

03. Vascular Anomalies & Lymphatic Malformations

Imaging classification and characteristic analysis of thoracic complex lymphatic malformation based on CT and MRI

Wang rengui ⁽¹⁾

Capital Medical university, Beijing Shijitan Hospital, Department of Radiology, Beijing, China ⁽¹⁾

Imaging classification and characteristic analysis of thoracic complex lymphatic malformation based on CT and MRI

Wang rengui, MD (renguiwang@126.com)

Department of Radiology, Beijing shijitan hospital of Capital Medical University, Beijing 100038, China

According to ISSVA (2021), thoracic lymphatic malformations are classified into simple and complex types. The simple type includes macrocystic, microcystic and mixed lesions limited to one anatomical unit. The complex lymphatic anomalies (CLA) are divided into generalized lymphatic anomaly (GLA), Kaposiform lymphangiomatosis (KLA), Gorham-Stout (vanishing bone) disease (GSD), central conducting lymphatic anomaly (CCLA) and PIK3CA-related overgrowth spectrum (POS) with multiple site involvement and overlapping pattern of clinical symptoms, imaging features, hematological changes and complications. So it is difficult to make accurate classification, differential diagnosis, treatment and prognosis of CLA clinically and still face major challenges.

From June 2006 to December 2022, we collected 166 patients with thoracic CLA diagnosed by clinical or pathological diagnosis. Five image phenotypes are classified based on CT and MRI: (1) multiple macrocystic type in different parts ($n=$), also known as lymphangiomatosis with cystic diameter $\geq 10\text{mm}$; (2) multiple microcapsules, dense number and diameter $< 10\text{mm}$; (3) multiple lymphangiectasia, also divided into tortuosity and dilation of small and larger lymphatics (CCLA); (4) diffuse swelling type, edema or small lymphangitic hyperplasia; (5) mixed type, polycystic or dilation or swelling or consolidation etc.

The intrathoracic and extrathoracic CT and MRI features of five types of CLA are shown in Table 1. The results showed that there were significant differences in mediastinal turbidity and cystic change, lymphatic reflux, chylous leakage, pleural abnormalities, skeletal

abnormalities, hepatosplenic lymphangioma, pulmonary interstitial and parenchymal abnormalities between the five types of CLA. MRI is superior to CT in diagnosis of cystic change, lymphatic tortuosity and dilation, edema, affected area and abnormalities of thoracic duct of CLA With statistical significance. CT(especially CTL) is significantly superior to MRI in identifying lymphatic reflux, chylous leakage, pulmonary interstitial and parenchymal abnormalities with $P < 0.05$.

Conclusion: CT and MRI are important imaging methods for the diagnosis of CLA. The imaging phenotypes are closely related to their pathological types, providing imaging basis for differential diagnosis, clinical staging and evaluation of pathogenesis.

Conflicts of interest:

The author declares that there is no conflict of interest.

06. Immunology & Immunotherapy for Lymphatic Disorders

The missing gap in treating edema vs treating the immune system

Petra Kooloos ⁽¹⁾

Dr Vodderschool, MLDV, Brugge, Belgium ⁽¹⁾

The missing gap in treating edema vs treating the immune system.

Petra Kooloos: teacher Vodderschool Belgium/The Netherlands

General president MLDV Belgium/The Netherlands

Onco/Edema fysiotherapist

Introduction:

Once upon a time there were a couple of very intelligent men who decided to set up an association regarding the immune system within lymphology. Edema was not an issue in those days. The medical researchers from 1622 until 1974 used keywords like: Intra/extracellulair lympe, elixer of life, acidity of bodyfluids, most vital system and most important cell regeneration and immunity. From 1974 the aspect of immunity seemed to recede into the background.

Method:

While searching online I used the same keywords as the medical researchers in those days used. I read about the same things and everything related to the immune system. In this day and age they talk mainly about Telomeres and especially their length. In 2009 E. Blackburn, C. Greider and J. Szostak won the Nobel Prize for Physiology in Medicine. They discovered the Telomeres. Telomeres are exactly the same what E. Vlodavets et al. meant by cell regeneration and immunity.

Conclusion:

In my presentation I'll make the comparison between cell regeneration and telomeres using scientific studies.

So let's close the gap by examining what MLDV does to the Telomeres and the immune system.

References:

-Telomeres and Telomerase: The Means to

the End

Nobel Lecture, December 7, 2009

by

ELIZABETH H. BLACKBURN

Department of Biochemistry and Biophysics, The University of California

San Francisco, San Francisco, CA 94158, U.S.A

-HHS Public Access

Author manuscript

Psychoneuroendocrinology: March ; 101 : 97-100. doi:10.1016/j.psyneuen.20018.10.019

The role and immunosenescence: the role of telomerase.

Karin de Punder. Christine Heim, Pathik D. Wadhwa, and Sonja Entringer

07. Oncolymphology; Research & Technological Development

Clinical Utility of Bioimpedance Analysis for Upper Limb Lymphedema with Physiologic Surgical Treatment

Min Gi Kim⁽¹⁾ - Ga Ram Hong⁽¹⁾ - Jaeyong Jeon⁽¹⁾

Asan Medical Center, Rehabilitation Medicine, Seoul, Republic Of Korea⁽¹⁾

Clinical Utility of Bioimpedance Analysis for Upper Limb Lymphedema with Physiologic Surgical Treatment

Abstract

Background: In lymphedema, accumulation of subcutaneous interstitial fluid is the most characteristic feature. Bioimpedance analysis (BIA) is a promising technique to measure amount of body components using a non-invasive method. In this study, we identified the clinical importance of BIA parameters in upper limb lymphedema with physiologic surgical treatment such as lymphovenous anastomosis (LVA) or vascularized lymph node transfer (VLNT).

Methods and Results: A single center retrospective study using a multifrequency BIA. The perioperative BIA parameters such as extracellular water (ECW) ratio or fat free mass (FFM) ratio and limb volume defined as percentage of excess volume (PEV) were measured. The relationships between the amount of change in PEV and in BIA parameters during surgery were evaluated. Out of 48 unilateral lymphedema patients, 46 were female and the average age was 55.4 years. PEV and all BIA parameters showed significant decrease after surgery ($p < 0.001$). There were significant correlations between Δ PEV and the degree of changes in all BIA parameters. In particular, the Δ FFM ratio showed the highest correlation with the amount of change in PEV ($r = 0.599$, $p < 0.001$).

