

## LYMPHSPARATION

### EVIDENCE-BASED OR TRADITIONAL TREATMENT OF CANCER-RELATED LYMPHEDEMA

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#### ABSTRACT

*The incidence of lymphedema (LE) related to treatment of women's cancer (breast and gynecologic) is as high as 40%. Treatment of LE varies around the world but was decades ago initially based on programs including manual lymph drainage (MLD), compression, skin care and easy exercise. With accumulating evidence and experience, it is time to consider if altering these treatment principles is needed. Based on accumulating evidence, we suggest less emphasis on manual lymph drainage and more on early diagnosis, compression, weight control and exercise for improvement of strength and circulation.*

**Keywords:** cancer, lymphedema, treatment, manual lymph drainage, compression, exercise

The function of the lymphatic system can be damaged by surgery and radiotherapy for cancer treatment resulting in lymphedema. Without adequate treatment, LE can result in complications as massive edema, lymphangitis/cellulitis, impaired limb function, psychosocial disability, and even malignant complications. Even early and well-treated lymphedema may become a chronic condition requiring lifelong treatment.

Cancer patients at risk include particularly those who have had lymph node

dissection followed by radiotherapy. The incidence related to this treatment in breast cancer and gynecological cancer patients is about 40% (1).

Treatment of lymphedema varies around the world and availability is important. This may be determined by distance to lymphedema therapist, number of trained therapists, and costs which in some countries are subsidized but in others paid fully by the patient. For these reasons, therapists and patients in different countries may choose different treatment strategies. In some countries, there still is a strong tradition of providing treatment based on Complex Decongestive Therapy (CDT) including time consuming massage treatment (manual lymph drainage, MLD) though it has been shown in meta-analysis that MLD has a very small or no effect on lymphedema volume (2,3).

Also by tradition, lymphedema diagnosis and the main outcome measure of successful lymphedema treatment for long is based on reduction of extremity volume. However, during the last decade measurement of tissue fluid by bioelectrical impedance (4) and tissue water by tissue dielectric constant (5) has become available and applied in the clinic. These devices enable early diagnosis (6).

More recent research in breast cancer-related arm lymphedema (BCRL) reveals that lymph flow is raised in both the subcutis and

muscle of both arms in postsurgical breast patients who later developed BCRL, compared with patients who did not develop BCRL (7). Further Stanton et al (7) found lymphatic abnormalities in the contralateral (non-swollen) arm in women with established BCRL. These new observations indicate a predisposition to BCRL in some women, highlighting the need for a post-surgical follow-up strategy to be able to diagnose LE at an early stage.

Another finding by Stanton et al (7) is that lymph drainage is slowed in the subcutis, where most of the edema lies. The drainage is also slower in the subfascial muscle compartment, which normally has much higher lymph flows than the subcutis. The muscle does not swell significantly; however, the impaired muscle drainage correlates with the severity of arm swelling (7). These findings indicate that muscle lymphatic function has an important key role and that lymph flow maybe could be increased by dynamic exercises.

Recently, Jammallo et al (8) found that breast cancer patients with a pre-operative BMI  $\geq 30$  and those who experience large weight fluctuations (10 pounds gained/lost per month) during and after treatment for breast cancer should be considered at higher risk for lymphedema. They suggest follow-up and early intervention for optimal treatment.

Based on this recent research and on clinical experience, a paradigm shift may now be needed. The goal of cancer related-lymphedema treatment should focus more on follow-up programs, early diagnosis, preventive care, and physical activity.

#### *Follow-up and Early Diagnosis*

There are many benefits of early diagnosis and treatment within many areas and these also apply to cancer-related LE (9,10). The LE can either be eliminated at an early stage when still minor or reduced to a level that does not affect activities.

In Sweden, early diagnosis by routine follow-up visits for all patients at risk is

recommended. In a clinical survey it was found that within a year after surgery about 50% are detected at follow-up 4-5 weeks after surgery using volume measurement and palpation of thickness in the subcutaneous tissue. Another examination 3-4 months after completion of radiotherapy detected 30% (our own unpublished series).

