European Society of Lymphology

TURKISH SOCIETY OF LYMPHEDEMA

47th Congress of European Society of Lymphology

May 30 - June 1, 2024

Hilton Bosphorus Hotel, İstanbul, Türkiye

ORGANIZED BY SOLO event

ABSTRACT BOOK

May 30, 2024	
Cappadocia Hall	
13:00 - 14:00	**Lymphology Past, Now and Future** **Chairs: Pınar Borman, Francesco Boccardo, Evangelos Dimakakos**
13:00 - 13:15	**A Historical Panorama of Istanbul in Regard to Medical Sciences** **Speaker**: Ahmet Özdinç
13:15 - 13:45	**History of ESL and Its Spirit** **Speakers**: Albert Leduc (video), Alexandre Pissas
13:45 - 14:00	**Past, Present and Future Scientific Perspectives of ESL** **Speaker**: Pierre Bourgeois
14:00 - 14:15	**Turkish Folklore Dance Show**
14:15 - 15:00	**Genetics and Lymphological Disorders** **Chairs: Sandro Michelini, Miikka Vikkula, Francesco Boccardo**
14:15 - 14:25	**Experimental Models for Lymphatic Malformation (LM)** **Speaker**: Taija Makinen (video)
14:25 - 14:35	**Primary Lymphedema (PL): Role of ERG** **Speaker**: Pia Ostergaard
14:35 - 14:45	**RASA1 Related Primary Lymphedema (PL)** **Speaker**: Isabelle Quere
14:45 - 14:55	**Novel Genetic Findings in Primary Lymphedema (PL) and Therapeutic Strategies** **Speaker**: Miikka Vikkula
14:55 - 15:00	**Discussion**
15:00 - 15:30	**Coffee Break**
15:30 - 17:00	**Imaging in Lymphological Disorders** **Chairs: Francesco Boccardo, Pierre Bourgeois, Evangelos Dimakakos, Murat Fani Bozkurt, Giuseppe Villa**
15:30 - 15:40	**Lymphoscintigraphy- The Gold Standard? How and When?** **Speaker**: Pierre Bourgeois
15:40 - 15:50	**US and Elastosonography in Lymphological Disorders** **Speaker**: Alberto Onorato
15:50 - 16:00	**Contribution of ICG Lymphography in Diagnosis and Treatment Management of Lymphedema** **Speaker**: Jean Paul Belgrado
16:00 - 16:10	**MR Lymphangiography in Clinical Practice** **Speaker**: Claus C. Pieper
16:10 - 16:20	**Indications and Information Deriving From Lymphatic Scintigraphy Alone and Combined with SPECT-CT** **Speaker**: Giuseppe Villa
16:20 - 16:30	**The Use of Noninvasive Imaging Techniques in the Assessment of Tissue Changes in Lymphedema** **Speaker**: Nele Adraienssens (video)
16:30 - 16:45	**Toxicity of ICG Do We Have To Take It Into Consideration** **Speaker**: Pierre Bourgeois
16:45 - 17:00	**Discussion**
17:00 - 18:00	**Basic Lymphology** **Chairs: Andrzej Szuba, Figen Ayhan, Şehim Kutlay, Miguel Amore**
17:00 - 17:10	**Anatomy of Lymphatic System – Crucial Importance of Anatomical Studies** **Speaker**: Miguel Amore
17:10 - 17:20	**Recent Advances in Physiology And Pathophysiology of Lymphatic System** **Speaker**: Andrzej Szuba
17:20 - 17:30	**Characterization of Molecular Mechanisms Involved in The Development and Age-Dependent Regression of Meningeal Lymphatics** **Speaker**: Zoltan Jakus
17:30 - 17:40	**Lymphatic System in Pathogenesis of Hypertension in Humans** **Speaker**: Angelika Chachaj
17:40 - 18:00	**Discussion**
Aspendos Hall	
09:00 - 11:30	**Diagnostic Ultrasound Workshop for Lymphedema, Lipedema and Related Disorders**
09:00 - 09:15	**Ultrasound Physics and General Principles** **Speaker**: Demirhan Dıraçoğlu
09:15 - 09:30	**Ultrasonographical Evaluation of Normal Skin and Subcutis** **Speaker**: Zeliha Ünlü
09:30 - 09:45	**The Role of Ultrasonography in Lymphedema Diagnosis and Treatment Follow-Up** **Speaker**: Alberto Onorato
09:45 - 10:15	**The Role of Ultrasonography in Lipedema Diagnosis and Treatment Follow-Up** **Speaker**: Burcu Duyur Çakıt
10:15 - 10:30	**Coffee Break**
10:30 - 11:30	**Hands on Practice with Patients**

18.15-19.15	**ESL Executive Committee Meeting**
Zeugma Hall	
08:30 - 12:30	**Genital Lymphedema Complete Decongestive Therapy (CDT) Workshop** **Chairs: Pınar Borman, Giovanni Moneta, Steve Norton**
08:30 - 08:45	**Genital Lymphedema Complete Decongestive Therapy (CDT) General Principles** **Speaker**: Pınar Borman
08:45 - 09:15	**The Schemes of Manual Lymphatic Drainage Tailored on Each Patients** **Speaker**: Giovanni Moneta
09:15 - 10:15	**Genital Manual Lymphatic Drainage (MLD)** **Speaker**: Steve Norton
10:15 - 10:30	**Coffee Break**
10:30 - 11:30	**Genital Bandaging** **Speakers**: Steve Norton, Mine Şimşek
11:30 - 11:45	**Exercises for Genital Lymphedema** **Speaker**: Giovanni Moneta
11:45 - 12:30	**Compression Garments for Genital Lymphedema** **Speaker**: Giovanni Moneta
Ephesus Hall	
09:00 - 12:00	**Wound Care Course** **Chairs: Christine Moffatt, Hakan Uncu, Figen Ayhan**
09:00 - 09:30	**General Approach to Wound Care in Lymphedema** **Speaker**: Christine Moffatt
09:30 - 10:15	**Lymphatic Ulcers and Treatment** **Speaker**: Alberto Maccio
10:15 - 10:30	**Coffee Break**
10:30 - 11:00	**Venous Ulcers and Treatment** **Speaker**: Hakan Uncu
11:00 - 12:00	**Wound Dressings** **Speaker**: Gaye Filinte
Olympos Hall	
09:00 - 12:30	**Head and Neck Lymphedema Complete Decongestive Therapy (CDT) Workshop** **Chairs: Pınar Borman, Mohammed Shafi**
09:00 - 09:20	**Head and Neck Complete Decongestive Therapy (CDT) General Principles** **Speaker**: Pınar Borman
09:20 - 10:00	**Drainage Pathways in Head and Neck Lymphedema** **Speaker**: Jane Wigg
10:00 - 10:15	**Exercises for Head and Neck Lymphedema** **Speaker**: Jane Wigg
10:15 - 10:30	**Coffee Break**
10:30 - 11:00	**Head and Neck Manual Lymphatic Drainage(MLD)** **Speaker**: Mohammed Shafi
11:00 - 11:45	**Head and Neck Bandaging** **Speaker**: Mohammed Shafi
11:45 - 12:30	**Compression Garments for Head and Neck Lymphedema** **Speaker**: Jane Wigg
Troya Hall	
10:00 - 12:30	**Patient Meeting: Self-Care in Lymphedema and Lipedema** **Chairs: Sevil Ceyhan Doğan, Hülya Uzkeser, Başak Mansız Kaplan**
10:00 - 10:15	**Skin Care in Lymphedema** **Speaker**: Başak Mansız Kaplan
10:15 - 10:30	**Self-Drainage Methods in Upper Extremity Lymphedema** **Speaker**: Hilal Yeşil
10:30 - 10:45	**Self-Drainage in Lower Extremity Lymphedema** **Speaker**: Aslıhan Ulusoy
10:45 - 11:00	**Self-Bandaging in Upper Extremity Lymphedema** **Speaker**: Feyza Begoğlu
11:00 - 11:15	**Coffee Break**
11:15 - 11:30	**Self-Bandaging in Lower Extremity Lymphedema** **Speaker**: Mine Şimşek
11:30 - 11:45	**Exercises in Upper Extremity Lymphedema** **Speaker**: Hülya Uzkeser

11:45 - 12:00	**Exercises in Lower Extremity Lymphedema** **Speaker**: Sevil Ceyhan Doğan
12:00 - 12:15	**Nutrition in Lipedema and Lymphedema** **Speaker**: Busem Atar
12:15 - 12:30	**What Is Lipedema? How Is It Treated?** **Speaker**: Ebru Şahin

May 31, 2024	
Cappadocia Hall	
08:30 - 09:00	**Meet the Experts** **CDT: Dosage of CDT in Multicausal Lymphedema Compared to Lymphedema in Pure Form** **Speaker: Etelka Földi**
09:00 - 10:00	**Vascular and Lymphatic Malformations and Primary Lymphedema** **Chairs: Pınar Borman, Isabel Quere, Lale Cerrahoğlu**
09:00 - 09:10	**Classifications of Primary Lymphatic Anomalies – Where Do We Stand?** **Speaker**: Pia Ostergaard
09:10 - 09:20	**Vascular Malformations Related with Lymphedema?** **Speaker**: Raul Mattasi
09:20 - 09:30	**Pediatric Lymphedema Management – What Do We Need To Improve?** **Speaker**: Isabel Quéré
09:30 - 09:40	**Adapting CDT for Pediatric Patients** **Speaker**: Pınar Borman
09:40 - 09:50	**4503 - Surgical Treatment of Arteriovenous Malformations of the Hand** Amriddin Rakhimov, Dmitrii Romanov, Maxim A. Korolev
09:50 - 10:00	**Discussion**
10:00 - 10:30	**Industry Sponsored Session** **Upper Limb Lymphedema Management:** **State of the Art and New Horizons in** **Maintenance Phase** **Speakers: Isabelle Quere, Pinar Borman**
10:30 - 11:00	**Coffee Break**
11:00 - 12:30	**Prevention, Early Diagnosis and Follow-up** **Chairs: Karin Johansson, Sibel Ünsal Delialioğlu, İpek Yeldan, Zeynep Erdoğan İyigün**
11:00 - 11:10	**The Role of Early Diagnosis In Prevention and Treatment of Lymphedema** **Speaker**: Karin Johansson
11:10 - 11:20	**Noninvasive Detection and Documentation of Objective Upper and Lower Extremity Lymphedema** **Speaker**: Stanley Rockson
11:20 - 11:30	**3062 - Establishment and Validation of Lower Limb Lymphedema Risk Prediction Model After Cervical Cancer Surgery Based on Artificial Neural Network** Gaoming Liu, Guorui Zhao, Ying Zhou, Yuanli Zeng, Jin Hu
11:30 - 11:40	**Myths and Facts in Skin Care** **Speaker**: Jane Wigg
11:40 - 11:50	**The Role of Exercise in Prevention and Treatment of Lymphedema** **Speaker**: Sandi Hayes
11:50 - 12:00	**Self Management in Prevention of Secondary Lymphedema** **Speaker**: Ayşe Arıkan Dönmez
12:00 - 12:10	**Surgical Prevention of Secondary Lymphedema – Where Are We Now?** **Speaker**: Francesco Boccardo
12:10 - 12:30	**Discussion**
12:30 - 13:30	**LUNCH**
13:30 - 15:00	**Let's Talk About Lipedema** **Chairs: Sandro Michelini, Isabel Forner Cordero, Pınar Borman, Marina Cestari, Öznur Öken**
13:30 - 13:40	**Latest Pathophysiology and Genomics In Lipedema** **Speaker**: Sandro Michelini
13:40 - 13:50	**Lipedema Today: Treatment and Progression** **Speaker**: Isabel Forner Cordero
13:50 - 14:00	**Comparison of Consensus Documents and Guidelines** **Speaker**: Philipp Kruppa
14:00 - 14:10	**Exercise and Life Style Changes in Lipedema** **Speaker**: Serena Michelini
14:10 - 14:20	**3D Ultrasonographyin Lipedema** **Speaker**: Marina Cestari
14:20 - 14:30	**Lymphangio-MR In Assessing Patients Affected From Lipedema** **Speaker**: Francesco Boccardo
14:30 - 14:40	**Role of Patient Associations in the Management of Lipedema** **Speaker**: Valeria Giordano (video)
14:40 - 15:00	**Discussion**
15:00 - 15:30	**Industry Sponsored Session** **Cryo-T Shock: A New Device As A Potential** **Adjunct Therapy for Lipedema** **Chair: Pınar Borman** **Speaker: Orhan Rodoplu**
15:30 - 16:00	**Coffee Break**

16:00 - 17:00	**Veins and Lymphatics: Inseperable Duo** **Chairs: A. Kürşat Bozkurt, Corradino Campisi, Erdal Aslım, Kanat Özışık**
16:00 - 16:10	**Phlebolymphedema, Mechanism** **Speaker**: H. Tankut Akay
16:10 - 16:20	**Science Per Aquam: Project For Vein- Lymphatic Patients** **Speaker**: Sergio Gianesini (video)
16:20 - 16:30	**Treatment in Pheloboedema** **Speaker**: Franz Josef Schingale
16:30 - 16:40	**Compression Therapy in Venous Insufficiency** **Speaker**: Erdal Aslım
16:40 - 16:50	**Surgery for Lymphedema Cardiovascular Surgeon's Perspective** **Speaker**: Deniz Çevirme
16:50 - 17:00	**Discussion**
17:00 - 18:30	**New Technologies and New Developments in Treatment of Lymphedema and Lipedema** **Chairs: Burcu Duyur Çakıt, Alberto Maccio, Aleksandra Rovnaya, Ayşe Nur Tunalı**
17:00 - 17:10	**DOT-IPC Mechanical Lymph Drainage New Combined Technique** **Speaker**: Alberto Maccio
17:10 - 17:20	**A Novel Approach in Lymphedema Treatment: Combining Biobridge and CDT** **Speaker**: Aleksandra Rovnaya
17:20 - 17:30	**ESWT Treatment in Lymphedema** **Speaker**: Nele Adraienssens (video)
17:30 - 17:40	**Ultrasound and Heat Therapies in Lymphedema** **Speaker**: Burcu Duyur Çakıt
17:40 - 17:50	**Ozone Therapy in Lymphedema** **Speaker**: Jane Wigg
17:50 - 18:00	**Tissue Engineering for Lymphatic Revascularization** **Speaker**: Corrado Campisi
18:00 - 18:10	**Developing New Treatment Protocols for Decongestive Lymphedema Treatment** **Speaker**: Jane Wigg
18:10 - 18:20	**Resolution of Inflammation in Lymphedema: A Discussion Therapeutic Pathway for An Unmet Medical Need** **Speaker**: Barbara Garmy-susini (video)
18:20 - 18:30	**2899 - Complete Decongestive Therapy and Deep Oscillation in The Treatment of Patients with Severe Lymphedema (Elephantiasis) – Case of Study** Catalina Musteata, Mariana Rotariu, Sanda Bolos
Aspendos Hall	
08:30 - 09:00	**Meet the Experts** **Wound Care** **Speaker: Tony Karlsmark**
09:00 - 10:00	**Differentiation of Edema in Legs and Infections** **Chairs: Alexandre Pissas, Meltem Dalyan, Christine Moffatt, Yasemin Çırak**
09:00 - 09:10	**Every Edema Is Not Lymphedema** **Speaker**: Stanley Rockson
09:10 - 09:20	**Cutaneous Manifestations of Lymphedema** **Speaker**: Tanja Planinsek Rucigaj
09:20 - 09:30	**Red Legs, Wet Legs and Cellulitis** **Speaker**: Tony Karlsmark
09:30 - 09:40	**Management of Cellulitis in Lymphedema** **Speaker**: Gurusamy Manokaran (video)
09:40 - 09:50	**7987 - Inflammation and Lymphatic Vessel Insufficiency Lead To Impaired Lymphatic Transport and Lymphedema in Obese Patients** Marzanna Zaleska, Natalia Krzesniak
09:50 - 10:00	**7922 - Ultrasonographic Classification and Progression Tracking in Dercum's Disease: A Study of Subcutaneous Adipose Nodules** Emily Iker
10:00 - 10:30	**Industry Sponsored Session** **Upper Limb Lymphedema Management:** **State of the Art and New Horizons in** **Maintenance Phase** **Speakers: Isabelle Quere, Pinar Borman**
10:30 - 11:00	**Coffee Break**
11:00 - 12:30	**Cancer Rehabilitation** **Chairs: Gülseren Akyüz, Dilşad Sindel, Jale İrdesel, Elif Akalın**
11:00 - 11:10	**Cancer Rehabilitation: Main Principles in Regard to Physical Medicine Rehabilitation (PMR)** **Speaker**: Vishaw Raj (video)
11:10 - 11:20	**Osteoporosis in Cancer** **Speaker**: Şansın Tüzün
11:20 - 11:30	**The Role of PMR Specialist in the Uncommon Problems of Patients with Cancer** **Speaker**: Gülseren Akyüz
11:30 - 11:40	**Lymphedema From Perspective of Medical Oncologists** **Speaker**: Berna Öksüzoğlu (video)

11:40 - 11:50	**Lymphedema From Perspective of Breast Surgeon** **Speaker**: Vahit Özmen
11:50 - 12:00	**Symptomatic Lymphedema in Cancer Diseases** **Speaker**: Sandro Michelini
12:00 - 12:10	**6319 - Effectiveness of Manual Therapy to Correct Scapular Dyskinesis in Post-Surgical Head and Neck Cancer Patients** Dr. Shailendra Kumar Mehta
12:10 - 12:20	**7302 - A Multi-Center Randomized Control Cross-Over Study to Evaluate the Effectiveness of A Novel Portable Non-Pneumatic Active Compression Device Vs. An Advanced Pneumatic Compression Device for Treating Lower Extremity Lymphedema** Stanley Rockson
12:20 - 12:30	**8039 - The Effect of Complete Decongestive Therapy in Patients with Lower Limb Lymphedema After Endometrial Cancer Surgery** Yuanli Zeng, Gaoming Liu, Zheng Peng, Anhui Zhang, Liqun Luo, Hua Li, Yuanyuan Liu, Ying Zhou
12:30 - 13:30	**LUNCH**
13:30 - 15:00	**Comorbidities Affecting Lymphedema Treatment** **Chairs: Amer Hamadé, Evrim Coşkun, Ebru Şahin, Didem Sezgin Özcan**
13:30 - 13:40	**Treatment of Lymphedema in Congestive Heart Failure and Kidney Failure** **Speaker**: Vaughan Keeley
13:40 - 13:50	**Chyloperitoneum: Diagnostic and Therapeutic Options** **Speaker**: Sara Dessalvi (video)
13:50 - 14:00	**Bandaging in Acute Lymphangitis** **Speaker**: Alberto Maccio
14:00 - 14:10	**Treatment of Lymphedema in Patients with Arterial Disease of Lower Limbs** **Speaker**: Amer Hamadé
14:10 - 14:20	**Percutaneous Lymphocele Sclerosis Using Povidoneiodine Combined with Aetoxisclerol** **Speaker**: Amer Hamadé
14:20 - 14:30	**Management of Lymphedema in the Presence of Deep Vein Trombosis** **Speaker**: Rebecca Elwell (video)
14:30 - 14:40	**Minimally-Invasive Procedures in Patients with Lymphatic Leakages, And Lymphatic Malformations** **Speaker**: Claus C. Pieper
14:40 - 14:50	**Multidisciplinary Approach to Difficult Lymphedema Cases with Obesity** **Speaker**: Franz Josef Schingale
14:50 - 15:00	**Discussion**
15:00 - 15:30	**Industry Sponsored Session** **Cryo-T shock: A New Device As A Potential Adjunct Therapy for Lipedema** **Chair: Pınar Borman** **Speaker: Orhan Rodoplu**
15:30 - 16:00	**Coffee Break**
16:00 - 17:00	**Nutrition in Lymphedema and Lipedema** **Chairs: Sandro Michelini, Roberto Cannataro, Meltem Vural, Ayça Utkan Karasu, Canan Şanal Toprak**
16:00 - 16:10	**Microbiata In Lymphedema and Lipedema** **Speaker**: Meltem Yalınay (video)
16:10 - 16:20	**Management of Inflammation Via Nutrition in Lipedema and Lymphedema** **Speaker**: Roberto Cannataro
16:20 - 16:30	**Dietary Supplements and Nutriceutical Approach in Lymphedema and Lipedema** **Speaker**: Serena Michelini, Sandro Michelini
16:30 - 16:40	**Ketogenic Diet Acts on Body Remodeling and MicroRNAs Expression Profile** **Speaker**: Roberto Cannataro
16:40 - 16:50	**The Importance of Vitamin D in Patients with Lipedema and Lymphedema** **Speaker**: Seçil Vural
16:50 - 17:00	**5383 - Evaluating the Impact of Micronized Purified Flavonoid Fraction with Vitamin D and Selenium on Lipedema** Emily Iker
17:00 - 18:10	**Pharmacological Treatments in Lymphedema and Related Conditions** **Chairs: Figen Ayhan, Sibel Ünsal Delialioğlu, Stanley Rockson, Kerem Alptekin, Alis Kostanoğlu**
17:00 - 17:10	**The Search for Pharmacological Solutions in Lymphatic Disease** **Speaker**: Stanley Rockson
17:10 - 17:20	**Musculoskeletal Pain Treatment in Cancer Patients: Rational Use NSAII, Myorelaxants and Analgesics** **Speaker**: Figen Ayhan
17:20 - 17:30	**Medical Treatment for Obesity?** **Speaker**: Dilek Yazıcı
17:30 - 17:40	**Pharmacological Treatment for Venous Insufficiency** **Speaker**: Dilek Erer
17:40 - 17:50	**Drug Therapy for Lymphatic Malformations** **Speaker**: Emmanuel Seront
17:50 - 18:00	**2292 - Effectiveness of Herbal Drug {Terminalia Arjuna} In Chronic Venous Insufficiency - A Prospective Observational Study.** Pratap Shankar K M
18:00 - 18:10	**8993 - Advantages and Safety of A Low-Carbohydrate, High-Fat (LCHF) Diet In the Reduction of Body Weight, Leg Volume, Adipose Tissue Pain, and Laboratory Parameters In Both Short And Long-Term Periods Among Women with Lipedema** Angelika Chachaj, Małgorzata Jeziorek, Monika Sowicz, Agnieszka Adaszyńska, Andrzej Szuba

Zeugma Hall	
08:30 - 09:00	**Meet the Experts** **Lipedema** **Speaker: Isabel Forner Cordero**
09:00 - 12:30	**Surgical Workshop for Lymphedema** **Chairs: Francesco Boccardo, Hakan Brorson, Hasan Büyükdoğan**
09:00 - 09:20	**Lymphatic-Venous By-Pass Surgery At the Obstruction Site** **Speaker**: Francesco Boccardo
09:20 - 09:40	**LY.M.P.H.A. Preventive Surgical Technique** **Speaker**: Francesco Boccardo
09:40 - 10:00	**Lymphatico-Venular Peripheral Subdermal Anastomoses** **Speaker**: Sarah Thomis
10:00 - 10:30	**Industry Sponsored Session** **Upper Limb Lymphedema Management:** **State of the Art and New Horizons in** **Maintenance Phase** **Speakers**: Isabel Quere, Pınar Borman
10:30 - 11:00	**Coffee Break**
11:00 - 11:20	**Lymph Nodal Transplants** **Speaker**: Corinne Becker
11:20 - 11:40	**Liposuction After CDT** **Speaker**: Hakan Brorson
11:40 - 12:00	**Liposuction After CDT + Microsurgery** **Speaker**: Corrado Campisi
12:00 - 12:30	**Postoperative Conservative Treatment of Lymphedema** **Speaker**: Karin Ohlin (video)
12:30 - 13:30	**LUNCH**
13:30 - 17:30	**Surgical Workshop for Lipedema** **Chairs: Hakan Brorson, Corrado Campisi, Reşat Aktaş**
13:30 - 14:15	**Lymph Vessel Sparing US Assisted Liposuction** **Speaker**: Corradino Campisi
14:15 - 15:00	**Liposuction of Lipedema: The Swedish Perspective** **Speaker**: Liss Anders
15:00 - 15:30	**Industry Sponsored Session** **Cryo-T shock: A New Device As A Potential** **Adjunct Therapy for Lipedema** **Chair: Pınar Borman** **Speaker: Orhan Rodoplu**
15:30 - 16:00	**Coffee Break**
16:00 - 16:30	**Case Series in Lipedema Surgery** **Speaker:** Ali Rıza Erçöçen
16:30 - 17:30	**Lipedema and Lipo-Lymphedema: Different Approaches to Maximize the Final Outcome?** **Speaker:** Corradino Campisi
Ephesus Hall	
08:30 - 09:00	**Meet the Experts** **Management of Axillary Web Syndrome** **Speaker: Mohammed Shafı**
09:00 - 10:00	**Free Papers 1 – Lymphedema Treatment Complete Decongestive Therapy (CDT)** **Chairs: Hilal Yeşil, Erkan Kaya**
4490 - Does Complex Decongestive Therapy Have An Effect on Balance Parameters in Patients with Breast Cancer-Related Lymphedema? Preliminary Report Elif Becenen Durmuş, Ayşegul Yaman, Fatma Melis Ertuğrul, Emre Adıgüzel, Şeyma Özmen, Şeyma Çiftçi, Zeynep Tuba Bahtiyarca, Emel Ekşioğlu	
7479 - Results of Combined Decongestive Therapy in Patients with Lower Extremity Lymphedema: Experience of Bursa City Hospital Lymphedema Rehabilitation Center Erkan Kaya, Beyza Işık, Nehar Sahin, Selma Kızıltoprak, Ömer Berkan Ozcan, Esra Nur Canazlar, Hatice Sümeyye Güçlü, Olgun Genç, Demet Canbaz, Tolga Canbaz, Taner Dandınoğlu	
6290 - Evaluation of the Effectiveness of Complex Decongestive Therapy and Cold Compression Application in Patients with Breast Cancer-Related Lymphedema Ayşegül Yaman, Hilal Büşra Ayçiçek Tüfekçi, Emre Adıgüzel, Arif Kenan Tan, Aysel Özge Kemer	
6021 - Demonstration of the Effectiveness of Continue Decongestive Therapy in Lymphedema Patients Who Develop After Total Knee Arthroplasty Cansın Medin Ceylan, Sedef Ersoy, Nur Kesiktaş, Armağan Özöbek	
5243 - Effect of Digital Combined Decongestive Therapy in Patients with Breast Cancer-Related Lymphedema: A Follow-Up Study Alis Kostanoğlu, Selva Otsay, Gökhan Can Törpü	
9947 - An Audit of the Efficacy of Lymph Drainage in the Management of Lymphedema Abeer Felmban, Shaima Bajunaid	

10:00 - 10:30	**Industry Sponsored Session** **Upper Limb Lymphedema Management:** **State of the Art and New Horizons in** **Maintenance Phase** **Speakers: Isabelle Quere, Pinar Borman**
10:30 - 11:00	**Coffee Break**
11:00 - 12:30	**Free Papers 2 – Imaging in Lymphology** **Chairs: Belgin Erhan, Marzanna Zaleska, Filiz Sertpoyraz**
6432 - Can LSC And ICG Help to Differentiate Lipedema From Lymphedema and Obesity? Marzanna Zaleska, Natalia Krzesniak	
7131-Status of the Superficial Lymphatic System in Patients with Chronic Venous Disease As Detected By ICG-Lymphography Marina Demekhova, Kirill Lobastov, Igor Sonkin, Tatyana Gurina, Astanda Bargandzhiya	
3756 - The Role of Lymphoscintigraphy in Lower Extremity Peripheral Edema Seckin Bilgic, Tugba Sahbaz	
8102 - IPC Effect on Edema Fluid Movement And Creation of New Roots of Fluid Drainage -Evaluation On ICG Lymphography Marzanna Zaleska, Natalia Krzesniak	
6755 -Evaluation of Elastographic Parameters in Patients with Breast Cancer-Related Lymphedema and Examination of Their Relationship with Clinical Data Merve Demirci, Canan Sanal Toprak, İlker Yağcı, Gulseren Akyuz	
3362 - Changes in Tissue Elasticity in Upper Limbs Lymphedema After IPC Compression Measured in USG Elastography Marzanna Zaleska	
5061 - Inter-Rater and Intra-Rater Reliability of Biomechanical Skin Stiffness Characteristics Measurement Via MyotonPRO Device in Patients with Breast Cancer–Related Lymphedema (BCRL) and Their Relationship with Ultrasonographic Tissue Changes Rabia Sanir, Esra Nur Türkmen, Feyza Akan Begoğlu, Feyza Ünlü Özkan, İlknur Aktaş, Gulseren Akyuz, Esra Gıray	
9552 - Relationship Between Lymphedema, Pain, Muscle Strength, Emotional State, And Kinesiophobia in Patients with Operable Breast Cancer Filiz Meryem Sertpoyraz, Murat Akyol, Elif Umay Altaş, Ecem Beytorun	
4657 - Does Ultrasonography Measurement of Upper Extremity Muscle Thickness Have Value In Evaluating Post Mastectomy Lymphedema Patients? : A Preliminary Study Kevser Gumussu, Cigdem Ozkara Bilgili, Mazatulfazura Sf Salim, Ayse Nur Coban, Zeynep Tumler, Ebru Yilmaz Yalcinkaya	
12:30 - 13:30	**LUNCH**
13:30 - 15:00	**Free Papers 3 – Education in Lymphedema and Lipedema** **Chairs: Ayça Utkan Karasu, Havva Çalış**
3381 - The Effect of A Mobile-Based Lymphedema Self-Care Support Program on Self-Care, the Quality of Life and Lymphedema Symptoms in Women with Breast Cancer-Related Lymphedema: A Single-Blind Randomized Controlled Study Zeynep Deveci Koçbilek, Özgül Karayurt, Özlem Bilik, Sibel Eyigör	
2709 - Investigation of the Effect of Lymphedema School on Functionality, Quality of Life, Lymphedema Volume and Body Value in Patients with Lower Extremity Lymphedema: A Quasi-Experimental Study Sibel Eyigör, Zeynep Deveci Koçbilek, Başak Durdu Akgün, Menekşe Özgür İnbat, Sedef Çalışkan Kabayel	
9178 - Does Digital Physiotherapy Demonstrate Effectiveness in Both Short and Long-Term Management of Lower Extremity Lymphedema? Alis Kostanoğlu, Selva Otsay, Gökhan Can Törpü	
7346 - A Brief Look At the Last 50 Years of Postmastectomy Lymphedema Research: A Bibliometric Study Elif Özyiğit, Mert Zure, Fatih Bağcıer	
1600 - Assessing YouTube Videos on Lymphedema for Patient Education: A Comprehensive Evaluation Ayça Utkan Karasu, Levent Karataş	
5568 - The Effect of Lymphedema School on Preventing the Development of Breast Cancer Related Lymphedema Zeynep Deveci Koçbilek, Sibel Eyigör, Menekşe Özgür İnbat, Sedef Çalışkan Kabayel	
3347 - Awareness And Knowledge of Lymphedema Among Breast Cancer Patients: A Cross-Sectional Study Dilek Baday-keskin, Selim Yalçın, Şerife Çobankaya	
8554 -Lymphangiosarcoma, A Rare Complication of Lymphostasis: The Role of the Physiotherapist In Early Recognition And Medical Referral. An Observational Survey of Physiotherapists" Alberto Macciò, Silvia Caruso, Chiara Palmero, Matteo Quattro, Lisa Biava, Tiziana Galli	
1873 - Lipoedema: Specialsit Training and Development Tool Stacy Pugh, Jane Wigg	
9267 - The Effect of Early Rehabilitation on Subdermal Fluid Level and Quality of Life After Breast Cancer Surgery Sozdar Söğüt Tekın, Orçin Tellı Atalay, Sevda Yilmaz, Atiye Kaş Özdemir	
15:00 - 15:30	**Industry Sponsored Session** **Cryo-T Shock: A New Device as a Potential** **Adjunct Therapy for Lipedema** **Chair: Pınar Borman** **Speaker: Orhan Rodoplu**
15:30 - 16:00	**Coffee Break**
16:00 - 17:30	**Free Papers 4 – Non-Surgical Treatment of Lymphedema** **Chairs: Sefa Gümrük, Elodie Stasi, Meltem Dalyan**
5321 - The Preview Study: Effectiveness of Whirlpool Treatment in Patients with Upper Extremity Lymphedema After Mastectomy Evrim Coşkun, Ebru Kübra Taşpolat, Esra Kutlu, Mücahit Atasoy	
9888 - Investigation of the Effect of Complex Decongestive Therapy on Balance and Proprioception Applied to Patients Who Developed Secondary Lymphedema in the Lower Extremities After Cancer Surgery: Pilot Study Emine Cihan, Cansu Şahbaz Pirinççi	

3715 - Does the Addition of Manual Lymphatic Drainage to Standard Treatment Impact Arm Volume In Patients with Breast Cancer-Related Lymphedema? A Randomized Controlled Trial with Long-Term Results Ekin İlke Şen, Sina Arman, Serhat Yavuz, Hadi Yavuz, Dilşad Sindel, Gizem Yıldırım	
5958 - Pharmacological Regulation of Lymphatic Drainage in Experimental Stroke Konstantin I. Ershov, Alexandra M. Shvetsova, Maxim A. Korolev, Pavel G. Madonov	
5134 - The Efficacy of Complete Decongestive Therapy Based on Fluoroscopy Guided Manual Lymph Drainage in 123 Chinese Patients with Breast Cancer-Related Lymphedema. Yuanyuan Liu, Xiaohua Song, Meifang Yuan, Qinqin Chen, Sha Ye	
8163 - The Chronic Effects of Dragon Boat Paddling on Bioelectrical Impedance Vector Applied To Body Composition Evaluation of Breast Cancer Survivors Elodie Stasi, Savino Sciascia, Dario Roccatello	
7757 - Lymphedema Rehabilitation – Between "No Men's Land" And "Terra Incognita". Bulgarian Clinical Experience Debut. Lyubina Vesselinova	
1528 - Lower Body Half Compression-Associated Effects on Cardiac Function in Secondary Leg Lymphedema Győző Szolnoky, Árpád Kormányos, Anita Kalapos, Nóra Ambrus, Péter Domsik, Lajos Kemény, Rolland Gyulai, Attila Nemes	
17:30 - 18:30	**Free Papers 5 – Surgical treatments for Lymphedema and Lipedema** **Chairs: Hüseyin Borman, Mehmet Veli Karaaltın, Dicle Aksöyler**
2732 - Excisional Procedures for Lymphedema Treatment: Is Charles Procedure Relevant? Vladimir Ivashkov, Sergey Semenov, Rayana Dakhkil'gova, Ivan Arutyunov, Alexander Legon'kih, Alexander Kolsanov, Andrey Nikolaenko, Aleksandr Denisenko	
1484 - Combined Treatment of Lower Limbs of Patients Affected by Elephantiasis As Results of Multiple Bariatric Surgery Roberto Risso, Elena Parodi, Mirco Ponsini, Corradino Campisi, Lidia Molinari, Arianna Demoro	
4063 - Lymphonodulovenous Anastomoses in the Complex Treatment of the Lower Extremity Lymphedema Vladimir Ivashkov, Sergey Semenov, Rayana Dakhkil'gova, Ivan Arutyunov, Alexander Legon'kih, Alexander Kolsanov, Andrey Nikolaenko, Aleksandr Denisenko	
5759 - The Multiple Level Vascularized Lymph Node Transfers Mehmet Veli Karaaltin	
9083 - Lower Leg Liposuction, Is It Worth Being Scared? Resat Aktas	
9556 - Pre- And Postsurgical Protocols: How to Decrease Risks of Lymphatic Surgery and Increase Efficacy Aleksandra Rovnaya	
Olympos Hall	
08:30 - 09:00	**Meet the experts** **CDT modifications for internal organ deficiencies (hypertension, heart, kidney and liver insufficiencies), Vaughan Keeley** **Speaker: Vaughan Keeley**
09:00 - 10:00	**Free Papers 6 – Quality of life and exercise therapies in lymphedema** **Chairs: Oya Yemişci, Fatma Nur Kesiktaş**
1834 - An Investigation of Body Image And Quality Life Among Patients with Lymphedema and Lipedema of the Lower Extremity Fatma Nur Kesiktaş, Sedef Ersoy, Merve Tanrıkulu, Armağan Özöbek, Kubra Uğurtay	
8916 - Lower Limb Lymphoedema and Quality of Life Fabio Romaldini, Daniela Vaglio, Serena Michelini, Elodie Stasi, Sandro Michelini, Marco Monticone	
1968 - The Relationship Between Self-Reported Swelling and Anxiety, Depression, Quality of Life and Overall Survival Post-Gynaecological Cancer Melanie Louise Plinsinga, Monika Janda, Hildegard Reul-hirche, Dimitrios Vagenas, Andreas Obermair, Kira Bloomquist, Sandra Hayes, Sandi Hayes	
1555 - Efficacy of Core Stabilization Exercises Applied with Complex Decongestive Physiotherapy in Patients with Cancer Related Lower Extremity Lymphedema Kübra Uğurtay, Sedef Ersoy, Rengin Demir	
2036 - The Effect of Clinical Pilates Exercises On Pain, Quality of Life, Depression and Aerobic Capacity in the Treatment of Secondary Lymphedema Esin Catakkaya, Ayla Çağliyan Türk, Tomris Duymaz	
9730 - A Comparison of the Efficacy of High-Intensity and Low-Intensity Resistive Exercises Applied to Patients with Upper Extremity Lymphedema Esra Konur	
10:00 - 10:30	**Industry Sponsored Session** **Upper Limb Lymphedema Management:** **State of the Art and New Horizons in** **Maintenance Phase** **Speakers: Isabelle Quere, Pinar Borman**
10:30 - 11:00	**Coffee Break**
11:00 - 12:30	**Free Papers 7 – Lipedema From Diagnosis to Treatment** **Chairs: Ayla Çağliyan Türk, Feyza Akan Begoğlu**
4684 - Assessment of Resting Microcirculation in Lipedema Using Laser Doppler Flowmetry Győző Szolnoky, Jetta Szabó, Orsolya Ágnes Péter, Attila Nemes, Zoltán Ruzsa	
5558 - Lipedema or Lipalgia ?: An Ultrasonographic Study Protocol Hüma Bölük Şenlikci, Sibel Ünsal Delialioğlu, Ayşe Merve Ata, Meltem Dalyan	
2104 - Multifaceted Treatment of Lipedema: A Case Series Hatice Durmuş, Ayşe Nur Benlibay, Zeynep Çelik, Rengin Yılmaz, Suat Doğancı	
2791 - Two Diseases of Soft Tissue: Fibromyalgia and Lipedema Mihrinur Dilvin Türköz, Zerrin Kasap, Benay Sari	
9880 - The Role of Inflammation In Lıpedema: Neutrophil Lymphocyte Ratio, Platelet Volume, Platelet Distribution Range Ayla Çağliyan Türk, Ender Erden, Pinar Borman	
9207 - Is the Pain in Lipedema A Neuropathic Pain? İzel Topaloğlu, Ebru Şahin, Nihan Erdinç Gündüz, Banu Dilek, Hülya Ellidokuz, Elif Akalın	

4019 - Relationship of the Tissue Stiffness Measured Using Shear Wave Elastography with the Pain Threshold and Quality of Life of Patients with Lipedema: A Cross-Sectional Study Feyza Akan Begoğlu, Gülcan Öztürk	
6044 - Body Composition by Bioelectrical Impedance and Ultrasonographic Findings in A Group of Patients with Lipoedema and Lower-Limb Lymphedema: Relation with Quality of Life and Functional Status Kerim Demirsöz, Pınar Borman	
12:30 - 13:30	**LUNCH**
13:30 - 15:00	**Free Papers 8 – Evaluation in Lymphedema** **Chairs: Gül Mete Civelek, Aleksandra Rovnaya, Alper Tuğral**
2237 - Behind the Scenes: The Dielectric Values of Males with Or Without Suffering From Breast Cancer-Related Lymphedema: A Pilot Study Alper Tuğral, Yeşim Bakar	
7575 - Moisturemeter: Can We Measure Different Values in the Breast Before Cancer Really Developes: A Pilot Study Decock Tim, Balduyck Bram	
6492 - Multifunctional Edema Tracking Device Şenay Çetinkaya	
1866 - {MRI Features of Lymphatic Flow Disturbances in Multifragmentary Fractures of the Ankle Joint} Julia Kononova, Victor Zuev, Amriddin Rakhimov, Nikolay Yarygin	
9798 - Frequency and Clinical Features of Pain in Lymphedema Bilge Kesikburun, Zeynep Sena Güneş, Meltem Dalyan, Pınar Borman	
2284 - Turkish Translation, Reliability and Validity of the Tool of Myofascial Adhesions in Patients After Breast Cancer (MAP-BC) Gökçenur Yalçın, Özden Tömek, Feyza Nur Yücel, Emre Ata, Yeliz Bahar Özdemir, Canan Şanal Toprak	
5236 - Development and Validity of Breast Cancer Related Lymphedema Knowledge, Attitude, Practice Questionnaire-Pilot Study Elif Duygu Yildiz, Ayşe Akduman, Hilal Karacan, Mustafa Şit	
8084 - A New Accurate and Reproducible Methodology to Standardize Limb Circumferences and Volume in Lymphedema Joseph Harfouche, Maxime Louys, Maxime Mathieu, Sarah Harnie, Nele Adraienssens	
3089 - Treatment of Malignant Lymphedema: Importance of Holistic Approach Elena Nikolaeva, Aleksandra Rovnaya	
15:00 - 15:30	**Industry Sponsored Session** **Cryo-T shock: A New Device as a Potential Adjunct Therapy for Lipedema** **Chair: Pınar Borman** **Speaker: Orhan Rodoplu**
15:30 - 16:00	**Coffee Break**
16:00 - 17:30	**Free Papers 9 – Breast Cancer Related Lymphedema** **Chairs: Zeliha Ünlü, Ayşegül Yaman, Esra Giray, Çağla Çicek**
5472 - Kinesiophobia, Physical Activity Levels and Barriers of Patients with Breast Cancer and Breast Cancer Survivors Compared to Healthy Controls Nuray Alaca, Kübra Türker Karayazı, Cihan Uras, Dilek Çağrı Arslan, Meryem Bektaş Karakuş	
3219 - Evaluation of Balance and Functional Status in Patients with Breast Cancer-Related Lymphedema Ayşegul Yaman, Emre Adıgüzel, Elif Becenen Durmuş, Zeynep Tuba Bahtiyarca, Emel Ekşioğlu	
9537 - The Co-Morbidities in Breast Cancer Related Lymphedema Fikriye Figen Ayhan, Tara Tekin, Ali Bavaghar, Azra Tunçer, Liman Mal-lawane, Moemen Eldereini, Lara Altay, İdil Erzengin, Rana Yılmaz, Muhammed Al-heyasat, Feyza Bilgin, Lin Ahmad	
6340 - Evaluation of the Relationship Between Lymphedema Symptoms And Edema Assessments in Patients with Breast Cancer-Related Lymphedema Aysel Ozge Kemer, Esra Uzelpasaci, Turkan Akbayrak, Serap Ozgul, Ayşegul Yaman, Ceren Gursen	
4381 - Investigation of Myofascial Pain Syndrome Co-Occurrence in Patients with Breast Cancer Related Lymphedema Gökçenur Yalçın, Özden Tömek, Feyza Nur Yücel, Yeliz Bahar Özdemir, Canan Sanal Toprak, Emre Ata	
6052 - Breast Cancer-Related Lymphedema: Evaluation of Sarcopenia with Ultrasonography Zeliha Ünlü, İlhan Celil Özbek, Emir Onağ	
7264 - Evaluation of Response to Treatment in Breast Cancer-Related Lymphedema Ezgi Yıldız Güvercin, Sibel Eyigör, Ece Çınar, Göksel Tanıgör, Menekşe Özgür İnbat, Sedef Çalışkan Kabayel	
3146 - The Effectiveness of Lymphedema Rehabilitation in Patients with Breast Cancer-Related Lymphedema; Ankara University Faculty of Medicine PMR Clinic Experience Seçilay Güneş, Burak Turan, Aysun Genç, Şehim Kutlay	
5125 - Qatar's Breast Cancer-Related Lymphedema and Functional Impairment: A Three-Year Data Collection Study Emad Abdalla, Anita Rebecca, Mohammed Shafi	
5881 - The Role of Physical Activity in Lymphedema Patients. Myths Vs Reality Andrea Damato, Aleksandra Rovnaia, Polly Armour	
17:40 - 18:30	**Free Papers 10 – Primary lymphedema** **Chairs: Emily Iker, Nilay Şahin, Onur Aksoy**
1240 - Ultrasonographic Evaluation of Lipedema Progression in Pediatrics Emily Iker	
9610 - Primary Lymphedema of Childhood: Treatment Results From A Tertiary Center Ece Cinar, Benil Nesli Ata, Sibel Eyigor	
4839 - Case Report: Family-Centered Comprehensive Treatment of Pediatric Lymphedema in Early Childhood (6 Months - 4 Years) Elena Parodi, Corradino Campisi, Arianna Demoro, Roberto Risso, Mirko Ponsini	
2863 - Klippel-Trenaunay Syndrome: What To Do? Amriddin Rakhimov, Dmitrii Romanov, Julia Kononova, Maxim Karev, Anastasiya Bryleeva	
7481 - The Relationship Between Joint Hypermobility Aad Primary Lymphedema Feyza Akan Begoğlu	

3929 - Management of Penis with Lymphedema - A Case Report Evangelos Dimakakos, Per. Tsitsopoulos, M. Toumanidou, A. Profka, V. Poulakis, K. Mileounis	
Troya Hall	
09:00 - 09:50	**Free Papers 11 – Lymphatic Anatomy and Related Conditions** **Chairs: Aylin Rezvani, Busem Atar**
6628 - Lymphatic Connection Between Palatine Tonsils and Heart (Literature Review) Hung Vu Duy, Fahed Alzawahreh, Vyacheslav Milov	
4542 - An Immunohistochemical Study on Distribution of Podoplanin-Positive Lymphatic Vessels And Podoplanin Deposition In Colorectal Neoplastic Legions. Eikichi Okada, H Hayashi, Y Yokoi, M Makino, S Terabe, N Takayanagi	
9983 - Automated Detection and Classification of Cancerous Cells Using Machine Learning Algorithms Shiv Singh Sarangdevot	
3755 - The Effect of Neoadjuvant Chemotherapy on Lymphedema Formation: Preliminary Results of a Prospective Clinical Study Ceren Hafızoğlu, Zeynep Erdoğan İyigün, Enver Özkurt, Naziye Ak, Ahmet Serkan İlgün, Tomris Duymaz, Çetin Ordu, Gürsel Remzi Soybir, Vahit Özmen	
1928 - Is There a Difference Between Right and Left Upper Extremity Involvement in Breast Cancer Related Lymphedema? Busem Atar, Burcu Duyur Çakit, Nursel Doğanyiğıt Kuzan, Ayşegül Yaman, Pınar Borman	
10:00 - 10:30	**Industry Sponsored Session** **Upper Limb Lymphedema Management:** **State of the Art and New Horizons in** **Maintenance Phase** **Speakers: Isabelle Quere, Pinar Borman**
10:30 - 11:00	**Coffee Break**
11:00 - 12:00	**Free Papers 12 – Epidemiology and Miscellaneous Topics in Treatment of Lymphedema** **Chairs: Sibel Mandıroğlu, Sandi Hayes**
8907 - Incidence of Cancer-Related Lymphedema: A Protocol and the Conduct of a Living Systematic Review with Meta-Analysis Melanie Louise Plinsinga, Ben Singh, Sandra Christine Hayes, Sandi Hayes	
6816 - Incidence and Identification of Plantar Oedema Stacy Pugh, Jane Wigg	
3675 - Association of Stemmer Sign Presence with Demographic and Clinical Data in Lymphedema Patients Mehmet Köksal, Havva Talay Çaliş, Ayşe Güç, Fatma Gül Ülkü Demir	
2330 - Covid-19 Vaccination in Patients with Breast Cancer Related Lymphedema Gül Mete Civelek, Onur Kara, Baran Tuncer, Meltem Dalyan	
7985 - Is it Time to Revolutionise Compression Stockings? Victor Izraylit, Muhammad Farhan, Sarai Herrmann	
3172 - Can It Be A Miracle ? Kinesiologic Taping for Lower Extremity Swelling in a Patient with Factor V Leiden Mutation Erkan Kaya, Nehar Sahin, Selma Kiziltoprak, Beyza Isik, Demet Canbaz, Tolga Canbaz, Ömer Berkan Ozcan, Hatice Sümeyye Guclu, Olgun Genç, Semih Yildirim, Taner Dandinoglu	
9847 - A Rare Cause of Lymphedema: Compression of the Vein by Osteophyte Formation Cevriye Mülkoğlu, Çağıl Özer, Burcu Duyur Çakıt	
12:30 - 13:30	**LUNCH**
15:00 - 15:30	**Industry Sponsored Session** **Cryo-T shock: A New Device As a Potential** **Adjunct Therapy for Lipedema** **Chair: Pınar Borman** **Speaker: Orhan Rodoplu**

June 1, 2024	
Cappadocia Hall	
08:30 - 09:00	**Industry Sponsored Session** **Meet the experts** **Treatment of Obese Patients with Lymphedema** **Speaker: Franz Josef Schingale**
09:00 - 10:30	**Surgical Treatment for Lymphatic Disorders** **Chairs: Francesco Boccardo, Martin Wald, Ufuk Emekli**
09:00 - 09:10	**Microsurgery Combined with Liposuction for Lymphedema: Which Are the Results** **Speaker**: Corrado Campisi
09:10 - 09:20	**Fifty Years for Lymphatic Surgery: Advances and Future Perspectives** **Speaker**: Corradino Campisi
09:20 - 09:30	**Liposuction for Lymphedema: Techniques, Results and Patient's Compliance** **Speaker**: Hakan Brorson
09:30 - 09:40	**Surgical Treatment of Genital Elephantiasis** **Speaker**: Martin Wald
09:40 - 09:50	**Surgical Management of Genital Lymphedema** **Speaker**: Gurusamy Manokaran (video)
09:50 - 10:00	**Other Microsurgical Techniques: Peripheral LVA, Lymph Nodal Transplants – Pros and Cons** **Speaker**: Sarah Thomis
10:00 - 10:10	**Lymphatic-Venous Bypass Surgery – Rational Approach on Pathophysiological Bases** **Speaker**: Francesco Boccardo
10:10 - 10:20	**Navigating Potential Pitfalls of Lymphedema Surgery for the Young Microsurgeon** **Speaker**: Anıl Demiröz
10:20 - 10:30	**Discussion**
10:30 - 11:00	**Coffee Break**
11:00 - 12:00	**Surgical Therapies in Lipedema** **Chairs: Corrado Campisi, Ali Rıza Erçöçen**
11:00 - 11:10	**Lymph Vessel Sparing Ultrasound- Assisted Liposuction** **Speaker**: Corrado Campisi
11:10 - 11:20	**Lipedema Surgery: Latest Techniques and Technologies** **Speaker**: Alexo Carballeira Braña (video)
11:20 - 11:30	**Tumescent Liposuction Technology for Lipedema Treatment** **Speaker**: Liss Anders
11:30 - 11:40	**Tissue Analysis Comparing Standard Liposuction with Other Techniques** **Speaker**: Corradino Campisi
11:40 - 11:50	**Superdry Liposuction in Treatment of Lipedema: A 20-Year Experience** **Speaker**: Ali Rıza Erçöçen
11:50 - 12:00	**Discussion**
12:00 - 13:00	**Closing Ceremony**
13:30 - 17:00	**Upper Extremity Complete Decongestive Therapy (CDT) Workshop** **Chairs: Figen Ayhan, Yeşim Bakar, Aleksandra Rovnaya**
13:30 - 14:00	**Upper Extremity Complete Decongestive Therapy (CDT) General Principles-Experiences** **Speaker**: Etelka Földi
14:00 - 15:15	**Upper Extremity MLD** **Speaker**: Aleksandra Rovnaya
15:15 - 15:30	**Coffee Break**
15:30 - 15:45	**Axillary Web Syndrome Management** **Speaker**: Sibel Ünsal Delialioğlu
15:45 - 16:15	**Upper Extremity Multilayer Bandaging** **Speaker**: Aleksandra Rovnaya
16:15 - 16:40	**Compression Garments for Upper Extremity Lymphedema** **Speaker**: Figen Ayhan
16:40 - 17:00	**Exercises for Upper Extremity Lymphedema** **Speaker**: Yeşim Bakar
Aspendos Hall	
08:30 - 09:00	**Meet the Experts** **Pediatric lymphedema** **Speaker: Isabel Quere**
09:00 - 10:30	**Outcome Measures in Lymphology** **Chairs: Joseph Harfouche, Oya Özdemir, Christine Moffatt, Nilüfer Kablan**
09:00 - 09:10	**Volume Assessment in Lymphedema: Perometer in Clinical Practice** **Speaker**: Alberto Maccio
09:10 - 09:20	**Tissue Dielectric Constant (TDC) Provide A Solution to Midline Oedema Assessment?** **Speaker**: Jane Wigg

09:20 - 09:30	**A New Accurate and Reproducible Methodology to Standardize Limb Circumferences and Volume in Lymphedema** **Speaker**: Joseph Harfouche
09:30 - 09:40	**Outcome Measures in Lymhedema** **Speaker**: Susan Norregaard
09:40 - 09:50	**Children QoL Tool** **Speaker**: Christine Moffatt
09:50 - 10:00	**Disability and Chronic Edema** **Speaker**: Asma Alderaa
10:00 - 10:10	**2347 - Use of Compliance Assessment Tool in Garment Prescription and Fitting for Patients with Lymphedema and Lipedema in the State of Qatar** Anita Rebecca Sundrasekaran, Mohammed Km Shafi, Emad Abdalla, Marwa Inoubli
10:10 - 10:20	**3972 - Evaluation of the Influence of IPC on Tissue Elasticity and Fluid Movement in Lower Limb Lymphedema Using USG Elastography and ICG Lymphography** Marzanna Zaleska
10:30 - 11:00	**Coffee Break**
11:00 - 12:00	**LERN Session and Education on Lymphology** **Chairs: Arun Rekha, William Repicci, Evrim Coşkun, Füsun Terzioğlu, Sefa Gümrük Aslan**
11:00 - 11:10	**Introduction to LE&RN's Centers of Excellence (COE)** **Speaker**: William Repicci
11:10 - 11:20	**How the Standards of COE Were Developed and the Standardized Approach Document** **Speaker**: Stanley Rockson
11:20 - 11:30	**Creating A COE Where Funding is A Challenge: India Chapter** **Speaker**: Shashi B. Gogia
11:30 - 11:40	**The Global Need of CEO's** **Speaker**: Arun Rekha
11:40 - 11:50	**European Society of Lymphology-Education on Lymphology: Where Are We?** **Speaker**: Evangelos Dimakakos
11:50 - 12:00	**Discussion**
12:00 - 13:00	**Closing Ceremony**
13:30 - 16:30	**Lower Extremity Lymphedema Complete Decongestive Therapy (CDT) Workshop** **Chairs: Oya Özdemir, Nilüfer Kablan**
13:30 - 13:50	**Lower Extremity Complete Decongestive Therapy (CDT) General Principles** **Speaker**: Oya Özdemir
13:50 - 14:30	**Lower Extremity Manual Lymphatic Drainage (MLD)** **Speakers**: Jeanette Zucker, Nilüfer Kablan
14:30 - 14:50	**Compression Garments for Lower Extremity Lymphedema** **Speaker**: Ayşegül Yaman
14:50 - 15:15	**Exercises for Lower Extremity Lymphedema** **Speaker**: Ayşegül Yaman
15:15 - 15:30	**Coffee Break**
15:30 - 16:30	**Lower Extremity Multilayer Bandaging** **Speakers**: Jeanette Zucker, Nilüfer Kablan
Zeugma Hall	
08:30 - 09:00	**Meet the Experts** **The use of Perometer in Lymphological Disorders** **Speaker: Alberto Maccio**
13:00-15:00	**ESL General Assembly**
Ephesus Hall	
08:30 - 09:00	**Meet the experts** **One Reference Point & One Confirmation Point: An Easy, Fast, and Accurate Method of Extremity Volume Assessment in Lymhedema** **Speaker: Joseph Harfouche**
09:00 - 12:30	**Self Management in Lymphedema Course** **Chairs: Evrim Coşkun, Arun Gogia, Elif Akalın**
09:00 - 09:30	**General Approach and New Technologies in Self Management of Lymphedema** **Speaker**: Evrim Coşkun
09:30 - 10:30	**Self Manual Lymphatic Drainage (MLD) for Upper & Lower Extremity Lyphedema** **Speaker**: Seçil Vural
10:30 - 11:00	**Coffee Break**
11:00 - 11:30	**Self Bandaging** **Speaker**: Arun Gogia
11:30 - 12:00	**Exercises for Upper Extremity Lymphedema** **Speaker**: Sefa Gümrük Aslan
12:00 - 12:30	**Exercises for Lower Extremity Lymphedema** **Speaker**: Ayça Utkan Karasu

13:00 - 15:00	**Kinesio Taping Course for Lymphedema and Musculoskeletal Problems in BCRL** **Chairs: Lale Cerrahoğlu, Figen Ayhan, Duygu Geler Külcü**
13:00 - 13:30	**General Principles of Kinesio Taping** **Speaker**: Pinar Borman
13:30 - 14:00	**Kinesio Taping for Upper Extremity Lymphedema** **Speaker**: Meltem Vural
14:00 - 14:30	**Kinesio Taping for Lower Extremity Lymphedema** **Speaker**: Figen Ayhan
14:30 - 15:00	**Kinesio Taping for Musculoskeletal Problems in Breast Cancer-Related Lymphedema** **Speaker**: Duygu Geler Külcü
Olympos Hall	
08:30 - 09:00	**Meet the Experts** **The Swelling and Edema In Rheumatoid Arthritis: Differential Diagnosis and Treatment** **Speaker: Aylin Rezvani**
09:00 - 13:00	**Minimal Invasive Therapeutical Approaches for Phelobological Problems Workshop** **Chairs: Suat Doğancı, Dilek Erer, H. Tankut Akay**
09:00 - 09:30	**Nonthermal Ablation for Venous Insufficiency** **Speaker: Erdal Aslım**
09:30 - 10:30	**Thermal Ablation for Venous Insufficiency** **Speaker**: Dilek Erer
10:30 - 11:00	**Coffee Break**
11:00 - 11:30	**Pharmacomechanical for Acute DVT** **Speaker**: Mustafa Şırlak
11:30 - 12:00	**Venous Stenting – Indications and Pitfalls** **Speaker**: Suat Doğancı
12:00 - 12:30	**Sclerotherapy- Technical Considerations** **Speaker**: Erdal Aslım
12:30 - 13:00	**Case Presentations for Lymphedema Venous Insufficiency and DVT**
Troya Hall	
08:30 - 10:30	**ICG Fluoroscopy Workshop: The Usefulness in Lymphology**
08:30 - 08:45	**Dynamic Testing of the Physiology of the Superficial Lymphatic Collectors** **Speaker**: Jean Paul Belgrado
08:45 - 09:00	**Clinical Cases of Primary and Secondary Lymphedema Observed Under the Eyes of ICG Lymphography** **Speaker**: Jean Paul Belgrado
09:00 - 10:30	**ICG Lymphography During MLD, Elastic Stocking, Under Water and Various Compression Systems** **Speaker**: Jean Paul Belgrado
10:30 - 11:00	**Coffee Break**
11:00 - 13:00	**Pressure Profile Under Compression in Real Time**
11:00 - 11:30	**Quality of Data From Different Pressure Measurement Instruments** **Speaker**: Jean Paul Belgrado
11:30 - 12:00	**Importance of Proper Positioning of Pressure Sensors Under Different Compression Systems** **Speaker**: Jean Paul Belgrado
12:00 - 12:30	**Analysis of Different Pressure Profiles in Decubitus, Orthostatic and Active Positions** **Speaker**: Jean Paul Belgrado
12:30 - 13:00	**Hands-On Examination of Pressure Profile Under Different Compression Systems** **Speaker**: Jean Paul Belgrado

E-POSTER PRESENTATIONS

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PP-002	8224	The Effect of Treatment With Tumor Type on Lymphedema Volume in Breast Cancer Patients Undergoing Complex Decongestive Lymphedema Therapy - Retrospective Study **Kubra Turker, Nuray Alaca, Nuray Alaca, Cihan Uras**
PP-003	5903	The Treatment of Elephantiasis Nostras Verrucosa with Complete Decongestive Therapy **Özge Büşra Arar Batur, Hande Yakar, Cansu Şahbaz Pirinççi, Pınar Borman**
PP-004	5216	A case of very early skin wound complications after lymphedema bandaging **Sedat Öztürk, Mustafa Toprak**
PP-005	4955	The Effects Of Two Different Types Of Compression Garments On Extremity Volume And Patient Satisifaction In Lymhedema Patients **Orçin TELLİ ATALAY, Sozdar SÖĞÜT TEKİN, Atiye KAŞ ÖZDEMİR, Sevda YILMAZ**
PP-006	9531	Complete Decongestive Therapy in the Estonian Healthcare: An Overview **Katrin Kõre**
PP-007	9748	Complete Decongestive Therapy Provided at the North Estonia Medical Centre, 2014-2023 **Katrin Kõre**
PP-008	4220	Experience of Bursa City Hospital Lymphedema Rehabilitation Center: What did we do to the patients with breast cancer related lymphedema? **Erkan KAYA, Nehar SAHIN, Beyza ISIK, Selma KIZILTOPRAK, Demet CANBAZ, Tolga CANBAZ, Ömer Berkan OZCAN, Ismail Oguz HUR, Dogukan YAMAN, Bulut CAKIR, Taner DANDINOGLU**
PP-009	7195	First Steps to Becoming a Lymphedema Rehabilitation Center: Case Series **Selda Çiftci İnceoğlu, Aylin Ayyıldız, Banu Kuran**
PP-010	6488	The influence of social determinants of health on lymphedema outcomes **HARI KASHYAP**
PP-011	8658	Lymphedema And Obesity: A Systematic Review. **Cedeño-Sánchez César A., Rosa Just-Ferrer, Àngela Andrés-Millet, Isabel Forner-Cordero**
PP-012	8533	The Clinical Characteristics of Lower Extremity Lymphedema in 116 Patients **Feyza Akan Begoğlu**
PP-013	9120	Often Ignored: Breast Edema **Faika Nur Erkol, Cihan Uras, Nuray Alaca**
PP-014	8815	The Effect of Postmastectomy Lymphedema on Upper Extremity Function: Preliminary Results **Hasan Ocak, Oya Özdemir**
PP-015	5735	The Determination of Factors Associated with Lymphedema in Women Who Have Undergone Breast Cancer Surgery **Tugce Sirin Korucu, Tugce Sirin Korucu, Sevtap Gunay Ucurum, Engin Tastaban, Hedef Ozgun, Derya Ozer Kaya**
PP-016	2582	A RARE CASE OF BREAST CANCER RELATED LYMPHEDEMA: CUTANEUS METASTASIS **Aslı Turan, Sibel Ünsal Delialioğlu, Esra Uçaryılmaz Özhamam, Meltem Dalyan**
PP-017	2440	Evaluatıon Of Fıbromyalgıa In Patıents Wıth Operated Breast Cancer - Preliminary Study Results **Filiz Meryem Sertpoyraz, Murat Akyol, Ecem Beytorun, Elif Umay Altaş, Ömer Faruk Aslan**
PP-018	2117	Anterior Interosseous Nerve Syndrome Following Breast Cancer Related Lymphedema: A Rare Case **Fatma Betül Kıvanç İnanöz, Ekin İlke Şen, Merih Akpınar, Sina Arman, Dilşad Sindel**
PP-019	8937	Development of the wearable arm volume measurement device and mobile application (mobiLenf) in the prevention and early detection of breast cancer-related lymphedema and evaluation of their efficiency: A protocol for a randomized trial **İsmail Toygar, Gulcan Bagcivan, Ayse Arikan Donmez, Cigdem Fulya Donmez, Furkan Bilek, Mehmet Durmus Calisir, Yasin Karan, Pinar Borman**
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PP-021	9398	The Effect of Low-Intensity Extracorporeal Shock Wave Therapy on Lower Extremity Circumference Measurement in Lipedema: A Case Series **Hatice Durmuş, Ayşe Nur Benlibay, Zeynep Çelik, Rengin Yılmaz, Suat Doğancı**
PP-022	7576	Prevalence Of Joint Hypermobility In Lipedema Patients. **Isabel Forner-Cordero, Juan Vazquez-Diez, Jose Muñoz-Langa**
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PP-024	3531	The impact of lipedema on female sexual function, quality of life, and mood: A cross-sectional study **Hilal Yesil**
PP-025	1569	Nutritional Intervention In Patients With Lipedema: A Clinical Case **Eraci Drehmer Rieger, Isabel Forner Cordero, Naiara Piedrafita Gibanel**
PP-026	4770	Management of lipedema with biphasic ketogenic diet/lowcarb diet, follow up after surgical intervention **Roberto Cannataro**
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PP-029	8799	Lymphedema in a Patient with Parkinson's Disease: Is It Only Due to Restriction of Mobilization? Or is Lymphatic Microangiopathy Developing? **Selda Çiftci İnceoğlu, Aylin Ayyıldız**
PP-030	8111	Neck, trunk, and arm lymphedema after thoracic outlet surgery **Sedef Ersoy, Fuat Orhun Alaylıoğlu, Armağan Özöbek, Kübra Uğurtay**
PP-031	7394	Lymphedema Following Covid-19 Infection: A Case Series of 3 Young Patients **Hasan Ocak, Oya Özdemir**
PP-032	5419	Lymphedema in a Patient with Yellow Nail Syndrome **Abdülhamid Güneş, Busem Atar, Burcu Duyur Çakıt**
PP-033	3860	A Rare Cause of Lymphedema: Cat Scratch Disease **Faika Nur Erkol, Nuray Alaca, Reyhan Çeliker**
PP-034	2885	Acquired lymphedema as a red flag sign: A case of endometrial sarcoma presenting with subclinical lower extremity lymphedema **Nur Kakilli, Semiha Öztürk Yıldız, Derya Demirbağ Kabayel**
PP-035	2780	Genital Lymphedema: A Complex Case Presentation **Büşra Nur Aslantaş, Tuğba Akkaya, Şansın Tüzün**
PP-036	4692	Vascularized Lymph Node Transplantation for the Treatment of Factitious Lymphedema: A Case Report **Dicle AKSOYLER, Ilker OZGUR, Cagla CANBAY SARILAR, Emre Sertac BINGUL, Mustafa ALTINKAYNAK, Dilara DENIZMEN, Enes KUSDOGAN, Emre OZBEY, Mehmet Can NERGIZOGULLARI, Aykan HATIPOGLU**

PP-037	2471	The management of varicose veins with concomitant lymphedema of lower extremities. A case report. **Tatiana Chernyago**
PP-038	5912	Complete Decongestive Therapy for Persistent Localized Swelling in the Hand Following Complicated Soft Tissue Infection: A Case Report **Ayça Utkan Karasu, İlknur Onurlu**
PP-039	9094	Treatment of Head and Neck Lymphedema Following Surgery and Radiotherapy for the Laringeal Squamous Cell Cancer; A Case Report. **İzel Deniz Pehlivan Çakıcı, Sedef Ersoy, Armağan Özöbek, Fatma Nur Kesiktaş**

*** Using e-poster kiosks in the exhibit area, our attendees can access the poster presentations.**

ORAL PRESENTATION

OP-001

Ultrasonographic Evaluation of Lipedema Progression in Pediatrics

Emily Iker[1]

[1]lymphedemacenter

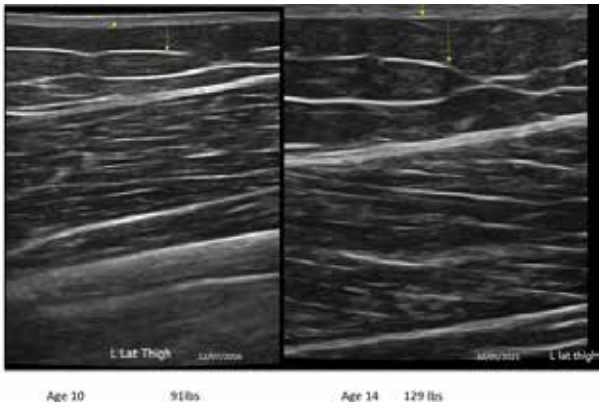
Objectives: This case study aimed to longitudinally evaluate the progression of lipedema in a pediatric patient using ultrasonography, focusing on changes in subcutaneous tissue thickness, hypoechogenicity, and fascia over a six-year period.

Background: Lipedema presents significant diagnostic challenges, especially in pediatric populations, due to its similarity to other conditions. Accurate diagnosis and monitoring are crucial for effective management and treatment.

Methods: The case study involved annual ultrasonographic evaluations of a female pediatric patient aged 10 to 16, using a Terason 3200 model with a 15 MHz probe. Assessments were performed at four anatomical sites to document changes in skin, subcutaneous tissue, and fascia.

Results: Results showed a consistent increase in subcutaneous fat thickness and fascial changes, highlighting ultrasonography's value in diagnosing and monitoring lipedema. These findings emphasize the importance of early diagnosis and the potential for ultrasonography to guide treatment strategies.

Comparison



Conclusions: The study demonstrates ultrasonography's utility in tracking lipedema progression in pediatric patients, reinforcing the need for early and accurate diagnosis. The insights gained underscore the importance of incorporating ultrasonography into the diagnostic and monitoring protocols for pediatric lipedema, potentially influencing future treatment approaches.

Keywords: Pediatric Lipedema, Ultrasonography, Longitudinal Study, Subcutaneous Tissue

OP-002

Combined treatment of lower limbs of patients affected by elephantiasis as results of multiple bariatric surgery

Arianna Demoro[1], Roberto Risso[1], Elena Parodi[1], Mirco Ponsini[1], Corrado Campisi[1], Lidia Molinari[1]

[1]Campisi & partners

Objectives: Combined treatment of lower limbs of patients affected by elephantiasis as results of multiple bariatric surgery

Background: The study that we are presenting deals with a clinical case of primary lymph.In the lower left limb and of lipofibromatosis in the lower right limb, involving both superficial and deep structures. The patient had multiple bariatric surgeries with weight loss, opposed by worsening lymphatic disease: reaching the 3rd stage of elephantiasis, ulceration, movement difficulties, worsening the general conditions. When the patient first arrived we measured with the perometer a volume of 16753mL for the left leg and 20176 for the right leg.

Before treatment

Methods: After multiple medications on several ulcerations and functional multilayered bandages to reduce the edema, the patient began to perform the CPT.

Results: After one month the clinical status of the patient has improved enough for a MLVA to the left leg. The results were astonishing, showing weight loss, decrease of edema, improved physical abilities. Volumes have decreased, with the right leg measuring 9153mL and the left leg 8670mL.

After the treatment

Conclusions: The patient will have more MLVA and FLLA surgeries in order to reach a standard quality of life.

Keywords: elephantiasis, Obesity, Lymphoedema, Limbs

OP-003

Lower Body Half Compression-associated Effects On Cardiac Function In Secondary Leg Lymphedema

Győző Szolnoky[1], Árpád Kormányos[2], Anita Kalapos[2], Nóra Ambrus[2], Péter Domsik[2], Lajos Kemény[1], Rolland Gyulai[1], Attila Nemes[2]

[1]Department of Dermatology and Allergology, Albert Szent-Györgyi Medical School, University of Szeged, Szeged, Hungary
[2]Department of Medicine, Albert Szent-Györgyi Medical School, University of Szeged, Szeged, Hungary

Objectives: Lower body half compression of bilateral secondary leg lymphedema (LE) without relevant cardiac insufficiency gives rise to the examination whether external leg compression may influence LV function measurable with two-dimensional transthoracic echocardiography (2DTTE) for general assessment and three-dimensional speckle-tracking echocardiography (3DSTE) for precise analysis.

Background: However baseline and posttreatment assessments of LE are usually restricted to local alterations, cardiovascular systemic impacts should also deserve attention. Theoretically, lymphedema-related fluid retention and its evacuation may affect left ventricular (LV) as the heart's main pump's mechanics which could be detailed by recent three-dimensional speckle-tracking echocardiography.

Methods: Patients with stage 2 leg secondary LE and age- and gender-matched controls were subjected to baseline 2DTTE then 3DSTE was conducted for the assessment of LV rotational mechanics where apical (AR), basal rotations (BR) and LV strains (local myocardial shortening, thickening and lengthening) were measured before and 1 h after the use of compression class 2 (ccl 2) flat-knitted medical compression pantyhoses (MCP) (pressure range: 23-32 mmHg).

