

Chapter 32

Other Contemporary Treatment Modalities

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Conservative Therapies for Secondary Lymph Edema

We have a plethora of treatments and strategies for dealing with lymphedema. Some show scant evidence of their effectiveness and often little rationale for their use. We must advance our knowledge in the breadth of treatments with an open mind, but must provide evidence for their efficacy so that patients and practitioners know what to expect. For many new treatments, the trials are often small, but some are well designed and are objective with rigorous evaluation, so we can have confidence in the outcomes.

Contemporary Treatments

Patients may seek contemporary treatments from others or the internet. It is important for therapists to be aware of these contemporary options, just as it is important to be aware of any comparative benefits of this range of therapies.

The Groupings of Contemporary Treatments

Some are patient-based with no therapist input and some are administered by a therapist or clinician. They can be broadly categorized into those that vibrate the

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tissues (encompassing a range of frequencies and amplitudes), those involving a pharmacological agent that induces or promotes a biological event, those that electrically stimulate the lymphatics, those that vary tissue pressures including exercise, those that encourage diet change, and those that are a result of the placebo effect.

Methods

This overview is limited to patient populations with clinically-diagnosed limb lymphedema secondary to cancer treatment and to articles written in English. Online health databases, lymphatic societies and lymphology journals were searched, with the primary study outcomes to include: a change in limb volume (generally measured by perometry, water displacement or calculated via circumference measurement), subjective symptoms and/or quality of life/activities of daily living. The quality of each article was assessed according to Mulrow and Oxman.¹ Reviews that match the above criteria are also included.

Pharmacogenomics and Medications Targeting the Lymphatic System

There have been a range of treatments that have targeted the lymphatic system or its components pharmacologically, the best known of which are the flavonoid/benzopyrone groups. Studies included those of Pecking et al.,^{2,3} who first investigated Daflon, and Cluzan et al., who studied Cyclofort,⁴ both of whom had significant objective improvements for the patient group tested. Lodema provided good outcomes for patients in terms of reducing their lymphedema according to one report,⁵ but another showed it to have little objective effect.⁶ Anecdotal information suggested excellent outcomes. The use of coumarin (5-6 benzo- α -pyrone) for the treatment of lymphedema, had hepatotoxic effects for some, but we now know that this was a consequence of a genetic metabolic problem relating to the breakdown of coumarin.⁷ Developing genetic and genomic knowledge will mean that in the future we will be able to determine who will respond well (and who may not) and overcome the above adverse outcomes.

Low-Level Scanning and Hand-Held Laser

The first trials of the low-level laser in lymphedema were reported in 1995,⁸ although the general benefits were first reported in the late 1960s.⁹ Of key importance is the dose and delivery. Double blinded, cross-over placebo controlled trials

have been conducted using laser with good subjective and objective outcomes.¹⁰ One of the issues of general lymphedema treatment and perhaps an explanation for less than expected outcomes at times may have been the faulty decision-making process used for its sequencing. Trials^{8,10} of scanning and the hand-held laser have shown that its application is particularly beneficial when there is fibrotic induration of the tissues (associated with surgical or radiation-induced scarring), in reducing swelling, softening the tissues, improving scars, and improving how the limb feels.^{11,12} The low-level laser has a role to play in the early phases of treatment of lymphedema as well as in its later management (when fibrotic induration has spread through the lymphatic territories), both from the perspectives of the health professional and the patient. Optimal treatment time is generally short with gaps between treatments.¹³

Lymphatic Drainage Massage Delivered by Partners/Carers and Mechanically

Massage aimed at improving lymphatic drainage administered by trained lymph therapists possesses a body of evidence supporting its effectiveness,¹⁴ but it is far from complete. However, it is very important that therapists, clinicians, and patients are aware of what can be expected when using tools that also can improve lymphatic drainage by mimicking therapist massage and from partner/caregiver massage.

Massage, in general terms, is known to encourage the entry of fluids into the initial lymphatics, to facilitate transport along lymph collectors and to open anastomoses between adjacent collectors or lymph territories. It does this by means of changes in tissue pressures.

Piller et al.¹⁵ showed that when partners/caregivers were trained by lymphedema therapists, the objective and subjective results were similar to those of professional treatment programs. Perhaps the partner/caregiver knows the patient's body better and when the limb is responding and when it is not. Such programs need further research because they can empower the patient, reduce costs and travel time, and re-establish a touching relationship.