Conclusion: BIA parameters correlated well with the volume change after surgery. BIA could be useful as a quick and easy tool for follow-up after lymphedema surgery.

07. Oncolymphology; Research & Technological Development

Breast cancer related lymphedema rehabilitation care during Covid-19

F. Figen Ayhan ⁽¹⁾

Atılım University School of Medicine, Medicana International Ankara Hospital, Physival Medicine and Rehabilitation, Ankara, Turkey ⁽¹⁾

Introduction

It was reported that breast cancer health services have been affected by the COVID-19 (1,2). As far as we know, breast cancer rehabilitation services were not investigated during pandemic period. The most common cause of secondary lymphedema is breast cancer management in developed countries. Breast cancer related lymphedema (BCRL) is a common problem in patients admitted to rehabilitation program.

Aims of the Study

We aimed to evaluate breast cancer rehabilitation services during the pandemic and compare them with pre-pandemic data.

Methods

The data of 122 patients were collected for 2 years before and during the pandemic. Fifty female patients with unilateral breast cancer (mean age: 54,10 \pm 10,18) were included in the study. Demographic data, body mass index (BMI), time after surgery (TAS), disease and management characteristics were recorded.

Results

Modified radical mastectomy (MRM) history was present in 29 of 50 patients (58%). Chemotherapy and radiotherapy were given in 22 (44%) and 27 (54%) patients, respectively. Breast cancer related lymphedema (BCRL) was detected in 24 (48%) patients. Breast reconstruction surgery was detected in 3 patients (6%). Limitation of shoulder movements due to axillary web syndrome was present in 4 patients (8%). Twenty-four patients (48%) were admitted to the complex decongestive therapy (CDT) program. There was no difference between the data of patients who received CDT and those who did not ($p>0.05$). Table 1 shows the data of patients diagnosed with BCRL who were provided lymphedema rehabilitation services before and during the pandemic. Table 2 shows the number of patients diagnosed with BCRL who were provided lymphedema rehabilitation services before and during the pandemic. The number of patients receiving rehabilitation program increased two-fold during pandemic. Figure 1 demonstrate the increased trends of patient and physician visits.

Conclusions

The Covid-19 pandemic has affected breast cancer rehabilitation services in different dimensions. The admitted number of patients with BCRL increased during the pandemic. Although the number of patients increased during the pandemic period, 48% patients were admitted to the rehabilitation program. Overloaded public hospitals may be responsible for this rising trend of admissions for BCRL.

	CDT (n=24)	No CDT (n=26)	p-value
Age (years), mean (SD)	56.6 (10.75)	52 (8.90)	0.100
Time after surgery (months)	32.67 (60.36)	22.77 (43.73)	0.507

BMI (kg/m²)	23.8 (5.76)	20.8 (6.28)	0.087
MRM (n, %)	16, %66.7	13, %50	0.242
Plastic surgery (n, %)	11, %40.3	3, %11.5	0.89
Chemotherapy (n, %)	9, %37.5	13, %50	0.384
Radiotherapy (n,%)	11, %45.8	16, %61.5	0.275
Removed lymph node	17.50 (8.50) (1-36)	14.85 (8.50) (1-35)	0.935
Positive lymph node	3.25 (3.27) (0-12)	3.15 (5.17) (0-19)	0.294
Percentage of difference	15.11(14.92) (0.5-52.90)	11.62 (12.41) (0.2-53.5)	0.371

Table 1. The comparison of patients regarding CDT during pandemic

	2018 n (%)	2019 n (%)	before n (%)	2020 n (%)	2021 n (%)	during n (%)	Total n (%)
P	19 (15.57)	22 (18.03)	41 (33.61)	42 (34.43)	39 (31.97)	81 (66.39)	122 (100)
V	31 (9.81)	37 (11.71)	68 (21.52)	121 (38.29)	127 (40.19)	248 (78.48)	316 (100)

Table 2. The distribution of patients (P) and visits (V) before and during the pandemic.

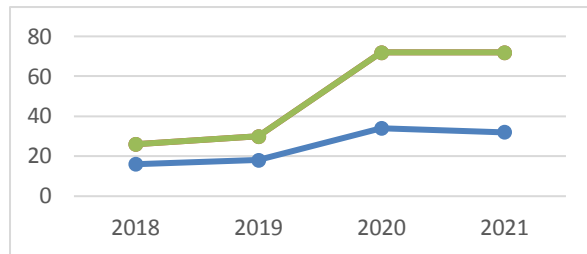


Figure 1. The increased trends of patient admissions and physician visits during pandemic

Key words: Breast cancer, rehabilitation, lymphedema, axillary web syndrome, complex decongestive therapy, pandemic, COVID-19

References

1. Li T, Nickel B, Ngo P, McFadden K, Brennan M, Marinovich ML, Houssami N. A systematic review of the impact of the COVID-19 pandemic on breast cancer screening and diagnosis. *Breast*. 2023;67:78-88.
2. Kripalani S, Kulshreshta S, Saracco B, Meterissian S. The effect of COVID-19 on breast cancer care and treatment in North America: A scoping review. *Am J Surg*. 2022;224(5):1222-1228.

07. Oncolymphology; Research & Technological Development

WHICH INTERFACE PRESSURE IS MORE EFFECTIVE IN REDUCING LOCAL TISSUE FLUID AND INCREASING UPPER EXTREMITY FUNCTION IN PATIENT WITH BCRL? SINGLE BLIND RANDOMIZED CONTROLLED COMPARATIVE STUDY

Elif DUYGU-YILDIZ⁽¹⁾ - Yesim BAKAR⁽²⁾ - Mustafa HIZAL⁽³⁾

Bolu Abant İzzet Baysal University, Faculty of Health Sciences, Physiotherapy and Rehabilitation, Bolu, Turkey⁽¹⁾ - Izmir Bakircay University, Faculty of Health Sciences, Physiotherapy and Rehabilitation, Bolu, Turkey⁽²⁾ - Bolu Abant İzzet Baysal University, Faculty of Medicine, Radiology, Bolu, Turkey⁽³⁾

WHICH INTERFACE PRESSURE IS MORE EFFECTIVE IN REDUCING LOCAL TISSUE FLUID AND INCREASING UPPER EXTREMITY FUNCTION IN PATIENT WITH BREAST CANCER RELATED LYMPHEDEMA? SINGLE BLIND RANDOMIZED CONTROLLED COMPARATIVE TRIAL