Results: 2DTTE showed significantly larger LV end-diastolic volume and ejection fraction among LE patients compared with control subjects (108.3 ± 20.1 vs. 98.5 ± 21.7 mL, 69.8 ± 4.8 vs. 65.5 ± 4.3%, respectively) and notably smaller LV end-systolic diameter and posterior wall thickness (28.9 ± 3.5 vs. 31.2 ± 3.4 mm, 8.1 ± 1.0 vs. 9.0 ± 1.7 mm, respectively). The rotational parameters of LE patients did not differ significantly from those of matched controls except significant reduction of LV BR following the application of MCP (-2.70 ± 1.26 degrees after 60-minute compression in patient group vs. -4.28 ± 2.18 degrees of the control group; $P < 0.05$).Baseline global LV circumferential and area strains and mean segmental LV circumferential strain were higher in lymphedema patients compared to controls. One hour after the use of MCP global and mean segmental LV strains remined nearly unaltered however a remarkable tendency of reduction was seen in LV circumferential strain. LV segmental analysis showed a significant increase in midventricular LV radial, circumferential and area strains whereas basal LV longitudinal and midventricular LV three-dimensional strains were decreased as compared to controls.

Conclusions: The application of MCP moderately but significantly decreased LV BR without a remarkable impact on twisting mechanism in LE patients. LE is featured by increased global LV circumferential strain nevertheless MCP altered LV deformation parameters towards the normal range highlighting some beneficial influences on cardiac function.

Keywords: left ventricular rotation, strain, lymphedema compression, echocardiography

OP-004

EFFICACY OF CORE STABILIZATION EXERCISES APPLIED WITH COMPLEX DECONGESTIVE PHYSIOTHERAPY IN PATIENTS WITH CANCER RELATED LOWER EXTREMITY LYMPHEDEMA

Kübra Uğurtay[1], Sedef Ersoy[1], Rengin Demir[2]

[1]SUAM Istanbul physical medicine nd rehabilitation training and research hospital
[2]İstanbul University-Cerrahpaşa Institute of Graduate Studies Department of Cardiology Physiotherapy and Rehabilitation

Objectives: The aim of the study is to evaluate the effect of core stabilization exercises with Phase I Complex Decongestive Physiotherapy (CDP) on edema, exercise capacity, physical activity level, lower extremity functionality, balance and quality of life parameters in unilateral lower extremity lymphedema caused by cancer.

Background: Lower extremity lymphedema due to secondary causes is a life-long complication. The most common factors causing secondary lymphedema in the lower extremities are genital area cancers, surgical interventions, trauma, radiotherapy and recurrent infections. Complex decongestive treatment is now considered the gold standard in the treatment of lymphedema. We evaluated whether core stabilization exercise has an additional effect on complex decongestive treatment in patients with lower extremity lymphedema caused by cancer.

Methods: The study included 26 patients aged 43-79 years with cancer-related lymphedema. Patients were randomly divided into treatment group (n=13) and control group (n=13). The treatment group received phase I CDP and Core Stabilization exercises. In the control group, only phase I CDP was applied. The treatment of bot hgroups was performed 5 days a week for 4 weeks. In the treatment group, core stabilization exercises were performed 3 days a week during the treatment period. Demographic information of the patients was recorded on the evaluation form. The measurements were performed before and after the treatment. Edema was assessed by xvi circumference measurement and frustum formula; exercise capacity by 6 Minute Walking Test (6MWT); physical activity level by International Physical Activity Questionnaire-Short Form (IPAQ); balance by Berg Balance Scale (BBS); quality of life by Lymphedema Quality of Life Scale-Leg (LYMQOL); lower extremity functionality by Lower Extremity Functionality Scale (LEFS). Body mass index (BMI) was also evaluated before and after treatment.

Results: When the demographic characteristics and other evaluation parameters of both groups were compared before treatment, the results were similar ($p>0.05$). In post-treatment measurements, improvement was observed in all parameters in both groups. In addition, the treatment group showed more improvement in circumference measurements, physical activity level, balance, lower extremity functionality and quality of life parameters compared to the control group ($p<0.05$). Improvements in BMI, edema volume and exercise capacity were similar in both groups ($p>0.05$).

Conclusions: The results of this study showed that core stabilization exercises given to CDP were effective in parameters related to edema, exercise capacity, physical activity level, balance, lower extremity functionality and quality of life. It was concluded that core stabilization exercises are an alternative option for the treatment of lower extremity lymphedema.

Keywords: Cancer Related Lymphedema, Complex Decongestive Physiotherapy, Core Stabilization Exercises, Quality of Life

OP-005

Assessing YouTube Videos on Lymphedema for Patient Education: A Comprehensive Evaluation

Ayça Utkan Karasu[1], Levent Karataş[1]

[1]Gazi University Faculty of Medicine, Physical Medicine and Rehabilitation Department

Objectives: Our principal aim was to critically examine and assess the reliability, accuracy, understandability, actionability and popularity of lymphedema-related videos from the perspective of patient education.

Background: In recent years, the incidence of lymphedema has been on the rise. The global availability of professionals providing health services for lymphedema is severely limited. This situation leads patients to turn to alternative sources of information. YouTube stands out as one of the most frequently consulted platforms. Recent research on YouTube videos indicates notable shortcomings, including deficiencies in content quality, objectivity, reliability, and comprehensibility. There are few studies evaluating the quality and reliability of YouTube videos. However, merely assessing the quality of videos is insufficient to determine their value for patient education. It is also important to utilize tools that evaluate educational materials.

Methods: Using the search keywords “lymphedema” and “lymphedema treatment” we analyzed the 54 most relevant videos. Our video popularity analytics encompassed viewing rate, like ratio, number of comments, and the video power index (VPI). We assessed content quality using the Global Quality Scale (GQS), the modified DISCERN questionnaire score, the Journal of the American Medical Association (JAMA) benchmark criteria score, Patient Education Materials Assessment Tool for Audio/Visual Materials (PEMAT-A/V).

Results: A significant portion of the analyzed videos originated from private health institutions (%25.9) and private health professionals (%24.1). The view rate (11.5) and VPI (11.1) of the videos were relatively modest. Based on the profession of those providing information content quality scale scores were higher in videos where lymphedema specialists/therapists provided information (Table 1). The understandability and actionability of videos correlate with popularity and impact of the videos and also view rate, video duration, and image quality. The quality, flow, and relevance of information in the videos (GQS) were correlated with the popularity and impact of the videos and view rate. The JAMA Benchmark Criteria, which evaluate authorship, appropriate citation of sources, currency of information, and disclosure of conflicts of interest, were correlated with the like ratio and video duration (Table 2).

Table 1. Video analytics and content quality scales based on the profession of information providers.

	Physician (n:23)	Lymphedema Therapist (n:21)	Others (n:10)	P value
Video duration (seconds)	196 (83-1462)	379 (80-908)	193.5 (118-552)	0.037
Number of likes	88 (4-33991)	246 (0-6800)	222.5 (55-1700)	0.217
Number of dislikes	2 (0-1073)	10 (0-1021)	8.5 (0-47)	0.346
Like ratio (%)	99.1 (88.4-100)	98.6 (75.7-100)	97.2 (94-100)	0.589
View rate (views/days)	5.99 (0.1-879.7)	31.5 (0.6-757)	16.3 (6.4-50.1)	0.226
Video power index	5.6 (0.1-785.8)	46.1 (0.6-612)	16.0 (6.2-49.5)	0.162
GQS	2 (1-5)	4 (1-4)	2 (1-4)	0.006
JAMA benchmark criteria	2 (1-3)	2 (1-4)	1 (1-3)	0.012
Modified DISCERN	2 (0-3)	2 (1-5)	1.5 (0-3)	0.008
PEMAT-A/V understandability	60 (33.3-100)	80 (44.4-90.9)	63.6 (54.5-90.9)	0.024
PEMAT-A/V actionability	0 (0-100)	66.7 (0-100)	0 (0-66.7)	<0.001

Table 2. Correlation coefficients between content quality scores and video analytics

Video Analytics	GQS	Modified DISCERN	JAMA Benchmark Criteria	PEMAT-A/V Understandability	PEMAT-A/V Actionability
VPI	0.333*	0.186	-0.21	.308*	0.403**
View rate	0.359**	0.216	-0.038	0.332*	0.492**
Like ratio	0.033	-0.031	0.310*	-0.80	-0.103
Number of comments	0.265	0.233	0.049	0.199	0.403
Video duration	0.265	0.265	0.376**	0.402**	0.551**
Image quality	0.252	0.046	0.216	0.278*	0.360**

Conclusions: Our findings suggest that lymphedema-related videos on YouTube are characterized by average content quality and understandability, but a lack of reliability and actionability. To ensure individuals seeking accurate lymphedema information on social media platforms we recommend directing them to videos uploaded by lymphedema specialists/therapists.

Keywords: lymphedema, youtube, reliability, quality

OP-006

An investigation of body image and quality life among patients with lymphedema and lipedema of the lower extremity

Fatma Nur Kesiktaş[1], Sedef Ersoy[1], Merve Tanrıkulu[1], Armağan Özöbek[1], Kübra Uğurtay[1]

[1]SBU İstanbul Physical Medicine and Rehabilitation Training And Research Hospital

Objectives: The present study is aimed to investigate the body image (body dissatisfaction, body invesment) and quality life among patients with lymphedema and lipedema of the lower extremity.

Background: In modern times, women see slimness as being an ideal. Shapelessness and lack of physical aesthetics of lower limb lymphedema patients affects Daily life and psychology. The onset of lipedema pathophysiology is thought to occur during periods of hormonal fluctuation and it is affected to patients psychology. It is aimed to investigate the body image and quality life among patients with lymphedema and lipedema of the lower extremity.

Methods: Cross-sectional data was collected from outpatient and inpatient lymphedema management units. Body Image Questionnaire, Beliefs About Appearance Scale (BAAS), Lymphedema Quality of Life for lower limb, body mass index, characteristic of secondary lymphedema and lipedema, demographics were recorded. SPSS statistic programme was used for analysing data of patients with secondary lymphedema and lipedema of the lower extremity.

Results: Participants were included patients with secondary lymphedema (n =14) and lipedema (n =12) of lower extremities. Lymphedema and lipedema presence and severity were evaluated by circumferential measurement and nearly all patiets severity were mild. All participants were female. 76.9% (n=20) were married. 73,1% (n=19) has no work. Ages of patients were 35-80 years. Mean age of all participants was 57,27±11,5 years. Mean Body Mass Index of secondary lymphedema group was 36,57±6,92 and for lipedema group was 36,58±6,72. Score of Lymphedema Quality of Life was 2,34±0,8 in secondary lymphedema group, 2,59±0,57 in lipedema group, Body Image scores were 128,28±29,28 in lymphedema group and 121,08±28,42 in lipedema group. Beliefs About Appearance Scale (BAAS) scores were 40,21±22,71 in lymphedema group and 39,0±21,9 in lipedema group, There were not statistical significance between groups' Body Image Questionnaire, Beliefs About Appearance Scale (BAAS), Lymphedema Quality of Life for lower limb, body mass index, ages.When 26 patients were evaluated for correlations, there were statistical siginificant correlations between body image queationnaire and Lymphedema Quality of Life ($r=-0.568$, $p<0.02$ spearman test),and BAAS ($r=-0.540$, $p<0.004$ spearman test).

Conclusions: In this study, Body image negative role is a problem for both groups. It effects psychology and quality of life. Sample size was limited in this study. Large sample sized studies are needed in the future.

Keywords: lympheudema, lipeudema, body image, quality of life

OP-007

{MRI Features of Lymphatic Flow Disturbances in Multifragmentary Fractures of the Ankle Joint}

Julia Kononova[1], Julia Kononova[3], Victor Zuev[2], Amriddin Rakhimov[4], Nikolay Yarygin[1]

[1]Department of Traumatology, Orthopaedics and Disaster Medicine, FSBEI HE "RUSSIAN UNIVERSITY OF MEDICINE" OF THE MINISTRY OF HEALTH OF THE RUSSIAN FEDERATION, Moscow
[2]Department of Radiology, I.M. Sechenov First Moscow State Medical University, Moscow, Russia
[3]Surgical Department, Central Clinic of the Ministry of Internal Affairs of the Russian Federation, Moscow
[4]Center of Vascular Pathology, Moscow

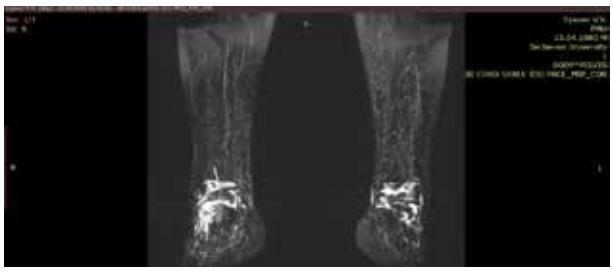
Objectives: To enhance the MR lymphography protocol in order to evaluate secondary vascular changes at the injury site, facilitating treatment and rehabilitation planning for patients with comminuted ankle joint fractures.

Background: Success in treating patients with multifragmented ankle joint fractures is hindered by the development and spread of limb edema. Post-traumatic edema is often underestimated in when manifesting as secondary lymphedema and can lead to functional pathology in the affected joint. MR lymphography is an optimal method for visualizing deep lymphatic vessels damaged in limb fractures.

Methods: From 2021 to 2023, 33 patients (26 males, 7 females; mean age 41.6±3.8 years) were observed. The study included patients with unstable fractures involving two or more components of the ankle joint. After cast removal, significant edema of the injured limb was observed. All patients underwent contrast-enhanced MR lymphography using a 1.5 Tesla MRI machine. Gadopentetate dimeglumine 0.1 mmol/kg and 2% lidocaine solution was injected subcutaneously in the interdigital spaces on the dorsal aspect of the injured and healthy limbs. Real-time assessment was done on T1, T2, and T2-STIR-weighted MR images in three projections, both native and with contrast enhancement. Lymphatic vessels were visualized in dynamic studies at 5, 15, 25, 35, 55, 60 minutes.

Results: Based on the data, patients were divided into three groups. The first group (17 patients) showed diffuse skin and subcutaneous tissue edema around the ankle joint on MR images, with fluid in the subtalar joint cavity and increased signal on T2-weighted images, indicating post-traumatic edema without anatomical disruption of lymphatic collectors. The second group (n=11) exhibited dilated lymphatic vessels distal to the injury site, collateral lymphangiectasia, subcutaneous edema, and extravasation at the fracture site. The smallest third group (5 patients) showed lymphatic vessel hypoplasia at the fracture level and partially visualized contralateral lymphatic transport pathways above the knee joint. Treatment and rehabilitation plans were developed individually for each patient group based on these findings and clinical presentation.

Post-traumatic edema of the right lower limb



3D frontal spoiled gradient-echo MIP(Maximum Intensity Projection)after 55 minutes the lymph flow is not disrupted, collateral vessels are clearly visible. There is diffuse edema of the subcutaneous tissue around the right ankle joint.

Contrast-enhanced MR lymphography of the lower extremities after gadopentetate injection

MRL in a 51-year-old women with secondary lymphedema of the left lower limb, fractures of the lateral malleolus and calcaneus, and a history of rheumatoid arthritis

Conclusions: 1.Minimum requirements for MR lymphography protocol: scanner of at least 1.5 Tesla, image sequences with T1, T2, and T2-STIR weighting, evaluation after 30 minutes post-contrast administration, and a maximum examination time of about one hour for clinical significance.2.An optimized MR lymphography protocol allows visualization of peripheral lymphatic system anatomy, giving detailed insight into post-traumatic edema pathology for personalized treatment and rehabilitation planning.

Keywords: MR lymphography, secondary lymphedema, post-traumatic edema, comminuted ankle joint fractures.

OP-008

Lipoedema: Specialsit training and development tool

Stacy Pugh[1], Jane Wigg[1]

[1]Lymphoedema Training Academy

Objectives: By the end of the session the delegate will;1. Understand the need for specialist lipoedema education to enhance lipoedema management and advice2. Be aware of a bespoke assessment tool to assist with prompts and holistic assessment, leading to improved diagnosis

Background: Very little lipoedema specific education and training is available or that which is, is often only included as a small section of general lymphoedema training. The assessment of Lipoedema is commonly undertaken within lymphoedema clinics by lymphoedema trained specialist practitioners who may not have current or extensive specific training.The development of Lipoedema specific training and a bespoke assessment form was developed and aimed at Health care professional's and therapists working within a lymphoedema role. The training was developed with the aim of improving the knowledge and skills of those assessing people with Lipoedema to avoid misdiagnosis and assist in differential diagnosis.

Differential Diagnosis

Image shows examples of differential diagnosis of lipoedema

Methods: Training was prepared and delivered, selecting relevant content agreed with experts. During training, the specific clinical assessment form was evaluated for its use in practice, considering how it assists in differential diagnosis in the absence of a diagnostic test. Expert keynote speakers covered a wide variety of topics including but not limited to; latest research and trends, history taking; differential diagnosis; specific treatment pathways, diet, gait and mobility. Clinical training skills consisted of specialist bandaging, garment fitting, post operative care skills, gait and activity programmes. The Lipoedema specific assessment form shared with learners enabled them to ensure all elements of condition are considered. The training continues with world experts over 4 days and 35 international CPD points.

Results: Evaluation of learner feedback followed successful completion of training. Intercourse evaluation of assessment form led to minor additions and changes. Post course evaluations asked learners to identify their 'first key change' in practice. Responses included: "implementing specific lipoedema assessment", "initiating self-management", "opening a dedicated lipoedema service", Further feedback demonstrated the importance of specific lipoedema training and assessment tool.

Conclusions: Specific training on lipoedema with evaluated content and assessment tool, demonstrated need and changes to clinical practice. It is evident with the breadth of knowledge increase, lipoedema training needs to be more specific, detailed and focused to current knowledge, research and recommended treatments.

Keywords: Lipoedema, Assessment tool

OP-009

Is There a Difference Between Right and Left Upper Extremity Involvement in Breast Cancer Related Lymphedema?

Busem ATAR[1], Burcu DUYUR ÇAKIT[1], Nursel DOĞANYİĞİT KUZAN[1], Ayşegül YAMAN[2], Pınar BORMAN[3]

[1]Ankara Training and Research Hospital, Physical Medicine and Rehabilitation
[2]Ankara Etlik City Hospital, Physical Medicine and Rehabilitation
[3]Ankara Medipol University Faculty of Medicine, Physical Medicine and Rehabilitation

Objectives: The lymphatic currents of the right and left halves of our body reach the heart via different pathways. The ductus thoracicus, which opens into the venous system, carries the lymphatic load of right and left lower extremities, left upper body half and left upper extremity, while the right lymphatic ductus collects the lymphatic flow of only the right upper extremity and right upper body half. We aimed to investigate whether there is a difference in lymphedema releated breast cancer (BCRL) in the right and left upper extremities and whether surgery in the right or left upper extremity affects the response to CDT.

Background: To our knowledge, there is no other study investigating the difference between right and left upper extremity lymphedema

Methods: The data of 102 patients with BCRL who were followed up in our clinics were retrospectively analyzed. Duration of lymphedema, duration of lymphedema development after surgery, type and stage of lymphedema, duration of follow-up in our clinics, years of first and last visits to our clinics, volumetric volume and volume differences measured in the lymphedematous extremity, and the number of CDTs received in our clinics over the years were noted.

Results: Among 102 patients, 52 patients had right and 50 patients had left upper extremity lymphedema. The mean age of these two groups was 54±25.3 years. There was no difference between the right upper extremity lymphedema group and the left group in terms of initial admission volume,the two groups in terms of the number of lymph nodes removed, number of metastatic lymph nodes, estrogen, progesterone, cerb2 receptor positivity. The stages and durations of the patients were similar. In the group of patients with right lymphedema, there was no difference between the first visit volumes and the last visit volumes ($p>0.05$ for all). However, in patients with left lymphedema, a statistically significant increasing trend was observed between the first visit volumes and the last visit volumes ($p=0.049$). A volume increase trend was also observed in the intact extremities of patients with left lymphedema, so there was a decreasing trend in the volume difference due to the closing of the difference in the intact extremity.

Conclusions: These findings suggest that patients with left BCRL had a greater increase in intact and diseased extremity volumes over the years compared to patients with right BCRL. Considering that left upper extremity lymphedema may also be considered as a risk factor considering the anatomically higher left lymphatic load.

Keywords: breast cancer, left lymphedema

OP-010

The relationship between self-reported swelling and anxiety, depression, quality of life and overall survival post-gynaecological cancer

Melanie Louise Plinsinga[1], Monika Janda[3], Hildegard Reul-Hirche[1], Dimitrios Vagenas[2], Andreas Obermair[4], Kira Bloomquist[1], Sandra Hayes[1], SANDI HAYES[5]

[1]Menzies Health Institute Queensland, Griffith University, Nathan, Queensland, Australia
[2]School of Public Health and Social Work, Queensland University of Technology, Kelvin Grove, Queensland, Australia
[3]Centre for Health Services Research, Faculty of Medicine, The University of Queensland, St Lucia, Australia
[4]Queensland Centre for Gynaecological Cancer Research, The University of Queensland, Herston, Australia
[5]Cancer Council Queensland, Queensland, Australia

Objectives: To explore the relationship between self-reported lower-limb swelling and anxiety, depression, quality of life and overall survival following gynaecological cancer.

Background: Lymphedema is a common and feared survivorship concern following gynaecological cancer. In the breast cancer setting, strong evidence exists on the adverse effects and impact lymphedema has on quality of life, mood and survival. However, evidence in the lower-limb setting following gynaecological cancer is lacking.

Methods: Data from the LEG study, which is a prospective, longitudinal, cohort study including 408 women with gynaecological cancer, contributed to analyses. Outcomes of interest were assessed at baseline (pre-definitive diagnosis of gynaecological cancer) and at 6 weeks to 3 months, 6 months to 12 months and 15 to 24 months post-surgery. Linear regression analyses were undertaken to assess associations between cumulative burden of self-reported lower-limb swelling (that is, any evidence of lower-limb swelling within the first 24 months post-surgery of gynaecological cancer) and anxiety and depression (as measured via the Hospital Anxiety and Depression Scale) and quality of life (as measured via the Functional Assessment of Cancer Therapy-General) assessed at 24 months post-surgery. Logistic regression was used to assess the relationship between cumulative burden of self-reported lower-limb swelling and overall survival at 5-years follow up. Results were described using means (SD) and n (%), and $p<0.05$ was considered statistically significant.

Results: By 24 months post-diagnosis, 48% of women self-reported lower-limb swelling. Those with swelling reported higher anxiety and depression scores (4.9 (4.2) and 3.5 (3.11), respectively) and lower quality of life (83.6 (16.6)) when compared with those who did not report leg swelling (3.9 (3.8), 2.6 (3.2), and 89.7 (14.5), respectively; $p<0.05$). Overall survival at 5-year follow up did not differ between groups (those with evidence of swelling: 30% deaths; no evidence of swelling: 36% deaths; $p=0.34$).

Conclusions: These findings demonstrate the impact of swelling on health outcomes, but not survival. Between now and the ESL conference, our team will also explore these relationships using objective measures of lymphedema.

Keywords: Lymphedema, gynaecological cancer, epidemiology

OP-011

The effect of clinical pilates exercises on pain, quality of life, depression and aerobic capacity in the treatment of secondary lymphedema

Esin Catakkaya[1], Ayla Cagliyan Turk[2], Tomris Duymaz[3]

[1]Free physiotherapist
[2]Hitit University, Faculty of Medicine, Department of Physical Medicine and Rehabilitation
[3]Istanbul Bilgi University Department of Physiotherapy and Rehabilitation

Objectives: The aim of this study was to investigate the effect of clinical pilates exercises combined with complex decongestive therapy (CDT) on pain, physical activity, depression, quality of life, aerobic capacity and posture in the treatment of upper extremity lymph edema secondary to breast cancer.

Background: Lymphedema is defined as disruption of lymphatic flow and interstitial accumulation of protein-rich fluid due to injury, infection, or congenital abnormalities of the lymphatic system. Lymphedema that occurs as a result of disease or treatments is secondary lymphedema. When we look at lymphedema cases, it is seen that most of them are secondary and occur due to malignancy or its treatment. Upper extremity lymphedema is seen in 2-83% of breast cancer patients after treatment.

Methods: Twenty-two patients with secondary lymphedema were included in the study. Patients were randomly divided into 2 groups as clinical pilates group (CPG) and control group (CG). Both groups received CDT program for 3 weeks, 5 days a week. For CPG, in addition to CDT, group sessions with clinical pilates exercises were performed every other day, 3 days a week. Edema assessment was performed by circumferential measurement. Pain intensity was assessed by Visual Analog Scale (VAS), quality of life by SF-36 and Quick Questionnaire for Shoulder and Hand Disability (QDASH), depression by Beck Depression Scale (BDS), posture by New York Posture Analysis Method of the Body (NYPAY), and aerobic capacity by 6-minute walking test. All evaluations were performed before and after treatment.

Results: The mean age and body mass index of the groups were similar ($p>0.05$). In the pretreatment evaluation, all parameters except NYPAY were similar between the groups ($p>0.05$). Pre- and post-treatment pain, feeling of fullness, depression, NYPAY, QDASH parameters and all subgroups of SF-36 showed improvement in both groups ($p<0.05$), and significant improvement was found in favor of CPG in intergroup comparison ($p<0.05$). 6DYT was significantly increased only in CPG ($p<0.05$) but there was no significant difference between the groups ($p>0.05$).

Initial and Final Evaluation Results of Research Participants in Clinical Pilates and Normal Treatment Groups with Various Parameters

	Clinical pilates group	Control group	p value
Pain 1	5,90±2,34	6,81±1,83	0,406
Pain 2	,36±,674	1,90±1,64	0,023
p value	0,003	0,003	
Heaviness 1	6,00±2,32	6,90±3,11	0.232
Heaviness 2	,54±,820	3,18±1,25	0,000
p value	0,003	0,005	
6MWT 1	968,4±1756,9	1452,6±2257,03	0.374
6MWT 2	1594,3±2428,7	1076,8±1227,2	0.793
p value	0,003	0.286	
Depression 1	16,55±5,98	20,55±8,63	0.340
Depression 2	7,27±4,62	16,45±7,54	0,002
p value	0.003	0.008	
NYPAY 1	48,82±7,23	40,64±8,18	0.029
NYPAY 2	62,09±2,73	44,64±9,15	0.000
p value	0.003	0.007	
QDASH 1	48,14±20,62	54,55±18,79	0.374
QDASH 2	10,12±4,91	38,43±13,42	0.000
p value	0.003	0.005	

Conclusions: In patients with upper extremity lymphedema due to breast cancer, the effects of clinical pilates exercises combined with CDT on pain, physical activity, mood, quality of life and posture are more effective than standard CDT. However, there is no significant difference between them in terms of aerobic capacity.

Keywords: Upper extremity lymphedema, breast cancer, clinical pilates exercises, quality of life

OP-012

Multifaceted Treatment of Lipedema: A Case Series

Hatice Durmuş[1], Ayşe Nur Benlibay[2], Zeynep Çelik[3], Rengin Yılmaz[4], Suat Doğancı[3]

[1]Hacettepe Üniversitesi Fizik Tedavi ve Rehabilitasyon Fakültesi
[2]Gülhane Eğitim ve Araştırma Hastanesi Kalp ve Damar Cerrahisi
[3]Prof. Dr. Suat Doğancı Muayenehanesi
[4]Dr. Rengin Yılmaz Muayenehanesi

Objectives: This study was planned to investigate the efficacy of a treatment protocol consisting of Low Intensity Extracorporeal Shock Wave Therapy (LiESWT), pneumatic compression application and recommendations on lipedema patients.

Background: We aimed to see whether the versatile designed treatment is effective in the treatment of lipedema and to measure the effect of LiESWT on lower extremity circumference measurement.

Methods: A total of 12 female patients diagnosed with lipedema were included in the study. The patients' lower extremities underwent treatment twice a week for five weeks, involving both Low-Intensity Extracorporeal Shock Wave Therapy (LiESWT) and pneumatic compression device application. LiESWT was administered using the Modus ESWT® Focused Shockwave Therapy (Inceler Medikal Ankara) device, targeting the anterior part of the extremities in one session and the posterior part in another session. A total of 6000 pulses were delivered along the length of the extremities at a rate of 4 pulses per second. The average intensity used was 0.23 mJ/mm² for the thigh and 0.18 mJ/mm² for the lower leg. Subsequently, patients underwent 30 minutes of pneumatic compression device treatment. At the beginning of the treatment, patients were advised to follow a diet under the guidance of a dietitian and engage in exercise. To assess effectiveness, circumference measurements were taken from specific points before and after treatment for both groups.

Results: In the patient group with a mean age of 44.4±13.8, significant improvements were found in the circumference measurements at all levels measured in both extremities, compared to before treatment ($p<0.005$). The demographic data and treatment outcomes of the patients are presented in Table-1.

Table-1

	Right Ankle 1	Left Ankle 1	Right Below Knee 1	Left Below Knee 1	Right Thigh 1	Left Thigh 1	Right Ankle 2	Left Ankle 2	Right Below Knee 2	Left Below Knee 2	Right Thigh 2	Left Thigh 2
1	28,5	28,5	40	38	56	54	25	25	37	37	50	50
2	21	21	39	39,5	51	51,5	20,2	20,2	37,5	38,5	48,5	48,5
3	23	23	38	38	48,5	48	22,3	22,3	36,2	36,4	44	43,9
4	23,5	23,5	41	46	48	47	23	23	38,5	37	45	44,5
5	23	23	35	35	51	51	22,5	22,5	33,5	33,5	49	49
6	24,5	24,5	43,5	43,5	56	55	24	24	41,5	41,5	52	52
7	22,9	22,6	37,7	37,5	47,2	47	22,3	22,2	37,1	37	46,5	46,4
8	21,5	21,8	35,8	36	44,5	43,3	21,5	21,7	35,5	35,6	44,2	43
9	23,5	23,7	39,7	37,7	59	57,7	23	23,1	38,7	37	57,3	57
10	24,7	24,6	44,5	43,3	55,6	55,5	24,4	24,4	44	43	55,7	54,5
11	34,6	36,6	47,6	49	73	72,5	33	34	45	48,3	70,2	70,5
12	20,7	21,2	31,9	31,2	42,5	40,7	20,6	21,1	31	30,7	40,8	39,9

Lower Extremity Circumference Measurement

Conclusions: The treatment protocol consisting of LiESWT, pneumatic compression and recommendations is among the methods that are effective, reliable and can be used in the treatment of lipedema.

Keywords: Lipedema, Low Intensity Extracorporeal Shock Wave Therapy, Pneumatic Compression, Modus ESWT ® Focused Shockwave Therapy

OP-013

BEHIND THE SCENES: THE DIELECTRIC VALUES OF MALES WITH OR WITHOUT SUFFERING FROM BREAST CANCER-RELATED LYMPHEDEMA: A PILOT STUDY

Alper Tuğral[1], Yeşim Bakar[1]

[1]İzmir Bakırçay Üniversitesi

Objectives: Although there is no study exists in which TDC values are measured in males with or without breast cancer-related lymphedema (BCRL), this pilot study showed that males with BCRL showed higher TDC values than those without.

Background: Male breast cancer is worth to be noticed due to its increasing incidence recently. Not only for early diagnosis of BCRL but also for tracking changes objectively is of utmost importance. In this regard, the Tissue Dielectric Constant (TDC) method carries a great opportunity to measure and quantify dielectric values that are directly related to local tissue water. To the best of our knowledge, there is no study in which the TDC values are compared in patients with BC in males with or without BCRL.

Methods: Moisture Meter-D was used to assess patients' dielectric values in both upper extremities in the following measurement sites after marking with a soft pen: 8 cm upper and 6 cm lower sites of the cubital crease and 10 cm lower site of the axilla for the arm, forearm, and thorax points, respectively. A triplicate measurement was performed on each reference point and the mean of them was recorded for each different penetration depth probe as follows: 0.5, 1.5, 2.5-,and 5.0 mm.

Results: 7 male patients with a history of BC (5 BCRL, 2 non-BCRL) were included in this study. Mean age and BMI were found as 61.43±8.42 years and 27.14±2.24 kg/m2, respectively. Group comparisons in TDC ratios (affected/unaffected) patients with and without BCRL showed significant differences in 1.5-mm depth probe in the arm (.95 vs 1.43, p=.029) and thorax (.93 vs. 1.19,p=.002). The forearm TDC ratio reached significance only in the 5.0-mm depth probe between groups (.94 vs. 1.53,p=.023). All TDC values gathered from four different probes showed significant differences in affected sites' reference points in the arm and forearm except for thorax reference points (p<.05).

Comparison of TDC values and ratios of patients with and without BCRL

n=7	PROBES	BCRL Affected Side (n=5)	BCRL Non-Affected Side (n=5)	BCRL Ratio	Non-BCRL Affected Side(n=2)	Non-BCRL Non-Affected Side(n=2)	Non-BCRL Ratio
ARM	0.5 mm	54.96±6.23	41.72±4.04	1.32±0.20	40.80±3.39	40.35±2.33	1.01±0.14
	1.5 mm	53.16±6.50	37.42±4.47	1.43±0.20	33.30±3.53	35.05±0.21	0.94±0.09
	2.5 mm	47.08±7.35	32.76±2.71	1.44±0.24	31.90±3.68	31.75±0.35	1.00±0.10
	5.0 mm	39.80±7.80	27.94±2.49	1.42±0.25	26.00±4.10	26.05±1.49	1.00±0.21
FOREARM	0.5 mm	52.54±6.24	42.22±4.12	1.26±0.24	46.75±10.82	40.95±1.48	1.14±0.30
	1.5 mm	48.66±3.88	38.04±5.42	1.30±0.22	34.90±7.07	35.40±0.84	0.98±0.17
	2.5 mm	46.26±3.53	34.70±3.97	1.35±0.19	32.35±4.45	30.80±0.42	1.04±0.13
	5.0 mm	41.82±5.39	27.94±4.39	1.53±0.37	24.85±2.33	26.30±1.41	0.94±0.03
THORAX	0.5 mm	43.42±6.10	41.12±4.28	1.06±0.12	44.10±3.39	45.45±2.90	0.97±0.01
	1.5 mm	45.50±9.52	37.82±5.27	1.19±0.10	37.40±1.55	40.15±2.61	0.93±0.02
	2.5 mm	41.90±6.31	35.96±2.23	1.17±0.18	36.90±4.38	35.60±0.55	1.03±0.10
	5.0 mm	35.54±6.82	30.28±2.29	1.17±0.21	28.95±1.48	27.95±0.63	1.03±0.03

Conclusions: The findings of this pilot study showed that patients with BCRL had significantly higher TDC values than those without BCRL in the affected sites' reference points as expected. Yet, when considering and comparing these values to the reported values of TDC in women with or without BCRL, males showed greater TDC values. Although this was a pilot study and we only had 2 males without BCRL, setting the threshold for 1.25-1.30 for inter-arm TDC ratio (Mean±2SD) whether having BCRL or not might be plausible to expect for further studies according to our findings.

Keywords: Breast Cancer, Breast Cancer Related Lymphedema, Tissue Dielectric Constant, Male Breast Cancer

OP-014

Turkish Translation, Reliability and Validity of the tool of Myofascial Adhesions in Patients after Breast Cancer (MAP-BC)

Gökçenur Yalçın[1], Özden Tömek[1], Feyza Nur Yücel[1], Yeliz Bahar-Özdemir[2], Canan Şenel-Toprak[2], Emre Ata[1]

[1]Sultan 2.Abdulhamid Han Training and Research Hospital, Clinic of Physical Medicine and Rehabilitation
[2]Marmara University Faculty of Medicine, Department of Physical Medicine and Rehabilitation

Objectives: The aim of this study is to create a Turkish version of the MAP-BC (Myofascial Adhesions in Patients after Breast Cancer) Tool and to test its validity and reliability.

Background: Myofascial adhesion is an important cause of upper extremity dysfunction among breast cancer patients. Manipulation of muscles during surgery, scarring, soft tissue adhesions, adaptive posture after surgery, radiotherapy fibrosis may result in myofascial adhesions. MAP-BC is a quantitative evaluation method developed for the scar tissue and adhesions. The aim of this study is to create a Turkish version of the MAP-BC Tool and to test its validity and reliability.

Methods: This is a cross-cultural adaptation and validation study including 80 female patients aged between 18 to 90 years who have undergone breast cancer surgery. Translation and cross-cultural adaptation were performed in compliance with the international guidelines. After translation to Turkish and back to English, the researchers agreed on the final version. For convergent validity, the patients were evaluated with MAP-BC and POSAS (Patient and Observer Scar Assessment)-observer subscale. For test-retest reliability a single researcher evaluated the patients on day 0 and 14, without any therapeutic intervention. For inter-rater reliability 29 patients were additionally evaluated by a second researcher blinded to first researchers' evaluation.

Results: The validity was found to be fair to good (rho:0.631). The ICC values of the subgroups and total scores calculated for the test-retest reliability ranged from 0.798 to 0.954, with a test-retest ICC value for the total score of 0.948; indicating good to excellent test-retest reliability of the questionnaire. Inter-rater ICC values ranged from 0.417 to 0.949, with a total score inter-rater ICC value of 0.938. This suggests good to excellent inter-rater agreement, except for the "frontal chest wall" subsection.

Conclusions: The Turkish form of MAP-BC is a valid and reliable tool for evaluating myofascial adhesions and scars after breast cancer surgery and adjuvant treatments. Clinicians are encouraged to use this tool in detection of myofascial adhesions and evaluating treatment efficacy; as this is the first tool in Turkish language to evaluate myofascial adhesions after breast cancer treatment.(Conflict of interest: There are no conflicts of personal and financial interest within the scope of the study.)

Keywords: breast cancer, myofascial adhesion, MAP-BC

OP-015

Effectiveness Of Herbal Drug {Terminalia Arjuna} In Chronic Venous Insufficiency - A Prospective Observational Study.

Pratap Shankar K M[1]

[1]Central Council for Research in Ayurvedic Sciences

Objectives: The primary objective was to evaluate the clinical outcome of Tablet Terminalia arjuna in the conservative management of chronic venous insufficiency.

Background: Chronic venous insufficiency (CVI) manifests in various clinical presentations ranging from asymptomatic but cosmetic problems to severe symptoms, such as lower limb edema, skin trophic changes, and ulceration. CVI substantially affects the quality of life and work productivity of the patients. Ayurveda, an ancient traditional medicine in India, evaluates the various pathological stages of CVI with a wide range of pathological conditions such as Siragranthi (venous abnormalities), Raktavaritavāta (disorders of vāta occluded by rakta ~ blood), ApanaVaigunya (vitiated apānavāyu), Arsha (hemorrhoids), VataRakta (rheumatism due to rakta), Kushtha (integumentary disease) and Dushta Vrana (putrefied wound) depending upon the presentations of the patient. Ayurvedic texts mention Terminalia arjuna as a potential herb for treating various conditions related to the circulatory system. The drug is an effective anti-inflammatory, anti-oxidant, and anti-hypertensive and has a definite role in improving cardiovascular hemodynamics and wound healing. These attributes suggest that the potential of Terminalia arjuna needs to be explored as a promising venoactive drug.

Methods: This prospective observational study included 25 patients (31 limbs) with CVI who were treated with Tab Terminalia arjuna (Bark extract of Terminalia arjuna in a dose of 500 mg, given twice a day) and were observed on two visits on day 30 and day 90. Follow-up was carried out for three months to evaluate post-treatment complications or adverse effects. The clinical outcome assessment was done using Venous Clinical Severity Score (VCSS), and clinical grading was performed using clinical classification (C0 – C6) of CEAP (Clinical–Etiology–Anatomy–Pathophysiology) classification.

Results: The median VCSS score (of both limbs) during the third visit was comparatively lower than the first, with a statistically significant improvement at 0.05 level. Further, there was a substantial positive improvement in the clinical classification of CEAP among the patients in pre and post treatment phase.

Related Sample Wilcoxon signed Rank Test for VCSS variables for both limbs

Limb	VCSS Variables	Related Sample Wilcoxon signed Rank Test Summary	
		Standardized Test Statistic (Z)	Asymptotic Sig. (2-sided) (P-Value)
Left (N=21)	Pain	-3.974	0.000*
	Varicose veins	-2.887	0.004*
	Venous edema	-3.464	0.001*
	Pigmentation	-3.217	0.001*
	Inflammation	-2.846	0.004*
	Induration	-3.176	0.001*
	Active ulcers	-2.000	0.046*
	Ulcer Duration	-1.841	0.066
	Active ulcer size	-2.121	0.034*
	Compressive therapy	-2.460	0.014*
Right (N=10)	Pain	-2.701	0.007*
	Varicose veins	-1.414	0.157
	Venous edema	-1.730	0.084
	Pigmentation	-2.070	0.038*
	Inflammation	-2.333	0.020*
	Induration	-2.070	0.038*
	Active ulcers	-1.414	0.157
	Ulcer Duration	-1.342	0.180
	Active ulcer size	-1.414	0.157
	Compressive therapy	-1.890	0.059
*Significant at 95% level of significance			

Summary statistics across sex

Parameter	Sex					
	Male			Female		
	Median	IQR	p-value	Median	IQR	p-value
VCSS Left (First Visit)	10	18	0.005*	9	8	0.005*
VCSS Left (Third Visit)	5	7		3	3	
VCSS Right (First Visit)	3	13	0.018*	9	11	0.027*
VCSS Right (Third Visit)	2	7		3	6	

'*' represents significance at 0.05 level of significance

Conclusions: The prospective observational study shows that Tab Terminalia arjuna is safe and effective in CVI, reducing the symptoms like pain, edema, inflammation, pigmentation, induration and also expediting ulcer healing.

Keywords: Chronic venous insufficiency, Ayurvedic therapy, Terminalia arjuna

OP-016

Covid-19 Vaccination in Patients with Breast Cancer Related Lymphedema

Gül Mete Civelek[1], Onur Kara[1], Baran Tuncer[1], Meltem Dalyan[1]

[1]Health Science University, Ankara Bilkent City Hospital, Physical Therapy and Rehabilitation Hospital

Objectives: In this study, we aimed to evaluate the side effects of COVID-19 vaccine and behaviours and attitudes towards COVID-19 vaccination in patients with breast cancer related lymphdema (BCRL).

Background: Patients with BCRL are concerned about the effects of the COVID-19 vaccination. Generally, authorities recommend COVID-19 vaccination to patients with breast cancer and it has been reported that COVID-19 vaccine is safe. However, COVID-19 vaccination causes various side effects, including lymphadenopathy. Although the prevalance of BCRL was high during the COVID-19 pandemic, patients with BCRL experienced difficulties in accessing medical services. Yet, there is no published data reporting side effects of COVID-19 vaccine and behaviours and attitudes of towards COVID-19 vaccination in patients with BCRL.

Methods: This prospective clinical study included 100 female patients with BCRL who attended oncologic rehabilitation unit of Ankara Bilkent City Hospital, Physical Treatment and Rehabilitation Hospital between May 2022 and December 2022. Demographical and clinical data of patients were noted. A questionnaire about COVID-19 vaccination including side effects, sources of information, reasons for vaccine refusal, COVID-19 fear and anxiety levels and COVID-19 infection history was applied to all participants. Patients with and without COVID-19 vaccination were compared.

Results: COVID-19 vaccination rate was high (82%) in patients with BCRL. Most common side effects were local reactions (pain, redness, swelling) in injection site (54.9%), fatigue or tiredness (40.2%), joint pain (35.4%), myalgia (31.7%), high fever (31.7%). Only 6.1% of patients reported increase in lymphedema symptoms. Most common sources of information about COVID-19 vaccine were television (37%) and internet sources including social media (25%). Most common reasons for not receiving COVID-19 vaccine were being afraid of side effects of the vaccine (27.7%), disrupting cancer treatment (22.2%) and already having had COVID-19 infection (22.2%). When patients with and without COVID-19 vaccination were compared, self-reported good adherence to COVID-19 precautions and COVID-19 fear and anxiety levels were significantly higher and COVID-19 infection rate was significantly lower in vaccinated group ($p=0.038$, $p=0.022$, and $p=0.047$, respectively).

Table 1. Demographic and Clinical Characteristics of Patients

Age (years)[]	56 (40-70)
BMI (kg/m2)*	27.5 (18-40)
Education status	
Illitered, n (%)	8 (8)
Primary School, n (%)	33 (33)
High School, n (%)	22 (22)
University, n (%)	37 (37)
Marital status	
Married n (%)	87 (87)
Single n (%)	13 (13)
Number of household members	
1, n (%)	11 (11)
2, n (%)	32 (32)
3, n (%)	29 (29)
4, n (%)	19 (19)
5, n (%)	8 (8)
6, n (%)	1 (1)
BMI classification	
Under-weight	1 (1)
Normal-weight, n (%)	21 (21)
Overweight, n (%)	37 (37)
Obese, n (%)	39 (39)
Morbid obese n (%)	2 (2)
Axillary dissection	
Yes, n (%)	95 (95)
No, n (%)	5 (5)
Surgery type	
Radical mastectomy, n (%)	11 (11)
Modified radical mastectomy, n (%)	52 (52)
Lumpectomy, n (%)	37 (37)
Cancer Stage (TNM)	
Stage 1, n (%)	16 (16)
Stage 2, n (%)	41 (41)
Stage 3, n (%)	41 (41)
Stage 4, n (%)	2 (2)
Chemotherapy	
Yes, n (%)	90 (90)
No, n (%)	10 (10)
Radiotherapy	
Yes, n (%)	89 (89)
No, n (%)	11 (11)
Hormonotherapy	
Yes, n (%)	84 (84)
No, n (%)	16 (16)
Lymphedema stage (TNM classification)	
Stage 1, n (%)	11 (11)
Stage 2, n (%)	59 (59)
Stage 3, n (%)	30 (30)
Increase in lymphedema symptoms after COVID-19 infection	
Yes, n (%)	20 (20)
No, n (%)	44 (44)
Did not have COVID-19 infection, n (%)	36 (36)
Adherence to COVID-19 precautions	
Good, n (%)	57 (57)
Bad, n (%)	4 (4)
Average, n (%)	39 (39)
Vaccination Status for Influenza virus	
Yes, n (%)	15 (15)
No, n (%)	85 (85)
Vaccination Status for COVID-19	
Yes, n (%)	82 (82)
No, n (%)	18 (18)

Side-Effects after COVID-19 Vaccination

Any side-effect	
Yes, n (%)	64 (78.5)
No, n (%)	18 (21.5)
Injection site reactions (pain, redness, swelling)	
Yes, n (%)	45 (54.9)
No, n (%)	37 (45.1)
Fatigue or tiredness	
Yes, n (%)	33 (40.2)
No, n (%)	49 (59.8)
Joint pain	
Yes, n (%)	29 (35.4)
No, n (%)	53 (64.6)
High fever	
Yes, n (%)	26 (31.7)
No, n (%)	56 (68.3)
Myalgia	
Yes, n (%)	26 (31.7)
No, n (%)	56 (68.3)
Headache	
Yes, n (%)	12 (14.6)
No, n (%)	70 (85.4)
Nausea/Vomiting	
Yes, n (%)	4 (4.9)
No, n (%)	78 (95.1)
Dizziness	
Yes, n (%)	3 (3.7)
No, n (%)	79 (96.3)
Rash	
Yes, n (%)	2 (2.4)
No, n (%)	80 (97.6)
Diarrhea	
Yes, n (%)	1 (1.2)
No, n (%)	81 (98.8)
Increase in lymphedema symptoms	
Yes, n (%)	5 (6.1)
No, n (%)	77 (93.9)

Conclusions: COVID-19 vaccine receival was high among patients wtih BCRL. Similar type of side-effects were seen with general population. No life threatening side-effects were observed. Only very small percentage of patients had worsening of lymphedema symptoms. COVID-19 infection rate was significantly lower in vaccinated group which shows that vaccination is effective in this patient group. Providing adequete information about vaccines and their possible side effects are suggested for patients with BCRL.Disclosure of interest: None declared

Keywords: COVID-19, breast neoplasms, breast cancer lymphedema, vaccination

OP-017

Use of Compliance Assessment Tool in garment prescription and fitting for patients with Lymphedema and Lipedema in the state of Qatar

Anita Rebecca Sundrasekaran[1], Mohammed KM Shafi[1], Emad Abdalla[1], Marwa Inoubli[1]

[1]Hamad Medical Corporation

Objectives: To describe the specific challenges involved in the garment prescription and fitting process for patients with stage (2) and stage (3) Lymphedema as well as patients with Lipedema, the development and implementation of an assessment tool aiming to improve the process, thus improving the outcomes.

Background: As the only dedicated lymphedema management clinic in the state of Qatar, our department has received 2112 patients with Lymphedema (LE) and Lipedema in the past five years. Six hundred twenty-six custom-made garments (CMG) were prescribed as a standard evidence-based care to reduce the volume in the complete decongestive therapy (CDT) maintenance phase. Several challenges have been identified over the entire process of garment prescription/fitting (GPF) and patients' adherence that led to the loss of the success achieved through the CDT program, progression of the symptoms, patients' readmissions into the decongestive phase, increasing the therapist burden in a busy lymphedema clinic, financial burden on the health care organization or patients and increased psychosocial burden.

Methods: The specific challenges related to patients, therapists and vendors during the GFP process were identified through patient electronic documentation data during reevaluations indicating non adherence to CMG, dissatisfaction, increase in volume; re-referrals identified through patient registry data, and garments' registry data requiring remeasurements. These were addressed through multiple patients focus group discussions and clinical experience opinions by experts in the department besides reviewing experts' views from the literature. This led to the formulation and implementation of a Compliance Assessment Tool (CAT) before the GPF.

Results: Preliminary data collected following the use of the CAT indicated that the number of ill-fitting has reduced, six months limb volume reduction was maintained with reduced number of readmissions to the decongestive phase, and patients' verbal satisfaction has improved. Later a patient satisfaction survey was introduced to evaluate the GPF process clearly.

Conclusions: The implementation of CAT is considered beneficial in lymphedema management. CAT at the early stage prior to the GPF process might improve long-term positive outcomes in LE and Lipedema patients requiring long-term compression garments. However, rigorous research is needed to validate the tool's efficacy.

Keywords: Custom made garment, Compliance assessment tool, Lymphedema. garment prescription and fitting

OP-018

INVESTIGATION OF THE EFFECT OF LYMPHEDEMA SCHOOL ON FUNCTIONALITY, QUALITY OF LIFE, LYMPHEDEMA VOLUME AND BODY VALUE IN PATIENTS WITH LOWER EXTREMITY LYMPHEDEMA: A QUASI-EXPERIMENTAL STUDY

Sibel Eyigör[1], Zeynep Deveci Koçbilek[2], Başak Durdu Akgün[1], Menekşe Özgür İnbat[1], Sedef Çalışkan Kabayel[1]

[1]ege university
[2]pamukkale university

Objectives: This study aims to examine the effect of lymphedema school on patient functionality, quality of life, body value, and lymphedema volume in patients with lower extremity lymphedema.

Background: Lymphedema is defined as the accumulation of protein-rich fluid in the extracellular space resulting from damage to the lymph system. It reduces the quality of life of patients by causing many physiological, psychological, social, and financial problems. There is a lack of patient knowledge in the management of lower extremity lymphedema. One of the effective methods to meet the education needs of patients is patient schools.

Methods: This single-group quasi-experimental study was conducted between September 2021 and June 2022. The sample of the study consisted of 21 patients with primary and secondary lower extremity lymphedema. A face-to-face lymphedema school was organized for three weeks, four hours a week, by a multidisciplinary team, which included self-care management in lower extremity lymphedema. Written and verbal consent was obtained from the participants with the approvals of the ethics committee and the institution. Patient data were collected before school and at 3 and 6 months after school. Patient identification form, “Lower Extremity Functional Scale (LEFS)”, “Lymphedema Functionality, Disability and Quality of Life Scale in Lower Extremity Lymphedema (LYMPH-ICF-LL)”, “Body Value Scale” and extremity circumference measurement method were used to collect data. Number, percentage, mean, single-factor repeated measures analysis of variance, eta square, and Bonferroni posthoc analyses were used to evaluate the data.

Results: The average age of the patients was 54.85±11.99 years and two-thirds had secondary lymphedema. Six people had right, 5 people had left, and 10 people had bilateral lower extremity lymphedema. In the study, a statistically significant difference was found in the mean scores of LEFS ($p<0.001$), LYMPH-ICF-LL ($p= 0.006$) in the 3rd and 6th months, and in the lymphedema volume change ($p= 0.031$) in the 6th month. Except for the LYMPH-ICF-LL mobility sub-dimension ($p= 0.013$), there was no statistically significant difference in the other sub-dimensions and body value scale mean score ($p>0.005$).

Conclusions: It was determined that lymphedema school improved functionality and quality of life in patients with lower extremity lymphedema and reduced lymphedema volume. Lymphedema school is a safe and effective training method for self-care management in individuals with lower extremity lymphedema.

Keywords: lower extremity lymphedema, self-care, lymphedema school, lymphedema volume

OP-019

Excisional procedures for lymphedema treatment: is Charles procedure relevant?

Vladimir Ivashkov[1], Sergey Semenov[2], Rayana Dakhkil'gova[3], Ivan Arutyunov[2], Alexander Legon'kih[4], Alexander Kolsanov[1], Andrey Nikolaenko[1], Aleksandr Denisenko[2]

[1]Samara State Medical University, 89, Chapaevskaya street, Samara, 443099, Russia
[2]Sechenov University, 8-2, Trubetskaya street, Moscow, 119992, Russia
[3]Federal State-Funded Educational Institution of Higher Education "ROSBIOTECH", Moscow, Volokolamskoye sh., 11, 125080, Russia
[4]Petrovsky National Research Centre of Surgery, Moscow, GSP-1, Abrikosovsky lane, no. 2, 119991, Russia

Objectives: To analyze a combined approach effectiveness for advanced lymphedema forms: a combination of CDT and modified Charles procedure in clinical practice.

Background: Excisional procedures, such as the Charles procedure, are used in late stages of lymphedema (ISL-3), when there is significant excess tissue, severe fibrous changes in the subcutaneous fat, and secondary skin changes. This operation was first proposed by Charles in 1912. Since then, many modifications have been described in the scientific literature.

Methods: Patients with ISL-3 lymphedema were included in the study. They were divided into two groups: 1 - lymphedema of the upper limb, 2 - lower limb. All patients underwent a course of complex decongestive therapy (CDT) as part of complex treatment. Further surgical intervention involved performing a modified Charles procedure: wide excision of all tissues down to the deep fascia covering the muscles, followed by covering the defect with a full-thickness skin graft. The outcome was assessed by automatically measuring the limb volume, assessing the results of autodermoplasty by measuring the area of graft engraftment, and also analyzing the incidence of erysipelas.

Severe fibrous changes in the subcutaneous fat

Intraoperative view after the procedure was completed

Results: The study included 12 patients with ISL-3 lymphedema: group 1 – 5 people, group 2 – 7 people. The average follow-up period was 24 months.The average volume of the limb in group 1 before surgery was 16546±2405.44 cm3 (CI 95%), 24 months after surgery 6478.42±903.55 cm3 (CI 95%), the average decrease in volume was 55.02±12.55 % (CI 95%).The average volume of the limb in group 2 before surgery was 25013±3443.54 cm3 (CI 95%), 24 months after surgery 9450.42±1 597.66 cm3 (CI 95%), the average decrease in volume was 60.43±15. 20% (CI 95%).The number of episodes of erysipelas decreased significantly from 3.2 per year to 0.8 per year during the total observation period. In both groups, the area of engraftment of the transplanted skin was 95±3.4% (CI 95%). Also, normalization of hemoglobin levels was noted in 50% of patients.

Conclusions: Excisional procedures, such as the Charles procedure, are the method of choice in the treatment of terminal forms of lymphedema when other surgical techniques are not possible. The modern treatment approach for this group of patients, the combination of CDT and excisional procedures, has significantly improved long-term treatment results and reduced the incidence of postoperative complications.

Keywords: Charles procedure, Excisional procedures, lymphedema, lymphostasis

OP-020

Two diseases of soft tissue: Fibromyalgia and Lipedema

Mihrinur Dilvin TÜRKÖZ[1], Benay SARI[1], Zerrin KASAP[1]

[1]Giresun University

Objectives: The aim of this study was to determine how many patients with lipedema met the diagnostic criteria for FMS, the effect of lipedema and FMS on pain, fatigue, and quality of life, and the relationship of lipedema disease data with fibromyalgia.

Background: Fibromyalgia and lipedema are health conditions that have a serious impact on chronic pain and quality of life. Fibromyalgia is a chronic condition characterized by widespread pain, sleep disturbances, fatigue and mood symptoms. Lipedema is a disease characterized by excessive fat accumulation, usually in the legs, buttocks and arms, and is associated with pain, swelling and tenderness. Researches has demonstrated that lipedema and fibromyalgia often coexist.

Methods: Thirty-one female patients diagnosed with lipedema and 31 volunteers without known disease were included in the study. Symptom Severity Scale (SSS), Widespread Pain Index (WPI) and Fibromyalgia Severity Score (FS), were calculated for FMS diagnosis. Pain intensity was evaluated by Visual Analog Scale (VAS) and Pressure Pain Thresholds (PPT) by algometry. Lower extremity volumes of the lipedema group were measured by circumferential measurements and fat mass were measured by dual X-ray absorptiometry. The 36-Item Short Form Health Survey (SF-36), fatigue severity scale (FSS) and fibromyalgia impact questionnaire (FIQ) were applied to both groups.

Results: The rate of people who met the diagnostic criteria for FMS was higher in the lipedema group (%64,5 vs %16,7) ($p<0,001$). WPI, FS, FIQ, VAS, and FSS scores were higher, and bilateral PPTs (R/L) were lower ($p=0,003$, $p=0,004$, $p=0,001$, $<0,001$, $p=0,024$, $p=0,001/p=0,01$ respectively). Also, physical function, role-emotional, vitality, pain, and general health parameters of the SF-36 were lower in the lipedema group ($p=0,001$, $p=0,012$, $p=0,011$, $p=0,05$, $p=0,008$, respectively). When the lipedema group was divided into two groups as lipedema with and without FMS, there weren't statistically significant differences in terms of lower extremity volumes, total and lower extremity fat mass, and SF-36 scores ($p>0,05$).

Conclusions: The results show that fibromyalgia is quite common in lipedema and lipedema patients' quality of life is poorer than controls. There wasn't any relationship between lipedema disease data and FMS. Lipedema and FMS usually accompany each other and it is difficult to distinguish them. If lipedema patients are co-diagnosed with FMS, its treatment should also be considered to improve the quality of life of patients and reduce their pain.

Keywords: Lipedema, fibromyalgia, soft tissue thickness, pain

OP-021

Klippel-Trenaunay syndrome: what to do?

Amriddin Rakhimov[1], Dmitrii Romanov[1], Juliya Kononova[1], Maxim Karev[1], Anastasiya Bryleeva[1]

[1]Center of Vascular Pathology

Objectives: To find new approaches in Klippel-Trenaunay syndrome treatment.

Background: Klippel-Trenaunay syndrome (KTS) is a complex, combined disorder characterized by capillary, lymphatic and venous malformation with overgrowth of the affected limb. KTS is associated with mosaic activating mutations in the PIK3CA gene. Capillary malformations are also called “port-wine stains” and are regarded as the most common vascular cutaneous malformation in KTS, seen in 98% of cases. The superficial veins are dilated, the deep veins may be normal, dilated or absent. Lymphatic vessels may be involved with aplasia and hypoplasia of the lymphatics but also of the lymph nodes, either independently or together. Lymphatic malformation (LM) lesions are observed in KTS patients and include primary lymphedema and lymphangiectasia (truncular LMs), as well as skin vesicles (containing lymph fluid) draining lymph fluid and cystic hygromas (extratruncular LMs).

Methods: A 23-year-old female with KTS, with dilated veins in her right leg since childhood which did not initially bother her, but since the age of 11 she has been having swelling and pain in her leg. There was however no history of trauma or surgical procedures performed on the right lower limb. Physical examination showed angiokeratomas on the lateral surface of the right knee. Doppler ultrasonography was done and showed dilated veins with small arteriovenous fistulas (AVFs) in the lateral aspect of the right lower limb starting from foot and continuing up to the upper thigh. The maximum diameter of the vein was 25 mm; deep vein hypoplasia. Computed Tomography, Venogram and 3D reconstruction showed the venous network and abnormal perforators. Our team performed 2 open surgery sessions to remove varicose veins with AVFs and to cut the marginal vein. After that, the patient was recommended to undergo physical therapy and to wear compression stockings.

Results: A 1year post-treatment follow-up using Doppler ultrasonography showed resolution of the lateral marginal vein along with the absence of abnormal perforators. However, there are some residual varicosities, for which sclerotherapy has been planned, other symptoms have completely subsided.

Conclusions: There is no radical therapy for KTS. The role of comprehensive approaches in KTS treatment (conservative, laser correction, surgery) is of utmost importance to improve the quality of life and to control complications: pain, thromboembolism, pulmonary hypertension, local bleeding and ulceration.

Keywords: Klippel-Trenaunay syndrome, lymphatic malformation, vascular anomaly

OP-022

Complete Decongestive Therapy And Deep Oscillation In The Treatment Of Patients With Sever Lymphedema (Elephantiasis) – Case of study

Catalina Musteata[1], Mariana Rotariu[1], Sanda Bolos[1]

[1]University of Medicine and Pharmacy „Grigore T. Popa", Iasi

Objectives: Lymphoedma is a swelling in the tissue spaces that develops due to an interruption in the lymphatic system. Managing lymphoedema in patients with advanced cases in palliative care is challenging. The main cause of lymphoedema in the world is cancer and its treatment, such as surgery to remove the lymph nodes, radiotherapy to nodal areas or local metastatic disease, or a combination of the above. The resultant swelling will depend on which area of the body the lymphatics have been damaged in, e.g. in the treatment of Breast Cancer the nodes in the axilla may be removed or be treated by radiotherapy and may subsequently lead to lymphoedema in the arm. There are many physical, psychological and social factors that can affect the swelling and its management.

Day 1

Background: Female patient with several Lymphoedema - Elephantiasis

Methods: Complete decongestive therapy (CDT) consists of: Manual Lymphatic Drainage (MLD): A light skin stretching technique that stimulates the lymphatic system; Compression Therapy: Layered bandaging with foam or specially fitted garments that support the area to control swelling; Exercises: With compression, special exercises will help to pump lymph out of the swollen area; Skin and Nail Care: Keeping the skin and nail clean will help prevent infections that often can happen with lymphedema. Self-Care Management and Training: Learning how to manage lymphedema at home including self bandaging or self MLD.DEEP OSCILLATION is a unique international patented non-invasive, non-traumatic therapy method. Its special structure allows you to create biologically effective oscillations in the treated tissue using electrostatic attraction and friction. In contrast to other therapies, these pleasant oscillations have a gentle and deep-acting effect on all tissue components (skin, connective tissue, subcutaneous fat, muscles, blood and lymph vessels).The following effects of DEEP OSCILLATION are clinically proven: prevention and reduction of secondary and primary lymphoedema, anti-inflammatory effect, preventive fibrotic, conversion processes, fibrosis reduction.

Results: Traditionally lymphoedema is managed with CDT and is based on four pillars of care: compression, massage, skin care and exercise. Standard CDT may not be appropriate due to weakness and frailty so this must be modified and adapted. Modified CDT has the capacity to significantly benefit patients with far advanced disease who have lymphoedema or multi-factorial oedema. CDT can enhance patients function and comfort while preventing needless complications and

enhancing psychological well-being.

Conclusions: Managing lymphoedema in patients with advanced disease is challenging.There are many physical, psychological and social factors that can affect the swelling and its management.

Keywords: Lymphoedema, Deep Oscilation, Compression therapy, Complete Decongestive Therapy

OP-023

Establishment and validation of lower limb lymphedema risk prediction model after cervical cancer surgery based on artificial neural network

Gaoming Liu[1], Guorui Zhao[2], Ying Zhou[3], Yuanli Zeng[1], Jin Hu[1]

[1]Hunan Cancer Hospital
[2]Xiang Ya Nursing School, Central South University
[3]School of Nursing,Hunan University of Chinese Medicine

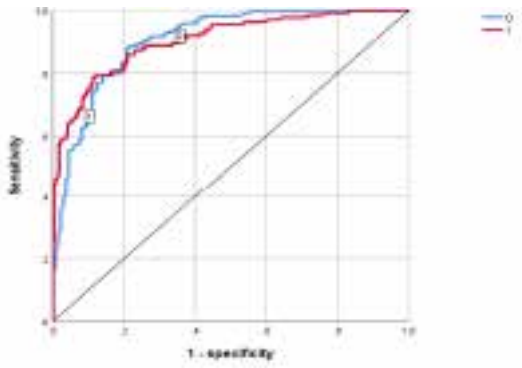
Objectives: To construct the risk prediction model of lower limb lymphedema (LLL) after cervical cancer surgery and verify the prediction effect of the model.

Background: Cervical cancer (CC) is one of the most common cancers in women.LLL may occur due to obstruction of lymphatic return caused by lymph node resection. LLL is progressive and can not be cured, which seriously affects the quality of life of patients. Therefore, it is essential to identify risk factors, predict the risk of occurrence, and achieve early prevention.

Methods: A prospective cohort study design was used to select 542 patients with CC who underwent surgery in a cancer hospital in Hunan Province from January to December 2020 by convenience sampling method, and they were randomly assigned to the modeling group and the verification group at a ratio of 7:3. Follow-up was conducted at 3, 6, 9, 12, 24, 36 months after surgery, the occurrence of endpoint events (LLL) was collected. The modeling group and verification group were divided into the LLL group and the non-LLL group according to whether the LLL occurred. Cox regression analysis was used to determine the independent risk factors of LLL after cervical cancer surgery. The artificial neural network was used to construct the risk prediction model, and the area under receiver operating characteristics (ROC) curve was used to evaluate the prediction effect of the model.

Results: In this study, a total of 135 patients (24.9%) were followed up for 36 months, of which 90 of 369 patients (24%) in the modeling group and 45 of 173 patients (26%) in the verification group developed lymphedema. Univariate analysis results showed that 35 variables were risk factors for LLL after cervical cancer surgery. Cox multivariate analysis results showed that 11 variables are independent risk factors for LLL after cervical cancer surgery.Combined with expert discussion, 3 variables of clinical significance were added, and finally 14 variables were included in the artificial neural network modeling. The test results of the modeling group showed that the area under ROC curve of the model was 0.905, the sensitivity was 66.7%, the specificity was 94.3%, and the Youden index was 0.610. Verification group test results showed that the sensitivity was 60.0%, the specificity was 97.7% and the Youden index was 0.577.

Figure 1 ROC curve of LLL prediction model of artificial neural network modeling group after cervical cancer surgery



“0” means no lower limb lymphedema. “1” means lower limb lymphedema

Table1 Results of univariate analysis of risk factors for lower extremity lymphedema after cervical cancer surgery

Items	X^2	P
Occupation	17.005	0.007
Dysmenorrhea	9.337	0.002
Number of births	4.999	0.025
The existing number of children	4.262	0.039
Hypertension	7.074	0.011
Pelvic disease	16.105	0.000
Smoking	11.571	0.001
Drinking	7.339	0.007
Abnormal menstruation	5.199	0.023
Pathological stage	8.106	0.044
Number of lymph nodes dissected	11.248	0.001
Inguinal lymph node cleaning	4.779	0.029
Lymph node positive	8.425	0.015
Preoperative chemotherapy	9.214	0.002
Preoperative radiotherapy	10.173	0.001
Postoperative time to get out of bed	11.089	0.026
Postoperative venous thrombosis	5.004	0.025
Radiotherapy was given within 3 months after surgery	50.935	0.000
Radiotherapy dose	56.254	0.000
Postoperative chemotherapy	19.369	0.000
Postoperative chemoradiation	71.340	0.000
Postoperative traditional Chinese medicine treatment	9.037	0.003
Preoperative daily labor intensity	34.198	0.000
Standing or sitting or keeping the body in the same position for a long time before surgery	92.882	0.000
Preoperative activities of daily living	13.566	0.001
Preoperative regular movement	17.927	0.000
Preoperative exercise mode	38.647	0.000
Work after surgery	10.344	0.001
Postoperative work intensity	19.623	0.001
Standing or sitting or keeping the body in the same position for a long time after surgery	94.659	0.000
Elevate your lower limbs while sleeping after surgery	15.046	0.000
Postoperative limb compression	6.857	0.009
Postoperative regular movement	13.949	0.000
Strength training was performed on the legs after surgery	12.157	0.000
Preventive wear of stress products	29.275	0.000

Table2 Results of multivariate analysis of risk factors for lower extremity lymphedema after cervical cancer surgery

items	X^2	P
Dysmenorrhea	17.484	0.000
Hypertension	7.284	0.007
Pelvic disease	6.736	0.009
Postoperative chemoradiation	31.891	0.000
Standing or sitting or keeping the body in the same position for a long time before surgery	3.723	0.054
Preoperative regular movement	8.390	0.004
Preoperative exercise mode	12.931	0.017
Standing or sitting or keeping the body in the same position for a long time after surgery	16.588	0.000
Elevate your lower limbs while sleeping after surgery	8.401	0.004
Postoperative limb compression	8.224	0.004
Preventive wear of stress products	26.635	0.000

Combined with expert discussion opinions, three clinically significant variables including the number of pelvic lymph node dissection, radiotherapy received within 3 months after surgery and radiotherapy dose were included in the analysis. Finally, a total of 14 variables were included in the artificial neural network modeling.

Conclusions: The risk prediction model constructed in this study has good prediction effect, which can provide reference for clinical medical staff to evaluate the risk of LLL after cervical cancer surgery.

Keywords: Cervical cancer; Lower limb lymphedema; Risk prediction; Artificial neural network

OP-024

Treatment of malignant lymphedema: importance of holistic approach

Elena Nikolaeva[1], Aleksandra Rovnaya[2]

[1]O'Medica medical centre
[2]State St Petersburg Medical University

Objectives: to develop and substantiate recommendations for the treatment of malignant lymphedema (ML), evaluate the effectiveness of the CDT technique for the treatment of such patients.

Background: according to various literature sources, secondary lymphedema of the upper limb occurs in 40-70% of patients diagnosed with breast cancer. Conservative treatment is successfully used for these patients (CDT - complex decongestive therapy) and surgery. But in some patients, lymphedema of the upper limb can be malignant (as a result of damage to the lymph lymphatic pathways (lymph nodes and vessels) due to compression or spread of tumor process). Such swelling is difficult to treat, it's often accompanied by skin defects (skin metastases or lymphorrhea), impaired limb mobility and pain. Due to the lack of official recommendations, very often such patients are denied treatment for edema, which significantly reduces the quality of life

Methods: Scientific papers on the treatment of ML (PubMed, ResearchGate, Science Direct, etc.), as well as international recommendations and consensus documents (ISL consensus, ILF, etc.) were analyzed. According to the recommendation, a treatment plan was drawn up for patients with malignant lymphedema in 2019-2023 – 14 people. The CDT method (MLD, compression multilayer bandaging with low-tensile bandages, skin care, exercise therapy) was used with limitations (MLD was not performed in areas of metastasis; for skin defects additional antiseptic treatment and wound dressings were required; if active movements were impossible, passive movements were performed within the exercise therapy). Treatment results (quality of life, limb dimensions, motor function of the upper limb) were analyzed

Results: 14 patients were treated with CDT followed by wearing flat knitwear or bandage Velcro systems. As a result of treatment, all patients experienced a significant decrease in limb volume (20%-90%) and an increase in quality of life (the ability to self-care and usual activities, reducing the need for outside care, etc.). Patients whose movement limitation was due to edema rather than paralysis/paresis had significant improvement in upper extremity motor function. During observation no side effects of CDT were noted

Conclusions: The use of CDT for the treatment of malignant lymphedema is safe, significantly improves limb condition and function, improves the patient's quality of life. The recommendations for the ML treatment were written, which were included in the draft of Clinical Guidelines for the treatment of lymphedema of the extremities, developed by the Russian Association of Lymphologists and the Association of Phlebologists of Russia.

Keywords: Malignant lymphedema, CDT in active cancer

OP-025

The effectiveness of lymphedema rehabilitation in patients with breast cancer-related lymphedema; Ankara University Faculty of Medicine PMR clinic experience

Seçilay Güneş[1], Burak Turan[1], Aysun Genç[1], Şehim Kutlay[1]

[1]Ankara University Faculty of Medicine, Department of Physical Medicine and Rehabilitation

Objectives: Breast cancer-related lymphedema represents a lifelong risk for breast cancer survivors and, once acquired, becomes a lifelong problem.

Background: This study aimed to investigate the clinical characteristics of patients treated for breast cancer-related lymphedema at Ankara University Faculty of Medicine, Department of Physical Medicine and Rehabilitation, Lymphedema Unit.

Methods: Patients who were admitted to the lymphedema rehabilitation program secondary to breast cancer at Ankara University Faculty of Medicine Lymphedema Unit between April 2016 and July 2019, were evaluated by retrospective file scanning. Demographic characteristics of the patients, type of surgery performed, pain intensity, duration of lymphedema development, and lymphedema-related complications were recorded. Extremity volume measurements were evaluated before and after rehabilitation.