While there is a plethora of massage pads/units only a few have been subjected to a formal trial in lymphedemas and trial sizes are often small. A trial⁴² of a massage pad on leg lymphedema showed that, in order to gain a good outcome, the pad had to be used so that it facilitated clearance of the lymph territories, just as in professional lymphatic drainage massage programs. Patients gained and maintained good reductions in their limb volume, with 1 h of pad use per day. Improvement also occurred in tissue softness, and how the limb felt. Patients felt more in control of the medical condition and felt better able to undertake activities of daily living. In a trial of a hand-held massage unit¹⁶ in a moderate secondary arm lymphedema used for 25 min each evening for 1 month, there were significant volume reductions and improvements in the perception of limb size and range of movement. Again, patient control and use in their own time and at their own pace were important.

Another strategy that varies tissue pressures by tissue movement revolves around “wobbling” the limbs from side to side. It is, in fact, a form of vibration, albeit slow. In this trial patients used the equipment while supine with the legs elevated on the unit, for periods of from 3 to 12 min twice per day for 3 weeks. The results¹⁷ were similar to the massage pad trial in that the limbs reduced in size, volume, they softened, and the limbs felt better.

Patients felt more in control and were better able to undertake their activities of daily living, a common theme with home-based management.

Mild Exercise (Tai Chi)

Tai Chi and Qi Gong can easily be performed by the patient. These actions vary tissue pressures more effectively and, when combined with variations in intra-thoracic and intra-abdominal pressures, help lymphatic system loading and flow. Patients with arm lymphedema who used Tai Chi 10 min daily achieved reductions within the same range as more demanding treatments and were able to maintain them.¹⁸ A water-based version of this type is used in the Encore program operated in Australia and around the world, but the outcomes are yet to be published.

Moderate Exercise (In and Out of Water)

A common question is: how much exercise can I do? Most studies^{19,20} indicate that mild exercise is good for the lymphatic loading and transport because of variation in tissue pressures. However, as we go up the scale of exercise intensity, we must know the capacity of the damaged lymphatic system to handle an augmented lymph load. Getting the balance right is very important.

One good way to undertake exercise, but at the same time to have tissue support through external pressure, is through the range of water-based programs. Some studies provide good evidence for this.²¹⁻²³ The temperature of the water is important, but it is physiologically sensible to have temperatures within the range of normal skin temperature: 28°C has been suggested.²¹

There are specific exercise classes available to patients with arm and leg lymphedemas. Casley-Smith²⁴ suggested gentle movement, deep breathing and slow rhythmic exercise of the proximal and distal muscles melded with self massage routines. Bracha and Jacob²⁵ showed this program to reduce limb volume and improve quality of life in some participants.

More strenuous exercise programs using weights have also been reported.^{26,27} In one trial, patients with arm lymphedema were asked to undertake increasing levels of weight-lifting while performing a series of pre-determined exercises to evaluate the maximal exercise points without worsening the lymphedema. In most cases,

while there was a slight increase in limb volume immediately after the exercise, the effect was short-lived as long as patients resumed their activities of normal daily living.²⁸ This study indicated that patients can undertake significant and even strenuous amounts of exercise/activity without worsening their lymphoedema, but obviously, it is crucial that the patient know the limit of exercise and stay below it. The impact of exercise and significant activity has been reviewed and shows an overall positive impact (varying in magnitude among studies) on limb size, range of movement, muscle strength, subjective limb symptoms, and quality of life.¹⁹ In all studies, a cooling-down period is essential. The question of when to begin an exercise program after surgery seems to have been answered by Todd et al.,²⁸ who indicated that a delay of 1 week for any full shoulder mobilization reduced lymphedema incidence.

Electro-Stimulation

Lymphatics pulsate between 6 and 10 times per minute and are myogenically and neurogenically regulated. Anecdotal evidence indicates that mild electro-stimulation has an effect on lymphedema, and can reduce size and volume. A study of secondary leg lymphedema²⁹ indicated that electrical stimulation has such benefits over current best practice self-management. Pain, heaviness, tightness and perceived leg size also improved. Truncal fluid was also reduced, indicating a possible additional clearance of major lymphatic trunks. Other units similar in function and principle to a TENS unit have also been shown anecdotally to reduce lymphedemas, but trials are still in progress.

