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Surgical treatment of lymphedema — experience of the Department of Oncological and Reconstructive Surgery, Cancer Center, Gliwice

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Introduction: Lymphedema is a chronic and progressive disease, that might be caused by different factors. It may be a symptom of congenital malformations of the lymphatic vessels or the result of previous injuries, infections and finally a symptom of neoplastic diseases blocking lymphatic vessels or the consequence of their treatment.

The breast cancer related lymphedema (BCRL) is thought to be related to the extent of axillary node involvement, type of breast surgery, and radiation therapy. It can occur years after the completion of all treatments in approximately 20–50% of women.

Patients might experience a range of symptoms in the affected limb including swelling, pain, decreased range of motion and higher risk of infection which significantly affects the quality of life. It often arises despite preventive physiotherapy (exercises, massages, compressions).

After lymphedema development the conservative therapy is introduced however when it fails surgical management might be an appropriate treatment alternative.

The goal of this study is to present three different methods of surgical treatment of secondary lymphedema (2nd and 3rd stage) of the upper limb after radical breast amputations.

Material and methods: Before the surgical treatment was undertaken, the upper extremities were evaluated with three methods: measurement of limb circumference, lymphoscintigraphy and single-photon emission computed tomography (SPECT), and intra-operatively indocyanine green lymphography (ICG).

After the patients' qualification, three different surgical procedures were performed:

Breast reconstruction with deep inferior epigastric artery perforator (DIEP) flap and simultaneous inguinal lymph node transfer.

The muscle sparing latissimus dorsi (msLD) flap transfer together with adjacent lymph nodes in the axillary region.

The lymphaticovenular anastomosis (LVA) in the forearm.

The effects of surgical treatment were assessed 3, 7 and 12 weeks after the procedure and included limb circumference, range of motion and lymphoscintigraphy.

Results: During the 3-months follow-up, a systematic improvement was achieved in the limb range of motion in patients after DIEP and the msLD reconstruction and reduction of extremity circumference in all patients. In addition, patients report a subjective improvement in the quality of life and reduction of symptoms within the affected limb.

Conclusions: Surgical treatment of upper limb lymphedema is an effective alternative for patients with conservative methods that are ineffective and unstable.

Key words: lymphedema, breast cancer

Lymphedema physiotherapy after breast radical amputation in Polish and German centres

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Introduction: Lymphedema of the upper extremity (LUE) is the most serious complication of radical breast cancer amputation. LUE treatment results remain unsatisfactory. Up to now, no consensus has been reached on the treatment of patients in Poland.

Aim of the dissertation was comparison of results of LUE stationary treatment in two leading centers dealing with LUE therapy: Polish Rosomak and German Feldbergklinik.

Material and methods: A group of 150 patients undergoing radical breast mastectomy in the period 1980–2012. The Polish group (P) consisted of 60 and the German group (N) of 90 women. Both groups did not differ in anthropometric features, and the periods from operations to diagnosing LUE, as well as suffering from LUE were similar.

In the evaluation of the limb volume, the circular method of measuring the circuits and calculating the volume of the limb in the form of a truncated cone accepted in the literature was used. The comparisons of the volume of the limb with LUE before therapy and after therapy, as well as the LUE-affected limb to the healthy limb before and after therapy were undertaken. In data analysis STATISTICA, version 10.0 was applied. For the significance level of differences $\alpha < 0.05$ was accepted.

Results: Failure of p/ed swelling was related to 6 (4%) patients (5 Polish women and 1 German woman). The remaining stationary therapy was evaluated as effective, which was manifested by the regression of LUE. Better results (less frequent use of irradiation and postoperative chemotherapy, higher baseline levels of LUE and systematic use of CPT) were obtained in patients in group N.

Conclusions:

1. Better results were obtained in group N
2. The reasons for better CPT results in group N seem to be influenced by:
 - a) less frequent use of armpit irradiation and systemic chemotherapy,
 - b) higher initial stage of LUE,
 - c) the period the p/ed swelling therapy was effected,
 - d) systematic CPT procedures.
3. For the classification of patients after radical mastectomy with diagnosed LUE to stationary CPT, consideration should be given to:
 - a) initial stage of LUE,
 - b) past oncological treatment,
 - c) the possibility of systematic daily CPT.

Key words: lymphedema, breast radical amputation, complex physical therapy

Physiotherapy after surgical treatment for lymphedema of upper extremity after radical mastectomy — case report

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Introduction: Secondary lymphedema may follow radical breast cancer therapy. Its symptoms include gradual increase of the circumference of the limb, limited range of motion, weakening of muscle, inflammatory and in result causes upper extremity functional impairment. In case the conservative treatment produces no results, the surgical treatment of lymphedema is being applied more and more frequently.