Elif DUYGU-YILDIZ¹, Yeşim BAKAR², Mustafa HIZAL³

¹Bolu Abant İzzet Baysal University, Faculty of Health Sciences, Department of Physiotherapy and Rehabilitation, Bolu, Turkey

²Izmir Bakircay University, Faculty of Health Sciences, Department of Physiotherapy and Rehabilitation, Izmir, Turkey

³Bolu Abant İzzet Baysal University, Faculty of Medicine, Department of Radiology, Bolu, Turkey

Background: Breast cancer-related lymphedema (BRCL) is an important complication after breast cancer surgery. BCRL may reduce the range of movement of the affected limb and deteriorates upper extremity function. Complex decongestive physiotherapy (CDP) is excepted as a gold standard therapy for BRCL. CDP consist of manual lymph drainage (MLD), skin care, compression bandage and exercise. Although the compression bandage is the most important component of the treatment, there is no consensus on how much compression pressure should be applied for BCRL. Aim of this study was to evaluate effect of different bandage interface pressures on edema and upper extremity function.

Materials/methods: A total of 22 patients with stage 2 BCRL was participated to the study. Patients randomly assigned to two groups which are low interface pressure (20-30 mmHg)(n:11) and high interface pressure (45-55 mmHg)(n:11). Tissue dielectric constant (TDC) values and ratios were evaluated from 5 reference points as wrist volar, forearm dorsum, forearm volar, arm dorsum, arm volar with MoistureMeter Compact. Quick-DASH was used to determine upper extremity function. Patients were blinded by not knowing the group they assigned. Interface pressure of compression bandage was assessed with Kikuhime. Patients received CDP according to their groups. Patients were evaluated at baseline and after 20 sessions over 4 weeks.

Results: The mean age and body mass index of the patients in the low and high interface pressure groups were 61.18 ± 8.87 , 65.54 ± 11.80 years and 28.07 ± 3.65 , 31.55 ± 4.17 kg/m² respectively. TDC ratios in the wrist volar, forearm volar, forearm dorsum, arm volar and arm dorsum were 1.29(1.08-1.55), 1.20(1.14-1.45), 1.33(1.03-1.37), 1.27(1.11-1.48) 1.33(1.03-1.37) respectively in the low interface pressure group before CDP. TDC ratios in the wrist volar, forearm volar, forearm dorsum, arm volar and arm dorsum were 1.47(1.36-1.58), 1.64(1.32-1.78), 1.35(1.17-1.44), 1.58(1.28-1.75), 1.54(1.33-1.84) respectively in the high interface pressure group after CDP before CDP. TDC ratios of all references were reduced significantly in the high interface pressure group ($p=0.003, 0.026, 0.021, 0.004, 0.013$). In the low interface pressure group, TDC ratios were reduced in the wrist volar, forearm dorsum, forearm volar ($p=0.016, 0.021, 0.016$) after CDP. There were no significant differences between the groups in TDC ratio values. Q-DASH scores of low interface pressure and high interface pressure group were 42.353 ± 20.66 , 34.29 ± 34.65 respectively. There was no change in upper extremity function of patients in both groups at the end of treatment ($p>0.05$).

Conclusion: Both interface pressures were effective in reducing BRCL in the forearm, but high interface pressure may be more efficient in the upper arm edema. The low interface pressure may not have been sufficient to reduce the proximal edema because the bandage pressure had to be reduced gradually. CDP had no affect upper extremity function regardless of interface pressure. The fact that the evaluation was made immediately at the end of the treatment and that the patients did not have the opportunity to use their arms in daily life may have caused this situation. It can be suggested to reproduced in a larger sample by evaluating the factors that may influence the reduction of edema such as fibrosis.

EARLY DETECTION AND MONITORING OF LYMPHEDEMA IN A MULTIDICPLINARY MELANOMA CLINIC

Saskia R.J.Thiadens Will Lockett, Sylvia Sudat, Mohammed Kashani-Sabet, Stanley P. Leong, Center of Melanoma Research and Treatment.
Sutter Pacific Medical Foundation San Francisco, CA, USA

Hypothesis/Objectives: We hypothesize that postoperative monitoring of lymphedema (LE) with early detection may result in better outcomes in postoperative lymphedema. Our goal is to intervene when early subclinical lymphedema is detected and initiate with compression garments and quarterly L-dex monitoring to prevent a chronic lifelong condition.

Materials-Methods: Patients were seen the day before surgery (including wide excision of primary melanoma and sentinel lymph node biopsy) by LE nurse and educated in the lymphatic system, risk reduction practices, signs & symptoms of LE, and instructions in post-surgery exercises. BioImpedence Spectroscopy (BIS) the SOZO device is used to measure extracellular fluid and produces a baseline L-dex measurement. BIS identifies early subclinical lymphedema and provide an opportunity for early intervention and possible prevention of a chronic lifelong condition. Patients are educated in the value of L-dex measurements and agree to be followed 2 weeks post-op and every 3-months for 2 years or longer.

Results:

There were 103 male and 110 female patients. There were 142 patients with normal pre-op L-dex measurements, 10 patients with slightly elevated measurements and 4 with high measurements. There were 178 unilateral sentinel lymph node sites with 98 (upper extremity) in the axilla and 80 (lower extremity) in the groin. Twenty-nine patients had bilateral axillae or groins from trunk melanoma. The pre-op and first post-op L-Dex measurements are shown below. Garment was placed in 71 patients with slight or high measurements. Thirty-two patients experienced excellent resolution of LE and the garment was discontinued.

Pre-op L Dex			1st Post-Op L-Dex			Garment Started		Garment Stopped	
Normal (<7.0)	142	90%	Normal (<7.0)	72	46%				
Slightly High (>7-10)	10	6%	Slightly High (>7-10)	24	15%	19	27%	10	53%
High (>10)	4	3%	High (>10)	55	35%	52	73%	22	42%

Our data shows that the incidence of subclinical LE in the post-op patients is 56%. Of the 79 patients with subclinical LE, 71 patients were treated with garments with a response rate of 45%.

Conclusion:

Patients have been benefitted from early detection for post-operative LE in patients undergoing melanoma surgical treatment. Our data suggests that early detection and monitoring of lymphedema should be standard of care in all cancer centers potentially for all cancer-related treatment.