It is recommended that patients at risk are provided with brief LE prevention information at surgery and additional information at the first follow-up individually or in a group setting. This information should include basic function of the lymphatic system, early signs of lymphedema, and skin care. At this time, the therapist measures the leg or arm and orders a compression garment if there is edema. If the first and follow-up visits are provided by a physiotherapist, joint range of motion also can be assessed, and the patient can be informed of individual exercises.

Due to the follow-up procedure at Swedish hospitals with patients being well educated about recognition of early signs, we usually are presented with very early and minor edema at stage 0-2. In most cases we provide a compression garment or, if needed, bandage a few days in order to reduce the edema, and thereafter a garment. MLD performed by a therapist is never the first choice of treatment. Patients are informed of the current lack of evidence concerning MLD but are encouraged to do self-lymph massage for a short period to evaluate the effect. If there is a lack of subjective results, the patient can exclude the self-lymph massage and focus on wearing compression garment and being physically active. They are also encouraged to begin with some form of exercise for improvement of lymph circulation (11).

#### *Physical Activity, Exercise and Weight Control*

There is a body of research demonstrating a range of physical and psychosocial benefits that can be gained following breast cancer via exercise (12) and also its application being vital to overall health (13). By tradition,

patients treated for cancer have often been told to avoid muscle strengthening exercises or other physical activities that include cardiovascular exercises putting pressure on the circulatory system. Prohibition of these kinds of activities has prevented, particularly cancer patients, achieving these health benefits. Studies that have involved women with upper limb lymphedema following breast cancer show that exercises for strength as well as range of motion do not initiate or exacerbate existing lymphedema. On the contrary, exercise leads to benefits with respect to lymphedema-associated symptoms, upper-body strength and mobility (14,15) and may even reduce volume as shown by pole walking (16). A pilot study on lower-limb lymphedema indicates similar results (17).

It is recommended that the cancer patients are informed of the importance of performing physical activity. All patients should be encouraged to start physical activities as soon as possible, preferably 2-3 weeks after surgery. As for axillary clearance, previously physically inactive patients are advised to take up some kind of activity and exercise for the upper body such as swimming, pole walking, weight lifting, cross country skiing, rowing etc. in order to stimulate the lymphatic and blood circulation. In the case of inguinal clearance, cycling and swimming can be recommended.

High BMI is a risk factor for development of lymphedema and close monitoring and early intervention to ensure optimal treatment with physical activity recommended above, may be appropriate for these patients. Further, weight control is an important part of management of lymphedema, and weight reduction may even serve as a treatment (18). Thus more research is needed to identify patients in specific need of support by a dietitian or cognitive behavioral therapeutic, or similar healthcare professional.

#### *Treatment of Severe Lymphedema*

Not all edemas are simple, some may

also be complex, and this caveat is particularly so for the lower limbs. Cancer related-lymphedemas are seldom of only lymphatic origin and some may have a major or minor degree of venous insufficiency (7). This means that patients respond differently to both compression and physical activity. Often the therapist has to assess which methods work best for that patient as an individual, and the treatment strategies may include both MLD and pump compression. At times, it can be similar to a single subject design, in which the patient serves as his/her own control, and where one change is made at a time and its effect is evaluated. This approach requires a therapist with skills and long experience.

In advanced cancer, the treatment plan is different and depends on other factors such as venous obstruction, medication-related edema, levels of plasma protein, activity/inactivity and oncological treatment, edema status, and other considerations. Nonetheless, treatment is mainly aimed at improving functioning and comfort.

#### *CONCLUSION*

Based on recent research, there is a need for adjustment from patient-passive treatments of cancer related-lymphedema into a patient-active approach including providing up-to-date information to patients at risk, timely and educated follow-ups in the clinic, and thereby, early diagnosis and treatment to eliminate or greatly reduce lymphedema burden.

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