The aim of the study is to show physiotherapy with periodic evaluation of muscle strength, range of motion and the measurement of circumference of the arm in 65-year-old woman with secondary lymphedema in right arm, after radical mastectomy. A lymph node transplantation surgery was conducted on the patient transferring the ms LD flap with the lymph nodes to the affected axilla.

Material and methods: Physiotherapy began the second day after the surgery: breathing exercises, active exercises without pain, compression bandages were applied.

In 4–7 weeks after surgery the patient underwent treatment at the Rehabilitation Unit in Oncology Center in Gliwice. We implemented: Complete Decongestive Therapy, scar tissue management techniques and techniques designed to help the patient regain normal range of motion of the extremity. In order to maintain therapeutic effects it was recommended the patient: wears class 2 compression sleeve, active exercises which improve transport of the lymph in the lymphatic system and other exercises which maintain the correct range of motion in the joints. The muscles strength, range of motion, circumferences of the limb was measured before surgery and also in 3, 7 and 12 weeks after surgery. Lymphoscintigraphy of upper extremities was performed before surgery and 12 weeks after surgery.

Results: We observed improvement of mobility in the right shoulder in the scope flexion and abduction, increase muscles strength and reduction of the edema of the right upper extremity. In subjective assessment of the patient the feeling of heaviness in the limb decreased.

Conclusion: The physiotherapy is an effective method that supports the effectiveness of the surgical treatment of the second lymphedema after radical mastectomy.

Key words: secondary lymphedema, lymph node transfer, physiotherapy

The effects of selected forms of physical activity on lymphedema in women following breast cancer treatment

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Introduction: Arm lymphedema is a frequent complication of breast cancer therapy and axillary lymph node dissection, with an estimated incidence of 5–30%. It is a chronic debilitating disease.

Aim was to assess the effects of various forms of physical activity on the lymphedema of upper extremity in women after breast cancer treatment.

Material and methods: The study was conducted on a group of 84 women with a mean age of 65 years (± 8.0), with axillary lymphadenectomy due to breast cancer. They were divided into 4 groups: general fitness exercises, Nordic Walking, resistance exercises using Thera-band and water resistance exercises. The extent of lymphedema was measured using a centimeter tape and Limb Volumes Professional 5.0 software at baseline and after an 8-week regimen of appropriately selected physical exercises.

Results: No significant differences in volumes of upper extremity and lymphedema were noted in the general fitness exercises group: 241.5 ml \pm 353.3 ml (11.1%) vs 196.7 ml \pm 254.6 ml (8.9%), $p = 0.28$; in the Nordic Walking group: 158.0 ml \pm 236.2 ml (7.6%) vs 160.2 ml \pm 239.4 ml (7.8%), $p = 0.95$ and in the resistance exercises using Thera-band group: 110 ml \pm 232.1 ml (5.7%) vs 93.6 ml \pm 225.9 ml (4.7%), $p = 0.69$. The significant differences were observed in the water resistance exercises group. The study showed an increase in the volume and risk of developing a lymphedema: 70.3 ml \pm 203.8 ml (3.5%) vs 182.3 ml \pm 215.0 ml (10.3%), $p = 0.01$.

Conclusions: The general fitness exercises, Nordic Walking and the resistance exercises using Thera-band are considered to be a safe form of physical activity in women after breast cancer treatment. The water resistance exercises have increased the volume of the upper extremity, therefore this form of physical activity requires verification and caution when used in women treated for breast cancer.

Key words: breast cancer, lymphedema, physical activity

Intermittent pneumatic compression in the maintenance therapy of lymphedema in women after breast cancer treatment. A preliminary report

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Introduction: Intermittent pneumatic compression (IPC) has been a recognized auxiliary method applied in the comprehensive physical therapy of lymphedema. A greater reduction of oedema during the incorporation of intermittent pneumatic compression at an early

(intensive) stage of physical therapy in post-mastectomy patients has been confirmed in the literature. Less has been known about the usefulness of IPC at the subsequent long-term stage of treatment, the most important aspect of which is to maintain the improved condition attained at the preceding stage and to prevent any exacerbation of the disease (oedema intensification, inflammatory complications) that would require the reapplication of intensive treatment. Some of the patients who completed the initial treatment continue to suffer from substantial asymmetry in limb volume. The optimum model of treatment has been sought for them.