07. Oncolymphology; Research & Technological Development

State of play of the rehabilitation of lymphoedema in the city of Kinshasa - DR Congo

Jean Muzembo Ndundu ⁽¹⁾ - Judith Nie Karmen ⁽¹⁾ - François Mabusa ⁽¹⁾

Institut Supérieur des Techniques Médicales de Kinshasa, Department of Physiotherapy and rehabilitation, Kinshasa, Democratic Republic Of The Congo ⁽¹⁾

Background

Cancer is a major concern in society, and public authorities, along with healthcare and scientific research teams, are striving to provide patient care and find solutions for effective drug treatments and management of cancer-related complications. Among the strategies to address cancer complications, physiotherapy plays a significant role in managing lymphedema. In order to explore the field of cancer-related lymphedema, an assessment of lymphedema management in the city of Kinshasa was undertaken.

Objectives

The objectives of this study are twofold:

1. To survey cases of various types of cancer diagnosed in several hospitals in Kinshasa, Democratic Republic of Congo (DRC), during two periods:
 - a. 2016 – 2018 in three general and university hospitals;
 - b. January 2022 – March 2023 in a specialized cancer care hospital.
2. To analyze cases of breast cancer and assess the significance of lymphedema complications in breast cancer patients. Furthermore, particular attention was given to the techniques used by physiotherapists in managing lymphedema.

Materials and methods

In the first phase, new cases of cancer were registered in three hospitals in Kinshasa. Data was collected through the exploration of patients' medical records and information obtained from paramedical rehabilitation professionals and physiotherapists, using a standard questionnaire. These records only included patients who were referred for physiotherapy and rehabilitation.

In the second phase, a retrospective search was conducted through patient records at a specialized cancer treatment facility in Kinshasa. All cases diagnosed throughout the year 2022 and the first three months of 2023 were documented. This work was carried out in collaboration

with the (para)medical staff of the hospital, who examined the patient files. A final meeting was held with them to verify the validity of the collected information.

Results

In the study conducted at the general and university hospitals, 60 cases were identified from 2016 to 2018. The age of the subjects ranged from 10 to 89 years, with a higher proportion of females (73%) compared to males (27%). Thirty-two subjects were over 50 years old. These patients were undergoing rehabilitation for various cancer-related complications. In this sample, breast cancer cases represented 43.3%. The remaining cases consisted of prostate cancer (26.7%), lung and respiratory tract cancers (16.7%), and digestive tract cancers (13.3%). Common complications observed in these patients included lymphedema, pain, and physical deconditioning.

In the second phase of the study, 129 cases of cancer were diagnosed, with a predominance of females (89/40). The majority of subjects were over 50 years old (63%). Various types of cancer were identified, with breast cancer being the most prevalent (28%). In addition to breast cancer, the following cases were noted:

- 29 cases of cervical and endometrial cancer
- 21 cases of digestive cancer
- 13 cases of prostate cancer
- 11 cases of connective tissue and blood cancer
- 8 cases of respiratory organ cancer

Analyzing this group of patients diagnosed in a specialized facility, lymphedema was found to be the most common complication among those undergoing rehabilitation. Among the 13 patients in the physiotherapy department during the first quarter of 2023 after breast cancer, twelve had lymphedema, indicating a 92% probability of lymphedema presence in this group.

The management of lymphedema involved the use of commonly implemented techniques recommended by international literature, including pneumatic compression, manual lymphatic drainage, compression garments, as well as passive and active mobilization.

Conclusion

Cancer is a clinical reality in our society, and early detection and diagnosis are crucial for optimal management. Lymphedema is a frequent complication of breast cancer, but it can be effectively managed through a combination of physiotherapy and standard medical treatment.

08. Peripheral Lymphedema and Related Disorders

A Quantitative Analysis of Lymphedema Patient Perceptions and Subjective Outcomes within the Healthcare System

STANLEY ROCKSON⁽¹⁾ - CATHARINE BOWMAN⁽¹⁾

Stanford University School of Medicine, Stanford Center for Lymphatic and Venous Disorders, STANFORD, United States Of America⁽¹⁾

Lymphedema is an incurable and progressive lymphatic disease that potentiates physical and psychosocial distress. Patients continue to encounter lymphatic ignorance and disinterest across the healthcare system; however, there is minimal epidemiologic evidence to quantify the subjective burden of relative disease neglect. This study was designed to characterize the clinical characteristics and interactions of lymphedema patients within the American healthcare system. A cross-sectional design was implemented. A 23-item, unbiased online questionnaire was anonymously distributed to self-identified lymphedema patients utilizing social media and organizational platforms. Data were collected regarding clinical characteristics, healthcare experiences and patient satisfaction with care. Descriptive statistics were performed with SAS software.

The questionnaire was completed by 1739 patient participants. More than half of the respondents had cancer-related lymphedema (CRL, 52.4%). The impact of lymphedema on quality of life was greater in participants with non-CRL than with CRL ($P < 0.05$). Both non-CRL and CRL respondents reported similar levels of physician disinterest in their lymphedema; however, non-CRL patients reported more dissatisfaction with their lymphedema diagnosis and treatment ($P < 0.05$). Participants experienced substantial delays in diagnosis and treatment, with 45.9% of CRL and 81.3% of non-CRL patients requiring consultation with more than one physician prior to diagnosis ($P < 0.05$).

Lymphedema has a substantial impact upon patient well-being. Despite this impact, patients continue to face delays in diagnosis and treatment, and remain dissatisfied with their current lymphatic healthcare. This is the first formal attempt to validate and quantitate levels of dissatisfaction within the patient community. Research and reform are needed to optimize lymphatic healthcare education and delivery within the U.S. medical system.