Results: A total of 80 women and 1 man with complete records, were included in the study. The mean ages were 58.33 ± 11.51 years and the mean time from surgery to the emergence of lymphedema symptoms was 13.38 ± 20.60 months. Most patients underwent (74.6%) non-breast-conserving surgery. The duration of lymphedema was 48.82 ± 66.28 months before rehabilitation and the pain intensity (VAS) was 2.77 ± 3.11 in the affected extremity. A total of 9.46 ± 3.93 sessions of lymphedema rehabilitation were applied to the patients. The most common accompanying findings were joint movement limitations (26.3%), superficial fungal infections (14.9%), cyanotic skin changes (10.3%) and fibrotic changes (7.7%). Extremity volume measurements of the patients before and after treatment were determined as 2889.17 ± 764.85 ml and 2459.88 ± 562.98 ml, respectively (<0.001). Extremity volume changes were correlated with age (r=0.362, p=0.001), number of therapy sessions (r=0.359, p=0.001), and the duration of lymphedema (r= 0.229 p=0.05).

Conclusions: Complete decongestive therapy in breast cancer patients with lymphedema leads to clinical improvement in all patients. The effectiveness of therapy is improved with the increase in the number of therapy sessions. Even in patients with older age or longer duration of lymphedema, an acceptable level of treatment success was achieved.Acknowledgment: We would like to thank physiotherapists Zahide Pala and Ayşe Kutlu, who work in our lymphedema unit, for their valuable efforts during therapy sessions

Keywords: Complete decongestive therapy, Breast cancer, Lymphedema

OP-025

Can it be a miracle ? Kinesiologic taping for lower extremity swelling in a patient with Factor V Leiden mutation

Erkan KAYA[1], Selma KIZILTOPRAK[1], Nehar SAHIN[1], Beyza ISIK[1], Demet CANBAZ[1], Tolga CANBAZ[1], Ömer Berkan OZCAN[1], Hatice Sümeyye GUCLU[1], Olgun GENC[1], Semih YILDIRIM[1], Taner DANDINOGLU[1]

[1]Bursa City Hospital, Physical Medicine and Rehabilitation, Bursa, Türkiye

Objectives: To show the effects of kinesio taping on pain, edema, range of motion, muscle strength, functional level and quality of life in a patient with lower extremity swelling due to Factor V Leiden mutation.

Background: Factor V Leiden is a genetic disorder characterized by a poor anticoagulant response to activated Protein C and an increased risk for venous thromboembolism. Deep venous thrombosis (DVT) and pulmonary embolism are the most common manifestations, but thrombosis in unusual locations also occurs.

Methods: This report describes a previously healthy 50-year-old woman who presented with simultaneous bilateral lower extremity DVT after 2 hours airplane trip. She had bilateral lymphedema for 5 years. She presented to the our outpatient clinic with a 5-years history of bilateral thigh swelling and pain. She hadn't taken any rehabilitation program. We applied her kinesiologic taping per a week during two months. The outcome measures were limb circumference, Disability of Arm, Shoulder and Hand (DASH), hand grip strength, and quality of life at the baseline and end of 2 months

Kinesiologic Taping

Fan-shaped kinesiologic taping

Results: The sum of limb circumferences, DASH, hand grip strength, and quality of life significantly improved after treatment . Our patient said that KT was a miracle.

Conclusions: Primary lower extremity DVT, or effort thrombosis, typically occurs in young, healthy individuals with a history of repetitive lower extremity movement while secondary lower extremity DVT is associated with a number of predisposing factors. The role of factors such as hypercoagulability in the development of effort thrombosis is less well described. KT had significant changes in limb circumference, DASH, hand grip strength and overall quality of life

Keywords: kinesiologic taping, factor V Leiden mutation, lower extremity swelling

OP-026

Evaluation of Balance and Functional Status in Patients with Breast Cancer-Related Lymphedema

Ayşegül Yaman[1], Emre Adıgüzel[2], Elif Becenen Durmuş[1], Zeynep Tuba Bahtiyarca[1], Emel Ekşioğlu[1]

[1]Ankara Etlik City Hospital, Physical Therapy and Rehabilitation Hospital, Ankara, Türkiye
[2]Ankara Bilkent City Hospital, Physical Therapy and Rehabilitation Hospital, Ankara, Türkiye

Objectives: Lymphedema patients commonly experience secondary musculoskeletal problems.

Background: This study aims to evaluate functional status and balance in patients with breast cancer-related lymphedema (BCRL).

Methods: In this case-control designed trial, patients diagnosed with breast cancer-related upper extremity lymphedema were compared with health volunteers in terms of balance and functional status. Demographic and clinical characteristics of the participants were recorded. Functional status was assessed with Quick Disabilities of the Arm, Shoulder, and Hand (Q-DASH). The Tecnobody PK252 isokinetic balance measurement system, the one-leg standing test, and the functional reach test were also evaluated for static and dynamic balance measures.

Results: This study recruited 33 BCRL patients and 33 healthy individuals. The mean age of the participants was 53.74±8.29 years (patient group 56.18±7.69, control group 51.31±8.25 p:0.016) and the average body mass index was 28.32±4.23 kg/m² (patient group 29.72±4.43 kg/m², control group 26.92±3.56 kg/m² p:0.006). Q-DASH score was 43±18.43 in the patient group and 1.33±3.09 in the control group ($p<0.001$). The one-leg standing test and functional reach test results were statistically significantly lower in the patient group (36.85±26.40 and 75.72±34.30 $p<0.001$; 17.42±5.05 23.24±5.04 $p<0.001$). In Tecnobody measurements, stability index, average center of gravity, forward-backward standard deviation, and average track error were determined to be statistically different between the two groups.

Conclusions: We detected deteriorations in static and dynamic balance parameters in patients with breast cancer-related lymphedema. We suggest that balance and coordination exercises be added to the exercise programs of patients with breast cancer-related upper extremity lymphedema.

Keywords: breast cancer-related lymphedema, functional status, balance

OP-027

Awareness and knowledge of lymphedema among breast cancer patients: a cross-sectional study

Dilek Baday-Keskin[1], Selim Yalçın[2], Şerife Çobankaya[1]

[1]Department of Physical Medicine and Rehabilitation, Kirikkale University Faculty of Medicine, Kirikkale, Turkey
[2]Department of Medical Oncology, Kirikkale University Faculty of Medicine, Kirikkale, Turkey

Objectives: Lymphedema is a chronic condition caused by the accumulation of protein-rich lymphatic fluid in the extracellular space. Breast cancer and its treatments are common causes of lymphedema worldwide. Educating patients about breast cancer-related lymphedema (BCRL) is crucial in preventing lymphedema or treating the disease in the early stages.

Background: This study aimed to determine the awareness of lymphedema in patients with breast cancer.

Methods: The study included 72 consecutive patients with breast cancer aged over 18 years who presented at the Oncology Outpatient Clinic between May 2023 and March 2024. Demographic variables, history of breast cancer and lymphedema treatment, and knowledge about lymphedema were recorded. The extremity volumes were calculated by using truncated cone formula.

Results: The median age of the participants was 59.5 years (IQR, 51.3-66.0). The lymphedema prevalence was 52.8%. The median duration of breast cancer diagnosis was 24.0 months (IQR, 12.0-52.5). Out of the patients with BCRL, 36.8% reported having undergone circumferential limb measurements in the past. Among those who had undergone measurements, 78.6% had their first limb measurement taken after the onset of arm swelling. 50.0% of patients with BCRL and 23.5% of patients without lymphedema reported that they had heard of lymphedema (p=0.021). 26.3% of patients with BCRL reported receiving treatment for lymphedema in the past. 26.3% of patients with lymphedema and 8.8% of patients without lymphedema reported being informed about lymphedema by a physician (p=0.156). 95.8% of the participants were informed to avoid having blood drawn and measuring blood pressure on the affected extremity. 90.3% of the participants were advised not lift heavy objects with their affected limb. 55.6% were informed about daily exercises and 43.1% were informed about weight control. 34.7% were advised to protect the affected limb from traumas. 23.6% was suggested to protect the affected limb from extreme heat and cold. 20.8% were advised of protecting the affected extremity from infections and contacting their physician if signs of infection arise. 11.1% avoided wearing tight clothing or jewelry. 9.7% was informed about preventing sunburn on the affected extremity. 5.6% reported that they were advised to wear gloves while gardening. 4.2% were advised to take precautions against pet scratches. 2.8% reported being advised to use a thimble while sewing. 8.3% were aware about skin care. 75% of participants reported not knowing which department is responsible for treating lymphedema.

Conclusions: Breast cancer patients should be informed about the risk factors and precautions for lymphedema and receive multidisciplinary follow-up.

Keywords: breast cancer, lymphedema, awareness

OP-028

Changes in tissue elasticity in upper limbs lymphedema after IPC compression measured in USG elastography.

Marzanna Zaleska[1], Marzanna Zaleska[2], Marzanna Zaleska[3]

[1]Medical Research Institute, Dept. of Applied Physiology, Polish Academy of Sciences, Warsaw, Poland
[2]National Medical Institute of the Ministry of Interior and Administration, Warsaw, Poland
[3]Juzo Competence Center, Warsaw, Poland

Objectives: To investigate the usefulness of USG elastography in estimating changes in skin and subcutaneous tissue elasticity after IPC compression and correlate them with durometry, tonometry, and skin water concentration.

Background: The most common etiology of upper limb lymphedema is breast cancer therapy. Surgery, lymphadenectomy, and radiation therapy impair lymphatic transport and cause the slow process of accumulation of tissue fluid in tissue spaces and overgrowth and remodeling of tissue. Both factors influence tissue biophysical properties and tissue stiffness. The main goal of conservative treatment is the reduction of volume and weight of edematous limbs and the prevention and reduction of tissue fibrosis and stiffness. Our previous studies using skin and deep tissue tonometer prove the effectiveness of IPC on increasing tissue elasticity in lymphedematous limbs.

Methods: Twenty patients with upper limb lymphedema after breast cancer treatment stage I-III were investigated. In all patients, we did ICG lymphography (Photodynamic Eye; Hamamatsu Photonics) to estimate the advancement of edema and sites of fluid accumulation. In the middle part of the inner side of the forearm, we selected a region (10 x 5 cm), where we did USG examination (SE, SWE) (Canon APLIO i800) and), durometry (SkinFibrometer; Delfin Technologies Ltd.), tonometry (Wagner, Seattle, WA), skin water concentration (LympScanner; Delfin Technologies Ltd.). The strain elastography and tissue elasticity (kPa) were measured at four subcutaneous tissue levels (ROIs). After 45 min of IPC (Bio Compression system) with a pressure of 60 mmHg, all measurements were repeated.

Results: After 45-minute sessions with IPC, we observed a reduction in skin water concentration of 11.0 %, skin stiffness by 36.4 %, and subcutaneous tissue stiffness by 28.6 %. We also observed the changes in strain ratio and elasticity (kPa). Before IPC, the strain ratio and elasticity values were different at different tissue levels: dermis, upper, middle, and lower levels of subcutis, and they change differently at different tissue levels.

Conclusions: IPC changes the biophysical properties of tissue and reduces tissue stiffness. Both types of USG elastography can be used to investigate changes in tissue elasticity after IPC. However, correlation with other methods measuring skin and subcutaneous tissue can help to understand the changes that develop in tissue under the influence of IPC.

Keywords: Breast cancer related lymphedema, tissue stiffness, compression therapy, USG elastography

OP-029

The Effect of A Mobile-Based Lymphedema Self-Care Support Program on Self-Care, The Quality of Life and Lymphedema Symptoms in Women with Breast Cancer-Related Lymphedema: A Single-Blind Randomized Controlled Study

Zeynep deveci koçbilek[1], özgül karayurt[4], özlem bilik[3], sibel eyigör[2]

[1]pamukkale university
[2]ege university
[3]dokuz eylul university
[4]izmir university of economics

Objectives: To examine the effect of a mobile-based lymphedema self-care support program (m-LSSP) on self-care, the quality of life, and lymphedema symptoms in women with breast cancer-related lymphedema (BCRL).

Background: Most of the breast cancer survivors could live lymphedema-free with certain self-care management. However maintaining self-care is complicated.

Methods: This single-blind, randomized controlled study conducted between January and December 2021. Ethical and institutional approvals were obtained. Informed consent was obtained from the participants. The m-LESSP was developed by researchers and the help of a software company. The m-LESSP aims to help women with BCRL access information about lymphedema, facilitate their routine self-care practices and allow them to receive support from the program manager and share their experiences with the program. A control group (n=35) was offered online standard lymphedema education and an intervention group (n=37) was provided with the m-LSSP in addition to the standard education. Data were collected on the phone with the Breast Cancer Related Lymphedema Self-Care Scale, the Quality of Life Measure for Limb Lymphedema–Arm, the Lymphedema Symptom Intensity And Distress Survey-Arm and arm circumference measurements. Data were analyzed with SPSS 24 and Student's t-test, Chi-square test, variance analysis of repeated measures with one factor and two factors, Mann-Whitney U, Friedman, and Wilcoxon tests. The present study was registered on ClinicalTrials.gov and assigned the project number NCT05058495. This study with project number 2020.KB.SAG.069 was funded by Dokuz Eylül University Scientific Research Projects Coordination Unit.

Results: The intervention and control groups were similar in sociodemographic and clinical features at baseline ($p>0.05$). Group ($F=4.171$, $p=0.045$), time ($F=15.958$, $p<0.001$), and group-by-time, ($F=3.709$, $p=0.027$) interactions in the mean score on the BCRLSS were statistically significant. The effect size was large for time interactions ($\eta 2=0.18$). There was no significant difference in the mean scores on the quality of life and lymphedema symptoms ($p>0.05$). The mean scores on self-care ($F=17.350$, $p<0.001$) and the quality of life ($F=24.980$, $p<0.001$) increased, lymphedema symptoms ($F=14.371$, $p<0.001$) and arm circumferences ($p\leq 0.001$) decreased significantly across time in the intervention group. The mean scores on lymphedema symptoms ($F=7.741$, $p=0.002$) and arm circumferences ($p<0.05$) also significantly decreased across time in the control group.

Conclusions: The m-LSSP is a beneficial method to enhance self-care and the quality of life and decrease symptoms in women with BCRL. Breast cancer survivors can increase their self-care practices, prevent an increase in their symptoms and arm circumferences, and improve the quality of their lives by using the m-LSSP.

Keywords: breast cancer-related lymphedema, mobile application, self-care, quality of life

OP-030

Association of Stemmer Sign Presence with Demographic and Clinical Data in Lymphedema Patients

MEHMET KÖKSAL[1], HAVVA TALAY ÇALIŞ[2], AYŞE GÜÇ[3], FATMA GÜL ÜLKÜ DEMİR[3]

[1]Kahramanmaraş Afşin State Hospital, Physical Medicine and Rehabilitation Clinic, Kahramanmaraş, Türkiye
[2]University of Health Sciences, Kayseri Faculty of Medicine, Department of Physical Medicine and Rehabilitation, Kayseri, Turkey
[3]Kayseri City Training and Research Hospital, Kayseri, Turkey

Objectives: Stemmer's sign is a physical examination finding used in the diagnosis of lymphedema. If the examiner cannot pinch the skin on the dorsum of the feet or hands, this positive finding is associated with lymphedema. If the test is positive, there is a high probability that the patient has lymphedema. Stemmer's sign is a useful method to distinguish lymphedema from other diseases. However, if the exam is negative, the patient may still have lymphedema, depending on the severity of the condition and the duration of the disease. The aim of the study was to compare demographic and clinical data with the presence of Stemmer's sign.

Background: Demographic and clinical data of lymphedema patients will be determined, risk factors will be evaluated and will contribute to lymphedema treatment and follow-up management.

Methods: Local ethics committee approval was received for the research (Decision No:11.07.2023/ 867). In the single-center planned study, patients who applied to Kayseri City Hospital Physical Medicine and Rehabilitation Lymphedema outpatient clinic; 75 lymphedema patients, whose lymphedema diagnosis was confirmed by physical examination and lymphoscintigraphy, were included in the retrospective study by scanning the archives from the file. They were divided into two groups: 31 patients with positive Stemmer sign and 44 patients with negative Stemmer sign, and the demographic data and examination findings of the groups were compared.

Results: In our study, no statistically significant difference was found between the groups in terms of demographic data, comorbidities, course of lymphedema, and complications accompanying lymphedema. In the group with a negative Stemmer sign, the number of undergraduate graduates, the presence of a feeling of heaviness in the extremities, and the number of patients admitted to the hospital for lymphedema in the first 6 months were significantly higher. There were more lymphedema patients with lower extremity involvement in both groups. In the group with a positive Stemmer sign, the presence of deformity in the affected extremity was significantly higher. According to the International Society of Lymphology (ISL) swelling degree stages, stemmer positivity was significantly higher in the 2nd and 3rd stages, while stemmer negativity was significantly higher in the 1st stage (Table1).

Table 1. Results

Parameters	Stemmer Positive N:31		Stemmer Negative N:44		P value
Gender	n	%	n	%	0.224**
Woman/Man	27/4	87.1/12.9	42/2	95.5/4.5	
Educational Status	n	%	n	%	0.040***
Illiterate	1 [a]	3.2	7a	15.9	
Primary education	20 [to]	64.5	22 [a.]	50.0	
High school	9 [a.]	29.0	7a	15.9	
University	1 [a]	3.2	8b	18.2	
Previous Surgery	n	%	n	%	0.417**
Yes/No	22/9	71/29	26/18	59.1/40.9	
Marital status	n	%	n	%	0.927**
Married/Single	27/4	87.1/12.9	38/6	86.4/13.6	
Lymphedema Duration	n	%	n	%	0.224**
<6 Months	1 [a]	3.2	8b	18.2	
6 Months-1 Year	4 [a.]	12.9	3 [a]	6.8	
1-2 Years	2 [a]	6.5	6 [a.]	13.6	
2-5 Years	5 [a]	16.1	9 [a.]	20.5	
5-10 Years	10 [a]	32.3	8 [a.]	18.2	
>10 Years	9 [a.]	29.0	10 [a]	22.7	
Starting Zone	n	%	N	%	0.760**
Proximal/Distal	4/26	13.3/86.7	7/37	15.9/84.1	
Beginning	n	%	n	%	0.760**
Acute/Insidious	4/27	12.9/87.1	5/39	11.4/88.6	
Family History	n	%	n	%	0.438**
Yes/No	4/27	12.9/87.1	3/41	6.8/93.2	
Pain	n	%	n	%	0.350**
Yes/No	17 / 14	54.8 / 45.2	30 / 14	68.2 / 31.8	
Feeling of Heaviness	n	%	n	%	0.042**
Yes/No	17/14	54.8/45.2	35/9	79.5/20.5	
Wound discharge	n	%	n	%	0.643**
Yes/No	3/38	9.7/90.3	2/42	4.5/95.5	
Infection	n	%	n	%	0.082**
Yes/No	24/7	22.6/77.4	3/41	6.8/93.2	
Prophylactic Antibiotic Use	n	%	n	%	0.687**
Yes/No	3/28	9.7/90.3	3/41	6.8/93.2	
Diuretic Use	n	%	n	%	0.927**
Yes/No	4/27	12.9/87.1	6/38	13.6/86.4	
Wound	n	%	n	%	0.566**
Yes/No	2/29	6.5/93.5	1/43	2.3/97.7	
Deformity	n	%	n	%	0.005**
Yes/No	16 / 15	51.6 / 48.4	8 / 36	18.2 / 81.8	
Lymphedema Zone	n	%	n	%	0.381***
Right arm	1 [a]	3.2	6 [a.]	13.6	
Left arm	7a	22.6	5 [a]	11.4	
Right Leg	5 [a]	16.1	9 [a.]	20.5	
Left Leg	3 [a]	9.7	6 [a.]	13.6	
Both Lower Extremities	15 [a.]	48.4	18 [a.]	40.9	

Parameters	Stemmer Positive N:31 Mean±SD	Stemmer Negative N:44 Mean±SD	P value
Age(years)	54.09±13.08	56.84±13.22	0.377*
Body Mass Index((kg/m²)	35.89±7.73	34.84±7.98	0.572*
ISL Swelling Degree	2.12±0.71	1.38±0.53	0.001*

SS:Standard Deviation. n: number of people.
%: percent value
*Mann Whitney U test was used for statistical analysis.
**Chi-Square test was used for statistical analysis.
*** Chi-Square test with Bonferroni correction was used.
[ab] There is no difference in the ratios between groups with the same letter.
p<0.05 indicates statistical difference.

Conclusions: Absence of Stemmer's sign does not exclude the diagnosis of lymphedema. Stemmer negativity is more common in lymphedema patients with symptoms of feeling of heaviness, especially those who are educated and present to the hospital early. Stemmer positivity is higher in patients with ISL Stage 2 and 3 or lymphedema with deformity.

Keywords: Lymphedema, Stemmer's Sign, International Society of Lymphology (ISL) staging

OP-031

Does The Addition of Manual Lymphatic Drainage to Standard Treatment Impact Arm Volume in Patients with Breast Cancer-Related Lymphedema? A Randomized Controlled Trial with Long-Term Results

Ekin İlke Şen[1], Sina Arman[1], Serhat Yavuz[1], Gizem Yıldırım[1], Hadi Yavuz[1], Dilşad Sindel[1]

[1]Istanbul University Istanbul Faculty of Medicine, Department of Physical Medicine and Rehabilitation

Objectives: This study aimed to investigate the effectiveness of combining manual lymphatic drainage (MLD) with multilayer compressive bandage therapy, along with an exercise regimen, in improving arm volume among patients with breast cancer-related lymphedema (BCRL). Additionally, the study aimed to evaluate the efficacy of the second phase of complex decongestive therapy, which included a compression garment and exercise program, in patients with BCRL.

Background: BCRL is a potentially severe consequence of breast cancer and its therapies. Despite MLD being a significant component of complex decongestive therapy, the findings from studies and systematic reviews evaluating its impact on BCRL are inconsistent.

Methods: In this prospective, randomized, single-blind, interventional trial, 40 women diagnosed with BCRL were enrolled. Eligible patients were randomly assigned to either the complex decongestive therapy (CDT) group (n=20) or the standard treatment (ST) group (n=20). Both groups participated in a 15-session program held every weekday for three weeks, which included compressive multilayer bandaging and exercise training. The patients in the CDT group received MLD before bandaging, in addition to the ST. All patients participated in a one-session educational program. All participants were instructed to wear an elastic compression garment and to continue the home-based exercise program after completing all sessions. Arm circumferences were measured bilaterally at six reference points using a measuring tape. The therapeutic response of the treatment approaches was measured by assessing the absolute change in both affected and unaffected arm volumes, as well as the excess arm volume.

Results: The intra-group analysis showed a significant decrease in affected arm volume and excess arm volume in both the CDT group and the ST group at the end of the three-week period ($p<0.05$). There was also a significant decrease in affected arm volume at the 6-month follow-up after the treatments ($p<0.05$). However, the excess arm volume increased significantly in both training groups compared to the post-intervention period by the end of six months ($p<0.05$). The pairwise comparison did not reveal a significant difference among the groups in terms of outcome measures over a six-month period ($p>0.05$), indicating that neither group had a clear advantage over the other.

Conclusions: The study findings indicated that both treatment approaches were effective in patients with BCRL. However, no additional benefit from MLD was observed in terms of reducing arm volume over a 6-month period.

Keywords: Breast cancer, lymphedema, manual lymphatic drainage, compressive bandage

OP-032

The Effect of Neoadjuvant Chemotherapy on Lymphedema Formation: Preliminary Results of a Prospective Clinical Study

Ceren Hafızoğlu[1], Zeynep Erdoğan İyigün[2], Enver Özkurt[3], Naziye Ak[4], Ahmet Serkan İlgün[5], Tomris Duymaz[6], Çetin Ordu[7], Gürsel Remzi Soybir[8], Vahit Özmen[1]

[1]Breast Health Center, Istanbul Florence Nightingale Hospital, Istanbul, Turkey
[2]Department of Physical Theraphy and Rehabilitation, Istanbul Bahcesehir University School of Medicine, Istanbul,
[3]Department of General Surgery, Istanbul Demiroglu Bilim University School of Medicine, Istanbul, Turkey
[4]Division of Medical Oncology, Department of Internal Medicine, Istanbul University School of Medicine, Istanbul, Turkey
[5]Department of Surgery, Mater Dei Hospital, Msida, Malta
[6]Department of Physiotherapy and Rehabilitation, Faculty of Health Sciences, Istanbul Bilgi University, Istanbul, Turkey
[7]Division of Medical Oncology, Department of Internal Medicine, Istanbul Demiroglu Bilim University, Istanbul, Turkey
[8]Department of General Surgery, Istanbul Sisli Memorial Hospital, Istanbul, Turkey

Objectives: Researches that evaluating the effectiveness of chemotherapy on lymphedema mostly relies on postoperative data and retrospective studies. Despite the studies carried out in this field, the effect of chemotherapy on lymphedema is still controversial.

Background: The aim of this prospective clinical study is to determine the impact of chemotherapy regimens administered to breast cancer diagnosed patients who are receiving neoadjuvant chemotherapy, on the development of lymphedema.

Methods: Thirty-one patients receiving neoadjuvant chemotherapy for breast cancer diagnosis were included in the study. Demographic, clinical, and pathological data of the patients were recorded. Circumference measurements of both arms and bioimpedance measurements with the L-DEX U400® device were conducted before starting chemotherapy. The second evaluation of the patients was performed one week after the completion of chemotherapy. Measurements were conducted and recorded by an experienced physiotherapist in this regard. In 20 patients, chemotherapy regimens of 4 AC + 12 Paclitaxel were administered, in 6 patients, 4 AC + 12 Paclitaxel + Trastuzumab + Pertuzumab, in 1 patient, 4 AC + 12 Paclitaxel + 4 Pembrolizumab, in 1 patient, 4 AC + 12 Paclitaxel + Trastuzumab, and in the other 3 patients, 4 AC + 12 Paclitaxel + Carboplatin were applied.

Results: The average age of the patients was 49.6±10.5 years and body mass index was 26.09±3.7. According to the LDEX score evaluation before and after NCT, it was determined that the LDEX score increased by at least 7 units in 7 patients (22.5%) after NCT, and the LDEX score decreased by at least 7 units in 5 patients after NCT. While 57% of the patients with an increase in the LDEX score had a pathological complete response, no pathological complete response was detected in the patients with a decrease in the score. In the group with no change, pathological complete response of 21% was detected.

Conclusions: Despite the limited number of patient data in this study, data suggesting that chemotherapy may initiate lymphedema by causing an increase in extracellular fluid due to the fibrosis effect.

Keywords: Lymphedema, Breast Cancer, Neoadjuvant Chemotherapy

OP-033

The Role of Lymphoscintigraphy in Lower Extremity Peripheral Edema

Seckin Bilgic[1], Tugba Sahbaz[2]

[1]Sirnak State Hospital, Department of Nuclear Medicine, Sırnak, Turkey
[2]Beykent University, Faculty of Medicine, Department of Physical Medicine and Rehabilitation, Istanbul, Turkey

Objectives: Lower extremity edema (LEE) presents a diagnostic challenge due to its multifactorial etiology, including but not limited to venous insufficiency, lymphedema, and cardiac or renal conditions.

Background: This study aims to evaluate the efficacy and diagnostic value of lymphoscintigraphy in distinguishing lymphedema from other causes of LEE.

Methods: In the present study, we conducted a comprehensive evaluation of demographic data and lymphoscintigraphic outcomes for a cohort of 56 patients who underwent lymphoscintigraphy over the preceding year. A dose of 0.5 mCi (18.5 MBq) of 99Tc-Nanocolloid radiopharmaceutical was administered subcutaneously into the first webspace of both feet using a 26-gauge needle, in a volume of 0.4 mL. After a brief walking period, scintigraphic scans were conducted at 15 and 120 minutes. The analysis of lymphoscintigraphy results was performed utilizing the Lee and Bergan classification system.

Results: Of the 56 patients included in our study, 47 (83.9%) were female, 9 (16.1%) were male and the mean age was 44.86+15.72 years. At the time of admission, 24 patients had bilateral, 17 right and 15 left lower extremity edema. According to the results of lymphoscintigraphy, lymphedema was diagnosed in 45 patients. Of the patients diagnosed with lymphedema, 37 were female and 8 were male with a mean age of 44.27+16.70 years and a mean BMI of 28.94+7.76. Of the patients diagnosed with lymphedema, 21 had bilateral, 12 had right-sided and 12 had left-sided lymphedema. According to lymphoscintigraphy, 34 (75.6%) inguinal lymph nodes, 30 (66.7%) popliteal lymph nodes, 22 (48.9%) main lymphatic duct, 23 (51.1%) collateral duct, and 36 (80%) dermal-back-flow pathology were detected. In unilateral lymphedema, the stages of 24 patients were determined as G1 in 2 patients, G2 in 12 patients, G3 in 6 patients, and G4 in 4 patients, according to the Lee and Bergan classification. In 21 bilateral lymphedema cases, the stages in a total of 42 extremities were determined as G1 in 3 extremities, G2 in 25 extremities, G3 in 6 extremities, and G4 in 8 extremities.

Conclusions: This study underlines the important role of lymphoscintigraphy using the Lee and Bergan classification system in the accurate and early diagnosis of lymphedema in patients presenting with lower extremity edema. Consequently, lymphoscintigraphy emerges as an indispensable diagnostic tool in the management of lower extremity edema, facilitating targeted therapeutic interventions.

Keywords: Lymphoscintigraphy, Lower Extremity Edema, Lymphedema, Diagnostic Imaging

OP-034

Evaluation of the influence of IPC on tissue elasticity and fluid movement in lower limb lymphedema using USG elastography and ICG lymphography.

Marzanna Zaleska[1], Marzanna Zaleska[2], Marzanna Zaleska[3]

[1]Mossakowski Medical Research Institute, Dept. of Applied Physiology, Polish Academy of Sciences, Warsaw, Poland
[2]National Medical Institute of the Ministry of Interior and Administration, Warsaw, Poland
[3]Juzo Competence Center, Warsaw, Poland

Objectives: To evaluate the effect of Intermittent Pneumatic Compression on fluid movement from the distal to the proximal part of the limb on ICG lymphography and how it influences tissue elasticity.

Background: One of the common causes of lower limb lymphedema is cancer therapy with lymphadenectomy and radiation. Consequently, tissue fluid with biologically active factors accumulates in tissue spaces. If not evacuated regularly, it leads to the proliferation of cells and remodeling of tissue. All these changes make lymphedema challenging to treat. The primary conservative methods for tissue fluid evacuation are different types of compression, including IPC.

Methods: We investigated 20 patients with lower limb lymphedema with post-cancer etiology (prostate cancer, cervical cancer, endometrial cancer) in stage II-III. We did ICG lymphography in all patients. The observation and recording (Photodynamic Eye; Hamamatsu Photonics) were done five minutes after injection, after a one-hour walk, and after 45 minutes with IPC (80 mmHg). In selected regions (10x5 cm) in the middle calf and thigh, we measured skin stiffness in USG Strain elastography (SE) (Canon APLIO i800) on the four subcutaneous tissue levels (ROIs), skin water concentration (LympScanner; Delfin Technologies Ltd.), skin and subcutaneous tissue stiffness (SkinFibrometer; Delfin Technologies Ltd., Wagner, Seattle, WA). On ICG lymphography, we concentrated on fluorescent intensity along the entire limb with a correlation in changes in water concentration and skin and subcutaneous tissue stiffness.

Results: After an hour's walk, we observed on ICG lymphography the accumulation of fluid as dermal backflow covering entire limbs in 13 patients, in 4 patients, in the feet, and in the calves without visible lymph vessels above and in 3 patients with dermal backflow in the foot and the calf and the upper part of the thigh and in the groin. After 45 min IPC, we observed a decrease in fluorescent intensity (10-30%) in different parts of the limbs in 12 patients (92%) and movement of the fluid upper in the tight in 4 patients (100%). In one patient, we observed fluid movement above the inguinal ligament and lymphatic vessel going to the contralateral inguinal lymph node. The changes in strain ratio were seen in most patients in both measured limb areas (calves and thighs). The skin water concentration and skin and subcutaneous tissue stiffness decreased.

Conclusions: Intermittent Pneumatic Compression can effectively evacuate edema fluid from most distal parts of the limbs, reduce tissue stiffness, and prevent the development of advanced tissue fibrosis and ulceration.

Keywords: lower limb lymphedema, tissue elasticity, edema fluid movement, Intermittent pneumatic compression

OP-035

Relationship of the Tissue Stiffness Measured Using Shear Wave Elastography with the Pain Threshold and Quality of Life of Patients with Lipedema: A Cross-sectional Study

Feyza Akan Begoğlu[1], Gülcan Öztürk[1]

[1]Fatih Sultan Mehmet Research and Training Hospital

Objectives: This study aimed to assess the relationship between disease severity in patients diagnosed with lipedema and tissue stiffness measured using shear wave elastography (SWE) concerning pain threshold and quality of life as well as determine differences in subcutaneous tissue stiffness between patients with lipedema and healthy subjects.

Background: Lipedema is a chronic connective tissue disorder characterized by abnormal subcutaneous adipose tissue storage and distribution. Pain is a prevalent symptom in patients with lipedema. The pathogenesis of pain in lipedema and morphological changes in subcutaneous fat tissue have not yet been fully elucidated.

Methods: Seventy-one participants were subjected to measurements using subcutaneous tissue elastic modulus with SWE imaging of lower limbs at three anatomical levels. The participants were divided into two groups: those diagnosed with lipedema (group 1) (n=35) and those without a lipedema diagnosis (group 2) (n=36). Patients with lipedema were further categorized into three stages based on disease severity. Pain levels were assessed using the visual analog scale(VAS), algometric measurement, and EQ-5D general quality of life scale.

Results: The mean elastic modulus for the right thigh, left thigh, and right pretibial was statistically significantly lower in group 1 than ingroup 2 ($p<0.05$).The mean right thigh elastic modulus in patients with stage 3 lipedema was significantly lower than that in the control group ($p<0.05$). The mean right pretibial region elastic modulus in stage 3 cases was significantly lower than that in stage 2 cases and the control group ($p<0.05$).No statistically significant differences were observed in elastic modulus between various stages for the right thigh and right pretibial region ($p>0.05$). Similarly, no statistically significant differences in elastic modulus were observed between patients with lipedema and controls for the left thigh, left pretibial region, and right and left supramalleolar regions ($p>0.05$). The mean spontaneous and palpation VAS scores in stage 1 cases were significantly lower than those in stage 2 and3 cases ($p<0.05$).No statistically significant difference was observed between stage 2 and 3lipedema patients ($p>0.05$). The EQ-5D VAS scores of the control group were significantly lower than those of stage 1, 2, and 3 cases ($p<0.05$).No significant difference was observed in algometric measurements and EQ-5D total scores between the stages of lipedema ($p>0.05$).

Conclusions: SWE revealed increased subcutaneous tissue elasticity in patients with lipedema. Notably, stage 3 lipedema patients exhibited higher subcutaneous tissue elasticity. Moreover, pain parameters and disability were not related to disease severity.

Keywords: Lipedema, shear wave elastography, pain, quality of life

OP-036

Lymphonodulovenous anastomoses in the complex treatment of the lower extremity lymphedema

Vladimir Ivashkov[1], Sergey Semenov[2], Rayana Dakhkil'gova[3], Ivan Arutyunov[2], Alexander Legon'kih[4], Alexander Kolsanov[1], Andrey Nikolaenko[1], Aleksandr Denisenko[2]

[1]Samara State Medical University, 89, Chapaevskaya street, Samara, 443099, Russia
[2]Sechenov University, 8-2, Trubetskaya street, Moscow, 119992, Russia
[3]Federal State-Funded Educational Institution of Higher Education "ROSBIOTECH", Moscow, Volokolamskoye sh., 11, 125080, Russia
[4]Petrovsky National Research Centre of Surgery, Moscow, GSP-1, Abrikosovsky lane, no. 2, 119991, Russia

Objectives: The purpose of the study is to identify possible options for using this method in the complex treatment of low extremity lymphedema in combination with liposuction.

Background: Supermicrosurgical version of lymph-node-to-vein anastomosis (LNVA) as a treatment for low extremity lymphedema was first described in 2021.

Methods: Female patients with low extremity lymphedema stage 2 ISL were included. Reduction in limb volume was used as a method of effectiveness assessment. All the participants were divided into two groups: in the first group liposuction was performed as treatment. In the second group treatment was carried out in two stages (1st – liposuction, 2nd – LNVA formation in the groin area 3-5 months after the 1st stage). Functionally active lymph node was visualized with a use of fluorescent ICG. Limb circumference measurements were taken at 8 levels before surgery, after 1, 3 and 9 months, respectively, using a patented program [2] for measuring the limb volume.

Preparation for LNVA formation

Intraoperative view. The wall of the lymph node is dissected. The nearby vein is prepared to form an anastomosis.

Formed LNVA

Performing an opening in the lymph node wall. Then, anastomosis is formed between the lymph node and a nearby vein.

Results: Each group included 16 patients with lymphedema of the lower limb ISL2. The average follow-up period was 18 months.Limb volume in group 1 before surgery was 10,314.16±1,884.44 cm3 (CI 95%), 18 months after surgery 8934.42±1,522.72 cm3 (CI 95%), the average decrease in volume was 13. 15±11.22% (CI 95%).Limb volume in group 2 before surgery was 10,368.49±1,841.96 cm3 (CI 95%), 18 months after surgery 8,784.42±1,436.66 cm3 (CI 95%), the average volume reduction was 15.01±12 .04% (CI 95%).

Conclusions: In our opinion, the use of the technique of forming a LNVA looks promising and can be considered as an addition to liposuction in the treatment of lymphedema of the lower extremities.

Keywords: Lymphedema, Lymphovenous anastomosis (LVA), lymph-node-to-vein anastomosis (LNVA), Microsurgery

OP-037

Investigation of Myofascial Pain Syndrome Co-occurrence in Patients with Breast Cancer Related Lymphedema

Özden Tömek[1], Gökçenur Yalçın[1], Feyza Nur Yücel[1], Yeliz Bahar-Özdemir[2], Emre Ata[1], Canan Şanal-Toprak[2]

[1]Sultan 2.Abdulhamid Han Training and Research Hospital, Clinic of Physical Medicine and Rehabilitation
[2]Marmara University Faculty of Medicine, Department of Physical Medicine and Rehabilitation

Objectives: The aim of this study is to investigate the relationship between the stage of lymphedema and the frequency of myofascial pain syndrome (MPS) in breast cancer patients. The second objective is to determine the pressure-pain threshold (PPT) values of the muscles that are most frequently affected following breast cancer surgery (BCS).

Background: Lymphedema and MPS are among the most prominent causes of upper-limb dysfunction in women with breast cancer. It is important to detect treatable conditions in order to restore upper extremity functionality and increase quality of life. The co-occurrence of MPS and lymphedema following BCS has not been determined previously. This study aims to investigate the relationship between the presence of lymphedema and accompanying MPS in breast cancer patients.

Methods: This cross-sectional, single-center study involved a total of 71 female patients aged between 18 and 75 years with a history of BCS. Patients were divided into two groups: latent lymphedema (stage 0) (n=35) and clinical lymphedema (n=36). The primary endpoint was to determine the frequency of trigger points (MTrP) in muscles commonly observed MTrP in breast cancer patients in each group. Secondary endpoints included determination of the PPT for those muscles with algometry, VAS pain scores, volumetric measurements of upper extremities (Limb Calculator Excel program), LYMQOL-Arm, and Quick DASH questionnaires.

Results: Patient distribution according to lymphedema stages: 36 (53.7%), 18 (25.4%), 13 (18.3%), and 4 (5.6%) for stages 0, 1, 2, and 3, respectively. MTrPs were present in all muscles, ranging from 52.1% to 84.5%, with a higher prevalence on the affected side (Table 2). MTrP frequencies were significantly higher for the latissimus dorsi and serratus anterior muscles on the affected side (Table 2). A comparison of the latent and clinical lymphedema patient groups revealed no significant difference in MTrP frequency on the affected sides ($p>0.05$). PPT values were significantly lower on the affected side for all muscles ($p = 0.001$ for trapezius and latissimus dorsi, $p<0.001$ for infraspinatus, serratus anterior, and pectoralis).

Table 1. Demographic and clinical data of the enrolled patients

Age (year), mean (SD)	57.11 (10.24)
BMI (kg/m2), mean (SD)	28.12 (4.90)
Affected side, %(n) Right Left	 50.7 (36) 49.3 (35)
Dominant side, %(n) Right Left	 88.7 (63) 11.3 (8)
Treatment, %(n) Chemotherapy Radiotherapy Hormonotherapy	 83.1 (59) 83.7 (62) 73.2 (52)
Surgery, %(n) Mastectomy Breast conserving surgery	 53.5 (38) 46.5 (33)
Lymph node dissection, %(n) Yes No	 63.4 (45) 36.6 (26)
Metastasis, %(n) Yes No	 28.2 (20) 71.8 (51)
Lymphedema duration, median (IQR)	0.75 (3.25)
Upper extremity volume of the affected side, (ml), median (IQR)	1991 (568)
VAS-Pain, median (IQR)	4 (5.25)
VAS-Tension, median (IQR)	3 (5.25)
VAS-Sense of heaviness, median (IQR)	3 (5.0)
QuickDASH, mean (SD)	40.77 (24.34)
LYMQOL, median (IQR)	1.83 (0.62)

BMI: Body Mass Index, VAS: Visual Analogue Scale, QuickDASH: Quick Disabilities of the Arm, Shoulder and Hand, LYMQOL: Lymphoedema Quality of Life, SD: Standard deviation, IQR: Interquartile range

Table 2. Trigger point frequency and pain pressure thresholds of the examined muscles

	Presence of MTrP % (n)	PPT mmHg/cm2
Trapezius Affected side Spared side p	 77.5 (55) 70.4 (50) 0.267	 4.32 (1.64) 4.46 (2.20)* 0.001
İnfraspinatus* Affected side Spared side p	 62.0 (44) 54.9 (39) 0.383	 4.25 (1.52) 4.44 (1.59) <0.001
Latissimus dorsi Affected side Spared side p	 77.5 (55) 52.1 (37) 0.002	 3.0 (1.37)* 3.50 (1.36) 0.001
Serratus anterior Affected side Spared side p	 84.5 (60) 56.3 (40) <0.001	 2.10 (1.10)* 2.76 (1.27)* <0.001
Pectoralis Affected side Spared side p	 76.1 (54) 62.0 (44) 0.052	 2.38 (0.83) 2.76 (1.26)* <0.001

MTrP: Myofascial trigger point, PPT: Pain pressure threshold, * Paired T test. Wilcoxon test is used for other comparisons.

Conclusions: BCS patients have more frequent MTrPs in the serratus anterior and latissimus dorsi muscles on the affected side compared to the unaffected. Patients present decreased PPT in the trunk muscles of the affected side, regardless of the presence or stage of lymphedema. . Clinicians are advised to consider these findings when evaluating pain in patients who have undergone BCS. (Conflict of interest: There are no conflicts of personal and financial interest within the scope of the study.)

Keywords: lymphedema, breast cancer-related lymphedema, myofascial pain syndrome, myofascial trigger point

OP-038

Does Complex Decongestive Therapy Have an Effect on Balance Parameters in Patients with Breast Cancer-Related Lymphedema? Preliminary report

Elif Becenen Durmuş[1], Ayşegül Yaman[1], Fatma Melis ERTUĞRUL[1], Emre Adıgüzel[2], Şeyma ÖZMEN[1], Şeyma ÇİFTÇİ[1], Zeynep Tuba BAHTİYARCA[1], Emel EKŞİOĞLU[1]

[1]Ankara Etlik City Hospital, Physical Therapy and Rehabilitation Hospital, Ankara, Türkiye
[2]Ankara Bilkent City Hospital, Physical Therapy and Rehabilitation Hospital, Ankara, Türkiye

Objectives: Upper extremity lymphedema is a concerning complication after treatment for breast cancer. Functional disability, psychosocial problems, and impaired quality of life (QoL) may be observed in patients with breast cancer-related lymphedema (BCRL). Complex decongestive therapy (CDT) is effective in reducing extremity volume and improving functional status and quality of life.

Background: The purpose of this study was to assess how patients with BCRL responded to CDT in terms of balance parameters.

Methods: The study recruited participants who had unilateral BCRL. All patients received combined phase 1 CDT including skin care, manual lymphatic drainage, multilayer bandaging, and supervised exercises five times/week for three weeks, a total of 15 sessions. The limb excess volumes according to serial circumference measurements were recorded at baseline and the end of the third week. The improvement of functional status and QoL scores were evaluated by Quick Disabilities of the Arm, Shoulder, and Hand (Q-DASH) and Lymphedema QoL-Arm (LYMQOL-Arm) questionnaires. Static and dynamic balance assessments were conducted using the Tecnobody PK252 isokinetic balance testing system, the one-leg standing test, and the functional reach test.

Results: Fifteen BCRL patients who received CDT were included in this study (mean age 55.40±7.46 years; mean body mass index 29.83±4.62 kg/m²). The mean excess volumes were significantly decreased at the end of therapies (35.7% vs 17% $p<0.001$). The scores of Q-DASH, as well as subscores of LYMQOL-Arm questionnaires (except symptom subscore), were significantly improved after 3 weeks of CDT ($p<0.05$). A statistically significant improvement was detected in the results of the one-leg standing test and functional reach test ($p<0.05$). In the Tecnobody TPK252 isokinetic balance test, it was observed that there was no statistically significant difference in static and dynamic balance parameters.

Conclusions: We determined improvement of the static and dynamic balance in patients with BCRL after 3 weeks of CDT by one-leg standing test and functional reach test although we could not obtain similar results with the Tecnobody TPK252 isokinetic balance test.

Keywords: balance, breast cancer-related lymphedema, functional status, Complex decongestive therapy

OP-039

Surgical treatment of arteriovenous malformations of the hand

Amriddin Rakhimov Dmitrii Romanov, Maxim Karev[1]

[1]Center of Vascular Pathology

Objectives: The aim of this work was to demonstrate the results of successful open intervention in patients with AVM of the hand using a surgical microscope.

Background: Surgical treatment of arteriovenous malformations (AVMs) of the hand might be challenging due to its anatomical stucture. The main options of treatment are an open surgery and endovascular procedures. The pathogenesis involves different types of vessels and as the musculoskeletal system and nerves are located in a limited anatomical space too, even a well-planned surgical incision may act as a resistance point potentially leading to inferior outcomes. However endovascular approaches such as embolization or sclerotherapy are still associated with a high risk of serious complications as soft tissue necrosis, thrombosis of the distal vascular bed, disorders of the sensitive and motor functions of the hand.

Methods: The study included 4 female patients aged 21 to 36 years diagnosed with AVM of the hand, who had severe pain syndrome, periodically bleeding ulcers, limited mobility of the area. Pathological process involved only the palm surface of the hand in one patient, the fingers and palm surface were affected in another patient and the fingers were involved in other two patients. All patients underwent MSCT of the hand with intravenous contrast, as well as color Doppler mapping (CDM) to determine the volume of the pathological process and preoperative planning. In all four cases, AVM with afferent and excretory vessels was isolated under an arterial tourniquet, and radical removal of AVM was performed while maintaining distal arterial blood supply. The wounds were sewn up with non-absorbable sutures. The early postoperative period was uneventful.

Results: At both 6- and 12-months follow-up examination, three patients presented neither pain syndrome nor ulcers, the fourth patient showed a decrease in pain syndrome. In all patients the range of motion (ROM) of the hand increased after the intervention. The data of the clinical examination were confirmed by the results of an ultrasound examination.

Conclusions: Thus, we may conclude it is necessary to rely on a multimodal diagnostic examination in the treatment of arteriovenous malformations of the hand. These clinical examples illustrate that open surgery of AVMs of the hand may be associated as safe and effective treatment method with a good medium-term result.

Keywords: arteriovenous malformation, vascular malformation, hand surgery

OP-040

An immunohistochemical study on distribution of podoplanin-positive lymphatic vessels and podoplanin deposition in colorectal neoplastic legions.

EIKICHI OKADA[1], H Hayashi[1], Y Yokoi[1], M Makino[1], S Terabe[1], N Takayanagi[1]

[1]Toyama City Medical Association Health Control Center

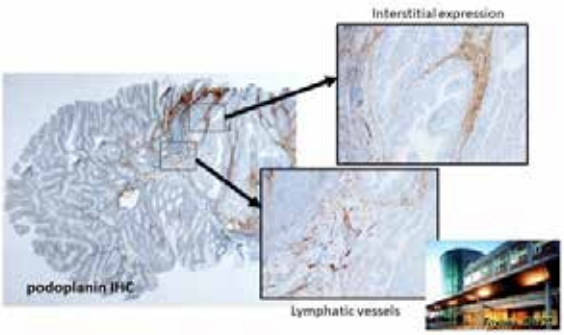
Objectives: To make an immunohistochemical study on distribution of podoplanin-positive lymphatic vessels and podoplanin deposition in colorectal neoplastic legions

Background: We presented a study on distribution of podoplanin expression in polypoid colorectal lesions at ISL meeting held in Genoa last year. We present the results of the same manner of study with larger number of cases including advanced colorectal cancers in addition to polypoid lesions.

Methods: Polypoid lesions (hyperplastic polyp, tubular adenoma, tubulovillous adenoma, serrated adenoma, SSA/P(sessile serrated adenoma/polyp), carcinoma in adenoma) and advanced cancers (adenocarcinoma) excised from human colon and rectum were studied by immunohistochemistry using anti-podoplanin antibody (D2-40, Dako M3619). Hematoxylin and eosin and elastica van Gieson-stained specimens of the same sites as the immunohistochemically processed were also prepared and observed for comparison.

Results: In the tubular adenomas and the tubulovillous adenomas, the lymphatic capillaries distributed around the adenomatous glands in some areas, and they were thought to be caused by the lift-up of the lymphatic capillaries in deep location of the lamina propria. There was also mild to moderate diffuse podoplanin deposition in the peri-glandular interstitium. In the serrated adenomas, the lymphatic capillaries distributed around the glands, but the density was lower than in tubular adenomas. No podoplanin deposition was present in the stroma of serrated adenomas and SSA/P. In the lesions of carcinoma in adenoma, there was an increase in podoplanin-positive lymphatic capillaries around the cancer components in adenomas, and we observed moderate to dense podoplanin deposition in the interstitium. In the lesions of advanced cancers, we observed lymphatic vessels around neoplastic glands and diffuse podoplanin deposition in the interstitium.

podoplanin in cancer in adenoma



Conclusions: The distribution of podoplanin-positive lymphatic vessels and podoplanin deposition in interstitium may have important pathogenetic implications in colorectal neoplastic legions.

Keywords: podoplanin, colorectal neoplastic legions, immunohistochemistry

OP-041

Does ultrasonography measurement of upper extremity muscle thickness have value in evaluating post mastectomy lymphedema patients? : A Preliminary Study

Kevser Gumussu[1], Cigdem Ozkara Bilgili[2], Mazatulfazura SF Salim[3], Ayse Nur Coban[1], Zeynep Tumler[1], Ebru Yilmaz Yalcinkaya[1]

[1]Physical Medicine and Rehabilitation Department, University of Health Sciences ,Gaziosmanpasa Research and Training Hospital, Istanbul, Turkiye
[2]Radiology Department, University of Health Sciences, Gaziosmanpasa Research and Training Hospital, Istanbul, Turkiye
[3]Department of Rehabilitation Medicine, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, Selangor , Malaysia

Objectives: The aim of this study is to evaluate the upper extremity(UE) muscle thickness (MT) in post mastectomy lymphedema patients by using ultrasonography. Secondly, the study was also aimed at investigating whether upper extremity muscle thickness has any correlation with the patients' physical, psychosocial and functional impairment.

Background: It is an established fact that UE are directly related to functionality and independence. One of the common presentation of lymphedema is swelling which will lead to lack of physical activity and later will result in muscle atrophy. Changes in upper limb volume and the muscle loss of the UE, may result in further declining of function. To the best of our knowledge, it is still unknown whether there is actual muscle loss in the UE of the post mastectomy lymphedema patients and if any, whether the MT changes can cause implications towards patients' functionality and quality of life.

Methods: A total of 23 post mastectomy lymphedema patients were enrolled in this study. The UE muscle thickness (MT) and subcutaneous (SC) thickness of the biceps, triceps, brachioradialis, flexor digitorum profundus (FDP) and flexor digitorum superficialis (FDS) were evaluated with an ultrasonography and the extremity volume were calculated using the truncated cone formula. The hand grip strength was measured using handheld dynamometer. Patients' physical, psychosocial and functional impairments were also assessed using Lymphedema Life Impact Scale (LLIS).

Results: The mean age of patients was 57.74 ± 11.85 years with BMI of 33.17 ± 6.92 kg/m2 and 22 of our patients were females. The extremity volume was found to be higher in the affected arm with p=0.001 compared to the unaffected arm. We also found that the subcutaneous thickness measurement of triceps and the subcutaneous tissue of the forearm in the affected UE are higher and highly significant with p=0.001 and p=0.0001 respectively compared to the unaffected UE. Although the measurements of the MT of the arm and forearm muscles in the affected UE compared to the unaffected UE were not statistically significant , we found that the triceps, brachioradialis, FDP and FDS muscle thickness are smaller compared to the unaffected UE. Nonetheless, the MT values has no significant correlation with patients' physical, psychosocial and functional impairments.

Table 1. Demographic characteristic of patients

Age (mean ± SD)	57.74 ± 11.85
BMI kg/m2 (mean ± SD)	33.17 ± 6.92
Gender (% females)	22 (95.7)
Lymphedema side (%) Right Left	 10 (43.5) 13 (56.5)
Dominant hand (% Right)	23 (100)
Lymphedema duration in years – median (minimum-maximum)	4(0.5-30)
Lymphedema staging- median (minimum-maximum)	1 (0-3)

Characteristic of the study sample (n= 23)

Values of the hand grip strength ,muscle thickness (MT) and subcutaneous (SC) measurements

	Affected UE	Unaffected UE	P value
Hand Grip Strength (kg)	15.2 ± 6.3	15.8 ± 6.5	0.745
Extremity Volume (mls)	3114.95 ± 883.66	2400.63 ± 495.23	0.001*
Biceps brachi MT (mm)	23.60 ± 4.11	21.74 ± 5.69	0.100
Triceps MT (mm)	22.17 ± 3.59	23.59 ± 4.42	0.108
Brachioradialis MT (mm)	15.41 ± 3.34	16.83 ± 3.94	0.053
+FDP-FDS MT (mm)	28.16 ± 4.86	30.01 ± 5.45	0.078
Biceps brachii SC (mm)	8.10 ± 3.67	7.46 ± 3.04	0.512
Triceps brachii SC (mm)	14.56 ± 6.31	8.82 ± 3.03	0.001*
+FDP-FDS MT (mm)	8.62 ± 3.14	5.49 ± 1.19	0.0001*

Data are presented as mean ± standard deviation with *p<0.05, according to paired t-test. +Flexor Digitorum Profundus- Flexor Digitorum Superficialis

Conclusions: Our preliminary study showed notable changes in the upper extremity MT of post mastectomy lymphedema patients. However, larger trial is needed to further explore the significance value that will possibly affect the future management of UE lymphedema in this population.

Keywords: Lymphedema, Extremity Volume, Ultrasonogphy, Muscle Thickness

OP-042

Assessment Of Resting Microcirculation In Lipedema Using Laser Doppler Flowmetry

Győző Szolnoky[1], Jetta Szabó[1], Orsolya Ágnes Péter[2], Attila Nemes[2], Zoltán Ruzsa[2]

[1]Department of Dermatology and Allergology, Albert Szent-Györgyi Medical School, University of Szeged, Szeged, Hungary
[2]Department of Medicine, Albert Szent-Györgyi Medical School, University of Szeged, Szeged, Hungary

Objectives: Our aim was to compare the ankle-brachial index (ABI) and Laser Doppler Flowmetry (LDF) results in persons with and without lipedema.

Background: Lipedema is chronic and usually progressive debilitating disease characterized by symmetric enlargement of painful nodular and fibrotic adipose tissue mostly affecting lower body half. Even in early stages lymphatic circulation appeared to be compromised and lipedema is associated with increased aortic stiffness and altered heart left ventricular mechanics. Regarding capillary circulation patients usually complain of skin coldness and capillary fragility is a typical feature however extensive research of blood microcirculation of lipedematous skin is scarce.

Methods: We have included 14 patients with stage 2 lipedema and 10 control persons in the clinical study. ABI was measured bilaterally. LDF measurements were conducted on medial sides of both lower limbs using Periscan PIM 3 (Perimed AB, Jarfalla, Sweden) at rest in supine position, measuring the peak and mean Doppler Perfusion Units (pDPU and mDPU; respectively).

Results: Patient and control demographics did not show differerencies in ABI, blood pressure (RR), waist-to-hip and waist-to-height ratios ($p>0.05$). There were statistically non-significant differencies in mDPU and pDPU between patient and control groups ($p>0.05$).

Conclusions: Resting cutaneous microcirculatory values measured by LDF did not show differencies between lipedematous and non-lipedematous legs.

Keywords: lipedema, laser doppler flowmetry, blood microcirculation

OP-043

Case Report: Family-Centered Comprehensive Treatment of Pediatric Lymphedema in Early Childhood (6 months - 4 years)

Elena Parodi[1], Corradino Campisi[1], Corrado Campisi[1], Arianna Demoro[1], Roberto Risso[1], Mirko Ponsini[1]

[1]Campisi Clinic

Objectives: The objective of this abstract is to highlight the importance of a family-centered approach in the comprehensive treatment of pediatric lymphedema during early childhood (6 months - 4 years). Following early diagnosis by lymphologist Campisi, treatments commenced, with clinic visits every two weeks and interventions such as massages and daily bandaging, facilitated through parental education. This integrated therapeutic approach aims to maximize functionality and quality of life for pediatric patients, minimizing the risk of lymphedema-related complications through collaborative and personalized care.

Background: Pediatric lymphedema poses a clinical challenge that demands a comprehensive, family-centered approach, particularly in very young children. This study aims to examine an integrated therapeutic approach that considers not only traditional methods of lymphedema management but also the essential role of the family in the treatment process. Through active and ongoing collaboration with parents, treatment is personalized to meet the specific needs of the child. Therapies include physiotherapeutic techniques, MLD, compressive therapy, management of wearing stockings, and home self-care instructions. The primary goal is to maximize the child's functionality and quality of life while minimizing the risk of lymphedema-related complications. This integrated, family-centered approach proves crucial in ensuring optimal outcomes in the treatment of pediatric lymphedema during early childhood.

Methods: The treatment protocol involved continuous follow-up appointments at least every two months. Due to the constant growth of the child, traditional measurement methods in centimeters were deemed unreliable. Instead, photo documentation was utilized as a method of evaluation. Additionally, the firmness of the lymphedema and the condition of the skin were assessed through both photographic evidence and clinical reports documented in the patient's medical records.

Results: The current results indicate that the child is in a stable phase of lymphedema. Presently, the child wears a compression stocking that enables them to engage in all daily activities, including walking and playing with their kindergarten peers. The child's ability to participate in regular daily activities while wearing the compression stocking suggests significant improvement in lymphedema management.

Conclusions: In the future, it may be necessary to perform a lymphoscintigraphy to assess the state of the lymphatic pathways in the child. Medical and physiotherapeutic follow-up will be essential to potentially modify the approach of home care based on the manifestation of the child's condition. The ultimate goal of treatments both in the clinic and at home is to ensure a life free of obstacles and promote the best possible psychomotor development for the child.

Keywords: Pediatric lymphedema, home self-care instructions., family-centered approach

OP-044

Inter-rater and intra-rater reliability of biomechanical skin stiffness characteristics measurement via MyotonPRO device in patients with breast cancer–related lymphedema (BCRL) and their relationship with ultrasonographic tissue changes

Rabia SANIR[1], Esra Nur TÜRKMEN[2], Feyza AKAN BEGOĞLU[3], Feyza ÜNLÜ ÖZKAN[3], İlknur AKTAŞ[3], Gülseren AKYÜZ[4], Esra GİRAY[3]

[1]Health Science Faculty, Phsyiotherapy and Rehabilitation Department (English), Haliç University, Istanbul, Turkey
[2]Vocational School of Health Services, Department of Therapy and Rehabilitation, Physiotherapy Program, Kahramanmaras Sutcu Imam University, Kahramanmaras, Turkey
[3]Istanbul Fatih Sultan Mehmet Health Application and Research Center, Department of Internal Medicine, Department of Physical Medicine and Rehabilitation, University of Health Sciences, Istanbul, Turkey
[4]Physical Medicine and Rehabilitation Clinic and Neurophysiology Laboratory, Sante Medical Center, Istanbul, Turkey

Objectives: The aim of this study is to investigate the intrarater and interrater reliability of skin stiffness measurements via the MyotonPRO device. The second aim of this study is to investigate the relationship between ultrasonographic subcutaneous tissue changes and skin stiffness measured via the MyotonPRO.

Background: The MyotonPRO device has been used to detect differences in patients with breast cancer-related lymphedema in previous studies. However, its intrarater or interrater reliability has not been studied before.

Methods: Women with unilateral breast cancer–related lymphedema (BCRL) were included. Patients with bilateral BCRL, other diseases which may affect skin stiffness were excluded. The clinical stage of lymphedema was determined according to the International Society of Lymphology (ISL). The skin stiffness and hardness were measured in fifteen patients with BCRL by two blinded observers with MyotonPRO on five body sites including metacarpophalangeal joint (MCP), wrist, 15cm below and above medial epicondyle (ME), ME. Subcutaneous echogenicity grade (SEG) and subcutaneous echo-free space grade (SEFS) were graded at the same body sites by a physiatrist using ultrasound. The relationship between stiffness measurements and ultrasonographic tissue changes were analysed using Spearman correlation coefficient. Intraclass correlation coefficients (ICC) were calculated for inter-rater and intrarater reliability. ICC values less than 0.5 were considered poor, values between 0.5 and 0.75 were considered moderate, values between 0.75 and 0.9 were considered good, and values greater than 0.90 were considered excellent reliability.

Results: Women with unilateral breast cancer–related lymphedema (BCRL) were included. Patients with bilateral BCRL, other diseases which may affect skin stiffness (e.g.skin infection, scleroderma) were excluded. Demographic data and characteristics of patients were recorded. The clinical stage of lymphedema was determined according to the International Society of Lymphology (ISL). The skin stiffness and hardness were measured in fifteen patients with BCRL by two blinded observers with MyotonPRO on five body sites including the metacarpophalangeal joint (MCP), wrist, 15cm below and above medial epicondyle (ME) and ME. Subcutaneous echogenicity grade (SEG) and subcutaneous echo-free space grade (SEFS) were graded at the same body sites by a physiatrist using musculoskeletal ultrasound. The relationship between skin stiffness measurements and ultrasonographic tissue changes were analysed using Spearman correlation coefficient. Intraclass correlation coefficients (ICC) were calculated to determine inter-rater and intrarater reliability.

Table 1:Intrarater and interrater reliability of skin stiffness measurements via the MyotonPRO device measured at different upper extremity levels.

	ICC for intra-rater rater 1	ICC for intra-rater rater 2	ICC for inter-rater 1	
ME 15cm above	0,55	0,91	0,83	0,56
ME	0,94	0,96	0,93	0,94
ME 15 cm below	0,98	0,90	0,73	0,91
Wrist	0,91	0,86	0,67	0,81
MCP	0,76	0,84	0,61	0,76

ICC: intraclass correlation coefficient; MCP: metacarpophalangeal joint; ME: medial epicondyle

Conclusions: Skin stiffness measurements via MyotonPRO showed moderate to excellent interrater and intrarater reliability, and they exhibited correlations with ultrasonographic tissue changes. This suggests that they can be effectively used as an outcome measurement in future studies.

Keywords: stiffness, tissue viscoelasticity, edema, intraclass coefficient

OP-045

Qatar's Breast Cancer-Related Lymphedema and Functional Impairment: A Three-Year Data Collection Study

Emad Abdalla[1], Anita Rebecca[1], Mohammed Shafi[1]

[1]Hamad Medical Corporation

Objectives: To determine the prevalence and severity of breast cancer-related lymphedema (BCRL) among breast cancer survivors in Qatar over a three-year period, using standardized assessment tools and diagnostic criteria.-To investigate the functional impairment and quality of life impact associated with BCRL among breast cancer survivors in Qatar, examining factors such as age, cancer stage, treatment modalities, and comorbidities, to inform tailored survivorship care strategies and interventions.

Background: Breast cancer-related lymphedema (BCRL) is a debilitating condition affecting the physical and psychological well-being of patients. Despite its significant impact, there is limited data on BCRL prevalence and associated functional impairments in the Middle Eastern context, particularly in Qatar.

Methods: This study presents a comprehensive analysis of BCRL and its functional implications based on a three-year data collection effort in Qatar. A cohort of breast cancer survivors was followed up longitudinally, assessing lymphedema occurrence, severity, and functional limitations using standardized measures.

Results: Preliminary findings reveal a notable prevalence of BCRL among breast cancer survivors in Qatar, with varying degrees of functional impairment observed across different stages of lymphedema. Factors such as age, cancer stage, treatment modalities, and comorbidities were found to influence the onset and progression of BCRL and its impact on daily activities and quality of life.

Conclusions: This study underscores the importance of addressing BCRL as a significant health concern among breast cancer survivors in Qatar. The findings provide valuable insights into the prevalence, risk factors, and functional consequences of BCRL, thereby informing targeted interventions aimed at improving patient outcomes and enhancing survivorship care strategies in the region. Further research is warranted to elucidate optimal management approaches tailored to the unique cultural and healthcare landscape of Qatar and the efficacy of a national BCRL screening program.

Keywords: Breast cancer, Lymphedema, Qatar, Surveillance

OP-046

The efficacy of complete decongestive therapy based on fluoroscopy guided manual lymph drainage in 123 Chinese patients with breast cancer-related lymphedema.

Yuanyuan Liu[1], Xiaohua Song[1], Meifang Yuan[1], Sha Ye[1], Qinqin Chen[1]

[1]Hunan Cancer Hospital

Objectives: To explore the application effects of Complete Decongestive Therapy (CDT) based on Fluoroscopy Guided Manual Lymph Drainage (FG-MLD) in patients with Breast Cancer-Related Lymphedema (BCRL), including changes in limb circumference, improvement in body water composition indices, subjective symptom and quality of life.

Background: Breast cancer is the most common malignant tumor among women. The latest international cancer statistics report in 2020: breast cancer has reached 2.26 million new cases, becoming the largest cancer among women in the world. BCRL is one of the common chronic complications of breast cancer patients after surgery, which is manifested by lymph stasis in the tissue space. It can caused swelling, pain and other discomfort, and even disability. The WHO believes that lymphedema is the second most disabling disease, and treatment is extremely difficult. It causing physical and psychological problem to patients and seriously affecting their quality of life. CDT is currently internationally recognized as the most effective conservative treatment method for BCRL, including Manual Lymphatic Drainage (MLD), elastic bandage wrapping, functional exercise, and skin care. FG-MLD is a innovative technique for lymphatic drainage based on Near-Infrared Fluorescence Lymphatic Imaging (NIRFLI). Compared to traditional MLD, FG-MLD is evidence-based, among which the fill&flush technique is more suitable for irregularly shaped edema and fibrotic areas, which can better promote lymphatic drainage and local tissue softening in edema area. This study applied CDT based on FG-MLD in 123 Chinese BCRL patients and explored its application effect.

Methods: 123 Chinese patients with upper limb lymphedema were treated with FG-MLD, elastic bandage wrapping for 7 days, with skin care, functional exercise, and regular follow-up after discharge.

Results: After 7 times treatment, the circumference , segmental water of the affected limb were significantly lower than before. The extracellular water(ECW) and extracellular water ratio (ECW/Total Body Water,TBW) were significantly lower than before. While the 1kHz bioelectrical impedance value was higher than before, and subjective symptom and quality of life improved after treatment.(All P<0.05)

Observation indices before and after treatment

Project	Before treatment	After treatment	Diffference	t	p
Circumference of the affected limb(cm)	141.39±13.87	128.37±10.37	13.02±5.65	25.563	P<0.05
ECW(L)	11.99±0.79	11.38±0.66	0.61±0.25	26.718	P<0.05
Segmental water of the affected limb segment(L)	2.57±0.49	2.24±0.36	0.33±0.26	13.988	P<0.05
ECW/TBW	0.3896±0.0041	0.3835±0.0039	0.0061±0.0025	26.651	P<0.05
1-kHz Bioelectrical impedance of the affected limb(Ω)	236.71±35.59	272.35±34.10	-35.64±19.76	-20.005	P<0.05
Subjective symptom	71.21±25.54	58.31±23.95	12.90±4.67	30.664	P<0.05
Quality of life	33.76±7.36	25.34±6.98	8.42±2.53	36.911	P<0.05

Conclusions: Complete decongestive therapy based on FG-MLD can effectively improve BCRL and enhance the quality of life for patients.

Keywords: Breast Cancer-Related Lymphedema, Complete Decongestive Therapy, Fluoroscopy Guided Manual Lymph Drainage

OP-047

Development And Validity of Breast Cancer Related Lymphedema Knowledge, Attitude, Practice Questionnaire-Pilot Study

Elif DUYGU-YILDIZ[1], Ayşe AKDUMAN[1], Hilal KARACAN[1], Mustafa ŞİT[2]

[1]Bolu Abant Izzet Baysal University, Faculty of Health Sciences, Department of Physiotherapy and Rehabilitation
[2]Bolu Abant Izzet Baysal University, Faculty of Medicine, Department of General Surgery

Objectives: Since there is no valid questionnaire in the literature that assesses knowledge attitudes and practice in individuals with breast cancer related lymphedema (BCRL), the aim of this study was to develop a questionnaire to objectively assess the knowledge, attitudes, and practice about BCRL in breast cancer survivors.

Background: Most breast cancer survivors have lack of awareness and knowledge about breast cancer related lymphedema itself and management. Hence, they often miss the opportunity for prevention and early interventions. Since there is no valid questionnaire in the literature that assesses knowledge attitudes and practice in individuals with BCRL, the aim of this study was to develop Breast Cancer Related Lymphedema Knowledge Attitude Practice Questionnaire (BCRL-KAP).

Methods: A pool of questions was prepared by reviewing the literature under KAP survey model. The initial BCRL-KAP Questionnaire had 21-items. Number of items were increased to 28 based on the suggestions of 6 experts. Of the 28 items, the first 10 items assess knowledge, 6 items assess attitude, and 12 items assess practice. Validity of the questionnaire was made with content and face validity. For content validity, the questionnaire was sent to 6 experts who were asked to evaluate the relevance of the items to the sub-dimension. The relevance of the items was scored on a 4-point Likert scale. While evaluating the relevance of each item for the sub-dimension, the experts were asked to give 1 point if the items were “not relevant”, 2 points if they were “partially relevant”, 3 points if they were “quite relevant” and 4 points if they were “very relevant”. Items scoring 1 and 2 were considered irrelevant to the sub-dimensions, while items scoring 3 and 4 were considered relevant to the sub-dimensions. 13 breast cancer survivors with BCRL (n:11) and without BCRL (n:3) was participated for comprehensibility of the questionnaire for face validity,

Results: Average proportion of items judged as relevance across 6 expert was 0.98. Scale-level content validity index (S-CVI) based on the average method and S-CVI based on universal agreement method was 0.98, 0.93, respectively. Item level-CVI of items, except 13th (0.66) and 16th items, (0.83) were 1. The questionnaire was easily understood and filled by individuals.

Item revelance rating

Items	Expert 1	Expert 2	Expert 3	Expert 4	Expert 5	Expert 6		Experts agreement	Item Content Validity Index	Universal agreement
1	1	1	1	1	1	1		6	1	1
2	1	1	1	1	1	1		6	1	1
3	1	1	1	1	1	1		6	1	1
4	1	1	1	1	1	1		6	1	1
5	1	1	1	1	1	1		6	1	1
6	1	1	1	1	1	1		6	1	1
7	1	1	1	1	1	1		6	1	1
8	1	1	1	1	1	1		6	1	1
9	1	1	1	1	1	1		6	1	1
10	1	1	1	1	1	1		6	1	1
11	1	1	1	1	1	1		6	1	1
12	1	1	1	1	1	1		6	1	1
13	0	1	1	1	0	1		4	0,66	0
14	1	1	1	1	1	1		6	1	1
15	1	1	1	1	1	1		6	1	1
16	1	1	1	1	0	1		5	0,83	0
17	1	1	1	1	1	1		6	1	1
18	1	1	1	1	1	1		6	1	1
19	1	1	1	1	1	1		6	1	1
20	1	1	1	1	1	1		6	1	1
21	1	1	1	1	1	1		6	1	1
22	1	1	1	1	1	1		6	1	1
23	1	1	1	1	1	1		6	1	1
24	1	1	1	1	1	1		6	1	1
25	1	1	1	1	1	1		6	1	1
26	1	1	1	1	1	1		6	1	1
27	1	1	1	1	1	1		6	1	1
28	1	1	1	1	1	1		6	1	1
Propotion revelance	0,96	1	1	1	0,93	1	0,98		0,98	0,93

Items with 1 and 2 points were considered irrelevant to the sub-dimensions and given 0 points for analysis. Items scoring 3 and 4 were considered relevant to the sub-dimensions and given 1 point for analysis.