The study aimed at verifying the purposefulness of incorporating IPC into long-term physical therapy in the patients with lymphedema in whom the results of treatment involving only compression garments and exercise have not been satisfactory.

Material and methods: The study involved patients with unilateral lymphedema following breast cancer treatment and without the symptoms of active cancer, decompensated circulatory failure, or inflammatory condition. The patients had undergone intensive physical therapy in the past and were subject to outpatient maintenance treatment (which consisted in wearing fitted compression sleeves and in performing aerobic exercises with the sleeve on). The size of oedema (measured as the difference in limb volume) remained at more than 20%. Twelve patients were randomly qualified for a two-week continuation of the former compression therapy with compression garment combined with an aerobic exercise programme, and for a two-week therapy extended to include a 30-minute session of IPC performed twice a day.

Results: The outcome consisted in a significantly greater reduction in the relative volume of the limb section with oedema ($p = 0.047$), a tendency for greater reduction in the relative volume of the affected limb, and a lack of meaningful variations in the intensity of the typical concomitant symptoms, quality of life and fitness.

Conclusion: IPC appears to be a helpful method of oedema reduction with a good tolerance in maintenance therapy in patients with unsatisfactory results of treatment during the intensive stage.

Key words: breast cancer-related lymphedema, intermittent pneumatic compression, maintenance therapy of oedema

Do compression sleeves reduce the incidence of arm lymphedema and improve quality of life? Two-year results from a prospective randomized trial in breast cancer survivors.

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Introduction: In a previous randomized controlled trial it has been demonstrated that arm compression sleeves (CG) in class I (cclI, 15–21 mm Hg) worn immediately after breast cancer surgery including axillary lymph-node removal in addition to physical therapy are able to reduce the occurrence of early postoperative swelling and of arm lymphedema up to one year. The available data indicated also that CG neither interfere with the level of physical activity nor decrease quality of life 1 year after breast cancer surgery [1, 2].

Aim of the present investigation was to check the further development of the arm swelling in patients using compression sleeves or not, and to compare the quality of life in women treated due to breast cancer two years after surgery.

Material and methods: 20 from originally 23 patients who still wore their compression sleeves in cclI (CG) and 21 from 22 patients who had been randomized into the control group without compression (NCG) could be seen after one more year. Arm volume measurements were performed and quality of life (QLQ-C30 and QLQ-BR23 questionnaires) was assessed.

Results: CG showed significantly lower mean affected arm volume compared to NCG ($p = 0.023$) after 2 years. Three from 20 patients in the CG and 6 from 21 in NCG showed arm lymphedema, defined by an increase of the arm volume exceeding 10% compared to the preoperative values. Significant improvement of several QOL parameters were found in the compression group.

Conclusion: Light compression sleeves worn for 2 years are not only able to reduce the incidence of early postoperative edema and of lymphedema, but also lead to a significant improvement of important quality of life parameters like physical functioning, fatigue, pain, arm and breast-symptoms and future perspectives.

Key words: breast cancer-related lymphedema, compression garments, physical activity, prevention

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Edemas at the end of life — a single hospice cross sectional study

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Introduction: Edemas within the end of life population are seldom recognized in the literature. They may have multifactorial etiology, negative impact on life quality and could be difficult to manage. The purpose of this study was to assess the frequency, suspected etiology, impact on common symptoms, quality of life and effectiveness of the conservative management.

Material and methods: Between July 2016 and November 2017 119 patients (15.2%) among 784 admitted to the free standing acute hospice 42-beds ward were diagnosed with edema. Patients with edema were usually in stage C according to Gold Standard Framework (73 cases; 61%), median age of 72 years; 70 (58.8%) were female and 115 (96.6%) with advanced cancer. The median length of care to death (106 patients, 89.0%) or to discharge in this group reached 11 and 15 days consecutively. The most frequent laboratory abnormalities seen within this group were anemia, leukocytosis, hyponatremia and hypoproteinemia.

Results: Sixty-two patients (52.1%) were in stage 2 according to International Society of Lymphology, 97 cases (81.5%) occurred bilaterally, 93 (78.1%) revealed in the lower half of the body and 13 edemas (10.9%) were generalized. Thirteen cases (10.9%) were complicated by lymphorrhea and 7 (5.9%) by ulcerations. Within 61 (51.3%) patients clinically suspected of lymphedema 56 (91.8%) had Stemmer sign which contrasted to 11 (19.0%) patients within the group who were not diagnosed.