08. Peripheral Lymphedema and Related Disorders

Microsurgical Management of Lymphorrhea/Lymphocyst refractory to Conservative Management

Takashi Kageyama ⁽¹⁾ - **Toko Miyazaki** ⁽¹⁾ - **Hayahito Sakai** ⁽¹⁾ - **Reiko Tsukuura** ⁽¹⁾ - **Nana Yamamoto** ⁽¹⁾ - **Takumi Yamamoto** ⁽¹⁾

National Center for Global Health and Medicine, Department of Plastic and Reconstructive Surgery, Tokyo, Japan ⁽¹⁾

Microsurgical Management of Lymphorrhea/Lymphocyst refractory to Conservative Management

Takashi Kageyama, Toko Miyazaki, Hayahito Sakai, Reiko Tsukuura, Nana Yamamoto, Takumi Yamamoto

Department of Plastic and Reconstructive Surgery, National Center for Global Health and Medicine, Tokyo, Japan

Objective: Lymphorrhea/lymphocyst (LOLC) may occur after surgical intervention to a lymph-abundant region such as the groin, and are sometimes refractory to conservative management. To prevent recurrence and lymphedema development, reconstructive microsurgery is warranted for intractable cases. This study aimed to evaluate feasibility of navigation lymphatic microsurgery for the treatment of intractable LOLC.

Methods: Patients who underwent lymphatic microsurgery for intractable LOLC were included. Lymphatic microsurgery was performed under indocyanine green (ICG) lymphography navigation. Ruptured lymph vessels were identified under the navigation, and reconstructed with microsurgical procedures. Postoperative recurrence and lymphedema development were evaluated.

Results: All patients suffered from iatrogenic LOLC in the groin/thigh regions refractory to conservative treatments with or without failed macroscopic surgeries. Ruptured lymph vessels could be identified in all cases. Lymphaticolymphatic anastomosis or lymphaticovenous anastomosis was performed when a recipient lymph vessel or vein could be found nearby the ruptured lymph vessels. Microsurgical ligation was performed in 1 case where a recipient vessel could not be found. LOLC was cured without recurrence in all cases, and lymphedema was not identified except for 1 case where ligation was performed.

Conclusions: Lymphatic microsurgery allows secure treatment of LOLC without recurrence. ICG lymphography is useful to identify ruptured lymph vessels, which is critical for the treatment of intractable LOLC. Ruptured lymph vessel should be reconstructed, as simple ligation may cause postoperative lymphedema.

08. Peripheral Lymphedema and Related Disorders

Prevalence and prognostic role of lymphedema in patients with deep venous thrombosis and thrombophlebitis

Alexandru Grigorean ⁽¹⁾ - Nicole Lindenblatt ⁽¹⁾ - Isabelle Luchsinger ⁽²⁾ - Lukas Hobohm ⁽³⁾ - Stavros V Konstantinides ⁽³⁾ - Thomas Münzel ⁽⁴⁾ - Stefano Barco ⁽¹⁾ - Karsten Keller ⁽⁴⁾

University Hospital Zürich, Clinic of Angiology, Zürich, Switzerland ⁽¹⁾ - *University Children's Hospital Zurich, Dermatology Department, Zurich, Switzerland* ⁽²⁾ - *University Medical Center Mainz, Center for Thrombosis and Hemostasis, Mainz, Germany* ⁽³⁾ - *University Medical Center Mainz, Department of Cardiology, Cardiology I, Mainz, Germany* ⁽⁴⁾

Prevalence and prognostic role of lymphedema in patients with deep venous thrombosis and thrombophlebitis

Alexandru Grigorean, MD¹; Nicole Lindenblatt, MD²; Isabelle Luchsinger, MD³; Lukas Hobohm, MD^{4,5}; Stavros V. Konstantinides, MD, PhD^{4,6};

Thomas Münzel, MD^{5,7}; Stefano Barco, MD, PhD^{1,4*}; Karsten Keller, MD^{5,4,8*}

ü

Abstract

Background

Deep venous thrombosis poses a substantial disease burden. Lymphedema may present with similar symptoms making the diagnosis process more difficult. Data on the epidemiology of lymphedema is lacking.

Methods

The German nationwide inpatient sample served to analyze all patients hospitalized due to deep venous thrombosis and/or thrombophlebitis (referred to as “DVT”) of the legs in Germany 2005-2020. We stratified these patients for additional lymphedema and analysed the impact of lymphedema on adverse in-hospital events.

Results

Overall, 1,136,574 hospitalizations related to DVT were recorded in Germany 2005-2020 (53.3% females; 51.3% aged ≥ 70 years). Lymphedema was coded in 9,974 (0.9%) patient-cases (82.0% not elsewhere classified, 17.7% secondary lymphedema). Annual numbers of hospitalizations with lymphedema among DVT patients increased from 450 (2005) to 613 (2016) (β 0.57 [95%CI 0.48-0.66], $P < 0.001$) and decreased thereafter. Despite similar age, DVT patients with lymphedema had higher prevalence of cardiovascular diseases, chronic organ failure, and all types of investigated cancer. Prevalence of pulmonary embolism with shock/CPR (4.1% vs. 1.5%), acute renal failure (6.7% vs. 2.5%), and stroke (5.2% vs. 4.2%) was higher in DVT patients with lymphedema than without. Lymphedema was independently associated with pulmonary embolism with shock/CPR (OR 2.1; 95%CI 1.9-2.3) as well as death (OR 1.3; 95CI 1.2-1.4).

Conclusions

Comorbidity conditions like cancer, obesity, and cardiovascular risk factors, but also infectious complications, were more prevalent in DVT patients with lymphedema than in those without. Lymphedema was independently associated with severe in-hospital complications, particularly when its genesis was related to severe comorbidities.

08. Peripheral Lymphedema and Related Disorders

The longitudinal course of breast edema in breast cancer patients following breast-conserving surgery and radiotherapy – 30 months follow-up

Hanne Verbelen ⁽¹⁾ - Katrien Erven ⁽²⁾ - Eric van Breda ⁽¹⁾ - Timia van Soom ⁽¹⁾ - Wiberen Tjalma ⁽³⁾ - Nick Gebruers ⁽¹⁾

University of Antwerp, Rehabilitation sciences and physiotherapy, Antwerp, Belgium ⁽¹⁾ - GZA Ziekenhuizen campus St-Augustinus, IRIDIUM kankernetwerk, Wilrijk, Belgium ⁽²⁾ - Antwerp University Hospital (UZA), Multidisciplinary Breast Clinic Antwerp, Edegem, Belgium ⁽³⁾

The longitudinal course of breast edema in breast cancer patients following breast-conserving surgery and radiotherapy – 30 months follow-up

Hanne. Verbelen^a, Katrien Erven^e, Eric. van Breda^a, Timia. Van Soom^a, Wiebren. Tjalma^{b,c}, Nick. Gebruers^{a,d}