Conclusions: The BCRL-KAP Questionnaire has content and face validity. After this pilot study, it is planned to apply the questionnaire to a larger population, and then conduct internal consistency and Rasch analysis within the context of reliability.

Keywords: Validity, Knowledge, Breast cancer related lymphedema

OP-048

Effect of digital combined decongestive therapy in patients with breast cancer-related lymphedema: a follow-up study

Alis Kostanoğlu[1], Selva Otsay[2], Gökhan Can Törpü[2]

[1]Bezmialem Vakıf University, Faculty of Health Sciences, Department of Physiotherapy and Rehabilitation
[2]Bezmialem Vakıf University, Institute of Health Sciences, Department of Cardiopulmonary Physiotherapy and Rehabilitation

Objectives: This study present the feasibility of digital combined decongestive therapy in breast cancer-related lymphedema. At the same time, our study aims to reveal the short and long-term effects of digital combined decongestive therapy.

Background: Breast cancer patients are at high risk for the development of breast cancer-related lymphedema due to axillary lymph node dissection and radiotherapy. Breast cancer-related lymphedema may occur immediately after treatment or may occur years later. Breast cancer-related lymphedema treatment involves intensive combined decongestive therapy followed by long-term maintenance. Digital implementation of combined decongestive therapy is a method that aims to demonstrate its potential to provide a cost-effective, safe and at the same time measurable tool for breast cancer-related lymphedema patients.

Methods: The study population consisted of breast cancer patients who were admitted to the outpatient clinic due to upper extremity lymphedema. The circumferences of the extremities were measured by a trained physiotherapist, by marking reference points at 4-cm intervals from the ulnar styloid to the axillary region, using a standard tape measure. In first face-to-face session, patients received a basic introduction to skin care and risk reduction training. In this session, self-bandaging technique and self-manual lymphatic drainage technique was demonstrated while the caregiver videotaped it. At the same time, decongestive and breathing exercises were taught to the patient and caregiver. After the first face-to-face session, treatment was supervised with the help of electronic information and telecommunication technologies for 4 weeks. Following the intensive treatment phase, maintenance therapy commenced, which included the implementation of compression stockings. Breast cancer-related lymphedema patients were re-evaluated for follow-up after 12 weeks.

Results: Total of 29 breast cancer-related lymphedema patients were included in the study (mean age=54.17±11.10 years). The mean pre-treatment extremity volume was 2998.06±930.61 mL. After digital combined decongestive therapy, the mean extremity volume was 2792.78±870.86 mL. There was a significant positive change in extremity volume in the patients after treatment ($p<0.001$). The mean extremity volume at follow-up was 2692.63±693.81 mL. There was also a significant positive change in the extremity volumes of the patients in the follow-up compared to the post-treatment ($p<0.05$).

Conclusions: Our results revealed that digital combined decongestive therapy was effective in extremity volume reduction for breast cancer-related lymphedema. Following maintenance therapy, there was also a noticeable reduction in extremity volume. In conclusion, digital combined decongestive therapy was found to be a usable method for patients who cannot participate in face-to-face therapy due to financial or transportation reasons.

Keywords: breast cancer-related lymphedema, combined decongestive therapy, caregiver, self-management

OP-049

The Preview Study: Effectiveness of Whirlpool Treatment in Patients with Upper Extremity Lymphedema After Mastectomy

Ebru Kübra Taşpolat[1], Mücahit Atasoy[2], Esra Kutlu[1], Evrim Coşkun[1]

[1]Başakşehir Çam ve Sakura Şehir Hastanesi
[2]Medipol Bahçelievler Hastanesi

Objectives: Lymphedema is characterized by the abnormal accumulation of plasma protein-rich fluid in the subcutaneous tissue and subfascial compartments. The gold standard among the methods used in treating lymphedema is complex decongestive physiotherapy (CDT) approaches. Whirlpool bath treatment involves submerging the affected limb in warm water, using the water's vortex effect to promote circulation and lymphatic drainage. Therefore, this study was designed to evaluate whirlpool therapy for the effect of upper extremity lymphedema.

Background: This study is carried out to contribute to the literature on the inclusion of different treatments in the treatment plan for lymphedema.

Methods: Upper extremity lymphedema patients who developed a voluntary consent form and block randomization system after the initial assessment were divided into experimental and control groups. 12 healthy individuals participated in this study. The average age of the patients was 56.75 ±11.85 years. Ethics committee approval was received for this study. CDT treatment was given to both groups. An additional 15 sessions of whirlpool treatment were given to the study group. Patients were evaluated before and after treatment with limb diameter measurement, body mass index (BMI) measurement, extremity photography, Lymphedema Quality of Life Scale (LYKO), Upper Extremity Functional Index (UEFI), Brief Pain Inventory (BPI).

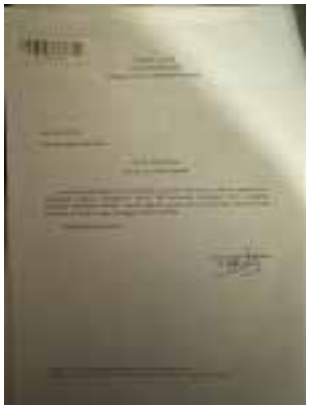
Results: 9 out of 12 patients (75%) were housewives. Ten of them (83.3%) were married. 5 of 12 patients (41.6%) had no chronic comorbidities. 11 had stage 2 (91.7%), and 1 (8.3%) had stage 1 lymphedema. The average duration of lymphedema of the patients was 38.42±35.24 months. Whirlpool therapy (6 people) and control (6 people) groups (the initiation of treatment, three weeks) were evaluated, and no statistically meaningful difference was found in the difference between circumference measurements between the two groups ($p > 0.05$). Regarding UEFI and LYKO scores, there was no statistically meaningful correlation between the control and whirlpool treatment (the initiation of treatment, three weeks) groups ($p > 0.05$). When the "effect of pain on activity last week" was compared according to BPI, no statistically meaningful correlation was detected ($p > 0.05$). When the difference in "most pain in the last week" was compared, it was statistically meaningful ($p=0.049$).

Whirlpool bath therapy

A patient receiving whirlpool bath therapy

Conclusions: Our results suggest that combined therapy, including CDT and whirlpool therapy, has a positive effect on pain in patients with upper extremity lymphedema. This study sheds light on future studies as it is the first to be done in treating lymphedema. It is a preview study. Recruitment of patients for the study continues.

ethics form



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Keywords: Breast cancer, Lymphedema, Upper extremity, Whirlpool

OP-050

Evaluating the Impact of Micronized Purified Flavonoid Fraction with Vitamin D and Selenium on Lipedema

Emily Iker[1]

[1]lymphedemacenter

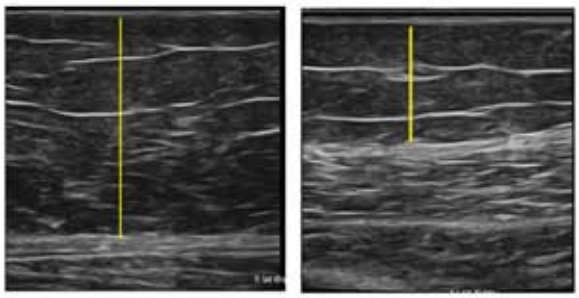
Objectives: This pilot study aimed to assess the efficacy of Micronized Purified Flavonoid Fraction combined with Vitamin D and Selenium (MPFF) in managing lipedema symptoms, specifically focusing on pain reduction and subcutaneous fat layer thickness.

Background: Lipedema is a chronic condition affecting approximately 11% of women, characterized by disproportionate lower body enlargement due to abnormal fat accumulation. Despite its prevalence, it is frequently misdiagnosed as obesity or fibromyalgia. Effective management strategies are essential for improving patient quality of life.

Methods: The study included 20 female patients diagnosed with clinical stages I and II lipedema, along with 8 control subjects. Participants were subjected to ultrasound evaluations to measure skin and subcutaneous fat layer thickness and echogenicity before and after treatment. In addition to standard therapies like Manual Lymphatic Drainage (MLD) and compression therapy, patients received daily doses of MPFF. Pain levels were quantitatively assessed using a 0 to 10 scale questionnaire.

Results: Significant reductions in subcutaneous fat layer thickness and pain levels were observed in the lipedema patients after MPFF treatment, indicating its potential efficacy as part of a comprehensive management strategy for lipedema.

Comparison



3.4 cm subcutaneous space 1.8 cm

Conclusions: The findings suggest that MPFF, when combined with standard lipedema treatments, can effectively reduce pain and subcutaneous fat layer thickness in lipedema patients. These results underscore the need for further research to explore the full potential of MPFF in lipedema management.

Keywords: Lipedema, Nonsurgical treatment of lymphedema, Pain therapies, Nutrition and Diet for Lymphedema and Lipedema

OP-051

Kinesiophobia, physical activity levels and barriers of patients with breast cancer and breast cancer survivors compared to healthy controls

Nuray Alaca[1], Nuray Alaca[2], Kübra Türker Karayazı[2], Dilek Çağrı Arslan[1], Dilek Çağrı Arslan[3], Meryem Bektaş Karakuş[1], Meryem Bektaş Karakuş[3], Cihan Uras[2]

[1]Department of Physiotherapy and Rehabilitation, Faculty of Health Sciences, Acibadem Mehmet Ali Aydinlar University, Istanbul, Turkey
[2]Department of General Senology, Senology Research Institute, Acibadem Mehmet Ali Aydinlar University, Istanbul, Turkey
[3]Department of Cardiopulmonary Physiotherapy and Rehabilitation, Institute of Health Sciences, Bezmialem Vakif University, Istanbul, Turkey

Objectives: The aim of the present case-control study is to investigate kinesiophobia, physical activity levels and barriers to physical activity in women with breast cancer (BC) and breast cancer survivors (BC-S) compared with healthy controls (HC).

Background: Physical inactivity, which has a significant impact on quality of life, is one of the issues that should be investigated during and after breast cancer treatment. The most common and persistent barriers to physical activity during and after breast cancer treatment include pain, fatigue, bad mood, depression, anxiety, apathy and kinesiophobia.

Methods: The study included patients with BC (n=70) and BC-S (n=70) and HC (n=72). The primary outcome measures were physical activity levels, barriers to physical activity and kinesiophobia levels, and the secondary outcome measures were levels of anxiety and depression, fatigue and quality of life.

Results: The HC group had better physical activity levels, fatigue and quality of life scores than the other groups, but they had worse perceptions of physical activity, more individual, psychosocial and environmental barriers to physical activity compared to the other groups ($p<0.05$). The BC group had more barriers to exercise related to fear of overall body pain, poor balance, fear of falling and fear of feeling worse after exercise compared to the other groups ($p<0.05$). Subjects in the BC-S group, on the other hand, were more afraid that lymphedema might be exacerbated if they exercised ($p<0.05$).

Conclusions: The present study found that women with breast cancer and breast cancer survivors had worse scores for physical activity levels, fatigue, and quality of life compared to the healthy controls. Furthermore, all the groups were found have a variety of barriers to physical activity. Thus, we suggest that barriers to physical activity should be treated with a special emphasis in order to promote participation in physical activity.

Keywords: Breast Neoplasms, Healthy Volunteers, Kinesiophobia, Survivors

OP-052

Lipedema or Lipalgia ?: An ultrasonographic study protocol

Hüma Bölük Şenlikci[1], Sibel Ünsal Delialioğlu[1], Ayşe Merve Ata[1], Meltem Dalyan[1]

[1]Ankara Bilkent City Hospital, Physical Medicine and Rehabilitation

Objectives: The aim of the study is to identify patients as lipalgia or lipedema by imaging with ultrasound. What percentage of what we think is lipedema is actually lipedema?

Background: Lipedema is an adipose tissue disorder and characterized by deposition of abnormal fat in upper, lower limbs and/or trunk. Significant enlargements, especially in the lower extremities, are generally seen in female patients and are painful. It does not leave a pit and ends at the ankles. Pathological fat tissue deposition may have an orange peel appearance or nodular shape. Although the name lipedema can mean an edematous subcutaneous tissue, edema is generally not detected in the subcutaneous tissue by ultrasonographic imaging in all cases, so the definition of lipalgia has recently entered the literature (1,2).

Methods: It is planned as an cross sectional study. Clinically lipedema diagnosted patients that > 18 year-old are going to participate the study and carry out in the Ankara Bilkent City Hospital, Physical medicine and Rehabilitation outpatient clinics. Patients with cardiovascular diseases, lymphedema, chronic renal or liver disease, any rheumatologic disease or neurologic disease that can cause immobility are going to exclude from the study. Sociodemographic and clinical characteristics will be recorded and participants will be evaluated physically and ultrasonographically (1-3).

Results: This study is started to carry out in Ankara Bilkent City Hospital, Physical medicine and Rehabilitation clinics and preliminary results would be presented at the time of congress.

Conclusions: This study is started to carry out in Ankara Bilkent City Hospital, Physical medicine and Rehabilitation clinics and preliminary results would be presented at the time of congress.

Keywords: Lipedema, Lipalgia, Ultrasound

OP-053

THE EFFECT OF LYMPHEDEMA SCHOOL ON PREVENTING THE DEVELOPMENT OF BREAST CANCER RELATED LYMPHEDEMA

zeynep deveci koçbilek[1], sibel eyigör[2], menekşe özgür inbat[1], sedef çalışkan kabayel[2]

[1]pamukkale university
[2]ege university

Objectives: This study aimed to investigate the effects of lymphedema school on the prevention of lymphedema, quality of life, body value, hand grip strength, and body mass index in patients who underwent breast cancer surgery.

Background: Breast cancer is the most prevalent form of cancer worldwide. Breast cancer treatment can lead to lymphedema on the affected side. Lymphedema can be prevented with early surveillance and patient education.

Methods: This prospective single-group quasi-experimental study was conducted between May-2021 and June-2023. The study included 27 individuals who had breast cancer surgery from January to September 2021. Lymphedema school is a 3-week course, with 4-hour classes each week. The school covers topics; lymphedema definition, symptoms, diagnosis, risk-reducing behaviors, exercises for arm mobility, self-lymphatic drainage, weight control, skin care, adaptation to life, and psychological support. Ethical and instutional approvals and patient consent were obtained. Patient data was collected at four time points: before the school, and at 6, 12, and 18 months after the school. Patient identification form, quality of life measure for limb lymphoedema-Arm, Cancer-Related Lymphedema of the Upper Extremity (CLUE) tool, Body Value Scale, hand grip strength, and arm circumference measurements were used to collect data. The stages of lymphedema was assessed based on the percentage of volume change, with 5-10% considered subclinical, 10-20% mild, 20-40% moderate, and over 40% severe. Number, percentage, mean, Freidman and Cohrane Q tests were used to evaluate the data.

Results: The study was completed with 19 patients. The patients' mean age was 49.63±9.75. 68.4% had breast-conserving surgery. The mean lymph nodes removed were 15.18±13.83, while the radiotherapy sessions' mean at 28.77±2.90. CLUE score averages showed a statistically significant change ($p<0.05$). An improvement in hand grip strength was observed over time, which was statistically significant ($F = 11.053$, $p = 0.011$). Only in the first follow-up, mild LE was observed in 2 patients (10.5%). There were no statistically significant changes observed in quality of life, body mass index, or lymphedematous arm volume over time ($p>0.05$).

Change analysis of outcome parameters over time

Time Variables	T0 X̄±SD	T1 X±SD	T2 X±SD	T3 X±SD	Freidman	p	KW	Will-coxon
LMYQOL	35.06±12.55 (20-62.5)	36.83±12.19 (20.9-68.8)	37.11±11.66 (21.1-67.3)	32.89±10.51 (20.6-68.4)	3.189	0.363	0.056	
CLUE	0.13±0.46 (0-2)	3.50±3.90 (0-14)	1.93±3.36 (0-14)	3.02±3.23 (0-10)	12.236	0.007	0.215	T0<T1, T0<T3
BVS	40.69±7.11 827-50)	44.11±6.68 (26-50)	42.53±6.22 (29-50)	42.48±5.57 (30-50)	10.641	0.014	0.187	T0<T1
hand grip strenght (affected side)	20.44±5.65 (13-37.50)	21.13±6.02 (12.50-38)	21.55±5.52 (12.50-38)	24.31±6.15 (11.80-40)	11.053	0.011	0.194	T0<T3, T1<T3, T2<T3
Body mass index (kg/m^2)	29.63±4.24 (22.75-39.63)	30.16±4.04 (22.95-38.87)	29.15±3.35 (23.22+35.56)	29.70±3.10 (24.40-34.20)	7.596	0.055	0.133	-
Affected side arm volume	2654.72±491.52	2730.15±529.54	2669.57±421.78	2700.37±441.70	7.484	0.058	0.131	
Contralateral arm volüme	2634.56±526.05	2683.08±482.01	2632.52±435.65	2664.98±441.36	5.084	0.166	0.089	

T0: before school T1: 6. month T2: 12. Month T3:18. Month LYMQOL: Quality of Life Measure for Limb Lymphoedema-Arm CLUE: Cancer-Related Lymphedema of the Upper Extremity tool BVS: Body Value Scale

Examination of lymphedema development status over time

Variables	Time	T0 n (%)	T1 n (%)	T2 n (%)	T3 n (%)	Cohrane Q	p	KW
Lymphedema	not lymphedema	19 (100)	17 (89.5)	19 (100)	19 (100)	6	0.112	0.105
	Mild lymphedema	0 (0)	2 (10.5)	0 (0)	0 (0)			

Conclusions: Following up with patients who have undergone breast cancer treatments is crucial to monitor the development of lymphedema. Educating patients about the risk factors associated with lymphedema and teaching them risk-reducing behaviors at the earliest possible stage can significantly reduce the risk of developing lymphedema. Additionally, if edema occurs, it can be treated effectively and the symptoms may regress. Lymphedema patient school is an effective method for preventing lymphedema development.

Keywords: breast cancer, breast cancer related lymphedema, lymphedema school, patient education

OP-054

The Multiple Level Vascularized Lymph Node Transfers

Mehmet Veli Karaaltin[1]

[1]Acibadem Taksim Hospital

Objectives: Vascularized lymph node (VLN) transfer has shown promising results in the treatment of lymphedema patients,However, the selection of appropriate donor sites for VLN is crucial. In this series, we present a novel technique of three and six consecutive free VLN transfers for the reconstruction of lower extremity lymphedema. To the best of our knowledge, this is the first report of such a technique in the medical literature.

Background: A novel surgical technique for lymphedema treatment

Methods: The technique involves harvesting three groups of vascularized lymph nodes (VLN) from the neck region, specifically submental Level Ia,b, II + III, and VB. The VLN's are then transferred to recipient sites: the anterior ankle, posterior knee, and inguinal regions. For the anterior ankle transfer, dorsalis pedis artery and concomitant veins, along with saphenous tributaries, are used as recipient vessels. The posterior knee transfer utilizes medial genicular perforators as recipient vessels, employing an end-to-end super microsurgery technique. In the inguinal region, the femoral artery and great saphenous tributaries are used, with an end-to-side anastomosis.To ensure efficiency, two surgical teams simultaneously perform VLN flap harvesting and recipient site preparation. Additionally, adipose-derived regenerative cells (15cc SVF, BioNTech Inc. Korea) are injected under the pericapsular layer of the lymph nodes to promote neo lymph angiogenesis. In some cases, patent lymphatic vessels are identified using an ICG camera (Spy Elite) to create a shunt to the vein of the transferred VLN. The vitality of all transferred VLN is assessed immediately using the ICG camera after the anastomosis

The VLN

Intraoperative view.The level Ia,Ib lymph node flap.

Results: A total of 22 patients (4 males and 18 females) underwent the VLN transfer surgery. The mean follow-up period was 48 months. On average, patients experienced a circumference reduction of 17.01 cm (rule of 10). Patient satisfaction, as assessed by the Face-Q questionnaire for the submental incision scar, was found to be statistically high ($p<0.05$).Postoperative ICG revealed the presence of newly formed lymphatic vessels surrounding the transferred VLNs in all patients. In cases of bilateral treatment, a lymphoscintigraphy performed six months after surgery clearly demonstrated a direct shunt of the isotope activity from the injection site to the VLNs and subsequently to the urinary bladder.

Neo Lymphangiogenesis

The Screen Shot, shows a VLNT via an ICG camera.The red arrow points to the newly formed lymphatic arcade around the transferred lymph node

Treatment and outcomes

Patient	SVF	Shunting	Follow-up	Outcome
67, M, Genital	No	No	96 months	No recurrence
16, F, Lower extremity, unilateral	No	No	96 months	-15.4 cm
24, M, Lower extremity, unilateral, left	SVF	No	60 months	-40.7 cm
36, F, Lower extremity, unilateral, left	SVF	No	63 months	-20.3 cm
67, F, Lower extremity, unilateral, left	SVF	No	61 months	-23.9 cm
24, F, Lower extremity, unilateral, left	SVF	No	61 months	-16.7 cm
32, F, lower extremity, unilateral, left	SVF	No	60 months	-18.4 cm
28, F, lower extremity, unilateral, left	SVF	No	59 months	-14.8 cm
36, F, lower extremity, unilateral	SVF	No	59 months	-20.1 cm
19, lower extremity, unilateral, left	SVF	No	55 months	-83 cm
36, M, Genital & lower extremity, unilateral	SVF	No	55 months	-12.4 cm, no recurrence
42, F, lower extremity, left	SVF	Shunting	48 months	-4 cm
32, F, lower extremity, left	SVF	Shunting	48 months	-17.3cm
39, F, lower extremity, left	SVF	Shunting	45months	-6.2 cm
19, F, lower extremity, left	SVF	Shunting	36months	-11.2 cm
49, F, upper extremity, left	SVF	No	36 months	-5.6 cm
45, F, lower extremity, right	SVF	No	35 months	-5.8 cm
14, F, lower extremity, bilateral	No	No	13 months	-4.1 cm
56, M, Genital	SVF	No	12 months	No recurrence
34, F, lower extremity bilateral	No	No	6 months	-6.3 cm
36, F, lower extremity, left	No	No	6months	10.7 cm
38, F, lower extremity, bilateral	No	No	6months	15.3 cm

The table shows the treatment, follow-up and clinical outcome

Conclusions: This clinical series presents a promising method for improving the quality of life in patients with extremity lymphedema. Although the technique is challenging and requires advanced microsurgical skills, it appears to be reproducible. Overall, the evidence suggests that it can be effective in treatment of lymphedema.

Keywords: Lymph nodes, Free, Vascularized, Lypmhedema

OP-055

The role of physical activity in lymphedema patients. Myths vs Reality

Andrea Damato[2], Aleksandra ROVNAIA[2], Polly McQuigan[1]

[1]University of Bath
[2]Physio Lympha

Objectives: The study was conducted to investigate whether resisted exercise programs are safe and beneficial to BCRL patients, and how this affects their function and QoL.

Background: Breast Cancer Related Lymphoedema (BCRL) can cause pain, discomfort, heaviness, tightness, distortion and reduced mobility and function of the affected limb (Hormes et al., 2010), and these symptoms heavily impact self-image, while also increasing anxiety, possible depression and frustration (Fu, Mei R. and Kang, 2013) affecting the psychosocial function and the QoL of patients (Vassard et al., 2010). The consensus is to advise patients to maintain an active lifestyle however there are limited guidelines on what types of activities may be beneficial or not (Lane, Worsley and McKenzie, 2005).

Methods: The study investigated the safety and effectiveness of adding a moderate/high intensity resisted exercise (RE) program for 6 weeks on arm circumference, muscular strength, and quality of life (QoL) measure including function, appearance, symptoms, and mood in patientswith BCRL. This study included thirty-five patients with a history of breast cancer who were in phase two of their lymphoedema rehabilitation. They were assigned to either the intervention (n=18) or control (n=17) groups. The intervention consisted of resistance band exercises 4 times a week for 6 weeks. These were performed independently and unsupervised during the study period using pre-recorded exercise programs. Limb circumference measurements, muscular strength, Disabilities of Arm, Shoulder, and Hand (DASH), Lower Extremity Functional Scale (LEFS) and Lymphoedema Quality of Life (LYMQOL) questionnaires were administered at baseline and at 6 weeks

Results: After 6 weeks, the intervention group demonstrated statistically significant improvements ($p<0.01$) in the DASH and LYMQOL scores. There was a significant change in UL and LL strength between both groups ($p<0.05$). Unexpectedly, there was a significant decrease in UL measurements in the hand, forearm, elbow, and proximal arm in the intervention group ($p<0.05$).

Conclusions: The results indicate that RE demonstrates a positive effect on arm function, symptoms and QoL without increasing arm volume in breast cancer-related lymphedema. Future work should assess longer term effects of such exercise. It could also assess whether RE can be performed without compression garments or whether RE can decrease the reliance of compression garments following lymphoedema diagnosis

Keywords: Exercise, Resisted exercise, Rehabilitation, QoL

OP-056

Pharmacological regulation of lymphatic drainage in experimental stroke

Konstantin I. Ershov[1], Alexandra M. Shvetsova[1], Pavel G. Madonov[1], Maxim A. Korolev[1]

[1]Research Institute of Clinical and Experimental Lymphology, Federal Research Centre Institute of Cytology and Genetics, Siberian Branch of the Russian Academy of Sciences

Objectives: to reveal the features of lymphatic drainage in experimental haemorrhage of rat brain against the background of endonasal administration of pegylated hyaluronidase.

Background: It is known that hyaluronidase can increase the bioavailability of drugs when co-injected. We have previously found that pegylated hyaluronidase administered intranasally against the background of haemorrhagic stroke in rats promoted their faster recovery in coordination of movements combined with a decrease in the degree of ischemia, necrosis and brain edema.

Methods: The experiment was performed on male Wistar rats. Autoblood in the volume of 0.2 ml was injected subdurally by stereotaxic coordinates into the hole in the parietal bone. The animals were further divided into groups. The first and second groups were injected endonasally with physiological solution (PS), pegylated hyaluronidase solution (H-PEG) 15 min after experimental hemorrhage. The third was the control group of intact animals. Microcirculation in deep cervical lymph nodes (LN) was determined by laser Doppler flowmetry, before and 1, 2, 4, 6 h after induced haemorrhagia.Brain and LN were taken at 1 and 6 hours after stroke, tissue samples were fixed and morphological sections were further prepared.

Results: In 1 h after subdural haemorrhage the microcirculation indices of LN by laser Doppler flowmetry decreased by 18% in the group with PS followed by a gradual trend to recovery by 6 h. In animals receiving G-PEG the microcirculation indices were reduced only by 5%, and by 4 h the perfusion rate was completely restored to the initial values. The LN slices had fragmented type (in contrast to the group with PS), and the LN sinuses were filled with erythrocytes by 15% more, which indicated a more active outflow of liquor with blood admixture through the lymphatic system against the background of endonasal administration of G-PEG. The area of perivascular spaces in the brain decreased (relative to control) by 20%. This type of drainage from the interstitium of brain tissues is one of the main ones, but in the experiment the area of pericellular spaces increased reflexively with it. These changes were more pronounced in the group with PS. By 6 h in the group with G-PEG treatment these indices reached intact values.

Conclusions: On the basis of the obtained results it is possible to conclude that G-PEG at endonasal administration has lymphostimulating function and promotes active drainage of blood from interstitium of nervous tissue, and also reduces development of ischemia, brain oedema, neurological disorders and has protective effect.

Keywords: hyaluronidase, lymphatic drainage, haemorrhagic stroke, pegylation

OP-057

Demonstration of the effectiveness of continue decongestive therapy in lymphedema patients who develop after total knee arthroplasty

Cansın Medin Ceylan[1], Sedef Ersoy[1], Nur Kesiktaş[1], Armağan Özöbek[1]

[1]SBU İstanbul Physical medicine and Rehabilitation Training and Research Hospital

Objectives: To present the post-treatment results of patients with lymphedema after total joint prosthesis and to identify the factors affecting the treatment.

Background: The aim of this study is to emphasize total knee arthroplasty, which is one of the causes of secondary lymphedema, and to describe the treatment results in patients who develop lymphedema after total knee arthroplasty (TKA).

Methods: A total of 10 lymphedema patients (15 lower extremities) who were admitted to the lymphedema outpatient clinic of Istanbul Physical Therapy and Rehabilitation Training and Research Hospital between June 1, 2023 and February 1, 2024, and who had undergone total knee arthroplasty at least one year ago, were included in the study. The patients were diagnosed clinically, stage 2-3 lymphedema patients were included, and lipedema patients were excluded. Continue decongestive treatment (Manual Lymphatic drainage (MLD)/ bandage/ exercise) was applied to the patients and leg diameter measurements were taken before and after treatment.

Results: The average age of the 10 female patients analyzed was 69.90 ± 11.19 years (min 50-max 86) and body mass index was 37.5260 ± 6.60. Six patients had a history of bilateral and four patients had a history of unilateral total knee arthroplasty. Arthroplasty duration was maximum 60 months. The response of all patients to continued decongestive treatment was significantly higher but there was no significant decrease at the end of the treatment only in the 30 cm measurements extending from the malleolus to the proximal of both the right and left legs. The proximal region has a higher response to treatment ($p<0.05$). No significant correlation was found between the time elapsed after knee arthroplasty and the time to lymphedema development. No correlation was found between treatment responses and BMI and right/left extremity.

Conclusions: Continue decongestive treatment is an effective treatment method in the treatment of lymphedema that develops after total knee arthroplasty. The effect of right and left extremity and BMI on treatment responses has not been determined, and studies with larger sample sizes are needed to evaluate the parameters affecting lymphedema treatment responses after TKA.

Keywords: Lymphedema, Arthroplasty, Manual Lymphatic drainage

OP-058

Body Composition by Bioelectrical Impedance and Ultrasonographic Findings in a Group of Patients with Lipoedema and Lower-limb Lymphedema: Relation with Quality of Life and Functional Status

Kerim Demirsöz[1], Pınar Borman[1]

[1]University of Health Sciences Ankara City Hospital, Rehabilitation Hospital, Ankara 06800, Turkey

Objectives: The aim of our study was to comparatively evaluate body composition in patients with lymphedema and lipedema and to investigate the relationship between the body composition variables and quality of life (QoL), functional status and ultrasonographic (US) measurements.

Background: There is no study in the literature that uses bioelectrical impedance analysis and ultrasonographic measurements in the same study, compares their results, and investigates their relationship with quality of life and functional status.

Methods: This single-center observational case-control study included women with lower-extremity lymphedema and lipedema, and control subjects. The demographic and clinical variables of the subjects were recorded. The body composition was measured by bioelectrical-impedance, in regard to whole fat-free mass, fat-mass ad total body water1. Skin and subcutaneous tissue thickness measurements were made by US examination. In addition EQ-5D-3L/LYMQOL, LEFS and VAS-pain scales were applied to the subjects to determine generic/disease-specific-QoL, functional status and pain intensity respectively.

Results: According to the inclusion and exclusion criteria; 44 subjects (22 lower-extremity lymphedema, 22-lipedema), who submitted to the outpatient-clinic of PMR in a tertiary hospital, and 22 volunteered control subjects, were included to the study. The demographic variables were similar but disease duration was longer in lipedema group. The lipedema patients had a higher total fat-mass and a lower body-water than in other groups. The thigh and cruris subcutaneous tissues and skin tissues of lipedema and lymphedema patients respectively, were thicker and more hypoechoic than in other subjects. The generic and disease-related quality of life and functional status of lymphedema and lipedema patients were similar and lower than in control group. Pain intensity was higher in lymphedema patients than in lipedema group. The US variables were correlated with body composition variables, pain, QoL and functional scores in both patient groups

Conclusions: The body components and US characteristics of lymphedema and lipedema patients were different and correlated with pain, quality of life and functionality. The subcutaneous tissue was affected in patients with lipedema and skin involvement was prominent in patients with lymphedema. Lymphedema caused more pain than in lipedema and but both conditions had similar impact on QoL and functional status. In conclusion body components and US findings may be helpful in differential diagnosis of these chronic conditions. Early diagnosis and treatment are important in order to improve quality of life and functionality in patients suffering from lower extremity lymphedema and lipedema.

Keywords: lymphedema, lipedema, bioelectrical impedance, ultrasonography

OP-059

BREAST CANCER-RELATED LYMPHEDEMA: EVALUATION OF SARCOPENIA WITH ULTRASONOGRAPHY

Zeliha Ünlü[1], İlhan Celil Özbek[1], Emir Onağ[1]

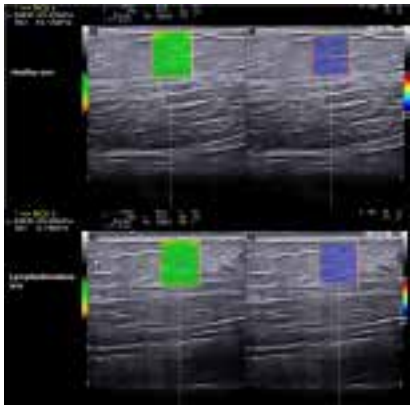
[1]Celal Bayar University, Department of Physical Medicine and Rehabilitation

Objectives: We aimed to evaluate sarcopenic in patients with lympedema secondary to breast cancer by measurement of biceps muscle thickness in ultrasonography. Also the patients were assessed by skin and subcutan ultrasonography features to compared healthy side.

Background: We aimed to evaluate sarcopenic in patients with lympedema secondary to breast cancer by measurement of biceps muscle thickness in ultrasonography.

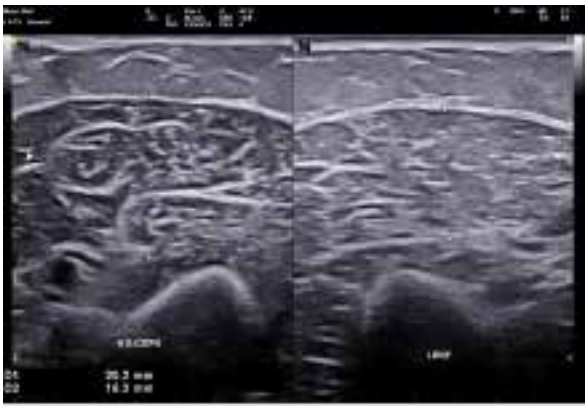
Methods: Female patients aged 18-65, diagnosed with unilateral lymphedema secondary to breast cancer treatment, were included in the study. Two groups were formed for comparison: the affected arm with lymphedema and the unaffected arm, serving as the control group. Demographic information, lymphedema forms, and LYMQOL-Arm (LYMQOL-ARM) questionnaires were recorded in patients. Circumferential measurements of the arms were taken, and limb volumes were calculated along with the Edema ratio. Ultrasonography was performed at three different points: the midpoint between the lateral and medial epicondyles, 10 cm below, and 10 cm above this point, measuring echogenicity, echo-free space, skin-subcutaneous tissue thickness, and shear wave elastography (pic-1). Skin-subcutaneous tissue thickness measurements were taken with relaxation measurements first, without compression, followed by measurements under compression, and compression ratio was calculated. Biceps muscle full thickness was measured without compression in ultrasonography (pic-2).

Picture-1



Shear wave elastography measurement

Picture-2



Biceps muscle full thickness measurement

Results: Limb volumes were calculated based on circumferential measurements of the included group, showing a statistically significant difference between the healthy and lymphedematous arms ($p<0.001$). The calculated Edema ratio value was 0.23±0.22 mls. When comparing SWE values and compliance ratio between the healthy and lymphedematous arms, no statistically significant difference was found. Biceps thickness of the lymphedematous arm was found significantly lower than healthy side($p=0.025$).

Conclusions: The study reveals that the majority of patients diagnosed with lymphedema were in clinical stages in 1-2 lympedema. Ultrasonographic examinations suggest that lymphedematous arms were generally similary clinical findings in earlier stages. In addition, measurements in shear wave elastography and compliance ratio showed similar tissue elasticity changes between lymphedematous and non-lymphedematous arms. These findings considered to absence of fibrosis in the skin of the lymphedematous arm. The arm with lymphoedema has statistically significantly less muscle thickness, which can be interpreted as sarcopenia. Considering the lack of a significant difference in tissue elasticity between lymphedematous and non-lymphedematous arms, the decrease in muscle thickness (sarcopenia) might be occured in patients even before the development of advanced-stage lymphedema. Therefore, it is important to recommend regular exercise including strenght muscle exercise after the post-operative period, before lymphoedema manifests itself in lympedema patients.

Keywords: Lymphedema, Sarcopenia, Ultrasonography, Shear wave elastography

OP-060

Evaluation of the Effectiveness of Complex Decongestive Therapy and Cold Compression Application in Patients with Breast Cancer-Related Lymphedema

Ayşegül Yaman[1], Aysel Özge Kemer[2], Hilal Büşra Ayçiçek Tüfekçi[2], Emre Adıgüzel[3], Arif Kenan Tan[4]

[1]Ankara Etlik City Hospital, Physical Medicine and Rehabilitation Hospital, Ankara, Turkey
[2]Gülhane Training and Research Hospital, Department of Physical Medicine and Rehabilitation, Ankara, Turkey
[3]Ankara Bilkent City Hospital, Physical Medicine and Rehabilitation Hospital, Ankara, Turkey
[4]Gaziler Physical Medicine and Rehabilitation Training and Research Hospital, Department of Physical and Rehabilitation Medicine Ankara, Turkey

Objectives: Upper extremity lymphedema is a concerning complication after treatment for breast cancer.

Background: This study aims to evaluate the effects of complex decongestive therapy (CDT) and cold compression application (Game Ready) in patients with breast cancer-related lymphedema (BCRL) in terms of volume reduction, functional status, and symptom scale.

Methods: Patients with unilateral breast cancer-related lymphedema who underwent CDT were included in this retrospective study. All patients received combined phase 1 CDT including skin care, manual lymphatic drainage, multilayer bandaging, and supervised exercises five times/week for three weeks, a total of 15 sessions. Patients were allocated to Group 1 (CDT n=14) and Group 2 (CDT+ cold compression application-Game Ready n=14). The limb excess volumes according to serial circumference measurements were recorded at baseline and the end of the third week. The functional status and symptom scale improvement were evaluated by Quick Disabilities of the Arm, Shoulder, and Hand (Q-DASH) and Lymphedema Symptom Intensity Distress Survey-Arm (LSIDS-A) questionnaires.

Results: This retrospective study included 28 BCRL patients (mean age 56.61±10.66 years and mean body mass index 29.66±3.48 kg/m²). We found no difference between the two groups regarding age, BMI, education, and duration of lymphedema. At the end of CDT, significant improvements in limb volumes were observed in both groups ($p<0.05$). However, we detected no statistically significant difference regarding improvements in limb volume between the two groups ($p>0.05$). The scores of Q-DASH, as well as subscores of LSIDS-A questionnaires (except resources and sexuality subscores), were significantly improved after 3 weeks of CDT ($p<0.05$).

Conclusions: We determined significant improvement in limb volume, functional status, and symptom scale in BCRL patients who received CDT with and without cold compression. Cold compression applications did not appear to have any negative consequences.

Keywords: Complex Decongestive Therapy, Upper extremity lymphedema, breast cancer-related lymphedema, cold compression

OP-061

Effectiveness of manual therapy to correct scapular dyskinesis in post-surgical Head and Neck Cancer Patients

Dr. Shailendra Kumar Mehta[1]

[1]JRNRV UNIVERSITY, UDAIPUR

Objectives: Spinal accessory nerve dysfunction is one of the complications of neck dissection in patients with oral cancer surgery. This study aimed to explore the effects of long-term scapular-focused exercises and scapular movement and quality of life (QoL).

Background: Manual therapy is standard set of physiotherapy treatments used for alleviating neck pain. The UT and MT muscle activities on the affected side were lower than those on the unaffected side when patients performed scapular exercises (eg, shoulder shrug, overhead press, shoulder adduction and flexion, and 1-arm row). In contrast to the decreased trapezius muscle activity, higher SA and rhomboid activity was observed on the affected side than on the unaffected side when performing the overhead press and 1-arm row. This increased SA activity was suggested to be a compensatory effect for the insufficient strength of the trapezius muscle. However, the SA protracts the scapula during arm elevation. Many studies have shown that scapular-focused exercise is effective in rehabilitating scapular dyskinesis additionally, motor control by conscious correction of scapular orientation is considered necessary to stabilize the scapula in both the static position and dynamic movements.

Methods: This study was a randomized controlled trial with concealed allocation, assessor blinding, and intention-to-treat analysis. Forty patients with oral cancer surgery were randomly allocated to the two group, group A motor-control group (scapular-focused exercise + conscious control of scapular orientation) or the group B regular-exercise group (scapular-focused exercises only). Both groups received conventional physical therapy after neck dissection for 3 months. Shoulder pain intensity, active range of motion (AROM) of shoulder abduction, scapular muscle strength and activity under maximal voluntary isometric contraction (MVIC), scapular muscle activity when performing scapular movements and QoL were measured at baseline, 1 month after the start of the intervention, and the end of the intervention.

Results: Both groups showed significant improvement in all outcomes except shoulder pain intensity. After the 3-month intervention, the motor-control A group had more significant improvement in AROM of shoulder abduction with muscle strength of upper trapezius and QoL than the regular-exercise B group.

Conclusions: Scapular-focused exercises have promising effects on spinal accessory nerve dysfunction. Combining scapular-focused exercises with conscious control of scapular orientation has more remarkable benefits on AROM of shoulder abduction, UT muscle strength, and muscle activation pattern than the scapular-focused exercises alone. Conscious control of scapular orientation should be considered to integrate into scapular-focused exercises in patients with oral cancer and scapular dyskinesis.

Keywords: scapular dyskinesis, MVIC, QOL, DASH (disability arm shoulder hand score)

OP-062

Evaluation of the Relationship Between Lymphedema Symptoms and Edema Assessments in Patients with Breast Cancer-Related Lymphedema

Aysel Ozge Kemer[1], Esra Uzelpasaci[2], Turkan Akbayrak[3], Serap Ozgul[3], Ayşegul Yaman[4], Ceren Gursen[3]

[1]Department of Physical Medicine and Rehabilitation, University of Health Sciences, Gulhane Training and Research Hospital, Ankara, Turkey.
[2]Faculty of Gulhane Physiotherapy and Rehabilitation, University of Health Sciences, Ankara, Turkey.
[3]Faculty of Physical Therapy and Rehabilitation, Hacettepe University, Ankara, Turkey.
[4]Ankara Etlik City Physical Medicine and Rehabilitation Hospital, University of Health Sciences Turkey.

Objectives: The aim of this study was to investigate the relationship between subjective lymphedema symptoms reported by breast cancer patients and edema evaluations.

Background: Lymphedema is a common and distressing complication that may arise from breast cancer treatments. Patients report symptoms associated with lymphedema, such as swelling, feeling of heaviness, tightness, and pain in the affected upper extremities. Objective evaluation of edema severity often involves methods such as circumference measurement, volumetric measurement, and Bioimpedance Spectroscopy (BIS). In addition to objective methods, it is important to ask patients about their subjective lymphedema symptoms. The presence of subjective lymphedema symptoms can contribute to early diagnosis, especially when objective methods are insufficient to detect lymphedema-related changes in the affected extremity.

Methods: This study included 120 women (n = 68 with lymphedema, n = 52 non-lymphedema; mean age = 52) who completed their breast cancer treatment. Subjective symptoms of lymphedema, such as swelling, heaviness, tightness, and pain, were assessed using the Visual Analog Scale (VAS). The presence of lymphedema was assessed using circumference measurement, Bioimpedance Spectroscopy (BIS), and Moisture Meter Compact device (Delphin Technologies, Finland). The study analyzed the correlation between measurement methods and subjective lymphedema symptoms using Pearson and Spearman Correlation Analysis. Statistical significance was considered at $p<0.05$.

Results: The frequency of swelling, heaviness, tightness and pain symptoms in patients with breast cancer-related lymphedema were 86.8%, 89.7%, 79.4% and 79.4%, respectively. In non-lymphedema patients, the frequency of swelling, heaviness, tightness and pain symptoms were 44.2%, 46.2%, 53.8% and 57.7%, respectively. There was a weak to moderate correlation ($r= 0.24–0.52$, $p<0.05$) between the severity of lymphedema, determined by circumference measurement, and the severity of symptoms such as swelling, heaviness, tightness and pain, as well as the level of distress. No significant correlation was found between pain severity and distress level, and the L-Dex score obtained by BIS measurement. A weak to moderate correlation was observed between the severity of other symptoms and distress level and BIS measurement ($r=0.33–0.46$, $p<0.05$). There was a weak, significant correlation found between the PWC (%) score obtained with the Moisturemeter and the severity of all symptoms and distress levels ($r = 0.22–0.37$, $p <0.05$).

Conclusions: The evaluation of lymphedema in the clinic involves objective methods that are related to subjectively reported symptoms such as swelling, heaviness, tightness, and pain. Therefore, in addition to objective methods, it is important to consider the subjective symptoms of patients in evaluating lymphedema.

Keywords: Breast cancer, lymphedema, symptom, distress

OP-063

Can LSC and ICG help to differentiate lipedema from lymphedema and obesity?

Marzanna Zaleska[1], Marzanna Zaleska[2], Natalia Krzesniak[3]

[1]Medical Research Institute, Dept. of Applied Physiology, Polish Academy of Sciences, Warsaw, Poland
[2]National Medical Institute of the Ministry of Interior and Administration, Warsaw, Poland
[3]Department of Plastic and Reconstructive Surgery, Centre of Postgraduate Medical Education, Warsaw, Poland.

Objectives: To evaluate and compare the changes in lymph drainage in the lower limb in patients with lipedema, lymphedema, and obesity on LSC and ICG images.

Background: Lipedema is a pathological accumulation of subcutaneous adipose tissue in the lower body and occurs mainly in women. Lymphedema of limbs is a pathological accumulation of tissue fluid in tissue spaces due to damage to lymphatics. Lipedema is often misdiagnosed with lymphedema and obesity, as clinical pictures of these three entities are similar. Without treatment and prevention, both lipedema and obesity can lead to impaired lymphatic vessels, inflammation, and the development of lymphedema. The lymphatic system imaging studies (LSC, ICG) may help make a proper diagnosis and differentiate.

Methods: We analyzed LSC and ICG images of 50 patients with lipedema stages I-III, 50 with lymphedema stages I-III, and 30 with obesity (BMI 32-41). We investigated skin water concentration (LympScanner; Delfin Technologies Ltd.) and skin and subcutaneous tissue stiffness (SkinFibrometer; Delfin Technologies Ltd., Wagner, Seattle, WA). We examined the skin and subcutaneous tissue on USG in some patients in each group. In the LSC and ICG images analysis, we were concerned with lymphatic vessel architecture and appearance (dilated, foggy, intermittent), lymph vessel damage sites, and fluid accumulation in the tissue (dermal backflow). In USG images, we investigated the presence or lack of fluid in the subcutaneous tissue.

Results: In lipedema and obese patients, we observed on LSC and ICG the presence of lymphatic vessels along the entire limb, as well as multiple, dilated, and tortuous LVs (more in advanced stages). In some patients with a history of skin and subcutaneous tissue inflammation, the sites of fluid accumulation in the tissue spice were seen in the calves. In lymphedema patients, we observed sites of fluid accumulation in the foot, calves, tights, and groin. The size and location of fluid accumulation depend on lymphedema advancement (stage) and pathological factors that cause lymphedema. Skin water accumulation (40% in lipedema and obesity vs. 57-70% in lymphedema), skin stiffness (0.14 N in lipedema and obese patients vs. 0.35 N in lymphedema), subcutaneous tissue stiffness (1.7 g x 103/cm2 in lymphedema vs. 0.7 in lipedema and obesity) were highest in patients with lymphedema.

Conclusions: Visualizing the limb lymphatic system with LSC and ICG may help to diagnose and differentiate lipedema and obesity from lymphedema. Additionally, they can support the early diagnosis of lymphatic changes that develop in advanced and poorly treated lipedema and obesity.

Keywords: lipedema, lymphedema, obesity, lymph drainage visualization

OP-064
MULTIFUNCTIONAL EDEMA TRACKING DEVICE

Şenay Çetinkaya[1]

[1]Çukurova University. Faculty of Health Science

Objectives: TECHNICAL FIELD The invention relates to a device that can be used automatically and manually, can be integrated with patient monitors, can be used for measurements such as head circumference, abdominal circumference, arm circumference in infants and children, and can measure edema in infants, children and adults.

Background: BRIEF DESCRIPTION OF THE INVENTION The invention has a touch screen where patient data can be entered in order to be used in people of all ages, it can connect with other medical products, it is easy to determine the ankle circumference in the inpatients and edema in the early period, and it can be used for measuring, recording and also for tracking of the head circumference, abdomen circumference, arm circumference in infants and children.

Methods: DETAILED DESCRIPTION OF THE INVENTION The edema tracking device subject to our invention comprises;- Integrated connection gateway that allows connection to devices such as intravenous pumps, ventilators, beds and other patient monitors,- Automatic usage that allows measurement at specified time intervals when plugged in, and manual use modes that allow it to measure (single) by adjusting manually when desired,- Touch screen interface where patient data can be entered so that it can be used in people of all ages,- Wireless network protocol to enable connection with other medical products,- Battery that allows external use,- For keeping the data records of the measurements made, the healthy/ sick individuals once enter gender, day / month / year, chronological age calculation (thanks to the program) height, weight, head circumference; for babies younger than 18 months, the ability to measure head circumference in older adults and evaluate it with special formulas.

Results: The device can be used for one measurement when desired, or it can be used for more than one measurement per day. In healthy individuals, at least two measurements are recommended daily, once in the morning and once in the evening. The number of measurements can be increased by determining this number according to individual differences in patients with circulatory system, renal system and cardiovascular system diseases.

Conclusions: It will be easy to determine the edema in the early period by measuring the ankle circumference, especially since inpatients' weight cannot be monitored daily. Apart from edema follow-up, possible fluid losses can be identified, especially in infants. It can also be used for measuring, recording and monitoring the head circumference in infants (younger than 18 months).

Keywords: Multifunctional, Edema, Tracking Device, Technological Application

OP-065

Comparison of the Efficacy of High-Intensity and Low-Intensity Resistive Exercises Applied to Patients with Upper Extremity Lymphedema

ESRA KONUR[1], Buket Akıncı[1], Ekin İlke Şen[1], Dilşad Sindel[1]

[1]Biruni University

Objectives: The aim of this study is to compare the efficacy of resistive exercises applied at different intensities in patients with upper extremity lymphedema.

Background: Lymphedema is a condition characterized by the accumulation of protein-rich fluid in the subcutaneous tissue of the affected body regions. Complex Decongestive Physiotherapy (CDP) is considered the gold standard in treatment, and one of the components of CDP is exercise. The literature contains many positive effects of exercise application in lymphedema. One type of these exercises is resistive exercises. To compare the effectiveness of resistive exercises, it is suggested to compare resistive exercises in terms of intensity, volume, and frequency for more effective results in exercise programs.

Methods: Patients aged between 35 and 60 were included in the study. Participants were randomized into two groups: High-Intensity Resistive Exercise (HIRE) Group (n=18), and Low-Intensity Resistive Exercise (LIRE) Group (n=18). Participants received Manual Lymphatic Drainage (MLD) and compression therapy with bandages for 5 days a week for a total of 2 weeks. Resistive exercises were applied two days a week. In the HIRE Group, exercises were performed at 80% of one maximum repetition, and in the LIRE Group, at 30% of maximum repetition, with 2 sets of 8/10 repetitions in the first week, and 3 sets of 8/10 repetitions in the second week. In addition, patients were continued home exercises for 2 weeks, and evaluations were repeated at the end of the 4th week. Data collection tools included; perimeter measurement, lymphedema symptom severities, McGill pain questionnaire, disability of arm, shoulder and hand questionnaire (DASH), lymphedema life impact scale, lymphoedema functioning, disability and health questionnaire (LOICF), jamar hand dynamometer, and pinchmeter.

Comparison of the Efficacy of High-Intensity and Low-Intensity Resistive Exercises Applied to Patients with Upper Extremity Lymphedema

Results: At the end of the treatment, all measurements in the LIRE and HIRE groups showed significant improvement, except for the lateral finger grip ($p<0.05$). Both our primary measurements, such as arm volume, grip strength, percent change of excess volume; our secondary measurements, including swelling, tightness, and heaviness sensations, upper extremity functional status, quality of life, and finger grip strength, showed improvement in both groups. An increase in grip strength, a decrease in PCEV (%), and a reduction in the sensation of tightness showed more significant improvement in the HIRE group, demonstrating differences between the groups.

ANCOVA Analysis of PCEV Measurements

PCEV(%	HIRE Δ (Mean±SD)	LIRE Δ (Mean±SD)	F	Effect Sizes	Lower Limit	Upper Limit	p
Pre-Treatment- Week 2	-18,94±8,06	-14,83±8,23	1,925	0,05	-0,108	0,572	0,175
Pre-Treatment- Week 4	-23,78±8,44	-18,73±8,51	1,346	0,04	-0,130	0,475	0,254
Week 2- Week 4	-4,38±3,53	-3,89±2,53	0,419	0,013	-0,245	0,127	0,522

In PCEV measurement, there were time-dependent differences between the HIRE and LIRE groups; however, the difference between the groups was not statistically significant.

Conclusions: Both LIRE and HIRE training led to similar improvements in perimeter measurements, lymphedema symptoms, pain, muscle strength, and quality of life, both methods can be used in the treatment of lymphedema without increasing symptoms.

Keywords: Exercise in Lymphedema, Exercise intensity, Lymphedema

OP-066

Lymphatic connection between palatine tonsils and heart (literature review)

Hung Vu Duy[1], Fahed Alzawahreh[1], Vyacheslav Milov[1]

[1]People's Friendship University of Russia

Objectives: Variants of the lymphatic connection between palatine tonsils and heart was the aim of this paper.

Background: Knowledge about the lymphatic connection can explain the routes of pathology spreading between the organs and allows to choose the optimal lymphotropic approach during lymphotropic therapy to block the channels of infection.

Methods: Justification of close relationship between lymphatic bed of the tonsils and heart was shown in papers of different scientific schools, which were carried out by means of polychrome interstitial injections. 101 papers were analyzed.

Results: According to literature, the lymph nodes (LNs) of the first order for the palatine tonsils are the following: upper, middle and rarely lower internal jugular LNs (including the jugulodigastric node); lateral retropharyngeal; submandibular; submental; LNs located along accessory nerve and sternocleidomastoid artery at the level of the roots of lingual and ascending pharyngeal arteries (rarely); anterior superficial cervical LNs. The LNs of the second and subsequent orders include: middle and lower internal jugular LNs; paratracheal; LNs located on the posterior surface of the right brachiocephalic vein (sometimes).Lymph fusion from the palatine tonsils and heart can be observed in four groups of LNs: most often the common LNs are the lower deep cervical LNs (internal jugular LNs), in 10% of cases the lymph fusion occurs in the paratracheal LNs, in 20% - in jugular trunk and rarely in the regional nodes of the heart on posterior surface of the right brachiocephalic vein.Lymph fusion can be also observed in lymphatic vessel anastomoses, of which five types are distinguished. In three types, the connection between the lymphatic vessels of these organs doesn't perform any lymph node; in other two types, there is one or more LNs which are on the way of lymph outflow. Lymph can perform retrograde flow from the LNs common to these two organs and anastomosis of lymphatic vessels appearing from the palatine tonsils and the heart. Direct fusion of lymphatic vessels or formation of the lymphatic capillary network between them are responsible for such anastomosis organization. One should also take into account the possibility of spreading of pathological microorganisms through non-vascular pathways of lymph transport: interstitial channels (prelymphatics), interfascial spaces, perineural and perivascular spaces (typical for children).

Conclusions: Lymphatic connection between the palatine tonsils and heart showed the numerous variants which is the possibility of spreading of infectious agents through the lymphatic system.

Keywords: palatine tonsils, heart, regional lymph nodes

OP-067

Evaluation of Elastographic Parameters in Patients with Breast Cancer-Related Lymphedema and Examination of Their Relationship with Clinical Data

Merve Demirci[1], Canan Sanal Toprak[2], Ilker Yagci[2], Gulseren Akyuz[3]

[1]Zonguldak Ataturk State Hospital
[2]Marmara University Pendik Training and Research Hospital
[3]Istanbul Private Sante Medical Center

Objectives: Evaluate the stiffness of the skin and subcutaneous tissues of the arm and forearm of patients with BCRL using shear-wave elastography (SWE) andInvestigate the relationship between the patients' symptoms

Background: What is Known?Most BCRL studies focus on volume differences, but patients' primary complaints are stiffness development. In stiffness measurement studies, affected lymphedematous extremities are stiffer than unaffected ones. However, contradictory results exist in skin and subcutaneous stiffness measurements on this subject, and the number of studies conducted is limited. What is New?Unlike the literature, this study reveals that unaffected arms of BCRL patients are affected, with a higher patient count. And also, the skin stiffness increased while subcutaneous tissue stiffness decreased in the lymphedematous extremities of patients; this study identified that these changes were associated with the patients' clinical conditions and functionality.

Methods: Both upper extremities of 72 patients with lymphedema and 72 healthy upper extremities were included in the study. The patients' demographic and clinical data were recorded. The stiffness of the skin and subcutaneous tissues was evaluated with shear-wave elastography. TInterobserver and intraobserver reliability analysis was performed elastography measurements. The patients' pain, tension, weight, and stiffness symptoms associated with lymphedema were questioned using a numerical scale. The patients' functionality and participation in daily life activities were evaluated with the Quick DASH and Life Impact Index questionnaires. The relationship between these findings and elastographic and ultrasonographic parameters was analyzed.

Flowchart of the Study

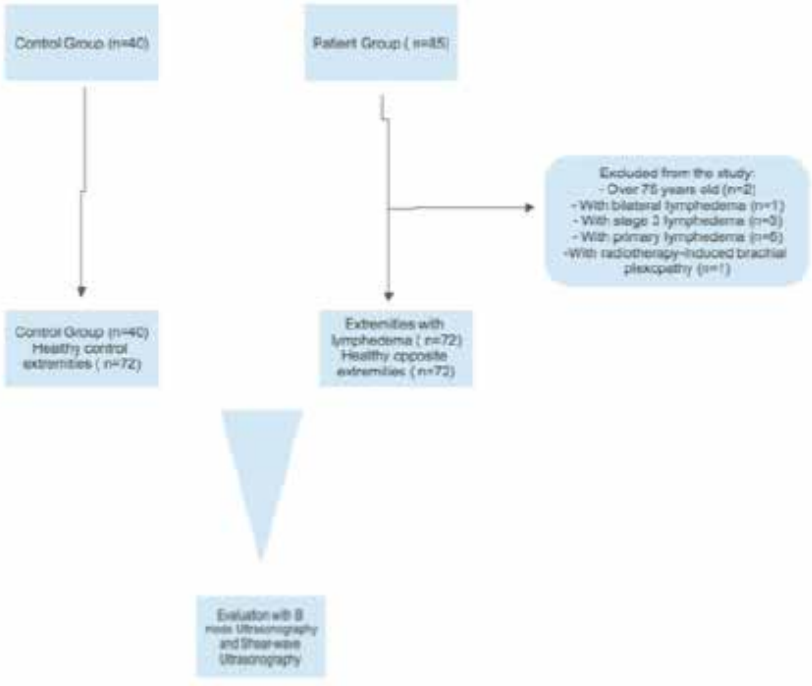


Figure 3

Results: The skin stiffness of the affected exremity was higher and the subcutaneous tissue stiffness was lower in patients than controls ($p<0.05$). The skin stiffness of the affected forearm was higher and the subcutaneous tissue stiffness of the affected arm and forearm was lower than their unaffected extremities ($p<0.05$). There was a correlation between the increase in skin stiffness and functionality and participation of patients. The decrease in subcutaneous tissue stiffness of the arm was associated with heaviness sensation, the increase in skin stiffness of the forearm was associated with tightness and the decrease in subcutaneous tissue stiffness of the forearm was associated with tightness and stiffness sensations.

Conclusions: The results of this study suggest that SWE measurements can be useful for diagnosis and follow-up of patients.

Keywords: Lymphedema, elastography, stiffness, functionality

OP-068

Incidence and Identification of plantar oedema

Jane Wigg[1], Stacy Pugh[1]

[1]Lymphoedema Training Academy

Objectives: By the end of the session the delegate will understand the incidence of plantar lymphoedema and the need for assessment and treatment

Background: Near Infrared lymphofluoroscopy imaging (NIRLFI) can identify plantar oedema. Following many years of assessment with ICG imaging, plantar oedema is identified and treatment protocols and assessment tools need to change to assess for this. These finding are present in 50% of lower limb lymphoedema patients following NIRFLI. The use of tissue dielectric constant analysis (TDC) allows for the measurement of superficial tissue fluid. The combination of NIRFLI and TDC has allowed the assessment of plantar oedema in a convenience sample. This study aimed to identify the incidence of plantar oedema and ascertain if TDC is a suitable tool for identification, in addition to other signs of plantar oedema.

Methods: An assessment tool and diagrammed was developed to capture the type of oedema and data. Data collection included, palpation of plantar oedema at assessment, foot temperature and TDC measurements taken in 3 places (sole, arch and ball of the foot). The foot was left for five minutes pre TDC reading to reduce any temperature or localsed changes. The identification of plantar oedema was accepted as a TDC value of above 47% for bilateral oedema or ratio volume of 1.2 if unilateral. In addition NIRFLI was used to confirm the presence of plantar oedema. The cohort consist of a convenience sample of 20 oedema patients and 40 ‘normal’ subjects.

Results: The results demonstrate that TDC is a useful tool to identify plantar oedema and this is quantified through NIRFL. In addition the presence of slight skinfolds to the arch of the affected foot and skin thickening assit diagnosis in the absence f TDC or ICG imaging

Conclusions: Early identification of planter oedema and implementation of treatment could reduce the impact of mobility issues in this group. Plantar oedema should be routinely assessed in all patients when using NIRFLI and added to assessment forms. General lymphoedema assessment forms should include an area for planar oedema assessment. This study is the precursor to treatment decisions which may include, MLD, KT or the use of orthotist inserts for the prevention of, or treatment of plantar oedema.

Keywords: Plantar oedema, assessment, Near Infrared Lymphofluoroscopy Imaging (NIRLFI), Tissue Dielectric constant (TDC)

OP-069

Status of the Superficial Lymphatic System in Patients with Chronic Venous Disease as Detected by ICG-lymphography

Marina Demekhova[1], Kirill Lobastov[2], Igor Sonkin[3], Tatyana Gurina[4], Astanda Bargandzhiya[2]

[1]NMRC of Oncology named after N.N.Petrov of MoH of Russia, Saint Petersburg, Russia
[2]Pirogov Russian National Research Medical University, Moscow, Russia
[3]Road Clinical Hospital of JSC "Russian Railways", Saint Petersburg, Russia
[4]Phlebocentr Private Clinic, Kaliningrad, Russia

Objectives: This study aimed to assess the status of the superficial lymphatic system according to the CEAP clinical class in patients with CVD.

Background: The novel hypothesis suggests that lesions of the superficial lymphatic system may be responsible for developing progressive forms of chronic venous disease (CVD) and trophic changes. However, there is not enough strong evidence to support it.

Methods: This cross-sectional single-center study enrolled healthy volunteers (C0a) and patients with primary or secondary CVD (C1-6) without evidence of lymphedema, cancer, and previous venous surgery. Clinical examination and duplex ultrasound scan were followed by indocyanine green (ICG)-lymphography to assess the status of the superficial lymphatic system of the lower limbs. The evaluated parameters included lymphatic pattern: linear (standard) or splash, stardust, diffuse or no visualization (pathological); the presence of interstitial or dermal reflux; segmentation or dilatation of vessels; and visible contractility.

Results: In total, 25 patients aged 25-70 (mean of 51.0±13.1) years, 17 females and 8 males, were included, and ICG-lymphography assessed 43 lower limbs. The CEAP clinical class was C0 (healthy volunteers) in 6; C1 in 9; C2 in 6; C3 in 6; C4 in 12; C5 in 2; and C6 in 2 lower limbs. The prevalence of the standard linear lymphatic pattern decreased in parallel with the CEAP clinical class increase: C0 – 100%; C1 – 88.9%; C2 – 83.3%; C3 – 50%; C4-6 – 25% (p=0.014). In 11.1% of C1 limbs, the splash pattern was found; in 16,7% of C2 limbs – the diffuse pattern; in 33.3% and 16.7% of C3 limbs – splash and diffuse patterns, respectively; and in C4-6 limbs, a diffuse pattern was observed in 37.5%, stardust pattern – in 18.8%, and lymphatic vessels were not visualized in 18.8% (one case of venous ulcer and another case of C4). A significant increase in interstitial (from 16.7% in C0 to 68.8% in C4-6; p=0.03) and dermal (from 0% in C0 to 62.5% in C4-6; p=0.03) reflux was detected. The contractility of lymphatic vessels decreased from 100% in C0 to 56.6% in C4-6 (p=0.022). However, no difference was found in segmentation and dilatation, observed in 16.7% of C0 and 31.3% in C4-6 lower limbs.

Conclusions: The prevalence of normal linear lymphatic patterns decreases in parallel with pathological patterns increasing with the progression of CEAP clinical class in CVD patients. It seems that lesions of the superficial lymphatic system play a pivotal role in the development of trophic changes in CVD.

Keywords: lymphatic insufficiency, icg-lymphography, Phlebolymphedema, venous insufficiency

OP-070

Evaluation of Response to Treatment in Breast Cancer-related Lymphedema

Ezgi Yıldız Güvercin[1], Sibel Eyigör[2], Ece Çınar[2], Göksel Tanıgör[3], Menekşe Özgür İnbat[2], Sedef Çalışkan Kabayel[2]

[1]Department of Physical Medicine and Rehabilitation, Tavşanlı State Hospital, Kütahya/ TÜRKİYE
[2]Department of Physical Medicine and Rehabilitation, Ege University Faculty of Medicine, İzmir/ TÜRKİYE
[3]Department of Physical Medicine and Rehabilitation, Izmir University of Economics Faculty of Medicine, İzmir/ TÜRKİYE

Objectives: The aim of this study was to assess and compare the response to the breast cancer-related lymphedema (BCRL) treatment with "Breast Cancer-Related Lymphedema of the Upper Extremity (CLUE)" scores, bioimpedance spectroscopy (BIS) and the volume-assessments /measurements. A secondary aim of the study was to show whether CLUE has a place in the treatment response and its correlation with the other measures of lymphedema.

Background: CLUE (Breast Cancer-Related Lymphedema of the Upper Extremity) is a tool that was developed by Spinelli et al. to assess the presence and severity of the lymphedema in these patients Having both objective and subjective measures, CLUE scores are shown to be a valid and reliable scale to assess BCRL. While there are many therapeutic approaches in the management of BCRL, the gold standard method is considered the complete decongestive therapy (CDT). The lack of a consensus is also valid for the measures of follow-up in the course of the therapy, with volume-related methods preferred more often, like the diagnostic measures. The use of bioimpedance spectroscopy and CLUE scores also requires more evidence for justification of their use in evaluating the effectiveness of the therapy. The aim of this study was to assess and compare the response to the BCRL treatment with CLUE scores, bioimpedance spectroscopy, and assessments/measurements. A secondary aim of the study was to show whether CLUE has a place in the treatment response and its correlation with the other measures of lymphedema.

Methods: The design of our study is a retrospective study. A total of 40 patients were included in the study. Patients were evaluated with CLUE score, assessment of the upper extremity volumes, Quick DASH score, BIS and hand-grip strength before and after the complete decongestive therapy.

Results: Correlation analyses showed that CLUE total score and BIS values were correlated with the reduction in the volumes ($p=0.04$ and $p<0.001$, respectively). Moreover, the CLUE total score was also found to be positively correlated with the BIS values ($p<0.001$). Hand grip strength and Quick DASH scores were not found to be correlated with the changes in the volume and CLUE total scores.

Changes before and after the treatment

	Pre-treatment	Post-treatment	p	% (Difference before and after the treatment in percentage)
Volume Measurement (extremity with lymphedema) (Mean ± SD)	3840.5 ± 820.3	3285.95 ± 560.11	<0.001	14.43
BIS value (Mean ± SD)	54.85 ± 31.88	29.48 ± 15.51	<0.001	46.25
Hand Grip Strength (Mean ± SD)	18.34 ± 5.64	17.68 ± 5.47	0.177	3.59
Quick DASH score (Mean ± SD)	39.03 ± 18.67	38.5 ± 17.86	0.572	1.35
CLUE (Mean ± SD) Total	37.45 ± 17.36	25.6 ± 14.56	<0.001	31.77

Correlation of change in clinical parameters after treatment

	Volume Measurement	BISvalue	Handgrip strength	Quick DASH score	Clue Total Score	Clue Anatomic Score	Clue Tissue Score
BIS value	.749**						
Handgrip strength	.116	.151					
Quick DASH score	.202	.264	.143				
Clue Total Score	.324*	.508**	.092	.201			
Clue Anatomic Score	.457**	.483**	.162	.130	.835**		
Clue Tissue Score	.263	.401*	.052	.139	.693**	.409**	
Clue Edema Score	.159	.312*	.124	.200	.593**	.383*	.173

Conclusions: In conclusion, the development of a structured clinical assessment like CLUE provides clinicians with a standardized evaluation for BCRL. For the novel studies aiming to assess treatment responses to patients with BCRL, the use of CLUE and BIS alongside routinely used volumetric methods is encouraged.

Keywords: Lymphedema, rehabilitation, physical therapy.

OP-071

A Multi-center Randomized Control Cross-over Study to Evaluate the Effectiveness of a Novel Portable Non-Pneumatic Active Compression Device vs. an Advanced Pneumatic Compression Device for Treating Lower Extremity Lymphedema

Stanley Rockson[1]

[1]Stanford University

Objectives: To Evaluate the Effectiveness of a Novel portable non-pneumatic active compression device vs. an advanced pneumatic compression device for treating lower extremityemphedema through a multi-center randomized control cross-over study

Background: Chronic edema is a common condition which can occur at a systemic or localized level. Regardless of the cause, various forms of edema are often overlooked by healthcare providers because of a poor appreciation of the magnitude and impact of these conditions and their manifestations. This further leads to challenges in management affecting outcomes, quality of life, and it can render a significant financial burden. The most common adjunctive treatment option are compression pumps. Existing pneumatic devices use air to inflate/deflate chambers creating a gradient compression over the extremity. These devices require an outlet for power necessitating the patient to be immobile during treatment. Patients also report these devices are bulky, noisy and adherence with use is poor. A novel non-pneumatic compression device (NPCD or Koya Dayspring®) with a portable battery enables patients to ambulate and be mobile while gaining the synergistic effect of the muscle pump. The NPCD utilizes a smart metal allow that dynamically stimulates the superficial lymphatics in conjunction with active compression. The NPCD with a multimodal approach has been developed to address the current unmet needs with the disease.

Methods: This was a prospective, randomized single crossover, multi-center clinical study. Consecutive subjects with chronic edema related to chronic venous insufficiency (CVI), lymphedema (primary or secondary), or phlebolymphedema were enrolled to receive, in a 1:1 randomization, either the Non-pneumatic Compression Device (NPCD) or the Advanced Pneumatic Compression Device (APCD) and were followed for 12 weeks each. Following a 4-week wash-out period, the subjects were crossed over to the alternate device. 97 subjects were enrolled and completed the study.

Results: Study closeout will occur January 2024 followed by data analysis. Final results will be provided at the meeting.

Conclusions: A novel non-pneumatic compression device (NPCD or Koya Dayspring®) with a portable battery enables patients to ambulate and be mobile while gaining the synergistic effect of the muscle pump. The NPCD utilizes a smart metal allow that dynamically stimulates the superficial lymphatics in conjunction with active compression. The NPCD with a multimodal approach has been developed to address the current unmet needs with the disease.

Keywords: lymphedema, dynamic, compression

OP-072

A Brief Look at the Last 50 Years of Postmastectomy Lymphedema Research: A Bibliometric Study

Elif Özyiğit[1], Mert Zure[1], Fatih Bağcıer[2]

[1]University of Health Sciences, Kanuni Sultan Süleyman Training and Research Hospital
[2]Cam Sakura City Hospital

Objectives: The objective of this study is to pinpoint the top 50 cited articles on postmastectomy lymphedema (PML) within the past 50 years. We aim to conduct a rigorous statistical analysis of the characteristics of these publications, thereby enhancing the foundational knowledge surrounding PML. Additionally, this investigation aims to facilitate the identification of potential research topics and promote collaboration among researchers in the field.

Background: Throughout the world, successive generations of dedicated scientists have published numerous articles on PML. Conducting a bibliometric analysis of current literature is essential to comprehend the contemporary landscape of lymphedema research output. This endeavor not only aims to gauge the present state but also to strategically advance research on lymphedema in alignment with international research frontiers.

Methods: To conduct the bibliometric analysis, a title-specific search was executed in February 2024 on the Web of Science database by Clarivate Analytics, using “postmastectomy lymphedema” as the primary search term. The selected timespan for the search extended from 1975 to 2024. The utilization of the Web of Science database was imperative, given its recognition as the most authoritative and comprehensive indexing tool for scientific and technological research citations. The top 50 most-cited articles in the last 50 years were reviewed for the analysis.