Tissue Manipulation

A technique originating in France, called “*endermologie*”, has generated evidence for the treatment of cellulite and obesity. Given the similarities among, mid-stage lymphedema, cellulite, lipedema, and obesity (the adipose connection), it is likely to be beneficial in the treatment of lymphedema. A single, blinded, randomized study of arm lymphedema comparing *endermologie* with traditional manual lymphatic drainage (MLD) over a 4-week period demonstrated the greatest reduction in limb volume and circumference in the first week, but showed benefit to continue over the 4 weeks of the trial.³⁰ Results were similar to MLD, although achieved in a shorter time. There were improvements in tissue hardness and subjective indicators. Better outcomes were achieved when combined with bandaging and with more time spent on clearance of the trunk and axillary area,³⁰ as is well known in CPT programs.

Kinesio-Taping

Kinesio-taping is believed to improve lymph drainage by lifting the skin away from the underlying fascial planes of the musculature, perhaps reducing interstitial pressures there, and facilitating blood and, particularly, lymph flow along these lower pressure areas. It can do this because of the puckering effect of the tape. It is widely used in sports injuries, but has recent been applied in treating lymphedemas^{31,32} and seems likely to be useful in hot and/or humid climates. In an audit of the use of kinesio-tape for breast and other edemas, Finnerty et al.³³ showed that kinesio-tape was being used in lymphedema management, particularly in the more challenging areas (breast, chest) where traditional bandaging and garments are difficult to use. Good quality trials are lacking. One trial of seroma following axillary clearance for breast cancer treatment showed significant benefits of kinesio-taping in reducing the severity and duration of the seroma, as well as subjective indicators.³⁴

Diet (Mid-Chain Triglycerides) and Abdominal Issues

Long-chain triglycerides are absorbed (as chylomicrons) via the mesenteric lymphatics, adding to the lymphatic load. If their structure or function is compromised, this absorbed load of fats may find its way into other organs/structures by retrograde flow.³⁵ Replacing long-chain triglycerides with mid- and short-chain ones is believed to reduce the incidence of this retrograde flow (chylous reflux). There are a number of suggested diets revolving around medium-chain triglycerides (MCT). The evidence is poor in the scientific literature, but is strongly represented in the “gray” literature. Other issues of diet⁴³, gastro-intestinal bloating, and constipation also appear in the “gray” literature and make sense empirically if the potential exists to create significant external pressure on the abdominal lymphatic collectors.

Placebo

The placebo effect is linked with the release of brain endorphins³⁶ associated with the anticipation of receiving active treatment. Placebos have a benefit in studies with continuous subjective outcomes measurement,³⁷ a phenomenon that is relevant to studies on lymphedema therapeutics.

Some of the studies cited in this chapter have used placebo groups in which patients have responded to placebo treatment, generally reporting symptomatic improvement (not usually accompanied by significant changes in limb volume). The trial investigating the effects of 5-6 benzo- α pyrone by Loprinzi et al.⁶ showed that, despite an arm volume increase in both groups, there were similar positive responses to perceived arm swelling, tightness, heaviness, and arm mobility in the

active treatment and the placebo groups and, even after 12 months, there was a slight preference for the placebo over the active intervention! Similar results arose in a study by Pecking et al.,^{2,3} who investigated Daflon. Both the placebo and the active group reported statistically significant reductions in arm discomfort and an improvement in the perception of constant heaviness. There were no objective changes in the placebo group. Cluzan et al.⁴ investigated Cyclo-fort versus placebo and found that while quantifiable edema volume increased in the placebo group patients, they nevertheless reported improvements in both arm heaviness and mobility. Casley-Smith et al.⁵ investigated the effect of coumarin and found a similar improvement in patient perceptions.

Box et al.³⁸ studied the effects of hydrotherapy compared with a control group who did not receive any active treatment. Although the control group demonstrated an increased arm volume after 7 weeks, they reported improvements in aching, limb appearance, heaviness, tightness, and work/leisure activities. A handheld laser study by Carati et al.¹⁰ involved a placebo group receiving sham laser with 1 and 3 months' follow-up. At 3 months, the placebo group experienced an increase in arm volume, but reported significant improvements in the overall mean perceptual score and activities of daily living.

The placebo effect may be used to the advantage of both the therapist and the patient. The patient's expectations, the therapist's belief in the treatment being offered, and the patient-therapist relationship³⁹⁻⁴¹ can accentuate the placebo effect. Being aware of these influences may help the therapist to initiate improvements in subjective symptoms, even if this is not necessarily followed by changes in more objective parameters.

Every treatment and management program needs to be balanced in terms of cost and benefit and linked to any contraindications. Treatment complacency must be avoided and perhaps changing therapy is one way around this. The overarching effect of even placebo on the patient's quality of life and frame of mind may encourage them to undertake other treatments that will have an impact on limb size, composition, and volume.

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