- a. Department of Rehabilitation Sciences and Physiotherapy, Faculty of Medicine and Health Sciences, University of Antwerp, Universiteitsplein 1, 2610 Antwerp, Belgium
- b. Multidisciplinary Breast Clinic Antwerp, Antwerp University Hospital (UZA), Wilrijkstraat 10, 2650 Edegem, Belgium
- c. Faculty of Medicine and Health Sciences, University of Antwerp, Universiteitsplein 1, 2610 Antwerp, Belgium
- d. Oedema clinic, Antwerp University Hospital and University of Antwerp, Drie Eikenstraat 655, 2650 Edegem
- e. GZA Ziekenhuizen campus St-Augustinus; IRIDIUM kankernetwerk, Oosterveldlaan 24, 2610 Wilrijk

Presenting author: Nick Gebruers

Introduction: Breast edema is a morbidity encountered by breast cancer patients following breast-conserving surgery (BCS) and radiotherapy. In contrast to lymphedema of the arm, breast edema is far less explored in the literature. Currently, its time course is still unclear. Nevertheless, breast complaints following breast cancer treatment are very common. Complaints of the breast which are associated with breast edema are swelling, pain, redness, tensed skin, peau d'orange, hardness, heaviness and pitting sign.

Objective: To describe the longitudinal course of breast edema in breast cancer patients who underwent BCS and radiotherapy.

Methods: In this prospective cohort study, female breast cancer patients older than 18 who were allocated for BCS followed by radiotherapy were recruited. Participants were asked to fill in the Breast Edema Questionnaire (BrEQ) on several time points: after BCS and prior to radiotherapy (T1), immediately after termination of the radiotherapy (T2), 3 months (T3), 6 months (T4), 12 months (T5), 18 months (T6), 24 months (T7) and 30 months post-radiotherapy (T8). In the BrEQ, symptoms associated with breast edema are scored on a scale from 0 (no distress) to 10 (maximal distress). Validity and reliability of the BrEQ have been proven in a previous study.

Results: In total, 127 patients were included in this study. All required data were retrieved from 122 participants at T1, 81 at T2, 77 at T3, 70 at T4, 64 at T5, 22 at T6, 30 at T7 and 10 participants at T8. At T1 the incidence was 48,9%. Thereafter, the incidence declined to 38.9%, 32,1%, 30,5% and 22,1% at respectively T2, T3, T4 and T5. Eighteen months and more post-radiotherapy, only a minority of patients had persistent complaints of breast edema, 5,3% at T6, 8,4% at T7 and 1,5% at T8.

Conclusion: BCS followed by radiotherapy results in a high incidence of breast edema. The peak incidence is reported after the BCS, but prior to radiation therapy. In most patients breast edema resolves in the following months. It is seen that on the long-term persistent breast edema is rather rare.

08. Peripheral Lymphedema and Related Disorders

THE RESULTS OF COMPLETE DECONJESTIVE TREATMENT AND EVALUATION OF HAND EDEMA IN PATIENTS WITH BREAST CANCER-RELATED LYPHEDEMA

ELİF BEGUM KILIC ⁽¹⁾ - *MELTEM DALYAN* ⁽²⁾ - *SİBEL ÜNSAL DELİALİOĞLU* ⁽¹⁾

Ankara Bilkent City Hospital, Physical Medicine and Rehabilitation Hospital, Lymphedema Rehabilitation Unit, Ankara, Turkey ⁽¹⁾ - *Ankara Bilkent City Hospital, Physical Medicine and Rehabilitation Hospital, Lymphedema Rehabilitation Unit, Çankaya, Turkey* ⁽²⁾

THE RESULTS OF COMPLETE DECONJESTIVE TREATMENT AND EVALUATION OF HAND EDEMA IN PATIENTS WITH BREAST CANCER-RELATED LYPHEDEMA

Elif Begum Kilic, Meltem Dalyan, Sibel Unsal Delialioglu

Ankara Bilkent City Hospital, Physical Medicine and Rehabilitation Hospital, Lymphedema Rehabilitation Unit

Aim: Breast cancer related lymphedema is a chronic condition that affects the quality of life of the patients. The gold standard in treatment is complete decongestive treatment (CDT). It was aimed to evaluate patients with breast cancer-related lymphedema before and at the end of CDT, to evaluate hand volume by volumetry and figure-of-eight (f-o-8) methods, and to determine the correlation of these two methods.

Materials and Methods: A total of 38 female patients with diagnosis of unilateral upper extremity breast cancer related lymphedema who have CDT indication were included in the study. Demographic data of the patients was recorded. Before the first phase of the CDT, both extremities were evaluated with circumferential measurements, both hand volumes were evaluated by hand volumetry and f-o-8 method. Extremity volumes were calculated using the truncal cone formula. Measurements were repeated in 34 patients after treatment.

Results: The mean age of the patients was 56.55±10.91 years. The median for complete decongestive treatment session (days) was 14 (10-21) days. Calculated the limb volume percentage reduction of excess volume 1 (PREV1), median 35.87% (0.39%-507.22%) and percentage of excess volume 1 (PEV1) median 18.9% (1.42%-95.77%), calculated over hand volume, PREV2 median 23.30% (0%-100%), PEV2 median 19.35% (-0.38%-107.51%). The mean f-o-8 measurement of individuals with lymphedema hand was 46.09 ± 2.78 cm before treatment, 44.91 ± 2.23 cm after treatment, mean hand volume was 539.25 ± 111.80 ml before treatment, 510.04 ± 99.36 ml after treatment. A statistically significant correlation was found between the f-o-8 measurements and hand volumetric values of the individuals (pre-treatment r: 0.85, post-treatment r: 0.86) (p<0.001).

Conclusion: The results of our study support that the f-o-8 method is an alternative method to hand volumetry method in evaluating hand edema and also the effectiveness of CDT treatment in hand edema. It is recommended to evaluate the hand edema of the patients and to monitor the efficacy of the treatment.