Results: The articles received a mean citation of 92.82 ± 62.07 per article. The top 10 articles were published between the years 2001 and 2015. The top 4 journals with the most publications were CANCER, BREAST CANCER RESEARCH AND TREATMENT, PLASTIC AND RECONSTRUCTIVE SURGERY and ANNALS OF SURGERY. The top 5 countries with the most publications were Taiwan, Canada, USA, China and Türkiye. The most productive research institutions were the University of Chang Gung, University of Alberta, University of Texas System and University of Toronto. Cheng MH and Mcneely ML were the most productive authors in the field. The majority of the articles (28) fell within the domain of oncology, along with 15 articles focusing on surgical aspects, and 8 contributing to the field of rehabilitation. 3 articles focused on physiology, 2 focused on immunology and 2 focused on imaging and nuclear medicine.

Conclusions: An increasing number of scholars are dedicating themselves to the study of PML. It is foreseeable that PML will continue to be a focal point of future research. Simultaneously, this study serves as a valuable resource for researchers to identify potential collaborators and partner institutions, thereby contributing to the advancement of further research in the field.

Keywords: Postmastectomy, Lymphedema, Bibliometrical Analysis

OP-073

Results of Combined Decongestive Therapy in patients with lower extremity lymphedema: Experience of Bursa City Hospital Lymphedema Rehabilitation Center

Erkan KAYA[1], Beyza ISIK[1], Nehar SAHİN[1], Selma KIZILTOPRAK[1], Demet CANBAZ[1], Tolga CANBAZ[1], Ömer Berkan OZCAN[1], Esra Nur CANAZLAR[1], Hatice Sümeyye GUCLU[1], Olgun GENC[1], Taner DANDINOGLU[1]

[1]Bursa City Hospital, Physical Medicine and Rehabilitation, Bursa, Türkiye

Objectives: The aim of this study is to present the results of modified combined decongestive therapy (CDT) in patients with lower extremity lymphedema (LEL).

Background: Lymphedema is a chronic condition caused by a failure in the lymphatic system that most commonly occurs in the limbs. There is currently no definitive treatment. However, some options have been proposed to mitigate its consequences. Complex Decongestive Therapy (CDT) stands out as one of the main treatment methods of choice. CDT is a noninvasive treatment for lymphedema. The therapy includes a variety of techniques, including manual lymphatic drainage, compression, exercise and skin care.

Methods: We retrospectively reviewed 75 patients aged 55.84 ± 15.70 years who had been diagnosed with LEL between December 2021 and December 2023. The patients were treated for 4 weeks with modified CDT, including self-manual lymphatic drainage, self-bandaging, decongestive exercises, and skin care.

Results: The mean reduction amounts circumference before and after treatment were 2.05 cm, 3.92cm, and 4.50 cm for stages 1, 2, and 3 respectively (P = 0.001). There were significant differences between the values before and after treatment in excess extremity volume (EEV) at all stages (P = 0.001). The circumference percentages of the secondary LEL patients were higher than those of the primary LEL patients (P = 0.04). There was no correlation between BMI and treatment response in terms of circumference percentages (r = −0.99; P = 0.36).

Conclusions: CDT can be helpful in managing chronic swelling from lymphedema that does not go away on its own. It is non-invasive and can be used alone, or in conjunction with other therapies, to improve symptoms and quality of life for patients with lymphatic conditions. Our results revealed that CDT is more effective in reducing extremity edema volume in secondary LEL than primary LEL. It should be an available method for self-management of LEL at all stages.

Keywords: Lower extremity lymphedema; self-management; complex decongestive therapy.

OP-074

The Relationship Between Joint Hypermobility and Primary Lymphedema

Feyza Akan Begoğlu[1]

[1]Fatih Sultan Mehmet Research and Training Hospital

Objectives: The aim of this study is to investigate the relationship between joint hypermobility and primary lymphedema.

Background: The lymphatic system begins to develop at the end of the fifth gestational week. Lymphatic vessels and lymph nodes develop from the mesoderm. The relationships between some structures that develop from the same mesoderm-derived structures and ligament, muscle, tendon structures and joint hypermobility have been examined. There are studies showing that hypermobility may be a risk for venous insufficiency. Primary lymphedema and hypermobility have not yet been studied in the literature.

Methods: Our study included 35 patients with primary lymphedema in the lower extremity, male and female, between the ages of 18-65, and 32 healthy volunteers in the same age range who did not have complaints such as edema or lymphedema in the lower extremity. Demographic information of all patients was obtained. While Beighton scoring was applied to all volunteers and patients for generalized joint hypermobility (GJH), Brighton criteria were questioned for benign joint hypermobility syndrome (BJHS).

Results: There was no statistically significant difference in terms of Beighton score averages between cases with and without lymphedema ($p>0.05$). 27.8% of the cases with lymphedema and 25% of those without lymphedema had GJH, and there was no statistically significant difference between them ($p>0.05$). 13.9% of the cases with lymphedema and 15.6% of those without lymphedema had BJHS, and there was no statistically significant difference between them ($p>0.05$).

Conclusions: In this study, although Beighton scores were higher in the lymphedema group than in the healthy group, no significant difference was found between the lymphedema group and the control group in terms of GJH and BJHS.

Keywords: Primary lymphedema, joint hypermobility, being joint hypermobility syndrome

OP-075

Moisturemeter: Can we measure different values in the breast before cancer really developes: a pilot study

Decock Tim[1], Balduyck Bram[1]

[1]Decockliniek, Dr. Vodderschool B/N
[2]Dr. Vodderschool

Objectives: Generally, 1 on 7 women develop breast cancer. In Belgium, women from 50 years old are invited by the government, to have a mammography by the radiologist to check their breasts. For 95% of the women this is an appropriate age to check, but perhaps we can make this number higher, with a non-invasive technique. If we devide the breast in 4 quadrants, we see that the quadrant, closest to the axillary region is the lowest PWC (percentage water content).

Background: The moisture meter was developed by Delfin and is a useful devise for measuring changes in BCRAL and other edemas. As physiotherapist and Drs-lecturer, I wondered if we could find out if there was a quicker way to find out if the lymph system is disturbed. Together with radiologists, who are doing the mammography, we tried to find out if there is a connection between a positive mammography and the measurements in the 4 quadrants of the breast.

Methods: The breasts of our patients will be measured at the 4 quadrants between 2-3 cm away from the nipple. Included: all patients who come to the radiologist for a breast controlling mammographyControl group: 100 young and healthy women without any complaints.excluded excluded: women breast feeding, women who already had breast operations

Results: in progress

Conclusions: In normal situations the subclavicular quadrant (quadrant 4) is the lowest value. Is the value higher when women have a positive mammography for breast cancer or does it stay lower? Can we use the moisturemeter to check already earlier the breast of the patient and prevent worse situations?

Keywords: bral, moisturemeter, prevention

OP-076

Lymphedema Rehabilitation – Between "No Men's Land" and "Terra Incognita". Bulgarian Clinical Experience Debut.

Lyubina Vesselinova[1], Lyubina Vesselinova[1]

[1]Military Medical Academy

Objectives: Presenting the multifocal possibilities of lymphedema rehabilitation in Bulgaria. Clinical: extremity/-ties volume reducing, lymphorrhea control; ulcerations, immobility, and severe complications as dermo-hypodermatitis prevention; keeping/restoration of quality of life. Educational: involve patients in the therapy process for successful long-term control of the condition.

Background: Our clinical experience in a complex rehabilitation approach to secondary lymphedema in Bulgaria has been presented. It is grounded on the basic principles of complete decongestive therapy as well as on the Bulgarian classical knowledge of medical rehabilitation. The realities in recognition of this interdisciplinary medical problem are presented, too.

Methods: In- and out-patients with pelvic and breast operations in their past anamneses with manifested lymphedema in different types and stages have been observed. A complex clinical approach in an individual rehabilitation program in a prospective way has been nominated – decongestive therapy with compressive bandaging, analytical exercises with or without appliances, intermittent centripetal pneumatic massage/drainage and the indicated synergic physiotherapy factors.

Results: Reached rehabilitation goals in a controlled clinical medium. The first steps for improving the understanding of lymphedema in Bulgaria as a multisystem and interdisciplinary disease and the motivation of patients for cooperation in the treatment process have been established.

Conclusions: The complex, individual rehabilitation program for lymphedema might stabilize and prevent its advancing and the related to this severe complication.

Keywords: complex rehabilitation program, long-term results, lymphedema rehabilitation

OP-077

Ultrasonographic Classification and Progression Tracking in Dercum's Disease: A Study of Subcutaneous Adipose Nodules

Emily Iker[1]

[1]Lymphedema Center

Objectives: Reviewing Ultrasonography in Diagnosing Dercum's Disease: Explore the use of cutaneous ultrasonography, specifically the Terason 3200 with a 15 MHz probe, in diagnosing and classifying Dercum's Disease nodules, emphasizing its role in differentiating the disease's subtypes. Analyzing the Study's Methodology and Results: Examine the methodology used in the study, focusing on the classification of Dercum's nodules in 36 patients and the results that identified the diverse manifestation of the disease in its different forms. Evaluating the Efficacy of Ultrasonography in Dercum's Disease Management: Assess how the ultrasonographic findings correlate with clinical presentations, and evaluate the effectiveness of this approach in providing a clear understanding of the disease's progression and severity. Discussing the Implications for Future Treatment and Research: Consider the study's implications for future treatment strategies, emphasizing the importance of early diagnosis and tailored treatments for Dercum's Disease, and discuss potential areas for further research in this field.

Background: Dercum's Disease, characterized by painful subcutaneous adipose nodules of varying sizes and shapes, poses a diagnostic challenge due to its unknown etiology and variable presentation. This study aimed to utilize cutaneous ultrasonography for the differentiation and classification of Dercum's nodules, correlating clinical presentations with ultrasound findings.

Methods: Over two years, 36 women with lipedema and an average BMI of 26.34 were examined using the Terason 3200 model with a 15 MHz probe. The study focused on identifying nodules as per Dercum's disease classification and documenting their progression.

Results: Results indicated a diverse manifestation of the disease, with different types and locations of nodules identified: 8 patients with generalized diffuse form type I, 9 with generalized nodular form type II, 10 with localized nodular form, and 9 with juxta-articular form type IV.

Conclusions: The findings suggest that early diagnosis and classification through ultrasonography can aid in tailoring treatment approaches, potentially halting the progression of this rare disorder. The use of ultrasonography proved effective in objectively measuring the characteristics and severity of Dercum's nodules.

Keywords: Dercums, Subcutaneous Adipose Nodules, Ultrasonographic Classification

OP-078

Is it time to revolutionise compression stockings?

Victor Izraylit[1], Muhammad Farhan[1], Sarai Herrmann[1]

[1]Helmholtz-Zentrum Hereon

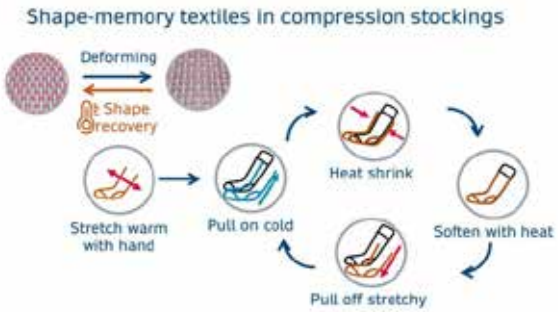
Objectives: Develop compression stockings, based on proprietary shape-memory yarns that exert pressures conforming to RAL GZ 387 standard.Realise thermally induced recovery of the developed compression stockings to the programmed fit and compression strength with recovery ratio over 98%.

Background: Compression therapy is arguably one of the oldest medical technologies that is used until today. The state-of-the-art textiles that we use for compression stockings are 70 years old and no significant innovation has been introduced since the beginning of 1990s. This leads to accumulation of problems that patients face in their everyday therapy, which cannot be solved by extensive improvements in the textile knit. To the major issues belong imperfection of fit and compression profile, unpredictable creep of compression force, and most importantly, difficulties with pulling the stockings on and off. This leads to incompliances of up to 70% of patients giving up on the therapy facing condition progression in a half of the cases and billions of euros burdening healthcare systems, as it was shown in our study.

Methods: Compression stockings in this work were knitted with industry-standard circular knitting machines. Compression strength was evaluated with a balloon test.

Results: In this project, we use an intensive technological approach going one step deeper and changing the chemical composition of the knitted yarns. For this, we have developed a new polymeric material, shape-memory yarns, that is capable of recovering their original, or memorised, shape in response to external stimuli as heat in a controllable and predictable manner. With this technology, we can change the size of a compression stocking on-demand with an uncomplicated procedure. In different, but overlapping embodiments of this technology, compression stockings can become easier in pulling on and off for weakened patients, each model – individually fitted, and compression strength – more resilient. Due to similarity in mechanical properties of out materials and elastane, typically used in compression stockings, we have successfully achieved compression strength within requirements of RAL GZ 387 standard with flexible opportunities for knitting different sizes and compression classes.

Graphical abstract



Shape-memory yarns in the knit of compression stockings make it easier to pull them on and off.

Conclusions: The developed textile has a genuine potential to revolutionise the technological field of compression therapy, solving issues with patient, therapeutic, and technical non-compliance as well as reducing financial burden of secondary costs for the healthcare system. As the following steps, the technology of shape-memory textile will be validated with patients and medical specialists, paving the way to clinical trials and applications.

Keywords: compression stockings, innovative textile

OP-079

Inflammation and lymphatic vessel insufficiency lead to impaired lymphatic transport and lymphedema in obese patients.

Marzanna Zaleska[1], Marzanna Zaleska[2], Natalia Krzesniak[3]

[1]Mossakowski Medical Research Institute, Polish Academy of Sciences, Warsaw, Poland
[2]National Medical Institute of the Ministry of Interior and Administration, Warsaw, Poland
[3]Department of Plastic and Reconstructive Surgery, Centre of Postgraduate Medical Education, Warsaw, Poland.

Objectives: To investigate the lymphatic vessel's function and lymph drainage in lower limbs in obese patients with and without acute tissue inflammation.

Background: Obesity is one of the significant and still increasing problems in the Western world. Irrespective of problems with metabolic, cardiac diseases, and diabetes, obesity is one of the more frequent causes of lymphedema. Excessively increased body mass and decreased physical activity causes increased venous and lymphatic vessel insufficiency, which leads to accumulations of excess fluid with bacteria drained from the skin and subcutaneous tissue inflammation. Untreated causes damage to the lymphatic vessels and lymphedema of the lower limbs.

Methods: We investigated 50 patients with obesity (BMI 32-50) appearing in our outpatient clinics and complaining about edema and pain in their lower limbs. All patients did not have a history of injury to the lower limbs and cancer treatment. We did ICG lymphography and LSC in all patients to evaluate the lymphatic vessel status. Patients with acute tissue inflammation were treated with antibiotics (Amoxicillin) for 2-4 weeks before ICG and LSC investigation. All patients were advised of compression therapy, ACS, bandaging, or stockings, depending on the edema and skin condition stage.

Results: Among 50 obese patients, in 36 (72%), visible signs of calves' skin and subcutaneous tissue inflammation, such as redness and increased skin temperature, were seen. In 4 patients, we noticed fluid leakage and a small ulcer. In ICG lymphography, we observed fluid accumulation in the entire or part of the calves in 85% of patients with inflammation and in 15% of dilated irregular lymphatic vessels. The most common changes in patients without acute inflammation were dilated and irregular LVs with slower lymph transport to the regional LNs. In LSC, we observed dermal backflow in the feet and calves in 55% of patients and in other changes such as dilated, multiple, and tortuous LV, dermal backflow in the calves, and slower lymph transit to inguinal LNs.

Conclusions: Obesity impairs lymphatic vessel's function and causes tissue inflammation. Early diagnosis and intervention are necessary to prevent lymphedema development, fluid leakage, and ulceration.

Keywords: obesity, inflammation, ICG Lymphography, Lymphoscintigraphy

OP-080

The effect of Complete Decongestive Therapy in patients with lower limb lymphedema after endometrial cancer surgery

Yuanli Zeng[1], Gaoming Liu[1], Zheng Peng[1], Anhui Zhang[1], Liqun Luo[1], Hua Li[1], Yuanyuan Liu[1], Ying Zhou[1]

[1]Hunan Cancer Hospital

Objectives: To investigate the clinical effect of Complete Decongestive Therapy (CDT) in patients with lower limb lymphedema after endometrial cancer surgery, which include the changes on the circumference, 50kHz bioelectrical impedance, BMI, lower limb function and quality of life.

Background: Surgery is the main treatment for endometrial cancer. Because of pelvic lymph node dissection during surgery, It may lead to lymphedema of the lower limbs. Lower limb lymphedema can cause swelling, pain, and even disability, seriously affect the quality of life. At present, the relevant studies mainly focus on the upper limb lymphedema, while the lower limb lymphedema related studies are few and mainly focus on cervical cancer. Due to lack of attention, lower limb lymphedema has become the most common, underestimated and least studied long-term complication after endometrial cancer surgery. CDT is the most common therapy for lymphedema. In this study, different comprehensive treatment measures were taken for lower limb lymphedema after endometrial cancer surgery in different stages to explore its clinical effect.

Methods: A total of 139 patients with lower limb lymphedema after endometrial cancer surgery participated in this study. Patients with stage 0-1 were treated with CDT at home, including self-drainage/simple lymphatic drainage, wearing pressure socks/pants or other pressure products, combined with functional exercise at home, self-skin care and other measures. Stage II-III patients are treated with systemic CDT in out-patient clinic, including Fluoroscopy guided - manual lymph drainage (FG-MLD), low elastic bandage, skin care and functional exercise. At the same time, Intermittent Pneumatic Compression (IPC) is used in combination with CDT. For patients with lower abdominal and perineal edema, combined use intramuscular tape. The treatment lasts for 10 days. Follow-up patient after treatment finished.

Results: After 10 days treatment, the circumference (t=-26.71,P<0.05) and segmental extracellular water ratio (t=-11.96,P<0.05) of the affected limb and patient's BMI (t=-8.574,P<0.05) were significantly lower than before. 50kHz bioelectrical impedance value (t=-14.01,P<0.05) of the affected limb was significantly higher than before. Total score of Lymph-ICF-LL (t=-23.39,P<0.05) and the scores of each dimension were also significantly higher than before. However, percentage of body fat (t=-0.427,P>0.05) was no significant difference than before.

Observation indices before and after treatment

Project	Before treatment	After treatment	Difference	t	P
Circumference of the affected limb(cm)	237.26±23.51	216.92±18.77	-20.34±8.98	-26.71	P<0.05
Extracellular water ratio of affected limb segment	0.4128±0.0216	0.3991±0.0143	-0.0137±0.0134	-11.96	P<0.05
50-kHz Bioelectrical impedance of the affected limb(Ω)	166.85±67.50	207.89±51.52	41.04±34.55	14.01	P<0.05
BMI	27.05±3.97	26.27±3.76	-0.7770±1.0684	-8.574	P<0.05
Percentage of body fat	36.70±6.45	36.58±6.53	-0.1115±3.0780	-0.427	P<0.05

The score of Lymph-ICF-LL

Project	Before treatment	After treatment	Difference	t	p
General symptom	22.92±8.83	13.52±5.67	-9.40±5.25	-21.12	P<0.05
Psychological symptom	28.47±12.77	18.11±8.80	-10.36±6.37	-19.18	P<0.05
Activity of daily living	18.63±7.62	12.04±5.68	-6.59±3.77	-20.61	P<0.05
Lower limb function	36.69±17.27	23.88±12.01	-12.81±8.09	-18.68	P<0.05
Work/social life	32.81±13.89	21.60±9.44	-11.20±6.84	-19.32	P<0.05
Total score of Lymph-ICF-LL	139.52±53.69	9.15±33.72	-50.37±25.39	-23.39	P<0.05

Conclusions: CDT can effectively improve the postoperative lower limb lymphedema and improve the quality of life of patients with endometrial cancer. Lymphedema therapists should take appropriate CDT for different stages of lymphedema. In addition, long-term nutritional status monitoring and nutrition management are recommended for patients with endometrial cancer to maintain a healthy weight and body fat percentage.

Keywords: Complete Decongestive Therapy, Fluoroscopy Guided Manual Lymph Drainage, Lower Limb Lymphedema, Endometrial Cancer

References

Author Note: This paper is a summary of the experience in the treatment of patients with lymphedema after endometrial cancer surgery in our hospital's lymphedema Rehabilitation Center

OP-081

A new accurate and reproducible methodology to standardize limb circumferences and volume in lymphedema

Joseph N. HARFOUCHE[1], MAXIME LOUYS[3], Maxime MATHIEU[3], Sarah HARNIE[2], Nele ADRIAENSSENS[2]

[1]Oncology & Angiology Rehab. Department, CHIREC Delta Hospital, Brussels, BELGIUM
[2]Medical Oncology Department, UZ Brussel, Brussels, Belgium, and Rehabilitation Research, Vrije Universiteit Brussel, Brussels (Belgium)
[3]Belgian Society of Lymphology, Young Lymphologists Group (Belgium)

Objectives: Precise measurements of the volume and/or circumference of a limb are essential in different pathologies (Lymphedema, lipedema, …) to ensure good medical follow-up of the patient. The aim of this new methodology (Harfouche) is to help standardizing the measurements and ease the measurement acquisition (inter assessors), by giving 2 steady landmarks (the “Reference Point” (RP) and the “Confirmation Point” (CP)).

Background: There are many different methods of measuring volume and circumference, each with its own specificities, but none of them being at the same time accurate, repeatable, reproducible, transportable, practical and easy to be used.

Methods: 57 healthy subjects took part in this study. This choice prevents the bias of edema variability. Any change in the measurements is considered as an inaccuracy. The circumference measurements were taken by the PeriKit on the upper limb. each 4 cm starting from the wrist joint as This new methodology is based on 2 points: “Reference point” on a bony steady landmark (styloide) and a “Confirmation point” That is specific and can caracterise each limb (Mole, scar, tatoo,…). The measurements were retaken independently by 2 assessors with the PeriKit. The PeriBase consisted of a graduated tapeline, installed longitudinally on the limb in order to: prevent marking the skin with the ink at the landmarks - thanks to the aperture at each cm, the measurements are taken during the whole procedure exactly at the precise distance. The measurements are taken with the PeriTape, equipped with an isotonic spiral to decrease the bias of the variable tension The measurements are downloaded in the app, displaying the measurements, comparing them, and calculating the volume simultaneously.

PeriKit: Taking Measurements with the PeriTape (blue) when the PeriBase (white) insures the reproducibility of the exact place

Results: The results showed that, concerning the CLM, the interclass correlation (ICC) was 0.99 . The Bland and Altman test confirmed the reproducibility of the concept. Concerning the reference points taking/retaking, differences were less than 2mm between the first and the second assessor.

Conclusions: This Methodology shows high accuracy in retaking the bony landmark RP, that can be exactly at the same place confirmed by the CP. and the mean difference between the assessors was less than 2 mm. It solved the classic error of inaccuracy accumulations between each landmark and the following one. High reproducibility : 96% of the measurements showed a difference between 0 and 0.5 cm. The Perikit can ease the measurements of the hand and the fingers. The PeriKit meets the requirements to standardize the measurements taking.

Keywords: Volume Measurements, Circumferential Measurements, PeriKit

OP-082

IPC effect on edema fluid movement and creation of new roots of fluid drainage -evaluation on ICG lymphography.

Marzanna Zaleska[1], Marzanna Zaleska[2], Natalia Krzesniak[3]

[1]Medical Research Institute, Dept. of Applied Physiology, Polish Academy of Sciences, Warsaw, Poland
[2]National Medical Institute of the Ministry of Interior and Administration, Warsaw, Poland
[3]Department of Plastic and Reconstructive Surgery, Centre of Postgraduate Medical Education, Warsaw, Poland.

Objectives: To evaluate the effect of Intermittent Pneumatic Compression on edema fluid movement and creating new roots for fluid drainage under ICG lymphography.

Background: Lymphedema of the upper limb is the most common complication in patients after breast cancer therapy (mastectomy, lymphadenectomy, radiation). The conservative treatment consists mainly of compression therapy, bandaging, compression sleeves, and MLD and IPC. Compression therapy aims to evacuate edema fluid from the distal parts of the limbs and create new roots for fluid flow. MLD is primarily applicable when LVs still exist and contract. In advanced lymphedema, IPC is the most useful for moving edema fluid along the tissues.

Methods: The studies included twenty-five patients with upper limb lymphedema after mastectomy in stages II-III. All patients undergo ICG lymphography (Photodynamic Eye; Hamamatsu Photonics). Observation and video recording were done immediately after ICG injection (Pulsion, Munich, Germany) into interdigital spaces, one hour after squeezing the ball, and after 45 min of IPC. We analyzed the areas and patterns of dermal backflow, edema fluid movement (dislocation) under IPC, fluorescent intensity along the entire limb (ICcalc, Pulsion Medical Systems, Munich), and the presence of new roots for fluid flow before and after IPC.Additionally, circumferential measurement, skin water concentration (LympScanner; Delfin Technologies Ltd.), skin (SkinFibrometer Delfin Technologies Ltd.), and subcutaneous tissue stiffness (Wagner, Seattle, WA) were measured before and after IPC.

Results: On ICG, we observed fluid accumulation in the hands in 79% of patients, in the forearms in 92%, and in some parts of the arms in 88 % of patients. We observed dilated lymphatic vessels or their fragments in some patients. After IPC, we observed the movement of edema fluid to the limb's upper parts in most patients. Fluorescent intensity decreased in the hands and forearms, increased in the upper parts of the arms in 63% of patients, and decreased along the entire limb in 37% of patients. In 6 patients (24%) after IPC, we observed lymphatic vessels and supraclavicular nodes, which had not been seen before. All other measured parameters decreased after IPC.

Conclusions: Intermittent Pneumatic Compression effectively moves edema fluid from the distal to the proximal part of the limbs. Movement of fluid can be observed and analyzed semi-quantitatively on ICG. In some patients, IPC can support (force) the lymph flow to existing, additional roots. Compression should be applied even in the early stages of lymphedema in the upper limbs.

Keywords: upper limb lymphedema, edema fluid movement, compression therapy, Intermittent pneumatic compression

OP-083

The chronic effects of Dragon Boat paddling on Bioelectrical Impedance Vector applied to body composition evaluation of Breast Cancer Survivors

Elodie Stasi[1], Savino Sciascia[1], Dario Roccatello[1]

[1]CMID Coordinating Center of the Interregional Network for Rare Diseases of Piedmont and Aosta Valley San Giovanni Bosco Hub Hospital, and Department of Clinical and Biological Sciences of the University of Turin, Turin, Italy

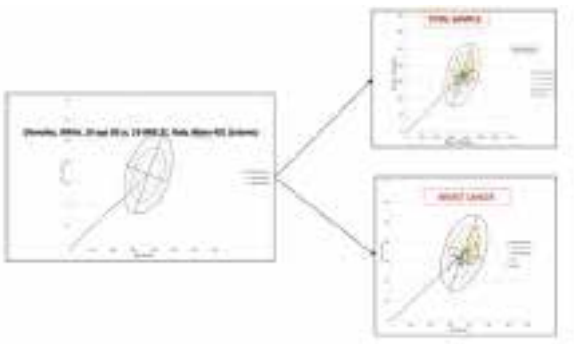
Objectives: To investigate the long-term training effects on body composition in Breast Cancer Related Lymphedema paddlers. This study specifically concentrated on examining changes in extracellular fluid, muscle mass, and LST measurements.

Background: Dragon boating is the most popular team sport among breast cancer patients. Several studies have shown that it has no impact on lymphoedema, stimulates the production of anti-inflammatory agents in the blood, improves cardiac function and quality of life. With proper rowing technique, the athlete can gain a significant amount of muscle mass and improve the function of the lymphatic system due to the effect of the muscle pump. However, the chronic effects of this type of training on Fat Free Mass have not yet been investigated. The analysis of body composition using bioimpendeziometric technique can be a valuable tool for monitoring the acute and chronic effects of training and tailoring the correct dosage of exercise.

Methods: 37 breast cancer patients (12 with lymphedema and 18 at risk of lymphedema) and 18 healthy subject as controls were assessed. Bioimpedance analysis was performed using a single frequency BIA (50 kHz) device. Row data and body composition estimates were acquired and analyzed.The raw bioelectrical data were processed by the Bioelectrical Impedance Vector Analysis and RXc Graph method for comparing the tolerance ellipses and vectors of the study populations and of individual subjects compared to reference populations.

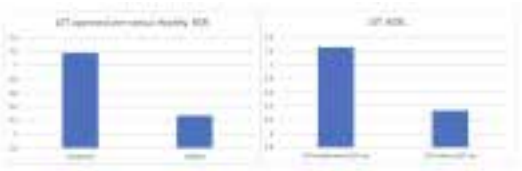
Results: The estimates of the sarcopenia indices of the study group are comparable to those of the control group (BC 7 kg/m2; Control 6.8 kg/m2), Resistance and Reactance are lower for the BCRL group (P<0.05); By analyzing the body composition of the upper limbs in lymphedema subgroup compared to the control subgroup (BC), the differences in the R/H and Xc/H appear significantly lower in BCRL (R/H p > 0.01; Xc/H p>0.01) Inversely, the amount of Lean Soft Tissue was significantly higher in the BCRL group (p>0.01) and remains significant when compared with the healthy contralateral limb of the same subjects (p>0.01) with lymphedema

Vector Analysis with the RXc Graph method



the Tolerance Ellipse of the Italian reference population (Females, White, 16 age 85 yr, 16 BMI 31, Italy, Akern-RJL Systems), available on both software programs that were used, placed all examined subjects within the 50% and 75% tolerance ellipses

Lean Soft Tissue



The amount of Lean Soft Tissue was significantly higher in the BCRL group

Conclusions: Body composition estimates in Breast Cancer patients engaged in dragon boating are comparable to the healthy control group.Lymphoedema appears to have no effect on muscle mass and strength. BIA is a useful tool not only for prevention, but also for monitoring localised extracellular fluids in lymphoedema at any stage. Estimation of LST seems to be a promising and complementary quantitative and qualitative lymphoedema assessment parameter for upper limb lymphedema assessment

Keywords: breast cancer Lymphedema exercice body composition

OP-084

Influence of physiotherapeutic factors on volumetric flow rate of fluid delivery during lymphotropic therapy

Fahed alzawahreh[1], Hung Vu Duy[1], Vyacheslav Milov[1]

[1]People's Friendship University of Russia

Objectives: Volumetric flow rate during lymphotropically fluid delivery (vfrFD) in the hip joint region and interspinous ligaments at the level of C6-7 were calculated.

Background: Research showed the ability of function management of lymphatic system.

Methods: 6.0 and 9.6 ml/hour volumetric flow rates of syringe pump (vfrSP) were used in 3 patients aged 20, 45 and 46 years, without and with vibroacoustic therapy and massage. 10.0 ml of normal saline with Chondrolone liophylisate (50 μg) was administered. VfrFD was calculated every 5 minutes.

Results: Only one vfrFD peak in hip joint region, 0.24 ml/min by 65 minute, was observed in 46-year-old patient when vfrSP was 9.6 ml/hour. Time period from 20 to 60 minutes showed a plateau with 0.16 ml/min. At lower vfrSP, 6 ml/h, two peaks in 15th and 75th minutes were found (0.12 and 0.17 ml/min, respectively). Within 30 minutes before the second peak, a plateau formed with 0.12 ml/min. All 5 minute-points of vfrFD were less than those at 9.6 ml/hour. Analysis of vfrFD in hip joint region at 6 ml/hour vfrSP in 20-year-old patient revealed an earlier time second peak and it 1.5 times exceeded (40 minutes and 0.24 ml/min) the same index in 46-year-old patient. The plateau before the second peak was short and amounted to 10 min, and 30 minutes between peaks. Thus, similar qualitative regularities were observed in 46 and 20-year-old patients. However, vfrFD of second peak at 6 ml/h vfrSP exceeded 1.5 times the same time point corresponding to higher vfrSP (9.6 ml/h) (0.24 and 0.19 ml/min, respectively). In 45-year-old patient (interspinous ligaments) at 6 ml/hour vfrSP without physiotherapeutic factors, two vfrFD peak were revealed (0.15 ml/min and 0.16 ml/min), but with a short time interval between them, at 55th and 65th minutes. Further, vfrFD levelled off at 0.10 ml/min. After manual massage of the collar zone lymphotropically injected fluid performed single peak by 35th minute, 0.18 ml/min, which was 1.2 times higher than that of without massage. Further, vfrFD didn't exceed 0.12 ml/min.Vibroacoustic exposure showed two peaks, in 35th and 70th minutes (0.22 and 0.15 ml/min, respectively). Further, vfrFD was 0.12 ml/min.

Conclusions: Lymphotropically administration of additional fluid volume into interstitium leads to functional activity increase of lymphatic system (vfrFD increase), especially in younger patient. Massage or vibroacoustic exposure contribute to further increase in the reserve capacity of the lymphatic system.

Keywords: lymphotropic therapy, volumetric rate, physiotherapeutic factors

OP-085

"Lymphangiosarcoma, A Rare Complication Of Lymphostasis: The Role Of The Physiotherapist In Early Recognition And Medical Referral. An Observational Survey Of Physiotherapists"

Alberto Macciò[1], Silvia Caruso[2], Chiara Palmero[3], Matteo Quattro[2], Lisa Biava[2], Tiziana Galli[2]

[1]Humanitas Medical Care & Gavazzeni- Bergamo
[2]LymphoLAB
[3]Fisiomed - Sanremo

Objectives: The aim of this study is to investigate, through a questionnaire, the skills of Physiotherapists, who deal with lymphology in their clinical practice, in recognizing suspicious dermal lesions in patients with lymphedema, in particular the dermal manifestations of lymphangiosarcoma.

Background: Lymphangiosarcoma represents a rare form of Angiosarcoma. First described in 1948 by Stewart and Treves, it is a malignant tumor and the 5-year survival rate after diagnosis is only 22.4%. It mainly develops in limbs affected by chronic lymphedema and it presents with dermal lesions in the affected area/limb. To increase the chances of survival, early detection of lymphangiosarcoma and timely beginning of treatments are critical.

Methods: A self-reported and self-compiled online questionnaire was developed using the "Google Forms" application. It is composed of 11 questions regarding academic training, practical experience, frequency of lymphatic treatments, ability to recognize suspicious dermal lesions, frequency of referral to a Specialist and opinion regarding the need for more specific training. The questionnaire was submitted to physiotherapists who deal with the management of lymphedema in their clinical practice and carry out their activity in Italy. The disclosure took place from 9 February to 30 March 2024 via email and social channels.

Results: The data collection has already involved 148 physiotherapists, and the number is further increasing. From the current data, it appears that 69.6% of those interviewed have attended lectures on dermal lesions in post-university specialization courses. Despite this, 59.5% declare that they would not be able to recognize lymphangiosarcoma, 28.4% have never seen one, and only 12.2% confirm having already seen at least one case. Additionally, 72.3% of physiotherapists believe it is "absolutely necessary" to provide specific training on skin/dermis lesions in patients with lymphedema at the university or post-university level.

Conclusions: Lymphagiosarcoma represents a rare complication of chronic lymphostasis but given its complexity, the prognosis is often poor. It is necessary that physiotherapists who deal with lymphological conditions receive adequate specific training. In fact, during rehabilitation sessions with patients, they could identify signs and symptoms of this pathology early. The data collected from this survey highlights the need for greater awareness and training regarding this pathology.

Keywords: Lymphangiosarcoma, Stewart-Treves syndrome, Chronic Lymphedema, Lymphangitis

OP-086

Incidence of cancer-related lymphedema: a protocol and the conduct of a living systematic review with meta-analysis

Melanie Louise Plinsinga[1], Ben Singh[2], Sandra Christine Hayes[1], SANDI HAYES[3]

[1]Menzies Health Institute Queensland, Griffith University, Nathan, QLD, Australia
[2]Allied Health and Human Performance, Alliance for Research in Exercise, Nutrition and Activity, University of South Australia, Adelaide, Australia
[3]Cancer Council Queensland, Queensland, Australia

Objectives: To describe the protocol and conduct a living systematic review with meta-analysis that provides the most up-to-date estimate of the incidence of cancer-related lymphedema. It is also an objective to use the collected data to evaluate the strength and consistency of the association between lymphedema and treatment and non-treatment-related risk factors.

Background: With a projected increase in the incidence of cancer treatment-related conditions such as lymphedema, alongside a lack of lymphedema research beyond good prognostic cancers, a more comprehensive understanding of cancer-related lymphedema incidence and associated risk factors across all cancers is warranted.

Methods: A systematic and grey literature search will be conducted to identify studies reporting the incidence, prevalence of lymphedema or associated risk factors in individuals who have undergone treatment for any type of cancer. Two investigators will independently extract data and assess risk of bias using the Cochrane Risk of Bias Tool Version 2.0, the Risk Of Bias in Non-randomised Studies – of Interventions (ROBINS-I), or the National Institutes of Health (NIH) Heart, Lung, and Blood Institute (NHLBI) Study Quality Assessment Tools, depending on study design. Overall strength of evidence will be appraised with the Grading of Recommendations, Assessment, Development and Evaluations tool. Random effect models will be used to produce pooled overall lymphedema incidence estimates. Subgroup analyses that explores relationships between lymphedema incidence and lymphedema measurement method, time since cancer diagnosis and treatment, and diagnosis, treatment and behavioural characteristics will be conducted dependent on available data.

Results: This living systematic review with meta-analysis is registered on PROSPERO (PROSPERO registration number: CRD42022333291), and the protocol paper has been submitted for peer-review. Screening will commence February 2024. Preliminary results will be available for presentation at the ESL conference.

Conclusions: This living systematic review enables clinicians and researchers to consult a contemporary, comprehensive overview of the incidence of cancer-related lymphedema, and the association between lymphedema and other treatment and non-treatment-related risk factors.

Keywords: Oncology, lymphoedema, edema, cancer

OP-087

Lower limb lymphoedema and quality of life.

Fabio Romaldini[1], Daniela Vaglio[1], Serena MMichelini[2], Elodie Stasi[3], Sandro Michelini[2], Marco Monticone[4]

[1]San Giuseppe Hospital Marino ASL Roma6
[2]San Giovanni Battista Hospital Rome Italy
[3]CMID Torino Italy
[4]Cagliari University Cagliari Italy

Objectives: Italian validation LymQOL-LL scale to measure Qol in patient with lower limb lymphoedema

Background: The measurement of disability induced by lower extremity lymphedema has always been a difficulty for health care providers since common disability scales are usually aimed at patients with neurological or peripheral diseases. For these reasons, AA is conducting this preliminary study which, by administering the items to patients aims to validate the LymQol-LL.

Methods: The validation has been set up in accordance with the international guidelines on the subject and is following the following pathway:- 2 Separate translations of the text from the original language (English) into Italian- A synthesis of the two translations closest to the specific meaning in the original language was made- Reformulation of the final text in english language (back translation)- Review of the document by the Committee of experts (Surgeon, Physiotherapist, Angiologist, Internist, the translators and an expert in the philosophy of language)- 120 patients, subject to informed consent, aged between 18 and 66 years, with primary or secondary lymphoedema of the lower limbs (mono or bilateral), in stages 1, 2 and 3 are studying; the test include: SF36 and LymQol-LL at times: zero (T0) and after one week (T1). The quality of life aspects investigated by LymQol are: function, body image, symptoms and mood.

Results: In the first preliminary study, which is still being completed, there is evidence of easy comprehension of the proposed items, quick administration time, repetitiveness of the test, and a tendency to externalize emerging problems caused by the disease

Conclusions: The importance of the study, which it's desiderable to be conducted in many other countries, is to have a reliable knowledge of the altered quality of life in patients with primary and secondary lymphoedema in order to better quantify their care needs, depending on the specific data that emerged on the individual aspects investigated, by national public and private healthcare systems.

Keywords: Lower Limb lymphoedema quality of life

OP-088

Advantages and safety of a low-carbohydrate, high-fat (LCHF) diet in the reduction of body weight, leg volume, adipose tissue pain, and laboratory parameters in both short and long-term periods among women with lipedema

Małgorzata Jeziorek[1], Angelika Chachaj[1], Monika Sowicz[1], Agnieszka Adaszyńska[1], Andrzej Szuba[1]

[1]Wroclaw Medical University

Objectives: The impact of a low-carbohydrate high-fat (LCHF) diet on body weight, leg volume, pain level, and laboratory parameters in women with lipedema over a 7-month period. The safety and challenges associated with adherence to the 3-year of LCHF diet in lipedema.

Background: Limiting carbohydrate intake through dietary interventions is a viable approach for addressing lipedema, and it has associated benefits, including weight reduction and decreased pain.

Methods: A group of 113 female (lipedema - 56; overweight/obesity – 57 -control group) were recruited from the Angiology Outpatient Clinic. Participants received personalized, caloric-restricted diets with specific nutritional compositions. Body weight, leg volume, adipose tissue pain intensity, and laboratory parameters were assessed at baseline, after 7 months, and after 3-years. The 52 females completed the 7 months of the study (lipedema - 28, overweight/obesity - 24). After 3 years, we contacted 28 lipedema patients. Twenty women had completely discontinued their diet, while the remaining eight expressed a willingness to undergo follow-up measurements. However, only three of them continued to strictly adhere to the LCHF diet throughout this period. The remaining five introduced small amounts of carbohydrates into their diet, resulting in an increased energy value.

Results: The majority (82.1%) of lipedema patients were overweight/obese at baseline. The most frequent was stage 2 (50%), and type 3 (67.9%) of lipedema. After 7 months of LCHF diet, a significant reduction in body weight was observed: -10.8 kg (6.4,14.5) in lipedema and -11.9 kg (10.5,13.8) in overweight/obesity (p=0.14). A significant decrease in leg volume and pain intensity was observed. The glucose profile, liver function, triglycerides, and HDL-C improved, with no effect on kidney and thyroid function. After 3 years, participants who strictly adhered to the diet showed no change in body weight (79.4 ± 7.2 kg vs 79.0 ± 7.2 kg) and a decrease in pain level (3.0 ± 1.7 vs 5.7 ± 1.5) compared to the measurements taken at 7 months. In the remaining 5 patients, there was an increase in mean body weight (85.3 ± 9.6 kg vs 80.6 ± 10.8 kg) compared to the measurements taken at 7 months.

Conclusions: LCHF diet could be a valuable and relatively safe nutritional approach for lipedema patients, providing positive effects on body weight, and pain reduction. The findings also highlight the potential of the LCHF diet as a long-term strategy for lipedema treatment, however there is a big challenge of sustaining adherence among a considerable number of patients with lipedema.

Keywords: lipedema, low-carbohydrate high-fat (LCHF) diet, body weight reduction, pain reduction

OP-089

Lower Leg Liposuction, Is it worth being scared?

Resat Aktas[1]

[1]Dr Resat Aktas Aesthetic Surgery Clinic

Objectives: One of the most hesitated part of the body for liposuction is lower legs. For minimising the complications, liposuction under tourniquet is one of the safest way to perform liposuction. In my cases I have never experienced complications related to big vein injuries with less than %4 skin irregularities.

Background: Lipedema is an underestimated disease and for years it has been misdiagnosed as obesity. However many of these patients would not lose weight and have to live with heavy legs. The most important reason that plastic surgeons do not want to perform liposuction to lower legs are first they don't trust themselves (lack of experience) second possible complications due to lack of experience. It is absolutely true that lower leg liposuction needs experience but it does not mean that it is impossible. What you need to know is doing the surgery in the right technique.

Methods: 166 patients have been operated since 01/08/2016. All patients were operated with liposuction under tourniquet. First 65 patients have been operated with superdry technique. Due to some problems of dry technique, I changed the technique to wet technique and remaining 101 patients have been operated with wet liposuction under tourniquet. 3 patients who were suffering stage 3 lipedema, have been treated with liposuction and Argo plasma to improve their skin elasticity. Apart from these 3 patients any of the patients have been treated with energy based liposuction devices. 46 patients had fat grafting to the depressed areas at the end of the operation.

Results: There was not any patient had fat embolism or any related big vein complications. Most of the patients had temporary skin sensation problems. Sensation problem continued around 3-4 months. The most common early post complication which needs intervention is seroma. 18 patients suffered seroma complication. Seroma mostly has been seen at high volume liposuction patients (>1.5 lt). 16 patients had minor skin irregularity problems. 1 patient had relapse and operated one more time. 1 patient who was living abroad suffered pyoderma gangrenosum and she has been treated and operated at a local hospital where she lives.

immediate result

long term result

Number of Complications

Seroma	18
Skin irregularity	16
Asymmetry	11
Hyperpigmantation	9
Skin necrosis	1
Infection	0
Fat embolism	0
Thromboembolism	0
Total complicated patients	43

Conclusions: Lipedema is a very common disease among women and lower leg is the second most effected part of the body after thighs. Many plastic surgeons would probably hesitate to operate lower legs due to its possible complications. With low complication rates liposuction under tourniquet is a safe method to have satisfactory results.

Keywords: lipedema, liposuction under tourniquet

OP-090

Does Digital Physiotherapy Demonstrate Effectiveness in Both Short and Long-Term Management of Lower Extremity Lymphedema?

Alis Kostanoğlu[1], Gökhan Can Törpü[2], Selva Otsay[2]

[1]Bezmialem Vakıf University, Faculty of Health Sciences, Department of Physiotherapy and Rehabilitation
[2]Bezmialem Vakıf University, Institute of Health Sciences, Department of Cardiopulmonary Physiotherapy and Rehabilitation, İstanbul

Objectives: The objective of this study is to demonstrate the applicability of digital physiotherapy in treating unilateral and bilateral lower extremity lymphedema (LEL). The study aimed to examine the effect of digital physiotherapy on extremity volumes in patients with lower extremity lymphedema after a 4-week treatment and a 12-week follow-up.

Background: Lower extremity lymphedema may arise as either a primary or secondary condition. Combined decongestive therapy is the gold standard treatment for lymphedema, known for its effectiveness in both short and long-terms. Digital physiotherapy for lymphedema patients is a modified form of combined decongestive therapy with the help of technology. Digital physiotherapy represents a modern approach that can promote treatment adherence and consistency.

Methods: The study included patients with unilateral and bilateral lower extremity lymphedema who were admitted to the outpatient clinic. The circumferences of the extremities were measured from the first metatarsophalangeal joint to the proximal with 4-cm intervals for each. Circumference measurements were taken pre-treatment (V0), post-treatment (V1), and follow-up (V2). During the initial session, which was conducted face-to-face, patients received basic introduction to skin care and risk reduction training. A trained physiotherapist demonstrated the self-bandaging and self-manual lymphatic drainage techniques while the caregiver videotaped it. Patients learned gluteal sets, knee sets, toe flexion-extension and breathing exercises and received booklets with instructions. After the first session, treatment was provided remotely for 4-weeks using digital telecommunication technologies. After 4-weeks of treatment, self-bandaging was replaced by compression stocking and patients were followed for 12-weeks.

Results: The study involved 82 (n=129 legs) patients with lower extremity lymphedema, with a mean age of 56.53±18.36 years (63 female/19 male, 47 bilateral/35 unilateral LEL, 37 primary/45 secondary LEL). The mean extremity volume of the patients in the pre-treatment evaluation was 5027.71±1826.05 mL. After 4-weeks of digital physiotherapy, mean extremity volume of the patients was 4682.31±1746.05 mL. Digital physiotherapy showed significant positive changes in lower extremity lymphedema patients (V0-V1=345.40±762.03 mL; $p<0.001$). The mean extremity volume at 12-week follow-up was 4310.52±1380.24 mL. In the long-term, digital physiotherapy continued to demonstrate significant positive effects in patients with lower extremity lymphedema (V1-V2=371.79±648.66 mL; $p<0.001$).

Conclusions: Our study found that the application of combined decongestive therapy as a digital physiotherapy method was effective for extremity volume reduction in lower extremity lymphedema patients. This approach has demonstrated both short-term and long-term efficacy for patients with lower extremity lymphedema. Therefore, digital physiotherapy offers lower extremity lymphedema patients an alternative method to combined decongestive therapy.

Keywords: lower extremity lymphedema, combined decongestive therapy, digital physiotherapy, self-management

OP-091

Is The Pain In Lipedema A Neuropathic Pain?

İzel Topaloğlu[1], Ebru Şahin[1], Nihan Erdinç Gündüz[1], Banu Dilek[1], Hülya Ellidokuz[2], Elif Akalın[1]

[1]Dokuz Eylul University, Faculty of Medicine, Department of Physical Medicine and Rehabilitation, Izmir, Turkey
[2]Dokuz Eylul University, Faculty of Medicine, Department of Biostatistics and Medical Informatics, Izmir, Turkey

Objectives: The aim of this study is to investigate whether the pain in lipedema has the character of neuropathic pain and to evaluate the effects of lipedema on patients' quality of life and psychosocial status.

Background: Pain is a common symptom among patients with lipedema. The mechanism of pain in lipedema is uncertain. The unclear nature of the pain adversely affects the diagnosis and treatment process. There is a lack of studies in the literature investigating whether the pain in lipedema patients is nociceptive or neuropathic.

Methods: The study included 43 patients diagnosed with lipedema and complaining of pain who applied to the Physical Medicine and Rehabilitation Outpatient Clinic, as well as a control group consisting of 42 patients diagnosed with acute subacromial impingement syndrome (SIS) and experiencing shoulder pain for less than 3 months as a nociceptive pain model. Patients' pain characteristics were assessed using the LANSS Pain Scale and the PainDETECT Pain Questionnaire. Quality of life was evaluated using the Nottingham Health Profile. The presence of depression and anxiety was assessed using the Hospital Anxiety and Depression Scale questionnaires. Data were evaluated comparatively between the lipedema and control SIS groups.

Results: 65.1% of lipedema patients were type 3 lipedema. 69.8% of patients were classified as Stage 2. There was no statistically significant difference between the groups in terms of age, height, education level, occupation, or presence of comorbidities ($p>0.05$). The mean BMI was statistically significantly higher in the lipedema group compared to the SIS group ($p=0.03$). According to the LANSS Pain Scale and PainDETECT Pain Questionnaire, prevalance of neuropathic pain in the lipedema group was significantly higher($p<0.001$). Also, in the lipedema group, LANSS and PainDETECT scores were found to be statistically significantly higher compared to the SIS group ($p<0.001$).No correlation was present among the LANSS and PainDETECT with the duration of sypmtoms and the lipedema stage ($p>0.05$). Nottingham Health Profile scores were significantly higher in the lipedema group, indicating lower quality of life compared to the SIS group ($p<0.001$). There was no statistically significant difference in the presence of anxiety and depression between the groups ($p>0.05$).

Conclusions: These findings suggest that neuropathic pain may be present in patients with lipedema, highlighting the importance of accurately identifying pain to improve quality of life and psychosocial well-being, as well as to facilitate diagnosis and treatment processes. Further studies are warranted to confirm these findings and explore potential therapeutic interventions for neuropathic pain in lipedema patients.

Keywords: Lipedema, Neuropathic Pain, Acute Subacromial Impingement Syndrome

OP-092

THE EFFECT OF EARLY REHABILITATION ON SUBDERMAL FLUID LEVEL AND QUALITY OF LIFE AFTER BREAST CANCER SURGERY

Atiye KAŞ ÖZDEMİR[1], Orçin TELLİ ATALAY[3], Sozdar SÖĞÜT TEKİN[2], Sevda YILMAZ[4]

[1]Pamukkale University Sarayköy Vocational School
[2]Pamukkale University Enstitute of Health Sciences
[3]Pamukkale University Faculty of Physical Therapy and Rehabilitation
[4]Pamukkale University Faculty of Medicine

Objectives: This study aims to investigate the effects of rehabilitation on subdermal fluid level and quality of life in individuals undergoing early rehabilitation after breast cancer surgery.

Background: Participants Twenty-one individuals aged between 30-65 years, diagnosed with stage 1-2-3 breast cancer, with at least basic literacy, stable clinical condition, good cooperation, directed by the relevant surgeon, having no contraindications for early postoperative physiotherapy, and no additional diseases affecting their physical and psychosocial functions were included in the study.

Methods: Interventions: Participants were informed by a physiotherapist preoperatively, and a brochure was provided. An exercise program under physiotherapist supervision was initiated from the first day postoperatively during the hospital stay. After discharge, exercises were continued as a home program. Follow-up calls were made every two weeks to monitor exercises, adherence to the program, and continuity. Assessment: Data were collected at preoperative (T1), postoperative discharge (T2), and 3 months after surgery (T3). Tissue dielectric constant (TDC) measurements, assisting in the early diagnosis of lymphedema, were determined by using the Moisture Meter-D compact device. Quality of life was assessed using the Functional Assessment of Cancer Therapy-Breast (FACT-B) questionnaire.

Results: There was a significant difference in subdermal fluid volume measured by TDC between postoperative and 3 months after surgery in the forearm (p=0.026). Significant differences were found in measurements at the biceps level between preoperative and 3 months after surgery and between postoperative and 3 months after surgery (p=0.000). At the thorax level, significant differences were found between preoperative and postoperative measurements and between postoperative and 3 months after surgery (p=0.000).Significant differences were found in FACT-B total scores among the three measurements, particularly between preoperative and 3 months after surgery (p=0.008) (p<0.05). In the social well-being subscale of FACT-B, significant differences were found between preoperative and 3 months after surgery (p=0.001). Emotional well-being showed significant differences between preoperative and postoperative measurements (p=0.01). Functional well-being showed significant differences between preoperative and 3 months after surgery (p=0.006).Four individuals with TDC ratios ≥1.20 were diagnosed with lymphedema at 3 months after surgery.

TDC measurements

Physical functions

Group 1

Volume of operated limb

T1

2337.43 ± 475.23

T2

2356.43 ± 463.93

T3

2448.52 ± 504.14

Within-group effects

0.000* (fr=19.108) (T1-T3, T2-T3)

Volume of non-operated limb

T1

2350.52 ± 460.78

T2

2340.48 ± 450.75

T3

2427.67 ± 494.28

Within-group effects p-value

0.002* (fr=12.602) (T1-T3, T2-T3)

Volume difference between limbs (operated limb volume- unaffected limb volume)

T1

-13.1 ± 80.44

T2

15.95 ± 100.81

T3

20.86 ± 97.94

Within-group effects

0.097 (F=2.469)

Percentage of volume difference (%)

T1

2.88 ± 2.34

T2

3.85 ± 3.31

T3

3.69 ± 2.4

Within-group effects

0.295 (F=1.26)

Local tissue water value of operated limb of forearm (%)

T1

36.81 ± 4.9

T2

38.19 ± 5.18

T3

35.9 ± 4.43

Within-group effects

0.023* (F=4.158) (T2-T3)

Local tissue water value of operated limb of biceps (%)

T1

37.9 ± 4.07

T2

38.24 ± 4.31

T3

35.33 ± 3.54

Within-group effects

0.000* (F=12.069) (T1-T3, T2-T3)

Local tissue water value of operated limb of thorax (%)

T1

39.38 ± 5.3

T2

49 ± 7.2

T3

41.29 ± 5.72

Within-group effects

0.000* (fr=22.462) (T1-T2, T2-T3)

Local tissue water value of non-operated limb of forearm (%)

T1

38.05 ± 4.26

T2

39.33 ± 4.77

T3

35.71 ± 4.46

Within-group effects

0.000* (F=17.173) (T1-T3, T2-T3)

Local tissue water value of non-operated limb of biceps (%)

T1

37.71 ± 4.68

T2

39.1 ± 4.61

T3

35.9 ± 3.52

Within-group effects

0.000* (F=13.861) (T1-T3, T2-T3)

Local tissue water value of non-operated limb of thorax (%)

T1

40.57 ± 5.15

T2

43.29 ± 5.6

T3

37.71 ± 3.77

Within-group effects

0.000* (F=17.098) (T1-T2, T1-T3, T2-T3)

Interarm local tissue water ratio (T3)

Forearm

0.01 ± 0.09

Biceps

0.98 ± 0.06

Thorax

1.10 ± 0.18

Number of people with local tissue water ratio greater than 1.20 (T3[AKÖ1])

Forearm

1

Biceps

0

Thorax

3

FACT-B Measurements

FACT-B Total

T1

106.86 ± 29.8

T2

105.95 ± 28.74

T3

115.9 ± 22.63

Within-group effects

0.008* (fr=9.732) (T1-T3)

FACT-B Subgroups

Physical Well-Being

T1

-6.95 ± 6.48

T2

-8.19 ± 7.33

T3

-5.38 ± 4.86

Within-group effects

0.051 (F=3.215)

Social/Family Well-Being

T1

20.14 ± 6.15

T2

21.24 ± 6.65

T3

22.71 ± 6.7

Within-group effects

0.001* (F=8.129) (T1-T3)

Emotional Well-Being

T1

-4.62 ± 6.36

T2

-2.33 ± 5.94

T3

-1.76 ± 4.5

Within-group effects

0.010* (fr=9.123) (T1-T2)

Functional Well-Being

T1

20.43 ± 7.81

T2

19.62 ± 6.63

T3

22.86 ± 6.19

Within-group effects

0.006* (fr=10.254) (T2-T3)

Additional Concerns

T1

-4.52 ± 7.47

T2

-5.05 ± 8.62

T3

-3.81 ± 7.48

Within-group effects

0.425 (F=0.874)

Conclusions: The most important finding of this study is the increase in volume indicating the onset of lymphedema or the absence of lymphedema in individuals undergoing early rehabilitation after breast cancer surgery. It is also observed that early rehabilitation leads to an increase in FACT-B scores, indicating an improvement in individuals' quality of life.

Keywords: Lymphedema, tissue dielectric constant, quality of life

OP-093

The co-morbidities in breast cancer related lymphedema

Fikriye Figen Ayhan[1], Lin Ahmad[1], Tara Tekin[2], Ali Bavaghar[2], Azra Tunçer[2], Liman Mal-Lawane[2], Moemen Eldereini[2], Lara Altay[2], İdil Erzengin[2], Rana Yılmaz[2], Muhammed Al-Heyasat[2], Feyza Bilgin[2]

[1]Atılım University School of Medicine, Department of Physical Medicine and Rehabilitation
[2]Atılım University School of Medicine

Objectives: 1. Investigate the impact of comorbidities on the severity and progression of BCRL. 2. Asses the prevalence and types of comorbidities experienced by BCRL patients. 3.

Background: Breast cancer-related lymphedema (BCRL) is a chronic progressive disabling disorder if left untreated. Co-morbidities seen in patients with BCRL are generally underestimated because of the focus on cancer climate, cancer-related treatments, and their side effects. We aim to investigate patients' breast cancer surgeries and management, and their relations with comorbidities in patients with BCRL.

Methods: The retrospective data from the medical record of Enzim HIMS searching ICD code I97.2 (breast cancer-related lymphedema) was extracted as an xlxs file. The prospective data was obtained by phone calls to these patients. To determine the proportion of BCRL patients with comorbidities and the rate of related treatment, one hundred thirty-one patients (mean age 54.56 ±11.15) with BCRL were evaluated in the aspects of their comorbidities. Patients with comorbidity were identified and then investigated to analyze the treatments for comorbidity. The types of surgery were mastectomy (53.4%), tissue expander-silicon implant (12.8%), and breast-conserving surgery (46.6%). Pathologically confirmed unilateral and bilateral (12.2%) cases who underwent breast cancer surgery were included. Chemotherapy (84%) and radiotherapy (75.2%) history for breast cancer were detected. The tendency of the body mass index (BMI) profile was overweight (mean BMI 27.0 ±4.66).

Results: Most of the patients (58%) were admitted to the cancer rehabilitation unit for lymphedema-complete decongestive treatment (CDT). There was a small difference in rehabilitation admissions regarding comorbidities (p=0.04). However, the type of surgery was not different regarding comorbidity (p=0.329). Of the 131 patients, 64.09% had at least one, comorbidity. According to present comorbidities, hypertension (20.0%), coronary artery disease (15.3%), allergy (15.27%), hypothyroidism (9.9%), and diabetes (4.6%) were not uncommon. Cardiovascular comorbidities were the most common co-existed medical diagnosis in this sample. Regarding surgery types, there were negative correlations between breast implants and body mass index (r= - 0.395, p=0.025), and between mastectomy and obesity (r= - 0.485, p=0.005). The diagnosis of Diabetes is associated with age (r= 0.430, p=0.014), aromatase inhibitor usage (r= 0.438, p=0.012), and the diagnosis of hypothyroidism (r= 0.400, p=0.023).

Conclusions: Our findings suggest that patients with BCRL have a high incidence of hypertension. This highlights the importance of paying close attention to the cardiac and metabolic comorbidities that co-existed with BCRL. The effects of CDT on hypertension, diabetes, and allergy should not be ignored before starting CDT.

Keywords: breast cancer, lymphedema, comorbidity, management

OP-094

RELATİONSHİP BETWEEN LYMPHEDEMA, PAİN, MUSCLE STRENGTH, EMOTİONAL STATE, AND KİNESİOPHOBİA İN PATİENTS WİTH OPERABLE BREAST CANCER

Filiz Meryem Sertpoyraz[1], Murat Akyol[2], Elif Umay Altaş[1], Ecem Beytorun[1]

[1]İzmir Bakırçay Unıversty, Medicine Faculty,Department of Physical Therapy and Rehabilitation
[2]İzmir Bakırçay Unıversty, Medicine Faculty, Internal Medicine, Department of Oncology

Objectives: Breast cancer is the most common cancer in women. Kinesiophobia can develop due to breast cancer and its treatments.

Background: Objective: The aim is to evaluate the relationship between lymphedema, pain, muscle strength, emotional state, and kinesiophobia in patients with operable breast cancer.

Methods: Materials and Methods: Demographic data of patients, their surgical history, pain, lymphedema, hand grip strength, depression, and kinesiophobia were evaluated. Lymphedema presence was assessed by arm circumference measurement, hand grip strength by hand dynamometer, emotional state by Beck Depression Scale, and kinesiophobia by Tampa Kinesiophobia Scale.

Results: Results: Forty-one (41) female patients who underwent surgery due to breast cancer were included in the study. The mean age of the patients was 59.85±11.4 years. The demographic and clinical characteristics of the patients are shown in Table 1 and Table 2. All patients had kinesiophobia. The right hand grip strength of the patients was 19.31±6.84, left hand grip strength was 17.03±6.38, kinesiophobia score was 43.30±8.71, and Beck Depression Scale average was 15.88±11.34. There was no relationship found between lymphedema and pain, muscle strength, emotional state, and kinesiophobia (p=0.295, p=0.638, p=0.779). A positive significant relationship was found between kinesiophobia and Beck Depression Scale (p=0.004, r=0.441).

Table 1: Demographic characteristics of patients with operable breast cancer

Occupation	n(%)
Homemaker	30(73.2)
Civil servant	3(7.3)
Retired	8(19.5)
Education	n(%)
None	4(9.8)
Primary school	7(17.1)
Secondary school	23(56.1)
Higher education	7(17.1)
Body Mass Index	n(%)
Normal	15(36.6)
Overweight	22(53.7)
Obese	4(9.8)
Chemotherapy	n(%)
None	14(34.1)
Yes	27(65.9)
Radiotherapy	n(%)
None	6(14.6)
Yes	35(8

Table 2: Clinical Characteristics of Patients with Operable Breast Cancer

Clinical Characteristics	
Lymphedema	
None	30 (76.8)
Present	11 (26.8)
Stage of Lymphedeman (%)	
Stage 1	30 (73.2)
Stage 2	7 (17.1)
Stage 3	3 (7.3)
Stage 4	
Compression Garment Usagen (%)	
Yes	34 (82.0)
No	7 (17.1)
Shoulder Pain	
None	14 (34.1)
Present	27 (65.9)
Shoulder Range of Motion Restriction	
None	32 (78.1)
Present	9 (21.9)

Conclusions: Result: It was observed that kinesiophobia is associated with mood disorders in patients undergoing breast cancer surgery.

Keywords: Breast Cancer, Kinesiophobia, Lymphedema

OP-095

Pre- and postsurgical protocols: how to decrease risks of lymphatic surgery and increase efficacy

Aleksandra Rovnaya[1]

[1]State St Petersburg Medical University

Objectives: Lymphatic surgery(LS) is developing rapidly, as it can give the results conservative treatment cannot achieve, so many surgeons want to perform it and many patients are willing to be treated with it. Unfortunately very rarely during education of new surgeons there is a module that covers what exactly should be done before surgery and what should be done after to improve the results of intervention and decrease the risks of side effects. It can lead to significant decrease in efficacy of LS and increase of adverse effects after.

Background: Aims: to analyze the current existing individual protocols for pre-op and post-op care in scientific literature, to analyze the situation in Russia with pre-op/post-op care in LS, to work out a draft of recommendations for pre-op/post-op care for LVA, LNT and liposuction.

Methods: Systematic literature - PubMed, Medline, Cochrane, ALF, ILF, LE&RN, LSN resources were observed to collect the different approaches in pre-op/post-op care in LS. The data was collected from Russian clinics who are performing LS – pre-op/post-op care, changes in limb before and after surgery (circumference volumetric method), adverse effects after surgery – 5 clinics, 76 patients. Referring to approaches in literature to discuss with the members of the Russian Lymphology Association (RLA) possible pre-op/post-op protocol guidelines.

Results: In literature there is relatively little to no information regarding pre-op/post-op procedures in LS, though there is a major opinion that a patient before LS should be fully decongested (CDT). Skin care and physical exercises are recommended, though there are no details. Regarding compression therapy and MLD the information is controversial or not sufficient. Analysis of Russian clinics showed that only one clinic is following strict pre-op and post op protocols, and the results of surgery are very good with very few slight adverse effects (liposuction protocol of H.Brorson). The rest of the clinics either do not have pre-op/post-op care at all, either it's not correct or sufficient, so very often there are no results after surgery or there are adverse effects (increasing/developing of edema, severe seromas, infections, etc). After RLA meeting we made a draft of the pre-op/post-op protocol guidelines.

Conclusions: Preoperative and postoperative care is very significant in LS, in case of poor care the results of surgery may be lost and risk of side effects increases. There should be a consensus on pre-op/post-op protocol guidelines that new lymphatic surgeons should follow. RLA prepared a draft of such protocol.

Keywords: Lymphatic surgery, Preoperative protocol, Postoperative care, Complications and adverse effects

OP-096

Primary lymphedema of childhood: Treatment results from a tertiary center

Ece Cinar[1], Benil Nesli Ata[2], Sibel Eyigor[1]

[1]Ege University School of Medicine, Dept. of Physical Medicine and Rehabilitation
[2]Izmir City Hospital, Dept. of Phsyical Medicine and Rehabilitation

Objectives: In this study we aimed to assess the effects of Complex Decongestive Therapy (CDT) on pediatric patients.

Background: Primary lymphedema is the most common form of lymphedema presenting in the pediatric age group. Pediatric lymphedema management is a difficult and less well studies area in lymphedema rehabilitation.

Methods: In this retrospective study, we have examined the patient files from the lymphedema treatment unit of our university hospital and recorded patient information and treatment results belonging to pediatric lymphedema subjects that received CDT. files were examined and 30 treatment sessions from 24 patients were included in the study. The main outcome was the volume of lymphedema reduction and secondary outcome was the duration of treatment.

Results: Pre- and post-treatment volume differences were compared only in the unilateral lower extremity lymphedema patients since other patient groups did not contain enough subjects to permit a proper statistical analysis. Excess volume percentage change between pre-and post-treatment volumes was found to be statistically significant ($p<0.05$) and CDT was found to be effective in controlling lymphedema volumes in these patients. Although in upper extremity lymphedema patietns, no statistical analysis was carried out, there was visible clinical improvement in most patients.

Conclusions: Although our numbers were limited, we believe our results will contribute to the current literature, since ours is the first study focusing on the results of CDT in a pediatric population.

Keywords: cancer rehabilitation, complex decongestive therapy, lymphedema, pediatric lymphedema

OP-097

A Comparison of the Efficacy of High-Intensity and Low-Intensity Resistive Exercises Applied to Patients with Upper Extremity Lymphedema

Esra Konur[1]

[1]Biruni University

Objectives: The aim of this study is to compare the efficacy of resistive exercises applied at different intensities in patients with upper extremity lymphedema.

Background: Lymphedema is a condition characterized by the accumulation of protein-rich fluid in the subcutaneous tissue of the affected body regions. Complex Decongestive Physiotherapy (CDP) is considered the gold standard in treatment, and one of the components of CDP is exercise. The literature contains many positive effects of exercise application in lymphedema. One type of these exercises is resistive exercises. To compare the effectiveness of resistive exercises, it is suggested to compare resistive exercises in terms of intensity, volume, and frequency for more effective results in exercise programs.

A Comparison of the Efficacy of High-Intensity and Low-Intensity Resistive Exercises Applied to Patients with Upper Extremity Lymphedema

Methods: Patients aged between 35 and 60 were included in the study. Participants were randomized into two groups: High-Intensity Resistive Exercise (HIRE) Group (n=18), and Low-Intensity Resistive Exercise (LIRE) Group (n=18). Participants received Manual Lymphatic Drainage (MLD) and compression therapy with bandages for 5 days a week for a total of 2 weeks. Resistive exercises were applied two days a week. In the HIRE Group, exercises were performed at 80% of one maximum repetition, and in the LIRE Group, at 30% of maximum repetition, with 2 sets of 8/10 repetitions in the first week, and 3 sets of 8/10 repetitions in the second week. In addition, patients were continued home exercises for 2 weeks, and evaluations were repeated at the end of the 4th week. Data collection tools included; perimeter measurement, lymphedema symptom severities, McGill pain questionnaire, disability of arm, shoulder and hand questionnaire (DASH), lymphedema life impact scale, lymphoedema functioning, disability and health questionnaire (LOICF), jamar hand dynamometer, and pinchmeter.

Results: At the end of the treatment, all measurements in the LIRE and HIRE groups showed significant improvement, except for the lateral finger grip ($p<0.05$). Both our primary measurements, such as arm volume, grip strength, percent change of excess volume; our secondary measurements, including swelling, tightness, and heaviness sensations, upper extremity functional status, quality of life, and finger grip strength, showed improvement in both groups. An increase in grip strength, a decrease in PCEV (%), and a reduction in the sensation of tightness showed more significant improvement in the HIRE group, demonstrating differences between the groups.

Conclusions: Both LIRE and HIRE training led to similar improvements in perimeter measurements, lymphedema symptoms, pain, muscle strength, and quality of life, both methods can be used in the treatment of lymphedema without increasing symptoms.

Keywords: Exercise intensity, Lymphedema, Exercise in Lymphedema

OP-098

Frequency and clinical features of pain in lymphedema

Bilge Kesikburun[1], Zeynep Sena Güneş[1], Meltem Dalyan[1], Pınar Borman[1]

[1]Ankara Bilkent Şehir Hastanesi Fizik Tedavi ve Rehabilitasyon Hastanesi

Objectives: Lower extremity lymphedema is a chronic condition that occurs mostly due to gynecologic malignancies and frequently affects the female population. It is a chronic disease that often requires lifelong treatment and psychosocial support that impairs quality of life in patients. The etiology of pain in patients with lower extremity lymphedema can be categorized under three headings: vascular, neurologic and musculoskeletal causes. The aim of this study was to determine the frequency and etiology of pain in patients with lower extremity lymphedema and to evaluate the effect of pain on quality of life.

Background: The word “lymphedema” describes a progressive and chronic collection of protein-rich lymphatic fluid in the interstitial space due to disruption of the lymph nodes and/or lymphatic vessels. Although lymphedema is not life-threatening, it can have detrimental consequences in terms of pain, functional impairment and reduced quality of life and infections. Pain is known to be a major problem in patients with lymphedema and affects quality of life.

Methods: The study included 38 patients with lower extremity lymphedema. Demographic and clinical information of the patients participating in the study were recorded. The differential diagnosis of lower extremity pain is divided into three categories as vascular, neurologic and musculoskeletal causes through doppler ultrasound, X-ray, MRI and ultrasound. Health-related quality of life was measured with in patients with The Lymphedema Life Impact Scale. The pain was evaluated with VAS and LANSS scores.

Results: Our study included 32 female and 5 male patients. The mean age of the patients was 55.6 years. As a result of the detailed evaluation and recording of the examination findings, 27 patients had lower extremity pain (72.9%), 1 patient had neuropathic pain(2.63%), 8 patients had only vascular pain (21.05%), 10 patients had mechanical pain(26.31%), and 9 patients had combined vascular and mechanical causes (23.68%). The intensity of pain was 6.2 in movement and the mean VAS was 2.1 at rest.According to these results, it was determined that the most common pain in patients with lymphedema was mechanical.

Conclusions: Pain is common in patients with lower extremity lymphedema and impairs quality of life. We suggest that a multidisciplinary approach may be useful in making the diagnosis and initiating the treatment plan.