The most prevalent edema precipitating factors observed were chronic immobilization (95 cases; 79.8%) and congestive heart failure (34; 28.6%). Seventy patients (58.8%) received one or more medication which could impact peripheral or generalized edema (26 [21%] were on prolonged steroids, 22 [18.5%]

on B-blockers and 12 [10.1%] on anticonvulsants). Sixty-five patients (54.6%) were treated for edema before the admission: 57 (47.9%) received diuretics, 13 (10.9%) steroids and only 5 (4.2%) had physiotherapy. In 33 patients (27.7%) edema was the main problem on admission.

During the hospice care the edema was managed in 44 patients (80 limbs in total): by daily compression bandaging or compression combined with intravenous loop diuretic in hypertonic saline. Both methods were equally effective, with mean limbs reduction of 1159 and 1328 mL consecutively ($p = 0.58$) but a tendency of greater reduction of common edema symptoms were seen in combined edema management.

Conclusion: Edema at the end of life is a common source of suffering that can be effectively managed conservatively.

Key words: diuretic effect, physical therapy, edema, lymphedema, palliative care

Obstructive sleep apnea in patients with lower extremity lymphedema. Effects of complex decongestive therapy

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Introduction: Obstructive sleep apnea syndrome (OSAS) is a common disorder resulting in intermittent upper airway obstruction and blood oxygen desaturation during sleep. It is considered an important cardiovascular risk factor. Nocturnal rostral fluid shift from lower extremities to the chest and neck area is hypothesized as one of the factors in pathogenesis of OSAS. Therefore, patients with lower extremity lymphedema may have increased prevalence of OSAS. Complex decongestive therapy by changing the body fluid volume and its distribution may influence the severity of OSAS in patients with lower extremity lymphedema.

Material and methods: We have studied 33 consecutive patients with lower extremity lymphedema (27 women and 6 men). All patients were admitted to the Internal Medicine Ward of the 4th Military Hospital in Wrocław, Poland. In all patients lymphedema was confirmed with lymphoscintigraphy. Initial evaluation included: physical exam, anthropometric measure-

ments, leg volume measurements using truncated cone formula, basic biochemistry including NT-proBNP, TSH, creatinine, serum protein level. Risk of OSAS was assessed in all patients with STOP-BANG questionnaire. Polygraphic examination was conducted (using Embletta Gold[®]) before and after complex decongestive therapy in all patients.

Results: OSAS was diagnosed based on polygraphic evaluation in 60% of patients (20 patients: 17 women and 3 men). Mild OSAS (AHI 5–15) was seen in 10 patients (50%), moderate OSAS (AHI 15–30) in 3 patients (15%) and severe OSAS (AHI > 30) in 7 patients (35%). After complex decongestive therapy lymphedema improved in all patients (mean leg volume reduction = 4.6 l). OSAS significantly improved in 12 patients (mean AHI decline 9.2/h) and worsened in 8 patients (mean AHI increase 14.5/h). Both groups did not differ in mean initial AHI, BMI, neck circumference, age, leg edema volume, edema volume reduction, concomitant disorders and biochemical parameters.

Conclusions: OSAS is highly prevalent in patients with lower extremity lymphedema. Complex decongestive therapy of lymphedema may result both in improvement or worsening of OSAS. Screening for OSAS should be recommended in all patients with lower extremity lymphedema.

Key words: lymphedema, obstructive sleep apnea, OSAS, complex decongestive therapy

The comparison of selected conservative methods of lower limbs lymphoedema therapy after treatment of genital organs cancer

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Introduction: Prophylaxis and treatment of leg secondary lymphoedema, plays the main role in quality of life management in women treated from genital organs cancer. The choice of treatment way is related to cancer type, localisation, histopathological character, stage of the cancer and patient age and her condition as well. In some cases like vulvar cancer, cervical cancer or endometrial carcinoma, inguinal lymph nodes and/or the lymph nodes of pelvis and hip area most probably are necessary to be removed. Radiotherapy after surgery increases the risk of leg lymphoedema. In some patients during physiotherapy, the Mobiderm mobilisation com-

pressive pad has been used, which is the active system for the effect of intermittent pneumatic compression intensification. The aim of this thesis was to compare effectiveness of chosen physiotherapy method which allow to reduce the volume and to improve the consistency of lower extremities lymphoedema.