Keywords: Postmastectomy lymphedema, Complete decongestive treatment, Hand edema, Figure-of-eight method,

08. Peripheral Lymphedema and Related Disorders

ONE YEAR DATA OF TURKEY'S LARGEST LYMPHEDEMA REHABILITATION UNIT

SİBEL DELİALIOĞLU⁽¹⁾ - Pınar Borman⁽¹⁾ - Meltem Dalyan⁽¹⁾ - Sevgi Gumus Atalay⁽¹⁾ - Gül Mete Civelek⁽¹⁾

Ankara Bilkent City Hospital, Physical Medicine and Rehabilitation Hospital, Lymphedema Rehabilitation Unit, Ankara, Turkey⁽¹⁾

ONE YEAR DATA OF TURKEY'S LARGEST LYMPHEDEMA REHABILITATION UNIT

Sibel Ünsal Delialioğlu, Pınar Borman, Meltem Dalyan, Sevgi Gümüş Atalay, Gül Mete Civelek

Ankara Bilkent City Hospital, Physical Medicine and Rehabilitation Hospital, Lymphedema Rehabilitation Unit

Objective: Ankara Bilkent City Hospital lymphedema rehabilitation unit serves as the largest lymphedema rehabilitation unit in Turkey. In this study, the data of patients who developed primary lymphedema and lymphedema secondary to malignancy followed in the unit for one year are presented.

Material-Method: Lymphedema rehabilitation polyclinic provides service once a week and 5 physicians evaluate patients in the unit on a rotational basis. Demographic data, lymphedema duration, lymphedema stages, infection history and malignancy types in patients who developed lymphedema secondary to malignancy were recorded from the hospital registry system of patients admitted to the unit in a one-year period.

Results: A total of 290 patients applied to the unit. Of these patients, 108 had lymphedema, 45 had lipedema, and 29 had phlebolymphe-
dema. Of the patients with lymphedema, 24% (n=26) had primary lymphedema and 76% (n=82) had secondary lymphedema. Of 26 patients with primary lymphedema, 76.9% (n=20) were female, 23.1% (n=6) were male, with a mean age of 34.88±13.88 years. The mean age of onset of lymphedema was 21.76±12.80 years. The mean duration of lymphedema was 143.42±133.13 months. The lymphedema stage was stage 1 in 26.9% (n=7), stage2 in 53.8% (n=14), and stage3 in 20% (n=5). Complex Decongestive treatment (CDT) was previously applied to 61.5% (n=16) of patients with primary lymphedema. A history of cellulite was found in 19.2% (n=5) of the patients.

Of the 82 patients who developed lymphedema secondary to malignancy, 93.9% (n=77) were female and 6.1% (n=5) were male, with a mean age of 56.26±11.57 years. The mean duration of lymphedema was 33.32±29.92 months. The mean time to the development of lymphedema after the operation was 30.73±26.02 months. Radiotherapy history was present in 93.9% (n=77) of the patients. Considering the distribution of malignancy,

61% (n=50) breast cancer, 13.4% (n=11) endometrium cancer, 11% (n=9) ovarian cancer, 8.5% (n=7) cervix cancer and 6.1% (n=5) had prostate cancer. 37.8% (n=31) of the patients had stage 1 lymphedema, 48.8% (n=40) stage2, 13.4% (n=11) stage3 lymphedema. CDT was performed previously in 40.2% (n=33) of the patients who developed lymphedema secondary to malignancy. A history of cellulitis was found in 20.7% (n=17) of the patients.

Conclusion: Lymphedema is a chronic condition that affects quality of life. Follow-up of patients with lymphedema in lymphedema rehabilitation units will ensure that data are recorded more regularly. At the same time, we think that the effectiveness of the treatments will increase with the periodic follow-up of the patients in these units.

08. Peripheral Lymphedema and Related Disorders

THE DEMOGRAPHIC AND CLINICAL CHARACTERISTICS OF PATIENTS IN A LYMPHEDEMA REHABILITATION UNIT DURING ONE YEAR PERIOD

Sibel Ünsal Delialioğlu⁽¹⁾ - Pınar Borman⁽¹⁾ - Meltem Dalyan⁽¹⁾ - Sevgi Gumus Atalay⁽¹⁾ - Gül Mete Civelek⁽¹⁾

Ankara Bilkent City Hospital, Physical Medicine and Rehabilitation Hospital, Lymphedema Rehabilitation Unit, Ankara, Turkey⁽¹⁾

ONE YEAR DATA OF TURKEY'S LARGEST LYMPHEDEMA REHABILITATION UNIT Sibel Ünsal Delialioğlu, Pınar Borman, Meltem Dalyan, Sevgi Gümüş Atalay, Gül Mete Civelek

Ankara Bilkent City Hospital, Physical Medicine and Rehabilitation Hospital, Lymphedema Rehabilitation Unit

Objective: Ankara Bilkent City Hospital lymphedema rehabilitation unit serves as the largest lymphedema rehabilitation unit in Turkey. In this study, the data of patients who developed primary lymphedema and lymphedema secondary to malignancy followed in the unit for one year are presented.

Material-Method: Lymphedema rehabilitation polyclinic provides service once a week and 5 physicians evaluate patients in the unit on a rotational basis. Demographic data, lymphedema duration, lymphedema stages, infection history and malignancy types in patients who developed lymphedema secondary to malignancy were recorded from the hospital registry system of patients admitted to the unit in a one-year period.

Results: A total of 290 patients applied to the unit. Of these patients, 108 had lymphedema, 45 had lipedema, and 29 had phlebolymphe-
dema. Of the patients with lymphedema, 24% (n=26) had primary lymphedema and 76% (n=82) had secondary lymphedema. Of 26 patients with primary lymphedema, 76.9% (n=20) were female, 23.1% (n=6) were male, with a mean age of 34.88 ± 13.88 years. The mean age of onset of lymphedema was 21.76 ± 12.80 years. The mean duration of lymphedema was 143.42 ± 133.13 months. The lymphedema stage was stage 1 in 26.9% (n=7), stage 2 in 53.8% (n=14), and stage 3 in 20% (n=5). Complex Decongestive treatment (CDT) was previously applied to 61.5% (n=16) of patients with primary lymphedema. A history of cellulite was found in 19.2% (n=5) of the patients.

Of the 82 patients who developed lymphedema secondary to malignancy, 93.9% (n=77) were female and 6.1% (n=5) were male, with a mean age of 56.26 ± 11.57 years. The mean duration of lymphedema was 33.32 ± 29.92 months. The mean time to the development of lymphedema after the

operation was 30.73 ± 26.02 months. Radiotherapy history was present in 93.9% (n=77) of the patients. Considering the distribution of malignancy, 61% (n=50) breast cancer, 13.4% (n=11) endometrium cancer, 11% (n=9) ovarian cancer, 8.5% (n=7) cervix cancer and 6.1% (n=5) had prostate cancer. 37.8% (n=31) of the patients had stage 1 lymphedema, 48.8% (n=40) stage2, 13.4% (n=11) stage3 lymphedema. CDT was performed previously in 40.2% (n=33) of the patients who developed lymphedema secondary to malignancy. A history of cellulitis was found in 20.7% (n=17) of the patients.