Keywords: Lymphedema Life Impact Scale, Pain, Lymphedema

OP-099

A Rare Cause Of Lymphedema: Compression of The Vein by Osteophyte Formation

Cevriye Mülkoğlu[1], Çağıl Özer[1], Burcu Duyur Çakıt[1]

[1]Health Sciences University Ankara Training and Research Hospital, Department of Physical Medicine and Rehabilitation

Objectives: Lymphedema is a chronic disease marked by the increased collection of lymphatic fluid in the body, causing swelling, which can lead to skin and tissue changes. Two types of lymphedema exist: primary and secondary. Primary lymphedema can be present at birth (congenital) or develop at the onset of puberty (praecox) or in adulthood (tarda). Secondary lymphedema can be caused by infection, surgeries or radiation treatments and is a common complication of cancer treatments that remove or damage lymph nodes or vessels.

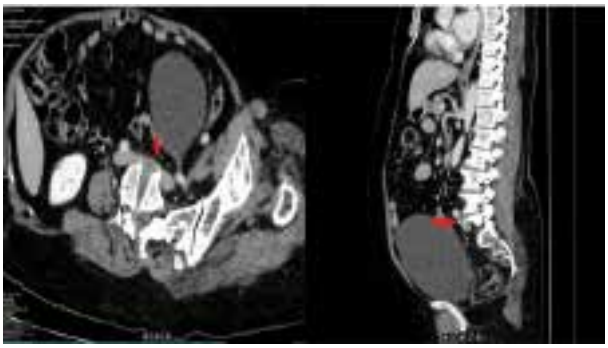
Background: In this article, lymphedema caused by osteophyte formation in a patient without any trauma, malignancy or congenital disorder will be discussed.

Methods: A 78-year-old female patient presented to our clinic with swelling in her left leg that had been present for 15 years (Image 1). The patient had no history of trauma, malignancy, operations or chronic illness. She had no family history of lymphedema. The patient had grade 2 lymphedema and the diameter difference between both lower extremities was 87.2 %. Abdominal CT scan with contrast revealed compression of the vein by osteophyte formation proximal to the level where the left common iliac vein drains into the inferior vena cava and focal dilatation of the vein was observed distal to this level (Image 2).

Image 1

A 78-year-old female presented to our clinic with swelling in her left leg that had been present for 15 years

Image 2



Abdominal CT scan with contrast revealed compression of the vein by osteophyte formation proximal to the level where the left common iliac vein drains into the inferior vena cava and focal dilatation of the vein was observed distal to this level

Results: Fluid exchange across the capillary wall was determined by the balance of hydrostatic and colloid osmotic forces in the capillary and interstitial fluid. In general, the capillary hydrostatic and colloid osmotic pressures are considered to be of primary importance. There is an increase in capillary filtration due to compression of the left iliak vein by osteophyte formation (Venous hypertension) , then lymphatic drainage will increase until it reaches its maximum transport capacity when edema will occur. Edema only occurs when the lymphatic system fails to deal with the increased capillary filtration and, therefore, can be considered as lymphedema. In situations of persistent increased capillary filtration and lymphatic drainage, over time the lymphatics become damaged and flow reduces, resulting in a conventionally understood secondary lymphedema.

Conclusions: Secondary lymphedema can have a number of different causes. We believe that in our patient, the osteophyte formation in the anterior part of the L5 vertebral corpus increased the pressure in the vessel as a result of its contact with the left iliac vein, and as a result, lymphedema occurred.

Keywords: secondary lymphedema, osteophyte

OP-100

The Role Of Inflammation in Lıpedema: Neutrophil Lymphocyte Ratio, Platelet Volume, Platelet Distribution Range

Ayla Cagliyan Turk[1], Ender Erden[1], Pinar Borman[2]

[1]Hitit University Faculty of Medicine, Department of Physical Medicine and Rehabilitation, Çorum
[2]Medipol University Faculty of Medicine, Department of Physical Medicine and Rehabilitation, Ankara

Objectives: In this study, we aimed to examine the neutrophil-lymphocyte ratio, platelet volume and platelet distribution range in order to demonstrate the role of inflammation in lipedema.

Background: Although various distinctive morphological features such as hyperproliferation of fat cells, fibrosis and inflammation have been identified in lipedema progression, the mechanisms underlying these changes are not yet fully known.

Methods: : Our retrospectively designed study included 60 lipedema and 40 healthy controls. Age, height, weight, body mass index (BMI), lipedema type and stage of the patient group were recorded from retrospective records. Additionally, the patients' hemogram results were obtained. The healthy group was selected from hospital staff. Hemoglobin, leukocyte, lymphocyte, neutrophil, platelet, mean platelet volume (MPV), platelet distribution width (PDW), neutrophil lymphocyte ratio (NLR), C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR) of all participants were evaluated.

Results: The mean age was 45.45±10.17 years in Group 1 and 44.90±10.69 years in Group 2, there was no significant difference between the groups (p>0.05). Body mass index was 32.15±5.05 in the patient group and 30.94±4.98 in the control group, which were similar (p>0.05). While Type 2 Lipedema was the most common type, ESR was similar between groups (p>0.05). CRP was 4.97±3.15 in Group 1 and 3.46±0.54 in Group 2, and there was a statistically significant difference between them (p<0.05). While hemoglobin, leukocyte, lymphocyte and neutrophil counts were similar between groups, platelet count was significantly higher in the patient group (p<0.05). NLR was 2.10±0.76 in the patient group and 1.68±0.40 in the control group, and the difference between them was significant (p<0.05). MPV and PDW were similar between groups (p>0.05). A positive correlation was detected between BMI and leukocyte and CRP, and a positive correlation was found between age and leukocyte (p<0.05).

Comparison of demographic and laboratory parameters of patient and control groups

	Lipedma	Control	p value
Year	45.45±10.17	44.90±10.69	0.796
BMI	32.15±5.05	30.94±4.98	0.242
Hemoglobin	13.33±1.03	13.29±1.33	0.941
Leukocyte	7.44±1.79	6.89±1.27	0.098
Monocyte	0.52±0.14	0.48±0.11	0.126
Neutrophil	4.47±0.89	3.89±0.57	0.059
Lymphocyte	2.25±0.57	2.36±0.52	0.327
NLR	2.10±0.76	1.68±0.40	0,002
Platelet	300.52±81.02	266.10±70.61	0.020
MPV	10.59±0.85	10.56±0.79	0.844
PDW	12.34±1.85	12.28±1.21	0.855
25 OH Vit D	18.63±11.04	16.95±8.40	0.673
Vitamin B12	352.59±136.28	370.65±193.64	0.784
ESR	18.62±10.25	17.05±7.55	0.855
CRP	4,97±3.15	3.46±0.54	0,001

Conclusions: In our study investigating inflammation in lipedema, the etiology of which is still unknown, neutrophil-lymphocyte ratio and platelet count were found to be high in the patient group. The increase in body mass index, leukocyte and CRP. This situation is important in terms of elucidating the etiopathogenesis of the disease and we think that it will shed light on new studies on the subject.

Keywords: Lıpedema, Inflammation, Neutrophil Lymphocyte Ratio, Platelet Volume

OP-101

Investigation of the Effect of Complex Decongestive Therapy on Balance and Proprioception Applied to Patients Who Developed Secondary Lymphedema in the Lower Extremities After Cancer Surgery: Pilot Study

Emine Cihan[1], Cansu Şahbaz Pirinççi[2]

[1]Selcuk University
[2]University of Health Sciences

Objectives: The aim of this study is to investigate the effects of Complex Decongestive Therapy (CDT) on balance and propriseception applied to patients who developed secondary lymphedema in the lower extremities after cancer surgery

Background: Due to unilateral lower extremity lymphedema, a volume difference occurs between the extremities, the stress on the lower extremity increases and balance losses may occur. Patients with lymphedema may restrict movements in their affected extremities, or the restriction of joint movements and decreased mobility due to lymphedema may lead to the development of muscle atrophy. Muscle atrophy can negatively affect proprioception by reducing the sensitivity of muscle spindles.

Methods: A total of 14 patients who developed LLL after cancer surgery were included in the study. Participants were divided into 2 groups (study group:7, control group:7). Patients included in the study group were treated with CDT treatments 5 days a week for 3 weeks. Patients for whom a CDT program was prepared and who were in the treatment queue were included in the control group. Balance and proprioception evaluations were made on the day the treatment was planned, and the final evaluations were repeated 3 weeks later. Balance and proprioception evaluations were made before and after treatment. Balance was assessed with the single-standing test. Proprioception was evaluated with a goniometer at 15-45 and 60 degrees of knee flexion.

Results: In the comparison between groups, the participants' age, height, weight, BMI, time after surgery, number of chemotherapy/radiotherapy courses are similar ($p>0.05$). Before the treatment, single standing time and 15, 45 and 60 knee proprioception angles were similar in both groups ($p>0.05$). After the treatment, single standing time increased in both groups but no superiority was detected between the groups ($p = 0.132$). Post-treatment knee proprioception values of 15, 45 and 60 were closer to the standard values in the study group ($p<0.001$, $p<0.001$, $p=0.012$, respectively).

Conclusions: According to our results, no significant improvement in balance was observed in patients treated for LLL. Joint proprioception sensation was positively affected in the study group compared to the control group. As a result, balance is a more complex process and its development may depend on many factors and the continuity of rehabilitation. Therefore, a longer treatment process and specific exercises may be needed. Proprioception may be characterized by a sense of feeling that increases with the load taken from the joints.

Keywords: lower extremity lymphedema, complex decongestive therapy, balance, proprioception

OP-102

An audit of the efficacy of lymph drainage in the management of lymphedema.

Abeer Felmban[1], Shaima Bajunaid[2]

[1]Department of Physical Therapy, Ministry of Human Resources and Social Development, Dammam, Saudi Arabia.
[2]Altadawy physical therapy centre Dammam, Saudi Arabia

Objectives: The objectives were to investigate the efficacy of lymph drainage of physical therapy intended to reduce lymphedema in the lower limbs. There is no cure for Lymphedema and so the immediate management of the disease aims to reduce the symptoms.

Background: Lymphedema in the legs is a serious problem for many women, particularly in Saudi Arabia. It is often poorly managed in the early stages. The aim of this study was to evaluate how effective physical treatment is in reducing limb volume.

Methods: The study aimed to compare limb volumes before and after treatment in a group of 30 adult women aged between 23 and 83 years. They completed treatment sessions 4 to 5 weeks (daily for 4 hours treatment including: shock wave, ultrasound and lymph drainage the most important advice faradic current, leg compression and bandaging) over a period of 2 to 12 weeks. Limb girth were measured from the ankle upwards at intervals of 4 cm for 60 cm at each session. These girths were combined to estimate the total limb volume and the three sub-regions, lowest, middle and upper. The girths at the first and last sessions were compared.

Results: Data were obtained from 50 legs. Twenty women had both legs measured. A single leg measurement was made in 10 women. Analysis of the whole limb volumes showed that 49 limbs were reduced in volume and one limb did not change. The range of reductions was 0-23% and the mean reduction was 8%. This was highly significant when before/after comparison were made using a paired t test ($p > 0.00001$). The changes in volume in the three regions were not significantly different when tested with an ANOVA ($p<0.05$).

Conclusions: Managing lymphedema is a continuing challenge, particularly in socially conservative regions where women may be reluctant seek treatment. The results reported here represent a cross section of patients attending the clinic. The initial results must be treated with caution. However, the findings reported here show clear improvement in each segment of the limb dimensions in almost all cases 2 cases lost 20 kg from body weight.

Keywords: Lymphedema, physical therapy

OP-103

Automated Detection and Classification of Cancerous Cells Using Machine Learning Algorithms

SHIV SINGH SARANGDEVOT[1]

[1]JANARDHAN RAI NAGAR RAJASTHAN VIDHYAPEETH UNIVERSITY

Objectives: The study evaluates the performance of state-of-the-art machine learning algorithms, including convolutional neural networks (CNNs), support vector machines (SVMs), decision trees, and random forests, in detecting and classifying cancerous cells from digitized histopathological images. A comparative analysis of these algorithms is conducted based on their sensitivity, specificity, precision, and computational efficiency.

Background: The rapid advancements in machine learning algorithms have revolutionized the field of cancer diagnostics by enabling automated detection and classification of cancerous cells from histopathological images. This research paper presents a comprehensive analysis of various machine learning techniques utilized for the automated detection and classification of cancerous cells, with a focus on their accuracy, efficiency, and clinical applicability.

Methods: Furthermore, the paper explores the challenges and limitations associated with automated cancer cell detection and classification, such as dataset imbalance, variability in staining techniques, and interpretability of results. Strategies to mitigate these challenges are discussed, including data augmentation, transfer learning, and ensemble methods.

Results: The research findings demonstrate the efficacy of machine learning algorithms in accurately detecting and classifying cancerous cells, with high sensitivity and specificity rates comparable to human experts. The potential clinical implications of automated cancer cell detection and classification are also discussed, including early diagnosis, personalized treatment planning, and prognosis prediction.

Conclusions: Overall, this research paper highlights the significant contributions of machine learning algorithms in advancing cancer diagnostics and emphasizes the importance of continued research and development in this promising field to improve patient outcomes and accelerate the pace of cancer research and treatment.

Keywords: Automated detection, Classification, Cancerous cells, Histopathological images

OP-104

Liposuction for lymphedema: techniques, results and patients' compliance

Håkan Brorson[1], Karin Ohlin[2], Barbro Svensson[2], Mattias Hoffner[3]

[1]Department of Clinical Sciences in Malmö, Lund University; Plastic and Reconstructive Surgery, Skåne University Hospital, Malmö, Sweden
[2]Department of Plastic and Reconstructive Surgery, Skåne University Hospital, Malmö, Sweden
[3]Department of Clinical Sciences in Malmö, Lund University; Department of Surgery, Blekinge Hospital, Karlskrona, Sweden

Objectives: To show the efficacy and superiority of liposuction to treat chronic, non-pitting lymphedemas leading to complete long-term outcomes at all stages.

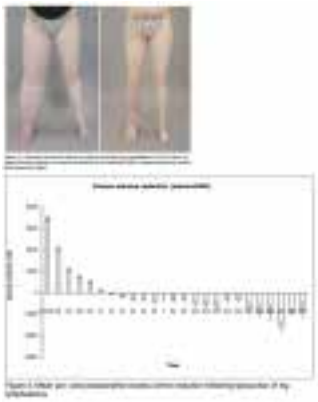
Background: Absent lymph flow and chronic inflammation leads to excess subcutaneous adipose tissue deposition. Chronic non-pitting lymphedema does not respond to conservative treatment or microsurgical procedures because they do not target the adipose tissue. Removing the adipose tissue using liposuction seems thus to be a logic treatment strategy.

Methods: Arms: 190 women, mean±SEM age of 62±0.8 years, with a duration of arm swelling of 8.6±0.5 years underwent liposuction. Age at breast cancer operation, interval between breast cancer operation and lymphedema start, and duration of lymphedema were 51±0.8 years, 2.8±0.4 years, and 8.6±0.5 years respectively (Figure1, 2)Legs: 128 patients with a mean age of 49±1.4 years and with a duration of leg swelling of 13±0.9 years underwent liposuction. There were 64 primary (PL) and 64 secondary lymphedemas (SL) following cancer therapy. Age at cancer treatment and interval between cancer treatment and lymphedema start were 2.5±0.7 years and 42±1.7 years respectively. Age at onset of PL was 10 years.

Results: Arms: Preoperative mean excess volume was 1404±52 ml. Postoperative reduction was 104±2.0% at 3 months and 117±2.1% at 1 year, and more than 100% during 28 years' follow-up (Figure 1, 2).Legs: Preoperative excess volume was 3580±153 ml. Postoperative reduction was 82%±2.3% at 3 months and 101±2.3% at 1 year, and more than 100% during 23 years' follow-up (Figure 3, 4).

Arm outcomes

Leg outcomes



Conclusions: Liposuction is effective for treatment of chronic lymphedema in patients who do not respond to conservative treatment. Removal of the hypertrophied adipose tissue leads to complete reduction. Constant use of compression garments maintains the outcome.

Keywords: liposuction, lymphedema, adipose tissue, long-term outcomes

OP-105

Postoperative Conservative Treatment of Lymphedema

Karin Ohlin[1], Barbro Svensson[1], Håkan Brorson[2]

[1]Plastic and Reconstructive Surgery, Skåne University Hospital, Malmö, Sweden
[2]Department of Clinical Sciences, Lund University, Sweden

Objectives: This presentation shows how Controlled Compression Therapy (CCT) works in practice and over time. The need of compression garments is discussed in relation to the patients' activity levels and the severity of the lymphedema.

Background: Lymphedema can successfully be treated with liposuction and CCT. The aim of CCT is to increase compression until the volume of the lymphedematous arm or leg is smaller or equal to the healthy one and then to maintain the outcome.

Methods: Three patient cases will be presented to illustrate this: two patients with arm lymphedema and one patient with leg lymphedema. The excess volumes were measured preoperatively and at 0.5, 1, 3, 6, 9, 12 and 18 months postoperatively, then annually. Extra check-ups were planned when needed. At the check-up, the outcome was evaluated and complementary measures were added if necessary. At each occasion the treatment strategy was identified.

Results: The treatment strategies used in CCT are: (1) decrease circumferential measurements of compression garments, (2) increase compressions class, (3) use of several compression garments (multilayer), (4) increase the amount of garments prescribed at the same time, and (5) taking in existing garments by use of a sewing machine. For arm lymphedema the decrease of the circumferential measurements of compressions garments is the most useful strategy. For leg lymphedema it is effective to combine several of these strategies. The choice of strategy depends on where increased compression is needed on the whole leg or part of it. It also depends on the patients' abilities to put on the compression garment and their preferences and motivation.

Conclusions: Varying strategies can be used and combined to increase compression until complete reduction is achieved. The compression then needs to be maintained and evaluated at regular check-ups to keep a good result over time. If the excess volume increases, the strategy needs to be adjusted in order to get the patient back on track.

Keywords: Compression therapy, Liposuction, Volume measurement, Follow-up

OP-106
Bandaging In Acute Lymphangitis

Alberto Macciò[1]

[1]Humanitas Medical Care & Gavazzeni - Bergamo

Objectives: We will explain in detail the technique we used to make a bandage in case of lymphangitis.

Background: The treatment of lymphangitis involves two types of intervention: antibiotic prescription and bandaging. The type of systemic antibiotic prescribed may be broad spectrum or guided by clinical signs.For what concern the term “bandaging” in lymphology is a very broad definition that includes different types of bandages that differ from one another according to the material from which they are composed and to the function that they are called to perform.In case of lymphangitis different types of bandaging are used, packaged with zinc oxide bandagesor new Manuka honey dressings, to reduce edema improve peripheral lymphatic flow and, in the case of Manuka, control local bacterial overload.

Methods: We will show you our specific experience on the use of a particular type of bandage born and modified over time following the indications provided by the patients themselves during twenty years of clinical experience.A special bandage that lasts up to 7 days, packaged with a high index of static Stiffness (SII) and with reduced pressure on the foot.

Results: In our experience, by packaging this type of bandage perfected over time, we have reached 99.8% of perceived comfort for up to 7 days from the packaging.

Conclusions: The success of an effective bandage and that it is well tolerated by the patient, depends both on the correct execution of the bandage and on the specific knowledge of the materials used to make it.

Keywords: compression therapy, lymphangitis, wound care, bandaging

OP-107

The role of exercise in the prevention and treatment of lymphoedema

Sandi Hayes[1], Ben Singh[3], Hildegard Reul-Hirche[4], Kira Bloomquist[5], Karin Johansson[6], Charlotta Jönsson[6], Melanie Plinsinga[2]

[1]Cancer Council Queensland, Queensland, Australia
[2]Menzies Health Institute Queensland, Griffith University
[3]Allied Health and Human Performance, Alliance for Research in Exercise, Nutrition and Activity, University of South Australia, Adelaide, South Australia
[4]Royal Brisbane and Women's Hospital, Physiotherapy Department, Queensland, Australia
[5]University Hospitals Centre for Health Research (UCSF), Copenhagen University Hospital, Copenhagen, Denmark
[6]Department of Health Sciences, Lund University, Lund, Sweden

Objectives: The purpose of this work was to evaluate effects of exercise on (i) the prevention of cancer-related lymphoedema (CRL), and (ii) the treatment of CRL, lymphoedema-related symptoms, and other health outcomes among individuals with CRL including quality of life, fatigue, upper- and lower-body strength, aerobic fitness, body weight, body mass index and body fat. It was also an objective to evaluate whether prevention or treatment effect differed according to exercise mode, length of exercise intervention, degree of exercise supervision, lymphoedema type and extent of lymph node removal (for prevention only).

Background: Since the late 1990's, there has been an exponential increase in the number of studies evaluating the role of exercise, including beyond resistance-based exercise alone, in the prevention and treatment of lymphoedema.

Methods: An electronic search of multiple databases (such as, Cochrane Library and PubMed) was undertaken to identify exercise studies measuring lymphoedema and involving individuals at risk of developing or with CRL, published prior to March 1, 2021. Study quality and overall quality of evidence were assessed using the Effective Public Health Practice Project Quality scale and the Recommendation, Assessment, Development and Evaluation (GRADE) approach, respectively. Meta-analyses were performed to evaluate effects of exercise on CRL incidence, existing CRL status, lymphoedema-associated symptoms (pain, heaviness, tightness) and health outcomes.

Results: Twelve (n=1,955; 75% moderate-high study quality) and 36 studies (n=1,741; 58% moderate-high study quality) were included in the prevention and treatment aim, respectively. Relative risk of developing CRL for those in the exercise group compared with the non-exercise group was 0.90 (95% CI: 0.72, 1.13) overall, and 0.49 (95% CI: 0.28, 0.85) for those with 5 or more lymph nodes removed. For those with CRL in the exercise group, the standardised mean difference of CRL pre- to post exercise was -0.11 (95% CI: -0.22, 0.01), and compared with usual care post-intervention was -0.10 (95%: CI -0.24, 0.04). Improvements post-intervention, compared to pre-intervention, were observed for pain, upper-body function and strength, lower-body strength, fatigue and quality of life for those in the exercise group (effect size: 0.3-0.8; $p<0.05$).

Conclusions: Findings from this review lend support for the application of physical activity and exercise guidelines for the wider cancer population to those with or at risk of CRL. This includes promotion of aerobic and resistance exercise, and not just resistance exercise alone, as well as unsupervised exercise guided by symptom response.

Keywords: exercise, physical activity, cancer-related lymphoedema

OP-108

Novel Genetic Findings on Heterogeneity of Primary Lymphedema

Miikka Vikkula[1]

[1]De Duve Institute, UCLouvain

Objectives: To elucidate the pathophysiological bases of primary lymphedema (PL).

Background: PL can be present at birth or develop in childhood or later in life. Thus, it may be a developmental disorder and/or due to a dysfunction of lymphatic vessels that develops with time. Since the discovery in 2009 of the first gene mutated in primary congenital lymphedema or Milroy's disease, the VEGFR3 gene, mutations in numerous genes involved in the initial formation of lymphatic vessels (including valves), in the growth and expansion of the lymphatic system and in associated pathways have been identified in syndromic and non-syndromic forms of PL. Thus, the current hypothesis is that the majority of cases of PL has a genetic origin. A causative pathogenic variant can be identified in only about one-third of affected individuals, and penetrance is often below 100%, making identification of mutations more difficult, but also suggesting that important genetic and/or environmental modifiers exist. Most mutations cause loss-of-function, although some, such as in the genes associated with Noonan syndrome, gain-of-function. Various functional pathways seem to be involved. Based on current knowledge, an algorithm dividing lymphatic anomalies into those with underlying hyperplasia or hypoplasia, and associating them with known genetic mutations, gives clues as to possible medicinal drug intervention on some of them.

Methods: We use whole exome sequencing and variant filtering using Highlander on our large PL Brussels cohort to identify likely pathogenic genetic variants underlying various forms of PL. We use in vitro and in vivo analyses to study the functional effects of the identified candidate variants.

Results: We find a likely pathogenic variant in about 30% of our samples. Likely pathogenic variants have been identified in novel genes associated with PL.

Conclusions: PL is very heterogeneous, and novel genes underling PL development are identified. Some cause increased intracellular signaling allowing to target them with inhibitors. The era of theragnostics has entered the field of syndromic primary lymphedema.

Keywords: Primary Lymphedema, Gene, Mutation

OP-109

PERCUTANEOUS SCLEROTHERAPY OF LYMPHOCELE USING POVIDONE IODINE AND LAUROMACROGOL 400

Amer Hamadé[1], Emma Morisot[1], Pauline Simonelli[1], Bouchra Hamadé[1], Camille Zamperini[1], Julien Tse[1], Pierre Michel[1], Nathalie Buschenrieder[1], Michèle Lehn-Hogg[1]

[1]Vascular Medicine , Emile Muller Hospital , Mulhouse ,Frnace

Objectives: Treatment of lymphocele

Background: The Lymphoceles (LE) can be treated by sclerotherapy: sclerosis using doxycline , sclerosis applying amidotrozoate , sclerosis using alcohol and povidone-iodone .Lymphocele are a possible complication after trauma, surgery and biopsy. Their treatment is considered to be as less traumatic as possible because it is intended for patients already operated. We propose the efficacy of the percutaneous sclerotherapy lymphocele using povidone-iodine and Lauromacrogol 400.

Methods: We studied 18 patients, 7 men and 11 women aged from 32 to 82 years who presented lymphatic complications with LE .The LE occurred in men after radical prostectomy and in 10 women after breast cancer surgery. The last woman had a deep abdominal LE after lymph node dissection. We have treated all the patients by percutaneous sclerotherapy using povidone-iodine combined with Lauromacrogol 400 . In deep lymphoceles an ulrasound's guidance was necessary.

Results: The evolution was favorable with complete but late closure of LE in 17 patients. Multiple sclerosis were necessary to treat the patients. No major complication was reported.

Conclusions: In certain cases, the treatment of choice LE would possibly be the percutaneaous sclerotherapy using povidone-iodine combined with Lauromacrogol 400..

Keywords: Povidone iodine, slerotherapy, Lauromacrogol, lymphocele

OP-110

Dietary supplements and Nutriceutical approach in Lymphedema and Lipoedema

Serena Michelini[1], Matteo Bertelli[2], Gabriele Bonetti[2], Fabio Romaldini[3], Daniela Vaglio[3], Sandro Michelini[4]

[1]San Giovanni Battista Hospital, Rome_Italy
[2]MAGI'S LAB, Rovereto (TN)_Italy.
[3]Vascular Rehabilitative Service San Giuseppe Hospital, Marino (Rome)_Italy
[4]Vascular Rehabilitative Service San Giovanni Battista Hospital, Rome_Italy

Objectives: The work aims to highlight the benefits of several dietary supplements and nutraceutical approach that cause fat burning and weight loss, acting synergistically with a healthy diet and physical exercise, and that could help in alleviating the edematous state, inflammation and symptoms in patients with Lymphedema and Lipoedema.

Background: Nutrition is considered a basic component in the management of any vascular and adipose tissue disease. Lymphedema is characterised by an increase of interstitial fluid due to a lymphatic system morphological and/or functional alteration. Lipoedema is a chronic disease that mostly manifests in females as the abnormal distribution of subcutaneous adipose connective tissue, usually coupled with bruising, pain, and edema. Complex decongestive therapy (CDT) has always been the mainstay of conservative treatment in Lymphoedema and is partly used in therapeutic management of Lipoedema. In both disorders weight control and anti-edema and anti-inflammatory diet are two additional necessary components of the holistic therapy, as these are two clinical conditions in which inflammation leads to a worsening and clinical progression of disease.

Methods: A careful analysis of the data available in the literature identified which nutritional and nutraceutical supplements could help in the therapeutic management of patients with Lymphoedema and Lipoedema.

Results: Fat burning supplements that have been shown to have the strongest evidence are green tea, caffeine, chromium, carnitine, and conjugated linoleic acid; they seem to promote mobilization and break down triglycerides in adipocytes, boost metabolism and lipogenesis inhibition. At the same time hesperidin, spermidine, poliphenols, omega-3 and vitamin A are some of supplements with an anti-inflammatory and which could potentially be important in the treatment of Lymphedema and Lipoedema

Conclusions: Dietary supplements cited could contribute to a greater effectiveness in controlling body weight and preventing disease progression in patients with Lymphedema and Lipoedema. More targeted and human studies are needed to assess the role of food and diet on the chronic progressive degeneration of inflammation, edema and fibroadiposis and to confirm the effectiveness of dietary supplements in those pathological conditions.

Keywords: Lymphedema, Lipoedema, Nutrition, Dietary supplements

OP-111
Treatment of phlebolymphedema

Franz-Josef Schingale[1]

[1]Lympho-Opt

Objectives: Chronic edema if it is venous or lymphedema has to be treated in two phases. Phase of reduction and phase of optimization and maintenance

Background: IntroductionPhlebolymphedema is not a new concept. Indeed, this “combined” condition of venolymphatic disorders has been well recognized and reported all along for many decades, but the term “phlebolymphedema” has not been properly defined.EdemaEdema is an excess of interstitial fluid and is an important sign of ill health in clinical medicine. The developing of edema finds its reason in the lymph system. But not all edema are lymphedema. Edema develops when the microvascular filtration rate exceeds lymph drainage for a sufficient period.Lymph drainage is intimately linked with venous drainage in health and disease. Evidence exists to support the view that lymphatics frequently fail in venous disease, particularly in its advanced stages. The difference of lymphatic insufficiencyHigh volume insufficiencyDepends on an overload of fluid like in inactivity edema, CVD stage 1 (C3, CEAP-classification), hypoproteinemia and premenstrual syndrome. Mechanical or low volume insufficiencyThe lymph system is damaged and as result a lymphedema develops. Lymphedema means a primary or secondary damage of the lymph system.combined insufficiencyThe TC is normal at the beginning but due to the growing of the LL the TC starts to go down, for example in phlebolymphedema

Methods: Treatment of phlebolymphedemaTwo phases, in reality three phasesPhase 1 ReductionPhase 2 transitional phasePhase 3 maintenancePhase 1Decongestive lymphatic therapy (DLT) is the recommended treatment which consists of intensive and long-term management phases. Phase 2There is still more than 15% of swelling which has to be reduced by the patient himself with flat knit stockings during the daytime and bandaging or AVW during night time.Phase 3To maintain the result in most cases the patient has to wear flat knit stockings, in limbs where the shape is nearly normal round knit garment with stiff material can be used too.

Results: After phase 1 there is a good reduction of the edema.

Conclusions: Phlebolymphedema is a condition in venous disease and often misdiagnosed and has to be treated like lymphedema

Keywords: venous insufficiency, lymphedema, decongestion, compression

OP-112

Workshop: Pressure profile under different compression systems Illustration in real time.

Jean-Paul Belgrado[1]

[1]Université Libre de Bruxelles

Objectives: Today's technology provides reliable measuring instruments that enables us to record pressure profiles in real time on curved surfaces where temperature is changing. These surfaces can be, for example, the skin of limbs during activity. Pressure sensors placed under various compression systems, such as elastic compression stockings, multi-component bandages of different materials, or static and dynamic wraps, communicate data in real time in wireless modality. This technology enables the analysis of different pressure profiles in decubitus or orthostatic positions, or during activities such as walking, running, cycling, etc. After discussing and evaluating the measurement quality of these instruments, we will equip volunteer participants with the pressure sensors.The analyzed limb will be covered by various static and dynamic compression systems. We will observe the pressure profile during simple activities such as walk, run and cycle. Based on the results of that pressure profile we will launch the discussion.The workshop takes 01:30 hours

OP-113

TREATMENT OF LOWER LIMB LYMPHEDEMA ASSOCIATED WITH PERIPHERAL ARTERIAL DISEASE

Amer Hamadé[1], Emma Morisot[1], Pauline Simonelli[1], Bouchra Hamadé[1], Camille Zamperini[1], Julien Tse[1], Pierre Michel[1], Nathalie Buschenrieder[1], Michèle Lehn-Hogg[1]

[1]Vascular Medicine ,Emile Muller Hospital , Mulhouse ,France

Objectives: Treatment of lymphedema in patient with peripheral arterial disease

Background: Normally multilayer low-stretch bandage and elastic compression (SBEC) is contraindicated in patients with severe peripheral arterial disease of the lower limbs (PAD). The problem becomes serious when PAD is associated with lower limb lymphedema (LLL).

Methods: In all patients with LLL, we measure the ankle-brachial systolic pressure index (ABI). When the ABI is less than 0.50, the EC is not indicated and we try to revascularize the limb before any treatment. When 0.50<ABI <0.60, we complete the examination with transcutaneous oxygen pressure (TcPO2); if TcPO2 is greater than 30mmHg, the patient is treated. When 10<TcPO2<30mmHg, the arterial reserve is studied by a hanging legs TcPO2 and when it is greater than 40mmHg, the SBEC is proposed. In diabetics with mediacalcosis and LLL , we perform the toe brachial index (TBI) and TcPO2 before CE. In case of significant lymphedema of the foot, TcPO2 is not reliable, an ABI and an TBI are performed.

Results: This protocol allowed us to treat 14 patients with LLL associated with PAD without an adverse effect of SBEC.

Conclusions: SBEC should be used with caution in patients with LLL associated with PAD . ABI, TcPO2 and TBI are necessary before each treatment.

Keywords: PAD, Lymphedema, ABI, TcPO2

OP-114

Management of Penis with Lymphedema

Per. Tsitsopoulos[1], M. Toumanidou[1], A. Profka[1], V. Poulakis[2], K. Mileounis[3], E. Dimakakos[1]

[1]Center of Prevention, Diagnosis and Treatment of Lymphedema -Lymphatic Diseases of Metropolitan Hospital Athens Greece
[2]Department of Urology of Metropolitan Hospital Athens Greece
[3]Department of Dermatology of Metropolitan Hospital Athens Greece

Objectives: The management of Penis with Lymphedema: combination of conservative and surgical treatment

Background: Penile lymphoedema is a rare case, but lymphedema in the genitalia area is frequently after Ca prostate with lymphadenectomy. It creates significant physical and psychosexual morbidity and presents considerable therapeutic challenges.

Methods: He underwent an operation with the removal of the prostate node and of 27 lymph nodes due to the cancer of his prostate node. He did not need any chemotherapy and radiation therapy but after 5 months from the surgery he presented lymphedema only in penis. He did not report any infection, but we found out very small skin bumps like papillomas in the genitalia area but not on his penis.

Results: He came in our lymphological center. He had very long and very thick lymphedematous penis. Our dermatologist confirmed our suspicion concerning the presence of warts of HPV. Dermatologist made ablations on these HPV skin disease and we followed the conservative complex decongestive treatment (CDT). The penis become weaker and thinner after three weeks of this special treatment.

Conclusions: Penile lymphoedema creates a heavy physical and psychosexual morbidity. The knowledge of the lymphatic status and of the comorbidities diseases of the patient with the combination of conservative and surgical treatment (here dermatologist, lymphologist and surgeons) can give excellent and permanent results in very special cases.

Keywords: penis, Lymphedema, treatment, management

OP-115

Exercise and lifestyle changes in Lipoedema

Serena Michelini[1], Sandro Michelini[2], Daniela Vaglio[3], Beatrice Campagna[3], Giulia Cocozza[3], Fabio Romaldini[3]

[1]San Giovanni Battista Hospital, Rome_Italy
[2]Vascular Rehabilitative Service San Giovanni Battista Hospital, Rome_Italy
[3]Vascular Rehabilitative Service San Giuseppe Hospital, Marino (Rome)_Italy

Objectives: The purpose of this study was to investigate in patients affected by Lipoedema the association between the level of intensity of physical activity and sitting time as part of their daily lives through the administration of the International Physical Activity Questionnaire - Short Form (IPAQ-SF), the degree of pain with Visual Analogic Scale (VAS score) and the stage of the disease.

Background: Lipoedema is a chronic disease characterized by abnormally increased of subcutaneous adipose tissue deposition and distribution, which appears poorly responsive to diets and physical activity. Patients often report poor adherence to exercise due to the pain at the affected areas, which tends to exacerbate during and after physical activity. Nevertheless, following a proper diet and exercising are essential to avoid further weight gain and prevent some of the complications of Lipoedema including obesity and musculoskeletal diseases.

Methods: Patients (n=112) aged between 18 and 64 years, with Lipoedema of the lower limbs (58 type 3, 36 type 2 and 18 type 5) in stages 1, 2 and 3 were recruited for the study. Physical activity was measured using the IPAQ-SF for the past 7 days. VAS score was recorded at the time of questionnaire administration together with the assessment of the clinical stage and type of the disease.

Results: The data analysis demonstrated the presence of a correlation between level of physical activity and pain; VAS values greater than 6 correlate with a lower level of physical activity resulting from the questionnaire administered as “inactive patient” that is the lowest level of physical activity. Lower level of physical activity, in turn, has been shown to be present mainly in patients with advanced stage with involvement of the entire lower limb region (Stage III, Type 3).

Conclusions: This preliminary study highlighted the impact of pain on the level of physical activity performed by patients with Lipoedema and its negative correlation with advanced clinical stages. Physical activity in these patients should be encouraged in any case because aims to prevent chronic pain by improving joint mobility and ensuring adequate muscle tone-trophism and greater joint stability, improve systemic and local circulation and avoid further weight gain. More studies are needed to validate the administration of the IPAQ questionnaire in the assessment of physical activity levels in Lipoedema.

Keywords: Lipoedema, physical activity, IPAQ-SF

OP-116
Liposuction after CDT

Håkan Brorson[1], Karin Ohlin[2], Barbro Svensson[2], Mattias Hoffneer[3]

[1]Department of Clinical Sciences in Malmö, Lund University; Plastic and Reconstructive Surgery, Skåne University Hospital, Malmö, Sweden
[2]Department of Plastic and Reconstructive Surgery, Skåne University Hospital, Malmö, Sweden
[3]Department of Clinical Sciences in Malmö, Lund University; Department of Surgery, Blekinge Hospital, Karlskrona, Sweden

Objectives: Chronic inflammation leads to adipose tissue increase and concomitant muscle tissue increase in patienten with lymphedema.

Background: There is a rising interest generated by the recognition of increased adipose tissue deposition in patients with chronic lymphedema. Recent studies suggest that inflammation plays a great role in the formation of excess adipose tissue.

Methods: The following methods were used: 1. Analysis of aspirate. 2. VR-CT (Volume Rendered Computer Tomography). 3. DXA (Dual emission X-ray Absorptiomerty). 4. MRI (Magnetic Resonance Imaging). 5. Size of lymphedema cells were compared to controls using ImageJ program. 6. Costs were analyzed using Monte Carlo simulation.

Results: 1. Consecutive analyzes of the aspirate removed under bloodless conditions, using a tourniquet, showed a very high content of adipose tissue in arm (94%) and in leg (100%) lymphedemas. 2. Investigation with VR-CT (Volume Rendered Computer Tomography) in 11 patients also showed a significant preoperative increase of adipose tissue, 81%, in the swollen arm, followed by a normalization at 3 months paralleling the complete reduction of the excess volume. 3. Analyses with DXA (Dual emission X-ray Absorptiomerty in 18 women with arm lymphedema showed a significant increase of adipose tissue (73%) and muscle tissue (47%) due to heaviness in the non-pitting swollen arm before surgery. The adipose tissue deposition starts already when the lymphedema starts. In a 1-year follow-up study the excess adipose tissue was completely removed and muscle tissue decreased due to less load on the arm. This paralleled the complete reduction of the excess volume. 4. MRI (Magnetic Resonance Imaging) showed that lymphedema leads to adipose tissue deposition in muscle. 5. Adipocytes are significantly larger in lymphedematous extremities than in controls, and larger in lymphedematous arms than in legs. 6. Liposuction is cost-effective.

Arm lymphedema: Pre-and postoperative outcome

A 57-years-old woman with a non-pitting secondary lymphedema of 4 235 ml since 5 years following breast cancer treatment. Complete reduction 6 months after liposuction.

Leg lymphedema: Pre-and postoperative outcome

A 32-years-old woman with a non-pitting secondary leg lymphedema of 7 070 ml since 12 years following treatment of a synovial sarcoma in the right groin (left). Postoperative result 6 months after liposuction (right).

Conclusions: Patients with chronic, non-pitting, lymphedema develop large amounts of subcutaneous adipose tissue, which prevents complete limb reduction utilizing microsurgical reconstruction or conservative treatment. This adipocyte proliferation has important pathophysiologic and therapeutic implications. Liposuction can be performed in patients who fail to respond to conservative management. So far, after more than 25 years, we have not had any complications, i.e. no deaths from fat embolism and no damage to blood supply or nerves. The technique has been implemented in many other centers world wide and is cost effective. Long-term outcomes of liposuction of arm and leg lymphedemas will be will be presented showing not only complete reduction, but also increased Health Related Quality of Life.

Keywords: liposuction, lymphedema, complete reduction, adipose tissue

OP-117

Latest pathophysiology and genomics in lipedema

Sandro Michelini[1], Gabriele Bonetti[3], Fabio Romaldini[2], Roberto Cannataro[4], Serena Michelini[1], Matteo Bertelli[3]

[1]San Giovani Battista Hospital Rome Italy
[2]San Giuseppe Hospital Marino ASL Roma6 Italy
[3]Magi's Lab Rovereto Italy
[4]Pharmacy, Health and Nutritional Sciences University of Calabria Cosenza Italy

Objectives: This study originate to help better understand the behaviour of the cells in the areas affected by Lipedema, which do not respond to the common self-regulating mechanisms of adipose tissue.

Background: There is much discussion about the etiological hypotheses of the disease. Female hormones certainly play an important role, but the genetic hypothesis, also linked to the evidence that the disease is hereditary in most cases, is gaining ground similarly to what happened for primary lymphedema.

Methods: The AA. selected 20 patients suffering from stage I and II lipedema, aged between eighteen and sixty years, strictly from a clinical point of view, by taking biopsy samples in affected areas, in the inferior-medial third of the thigh, and in healthy areas, in the interscapular region. Samples were analysed genetically (germinal and somatic), anatomically (using light and electron microscopy as well as histochemistry techniques), and biochemically (for the analytical study of more than eight hundred micro-rnaAll three types of studies, which started from a careful clinical selection and were directed towards the specific deepening of knowledge, as far as relevant to the individual branches, are ongoing.

Results: For genetics, we identified at least three more candidate genes and segregation studies on family members are underway. Metabolomics studies are also underway on material taken. The genetic study on affected tissue also revealed an important polymorphism of the PPARG gene, which is not present in healthy tissue.Anatomical studies have, in particular, shown an average increased volume (up to doubling) of adipocytes compared to those in healthy areas, increase in vascularisation, in particular of pericytes (which could be pre-adipocytes), an increase in collagen fibres and noticeable calcium deposits in endothelial cells and affected adipocytes. Calcium inhibits intracytoplasmic phospholipases and in this sense could contribute to the increase in intracellular lipid deposits resulting in increased cell volume.The biochemical studies, also still in progress, highlight the presence of 13 different micro-RNAs in the affected areas, out of a total of eight hundred analyzed in the two samples of each subject. One of these seems to have a particular activity for which it could represent a possible marker of the disease, which as is known, today has an exclusively clinical diagnosis.

Conclusions: In conclusion, Lipedema also requires great clinical attention, both for the management of the disease and for in-depth research. It is a genetic disease in which many aspects of epigenetics determine the different clinical aspects of individual cases.

Keywords: Lipedema genetics pathophysiology

OP-118

Treatment of obese patients with lymphedema

Franz-Josef Scchingale[1]

[1]Lympho-Opt

Objectives: There is a high number of obese patients developing edema.

Background: We developed a special inpatient program to treat these patients according to the principles of CDT.

Methods: Phase 1skin caremanual lymphatic drainagecompression bandagingexerciseselfmanagementphase2skin caremanual lymphatic drainagecompression garmentsexerciseselfmanagementBariatric lymphedema is a challenge for treating: manual lymph drainage can require two therapists working simultaneously. So we combine manual therapy with technical assistance from pneumatic compression therapy (IPC), in case the patient fits into the garment, Flowave, which applies audible sound waves for softening the tissue. After compression- in most cases with adjustable velcro devices- we do physiotherapy and excercises.Nutritional and psychological education is essentially required.

Results: After weight reduction we send some of the patients after decongestion to the plastic surgery for skin resection.

Conclusions: The in-patient program is very effective as a starting point for patients selfcare at home. The psychosocial aspect is very important, as bariatric lymphedema patients are often isolated and bed-ridden for long periods before they reach successful treatment.

Keywords: obesity, monstreous edema, treatment options, surgical treatment

OP-119

Characterization of molecular mechanisms involved in the development and age-dependent regression of meningeal lymphatics

Zsombor Ocskay[1], Laszlo Balint[1], Carolin Christ[1], Mark L Kahn[2], Zoltan Jakus[1]

[1]Department of Physiology, Semmelweis University
[2]Department of Medicine, University of Pennsylvania

Objectives: Here, we aimed to investigate the organ-specific functions of CCBE1 in developmental lymphangiogenesis and maintenance of meningeal lymphatics during aging.

Background: Recent studies have described the importance of lymphatics in numerous organ-specific physiological and pathological processes. The role of meningeal lymphatics in various neurological and cerebrovascular diseases has been suggested. It has also been shown that these structures develop postnatally and are altered by aging and that the vascular endothelial growth factor C (VEGFC)/ vascular endothelial growth factor receptor 3 (VEGFR3)signaling plays an essential role in the development and maintenance of them. However, the molecular mechanisms governing the development and maintenance of meningeal lymphatics are still poorly characterized. Recent in vitro cell culture-based experiments, and in vivo studies in zebrafish and mouse skin suggest that collagen and calcium binding EGF domains 1 (CCBE1) is involved in the processing of VEGFC. However, theorgan-specific role of CCBE1 in developmental lymphangiogenesis and maintenance of lymphatics remains unclear.

Methods: Conditional knockout mouse strain were used, which enables for the induced deletion of CCBE1 in vivo in newborn and adult animals.

Results: We demonstrated that inducible deletion of CCBE1 leads to impaired postnatal development of the meningeal lymphatics and decreased macromolecule drainage to deep cervical lymph nodes. The structural integrity and density of meningeal lymphatics are gradually altered during aging. Furthermore, the meningeal lymphatic structures in adults showed regression after inducible CCBE1 deletion.

Conclusions: Collectively, our results indicate the importance of CCBE1-dependent mechanisms not only in the development, but also in the prevention of the age-related regression of meningeal lymphatics. Therefore, targeting CCBE1 may be a good therapeutic strategy to prevent age-related degeneration of meningeal lymphatics.

Keywords: Meningeal lymphatics, Aging, Lymphatic development, CCBE1

OP-120

Symptomatic Lymphoedema in cancer diseases

Sandro Michelini[1], Daniela Vaglio[2], Serena Michelini[1], Fabio Romaldini[2]

[1]San Giovanni Battista Hospital Rome Italy
[2]San Giuseppe Hospital Marino ASL Roma6 Italy

Objectives: Malignant tumours, irrespective of whether they metastasise via the lymphatic or haematic route, may clinically manifest themselves in the early stages as symptomatic lymphoedema indicative of impaired lymphatic transport secondary to fibrotic obstruction of the lymphatic pathway or its compression from outside. The study underline the importance of a correct interpretation of clinical data to keep an early diagnosis and treatment of cancer.

Background: Even today, it is still common for symptomatic lymphoedema to be mistaken for loco-regional lymphatic system failure, whether congenital or acquired, and consequently treated as such with decongestive physical therapy, delaying the etiological diagnosis and the necessary related etiological treatment.

Methods: Sixty-nine subjects with lymphoedema of the upper or lower limbs were examined, 37 male, 32 female, aged between 48 and 75 years. In all subjects, the oedema was of recent onset and not related to any apparent cause. The subjects underwent a thorough clinical examination and instrumental investigations (HR ultrasound, CT, MRI), as well as laboratory tests.

Results: Out of a sample of 69 patients, 13 subjects (20%) were identified on close clinical and instrumental examination as having an impairment of the lymphatic pathway and its transport function due to primary localisation at lymphoglandular stations or compression of ab extrinsic lymphatic pathways by tumour formations. Prominent clinical cases were represented by metastatic pulmonary cancer with upper limb lymphoedema, bone metastases from breast cancer with upper limb lymphoedema, pelvic cancer with involvement of lymphatic trunks and pelvic lymphoglandular bundles with lower limb lymphoedema, clinical flare-up of Waldenstrom's macroglobulinemia with upper limb lymphoedema.

Conclusions: The lymphatic system with its clinical manifestations is capable of expressing itself in a language that the lymphologist clinician must understand in order to make an early diagnosis of symptomatic lymphoedema and allow for an etiological diagnosis that, depending on timeliness, may even safeguard the same patient's life.

Keywords: Symptomatic lymphoedema in cancer

OP-121

Management of inflammation via nutrition in lipedema and lymphedema

Roberto Cannataro[1], Diana Marisol Abrego-Guandique[3], Maria Cristina Caroleo[3], Erika Cione[1]

[1]University of Calabria
[2]Dynamical Business & Science Society
[3]University of Magna Grecia

Objectives: Elucidate and summarize the link between inflammation in lipedema and lymphedema management.

Background: Inflammation is probably a point in common between lymphedema and lipedema; even if the classic markers of inflammation, such as CRP and ESR, are not significantly altered, if the cytokines are analyzed, an imbalance is noted therefore, the management of inflammation in both conditions should be considered as a fundamental point

Methods: .

Results: one of the main aspects is that of glycemic peaks and the consequent production of AGEs; another fundamental point is that of food intolerances, to be considered after a careful medical history, without avoiding the use of any food in the first analysis; finally, the use of supplements must be directed in this direction but with a solid scientific rationale

Conclusions: .Overall, nutrition can be a valid support for therapy, but it must be remembered that both conditions are chronic and without a cure. Therefore, the palatability and the patient's compliance must also be considered strongly.

Keywords: AGEs, Inflammation, Glycaemic peaks, Food intolerance

OP-122

Workshop. ICG lymphofluoroscopy: the added value in the diagnostic and treatment strategy in lymphedema Illustration by clinical cases

Jean-Paul Belgrado[1]

[1]Université libre de Bruxelles

Objectives: The lymphatic system is invisible to the human eye because of its transparency. After anintradermal injection of highly diluted ICG, the superficial lymphatic system draining theinjected area becomes visible, thanks to a dedicated near infrared camera.Based on different clinical cases, the workshop aims to show the added value of the use of ICG lymphography exam to complete and orientate other examinations or guide treatment strategy.Based on videos from clinical cases, we will show and discuss: the diffusion of the dye from the injection point, the lymph progression in normal and pathological conditions, the contingencies of lymphangion valves and other characteristics of updated knowledge of lymphatic physiology and physiopathology.Impress your eyes: In this workshop you will see the superficial lymphatics and the lymph flow in real time in normal and pathological conditions.Surgeons, Clinical Physicians, Radiologist and Therapists will find new knowledge on the lymphatics for the they own practice. The workshop takes 01:30 hours

OP-123

Musculoskeletal Pain Treatment in Cancer Patients: Rational use NSAII, myorelaxants, and analgesics

F. Figen Ayhan[1]

[1]Atılım University School of Medicine, Department of Physical Medicine and Rehabilitation, Medicana International Ankara Hospital

Objectives: Many adult cancer survivors have chronic pain after treatment with the prevalence estimated to be up to 40% (1). The pharmacologic management of entities such as post-surgical pain, chemotherapy-induced neuropathy, aromatase inhibitor musculoskeletal syndrome (AIMSS), and checkpoint inhibitor-related pain are the main problems in these patients (2).

Background: Chronic pain in this population needs a different approach to that used for people with an estimated survival and prognosis.

Methods: Neuropathic pain (post-cancer surgery, chemotherapy-induced peripheral neuropathy, post-RT) and nociceptive pain (musculoskeletal pain post-surgery or RT, AIMSS, rheumatic and musculoskeletal pain associated with checkpoint inhibitors, joint and fascia manifestations of chronic graft vs host disease) are common in cancer survivors. Among chemotherapy agents, paclitaxel and oxaliplatin are neurotoxic. Rarely, chronic pain can occur as a late effect, remote in time from the administration of treatment such as radiation (RT)-plexopathy or tumoral invasion of the brachial plexus, or both seen in Fig.1 (pregabalin user-patient with right arm lymphedema and flask upper extremity).

Fig.1. The right arm lymphedema and paresis

Patient with right arm paresis due to brachial plexopathy caused by both RT and tumoral invasion of brachial plexus 6 months ago (54 years of age, breast cancer survivor under immunotherapy and pregabalin 150mg twice daily)

Results: A biopsychosocial approach to pain management is recommended for cancer survivors. AIMSS is often described as symmetrical pain and soreness in the joints, musculoskeletal pain, and joint stiffness seen in approximately half of breast cancer survivors. To date, evidence for safe and effective systemic therapies for the prevention or treatment of AIMSS has been minimal (3). One of them, Duloxetine may decrease AIMSS symptoms, although some patients experienced intolerable adverse effects. Opioids, adjuvant analgesics (paracetamol and NSAIDs, antidepressants, anticonvulsants, NMDA receptor antagonists such as ketamine, and magnesium, topical analgesics such as capsaicin, and lidocaine), Cannabinoids, and new drugs may be chosen in selected cases with chronic cancer pain (2). Novel opioids, α-adrenergic agonists, and oxytocin have been identified as potential candidates for new drugs. Common adjuvant analgesics include paracetamol, NSAIDs, selected antidepressants, anticonvulsants, N-methyl-D-aspartate (NMDA) receptor antagonists, and steroids. Other agents such as benzodiazepines, α2-agonists (e.g. clonidine or tizanidine), bisphosphonates, or monoclonal antibodies. The challenges related to opioid prescriptions in survivors are given special attention. Long Term Opioid Therapy should not be recommended in cancer survivors who have chronic pain from pre-existing non-malignant comorbidities

such as osteoarthritis, musculoskeletal painful disorders, or spondylosis, because they are ineffective for this purpose.

Conclusions: Adjuvant analgesics have an important role, and they are now often prescribed as first-line or monotherapy before opioids in the management of cancer treatment-related pain. ASCO and NCCN guidelines on pain management in cancer survivors recommend a combination of pharmacologic and non-pharmacologic interventions.

Keywords: musculoskeletal pain, cancer, survivor, pharmacologic management

OP-124

Surgical Treatment of Genital Elephantiasis

Martin Wald[1], Jakub Vlasák[1], Ladislav Jarolím[2]

[1]Department of Surgery, 2nd Medical Faculty of Charles University Prague, Czech Republic
[2]Department of Urology, 2nd Medical Faculty of Charles University Prague, Czech Republic

Objectives: Lymphoedema and/or elephantiasis in the region of male and female external genital is caused either by insufficient development of the regional lymphatic system (primary cause) or by damage due to tumour, inflammation, iatrogenic or any other injury of the regional lymphatic vessels and lymph nodes (secondary causes).

Background: From a pathophysiological point of view it is lympfatic insufficiency that leads to these clinically visible complications (oedema, lipohypertrophy, and/or soft tissue fibrosis, lymphatic cysts, verrucosis, lymphorrhea and infection). All these complications of lymphatic insufficiency affect the patient's quality of life (motion, personal hygiene, pain and attacks of erysipelas).

Methods: Causal treatment would be a microsurgical procedure creating lympho-venous or lympho-lymphatic anastomoses. Such an approach is rather sporadic, as patients usually present an advanced stage of the disease with fibrotic remodelling of the foreskin, skin of the penis and scrotum, or labia majora, and very often affecting also soft tissues of the pubic area. In such cases, a resection is the optimal approach that improves all aspects of the patient's quality of life.

Results: If lymphatic reflux is found from lower limbs and/or the abdominal wall, an anti-reflux procedure with a lymph-venous anastomosis is suitable.

Conclusions: The lecture presents the results of surgical treatment in patients with elephantiasis of the external genital with an emphasis on indications for surgery, particular steps of the surgical procedure, post-operative care and complications.

Keywords: Genital elephantiasis, surgery, complications

OP-125

The role of early diagnosis in prevention and treatment of lymphedema

Karin Johansson[1], Katarina Blom[2], Lena Nilsson-Wikmar[3], Christina Brogårdh[4]

[1]Lund University
[2]Karolinska University Hospital
[3]Karolinska Institute
[4]Skåne University Hospital

Objectives: The aim of this study was to examine (i) the proportional difference in progression/no progression in mild breast cancer related arm lymphedema (BCRL), and (ii) changes in arm volume and local tissue water at 9- and 12-months follow-up, when treated with compression sleeve or not for 6 months.

Background: Chronic lymphedema in the arm is a rather common side-effect of breast cancer treatment and prevention is desired. The most important and evidence-based treatment of arm lymphedema is daily use of compression sleeve. In a randomized controlled trial (RCT), progression/no progression of mild BCRL was examined among women randomized to a compression group (CG; compression sleeve (ccl 1)) or not (NCG) for 6 months. The RCT was followed by a prospective, observational study, where BCRL in the CG and NCG was followed for 12 months.

Methods: Seventy-five women treated for unilateral breast cancer, with axillary node dissection and diagnosed with mild arm lymphedema at the Lymphedema Unit, Skåne University Hospital and at the Physiotherapy Cancer Unit, Karolinska University Hospital were included in the RCT for 6 months. At the end of the RCT, 33 women with mild BCRL were eligible in CG and 37 in NCG. Proportional differences in no progression/progression of BCRL were defined as >2% increase from start of RCT or exceeding 10% in lymphedema relative volume (LRV). Also changes in LRV and tissue dielectric constant (TDC) ratio were examined at end of RCT, and then at 9- and 12-months. End of RCT was followed by a one-month treatment break in CG after which only women with progression resumed compression and continued.

Results: A larger proportion of women in the NCG ($p<0.001$, 0.005, 0.012) showed progression (57%, 61%, 67%) compared to the CG (16%, 22%, 31%) at 6, 9 and 12 months, respectively. More than 30% of NCG did not progress at all compared to start of RCT. No changes of LRV and local tissue water were found at any follow-ups but were stable on a low level.

Conclusions: To avoid progression of mild BCRL to become chronic, compression sleeve ccl 1 may be applied immediately at early diagnosis of mild BCRL.

Keywords: Arm lymphedema, Prevention, Early diagnosis, Early treatment

OP-126

microRNA expression in lipedema adipose tissue

Roberto Cannataro[1], Sandro Michelini[4], Serena Michelini[7], Nicola Vaia[5], Valeria Puleo[6], Diana Marisol Abrego-Guandique[3], Maria Cristina Caroleo[3], Erika Cione[1]

[1]University of Calabria
[2]Dynamical Business & Science Society
[3]University of Magna Grecia
[4]Marino Hospital
[5]European Hospital
[6]Catholic University of the Sacred Heart Rome
[7]Sapienza University

Objectives: Analyze microRNA expressed by lipedema tissue, highlighting possible mechanism and biomarkers.

Background: microRNAs are small non-coding nucleotide sequences (20-25 nucleotides) but capable of regulating protein synthesis, therefore with epigenetic action, even if each microRNA can pair with more than one mRNA; they are strongly conserved between species and present in all tissues; they meet again, via extracellular vesicles, in all body fluids

Methods: our analysis compared the expression of 800 microRNAs in healthy and lipedema-affected adipose tissue, via Nanostrin platform.

Results: We identified one downregulated microRNA (therefore increased relative protein expression) and 12 upregulated ones (decreased expression); through bio-informatic analysis, the significantly influenced pathways are steroidogenesis, glycemic regulation, and AGEs.

Conclusions: We conclude that microRNA could be a valid tool to elucidate better the etiopathogenesis and outcome of lipedema. Still, it could be an insight to find reliable and easy-to-use biomarkers.

Keywords: microRNA, Epigenetic, AGEs, Biomarker

OP-127
LYMPHOLOGY / THE PAST THE PRESENT THE FUTURE

PISSAS ALEXANDRE[1]

[1]DEPARTMENT OF SURGERY GENERAL HOSPITAL OF BAGNOLS SUR CEZE FACULTY OF MEDICINE OF MONTPELLIER

Objectives: Since Aselli, many great pionners of lymphology had built , stone by stone our present : Harvey, Cruishank , Mascagni , Pecquet , Sappey , Gerota, Rouviere, Papamiltiades and each put his stone in the field of his own speciality : anatomy,physiology,radiology , surgery , physiotherapy ,biology , genetics , psychology, social management …

Background: So in 1965 in New Orleans , invited by Mayerson , Ruttiman and Foldi decided to create a peculiar and new society : unic and only focused on lymphatic system . In 1966 , was born in Zurich the international Society of lymphology (ISL) : many glorious colleagues : M.and C. Witte, Gruwez , Godart … Thirteen years after, some months before the 7th ICL , and on the initiative of Albert Leduc eight persons decided to create in Brussels an european society : GEL(Groupement Européen de Lymphologie)This successfull initiative drove to the development of ESL(European Society of Lymphology)

Methods: Many challenges : rules and by-laws, language ; at the beginning there was a competition but quickly became a boon ; the way of those two societies were coming together to form a common platform : all the presidents of ESL till 1987 are members of ISL : Pissas , Campisi, Bourgeois, Michelini, Boccardo ….Many other national lymphological societies were created in each country : the more important are the american , the japonese and in europe the german .And so ,slowly but with determination new colleagues new ideas were born . ESL held its 26th congress in Assisi in 2022 and ISL its 29th in Genoa in 2023.Many new topics were opened concerning imaging : classical lymphograhy was left , CT Scan , MRI , lymphoscintigraphy ,lymphofluorescence.Some surgeons involved in oncology proposed the concept of Sentinal Lymph Node

Results: Lymphedema considered as inevitable before 1960 was treated by manual drainage , or some surgeons tried to supply decrease of lymph flow by lympho venous anastomosis ; eventually transplantation ; some colleagues prefer liposuccion to reduce volume. Psychology and quality of life , social approach went on with the evolution of north societies .But the very great progesses were done in molecular biology , genetics : try to identify some pats of DNA of our chromosoms linked to lymphatic pathologies

Conclusions: We do not know the future : maybe surgery wil disappear and perhaps the biological surgeon in the future will cut and sew up DNA chains .

Keywords: history, anatomy, lymphedema

OP-128

D Vitamin and Its Importance for Lymphedema and Lipedema

Seçil Pervane Vural[1]

[1]Özel Koru Hastanesi, Ankara

Objectives: This article aims to emphasize the importance of Vitamin D for the body's overall health and well-being, highlighting its role in regulating mineral absorption, immune system function, bone health, and muscle function.

Background: Vitamin D deficiency is a significant concern that can lead to various health problems such as osteoporosis, weakened immune system, muscle weakness, and psychological symptoms. While sunlight is the primary source of Vitamin D, it can also be obtained from certain foods and supplements.

Methods: The study utilized a comprehensive approach to explore the relationship between Vitamin D deficiency and health conditions, including lymphedema and lipedema. It involved analyzing data from various sources, including clinical studies and research articles, to understand the impact of Vitamin D on different physiological functions.

Results: The findings revealed that Vitamin D plays a crucial role in maintaining bone health, immune system regulation, cardiovascular health, and metabolic balance. Adequate levels of Vitamin D are essential to prevent health issues associated with its deficiency.

Conclusions: In conclusion, ensuring sufficient intake of Vitamin D through sunlight exposure, diet, and supplementation is vital for overall health and well-being. Further research is needed to fully understand the relationship between Vitamin D deficiency and specific health conditions like lymphedema and lipedema.

Keywords: lymphedema, lipedema, vitamin D

OP-129
VASCULAR MALFORMATIONS RELATED WITH LYMPHEDEMA?

Raul Mattassi[1]

[1]Columbus Medical Center, Milan, Italy

Objectives: -To improve the diagnostic procedure by selecting the most effective investigations-To improve the selection of the best treatment in the specific case

Background: Vascular malformations are inborn errors in the development of vessels that my involve arteries, veins and lymphatics. There are two types of defects: truncular, which defects of the main vascular trunks and extratruncular forms which manifest with masses of abnormal vessels in the context of tissues. Truncular lymphatic defects cause primary lymphedema, while extratruncular forms manifest with local masses in different parts of the body. Association with other type of defects is possible. The result may be extreme variable clinical pictures which requires a correct diagnostic approach necessary to be able to choose the best treatment. Mandatory is the recognition of the type of extratruncular defect (microcystic, macrocystic of mixed), combination of the different size of cyst and existence of also other type of defect, like venous malformations. Sometimes the selection of diagnostic procedures may be difficult as well as the decision of the strategy to approach and the technique to use.

Methods: A group of 116 cases of extratruncular lymphatic malformations were studied retrospectively by clinical examination and review of the investigations that were performed. Location of the malformation, type of the defect (microcystic, macrocystic and mixed) were recorded as well as the combination with other type of vascular malformations. Type of treatments were also signed as well as results.

Results: Location of the malformations were head 27%, upper limbs 22%, lower limbs, 22% , thorax 10%, abdomen 9%, neck 5% and gluteus 5%. Type of defects were: microcystic 50%, macrocystic 21%, mixed (micro + macro) 15% and combined with other defects 14%. Treatments incidence were: medical treatment 14%, surgery 38%, ethanol sclerosis 24%, laser 22% and electroporation 2%. Result of the echo Doppler examination was the most effective method to determine the size of the cysts which was the main data for the decision between sclerosis and other procedures. Surgery is the most frequent technique used in this study, followed by ethanol sclerosis. Limited masses had the best result by surgery. Macrocystic forms had an excellent regression by ethanol sclerosis.

Conclusions: Diagnostic of lymphatic extratruncular malformations should follow a precise progression by steps, from the easiest method (clinical examination), to echo Doppler and to MR. Only after obtaining a complete diagnosis, a treatment strategy should be decided, preferable in a multidisciplinary group.

Keywords: lymphangioma, lymphatic malformations

OP-130

BioBridhge in combination with CDT - a novel approach in lymphedema treatment

Aleksandra Rovnaya[1]

[1]State St Petersburg Medical University

Objectives: Development of new therapeutic approach to complement and improve the long-term outcome of CDT through utilization of recent advancements in research on lymphatic drainage by combining CDT with a minimally invasive implantation of BioBridge. Development and validation of treatment protocol to evaluate the efficacy of the combination therapy that can be applied in clinical practice.

Background: Effective treatments for lymphedema of the limb(s) are limited. Traditionally, the golden standard of care is the Complete Decongestive Therapy (CDT) which includes MLD, multilayer short stretch bandaging/flat knit compression garments, exercise, and skin care. While CDT has been shown to successfully reduce excess limb volumes, it cannot restore the functional capacity of the lymphatic system. The challenges of CDT are that it requires patient commitment to a life-long diligence to limit the progression of the disease and maintain treatment results and creates a costly time-consuming dependency on compression garments and ongoing CDT sessions. Microsurgery for lymphedema treatment has shown promising results but has many limitations and requires highly qualified personnel, specific equipment, may not be easily accessible and affordable. Combination of microsurgery with BioBridge® Collagen Matrix(BioBridge) - aligned nanofibrillar collagen scaffold - has already demonstrated its safety and efficacy in further reducing limb volume and tissue fibrosis, but still has similar issues with accessibility and cost because includes microsurgery.

Methods: ICG lymphography will be used to map the lymph drainage pattern in lymphedema patients, and BioBridge scaffolds will be implanted to enhance the existing and/or create a complementary drainage routes, to direct the flow of extracellular fluid along the BioBridge to the regions with identified viable lymphatic system improved with CDT. Identification of the functional lymph drainage route increases the efficacy of CDT; BioBridge scaffold implantation increases lymph drainage along the scaffold, therefore the efficacy of this approach will be evaluated by comparing pre- and post-treatment lymph flow pattern by ICG lymphography and limb volume by tape measurements/perometr

Results: A single-arm, prospective, open-label pilot study has been designed to evaluate efficacy of combining CDT with BioBridge implantation in patients with unilateral secondary lymphedema of the upper limb, based on ICG lymphography and volumetric analysis. A treatment protocol has been developed to implement the combination of CDT with BioBridge in clinical practice.

Conclusions: Using BioBridge collagen scaffolds in combination with classic conservative treatment is a promising technology for lymphedema treatment, and final conclusions we will have in the end of the study.

Keywords: BioBridge, Collagen scaffolds, Lymphangiogenesis, Combination with CDT

OP-131

Implementing changing treatment protocols for greater success

Jane Wigg[1], Stacy Pugh[2], Erika Van der Mescht[3]

[1]Lymphoedema Training Academy
[2]LymphVision
[3]Lymphtherapy

Objectives: By the end of the session the delegate will;1. have an understanding of differing treatment protocols and their cost effective outcomes2. understand how to induce anoikis during a DLT treatment to assist improved outcomes.

Background: Lymphoedema Management has continued the same linear path for several decades, with little change from traditional treatment programmes of Complex Decongestive therapy (CDT) or Decongestive Lymphatic Therapy (DLT). Despite this there have been advances in: understandings of cellular and biological pathology and inflammation; the introduction of ICG has informed lymphatic pathways and drainage routes; and, there have been advancements in compression garments. Our organisation has published treatment protocols to reflect these advancements in clinical evidence. Our protocols include lifestyle and dietary advice, including, assisting gut microbiome reducing inflammation. This presentation will discuss the changes in treatment protocols, respecting science and including innovation to improve outcomes.

Methods: Cases studies will be presented describing the DLT treatment protocols used to treat six people with lymphoedema. The outcomes evaluated include limb volume, tissue changes, limb circumference and skin thickening to determine if new protocols were of use. Patients were assessed at day1, and 3.Protocols consisted of daily Multi component bandaging, exercises, application of top layer bandage, exercise, removal and MLD to root of limb, and application of Velcro wrap for self reduction therapy. Treatment was for three or four days.

Results: Evaluation of new protocols (Belgrado Method) in these cases, demonstrate optimised treatment protocols reduce and maintain lymphoedema. MCB carried out over 3-5 days induced anoikis, with MLD carried out to the root of the limb only reduced lymphoedema. The number of treatment days was reduced and faster volume reduction and improved wellbeing were observed.

Conclusions: To ensure cost effect treatment, change is warranted embedded by improved understanding of physics and biology. This understanding has reduced the number of treatment days required to obtain reduction with DLT.

Keywords: Multi component Bandaging, Treatment protocol, Anoikis

OP-132

Superdry liposuction in treatment of lipedema-20 year experience

AliRıza Erçöçen[1]

[1]Bayindir Health Group Hospitals Dept of Plastic Reconstructive and Aesthetic Surgery

Objectives: Lipoedema, which is referred to with different definitions in the medical literature, is still an unknown entity and its treatment is not standardized, although its awareness is increasing day by day in social platforms.

Background: In this article, we will present the clinical results of a total of 295 female patients aged between 19 and 67 years who were diagnosed with lipedema according to standard diagnostic criteria between 2003 and 2022 and treated for lower leg lipedema with the standardized superdry liposuction technique by the same surgeon. The main criteria for patient selection were: BMI≤26, no metabolic and hormonal disease, hemoglobin ≥10g/dl, no venous insufficiency of grade 2 or higher in the lower extremities, no prominent varicose veins and packs, no stage IV lipolymphedema. BMI, proximal to distal thigh and leg perimetric circumferential measurements were performed and recorded in all patients at preop and postop controls.

Methods: Of the patients who underwent surgical treatment, 88 were classified as stage I, 177 as stage II, and 30 as stage III, All patients underwent superdry liposuction of the lower legs-distal thigh to midfoot regions-in a single session under general anesthesia with special liposuction cannulas during the operation period ranging from 2. Class 2 medium pressure compression stockings were applied intraoperatively and used continuously for at least 3 months in all patients, Manual lymph drainage massage was applied for 2-3 months with 2-3 sessions per week starting from the 3rd postoperative day. Controls were performed at the earliest postoperative 3 months and then at the first postoperative year and compared with preoperative values.

Results: The postoperative success rate was 93%, with a significant reduction in limb thickness, limitation of movement, spontaneous pain, bruising, and tightness, and a significant increase in psychosocial status, self-confidence, and quality of life.

Conclusions: The advantages and disadvantages of the superdry liposcution technique, which has been applied by a single surgeon for 20 years and no recurrence or relapse has been encountered, will be presented.

Keywords: lipoedema, lipedema, superdry liposuction

OP-133

Multidisciplinary approach to difficult lymphedema cases with obesity.

Franz-Josef Schingale[1]

[1]Lympho-Opt

Objectives: Obesity is a worldwide disease. In Germany about 54% of women and 68% of men are overweighing. In our hospital we see more obese patients than in the normal population.

Background: Obesity puts the lymphatic system at risk. We recognize that obesity confers a higher risk of progression of lymphedema. Lymphostatic edema of the legs is very often seen in morbidly obese patients with BMI >40kg/m². We call this type of lymphedema "dependency syndrom" because fat deposition is causing edema and skin changes. It is explained by a passive calf muscle pump, resulting venous hypertension, and inactivity.

Methods: Treatment DecongestionTransition to healthier ways of eatingMeal replacements / low energy diet, low carbMore physical activityBehavioural therapy, psychological therapyAnti-obesity medicationsBariatric surgeryTreatment DecongestionTransition to healthier ways of eatingMeal replacements / low energy diet, low carbMore physical activityBehavioural therapy, psychological therapyAnti-obesity medicationsBariatric surgery

Results: Reduction of weight and decongestion reduces lymphedema

Conclusions: Gastric banding and gastric bypasses are offered as "the only solution" for lymphedema in obesity. The gastric surgery causes weight reduction, but most of the patients are still morbidly obese even after reduction is obtained. Patients may even return to their previous weight as the underlying causes of the weight gain are unresolved.