Material and methods: This research covers 29 women in age 39–97 years (average age 64 years), in which lymphoedema of leg appears after genital cancer treatment. There were 41% of patient with endometrial carcinoma, 28% of patient with cervical cancer, 17% with ovarian cancer, and 14% with vulvar cancer. The examination card of each patient which is obligated in Rehabilitation Dpt. of Oncology Center Institute have been used as a research tool. This Examination card is related also to circumference measurements of extremities in physiotherapy treatment. The IPC group consisted on 19 patient, in which 10 procedures of multichamber IPC have been done. The second group consisted on 10 patients in which 10 procedures of single chamber pneumatic massage with Mobiderm have been done. All of the patient had the same sets of kinesiotherapy procedures.

Results: In order to result comparison, the non-parametrical Kruskal-Wallis test has been used. All statistically analyzed relations clearly indicated the higher effectiveness of therapy with Mobiderm. The average improvement of all therapies: whole the lower limb — 0.74, at the thigh 0.89, at the calf 0.61. For the group of IPC with Mobiderm the results were: whole limb 1.62, at the thigh — 2.0 and at the calf 1.33. The average improvement for the group of multichamber IPC was: whole limb 0.46, at the thigh 0.55, and at the calf 0.38.

Conclusion: 1. Essential correlation between: the time from surgery to therapy, actual age and age during surgery has been displayed. 2. The therapy with IPC and Mobiderm is more effective than the therapy with IPC only.

Key words: lymphoedema of lower limbs, genital organs cancer, treatment of lymphoedema

Lower limb's wound treatment and care with specialists dressings and compression therapy

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The abstract aim is to present the outcomes of highly personalised and patient-oriented wound treatment and care and to indicate specific wound healing stages, which can markedly reduce the treatment duration without the risk of painful surgeries.

Human skin wounds require diversified management and their treatment and care depend on their cause and the current stage. Appropriate wound dressing and selection of agents, dressings and treatment are the key elements of wound management. Proper treatment of chronic wounds must include skin culture and antibiogram to determine the wound bacteria type. More extensive diagnostics with CT, ultrasound and X-ray may often be required to determine skin changes precisely.

Chronic wounds was represented by patient treated with professional long-term dressings. The treatment was based on TIME strategy and included application of specialists recommendations. Rehabilitation, wound immunization in particular, was applied to promote epithelization.

The system wounds at Stage 3–4 by the Torrance and selected due to serious wound complications after long and varied treatment elsewhere.

The presentation shows the results achieved by personalised treatment and care which led to complete healing.

Key words: chronic wounds, sore, rehabilitation wound, ulceration

Is there place for pharmacotherapy in lymphedema secondary to oncological treatment?

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Introduction: Decongestive Lymphatic Therapy (DLT) is recommended by the ISL, UIP and the ILF as the first step in the primary lymphedema treatment. The DLT consists of manual lymphatic drainage (MLD), compression multilayer short-stretch bandaging, garments, meticulous skin care and decongestive exercises. Is there also a place for pharmacotherapy as a supportive therapy in lymphedema treatment?

Material and methods: Review of the literature in the field of pharmacotherapy in lymphedema secondary to oncological treatment.

Results: Sulodexide in post-mastectomy lymphedema of the upper limb was shown to be a very satisfactory therapy in term of lack of side effects and good compliance [1]. Another study, sulodexide in post-mastectomy therapy gave relatively large group of patients free of lymphedema [2]. In the animal model, positive

effects of both ketoprofen and tacrolimus on the reduction of secondary lymphedema have been proven [3]. The topical tacrolimus treatment is FDA approved for chronic skin conditions and has an established record of safety and tolerability in lymphedema [4]. Sodium selenite showed good results in reduction of lymphedema volume, increasing the efficacy of complex physical therapy, and in incidence reduction of erysipelas infections in patients with cancer-related lymphedema [5]. 5,6-Benzo-[alpha]-pyrone was demonstrated to give results in slow but safe reduction of lymphedema of the extremities [6]. Coumarin was not effective therapy for women who have lymphedema of the arm after treatment for breast cancer [7]. The skin changes in patients with lymphedema have been shown to be treated successfully with acitretin and tazarotene [8, 9].

Conclusions: The results of the studies have indicated that pharmacotherapy may be effective in secondary lymphedema treatment. However, further research must be carried out in this field.

Key words: lymphedema, sulodexide, pharmacotherapy

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Lymphedema as the first sign of a cancer

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Introduction: In many cases, the diagnosis of cancer can be difficult. Lymphedema may be the first sign of a cancer. Lymphoscintigraphy can not only confirm the presence of lymphoedema, but may also indicate a possible cause of the disease.