Conclusion: Lymphedema is a chronic condition that affects quality of life. Follow-up of patients with lymphedema in lymphedema rehabilitation units will ensure that data are recorded more regularly. At the same time, we think that the effectiveness of the treatments will increase with the periodic follow-up of the patients in these units.

08. Peripheral Lymphedema and Related Disorders

The importance of the correct compression garment in conservative and surgical lymphedema treatment

Aleksandra Rovnaya ⁽¹⁾ - Ivan Makarov ⁽²⁾

St Petersburg state Medical University n.b. I.P Pavlov, Physical therapy and rehabilitation, St Petersburg, Russian Federation ⁽¹⁾ - Limpha Clinic, Medical, Moscow, Russian Federation ⁽²⁾

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 behavior and nuances of oedema in individual cases and who know 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 the 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.

08. Peripheral Lymphedema and Related Disorders

Reduction of arm lymphedema with manual lymphatic therapy: Godoy method

Jose Maria Pereira de Godoy ⁽¹⁾ - *Maria de Fatima Guerreiro Godoy* ⁽²⁾ - *Henrique Jose Pereira de Godoy* ⁽¹⁾

Faculdade de Medicina de Sao Jose do Rio Preto-FAMERP, Vascular Surgery, Sao Jose do Rio Preto, Brazil ⁽¹⁾ - *Godoy & Godoy International School of Lymphatic Therapy-Clinica Godoy, Vascular Surgery, Sao Jose do Rio Preto, Brazil* ⁽²⁾

Reduction of arm lymphedema with manual lymphatic therapy: Godoy method

Abstract

Background: According to a systematic review study, there is some evidence that manual lymphatic drainage (MLD) in the early stages following surgical treatment for breast cancer can help prevent the progression of clinical lymphedema.

Objective: The aim of the present study was to evaluate the effectiveness of manual lymphatic therapy immediately after treatment.

Method: A randomized, blind, crossover, clinical trial was conducted involving 120 women with BCRL, who underwent one hour of manual physical therapy and one hour of the control procedure in Clinica Godoy-Brazil in 2022. Volumetric analysis was performed before and after treatment and differences were analyzed using the paired t-test.

Results: A significant reduction in the volume of the limb was found in all patients (p-value = 0.0001, paired t-test).

Conclusion: Manual lymphatic therapy is effective in reducing lymphedema after breast cancer treatment.

Key words (MESH): Lymphedema, breast cancer, manual lymphatic therapy

08. Peripheral Lymphedema and Related Disorders

Main challenges in the treatment of Stage III lymphedema (elephantiasis)

Jose Maria Pereira de Godoy⁽¹⁾ - **Maria de Fatima Guerreiro Godoy**⁽²⁾

Faculdade de Medicina de Sao Jose do Rio Preto-FAMERP, Vascular Surgery, Sao Jose do Rio Preto, Brazil⁽¹⁾ - *Godoy & Godoy International School of Lymphatic Therapy-Clinica Godoy, Vascular Surgery, Sao Jose do Rio Preto, Brazil*⁽²⁾

Main challenges in the treatment of Stage III lymphedema (elephantiasis)

Introduction: Elephantiasis is the clinical stage III of lymphedema where the large deformities. This stage brings a challenge in its approach and is a limiting factor in the in the treatment of these patients. **Objective:** To report the main challenges in the approach of large volumes of elephantiasis. **Method:** A series of 10 cases is reported. illustrations where it shows the alternatives and strategies adopted. **Results:** There were five women and five men. The main challenge was the size of the lymphedema, then the compression alternatives adapted to each patient, the pathophysiological diagnosis needs of each patient, the type of lymphatic therapy involved in each case and each phase of the treatment, the approach with excess skin with the evolution of the treatment and the surgical option when necessary. **Conclusion:** Therapeutic adaptation is mandatory in each patient and the results change the lives of these patients.

Key words: Lymphedema, treatment, Godoy method.

Sandra Hayes

Topic number: **08**

Title:

Does the presence of upper-body symptoms indicate increased risk for the development of breast cancer-related lymphoedema? Results from a longitudinal, population-based breastcancer cohort study.

Authors:

Sandra Hayes, Melanie Plinsinga, Hildegard Reul-Hirche

Abstract:

Introduction: Approximately one in five women develop lymphoedema as a consequence of breast cancer treatment. Lymph node dissection, more extensive surgery and receipt of adjuvant therapy (specifically, chemotherapy or radiotherapy) are associated with increased risk of developing breast cancer-related lymphoedema (BCRL). The prevalence and severity of upper-body symptoms, including pain, weakness and numbness, is higher among women with BCRL compared with women without lymphoedema. However, it is unclear whether the presence of symptoms precedes development of breast cancer-related lymphoedema. The objectives of this work were to (i) describe upper-body symptoms post-breast cancer; (ii) explore the relationship between symptoms and upper-body function, breast cancer-related lymphoedema, physical activity levels, and quality of life; and (iii) determine whether the presence of upper-body symptoms predicts BCRL.

Methods: Nine symptoms, upper-body function, lymphoedema, physical activity, and quality of life were assessed in women with invasive breast cancer between 2- to 9-months post-diagnosis (n = 2442), and at 2- and 7-years post-diagnosis. Mann–Whitney tests, unpaired t-tests, and chi-squared analyses were used to assess cross-sectional relationships, while regression analyses were used to assess the predictive relationships between symptoms at baseline, and BCRL at 2- and 7-years postdiagnosis.

Results: Symptoms are common post-breast cancer and persist at 2- and 7-years post- diagnosis. Approximately two in three women, and one in three women, reported >2 symptoms of at least mild severity, and of at least moderate severity, respectively. The presence of symptoms is associated with poorer upper-body function, and lower physical activity levels and quality of life. One or more symptoms of at least moderate severity increases the odds of developing BCRL by 2- and 7-years post-diagnosis ($p < 0.05$).

Conclusion: These findings suggest that improved monitoring and management of symptoms following breast cancer have the potential to improve health outcomes including the prevention of BCRL.