Keywords: obesity, lymphedema, decongestion, treatment of obesity

OP-134

Case studies indicating an improvement in secondary lymphoedema using medical ozone therapy (OT).

Jane Wigg[1]

[1]Lymphoedema Training Academy

Objectives: By the end of the session the delegate will be aware of the benefits of ozone therapy, how it works and its place in lymphoedema management. You will be aware of how ozone therapy is delivered and areas of use and benefit.

Background: Ozone therapy (OT) is used in traditional and complementary medicine combining 3 oxygen molecules. Studies demonstrate that systemic application of OT is effective in reducing organ damage from inflammation and oxidative stress. It has some cytoprotective effects against tissue damage in inflammatory disease and by reducing pro inflammatory cytokines, it offers an adjuvant treatment for lymphoedema. It can be delivered either via direct blood infusion (Major Autohemotherapy- MAHT), or intra joint in addition to rectal or vaginal application.

Methods: Two highly adherent patients with secondary lymphoedema and previous lymphatic surgery were offered OT and an adjunct therapy to their lymphoedema management. Pre and post treatment assessment included location/extent of oedema, skin condition, subcutaneous tissues and tissue dielectric constant (TDC) measurements. Patients completed pre and post questionnaire including impact upon their mobility, mood, relationships, occupation, hobbies/interests, appearance and quality of life. Both received weekly Major Autohemotherapy (MAHT) OT for 4 weeks followed by 2 fortnightly treatments. All other treatment remained the same.

Results: Both patients reported an improvement in the subcutaneous tissues, with the limb 'wobbling' and improved movement. The post questionnaire demonstrated improvement of mood, appearance and improved effect on occupation. Therapist post assessment demonstrated quantifiable changes as reduced TDC and softer subcutaneous tissue.

Conclusions: Evaluations have indicated; softening of fibrosed areas; visible reduction in oedema and reports of improved skin tension. In addition, general improvement of increased wellbeing and energy. OT provides targeted anti-inflammatory treatment for lymphoedema. Larger studies are required to monitor the effectiveness of OT for lymphoedema. These initial case studies offer a promising set of results and a possible new approach to addressing the inflammation associated with lymphatic conditions. In addition MAHT is used to support cancer journey and side effects of treatment.

Keywords: Ozone therapy, MAHT, Lymphoedema

OP-135

Incidence of lymphoscintigraphic abnormalities in the healthy lower limb in patients with unilateral secondary lymphedema. Preliminary experience with hybrid imaging

Villa Giuseppe[1], Boccardo Francesco[1]

[1]IRCCS San Martino Hospital1

Objectives: The aim of this study is the evaluation of bilateral lymphedema in patients with climically secondary unilateral lymphedema of the lower limbs

Background: Population and method: 123 consecutive patients (average age 61 years, 35 males and 88 females) with confirmed or clinically very suspicious unilateral secondary lymphedema of a lower limb underwent lymphoscintigraphy of the superficial and deep circulation respectively by subcutaneous and intrafascial injection of 99mTc -nanocolloid. The examination was carried out on different days for each circle. The total body images were recorded 20, 60 and possibly 120 minutes after the injection of the radiopharmaceutical. A multifactorial quantitative parameter (Transport Index) was calculated for each lymphatic circulation studied, both in limbs affected by edema and in clinically negative limbs In 18 patients the examination was completed with SPET tomoscintigraphic examination combined with CT (hybrid imaging).

Methods: The total body images were recorded 20, 60 and possibly 120 minutes after the injection of the radiopharmaceutical. A multifactorial quantitative parameter (Transport Index) was calculated for each lymphatic circulation studied, both in limbs affected by edema and in clinically negative limbs In 18 patients the examination was completed with SPET tomoscintigraphic examination combined with CT (hybrid imaging).

Results: The lymphoscintigraphic study demonstrates pathological findings in 92% of limbs with edema; among the affected limbs, abnormalities of only the superficial circulation were found in 16%, only the deep circulation in 18% and both pathological in 58%. A pathological TI was found in 31% of limbs without evidence of disease (superficial only 6%, deep only 14%, both 11%). Addition of SPECT/CT to planar scintigraphy has shown a very high rate of change compared to the planar study (Baulieu F, 2014; Hai-Jeon Yoon, 2023). In our initial experience, hybrid SPECT/CT appears to be able to provide more in-depth information on the extension and localization of dermal flow and on more accurate anatomical identification of inguinal-iliac vessels and lymph nodes.

Conclusions: Our data confirm the need to study both circles and both limbs in order to understand the lymphatic anomalies responsible for lymphedema and to establish the most effective therapeutic strategy. Actually, the association of planar and hybrid imaging provide useful and additional information in lymphatic disorders

Keywords: Lymphoscintigraphy

OP-136

DOT-IPC Mechanical Lymph drainage new combined technique

Alberto Macciò[1]

[1]Humanitas Medical Care & Gavazzeni - Bergamo

Objectives: To demonstrate the effectiveness of the complex decongestive therapy treatment in patients affected by primary and secondary lymphedema in the lower limbs, using Intermittent Pneumatic Compression combined with the use of the Dots. The aim is to establish whether this new therapeutic protocol can lead to a faster and more effective reduction of edema, thus reducing the number of patients' visits to healthcare facilities. We consider this approach an upgrade compared to the standard uses of Intermittent Pneumatic Compression.

Background: We have recently experienced the global pandemic of COVID-19, which has led us to reflect on how to refine and improve the possibility for patients to be more independent at home, thus minimizing their access to healthcare facilities as much as possible. With this purpose in mind, the use of Intermittent Pneumatic Compression has been reconfigured, integrating it into the treatment plan and ensuring that the patient can reach the maintenance phase more quickly, making it more manageable at home

Methods: Between 01/01/2023 and 30/05/2023, 23 patients [Table 1] suffering from lymphedema in the lower limbs (primary/secondary) were enrolled and underwent a treatment cycle: 4 sessions scheduled weekly, lasting 50 minutes at 35mmHg pressure. The patients wore stockings equipped with Dots applied under the machine's calf section.The machine had a peristaltic sequential pattern with a minimum of 8-12 sectors. Volumetric measurements were taken using a 3D perometer at the beginning and end of the treatment cycle.

Results: Compared to the GOLD standard treatment, which involves an average of 8-12 sessions of attack therapy required to reach the flat line and the maintenance phase, a significant reduction in the time needed to achieve the flat line and a shorter number of sessions required for positioning the stocking has been observed.

Conclusions: Based on the results obtained, we can assert that a significant improvement in the clinical picture is possible thanks to the use of the DOT IPC protocol, and that this treatment, along with the accurate use of elastic stockings, could lead patients to undergo follow-up checks at healthcare facilities with lower frequency and enable them to manage the condition more independently.

Keywords: Lymphedema, Compression therapy

OP-137

Volume Assessment In Lymphedema: Perometer In Clinical Practice

Alberto Macciò[1]

[1]Humanitas Medical Care & Gavazzeni - Bergamo

Objectives: In lower limbs lymphedema the monitoring of the progress of the therapies and their effectiveness takes place using both the clinical / instrumental evaluation of the tissues both the measurement of limbs volumes. The water volumetry has historically been considered the reference, although it has the limit of poor practicality in daily use. Several studies have subsequently shown how the perometer produces results superimposable (for precision and repeatability) to those of water volumetry with the advantage of simplicity of execution. Therefore, in order to evaluate the results of the therapy over time, it is essential to be able to evaluate, accurately and in a non-invasive way, the volume variations of the limb during the therapeutic process.

Background: our study aims to define a protocol that can help the specialist in managing the timing of treatment, both to better define in terms of quantitative assessment the transition from attack therapy to maintenance therapy and for better management of follow-up.

Methods: patients diagnosed with lower extremity lymphedema (primary or secondary) who referred to Alberto Macciò Medical Office underwent perometric scanning with Bodytronic®600 for volumetric assessment of the lower extremities and related Body Mass Index calculation

Results: Perometric scanning performed regularly at each visit allows the patient's condition to be monitored and possibly, in a timely manner, detect volumetric changes and investigate their cause.

Conclusions: volumetric monitoring of the limb in patients with lymphedema helps in the management of therapy as it allows identification of the maximum volumetric decrease achieved and consequently placement of the elastic stocking at the most correct time. In addition, at follow-up, changes can be highlighted quantitatively and timely intervention is possible.

Keywords: Perometer, Lymphedema

OP-138

LIPEDEMA TODAY: TREATMENT AND PROGRESSION

Isabel Forner-Cordero

Lymphedema Unit, Hospital Universitari i Politècnic La Fe, University of Valencia, Valencia, Spain

Lipedema is a chronic disease, frequent in women that causes an abnormal fat deposition in their lower limbs, easy bruising and pain, and a remarkable physical and psychological disability.

Despite the prevalence and the impact on patients' quality of life, little is known about the disease, and most of the patients are misdiagnosed as lymphedema or obesity.

Due to the absence of a defined etiology, evidence-based research is difficult in the management of lipedema. The setting of realistic expectations is important for both patient and medical care providers. The major aims of the management are multimodal for improvements in the quality of life; reduction in heaviness and pain, reshaping the affected limbs, weight control and improvements in mobility. Compression garments, physical therapy, exercise regimens, diet and psychological counseling are necessities. For selected patients, surgical treatment is an added option.

Few studies have been published concerning the evolution of lipedema. In our study with 100 lipedema patients, stability of the volume was observed in 62% of the patients, progression in 28% and improvement in 10%.

Age was not related to progression. Progression was related to body mass index increase but more interestingly with Waist-to-height ratio increase, that is an indicator of abdominal fat gain. This demonstrates the relationship between fat gain with the evolution of lipedema.

OP-139

Dosage of CDT in multicausal lymphoedema compared to lymphedema in pure form

Prof. Etelka Földi

Földiklinik, Center for Lymphology

Hinterzarten / Germany

Lymphedema caused by impaired lymphatic drainage in both forms: primary and secondary. New investigation possibilities have opened up for the visualisation of transport disorders in the drainage system. What has remained largely unexplored is the level of the lymphatic load, which is largely the result of microvascular filtration.

When microcirculation is impaired lymphatic load can be elevated. Both primary and secondary lymphoedema can occur in combination: Impaired drainage function with increased amount of fluid to be drained. The clinical consequences are rapid oedema progression and an increased need for therapy. We then speak of primary or secondary lymphoedema, aggravated by multimorbidity.

The number of patients suffering from lymphoedema has increased over the last 20 years, particularly in older patients with no evidence of primary or secondary forms of lymphoedema in their medical history. Based on findings from animal experiments, we have assumed that multimorbidity with an increase in lymphatic loads can cause an originally healthy lymphatic system to decompensate over time. We then described the resulting chronic oedema as multicausal. In the literature, we found numerous clinical pictures in which an increase of capillary permeability is described, resulting in elevated lymphatic load. We analysed the frequency of these diseases (diabetes, neuropathy…).

The lecture deals with multicausal lymphoedema and the need for multimodal therapies.

OP-140

Other Microsurgical Techniques: Peripheral LVA, Lymph Nodal Transplants – Pros And Cons

Sarah Thomis

Lymphovenous anastomosis (LVA) and lymph node transplantation are reconstructive surgical procedures used to treat lymphedema. LVA involves creating direct connections between lymphatic vessels and nearby veins to bypass blocked lymphatic pathways. This procedure aims to improve lymphatic fluid drainage and reduce swelling.

One advantage of LVA is its minimally invasive nature, often performed under local anesthesia, which can lead to quicker recovery times compared to more extensive surgeries. LVA can be particularly beneficial for early-stage lymphedema or in cases where localized lymphatic dysfunction is present.

However, LVA may not be suitable for all patients, especially those with advanced lymphedema or extensive lymphatic damage. The success of LVA can vary depending on individual factors such as the severity and cause of lymphedema, and not all patients experience significant improvement.

On the other hand, vascularized lymph node transplantation involves transferring Dear healthy lymph nodes from one part of the body (often from the groin or abdomen) to the affected area. This procedure aims to restore lymphatic function and reduce swelling by introducing healthy lymphatic tissue.

One major advantage of lymph node transplantation is its potential for long-term improvement, as the transplanted lymph nodes can establish new drainage pathways over time. This procedure is typically considered for patients with more advanced lymphedema who have not responded well to other treatments.

However, lymph node transplantation is a more complex procedure than LVA, often requiring general anesthesia and a longer recovery period. Complications such as donor site morbidity and wound problems are also considerations.

In conclusion, both lymphovenous anastomosis and lymph node transplantation offer potential benefits for treating lymphedema, but they also come with considerations and limitations. The choice of procedure and timing should be carefully discussed between the patient and their healthcare team based on imaging techniques, individual circumstances and treatment goals.

OP-141

Fifty years for Lymphatic Surgery: Advances and Future Perspectives

Corradino Campisi, MD, PhD, FACS

Professor of General Surgery (2004-2018), Specialist in General, Vascular & Emergency Surgery, Research Center & Scientific Section «Clinical Lymphology, Lymphatic Surgery & Microsurgery» - Department of Surgical Sciences and Integrated Diagnostics – DISC, School of Medical Sciences & Pharmaceutics - University of Genova, Genoa, Italy.

Dr. H.C., Prof. H.C., Honorary Fellow of the Italian Society of Surgery – SIC, Honorary President of ISEM, Chairman of Past Presidents Advisory Board ISL | President of the Italian (SIL) & Latin-Mediterranean Chapter of ISL,

Past President of Italy Chapter of ACS, and of ESL

Abstract

The Author presents the 50 years of Research and Experience on Surgical Therapy of Lymphatic and Chylous Disorders with Related Syndromes. The development of surgical techniques to restore lymphatic flow offers a treatment that targets more than symptomatic relief, but above all functional repair of the underlying problem of lymph or chylous stasis. Lymphatic Microsurgery has a basic role in the treatment of these disorders and of their related complications.

New techniques have also emerged for the combined treatment of advanced stages of chronic peripheral lymphoedemas, where there are significant fibrotic adipose tissue deposits with disease progression, which contributes to residual lymph stasis and increased risk of infection.

The original technique of Fibro-Lipo-Lymph-Aspiration using a Lymph Vessel Sparing Procedure (FLLA-LVSP) was developed to improve chronic swelling of patients with advanced lymphoedema.

In the diagnostic protocol and for the follow-up Lymphoscintigraphy of superficial and deep system represents, in the experience of the Author, a fundamental study for the surgical indication, including the Whole Body Lymphoscintigraphy to detect gravitational and/or chylous systemic disorders.

On the diagnostic and prognostic point of view, histopathologic staging by immuno-histo-chemistry is of basic importance.

Keywords: Lymphatic Disorders – Lymphedema – Chylous Disorders – Lymphatic Surgery & Microsurgery – Liposuction

OP-142

Comparison of Consensus Documents and Guidelines for lipedema

Philip Kruppa

Objective: This presentation evaluates key international consensus documents and clinical guidelines on lipedema, with a particular focus on the definition and clinical signs of the disease. The goal is to identify variations and commonalities to inform comprehensive treatment strategies.

Methods: A comparative analysis was conducted on seven major guidelines and consensus documents: the Dutch Guidelines, UK Best Practice Guidelines, German S1 Guidelines, Spanish AEL Consensus Document, International Consensus Document (Paradigm Shift), US Standard of Care, and the German S2k Guidelines.

Results:

The analysis revealed significant variations among the guidelines regarding the clinical definition and signs of lipedema. While all guidelines stress the importance of early diagnosis and comprehensive management, there is considerable inconsistency in the recommendations provided.

Conclusion: Clinical guidelines are crucial for providing comprehensive treatment for lipedema. However, the current lack of standardization across guidelines presents challenges for clinical application and research. Addressing these inconsistencies is essential to improve patient outcomes and advance the understanding and treatment of lipedema. Standardized guidelines would facilitate more consistent clinical practice and better-designed research studies, ultimately benefiting both patients and healthcare providers.

OP-143

Lymphatic system in pathogenesis of hypertension in humans

Angelika Chachaj

Department of Angiology and Internal Diseases, Wroclaw Medical University, Poland

Recent studies, primarily conducted on rodents, has unveiled the crucial role of the skin lymphatic system in maintaining sodium (Na^+) homeostasis, water balance, and blood pressure.

Skin is an extensive reservoir of Na^+ ions stored in an osmotically inactive form on glycosaminoglycans (GAGs). Accumulation of Na^+ in the skin of rodents fed a high-sodium diet resulted in hypertonic stress and subsequent stimulation of a pathway that started with infiltration of the skin by macrophages and activation of the nuclear factor of activated T cells 5 (NFAT5), also known as tonicity-responsive enhancer binding protein (TonEBP). The next step was macrophage secretion of vascular endothelial growth factor C (VEGF-C) and activation of lymphangiogenesis in the skin. Blocking the macrophages – VEGF-C – lymphangiogenesis axis in rodents' skin fed a high-sodium diet by genetic or pharmacological interventions resulted in salt-sensitive arterial hypertension. Recently, observational studies demonstrated that the NFAT5–VEGF-C–lymphangiogenesis pathway might also be present in humans.

The regulatory pathway, proposed in the experimental rodent model, holds significant promise as a potential protective mechanism against arterial hypertension. The primary stimulator of lymphangiogenesis, vascular endothelial growth factor C, also regulates the pump activity of lymphatic vessels and induces the expression of endothelial nitric oxide synthase (eNOS), which is associated with vasodilation and potentially, blood pressure reduction through NO elevation. Moreover, the formation of new lymphatic vessels might facilitate the removal of Na^+, water and hyaluronic acid from the skin interstitium.

The lecture is intended to provide a comprehensive summary of the most recent findings regarding the role of the skin lymphatic system in the pathophysiology of arterial hypertension.

OP-144

Education and patient projects in lymphology: why and how to develop a system

Aleksandra Rovnaya

St Petersburg State Medical University n.b. I.P. Pavlova, St Petersburg, Russia

Introduction: Russia – as many countries in the world – has many problems with lymphedema treatment: no insurance coverage; high cost of treatment and compression garments; no local production of flat knit compression garments; no LE treatment/diagnostics standards; no past education about lymphedema so lack of lymphology specialists; lack of information about lymphedema for doctors and patients, so most of patients are usually not diagnosed/misdiagnosed and get wrong treatment/no treatment; no cooperation between CDT specialists and lymphatic surgeons, etc. But the approximate number of LE patients in Russia is over 5300000. 10 years ago only one clinic for lymphedema treatment existed.

Aim: to build a system of lymphology treatment and education in Russia, to increase number of lymphology specialists, to increase number of patients who get right treatment on time, to improve providing information to patients and doctors about lymphedema, to manufacture local compression products.

Methods: Development of The Russian Lymphology Association to establish official medical standards for LE diagnostics and treatment, to establish lymphological educational programs in universities, to build connections with international lymphology societies and specialists, to provide information and support about lymphedema to patients and doctors (schools for patients, lectures and conferences for doctors, YouTube channel, journal “LIMPHA”, social nets), to establish local manufacturing of the flat knit garments.

Results: The Russian Lymphology Association was developed, as a part of public healthcare system it can establish official medical standards for lymphedema treatment and diagnostics, which are currently being written by experts, according to ILS, ILF & ELS recommendations. Accredited educational program in lymphology was established in two medical universities, 102 specialists were educated during last 6 years. Russian lymphology specialists are members of ELS, ILS, LE&RN and regularly participate in international lymphological conferences and courses. 28 private clinics treat lymphedema in 23 Russian cities and in Belorussia. 392 schools for patients, 46 lymphology conferences were organized (with international speakers), 3 years participating in The WLD project with total audience over 5000 people, the internet resources audience (YouTube channel, social nets, journal) is over 70000 people. That helps to get good results in prevention and early effective treatment of lymphedema. In 2023 first flat knit CM compression garments of local origin were produced in Moscow. Still financial and social problems exist, the main aim for future is to establish a productive dialogue with Healthcare Ministry about including lymphedema treatment into medical insurance programs and reimbursement of compression garment cost.

OP-145

Adapting CDT for Pediatric Patients

Pınar Borman MD Professor of PMR

Ankara Medipol University Medical Faculty Department of Physical Medicine and Rehabilitation, Ankara, Turkey

Pediatric lymphedema is generally represented by developmental lymphatic vascular deficiency which can be either congenital or hereditary but it rarely occurs in children with an intact lymphatic system, due to secondary causes consisting infection, trauma, and other conditions. Diagnosis is based mainly on clinical findings but physicians have to take detailed anamnesis, perform extensive physical examination for coexisting systemic involvement and secondary causes, and carry out required imaging modalities. Prevention of progression, early diagnosis and proper treatment are crucial in the management of pediatric lymphedema. There is no cure for this lifelong condition, but complete decongestive therapy -CDT (skin care, manual lymphatic drainage, multilayer bandaging, exercise, pressure garments, self-care education) as a gold standard of lymphedema treatment, reduce the volume, decrease the incidence of complications and improve quality of life in pediatric patients. The CDT principles resemble to those for adults but some modifications may be needed in compression degrees and pressure garments. As the tissues in pediatric cases are delicate, great care should be taken to avoid discomfort or injury. In MLD; depending on the age and size of the child, soft stationary circles and pump techniques may be used. Children are generally active and will not lie still the entire length of treatment session, bringing a favorite toy, game or book may be helpful. The MLD as home-program, can be applied when the child is asleep. Materials and techniques used in bandaging depend on child's age and developmental situation (decreased number of layers, extrasoft padding for delicate tissue). Multilayer short stretch bandages are not applied before the ambulation (toddler period),toes are not wrapped in small children. Bandages must not interfere with normal growth and should not greatly compromise the ability to walk or daily living activities. It is necessary to check the bandage several times during the day/ slipping- tourniquet and they may have to be renewed multiple times per day during the intensive phase. Compression garments are not recommended for children younger than 1 year of age. 18-21 mm Hg of compression (Class 1) should not be exceeded in children younger than 4 years of age. Custom garments according to site and severity of LE should be used.The use of compression garments during the day generally does not affect normal activities but frequently control for skin breakdown is needed .Colorful patterned garments may increase the compliance. In addition to wearing the compression garment during the day, in many cases it may be necessary to apply bandages during the night time. The garments should be checked every 4-6 months for general condition, proper compression and size. Children should be encouraged to engage in sports and recreational activities (walking, swimming, cycling). Limitations in activities of children should be avoided. Exercises should preferably be performed with pressure garments . The positive effects of pumps especially with new models have been shown in some pediatric patients. The pressures should be adjusted to the age of child, site and grade of lymphedema. Previous studies indicated better effects of kinesio-taping on decreasing lymphedema, when performed in addition to CDT. Caution is needed for childrens' delicate skin and allergic reactions, a small test strip may be needed before the application.

In conclusion CDT is the gold standard for treatment in pediatric lymphedema patients and resemble to those with adults but should be applied with modifications according to age, lymphedema site, and stage and great care should be taken to avoid discomfort or injury in their delicate skin.

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OP-146

The importance of the correct compression garment in conservative and surgical lymphedema treatment

Aleksandra Rovnaya

St Petersburg State Medical University n.b. I.P. Pavlova, St Petersburg, Russia

Introduction: Compression garments are still one of the core stones of effective maintenance of the results of lymphedema treatment: it is one of the irreplaceable components of the 2nd phase of CDT, which is the golden standard of the conservative lymphedema management, and the same time it is a well known way to improve and maintain results of different types of surgical lymphedema treatment. Still the compression garment topic is not widely spoken, or educated to medical personnel or put attention to. In different clinics the measuring for custom made flat knit garments and fitting of garments are done by different specialists, sometimes even without medical background (e.g. personnel of orthopaedic shop), or by not experienced in lymphedema treatment personnel. The protocols of supervising of fitting and effectiveness of the garment are absent in many places. That can lead to several problems , which result in compromising and losing the effectiveness of the treatment done before putting on a garment.

Aims: To analyse the frequency of the incorrect fitting of compression garments in patients in our clinics, to search for correlation between medical background in lymphedema treatment of a fitter and frequency of incorrect garments, to work out the educational program for measuring/fitting the garments, to work out a protocol of supervision a patient after fitting a garment.

Methods: a systematic literature - PubMed, Medline, Cochrane, and ALF, ILF, LE&RN, LSN resources were observed. As well, the analysis of patients in our clinics was done (2 years observation) – the frequency of incorrect fitting of custom made flat knit compression garments in patients, who got it from orthopedic shops or in clinics with personnel not trained in lymphedema treatment and who got it in our clinics where the measuring was done by experienced lymphologists. We also analyzed the outcome of the treatment (conservative – CDT, and surgical – LVA, LNT, liposuction), both physical and psychological (satisfactory level with the treatment) that have been performed before fitting a compression garment, on a 5-7 days and 1 month perspective in cases of correct and incorrect compression garments. We also analyzed the situations when patient after receiving a garment is fitting it himself without supervision.

Results: The number of incorrect garment fitting is the highest in the group when measures are done by personnel of orthopaedic shops or without medical background about lymphedema – 87 out of 105 cases. When the measuring was done by lymphology experts in specialized clinic – 15 out of 160 cases had complaints on fitting. The incorrect garments compromised the results of conservative and surgical treatment – the recurrence of edema more than 10 % in volume happened in 95 out of 102 patients with incorrect garment in 1 month after treatment. In cases when patient was supposed to fit his garment himself after receiving it, 75% fitted and were wearing it in incorrect way.

Conclusions: If possible, the measuring for custom made compression garments should be done by medical personnel trained in lymphedema treatment, who is understanding the behaviour and nuances of oedema in individual cases and who knows and can evaluate the background medical history of the patient. The incorrect garment results in compromising the effects of conservative and surgical treatment and recurrence of lymphedema, but in patient's mind he is not satisfied with the treatment itself, not connecting the problem with incorrect garment, and that can discredit the treatment method. It is strongly advisable to fit the garment in clinic under supervision and check the patient in 5-7 days after wearing it to confirm the correct fitting and no recurrence of oedema.

OP-147

Liposuction of Lipoedema: The Swedish Perspective – Instructor

Anders Liss

In Sweden lipoedema is not included in the group of diagnosis that the welfare- program admits. Patients are not even accepted to have free compressions garments for prophylactic treatment or manual treatment. Lipoedema is considered equivalent to over-weight problem. Liposuction is offered in private clinics offering different techniques and the results varies. Women are organizing to put pressure on the public health system.

Keywords: lipoedema, liposuction

OP-148

Treatment of lymphoedema in congestive heart failure and kidney failure.

Dr. Vaughan Keeley, Derby, UK

Background: Traditionally, compression has been considered to be contraindicated in uncontrolled heart failure, due to concerns about making the heart failure worse. Caution has also been recommended about the use of compression in kidney failure where fluid overload is present, again due to concerns about causing heart failure. However, currently, this approach is being questioned and guidelines have been developed which include the use of compression to manage oedema in certain stages of heart failure. Unfortunately, there is very little published evidence on the risks and benefits of compression in these settings.

A practical approach:

a) Congestive heart failure.

Heart failure may present to lymphoedema services in a variety of forms and management should be adapted accordingly: Examples are:

i) Lower limb oedema due solely to heart failure (which may be previously undiagnosed).

Heart failure is a life limiting condition which should be managed by appropriate specialists e.g. cardiologists. In exceptional circumstances, e.g. lymphorrhoea local light compression bandaging should be considered to control the lymphorrhoea and reduce the risk of cellulitis.

ii) Lower limb oedema may be due to a number of causes, especially in the elderly. These could include heart failure, reduced mobility, obesity and medication.

Initial management of the heart failure as above is appropriate. Following optimisation of the heart failure management, the oedema should have reduced and modified reduced compression may be appropriate to treat other contributory causes.

iii) Chronic leg oedema in controlled chronic heart failure.

Modified reduced compression can be appropriate.

iv) New heart failure in a patient with known lower limb lymphoedema, which causes the oedema to worsen.

Again, treating the heart failure is paramount but modified reduced compression may be appropriate in parallel to this.

b) Kidney failure.

Fluid balance becomes increasingly a problem in advanced kidney failure (e.g. eGFR <=15ml/min). At this stage, dialysis is likely to be used. This should help to control the fluid balance. Oedema may vary in the time between dialysis treatments. Compression probably has a limited part to play (e.g lymphorrhoea, wounds)

If the kidney failure is associated with nephrotic syndrome, hypoalbuminaemia will exacerbate the oedema. In this situation, compression of the lower limb may push the fluid proximally in the limb resulting in increased thigh / genital oedema.

OP-149

Low-Energy Extracorporeal Shockwave Therapy as a Therapeutic Option for Patients with a Secondary Late-Stage Fibro-Lymphedema After Breast Cancer Therapy: A Pilot Study

Erika Joos[1 2], Ina Vultureanu[1], Tom Nonneman[1], Nele Adriaenssens[2], Moustapha Hamdi[2 3], Assaf Zeltzer[2 3]

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Affiliations expand

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- DOI: 10.1089/lrb.2020.0033

Abstract

Background: Secondary lymphedema (LE) can occur after breast cancer (BC) therapy with axillary lymph node surgery and/or radiotherapy. Reported incidence varies around 20%. The aim of this study was to see whether low-energy extracorporeal shockwave therapy (ESWT) is a therapeutic option in end-stage secondary upper limb fibro-LE.

Methods and Results: A pilot study was performed on 10 adult patients who presented with an end-stage LE after BC treatment. They were all treated with usual physical therapy and all had lymphatic surgery before. Eight sessions of ESWT were applied, 2600 shocks at 0.1 mJ/mm^2, 2/week during 4 weeks. Upper limb volume decreased nonsignificantly, from 3086.4 ± 539.47 to 2909.1 ± 471.60 mL. Mean circumference of the upper limb was significantly decreased from 32.3 ± 3.01 to 31.4 ± 2.71 cm at the height of the upper arm, from 29.1 ± 2.89 to 28.1 ± 2.71 cm at the height of the elbow, and from 27.5 ± 4.08 to 26.8 ± 3.75 cm at the height of the forearm. Subjective measurements by visual analog scale showed significant decrease in both hardness from 57.3 ± 15.84 to 24.4 ± 21.89 mm and subjective feeling of edema from 44.2 ± 16.90 to 23.2 ± 21.16 mm. No adverse features were reported. ***Conclusion:*** We added some evidence that low-energy ESWT is well supported and has additional benefits also in longstanding fibro-lipo-LE on swelling of the arm leading to more subjective comfort for the patients.

The use of noninvasive imaging techniques in the assessment of tissue changes in lymphedema ' in the **Imaging Session**

Lymphat Res Biol. 2016 Sep;14(3):127-33.

doi: 10.1089/lrb.2016.0011.

The Use of Noninvasive Imaging Techniques in the Assessment of Secondary Lymphedema Tissue Changes as Part of Staging Lymphedema

An Tassenoy[1], Dorien De Strijcker[1], Nele Adriaenssens[1], Pierre Lievens[1]

- PMID: **27631582**
- DOI: 10.1089/lrb.2016.0011

Abstract: Too often, in clinical settings, the diagnosis and evolution of lymphedema is determined by limb circumference measurements and/or volume calculations. Besides the unrecognition of small lymphedemas, these techniques provide little to no information concerning the stage of the lymphedema. This latter is important in choosing appropriate treatment modalities and making an accurate prognosis. Different imaging techniques are described in literature giving insights in tissue changes due to lymphedema. The aim of this article is giving an overview of possible texture changes linked to the different edema stages, visualized with noninvasive imaging procedures like ultrasonography, computed tomography, dual-energy x-ray absorptiometry, or magnetic resonance imaging.

OP-150

Primary lymphedema: Role of ERG

Pia Ostergaard

Abstract

Objectives: (1) The ETS-family transcription factor, ERG, also has a role in the lymphatic system and (2) pathogenic variants in the *ERG* gene can cause a form of primary lymphoedema.

Background: Primary lymphoedema (PL) is caused by abnormal development of lymphatic vessels or failure of lymphatic function due to genetic abnormality. To date, the genetic causes of about 10-25% of PL cases are known.

Methods: Through whole genome analysis of PL cases included in the Genomics England 100,000 Genomes Project, six proband with novel variants in the *ERG* gene were identified. Verification and co-segregation analysis of the four frameshift and two nonsynonymous variants were completed by Sanger sequencing. Plasmids containing wildtype-ERG or mutant-ERG were overexpressed in human dermal lymphatic endothelial cells (hdLECs), and qRT-PCR, western blotting and immunofluorescence carried out.

Results: Wildtype-ERG was correctly localised in the nucleus with endogenous ERG. However, overexpression of mutant-ERG resulted in a diffuse distribution in the cytosol of hdLECs. Our studies showed that ERG expression colocalise with PROX1, a LEC marker, in vivo by immunostaining of ear skin from mice.

Conclusion: this study identifies novel heterozygous pathogenic variants in *ERG* causing dominantly inherited primary lymphoedema. ERG is a transcription factor, and its role is well known in the blood vascular endothelium as preserving adhering cell junctions, angiogenesis and blood vessel stability. However, the role of ERG in the lymphatic system is not clearly established and will need further study as understanding the underlying causes plays a huge role in the potential for the development of future therapies.

Disclosure of conflict of interest — No conflict of interest

Keywords: *ERG*, genetics, primary lymphoedema,

OP-151

Classifications of Primary Lymphatic anomalies – where do we stand?

Pia Ostergaard

Abstract

Objectives: (1) Clinical testing of a selective group of primary lymphoedema patients gives a diagnostic yield of approx. 11%. (2) Primary lymphoedema is a heterogeneous disease.

Background: Building on more than 20 years of experience in our Primary Lymphoedema Clinic at St George's Hospital, London, a classification of this condition has been proposed. This tool has been useful in our research department as well as molecular genetics and defines the genes being tested in the NHS.

Methods: An audit of all primary lymphoedema patients who underwent genetic testing in 2021 was carried out to get an overview of numbers of cases who ended up with a molecular diagnosis.

Results: The audit showed that only 11% of patients undergoing genetic screening using the Genomics England Primary Lymphoedema (v3.11) R136 gene panel were given a diagnosis. This low yield is despite our experience in selecting lymphoedema cases of clearly primary origin. A large proportion of patients have a variant of uncertain significance (VUS) in one of the known primary lymphoedema gene, but with current knowledge these findings cannot be reported.

Conclusion: This suggests that primary lymphoedema is a very heterogeneous disease and that we still have a long way to go in unravelling the genetic cause of primary lymphoedema. Finding the genetic causes of lymphatic dysfunction in Primary Lymphoedema, increases our understanding of the development of the lymphatic system, and can aid the development of therapies.

Disclosure of conflict of interest — No conflict of interest

Keywords: audit, primary lymphoedema, clinical testing

POSTER PRESENTATION

PP-001

Complex decongestive therapy for lower extremity lymphedema: results from a tertiary care center

Ece Cinar[1], Benil Nesli Ata[2], Ezgi Yildiz Guvercin[3], Sibel Eyigor[1]

[1]Ege University School of Medicine, Dept. of Phsyical Medicine and Rehabilitation
[2]Izmir City Hospital, Dept. of Physical Medicine and Rehabilitation
[3]Kutahya Tavsanli State Hospital, Dept. of Physical Medicine and Rehabilitation

Objectives: In this retrospective study, we aimed to evaluate the effectiveness of CDT in patients with lower extremity lymphedema.

Background: Lymphedema continues to be a hard-to-treat condition that may result from surgery, venous insufficiency, infections or congenital abnormalities of the lymphatic system. Golden standard of conservative treatment is Complex Decongestive Therapy (CDT) which includes compression therapy and manual drainage of the lymph fluid. Most studies assessing the effectiveness of CDT are carried out in patients with upper extremity lymphedema caused by breast cancer.

Methods: We have reviewed and recorded data from the patient files of those patients that had received at least one cycle of treatment for lower extremity lymphedema in the lymphedema care and treatment unit of our university hospital. Demographic data, disease characteristics, percentage of excess volume (PEV), lymphedema volume to body mass index ratio (LV/BMI) and treatment duration were recorded. Statistical analyses were carried out to compare results from patients with different etiologies and from patients that received different treatment modalities.

Results: Treatment outcomes from a total of 198 extremities from 127 patients were recorded and analyzed. Nearly half of subjects (44%) had cancer related lymphedema, followed by lymphedema related to venous insufficiency (23.6 %). Pre- and post-treatment LV/BMI values were significantly higher in the venous insufficiency group, although comparison of decreased volume percentages between the two groups was found to be insignificant ($p>0.05$). Lymphedema grade was found to have a positive and significant correlation with BMI ($p<0.05$). BMI was also positively correlated with the number of removed lymph nodes as well as number of chemotherapy cycles and radiotherapy sessions ($p < 0.05$). Pre-treatment LV/BMI ratio was not found to correlate with any clinical parameters, but post-treatment LV/BMI values showed a positive correlation with patients' activity levels and number of radiotherapy sessions ($p < 0.05$).

Conclusions: In this retrospective analysis of treatment results from a tertiary lymphedema clinic, we have observed that primary lymphedema responds equally well to CDT as cancer related lymphedema. We have also detected similar volume reduction values with CDT in patients with chronic venous insufficiency, although differences in BMI and body composition may have an additional effect on treatment outcomes.

Keywords: lymphedema, lower extremity, cancer rehabilitation

PP-002

The Effect of Treatment With Tumor Type on Lymphedema Volume in Breast Cancer Patients Undergoing Complex Decongestive Lymphedema Therapy - Retrospective Study

Kubra Turker[1], Nuray Alaca[1], Nuray Alaca[2], Cihan Uras[1]

[1]Institute of Senology
[2]Acıbadem Unıversty Physiotherapy and Rehabilitation

Objectives: In the current thesis study, it is aimed to investigate the hormonal tumor type relationship between the results of complex decongestive lymphedema therapy applied to patients with breast cancer and subsequently developed lymphedema, before and after treatment.

Background: Lymphedema is a common disease in women with breast cancer. Finding different related causes of lymphedema. To associate it with the type of tumor or the medications and treatment methods taken.

Methods: This study included 100 patients over the age of 18 with grade I-II-III breast cancer and at least 2 cm of lymphedema who applied to the Acbadem Maslak Hospital Breast Unit and received complex decongestive lymphedema therapy in the clinic. Sociodemographic, clinical disease information, anthropometric measurements and pain assessments of the patients were scanned and recorded from their files.

Results: Low educational status of the patients before the treatment, having cancer in the premenopausal period, aggressive type of surgery, duration of lymphedema, and being human epidermal growth factor receptor 2 positive (HER2+) were found to be factors that increase the severity of lymphedema (p=0,014). In addition, as the severity of lymphedema increased in the area above the lateral epicondyle, the pain values of the patients during activity were higher (p=0,009). In the evaluation of treatment efficacy, lymphedema severity improved less in patients with estrogen receptor positive (p=0,034). Factors associated with treatment effectiveness were determined as low educational status, cancer in the premenopausal period, aggressive type of surgery, duration of lymphedema, and estrogen receptor negativity ($p<0.05$).

Conclusions: Patients with low educational status, cancer in the premenopausal period, more aggressive type of surgery, long lymphedema duration, estrogen receptor positive and HER2+ should be more carefully evaluated and followed up for lymphedema.

Keywords: Breast cancer, Lymphedema, Hormone, Complex Decongestive Lymphedema Therapy

PP-003

The Treatment of Elephantiasis Nostras Verrucosa with Complete Decongestive Therapy

Özge Büşra Arar Batur[1], Hande Yakar[3], Cansu Şahbaz Pirinççi[2], Pınar Borman[1]

[1]Department of Physical Medicine and Rehabilitation, University of Health Sciences, Ankara Bilkent City Hospital, Ankara, Turkey
[2]University of Health Sciences, Gulhane Faculty of Physiotherapy and Rehabilitation, Ankara, Turkey
[3]Department of Physical Medicine and Rehabilitation, Şanlıurfa Education and Research Hospital, Turkey

Objectives: Elephantiasis nostras verrucosa (ENV) is a chronic, progressive, and rare secondary lymphedema syndrome described by cutaneous hypertrophy and deformation. ENV is characterized by non-pitting edema, verrucous lesions, and cobblestone-like hyperkeratotic papulonodules. The aim of this case presentation is to emphasize the effectiveness of complete decongestive therapy (CDT) used in the treatment of lymphedema associated with ENV.

Background: .

Methods: A 31-year-old male patient was admitted to the lymphedema unit with the complaint of swelling and deformity in the right leg. His medical history revealed onset of swelling following right inguinal lipoma excision at the age of 7, while deformity and verrucous lesions had been present for 5-6 years. The patient had experienced 6 cellulitis attacks in the past year, with the most recent occurrence being 1 month prior, necessitating antibiotic use. In the physical examination of the patient, it was observed that there was non-pitting edema extending from the right inguinal region to the foot, as well as scattered pigmented sclerotic skin changes and widespread multiple hypertrophic nodules with a verrucous appearance. Systemic examination was unremarkable. The patient had a body mass index (BMI) of 46.9 kg/m², and laboratory findings showed WBC: 5250/mm³, Hb: 12.8g/dl, ESR: 33 mm/s, and CRP: 20 g/L. Ultrasonographic examination of the right lower extremity venous system demonstrated venous insufficiency of right saphenofemoral junction and perforator veins. According to the International Society of Lymphology (ISL) classification, the patient was evaluated as stage 4 lymphedema. A diagnosis of ENV was made by dermatology based on clinical findings. Medical treatment for skin ulcers was regulated by dermatology and infectious diseases. Within the scope of CDT, 40 sessions of multilayer bandaging and manual lymphatic drainage were applied and self-care methods were trained. After the treatment, there was a significant reduction in right lower extremity volume (40729 cm³ vs 26297 cm³; 54.9%). After the treatment, daily activities and gait pattern were improved. A proper tailored compression garment with was prescribed and self-care methods were recommended. Control examination was recommended 6 months later.

Non-pitting edema, scattered pigmented sclerotic skin changes, widespread multiple hypertrophic nodules with a verrucous appearance

Before and after treatment of the right lower extremity

Results: .

Conclusions: ENV is a significant problem that can affect functionality and quality of life if left untreated. It can lead to permanent disfigurement and chronic skin infections, as well as life-threatening complications such as malignancy and sepsis. The results indicate that diagnosis and prompt application of CDT are recommended as effective methods for reducing extremity volume, improving daily life activities, and preventing complications in these patients.

Keywords: Elephantiasis nostras verrucosa, Complete Decongestive Therapy, Lymphedema

PP-004

A case of very early skin wound complications after lymphedema bandaging

Sedat Öztürk[1], Mustafa Toprak[2]

[1]Van Private Urartu Eye Medical Center, Van, Türkiye
[2]SBÜ Van Training and Research Hospital, Physical Medicine and Rehabilitation Clinic, Van, Türkiye

Objectives: The purpose of this case report is to keep in mind that, especially in patients with a high age group (over 65 years of age), even if bandaging is started with low tension, skin wounds may occur even at a very early stage

Background: A 68-year-old male patient applied to our clinic with a complaint of swelling in his left leg and foot that had been going on for 5 years. He had hypertension in his medical history and had no history of any surgery. No heart failure, renal dysfunction or thyroid dysfunction were detected in the examinations. No thrombosis was detected in lower extremity Doppler USG. Increased interstitial edema in the subcutaneous tissue was reported in lower extremity superficial tissue USG. On physical examination, Stemmer's test was positive. There was 3+ pitting edema in the left lower extremity. There was no genital involvement in the patient. In the patient's lower extremity measurements, left compared to right; An increased diameter difference of 1, 1.5, 3.5 and 4.5 cm was detected from the foot level, from the level 2 cm above the medial malleolus, from the level 10 cm distal to the lower end of the patella, and from the level 10 cm proximal to the upper end of the patella, respectively. Afterwards, compression bandaging was applied. During compression bandaging, an extra layer of bandage was applied to the malleolus and popliteal fossa. Due to the age of the patient, the tension of the winding was kept low. The compression bandage was kept for 12 hours on the first day. The patient continued manual lymphatic drainage and low-tension compression bandaging on the 2nd day. In this application, the compression bandage was kept for 20 hours. When the compression bandage was removed in the third session, an erythematous lesion measuring 3x3 cm was observed on the anterior aspect of the ankle. Treatment was interrupted. At the follow-up visit 2 days later, although the compression bandaging was discontinued, a stage 2 pressure ulcer with the same size in the epidermis and descending to the dermis was observed.The patient was treated with silver wound care spray, moisturizing cream containing hyaluronic acid and silver wound dressing.

skin wound

skin wound

Methods: case report

Results: case report

Conclusions: In this study, we wanted to emphasize that pressure ulcers can occur even in the very early stages of compression bandage application.

Keywords: Lymphedema, complex decongestive treatment, complications, skin wound

PP-005

THE EFFECTS OF TWO DIFFERENT TYPES OF COMPRESSION GARMENTS ON EXTREMITY VOLUME AND PATIENT SATISFACTION IN LYMHEDEMA PATIENTS

Orçin TELLİ ATALAY[1], Sozdar SÖĞÜT TEKİN[2], Atiye KAŞ ÖZDEMİR[3], Sevda YILMAZ[4]

[1]Pamukkale University Faculty of Physical Therapy and Rehabilitation
[2]Pamukkale University Enstitute of Health Sciences
[3]Pamukkale University Sarayköy Vocational School
[4]Pamukkale University Faculty of Medicine

Objectives: OBJECTIVES: The main purpose of the study is to compare the effects of two different types of compression garments on extremity volume in patients with lymph edema. Secondly, it was aimed to find out how the usage of these garments affect patients' adaptation and satisfaction in phase two treatment of complex decongestive physiotherapy (CDP)

Background: BACKGROUND: Complex decongestive physiotherapy plays important role on the management of lymphedema. In the first phase of CDP, a reduction in extremity volume is targeted and preventing the volume decrease is the main purpose of the second phase. For this purpose, compression garments are advised to be worn. The compression garments may, ideally be custom size or as an alternative standard size. This study was planned to compare the effects of these two different garments.

Methods: Twenty-one patients with lymphedema was included in the study. The patients in group I (n=9) used custom size compression garment in phase 2 CDP. The patients in group II (n=12) preferred to use standard size compression garments. All patients received phase I CDP including, manual drainage, exercise, compression bandages and skin care. The circumference of extremities was measured on nine different points and the extremity volume was calculated by Frustum formula. The patients' satisfaction was measured with visual analog scale (VAS) and was also assessed by a short questionnaire prepared related to the daily usage, discomfort, difficulties and satisfaction. All the measurements done at the beginning of the phase 2 treatment, as soon as the patients wore the garment and 6 weeks after.

Results: There was a significant difference in the measurement of extremity circumference at styloid, 15cm above, 15 cm above wrist measurement points between two groups in favor of Group I ($p < 0,05$). The extremity volume of patients in group I was also significantly lower than the patients in Group II ($p <0,05$). Any significance was not found between groups in terms of patient satisfaction ($p>0,05$).

Conclusions: The results of this study showed that custom size compression garments were more effective for preventing the extremity volumes in lymphedema. The patient satisfaction did not differ according to the type of compression garments. Factors affecting the use of compression garments are recommended to be studied in further studies.

Keywords: Lymphedema, Decongestive Physiotherapy, Compression Garment

PP-006

Complete Decongestive Therapy in the Estonian Healthcare: An Overview

Katrin Kõre[1]

[1]North Estonia Medical Centre

Objectives: The aim of the research is to give an overview of the provision of CDT in the Estonian health care system during the period 2014-2023. Within ten years, the number of patients receiving CDT has increased over the years, exceeding the limit of 1,000 patients in 2022 and 2023. The volume of CDT has also increased over the years, from 572 therapies in 2014 to 8,533 in 2023. Over the last few years in Estonia, approximately 1000 patients have received CDT annually. According to data, the prevalence of secondary lymphedema in America is reported to be 1 in 1,000. Based on this data, it can be expected that there are approximately 1,300 patients with lymphedema in Estonia. Although the provision of CDT as a healthcare service could be greater, it is still on the rise, and the number of providers has increased from four in 2014 to 14 in 2022 and 13 in 2023.

Background: Complete decongestive therapy (CDT) is the gold standard for treatment of lymphedema. CDT has been provided in Estonia as a healthcare service since 2014.

Methods: The database of the Estonian Health Insurance Fund on the provision of CDT for the period 2014-2023 was analyzed.

Results: The provision of CDT in the healthcare system has increased over the years. CDT was prescribed to 75 patients in 2014 and to 1,094 patients in 2023. The volume of sessions provided annually has increased from 572 to 8533 services over this period. The volume of therapies provided per person is rather small. This was the lowest in 2019 (6,2 sessions per person per year) and the highest in 2023 (7,8 sessions per person per year).The number of healthcare providers providing CDT has increased over the years, reaching its highest level in 2022 with 14 providers. The largest providers are regional and central hospitals, with smaller providers having been added over time. The majority of CDT is provided to outpatients, with less than 5% of total services provided to inpatients.

Conclusions: Over the past ten years, the number of patients receiving CDT and the volume of therapies provided have increased significantly. This indicates that the service is well-implemented within the healthcare system. Given the studies carried out worldwide on the cases of lymphedema, it can be assumed that there are some extent more patients in need of CDT in Estonia. Research on the prevalence of lymphedema in Estonia would be needed in the future.

Keywords: Complete decongestive therapy, Lymphedema

PP-007

Complete Decongestive Therapy Provided at the North Estonia Medical Centre, 2014-2023

Katrin Kõre[1]

[1]North Estonia Medical Centre

Objectives: The aim of the study is to provide an overview of the use of CDT in the North Estonia Medical Centre (NEMC). NEMC is the largest provider of complete decongestive therapy (CDT) in Estonia, the service has been provided since its addition to the list of health services of the Estonian Health Insurance Fund in 2014. In total, more than 16000 CDT sessions have been provided in the past ten years. Considering the overall number of patients at NEMC (more than 130,000 patients per year), the specificity (the hospital hosts the largest oncology centre in Estonia), and the total number of individuals receiving CDT, it is evident that some of the patients requiring CDT do not receive treatment. The volume of CDT provided per patient ranges from 5.21 to 8.85 sessions between 2014 and 2023. Based on international recommendations, the number of CDT sessions per person is rather small.

Background: The largest cancer treatment center in Estonia is located at NEMC. The hospital's rehabilitation center provides CDT, which has been offered since 2014 when the service was added to the list of health services covered by the Estonian Health Insurance Fund.

Methods: CDT usage data at North Estonia Medical Centre (2014-2023) and Estonian Health Insurance Fund's nationwide data (2014-2023) were analyzed.

Results: Over the past ten years, the hospital's share of all CDT providers in Estonia has ranged from 21% to 58%. Both the number of patients and the volume of CDT sessions provided have increased during this period. From 2014 to 2023, CDT was administered to more than 1000 patients, with the vast majority being cancer patients. In total, over the course of ten years, more than 16,000 lymphatic therapy sessions have been provided. On average, there have been 100 new lymphatic therapy patients added each year in recent years. The number of CDT sessions per patient varies from 5.21 to 8.85 per year.

Conclusions: In the light of the overall number of patients, the specificity and the circumstances of the hospital, the number of persons receiving CDT and the total volume of CDT sessions, it can be assumed that there is a higher number of patients requiring lymphatic therapy and that the need of CDT is higher. Based on world practice, the number of services per person is rather small. There is a need to increase the CDT capacity in NEMC.

Keywords: Complete decongestive therapy, Lymphedema

PP-008

Experience of Bursa City Hospital Lymphedema Rehabilitation Center: What did we do to the patients with breast cancer related lymphedema?

Erkan KAYA[1], Nehar SAHIN[1], Beyza ISIK[1], Selma KIZILTOPRAK[1], Demet CANBAZ[1], Tolga CANBAZ[1], Ömer Berkan OZCAN[1], Ismail Oguz HUR[1], Dogukan YAMAN[1], Bulut CAKIR[1], Taner DANDINOGLU[1]

[1]Bursa City Hospital, Physical Medicine and Rehabilitation, Bursa, Türkiye

Objectives: The aim of this study is to analyze the effectiveness of complete decongestive therapy in the treatment of postmastectomy lymphedema in order to reduce the circumference of lymphoedema and evaluate the improvement of the concomitant symptomatology.

Background: More than one in five patients who undergo treatment for breast cancer will develop breast cancer-related lymphedema (BCRL). BCRL can occur as a result of breast cancer surgery and/or radiation therapy. BCRL can negatively impact comfort, function, and quality of life (QoL). Complex decongestive therapy (CDT) is a fourfold conservative treatment which includes manual lymphatic , compression therapy (consisting of compression bandages, compression sleeves, or other types of compression garments), skin care, and lymph-reducing exercises

Methods: Lymphedema patients who underwent either complete decongestive therapy (CDT) or kinesiologic taping (KT) between 2021 and 2023 were retrospectively included. CDT group received complex decongestive physiotherapy (manual lymphatic drainage, compression bandages, skin care, and exercises). The intervention was conducted five sessions per week for 4 weeks. KT group received web shaped kinesiologic tape one session per week for 4 weeks. Outcomes evaluations used the circumferential reduction rate.

Results: One hundred thirty-eight unilateral extremity lymphedema patients, including 68 patients in the CDT group and 10 patients in the KT group, were included. The mean circumferential reduction rate of 5,05 ± 2.5 percent in the complete decongestive therapy group was statistically greater than the 3.2 ± 1.1 percent rate in the complete decongestive therapy group ($p = 0.01$).

Conclusions: The majority of the patients showed a clinical improvement in the intensity of symptoms after CDT. CDT is an effective treatment modality for early stage BCRL. Further study is required with respect to comparing breast cancer related lymphedema treatment modalities.

Keywords: postmastectomy; lymphedema, kinesiologic taping; complex decongestive therapy

PP-009

First Steps to Becoming a Lymphedema Rehabilitation Center: Case Series

Selda Çiftci İnceoğlu[1], Aylin Ayyıldız[2], Banu Kuran[1]

[1]Şişli Hamidiye Etfal Training and Research Hospital, Department of Physical Medicine and Rehabilitation, İstanbul, Turkey
[2]Kars Harakani State Hospital, Department of Physical Medicine and Rehabilitation, Kars, Turkey

Objectives: Lymphedema is an important clinical condition that affects individuals' activities of daily living and quality of life.However, many patients remain untreated due to reasons such as low awareness of lymphedema, failure to diagnose it at an early stage, and inability to reach the appropriate center for treatment.For this reason, we started lymphedema treatment in our hospital after the necessary training.

Background: The purpose of this case series is to share our data about the patients we are currently following and treating.

Methods: Patients who applied to the Physical Medicine and Rehabilitation(PMR) out-patient clinic of our hospital from September 2023 to January 2024 and were diagnosed with lymphedema after anamnesis, physical examination and tests were followed up for lymphedema.Demographic data of the patients were recorded such as the cause of lymphedema, the body part of the lymphedema, its stage, and previous treatments for lymphedema.

Results: A total of 8 patients were followed and treated due to lymphedema.All patients were women and the average age was 53.5 (min: 44, max: 79) years.7 of the patients (87.5%) had upper extremity lymphedema after breast cancer, and 1 (12.5%) patient had bilateral lower extremity lymphedema due to immobilization and obesity.When we evaluated in terms of the stages of lymphedema,Stage 3 lymphedema was detected in 3 (37.5%) patients, Stage 2 lymphedema was detected in 3 (37.5%) patients, and Stage 1 lymphedema was detected in 2 (25%) patients.Of the patients with lymphedema detected in the upper extremity, 4 (57.14%) had lymphedema in the left extremity and 3 (42.86%) had lymphedema in the right extremity.The mean duration of swelling in the extremities was 64.75 (min: 1 month, max: 168 months) months. Only 2 of the patients (25%) had previously received lymphedema treatment.All patients were given skin care, weight loss and exercise advice.Ready-made upper extremity compression garments were recommended after kinesiotaping treatment for 2 patients with stage 1 and upper extremity lymphedema.Ready-made compression garments were recommended in Phase 2 after complete decongestive therapy (CDT) for 3 patients with stage 2 and upper extremity lymphedema.Custom-made compression garments were applied to all 3 patients with stage 3 lymphedema in Phase 2 after CDT, and it was recommended to continue bandaging at night.

Conclusions: Lymphedema is one of the most important areas of rehabilitation that requires a multidisciplinary approach and experience.Even though we are not a fully equipped center yet, helping our patients by taking the first steps is our greatest source of motivation and happiness.

Keywords: lymphedema, rehabilitation

PP-010

The influence of social determinants of health on lymphedema outcomes

HARI KASHYAP[1]

[1]AUGUSTA UNIVERSITY

Objectives: The objective is to conduct 3 studies 1) systematic review to examine the influence of social determinants of health on lymphedema 2) retrospective review to examine whether social determinants of heath predict recovery and 3) to investigate the relationship between social determinants of health and treatment adherence.

Background: Despite lymphedema being a significant burden, there is little scientific documentation reporting the influence of social determinants of health on lymphedema outcomes.

Methods: For study 1, the electronic databases CINAHL, PubMed, Web of Science were searched using relevant terms. 336 studies examining influence of social determinants of health on lymphedema were included. Inclusion criteria included lymphedema diagnosis, adults' patients (21 -79 yrs.), with lymphedema diagnosis, receiving care at GCC from 2019 – 2023. Exclusion criteria included, children, pregnant females. One author will remove duplicates. Two authors will screen the search result articles on their eligibility criteria. Two authors will also use a designated extraction sheet to screen the articles that will then be compared to each other. If disagreements occur among the two authors that cannot be resolved, a third party will become involved to settle the difference. For study 2 & 3, retrospective chart review of lymphedema patients (n ≥300) will be conducted from April 2019 to December 2023

Results: These three studies are currently undergoing and results are expected to come out later this year.

NA

NA

Conclusions: This thesis aims to contribute to the fundamental knowledge about the influence of social determinants of health on lymphedema and its application to enhance policy, improve human life, reduce illness and disability.

Keywords: LYMPHEDEMA, SOCIAL DETERMINANTS OF HEALTH, BREAST CANCER RELATED LYMPHEDEMA, SOCIOECONOMIC STATUS

PP-011

LYMPHEDEMA AND OBESITY: A SYSTEMATIC REVIEW.

Cedeño-Sánchez César A.[1], Rosa Just-Ferrer[1], Àngela Andrés-Millet[1], Isabel Forner-Cordero[2]

[1]Lymphedema Unit. Physical Medicine and Rehabilitation Service. Hospital Universitari I Politècnic La Fe, Valencia, SPAIN.
[2]University of Valencia, SPAIN.

Objectives: The purpose of this systematic review was to analyze the link between obesity and lymphedema

Background: Lymphedema is a long-term condition that cannot be cured. It occurs due to abnormal development of the lymphatic system (primary lymphedema) or damage to the lymphatic vessels or nodes (secondary lymphedema). These conditions cause an accumulation of fluid in the body's tissues, leading to fibrosis, continuous inflammation, and increased fat deposits. This can cause significant enlargement of the affected area.Increasing evidence suggests a reciprocal relationship between obesity and lymphedema: obesity can decrease the lymphatic system's ability of fluid transport, and impaired lymphatic function can lead to the accumulation of fat. This association may explain why primary lymphedema can develop in patients with severe obesity and why obese patients face a higher risk of lymphedema.

Methods: We conducted a search in Web of Science, Pubmed and Cochrane Library with the key-words: Lymphedema AND Obesity. Clinical trials published in the last 10 years, written in English, French or Spanish were included.Trial protocols, redundant papers and those who were not focusing on our objective after reading the abstract were excluded.

Results: Altogether, 10 studies were included in the review. Six papers were randomized clinical trials, 1 a non-randomized clinical trial, 1 a cohort study and 2 descriptive studies.The different topics of the publications were the effects of exercise in lymphedema, the addition of symbiotics to diet, the efficacy of manual lymphatic drainage and compression garments, electrotherapy, and consequences of obesity in lymphedema severity.

Conclusions: Well-designed studies in obesity and lymphedema are scarce. Elevated BMI is associated with the development and severity of lymphedema in breast cancer survivors, and it is also a barrier to physical activity. Whenever there is a previous education, the combination of a home-based exercise program with a hypocaloric diet was shown to be an effective and applicable tool for reducing BMI and lymphedema volume. The use of symbiotic supplements can help decrease inflammatory markers, edema volume, and BMI. The use of preventive garments does not prevent lymphedema, its presentation is related to BMI.Obese individuals with lymphedema are more likely to have infections, hospitalizations, and larger extremities compared to subjects with a normal BMI.

Keywords: lymphedema, obesity, systematic review, clinical trials

PP-012

The Clinical Characteristics of Lower Extremity Lymphedema in 116 Patients

Feyza Akan Begoğlu[1]

[1]Fatih Sultan Mehmet Research and Training Hospital

Objectives: In our study, we aimed to present the etiological, demographic and clinical characteristics of 116 patients who applied to our lymphedema outpatient clinic due to swelling in the lower extremities and were diagnosed with lymphedema.

Background: While cancer is claimed to be the most common cause of lower extremity lymphedema in developing and developed countries, primary lymphedema is perhaps often overlooked as a potential cause.

Methods: The files of patients who came to lymphedema clinic with complaints of swelling in the lower extremities and were diagnosed with lymphedema between 2019 and 2024 were retrospectively examined.

Results: The four most common causes of lower extremity lymphedema are primary lymphedema (PLE) (51.7%), cancer-related lymphedema (CRLE) (27.6%), lipedema with secondary lymphedema (LIPLE) (12.1%), and phlebolymphedema (CVI) (8.6%).79.3% of the cases were female, 68.1% were stage 2, and 50% were bilateral. The duration of lymphedema varied between 1 and 50 years, the average was 10.01±9.04 and the median was 6 years. As expected, in terms of gender distribution, the proportion of LIPLE patients being female (100%) was statistically significantly higher than that of CRLE (75%) and CVI (50%) patients ($p<0.05$). Obesity was common (mean weight and body mass index; 85.43 kg and 32.16 kg/m2, respectively) and there was no statistically significant difference in BMI means between stages ($p>0.05$). The mean BMI of LIPLE patients was statistically significantly higher ($p<0.05$) than PLE (p:0.005), CRLE (p:0.013) and CVI (p:0.039) patients. There was no statistically significant difference in terms of the distribution rates of stages according to lymphedema etiologies, side of lymphedema involvement and cellulite attack ($p>0.05$). There was a statistically significant difference in lymphedema duration according to lymphedema etiologies (p:0.008; $p<0.05$). The duration of lymphedema in the CRLE group was significantly shorter ($p<0.05$) than the PLE (p:0.002), CVI (p:0.016) and LIPLE (p:0.030) groups.

Demographic and clinical variables of Primary and Secondary Lymhedema

		Primary(n=60) X±S	Secondary(n=56) X±S	Total(n=116) X±S	p
Age		51,53±17,89	59,11±12,25	55,19±15,82	[1]0,009*
Weight(kg)		83,53±21,05	87,46±18,52	85,43±19,88	[1]0,289
BMI (kg/m2)		31,42±6,87	32,96±7,14	32,16±7,01	[1]0,237
Gender n (%)	Female	49 (%81,7)	43 (%76,8)	92 (%79,3)	[2]0,675
	Male	11 (%18,3)	13 (%23,2)	24 (%20,7)	
Stage n (%)	0	0 (%0)	1 (%1,8)	1 (%0,9)	[3]0,975
	1	15 (%25)	14 (%25)	29 (%25)	
	2	41 (%68,3)	38 (%67,9)	79 (%68,1)	
	3	4 (%6,7)	3 (%5,4)	7 (%6)	
Limb Distrubition n (%)	Right	7 (%11,7)	10 (%17,9)	17 (%14,7)	[4]0,083
	Left	17 (%28,3)	24 (%42,9)	41 (%35,3)	
	Bilateral	36 (%60)	22 (%39,3)	58 (%50)	
Cellulite episode n (%)	Yes	26 (%43,3)	19 (%33,9)	45 (%38,8)	[2]0,396
	No	34 (%56,7)	37 (%66,1)	71 (%61,2)	
Duration of Lymphedema (year) Min-Max, X ±S (median)		11,86±10,78 (8,5)	8,03±6,20 (6)	10,01±9,04 (6)	[5]0,062

1Student t test 2Continuity (yates) test 3Fisher Freeman Halton Exact Test 4Ki-kare test 5Mann Whitney U test *$p<0.05$ $\bar{X}$±S: Mean±standard deviation (min-max); BMI:Body mass index

Demographic and clinical variables of PLE, CRLE, CVI and LIPLE

		PLE(n=60) X±S	CRLE(n=32) X±S	CVI(n=10) X±S	LIPLE(n=14) X±S	p
Age		51,53±17,89	59,13±11,68	64,6±12,93	55,14±12,41	[1]0,031*
Weight (kg)		83,53±21,05	83,66±17,11	88,6±25,55	95,36±14,07	[1]0,209
BMI (kg/m2)		31,42±6,87	31,64±6,53	31,27±7,65	37,2±6,88	[1]0,039*
Gender $_{n\ (\%)}$	Female	49 (%81,7)	24 (%75)	5 (%50)	14 (%100)	[2]0,019*
	Male	11 (%18,3)	8 (%25)	5 (%50)	0 (%0)	
Stage $_{n\ (\%)}$	0	0 (%0)	0 (%0)	0 (%0)	1 (%7,1)	[3]0,310
	1	15 (%25)	7 (%21,9)	2 (%20)	5 (%35,7)	
	2	41 (%68,3)	24 (%75)	6 (%60)	8 (%57,1)	
	3	4 (%6,7)	1 (%3,1)	2 (%20)	0 (%0)	
Lymphedema distribution $_{n\ (\%)}$	Right	7 (%11,7)	6 (%18,8)	1 (%10)	3 (%21,4)	[4]0,254
	Left	17 (%28,3)	16 (%50)	4 (%40)	4 (%28,6)	
	Bilateral	36 (%60)	10 (%31,3)	4 (%40)	7 (%50)	
Cellulite episode $_{n\ (\%)}$	Yes	26 (%43,3)	13 (%40,6)	4 (%40)	2 (%14,3)	[4]0,249
	No	34 (%56,7)	19 (%59,4)	6 (%60)	12 (%85,7)	
Duration of Lymphedema (year) Min-Max, ±S (median)		11,86±10,78 (8,5)	5,70±3,37 (5)	12,80±9,47 (9)	9,93±6,22 (9,5)	[5]0,008*

1Oneway ANOVA test 2Fisher Freeman Halton Exact Test 3Fisher's Exact test 4Ki-karetest 5Kruskal Wallis test *p<0.05 X ̄±S: Mean±standard deviation (min-max); BMI:Body mass index PLE: Primary Lymhedema , CRLE: Cancer Related Lymphedema, CVI: Phlebolymphedema LIPLE: Lipedema with secondary lymphedema

Conclusions: Among the notable clinical features, CRLE is among the most common causes in developing and developed countries. The majority of patients who applied to our clinic with complaints of swelling in the lower extremities were primary lymphedema patients. The reason for this can be interpreted as the fact that we are a specific polyclinic and therefore the primary etiology cannot be overlooked. In addition, other notable features were the majority of female gender in all groups except the CVI group, bilateral involvement in all groups except the CRLE group, stage 2 involvement and the presence of obesity in all groups.

Keywords: lower extremity lymphedema, lipolymphedema, phlebolymphedema, cancer-related lymphedema

PP-013

Often Ignored: Breast Edema

Faika Nur Erkol[2], Cihan Uras[2], Nuray Alaca[1]

[1]Acıbadem University Department of Physiotherapy and Rehabilitation
[2]Acıbadem University Research Institute Senology

Objectives: -To draw attention to breast edema, which may occur after breast cancer treatment and is ignored.-To understand the effect of complex decongestive therapy in the treatment of breast edema that may occur during adjuvant radiotherapy after breast-conserving surgery.

Background: Breast cancer is the most common type of cancer in women worldwide, representing 25% of all cancers. Breast-conserving surgery (BCS) and radiotherapy after lymph node biopsy are widely used in the treatment of breast cancer. In some patients, breast edema occurs in the breast that has undergone surgery and radiotherapy.

Methods: 46-year-old female patient; On the 10th day of radiotherapy, she applied to the outpatient clinic with complaints of swelling, heaviness and redness in her left breast. In the patient who had left breast-conserving surgery 1.5 months ago and had 5 lymph nodes excised and sentinel lymph node biopsy performed, breast edema, redness, and pore enlargement in the breast skin were detected on the 10th day of radiotherapy.In physical examination; In the upper extremity circumference measurements made with a tape measure at standard points, no significant difference in circumference was detected on the left side compared to the right side (<1 cm). Again, using a measure, the chest circumference was determined as 114 cm. No limitation was detected in the patient's shoulder joint range of motion. Objective edema, fibrosis, redness, and enlargement of breast skin pores were detected in the patient's left breast. Examination findings of other systems were normal. Complex decongestive therapy including 20 sessions of manual lymph drainage, self-drainage and exercise training was applied. Treatment was terminated with self-drainage, exercise and protection recommendations.

Results: -After complex decongestive therapy, the patient's breast edema, feeling of heaviness, redness and pore enlargement in the breast skin decreased.-The patient's chest circumference decreased by 2cm.

Picture 1

Skin pores appearance before complex decongestive therapy

Picture 2

Skin pores appearance after complex decongestive therapy

Table 1

Before Treatment	114 cm
10th seance	112 cm
3 Months After Radiotherapy (After 20 Seance)	112 cm

Breast volume circumference measurement

Conclusions: • Breast-conserving surgery with lymph node biopsy causes damage to the lymphatic pathways not only in the upper extremity but also in the breast.• The risk of developing breast edema increases due to radiotherapy following breast-conserving surgery in which lymph node biopsy is performed.• The importance of early intervention in breast edema during radiotherapy should be taken into consideration.• Complex decongestive therapy is effective in the treatment of breast edema, which may occur in patients who have undergone breast-conserving surgery and received adjuvant radiotherapy.

Keywords: lymphedema, breast edema, complex decongestive therapy

PP-014

The Effect of Postmastectomy Lymphedema on Upper Extremity Function: Preliminary Results

Hasan Ocak[1], Oya Özdemir[1]

[1]Hacettepe University Faculty of Medicine, Department of Physical Medicine and Rehabilitation, Ankara

Objectives: Lymphedema is a common complication following breast cancer treatment with physical and pyschosocial consequences.

Background: The aim of this study is to evaluate upper extremity function in post-mastectomy lymphedema patients and to investigate the relationships between upper extremity function and several demographic/clinical characteristics.

Methods: Twenty women with post-mastectomy lymphedema were included in this study. Demographic and clinical characteristics such as age, body mass index (BMI), dominant hand, affected side, cancer treatment methods, duration of lymphedema and volume difference between upper extremities were recorded. Arm circumferences were tape-measured at 4-cm intervals from wrist to axilla, then limb volume was estimated using the truncated cone formula. Inter-limb volume difference was expressed both in milliliters (ml) and percentages (%). According to the volume increase in the affected extremity, the severity of lymphedema was categorized as mild (<20%), moderate (20–40%), or severe (>40%). The Arm, Shoulder, and Hand Disability Survey (DASH) was used to assess upper extremity function.

Results: The mean age of the participants was 58.8±10.6 years. Of the 20 patients with a mean BMI of 28.8±4.0 kg/cm2, 40% were classified as obese (BMI≥30 kg/cm2). In addition to mastectomy, the percentage of patients whom were given chemotherapy and radiotherapy were 85% and 95%, respectively. All patients except one were right-handed and lymphedema developed in the dominant extremity in 40% of them. The median value of lymphedema duration was 68.9 months (ranged widely from 2 month to 20 years). Seven patients had mild, 4 had moderate, and 9 had severe lymphedema. The mean value of volume difference of the patients' arm was 610.5 ±426.1 ml. The mean value of DASH score was 27.2±18.1. There were no statistically significant relationships between DASH score and side of lymphedema, whether the dominant side was affected or not, and BMI. On the other hand, DASH score positively correlated with the patients' age (p=0.017), duration of lymphedema (p=0.07), and volume difference (ml) (p=0.021).

Conclusions: The presence of postmastectomy lymphedema negatively affects upper extremity function of breast cancer survivors. The findings indicate that older patients with longer duration of lymphedema and higher inter-limb volume difference have more severe disability. Therefore, early management of lymphedema with complex decongestive therapy is crucial not only for reducing the limb volume both also improving its function in these patients.

Keywords: Lymphedema Rehabilitation, Postmastectomy Lymphedema, Lymphedema, Upper Extremity Lymphedema

PP-015

The Determination of Factors Associated with Lymphedema in Women Who Have Undergone Breast Cancer Surgery

Tugce Sirin Korucu[1], Tugce Sirin Korucu[2], Sevtap Gunay Ucurum[3], Engin Tastaban[4], Hedef Ozgun[5], Derya Ozer Kaya[3]

[1]Izmir Katip Celebi University, Institute of Health Sciences, Department of Physiotherapy and Rehabilitation, Izmir, Turkey
[2]Izmir Bakircay University, Faculty of Health Sciences, Department of Physiotherapy and Rehabilitation, Izmir, Turkey
[3]Izmir Katip Celebi University, Faculty of Health Sciences, Department of Physiotherapy and Rehabilitation, Izmir, Turkey
[4]Department of Physical Medicine and Rehabilitation, Adnan Menderes University Medical Faculty, Aydin, Turkey
[5]Department of General Surgery, Outpatient Clinic, Aydin, Turkey

Objectives: We predict that high body mass index (BMI) and radiotherapy application duration may be risk factors for the development of lymphedema. These factors may increase the occurrence and severity of lymphedema. Weight control should be included in the prevention of lymphedema.