Case report: 56-year-old man was admitted to the Department of Vascular Diseases at the 4th Military Hospital in Wrocław, due to edema of the scrotum, penis and abdomen, lasting for several weeks. During the ambulatory diagnostics, performed before the hospitalization, the patient underwent urological examination, prostate ultrasound and a small pelvic MRI. They did not reveal any lesions that would be suggestive of neoplastic disease presence. The PSA level remained low.

During hospitalization, only lymphoscintigraphy of the lower limbs indicated the presence of a cancer disease. Another urological consultation, with a per rectum examination, followed by the biopsy of the prostate, confirmed the prostate cancer disease.

Conclusions: Lymphoscintigraphy is a helpful imaging study in the differential diagnosis of various edema causes.

Key words: lymphedema, cancer, lymphoscintigraphy

Lymphedema in the Klippel-Trénaunay syndrome

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Introduction: Klippel-Trenaunay syndrome (KTS) is a rare congenital disease, usually occurs sporadically and is characterized by the clinical triad: (1) capillary malformations (port wine stain); (2) soft tissue and bone hypertrophy or, occasionally, hypotrophy of usually one lower limb; (3) atypical, mostly lateral varicosity

and lymphatic malformations. This characteristic clinical symptoms are usually noticed during infancy or in early childhood. KTS and Parkes-Weber syndrome (PWS) are generally considered as the variants of the same genetic disorder, however, arteriovenous fistulas in PWS are clinically more significant and greater than in KTS. In KTS multidisciplinary approach of management is required, including careful diagnosis, prevention and treatment of complications.

Case report: 56-year-old man was admitted to the Department of the Internal Medicine of the 4th Military Hospital in Wrocław due to the right lower limb lymphedema. The lymphedema appeared in a patient at the age of 30 and gradually increased. Medical history of the patient was also relevant for deep vein thrombosis of the right lower limb and the pulmonary embolism 8 years earlier. The physical examination revealed the following: the right lower limb lymphedema with large flat haemangioma extending to the abdominal skin, varicose veins and right lower limb hypertrophy. Lymphoscintigraphy has confirmed the right lower limb lymphedema. Doppler ultrasound showed the insufficiency of the right saphenous vein, many varicoses and the arteriovenous fistula located just below the right knee, which has been later confirmed in angio-CT. During the next hospitalization embolization of the fistula with a good clinical effect was performed. The Decongestive Lymphatic Therapy (DLT), including: manual lymphatic drainage (MLD), SIPC (sequential intermittent pneumatic compression), multilayer short-stretch compression bandaging and decongestive exercises, resulted in significant edema reduction.

Conclusions: Lymphoedema may be a rare symptom of KTS. The compression is the hallmark of conservative management - this is beneficial in management of both, lymphedema and chronic venous insufficiency.

Key words: lymphedema, Klippel-Trénaunay syndrome, lymphoscintigraphy

Surgical treatment of advanced lymphedema: single-center preliminary reports

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Introduction: Despite highly satisfactory results of compression therapy in early stages of lymphedema as well as prevention of further progression, it is not suitable in advanced „non-pitting“ phase, when hypertrophied adipose tissue and fibrosis exists. Since early

1990s liposuction has become an important and approved approach to reducing limb volume by removal of the overgrown subcutaneous fat tissue. In recent years, microsurgical techniques increasing lymphatic drainage capacities such as Lymphaticovenous Anastomosis (LVA) or Vascularized Lymph Node Transfer (VLNT) have emerged.

Aim: Presentation of current and planned future surgical treatment protocols, being carried out in Department of Plastic Surgery in Wrocław, Poland.

Material and methods: Our current, database consists of 10 patients who are at different points of their surgical treatment, carried out predominantly by phased liposuction. Two patients with lower limb lymphedema were analyzed regarding change of the appearance and limb volume after the procedure.

Results: Two female patients aged 28 and 54 years old, with consecutively congenital and acquired lymphedema underwent two liposuctions within lower extremities. The mean aspirate volume during the single procedure was 2,300 ml. On average, limb volume was decreased by 2,200 ml (23%).

Conclusions: The ablative technique as Suction-Assisted Lipectomy (SAL) remains a gold standard in chronic lymphedema treatment, although the combination of SAL and up-to-date microsurgical LVA may help to reestablish physiological routes of impaired lymphatic drainage. This protocol may help lymphedema patients', treating not only symptoms but also cause, diminishing the twenty-four-hour need for compression therapy.

Key words: lymphedema; liposuction; lymphaticovenous anastomoses