Background: The aim of the study was to determine factors associated with lymphedema in women undergoing breast cancer surgery.

Methods: Fifty women with lymphedema (age, 54.34±9.08 years; body mass index, 30.10±4.03 kg/cm2) and 57 women without lymphedema (age, 53.68±9.41 years; body mass index, 29.0±5.44 kg/cm2) after unilateral surgery for breast cancer were included. The demographic and lymphedema disease-related data were collected. Age, height, weight, exercise habit, smoking, and the dominant side of all patients were noted via face-to-face interviews. Family history, the treatment process, the type and time of surgery related to cancer history, affected side related to lymphedema, and location were questioned. The severity of edema was assessed with perimeter measurements (Frustum model). The t test, x2 test, and Mann-Whitney U test were used for analyses.

Physical characteristics of participants

Table 1. Physical characteristics of participants

Characteristics	With Lymphoedema (n = 50)	Without Lymphoedema (n = 57)	p
Age (year, mean±SD)	54.34 ± 9.08	53.68 ± 9.41	0.716[a]
Height (m, mean±SD)	1.59 ± 0.05	1.58 ± 0.072	
Weight (kg, mean±SD)	77.38 ± 10.16	73.88 ± 14.43	0.265[a]
BMI (kg/m^2, mean±SD)	30.10 ± 4.03	29.40 ± 5.44	0.156[a]
Weight gain after surgery (kg, mean±SD)	4.96 ± 4.73	5.45 ± 5.52	0.452[a]
Post-op duration (year, mean±SD)	4.24 ± 2.97	3.19 ± 1.76	0.622[a] 0.159[a]
Dominant side (n; %)			
Right	44.0; 88.0	49.0; 86.0	
Left	6.0; 12.0	8.0; 14.0	0.783[b]
Affected side (n; %)			
Right	26.0; 52.0	30.0; 52.6	
Left	24.0; 48.0	27.0; 47.4	1,00[b]

p > 0.05, n: number of patients, SD: Standard deviation, BMI: Body mass index, Values are presented as number (%), a: Independent sample *t*-test, b: *Chi-square* test

Physical characteristics of participants

Results: The follow-up duration after the surgery was 4.24±2.97 years and 3.19±1.76 years, and the upper extremity volume was 2106.65±510.82 cm3 and 1725.92±342.49 cm³ in the lymphedema group and in the no-lymphedema group, respe-

ctively. In the group developing lymphedema, total number of days of radiotherapy taken and the duration of lymphedema development after surgery scores were found different ($p<0.05$). In our study, 52% of women who developed lymphedema were found to be obese, and higher BMI results were found in the group with lymphedema.

The comparisons of circumference measurements

Table 2. The comparisons of circumference measurements

Characteristics	With Lymphoedema (n = 50) Median (IQR 25-75))	Without Lymphoedema (n = 57) Median (IQR 25-75)	p
Circumference measurements (cm^3) Unaffected side	1802.08 (1560.39-1931.89)	1707.34 (1441.44-1949.99)	0.235[a]
Surgical side	2023.93 (1720.83-2339.12)	1679.94 (1468.81-1913.33)	0.000[a]*

*p < 0.05, n: number of patients, IQR 25-75: Interquartile range (25% -75 %), a: Mann-Whitney U test

The comparisons of circumference measurements

Conclusions: The number of received radiotherapy days increased the risk of developing lymphedema after surgery. In addition, it was found that as the body mass index of women who develop lymphedema increases, the incidence of developing lymphedema increases. Knowing these effects caused by lymphedema will be important in preventing problems and planning treatment approaches.

Keywords: Breast cancer, Lymphedema, Body mass index, Obesity

PP-016

A RARE CASE OF BREAST CANCER RELATED LYMPHEDEMA: CUTANEUS METASTASIS

Aslı Turan[1], Sibel Ünsal Delialioğlu[1], Esra Uçaryılmaz Özhamam[2], Meltem Dalyan[1]

[1]Ankara Bilkent City Hospital, Physical Medicine and Rehabilitation Hospital, Lymphedema Clinic
[2]Ankara Bilkent City Hospital, Pathology Department

Background: The gold standard treatment method for lymphedema is Complete Decongestive Therapy (CDT), currently. A detailed evaluation should be made before CDT. Symptoms such as skin changes, redness, increased temperature, pain and sudden increased volume in the extremity with lymphedema should be a warning sign for the clinicians. These symptoms may frequently occur in infectious conditions such as cellulitis and erysipelas, or more rarely, in breast cancer recurrence, lymphangiosarcoma or cutaneous metastasis of breast cancer.

Methods: A 63-year-old female patient presented with pain and swelling in her right arm. She had modified radical mastectomy, 2 years ago and received chemotheraphy and radiotheraphy. She had lymphedema diagnosis in the right arm at the postoperative 15th month. The patient underwent upper extremity Doppler USG and PET scan. Doppler USG was normal. PET revealed multiple hypermetabolic lesion areas in the soft tissue adjacent to the right shoulder joint, which could be compatible with tumoral involvement that cannot be distinguished from inflammatory changes secondary to radiotherapy, and a nodular lesion in the posterior of the pectoralis major muscle, which could be compatible with a pathological lymph node. With these findings, recurrence was not considered. The patient's skin lesions were evaluated as cellulitis and antibiotic therapy was administered for 10 days. When the symptoms did not change with this treatment, she was referred to the lymphedema clinic.On physical examination, there was swelling, redness and minimal temperature increase, radiating from the right chest area to the armpit and the right side of the abdomen, which was more prominent in the right shoulder and proximal right arm. In addition, sharply circumscribed erythematous and occasionally dry skin lesions were observed on the right chest and right side of the abdomen, right upper arm, and right upper back (Figure 1). The patient could not move his right arm due to severe pain and his right shoulder movements were severely restricted. No acute infection was detected. A punch biopsy was taken and pathology was invasive carcinoma metastasis of the breast. The patient was referred to the Oncology department and chemotheraphy was started.

Figure 1

Cutaneus lesion and right arm lymphedema

Conclusions: Patients with BCRL should be carefully evaluated for new-onset skin lesions before undergoing CDT. After conditions such as infection and radiation dermatitis are ruled out, a skin biopsy should be planned if necessary. Early diagnosis of cutaneous metastasis and timely initiation of malignancy treatment are important for the survival of patients.

Keywords: Lymphedema, cutaneus metastasis, complete decongestive theraphy

PP-017

Evaluatıon Of Fıbromyalgıa In Patıents Wıth Operated Breast Cancer - Preliminary Study Results

Filiz Meryem Sertpoyraz[1], Murat Akyol[2], Ecem Beytorun[1], Elif Umay Altaş[1], Ömer Faruk Aslan[1]

[1]İzmir Bakırçay University,Medicine Faculty, Departement of Physical Medicine and Rehabilitation
[2]İzmir Bakırçay University,Medicine Faculty, Departement of Internal Medicine

Objectives: Breast cancer is the most common cancer type in women and the second most common cause of cancer-related deaths.Fibromyalgia is defined as a chronic syndrome of unknown etiology characterized by widespread body pain, fatigue, sleep disturbances, cognitive dysfunction, and anxiety.

Background: Our aim is to evaluate fibromyalgia in women with operated breast cancer and to assess the emotional status, sleep, and severity of fibromyalgia in patients with fibromyalgia.

Methods: Fifty female patients who applied to the Department of Physical Medicine and Rehabilitation at Izmir Bakırçay University Medical Faculty were included. Demographic data and clinical characteristics of the patients were recorded. Patients with complaints of widespread pain were evaluated for fibromyalgia. Patients diagnosed with fibromyalgia were assessed using the Beck Depression Inventory, Jenkins Sleep Scale, and Fibromyalgia Impact Questionnaire.

Results: Fifty female patients with operated breast cancer aged 25 and above were included in the study. The mean age of the patients was 60.2 ± 10.2 years. The demographic data of the patients are shown in Table 1. Twenty-seven (54%) patients with operated breast cancer were diagnosed with fibromyalgia. When emotional status was evaluated, depression was detected in 93% ranging from mild to severe. “In %45 of the patients with fibromyalgia, sleep disorders were present.”

Demographic Characteristics of Patients with Operable Breast Cancer

	n (%)
Education Primary School Secondary School Higher Education	6 (12) 37 (74) 7 (14)
Body Mass Index Underweigh Normal Overweight Obese Morbidly Obese	0 (0) 17 (34) 24 (48) 7 (14) 2 (4)
Direction of Surgery Right Left	20 (40) 30 (60)
Radiotherapy Yes No	 42 (84) 6 (12)
Chemotherapy Yes No	 37 (74) 13 (26)
Medical Treatment Yes No	44 (88) 6 (12)

Table 2:Characteristics of Patients Diagnosed with Fibromyalgia among Patients with Operable Breast Cancer

	n (%)
Beck Depression Inventory Normal Mild Depression Moderate Depression Severe Depression	 2 (7) 11 (41) 9 (33) 5 (19)
Jenkins Sleep Scale Below 15 15 and above	 15 (55) 12 (45)

Conclusions: Conclusion: Fibromyalgia was detected in 54% of the patients. Depression tendency was observed in 93% of those diagnosed with fibromyalgia and 45% had sleep disturbances. We believe that the evaluation of the presence of fibromyalgia and the creation of treatment plans accordingly are important when evaluating patients with operated breast cancer."

Keywords: Breast cancer, Fibromyalgia

PP-018

Anterior Interosseous Nerve Syndrome Following Breast Cancer Related Lymphedema: A Rare Case

Fatma Betül Kıvanç İnanöz[1], Ekin İlke Şen[1], Merih Akpınar[1], Sina Arman[1], Dilşad Sindel[1]

[1]Istanbul Faculty of Medicine Department of Physical Medicine and Rehabilitation

Objectives: The anterior interosseous nerve (AIN) syndrome following breast cancer related lymphedema is a rare occurrence. In this case report, we aim to review the clinical findings of AIN paralysis and raise awareness regarding peripheral nerve paralysis in patients with lymphedema.

Background: The anterior interosseous nerve (AIN) syndrome following breast cancer related lymphedema is a rare occurrence.

Methods: A 70-year-old female patient presented to our clinic in 2022 with complaints of numbness and weakness in the first three fingers of her left hand, which began during a period of being unfollowed. She underwent modified radical surgery and lymph node dissection due to left breast cancer 25 years ago, , subsequently resulting in lymphedema in the left upper extremity. The patient has undergone complex decongestive at our lymphedema rehabilitation clinic in 2021. A custom compression garment has been prescribed, along with instructions to continue with a home exercise program and self-lymphatic drainage massage. Additionally, the patient has maintained periodic compression bandaging at home and has adhered to regular use of the compression garment.

Results: During the examination, passive range of motion of the upper extremity joints was fully assessed. Muscle strength examination revealed normal findings except for the following: Pronator quadratus muscle strength in the left hand was graded as 3/5, while the flexor digitorum profundus (FDP) muscle strength of the index finger and flexor pollicis longus (FPL) muscle strength were both graded as 1/5. Evaluation for thenar atrophy was inconclusive due to lymphedema. The patient was unable to perform the “OK sign”. There was no reported pain in the left forearm. Sensory and motor conduction studies of the median nerve showed normal but relatively decreased amplitudes compared to the right side. MRI imaging showed no specific features apart from edema in the common extensor tendon sheath.

Conclusions: AIN syndrome accounts for less than 1% of upper extremity nerve palsies (1). It can occur spontaneously (brachial plexus neuritis, compartment syndrome, compression neuropathy) or following trauma (2). Typically, it manifests with pain in the forearm and weakness in pinch movements of the first and second fingers. Sensory disturbances are not expected (1).The relationship between breast cancer-related lymphedema and entrapment neuropathies is debated (3). However, cases in the literature associate compression garments with radial nerve paralysis and common peroneal nerve paralysis (4,5).

PP-019

Development of the wearable arm volume measurement device and mobile application (mobiLenf) in the prevention and early detection of breast cancer-related lymphedema and evaluation of their efficiency: A protocol for a randomized trial

İsmail Toygar[1], Gulcan Bagcivan[2], Ayse Arikan Donmez[3], Cigdem Fulya Donmez[1], Furkan Bilek[1], Mehmet Durmus Calisir[4], Yasin Karan[4], Pinar Borman[5]

[1]Mugla Sitki Kocman University, Faculty of Health Sciences, Department of Gerontology, Mugla, Turkey
[2]Koc University, Faculty of Nursing, Department of Nursing, Istanbul, Turkey
[3]Hacettepe University, Faculty of Nursing, Department of Medical Nursing, Ankara, Turkey
[4]Recep Tayyip Erdogan University, Faculty of Engineering and Architecture, Department of Electrical and Electronics Engineering, Rize, Turkey
[5]Ankara Medipol University, Faculty of Medicine, Department of Physical Medicine and Rehabilitation, Ankara, Turkey

Objectives: To prevent breast cancer-related lymphedema with the mobile application to be developed and to detect the volume increase in the arm before clinical findings with an arm volume measurement device that will work with this mobile application.

Background: One of the main problems in breast cancer survivors is lymphedema. Breast cancer-related lymphedema is a condition that can be treated when detected early but has a very low success rate when detected in advanced stages. Therefore, the prevention and early detection is crucial.

Methods: The Project consists of two main steps; (a)development of the arm volume measuring device and mobile application (b)evaluation of the effectiveness of the products. Five components will be involved in the development of the mobile application: (I)exercise, (II)education, (III)coping mechanisms, (IV)arm volume measurement/records, and (V)reminder for exercise, measurement, and follow-ups. Exercise videos will include stretching exercises for the shoulder and arm area as recommended in the guides. The training content will be created in line with the guides and opinions will be taken from an expert panel. In support of coping mechanisms, existing problem areas in people will be determined with a qualitative study. People who have gone through a similar process in the past will be asked about the coping strategies they have developed for these problem areas. Themes obtained from patients who have gone through a similar process and suggestions of the guidelines will be presented in the mobile application. In arm volume measurement, a wearable technology product to be designed in the form of an arm cuff and strain sensors to be placed on the arm will detect the increase in arm circumference. After measuring the arm circumference with the sensors located every five centimeters, the arm volume will be calculated with the cylindrical volume calculation method. When there is an increase of 5% or more in the arm of the individual (preclinical lymphedema), a notification will be sent to the person and his/her physician via the mobile application. The person will also be able to follow the past measurement results via the mobile application.

Results: As this is a protocol study, the results will be available after finalised

Conclusions: Evaluation of the product's efficacy will be based on a pilot randomized controlled trial, a reproducibility study, and patient feedback. This product to be developed will provide a new arm volume measurement method to reduce patients' hospital admissions and contribute to the prevention and early detection of lymphedema.

Keywords: Breast Cancer, Lymphedema, Wearable Technology, Mobile Application

PP-020

Demographic and Clinical Characteristics Of The Patients We Follow With The Diagnosis Of Lipedema

Ayla Cagliyan Turk[1], Ender Erden[1], Yasar Turk[2]

[1]Hitit University Faculty of Medicine Physical Medicine and Rehabilitation Clinic, Çorum, Turkey
[2]Republic High School

Objectives: Our aim is to contribute to determining the lipedema case profile of our country by determining the demographic and clinical characteristics of our lipedema cases who applied to our polyclinic from Corum city center.

Background: Lipedema is an adipofascial disease that almost exclusively affects women. Lipedema causes chronic pain, swelling and other discomfort due to bilateral and asymmetric expansion of subcutaneous fatty tissue. In the clinic, lipedema is often misdiagnosed as obesity, lymphedema, lipodystrophies, or other fatty disorders.

Methods: Eighty female patients who applied to Hitit University Faculty of Medicine Erol Olçok Training and Research Hospital Physical Medicine and Rehabilitation outpatient clinic between January 2020 and July 2023 and were diagnosed with lipedema were included in the study. Age, height, weight, body mass index, lipedema type and stage of the cases were obtained from the records. Laboratory evaluations such as hemogram, Vitamin D, vitamin B12, erythrocyte sedimentation rate (ESR), C-reactive protein (CRP) and imaging evaluations, venous doppler ultrasound results of the lower extremity, were obtained from the records.

Results: The average age of the patients was 46.46±9.72 years. The average body mass index was determined as 32.12±4.84. The most common type of lipedema was Type 2, followed by Type 1 and Type 3 lipedema. 63.8% of our patients had stage 2 lipedema, 21.2% had stage 1 lipedema, and 15% had stage 3 lipedema. The average CRP level was 4.88±2.89 and ESR level was 18.58±10.06. 43.8% of the patients had abnormal Doppler findings such as short-term reflux or venous insufficiency. The average Vitamin D level was 18.73±12.95 ng/dl and Vitamin B12 level was 359.74±155.12 pg/ml. Average Hb was 13.36±1.03, Wbc was 7.22±1.83, Plt was 300.97±76.99. There was a positive correlation between BMI and CRP.

Demographic and Clinical Characteristics Data

Parameter	Lipedema
Age (years)	46,46±9,72
BMI (kg/m2)	32,12±4,84
Hemoglobin (g/dL)	13,36±1,03
Leukocyte (×10^9/L)	7,22±1,83
Neutrophil (×10^9/L)	4,12±1,41
Lymphocyte (×10^9/L)	2,38±0,67
Monocytes (×10^9/L)	0,59±0,78
Platelet (×10^9/L)	300,97±76,99
MPV (fL)	10,5±0,87
PDW (fL)	12,4±1,91
NLR	1,84±0,79
25 OH vitamin D (ng/dL)	18,73±12,9
Vitamin B12	359,74±155,12
ESR (mm/saat)	18,58±10,06
CRP (mg/L)	4,88±2,89
Abnormal Doppler USG	35 (43,8)

Lipedema stage and type

Lipedema Stage	
Stage 1	17 (21,3)
Stage 2	51 (63,8)
Stage 3	12(15)
Lipedema Type	
Type 1	34 (42,5)
Type 2	70 (87,5)
Type 3	31 (38,8)
Type 4	2 (2,5)
Type 5	0 (0)

Conclusions: Patients presenting with swelling and pain in the lower extremities should be evaluated for lipedema, and it should also be taken into consideration that venous insufficiency may be present in these patients.

Keywords: lipedema, Vitamin D, vitamin B12, venous insufficiency

PP-021

The Effect of Low-Intensity Extracorporeal Shock Wave Therapy on Lower Extremity Circumference Measurement in Lipedema: A Case Series

Hatice Durmuş[1], Ayşe Nur Benlibay[2], Zeynep Çelik[3], Rengin Yılmaz[4], Suat Doğancı[3]

[1]Hacettepe Üniversitesi Fizik Tedavi ve Rehabilitasyon Fakültesi
[2]Gülhane Eğitim ve Araştırma Hastanesi Kalp ve Damar Cerrahisi
[3]Prof. Dr. Suat Doğancı Muayenehanesi
[4]Dr. Rengin Yılmaz Muayenehanesi

Objectives: The aim of this study is to investigate the effectiveness of a multidimensional treatment that includes Low Intensity Extracorporeal Shock Wave Therapy (LiESWT) in the treatment of lipedema disease, which causes irregular fat deposition in the lower extremity, in the circumference measurement.

Background: We aimed to see whether the versatile designed treatment is effective in the treatment of lipedema and to measure the effect of LiESWT on lower extremity circumference measurement.

Methods: A total of 11 female patients diagnosed with lipedema were included in the study. Patients participated regularly in a treatment protocol that would last a total of 10 sessions, attending twice a week for five weeks. At the beginning of the treatment, patients were advised to exercise and follow a diet under the guidance of a dietitian. The sessions consisted of Low-Intensity Extracorporeal Shock Wave Therapy (LiESWT) applied using the Modus ESWT Radial Shockwave Therapy (Inceler Medikal Ankara) device, targeting the anterior part of the lower extremities in one session and the posterior part in another session. This was followed by a 30-minute pneumatic compression device application. The LiESWT application involved a total of 6000 pulses, delivered at a rate of 10 pulses per second with an average intensity of 4 bars. Circumference measurements were taken from specific points for the comparison of effectiveness.

Results: According to the circumference measurement results of the patients with a mean age of 38.4±13.5, significant improvements were observed in both right and left extremities, at all levels ($p<0.005$). The demographic data and treatment outcomes of the patients are presented in Table-1.

Table-1

	Right Ankle 1	Left Ankle 1	Right Below Knee 1	Left Below Knee 1	Right Thigh 1	Left Thigh 1	Right Ankle 2	Left Ankle 2	Right Below Knee 2	Left Below Knee 2	Right Thigh 2	Left Thigh 2
1	20,5	20,5	34,5	34	48	48	20	20	32	32	46	46
2	31	31	52	52	67	67	31	29	50	49	62	58
3	22	22,5	39,5	39	51,5	51,5	22	22	38,5	37,5	51	51
4	23	22	38	38,5	56	56	22,5	22	37,5	36,5	53	54
5	25,5	26	47	48	53,5	53	23	23	43,5	44	47,5	48
6	23	22,5	40,5	40	55	54,5	22,5	22,5	39,5	39	53	53
7	23	22,5	39	38,5	61	58	23	22,5	39	38	61	59
8	27,5	28	44	44,5	63	64,5	25	25	42	42	59	59
9	22	21,5	35,5	35,5	50,5	50,5	20	20	33,5	33,5	48	48
10	20,5	20,5	34	34	47,5	47,5	19,5	19,5	34	34	46,5	46,5
11	24,5	23,5	44	44,5	62,5	62,5	23,5	23	43	42	58	58,5

Lower Extremity Circumference Measurement

Conclusions: The multidisciplinary treatment protocol including LiESWT is an effective, reliable and applicable method for the treatment of lipedema.

Keywords: Lipedema, Low-Intensity Extracorporeal Shock Wave Therapy, Modus ESWT Radial Shockwave Therapy

PP-022

PREVALENCE OF JOINT HYPERMOBILITY IN LIPEDEMA PATIENTS.

Isabel Forner-Cordero[1], Juan Vazquez-Diez[2], Jose Muñoz-Langa[3]

[1]Hospital Universitari i Politècnic La Fe, University of Valencia, Valencia, SPAIN
[2]Hospital General Universitario de Castellon, Castellon, Spain.
[3]Hospital Arnau de Vilanova, Valencia, Spain.

Objectives: Aim: To analyze the prevalence of hypermobility in lipedema patients.

Background: The pathophysiology of lipedema is unknown. One of the theories is the alteration of collagen in the subcutaneous tissue that leads to the leakage of fluid and deposits of fat. Recent studies point at a possible association between lipedema and joint hypermobility, but research is still scarce. Hypermobility is diagnosed through the Beighton scale when the score is greater than 3.The estimated prevalence of hypermobility in general population is between 3-20%.

Methods: We performed a prospective descriptive study of patients meeting lipedema criteria who attended the Lymphedema Unit. Data were analyzed using SPSS and mean, median and 95%confidence-intervals were obtained. The correlation between the Beighton Score and the rest of variables was obtained through ANOVA and Chi-square tests. P-values <0.05 were considered statistically significant.

Results: Among 206 lipedema patients recruited in our prospective study, 144 were included.The median age was 43.8 yrs (Range:18-68). Mean BMI was 27.7 (95% CI:26.8-28.6). Mean Waist-to-Height-Ratio (WHtR) was 0.49 (95% CI:0.47-0.49), according to the WHtR-categorization, 13.9% of the patients were underweight, 38.9% were normal weight, 36.8% were overweight, and 10.4% were obese.Lipedema type frequencies were: type I: 1.4% (2 patients), type II: 10.4% (15), type III: 75.7% (109), type IV: 11.1% (16), and type V: 1.4% (2). Lipedema stage distribution was: stage 1: 46.5% (67 patients), stage 2: 38.2% (55), stage 3: 12.5% (18), and stage 4: 2.8% (4).Mean Beighton Score was 4.51 (95% CI:4.11-4.90). Fifty-three (53.5%) percent of our patients (77) showed a Beighton Score >3. We discovered that being hypermobile had a negative linear correlation with age (p<0.001), BMI (p<0.001) and Waist-to-Height ratio (p<0.001). No correlation was found between hypermobility and volume (p=0.621), lipedema type (p=0.282) nor lipedema stage (p=0.120).

Conclusions: Lipedema may have other clinical manifestations besides those widely known. Joint hypermobility seems to be more prevalent among these patients as compared to the general population. This supports the etiopathogenic theory that links lipedema with collagen abnormalities.

Keywords: lipedema, Hypermobility, collagen abnormalities, diagnosis

PP-023

The Clinical Characteristics of Lipedema Patients Evaluated in a Tertiary Lymphedema Outpatient Clinic

Seher Kalıç[1], Pınar Borman[2], Sibel Ünsal Delialioğlu[1], Hamit Göksu[3], Meltem Dalyan[1], Cemre Saymaz[1], Sevgi Gümüş Atalay[1], Gül Mete Civelek[1]

[1]University of Health Sciences, Ankara Bilkent City Hospital, Department of Physcial Medicine and Rehabilitation
[2]Ankara Medipol University Faculty of Medicine, Department of Physical Medicine and Rehabilitation
[3]Ankara Doctor Abdurrahman Yurtaslan Oncology Training and Research Hospital

Objectives: This study aimed to evaluate the characteristics of lipedema patients and determine the conditions associated with lipedema in a tertiary university hospital lymphedema unit.

Background: Lipedema is a chronic disabling condition characterized by bilateral swelling and pain in the legs and/or arms, affecting the subcutaneous fat of the extremities in women.

Methods: All lipedema patients who admitted to the lymphedema unit during the last 6 months were screened and demographic and clinical characteristics were recorded.

Results: There were 314 women with lipedema. The mean age was 52.12±11.92. The obesity frequency was quite high, at 95.9%. The most common types of lipedema were types 2 and 1. Approximately 60% of patients had stage 2 lipedema. More than half of the patients had at least two different types of lipedema together. The prevalence of lipolymphedema was 10%, and the prevalence of pain was about 60%. 40% of the patients had venous insufficiency. B12 deficiency was present in 4.5% of patients, and vitamin D deficiency was present in 54.1% of patients. The frequency of venous insufficiency was similar between patients with different lipedema stage (p=0.164). In patients with stage 2 and 3 lymphedemas, the frequency of lipolymphedema was higher than in the stage 1 lipedema group (p<0.01). BMI was positively associated with presence of lipolymphedema (p=0.024, OR: 1.061).

Conclusions: Patients with lipoedema were commonly obese and the most common types of the disease are type 1 and type 2. The presence of pain, vitamin D deficiency and venous insufficiency were quite common. Also, high BMI was a significant risk factor for lipedema and lipolymphedema. Weight-loss therapies with educational programs must be provided as a primary therapy for patients with lipedema.

Keywords: Lipedema, Lipolymphedema, Venous insufficiency, Pain

PP-024

The impact of lipedema on female sexual function, quality of life, and mood: A cross-sectional study

Hilal Yesil[1]

[1]Afyonkarahisar Health Sciences University

Objectives: We aimed to evaluate sexual function, quality of life, and depression in women with lipedema

Background: There are very limited publications in the literature about the effect of lipedema on depression and quality of life; however, it has been observed that the effect of lipedema on sexual dysfunction has never been investigated.

Methods: A total of twenty women with lipedema and 20 age-matched controls were included in the study. History and clinical findings of patients with lipedema were recorded. Sociodemographic form, female sexual function scale (FSFI), SF-36 quality of life (QoL) scale, and Beck depression inventory (BDI)were applied to both groups.

Results: There was no difference in terms of the ages of the participants between the lipedema and control groups (p=0.868). The FSFI, and QoL-SF 36 scores of the lipedema group were significantly lower than the control group (p<0.05). BDI scores of the lipedema group were significantly higher than the control group (p<0.001). A negative correlation was found between lipedema stage and all subgroups of the FSFI questionnaire except the satisfaction subgroup score (p<0.05). The age of the patients, QoL-SF 36 scores, and BDI scores were also significantly correlated with sexual dysfunction (p<0.05).

Conclusions: It was determined that female lipedema patients may be at risk for sexual dysfunction. These patients should be informed about possible sexual dysfunction during follow-up. Moreover, disease-related mood changes and poor quality of life may be associated with this condition. The quality of life of patients should be improved and necessary measures should be taken to provide psychosocial support.

Keywords: lipedema, quality of life, depression, sexual dysfunction

PP-025

NUTRITIONAL INTERVENTION IN PATIENTS WITH LIPEDEMA: A CLINICAL CASE

Eraci Drehmer Rieger[2], Isabel Forner Cordero[1], Naiara Piedrafita Gibanel[2]

[1]hospital universitari i politécnica La Fe
[2]Universidad Católica de Valencia

Objectives: G.O.1. To evaluate the efficacy of an anti-inflammatory diet and the body composition in patients with lipedema. G.O.2. To evaluate the efficacy of an anti-inflamatory diet and the pain.

Background: Many diets have been recommended for lipedema patients, but none of them have clearly shown to be effective. Although the main comorbidity in lipedema is obesity, many patients have normal weight. The influence of weight loss on the volume of lipedema is controversial. The benefits of nutrition are undeniable: a better general health status; better mobility, less joint pain; and less difficulty in wearing compression garments. There is no specific evidence-based diet for people with lipedema, as no randomized controlled trials have been published yet. Although lipedema is a disease of the subcutaneous adipose tissue, the study of body composition is extremely useful in providing information on fat mass, lean mass, bone mass and other relevant anatomical points.

Methods: A 34-year-old woman with stage 3, type III Lipedema, who was prescribed a gluten-free, anti-inflammatory diet of 1800 calories. The quality of the diet was calibrated by u sing the Easy Diet® management software. Body weight, height, waist perimeter and hip perimeter, percentage of body fat and muscle fat using ISAK method. The functional assessment was carried out with a pre- and post-study analysis of the grip strength of the upper limbs using the Jamar Plus device, and in lower limbs 10 min -walking-test. The DASH questionnaire was carried out to measure the variables of arm, shoulder and hand disabilities, and the ABC questionnaire of the Balance Scale Activities.

Results: Baseline examination showed a weight of 88.3 kg, BMI. 30.1 kg/cm2, Waist-to-Height-Ratio 0.46 (classified as Healthy), volume of the right LL was 16,312 ml; and left LL: 16,577 ml. After 3 months of diet, the patient lost 6.7 kg, the WtHR was 0.43, the percentage of fat decreased from 23.07% to 17.56%, the percentage of muscle mass increased from 39.39% to 43.64%, and the volume lower limbs reduced significantly (Right LL: 15,494 ml, Left LL: 14,956 ml). Functional test also showed an improvement after diet intervention.These results demonstrate a global improvement in anthropometric parameters: a decrease in LL volume, in body fat and increase in muscle mass, as well and functional status.

Conclusions: These results demonstrate a global improvement in anthropometric parameters: a decrease in LL volume, in body fat and an increase in muscle mass, as well as in the functional status.

Keywords: lipedema, nutrition, body composition, and functional assessment.

PP-026

Management of lipedema with biphasic ketogenic diet/lowcarb diet, follow up after surgical intervention

Roberto Cannataro[1]

[1]Università della Calabria

Objectives: Lipedema is a multifactorial pathology with a negativeevolutionary trend. Mainly present in women with a 10%incidence1.

Background: Herein, we reported a 41-year-old woman diagnosed withlipoedema type II-III stage II; she complains ofwidespread pain, particularly in the lower limbs, heaviness,and difficulty in operating various movements. She refusesany type of treatment if not nutritional. Therefore, it useda ketogenic diet (KD) for two months, then a low-carbapproach until three weeks before surgery and, continuingwith KD up to three days of surgery and, finally, repressedKD again.

Methods: The results in ponderal terms were striking: the subjectlost 12 kg, with a change of about 10 Bf%, as shown inFigure 1 panels A and B, and maintained a healthycondition. After surgery, with the KD approach, thepatients returned to a physical activity condition after only15 days (Figure 2 panels A and B).

Results: limiting, condition, as shown for RAND-36 in Figure 3.The WOMAC score had a decrease of 92.8 %%. However,SQS increased 6.9 %. We could not directly measure pain,but from the VAS scale, it was evident that the overallimprovement was 75%, up to a condition of normality.

Conclusions: Herein, we reported a subjectdiagnosed with lipedema whounderwent first a KD and then alow-carb approach, keeping thegood results obtained regardingquality of life improvement, weightcontrol, and pain management; shetrained regularly.

Keywords: surgical intervention, lipedema, diet, biphasic ketogenic diet/lowcarb diet

PP-027

Proximal Nail Unit Changes in Lymphedema: Ultrasonographic Imaging and Correlation with Dermis and Subcutaneous Tissue Thickness

Busra Nur Aslantas[1], Eren Aygun[1], Rana Terlemez[1], Sansin Tuzun[1]

[1]Istanbul University-Cerrahpasa, Cerrahpasa Medical Faculty, Department of Physical Medicine and Rehabilitation

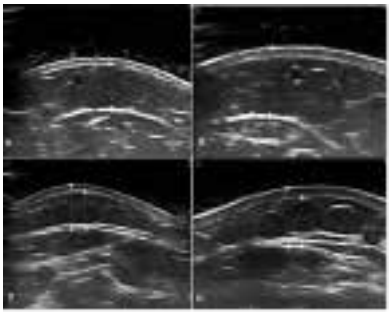
Objectives: We aimed to investigate if lymphedema could affect the thickness of the proximal nail unit, detectable via ultrasonographic imaging. We also evaluated the correlation between dermis and subcutaneous tissue thickness in lymphedematous limbs and proximal nail unit thickness.

Background: The impact of lymphedema is well-documented on the skin and subcutaneous tissue of the extremities, yet its potential effects on the proximal nail unit remain understudied to date. Considering that the proximal nail unit could be a potential predictor for early detection of lymphedema, we evaluated both the nails and subcutaneous tissue.

Methods: This cross-sectional study involved female patients diagnosed with unilateral secondary lymphedema associated with breast cancer. Comparative clinical and ultrasound imaging assessments were conducted on the lymphedematous and the contralateral limbs. Circumferences were measured at 10 cm above and below the elbow crease using a measuring tape. During the ultrasonographic examination (using an ESAOTE MyLab 70 model US device with a 6–18 MHz linear probe), the thickness (in millimeters) of the proximal nail units of all fingers of both hands (Figure 1), as well as the dermis and subcutaneous tissue thickness (in millimeters) at 10 cm above and below the elbow crease (Figure 2), were measured and the results were analyzed statistically.

The ultrasonographic measurement of thickness of the proximal nail unit

The ultrasonographic measurement of the dermis and subcutaneous tissue thickness



The ultrasonographic measurement of the a. dermis and subcutaneous tissue thickness at 10 cm above the elbow crease on the contralateral limb b. and the lymphedematous limb c. dermis and subcutaneous tissue thickness at 10 cm below the elbow crease on the the contralateral limb d. and the lymphedematous limb

Results: Fourteen patients diagnosed with unilateral lymphedema secondary to breast cancer were included. The patient's ages ranged from 37 to 65 years (mean 55,64 years); and body mass index, 18,73 to 32,84 (mean 26,8). Duration of secondary lymphedema ranged from 3 months to 20 years (mean 5,79 years). All patients had stage 2 lymphedema according to

the ISL (International Society of Lymphology).Dermis and subcutaneous tissue thickness were significantly higher in the lymphedematous limb, except for subcutaneous tissue thickness at 10 cm above the elbow crease ($p<0,05$). Although the thicknesses of the proximal nail units in all fingers of the lymphedematous limb were higher compared to the unaffected limb, no statistically significant difference was found between the two sides (Table 1). A positive moderate correlation was observed between the thickness of the proximal nail unit of the fifth finger and dermis thickness.

Ultrasonographic measurement of thicknesses of proximal nail units, dermis and subcutaneous tissue, mean

Ultrasonographic Measurement	Lymphedema	Control	P-value
Dermis thickness at 10 cm above the elbow crease(mm)	1,55	1,19	0,04
Subcutaneous thickness at 10 cm above the elbow crease(mm)	11,07	10,14	0,07
Dermis thickness at 10 cm below the elbow crease(mm)	1,87	1,05	<0,01
Subcutaneous thickness at 10 cm below the elbow crease(mm)	11,79	9,27	0,02
Proksimal nail unit thickness of the first finger(mm)	3,35	3,33	0,92
Proksimal nail unit thickness of the second finger(mm)	3,07	3,03	0,75
Proksimal nail unit thickness of the third finger(mm)	3,15	3,07	0,24
Proksimal nail unit thickness of the forth finger(mm)	2,96	2,91	0,59
Proksimal nail unit thickness of the fifth finger(mm)	2,66	2,56	0,08

Conclusions: Our study is the first to demonstrate the utility of ultrasonographic imaging as a valuable tool for detecting changes in proximal nail units in lymphedematous limbs. Nonetheless, future studies should aim to include a larger sample size to attain statistical significance.

Keywords: Lymphedema, proximal nail unit, ultrasonography

PP-028

Coexistence Of Elephantiasis Nostras Verrucosa And Foot Deformity

Sedef Ersoy[1], Armağan Özöbek[1], Fatma Nur Kesiktaş[1]

[1]SBU Istanbul Physical Medicine And Rehabilitation Research and Training Hospital

Objectives: We reported a case of a 34 year old man who had chronic primary lymphoedema of right lower limbs for 30 years. His disease was complicated with irreversible changes of elephantiasis nostras verrucosa and had recurrent admissions due to infection. He had many times(22 times)surgical treatment for his lympheudema.Our patient was taken to the complex decongestive physiotherapy program. We aimed to report the results of our patient.

Background: The most common factors causing lymphedema in the lower extremity are aplastic/hypoplastic/hyperplastic lymphatic abnormalities, gynecological cancers, surgical interventions, trauma, radiotherapy and recurrent infections.Elephantiasis nostras verrucosa (ENV) is a rare form of chronic lymphedema that causes progressive cutaneous hypertrophy. It can cause serious deformities, especially in the lower extremities.

Methods: The patient's complaints have been present since birth. He has a total of 22 vascular surgeries and orthopedic reconstruction surgery in his medical history. After the surgeries the patient had, severe deformity developed in his foot and ankle. Lymphedema, which started as primary, increased secondarily due to iatrogenic and enfective reasons. His functional status was severely impaired due to loss of ankle function. Deformities in his lower limbs limited his daily activities, and limited activities worsened his lymphedema.On physical examination, there was a port wıne staın on the right leg, and incision scars was visible along both the medial and lateral part of the lower extremity. His lowerextremity showed pitting edema; lichenification; indurated, cobblestone-like papulonodules; and plaques.

Elephantiasis Nostras Verrucosa

image of elephantiasis

Results: The patient received manual lymphatic drainage and bandaging treatment for 30 sessions, 5 days a week, by the same physiotherapist who has manual lymphatic drainage certification training.In thr beginning lower extremity circumference measurement, the ankle was evaluated as 28 cm, 20 cm proximal to the malleolus was 40 cm, and 10 cm above the patella was evaluated as 50 cm. After treatmentIn circumference measurement, the ankle was evaluated as 24 cm, 20 cm proximal to the malleolus as 35 cm, and 10 cm above the patella as 42 cm.

Conclusions: After 30 sessions of decongestive lymph drainage treatment, the patient's leg was thinned by 8 cm in the proximal and 4 cm in the distal. The treatment was completed by recommending a custom-made lymphedema compression garment suitable for the patient's measurements, outpatient clinic checks and self-drainage and exercise were recommended.

Keywords: Lymheudema, ElephantiasisNostras Verrucosa, Manual Lymphatic Drainage

PP-029

Lymphedema in a Patient with Parkinson's Disease: Is It Only Due to Restriction of Mobilization? Or is Lymphatic Microangiopathy Developing?

Selda Çiftci İnceoğlu[1], Aylin Ayyıldız[2]

[1]Şişli Hamidiye Etfal Training and Research Hospital, Department of Physical Medicine and Rehabilitation, İstanbul, Turkey
[2]Kars Harakani State Hospital, Department of Physical Medicine and Rehabilitation, Kars, Turkey

Objectives: Lymphedema is the accumulation of protein-rich interstitial fluid in the skin and subcutaneous tissue.Although secondary lymphedema is due to malignancy, heart or kidney failure, immobilization, obesity, vascular diseases or trauma.

Background: In this case report, we aim to present about a case of Parkinson's Disease (PD) and bilateral lower extremity lymphedema that started simultaneously with the disease and to review the literature.

Methods: A 78-year-old female patient with a known history of PD, hypertension, diabetes and vertigo was admitted to our outpatient clinic with complaints of swelling in both legs.She was diagnosed with PD 4 years ago. After a short time, increasing swelling developed in both lower extremities and mobility was further restricted.The patient, who was admitted to the cardiovascular surgery outpatient clinic, had lower extremity lymphoscintigraphy performed and an appearance consistent with lymphatic partial obstruction on the left side was observed.In the physical examination of the patient, it was observed that his mobilization was limited, she could walk with small steps and on flat ground.There was no rest tremor, but rigidity and bradykinesia were present.There was swelling in both lower extremities (Figure 1).Stemmer's test was positive.The patient's body mass index was 35.15 kg/m². In laboratory examinations, laboratory values were within normal limits.She didn't have kidney and heart failure.

Figure 1

Swelling in both lower extremities

Results: Lymphedema due to immobilization and obesity was first considered in the patient.Complet decongestive treatment was planned for both lower extremities(Figure 2).In addition, a rehabilitation program for PD was planned and increasing mobilization was planned as a priority target.When there was a regression in lower extremity peripheral measurements in the 3rd week of treatment, personalized compression garment measurements were taken.In the first month of treatment, a compression garment was used (Figure 3) and the patient was mobilized with a single cane.

Figure 2

Short tension bandaging of both lower extremities

Conclusions: In our case,although we thought that lymphedema was primarily due to mobility limitation and obesity, we wanted to investigate similar cases in the literature on this subject because it occurred simultaneously with the diagnosis of PD.It is not clear whether this edema is due to venous insufficiency, impaired posture compliance as a result of the activity of the calf muscles, or dysfunction in the autonomic nervous system. In the evaluation performed by microlymphography in a female patient with PD, and increase in interstitial and microlymphatic pressures was detected, and this was attributed to the insufficiency in venous and lymphatic drainage that developed after the deterioration in the function of the calf muscles.

Keywords: immobilization, lymphedema, obesity, parkinson's disease

PP-030

Neck, trunk, and arm lymphedema after thoracic outlet surgery

Sedef Ersoy[1], Fuat Orhun Alaylıoğlu[1], Armağan Özöbek[1], Kübra Uğurtay[1]

[1]SBU İstanbul Physical Medicine And Rehabilitation Training And Research Hospital

Objectives: We aimed to report a case of neck , trunk and arm lymheudema after Torasic Outlet Surgery

Background: Lymphedema is a slow-onset, progressive disease characterized by the accumulation of protein-rich interstitial fluid under the skin as a result of lymphatic system dysfunction caused by injury, infection, or congenital abnormalities. Thoracic outlet syndrome (TOS) defines a condition with upper extremity symptoms that occurs due to compression of neurovascular structures in the thoracic outlet. There are three types depending on where the compression occurs. After lympeudema , TOS can be seen, but as in this case we think it is rare to meet lympeudema after TOS surgey.

Methods: A 34-year-old male patient was referred to our outpatient clinic with complaints of swelling in the right neck, chest, and upper arm, and numbness between the shoulder and olecranon in the right arm, which had been present for 3-4 months.A In 2015, he had his first surgical operation due to TOS, through an axillary approach. 1. costa resection and pectoralis muscle relaxation were performed. Axillary hematoma developed after the operation. Afterwards patient received physical therapy and exercise therapy. In July 2017, the patient was operated on again using the pectoral and supraclavicular approach due to swelling, redness, and weak pulse in the right arm. The patient complained of swelling in the chest and neck after the operation. The patient had a third surgery in March 2020, but there was no improvement in his complaints of swelling after the operation. Following 3. surgery patient had manual lymphatic drainage as lymphedema treatment. In November 2022 the patient was operated on for the 4th time and after surgery his pain decreased, but edema in the chest and neck continued.

trunk lymheudema

Trunk Lympheudema after TOS treatment

Results: As a result, our patient had many surgeries for treatment of Torasic outlet syndrome. After these operations he has stage 2-3 lympeudema of neck trunk and arm.We applied manual lymphatic drainage complex decongestive treatment and exercises to our patient. we recommended him self-drainage and compression clothing.

Conclusions: Lymphedema is not mentioned at all among the complications seen after surgical treatment of thoracic outlet syndrome. Our patient is one of the rare cases of secondary lymphedema because it occurred after TOS surgery.

Keywords: lympheudema, torasic outlet syndrome

PP-031

Lymphedema Following Covid-19 Infection: A Case Series of 3 Young Patients

Hasan Ocak[1], Oya Özdemir[1]

[1]Hacettepe University Faculty of Medicine, Department of Physical Medicine and Rehabilitation

Objectives: Although lymphedema commonly develops secondary to cancer treatment, trauma and infection also play an important role in its etiology. It is well known that COVID-19 infection causes microvascular dysfunction by causing endothelial damage. However, the effect of COVID-19 on the lymphatic system has not been demonstrated yet. There are only a few case reports in the literature about lymphedema occurring after COVID-19 vaccination. Here, we present 3 patients with a diagnosis of lymphedema that developed or worsened after COVID-19 infection.

Background: Case 1: A 25-year-old woman with a complaint of left arm swelling for 2 months were admitted to our department. She declared that it developed 1 week after Covid-19 infection. The circumference of left arm was greater up to 1.5 cm than the rifgt side. Lymphoscintigraphy showed that there was no lymph flow in the left arm. At the end of 1 month, no significant volume reduction was obtained with self lymphatic massage and compression garment. Thus, complex decongestive therapy (CDT) was applied 5 days/week for 2 weeks. Unfortunately, only 10% volume reduction could be achieved.

Methods: Case 2: A 28-year-old woman with a complaint of swelling in her left lower limb for 6 months admitted to our department. She stated that the swelling increased significantly and became permanent after she had become sick with coronavirus. The volume difference between the legs was calculated as 1366 ml. Lymphoscintigraphy showed a significant decrease in left lower remity lymphatic drainage. A significant volume reduction has been achieved by 15 sessions of CDT. Self-massage, exercise and compression garment were prescribed.

Results: Case 3: A 22-year-old woman applied to our outpatient clinic with a complaint of swelling in her left foot and calf. The patient declared the slight swelling in the left ankle persisting for 3 years, increased dramaticaly following Covid-19 infection. The volume difference between the lower extremities was determined as 675 ml. Lymphoscintigraphy showed slowing of lymphatic flow in the left lower extremity. Self lymphatic massage, exercise and compression garment were recommended. At the end of 1st month, swelling reduced significantly.

Conclusions: Although great attention has been paid to the effects of COVID-19 infection on arteriovenous system, potential damage on lymphatic system has been overlooked. However, lymphatic vessels also consist of endothelial cells and are likely to be affected by Covid-19 infection. Therefore, detailed inquiry about COVID 19 infection is crucial to elucidate the etiology of swelling in patients diagnosed with lymphedema.

Keywords: Lymhedema, Physical Therapy, Lymhedema Rehabilitation

PP-032

Lymphedema in a Patient with Yellow Nail Syndrome

Abdülhamid Güneş[1], Busem Atar[1], Burcu Duyur Çakıt[1]

[1]Ankara Training and Research Hospital, Physical Medicine and Rehabilitation Clinic, University of Health Science

Objectives: Yellow nail syndrome (YNS) is a rare condition characterised by the presence of two of the following: (1) slow-growing, hard, yellow and dystrophic nails, (2) lymphedema and (3)respiratory disease. In general, the syndrome is acquired and affects adults over 50 years ofage. However, there are case reports of YNS occurring in children and even newborns.Anatomically, YNS affects the fingernails, toenails, respiratory tract and lymphatic vessels(often in the lower limbs). All of these signs and symptoms are believed to be caused byimpaired lymphatic circulation. In this case report, we present a patient with lower extremity lymphedema and persistent yellow nail changes.

Background: A 42 year old woman was admitted to our clinic with left leg swelling. Her complaints were left leg swelling, cough and sputum. There was no history of trauma, malignancy and insect bite. It was learnt that the patient had complained of swelling in both legs since the age of 18. Physical examination findings were as follows: edema on the left leg, stemmer sign +, yellow dystrophic nails on the toes and fingers. Cardiac examination revealed normal heart sounds and no murmur. Respiratory examination was normal. Echocardiography performed with cardiology consultation revealed an EF of 65% and no additional findings. There was no finding of respiratory tract disease as a result of chest diseases consultation. Culture and staining tests performed for onychomycosis were negative. There was a history of two previous pneumonia and bronchitis. His brother had similar yellow nail changes, low extremity lymphedema and a history of sinusitis infection every year.

lymphedema and yellow nail appearance

lower extremity lymphoedema and persistent yellow nail changes

lymphedema and yellow nail appearance

yellow dystrophic changes in fingernails

Methods: systemic examination and questioning of family history

Results: The patient received 15 sessions of complex decongestive therapy during his treatment in our ward. Right leg volume was 6.319 and left leg volume was 6.838 at the first measurement during the treatment, while right leg volume was 6.362 and left leg volume was 6.448 at the end of the treatment.

Conclusions: After detailed systemic examination and questioning of family history, we made a diagnosis of Yellow Nail Syndrome, which is rare in the literature. In conclusion, we wanted to draw attention to this genetic syndrome associated with lymphedema and yellow nail appearance.

Keywords: Lymphedema, yellow nail, dystrophic nail

PP-033

A Rare Cause of Lymphedema: Cat Scratch Disease

Faika Nur Erkol[1], Nuray Alaca[2], Reyhan Çeliker[2]

[1]Acıbadem University Research Institiute of Senology
[2]Acıbadem University Physiotherapy and Rehabilitation Department

Objectives: -Can lymphedema occur as a result of cat scratch disease?-Is complex decongestive therapy effective in the treatment of lymphedema caused by cat scratch disease?

Background: A 24-year-old female patient went to hospital with the complaint of swelling in her left hand. The patient said that he was scratched by a stray cat two months ago; Following the development of fever and painful swelling in the axillary region, ultrasound revealed two lymph nodes, 34x25 and 10x28 in size, with lobulated contours and necrosis in the middle, and it was learned that lymph node excision was treated for diagnostic purposes and antibiotic therapy with azithromycin was started.

Methods: In the pathological examination of the lymph nodes, chronic granulomatous lymphadenitis with abscess formation compatible with CSD was detected.In physical examination; In the upper extremity circumference measurements made with a tape measure at standard points, a 2 cm swelling was detected at the hand and wrist level compared to the right side. No limitation was detected in the shoulder joint range of motion of the patient, who was diagnosed with Stage 2 lymphedema. Examination findings of other systems were normal. Complex decongestive therapy was applied, including 10 sessions of manual lymph drainage, self-drainage training, multilayer bandaging, and then a compression garment. The treatment was terminated with self-drainage, exercise and protection recommendations.

Results: Table 1: Measurement Differences of Left-Right HandsStandart Points Standart PointsBefore Treatment (Left-Right) Difference (cm)After Treatment (Left-Right) Difference (cm)Middle Hand2,10,9Wrist20,7After treatment; The right and left hands and wrists had the same appearance.

Picture 1

It can be seen that there is a difference of 2 cm on the left the dorsal hand compared to the right side.

Picture 2

Left hand view before and after treatment

Table 1

Standart Points	Before Treatment (Left-Right) Difference(cm)	After Treatment (Left-Right) Difference(cm)
Middle Hand	2,1	0,9
Wrist	2	0,7

Measurement Differences of Left-Right Hands

Conclusions: •Cat Scratch Disease causes damage to lymphatic pathways due to chronic granulomatous inflammation. • The risk of developing lymphedema increases due to lymph node excision performed for diagnostic purposes.• Care should be taken against lymphedema, in infectious diseases that especially affect the lymphatic system.• Complex decongestive therapy was effective, the edema in the patient's hand completely subsided and fully recovered.

Keywords: lymphedema, infection, lymphadenopathy

References

Author Note:

PP-034

Acquired lymphedema as a red flag sign: A case of endometrial sarcoma presenting with subclinical lower extremity lymphedema

Nur Kakilli[1], Semiha Öztürk Yıldız[1], Derya Demirbağ Kabayel[1]

[1]Trakya University Physical Medicine and Rehabilitation Department

Objectives: Acquired lymphedema must be considered a red flag and prompt further investigation is needed before a diagnosis of primary lymphedema is made. Patient-reported lymphedema should be taken seriously which may be a revealing sign of malignancy.

Background: Lower extremity lymphedema (LEL) is a long term complication of gynecologic cancers. The onset of LEL may begin immediately or much later after surgery however, onset before diagnosis is overlooked. Appearance of LEL as the first clinical manifestation of a gynecologic malignancy is extremely rare. These patients are often referred to physiatrists by gynecologic oncologists but the opposite scenario is also possible, as in this case which concerns a rare case of endometrial stromal sarcoma presenting with LEL.

Methods: Informed consent was taken.

Results: A 49-year old female presented with complaints of heaviness and swelling in her legs for the last 3 months. She had no chronic illness. Family history was not remarkle. Neurological examination was intact except for hypoesthesia in right L2 dermatome. Stemmer test was bilaterally negative. There were no pitting edema or trophic skin changes (Figure 1). No obvious swelling was seen at inspection. Limb circumference measurement revealed only a maximum of 1 cm increase in the right lower extremity. Blood tests were normal except hypercalcemia. Bilateral lower extremity venous doppler ultrasonograpgy (USG) was normal. Lymphoscintigraphy revealed slowed lymphatic drainage in the right lower extremity at the femoral level. Abdominal USG showed a heterogeneous, hypoechoic nodular area measuring 7x10 cm in the uterus. She was referred to the gynecologist. In pelvic magnetic resonance imaging; the mass lesion showed regular boundaries, cystic necrotic areas in the center and heterogeneous contrast enhancement in the periphery. No periaortocaval or pelvic lymphadenopathy was detected. She underwent total hysterectomy with salpingo-oophorectomy with a preliminary diagnosis of myoma uteri but pathological examination revealed low-grade endometrial stromal sarcoma. No evidence of metastasis was detected in further examinations. Complex decongestive therapy was not deemed necessary. Exercise, self-massage, diet and general precautions were recommended. She was cured without chemoradiotherapy. At 2nd year follow-up, her lymphedema was still in latent stage.

Figure 1

Clinical appearance of patient's lower extremities at presentation

Conclusions: LEL, as the first presenting sign of a gynecologic malignancy is very rare. Our case is remarkable because early recognition of lymphedema provided cure for the patient. Patient-reported lymphedema should be taken seriously. It should be kept in mind that gynecologic malignancies can present with both advanced or subclinical LEL. Acquired LEL must be considered a red flag until proven otherwise.

Keywords: lymphedema, malignancy, lower extremity, endometrial sarcoma

PP-035

GENITAL LYMPHEDEMA: A COMPLEX CASE PRESENTATION

Büşra Nur Aslantaş[1], Tuğba Akkaya[1], Şansın Tüzün[1]

[1]İUC-Cerrahpaşa Tıp Fakültesi

Objectives: Genital lymphedema is a rare condition characterized by the expansion of the skin and subcutaneous tissue in the genital area due to impaired lymphatic drainage. It can develop secondary to malignancy, surgery, radiation, trauma or infections like filariasis. This case illustrates genital lymphedema's complexity.

Background: Genital lymphedema presents with recurrent erysipelas, lymphatic cysts, and lymphorrhea, causing personal hygiene, urination, and sexual activity challenges. Diagnosis delays are common due to psychosocial issues. Imaging for lymphedema includes lymphoscintigraphy, indocyanine green (ICG) lymphangiography, CT, and MRI. Treatment options include conservative and surgical approaches, tailored to each patient.

Methods: A 77-year-old man presented with bilateral lower extremity and penoscrotal lymphedema for 8 months, with low back pain. He had a history of rectal cancer surgery, chemotherapy, radiotherapy, hydrocelectomy, lumbar disc herniation, and inguinal hernia repair. Bilateral lower limb and genital lymphedema manifested in 2023. Oral antibiotics, topical treatment, and complex decongestive physiotherapy (CD) were initiated. During hospitalization, elevated acute phase reactant (APR) and urea creatinine prompted nephrostomy for grade 4 hydronephrosis. Elevated APR led to oncology referral, limiting lymphedema treatment for 3 weeks.

Results: Three weeks of CDP significantly reduced bilateral lower extremity and genital lymphedema, enhancing the patient's quality of life. Even without surgery, CDP proved effective.

before the CDP

after the CDP

Conclusions: Genital lymphedema challenges early diagnosis due to psychosocial impacts. Treatment involves conservative and surgical methods, individually tailored. Standardized protocols are lacking, emphasizing the need for personalized approaches.

Keywords: genital lymphedema, complex decongestive physiotherapy (CDP)

PP-036

Vascularized Lymph Node Transplantation for the Treatment of Factitious Lymphedema: A Case Report

Dicle AKSOYLER[1], Ilker OZGUR[2], Cagla CANBAY SARILAR[3], Emre Sertac BINGUL[4], Mustafa ALTINKAYNAK[5], Dilara DENIZ-MEN[6], Enes KUSDOGAN[7], Emre OZBEY[1], Mehmet Can NERGIZOGULLARI[1], Aykan HATIPOGLU[1]

[1]Department of Plastic Reconstructive and Aesthetic Surgery, Istanbul University Istanbul Faculty of Medicine
[2]Department of General Surgery, Istanbul University Istanbul Faculty of Medicine
[3]Department of Cardiovascular Surgery, Istanbul University Istanbul Faculty of Medicine
[4]Department of Anaesthesiology, Istanbul University Istanbul Faculty of Medicine
[5]Department of Internal Medicine, Istanbul University Istanbul Faculty of Medicine
[6]Department of Nuclear Medicine, Istanbul University Istanbul Faculty of Medicine
[7]Department of Child and Adolescent Psychiatry, Istanbul University Istanbul Faculty of Medicine

Objectives: Factitious disorders of the extremities can occur in various ways, including lymphedema. Several case presentations that were treated by amputation, Charles procedure, conservative medical treatment, or self-injury prevention.This is the first case report for treating factitious lymphedema using free vascularized lymph node transfer (VLNT).

Background: A 17-year-old girl presented with a hyperpigmented, stiff, swollen, brownish, heavily movable left arm with several punctures. Symptoms began a year ago, the patient had been in different hospitals. Lymphoscintigraphy demonstrated stage IIa lymphedema with epitrochlear dermal backflow and reduced activity on epitrochlear and axillary lymph nodes.

Methods: Under local anesthesia, two lymphovenous anastomoses (LVAs) were performed on her hand's dorsum. A compression garment was placed. The swelling on her hand reduced. She returned to the clinic a week later because of her entire arm was stiff and purple. VLNT using a gastro-omental flap was performed. Approximately 40% of the harvested flap was transported to the wrist, and 60% to the elbow. On the third day of the procedure, venous insufficiency was found in the wrist region. A pinhole in the vein wall was found during re-exploration, vein anastomoses were restored, yet venous insufficiency remained. During re-exploration, some lymph nodes became stuck on the wrist, were observed to be alive and were not removed. There were no problem in the ankle. The edema in her extremity had significantly lessened, and she was discharged. A week later the patient presented with swollen and painful extremity. She was re-admitted into service and during the next day round a bra strap was bound tightly on the upper arm; but she refused and became upset when confronted. This pattern continued throughout the day. A psychiatric evaluation was requested. Given that the patient generated the physical symptoms, presenting herself as unable to work due to pain, and the lack of a more plausible mental disorder to explain this situation, it was deemed consistent with factitious disorder according to DSM-5 TR.

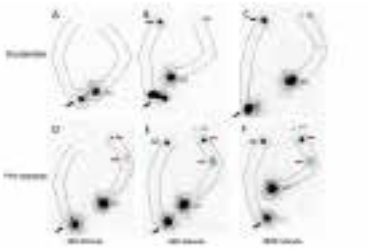
photo 1

Figure 1A: Immediate preoperative appearance of patient after lymphovenous anastomoses performed and before vascularized lymph node transfer (VLNT), open incisions on the hand's dorsum is visible and clear distinction above which

there is no edema at the proximal extent of axilla is visible. B: Harvested gastro-omental flap C: Flow through vein anastomoses of the VLNT in the wrist. D:Flow through vein anastomoses of the VLNT in the ankle E:Early postoperative appearance F:Reconstructed radial artery by using vein graft. Reddish lymph nodes are visible, which are left in the wrist like a graft. G: Final appearance of her arms

Results: She underwent psychiatric treatment and lymphedema did not occur again. Late term postoperative lymphoscintigraphy demonstrated a significantly rapid activity passage and additional lymph node visualization.

photo 2



Semi-whole body anterior images of (a–c) preoperative and (d–f) postoperative lymphoscintigraphy; (a and d) 10th-minute, (b and e) 90th-minute, and (c and f) 180th-minute images after 99mTc-nanocolloid injection to the hands. In the preoperative images, minimal activity passage from the left-hand injection site (blue arrow) was observed to the left axillary lymph node (red arrow), whereas in the postoperative images, a significantly rapid activity passage and additional left cervical lymph node (green arrow) visualization was detected, reflecting an increase in lymphatic drainage. Activity accumulation due to postoperative changes was observed on the left upper arm surgical site (purple arrow). Normal activity passage was observed from the right hand (black arrow) to the right axillary lymph node (dark blue arrow) at both time points

Conclusions: The tourniquet effect in factitious lymphedema is distinguished by the brawny discoloration of the arm, the field of unambiguous distinction above which there is no discoloration at the proximal reach of the axilla. Physicians should thoroughly and patiently examine these patients to prevent any self injury related organic pathology and avoid being manipulated into performing unnecessary procedures.

Keywords: factitious lymphedema, vascularized lymph node transfer, free gastroomental flap, lymphovenous anastomoses

PP-037

The management of varicose veins with concomitant lymphedema of lower extremities. A case report.

Tatiana Chernyago[1]

[1]JSC Phlebology Center

Objectives: We present a case of the successful treatment of varicose veins of the lower extremities combined with secondary lymphedema.

Background: The optimal approaches for concurrent vascular lesions with limb lymphedema are not well established. It is known that the presence of venous pathology aggravates the course of lymphedema of the extremities.

Methods: We present the case of a 60-year-old woman who underwent hysterectomy with lymph node dissection in 2016 for uterine cancer. Since then, the patient has noted swelling of the right lower limb. During the period from 2016 to 2022, she suffered 6 episodes of erysipelas. The established difference between right and left legs was 3002 ml. The presence of varicose veins has been noted for more than 10 years. The patient's quality of life was assessed at 14 points according to the CIVIQ questionnaire, the severity of the disease according to the VSCC scale was 13. Clinical class according to CEAP was C1,2,3,S,Ep,se,As,p,Pr GSVa,CPV,LII on both legs. We decided on the advisability of surgical treatment of varicose veins. At the first stage, the patient underwent a course of complex decongestive therapy for 10 days. During treatment, the edema regressed and the volume of the limb was reduced by 1785 ml. Then the patient underwent an endovenous laser ablation therapy of the great saphenous veins on both legs. The postoperative period proceeded without complications; ultrasound veins scan 2 weeks later showed the obliteration of the great saphenous veins in both extremities. The patient was prescribed II class compression stockings, use of venotonics and dynamic observation. A year after the surgical intervention, the patient noted an improvement in the quality of life - 52 points on the CIVIQ questionnaire, in addition, there was no recurrence of erysipelas over the year follow-up.

Results: Thus the elimination of venous pathology improves the quality of life of patients, and probably reduces the likelihood of erysipelas.

Conclusions: Today the literature does not provide enough data on the treatment of patients with combined lymphatic and venous pathology. Systematization of knowledge in this direction is relevant.

Keywords: Varicose veins, lymphedema, lymph-venous insufficiency

PP-038

Complete Decongestive Therapy for Persistent Localized Swelling in the Hand Following Complicated Soft Tissue Infection: A Case Report

Ayça Utkan Karasu[1], İlknur Onurlu[1]

[1]Gazi University Faculty of Medicine, Physical Medicine and Rehabilitation Department

Objectives: This case report presents the outcomes of a patient with persistent localized swelling in the hand, following a complicated soft tissue infection (CSTI), treated with complete decongestive therapy (CDT).

Background: Lymphedema can occur as a consequence of various factors, including infections that disrupt the normal flow of lymphatic fluid. Post-infection lymphedema, in particular, presents a unique challenge due to its potential to exacerbate tissue damage and hinder the body's ability to fight infection effectively. Understanding the underlying mechanisms and exploring effective treatment strategies for post-infection lymphedema is crucial in mitigating its impact on patients' quality of life and long-term outcomes.

Methods: Measurements of circumference, range of motion of joints, hand grip strength measurements with Jamar dynamometer, and assessment of quality of life using the quality of life assessment tool for lymphoedema (LYMQOL) scale were conducted before and after the patient's treatment.

Results: A 42-year-old male, employed as a plumber, presented to the dermatology department for management of a complicated soft tissue infection in the right arm, which began following work in an unclean environment (Figure 1). Despite discharge from the hospital, the patient continued to experience persistent swelling in the arm, weakness, and limited range of motion in the hand, prompting referral to the Department of Physical Medicine and Rehabilitation. It was noted that the patient faced difficulties in both daily and occupational activities. Superficial ultrasonography revealed widespread heterogenous edema in the skin-subcutaneous tissue interface. Complete Decongestive Therapy (CDT) was initiated. For 2 weeks, 5 days a week, the patient underwent multilayer bandaging, manual lymphatic drainage, and lymphedema exercises. Post-treatment Improvements were observed in edema, range of motion, grip strength, and LYMQOL scale scores (Figure 2). Pre- and post-treatment assessments are summarized in Table 1.

Figure 1

Complicated soft tissue infection in the right arm

Figure 2

Improvements in edema

Table 1

	Pre-treatment		Post-treatment	
	Right	Left	Right	Left
MCP (cm)	23,6	20,6	23,2	20,6
Wrist (cm)	18,7	17	18,3	16,9
+4 (cm)	20,4	19	19,3	19
+8 (cm)	23,3	21,8	21,7	21,6
+12 (cm)	26,4	24,7	24,8	24,6
+16 (cm)	27,3	25,8	26,8	26
+20 (cm)	27,4	26,4	27	26,4
+24 (cm)	27,3	26	27,2	26
+28 (cm)	28,5	27,8	28,2	27,7
+32 (cm)	30,3	29,1	30,3	28,9
+36 (cm)	32,5	31	32	31
+40 (cm)	33,8	32	34	32,5
Volume (ml)	2506	2249	2405	2248
Volume difference (%)	11,4		7	
Wrist flex (°)	15	62	80	77
Wrist ext (°)	19	60	30	65
Elbow flex (°)	124	135	135	135
HGS (kg)	30	45	39	46
LYMQOL	52		30	

Pre- and post-treatment assessments

Conclusions: Complete Decongestive Therapy (CDT) is a beneficial method for the earlier acquisition of hand functions affected by persistent edema developing after complicated soft tissue infections.

Keywords: Lymphedema, Complete Decongestive Therapy, Soft Tissue Infection

PP-039

Treatment of Head and Neck Lymphedema Following Surgery and Radiotherapy for the Laringeal Squamous Cell Cancer; A Case Report.

İzel Deniz Pehlivan Çakıcı[1], Sedef Ersoy[1], Armağan Özöbek[1], Fatma Nur Kesiktaş[1]

[1]Istanbul Physical Therapy and Rehabilitation Traning Research Hospital

Objectives: This study aims to take a glance at head and neck lymphedema treathment which was occured after the neck surgery due to laryngeal squamous cell cancer.

Background: Head and Neck Lymphedema (HNL) is a disastrous but common effect of head and neck cancer treatment. Removal of lymph nodes during cancer biopsy or tumor resection and radiation therapy are causes of HNL in head and neck cancer patients. HNL can progress to the point of creating frustration and embarrassment resulting in social withdrawal from obvious body image concerns, neck and facial deformity, as well as serious functional problems such as difficulty breathing and swallowing, or even walking. However, with appropriate treatment, HNL can usually be reduced to a manageable level.

Methods: Case Summary: Herein, we present a male patient who underwent a neck surgery, had lymphectomy and got the radiotherapy because of a larynx squamous cell cancer. After 3 years from the radiotherapy process, he was diagnosed with a stage 2 HNL.

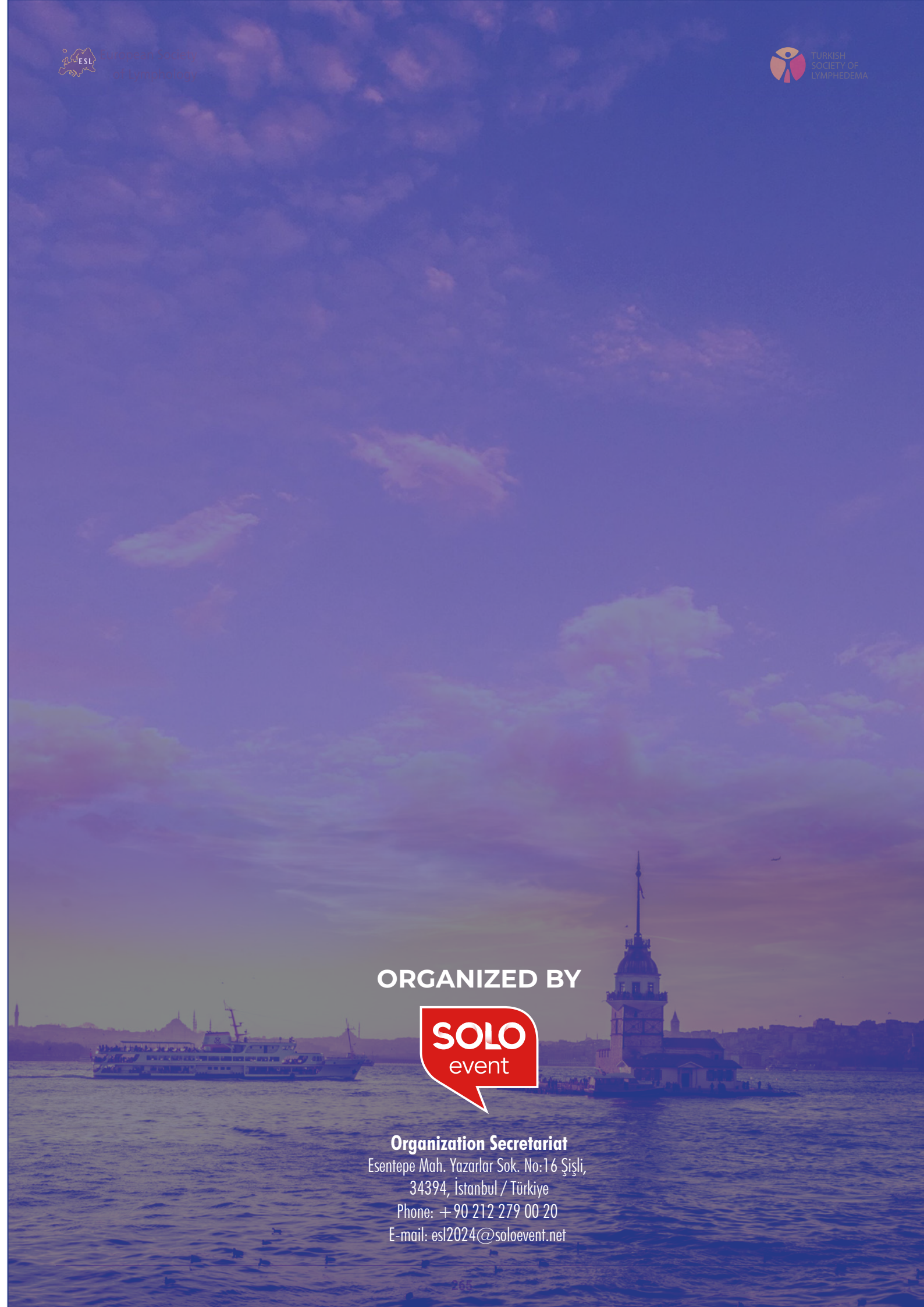
Results: A total of 30 sessions of rehabilitation program consisting of complete decongestive therapy (CDT) including manuel lymph drainage (MLD) was applied to our patient. In our study, even though our patient benefited from CDT, complete recovery was not achieved and we consider that more effective results can be obtained by trying additional methods.

Physical Examination and Manuel Lymph Drainage

Complete Decongestive Therapy Follow-up

Conclusions: Complete decongestive therapy is effective for HNL. However, further research and studies are needed.

Keywords: head and neck lymphedema, complete decongestive therapy, manuel lymph drainage



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Phone: +90 212 279 00 20

E-mail: esl2024@soloevent.net