

EDITORIAL

TREATMENT OF LYMPHEDEMA

A number of articles have appeared in recent issues as well as in the current issue of Lymphology which extol the virtues of operative management in the treatment of peripheral lymphedema. Despite the enthusiasm of the authors and the varied ingenuity of their approaches, many readers, reviewers, and practitioners remain skeptical of the overall efficacy of these operations. To provide a balanced overview on this subject, we submit the following comment. (Ed)

When the Editors asked me to address the issue of therapy for lymphedema, I was happy to do so because it provided me the opportunity to explain and clarify my point of view. Whereas I favor publication of articles related to operative management of lymphostatic elephantiasis, I hasten to emphasize that such therapy is only justified in communities where climate or economic circumstances render use of combined physiotherapy impractical or impossible; in other words, where no practical alternative to operative treatment currently exists. Indeed, had the clinical outcome as shown in many articles treated by operation occurred in Germany where combined physiotherapy is the preferred method of treating peripheral lymphedema, the results would be considered cosmetically and functionally unacceptable. Medical practice, unfortunately, has not as yet approached an exact science comparable to that of cosmological physics, the laws of which have universal applicability. Nonetheless, by means of combined physiotherapy, a manipulative form of treatment free of noticeable side

effects, lymphedema of the extremities even in the most advanced stages can be remedied with remarkable consistency (1). In a chapter in an acclaimed monograph on lymphedema, Barinka (2) describes the operative treatment of lymphedema. In my opinion, however, none of the patients illustrated would have required surgical treatment if combined physiotherapy had been available. Surgeons often recommend an operation for lymphedema after conservative therapy has failed. But the term "conservative therapy" of lymphedema is in disarray or chaotic (not the non-linear randomized chaos of Mandelbrot which is more accurately a stochastic mathematical concept) (3). For example, some therapists regard elevation of a limb for three days as "conservative therapy", others employ simple "massage" or intermittent pneumatic pump compression (pneumomassage) or "wring out" lymphedema by use of rubber tubes ("tuyautage") (4). Still others practice so-called "mesotherapy" which consists of an injection of a non-specific drug mixture as a "cocktail" using a gun-like instrument into the swollen limb. Many continue to treat lymphedema with diuretic drugs. A widely practiced method, (popularized in the United States) consists of the following ill-designed protocol: limb elevation, intermittent pneumatic compression and diuretics with premature application of elastic stockings or sleeves *before* the bulk of edema fluid has been properly evacuated.

To squeeze edema fluid towards the groin or axilla of a lymphedematous limb especially if the regional lymph nodes have been removed

or are diseased, defies an understanding of basic anatomy and physiology. The adjacent quadrants of the trunk are alternate lymphatic drainage pathways for both the axilla and inguinal region as are the genitalia for the leg lymphatics. Accordingly, it is common after standard compression therapy to see iatrogenic swelling of the genitalia as peripheral edema fluid has been translocated and then trapped more proximally. Often this development is overlooked by unsuspecting therapists who fail to examine the patient without undergarments. Whereas many of the nonoperative methods I mentioned previously are commonly used, in general, limb elevation alone has little or no benefit once lymphostatic edema has reached the advanced brawny stage. Moreover, treatment of lymphedema with diuretics which carries potential and subtle side effects is not only useless but contradicts both the pathophysiology of lymphedema (persistent protein-rich edema with maintenance of an obligatory osmotic force for holding on to extracellular fluid) and the pharmacologic action of the drugs (indirectly lowering microvascular hydrostatic pressure by plasma volume contraction).

Combined physiotherapy is properly designated as a two-phase treatment program and should be performed by specially trained physiotherapists under the guidance of a physician with broad experience in clinical lymphology. The first stage, which on the average takes 4 weeks, is termed the "phase of drainage" whereas the second, which usually lasts several years and for practical purposes is a lifetime commitment is the "phase of conservation and optimization". Whereas phase one is preferably carried out as intense outpatient therapy or in an inpatient clinic-type facility devoted to lymphology, phase two continues in the patient's own home.

Combined physiotherapy has four major components.

- meticulous skin care including topical and systemic antimycotic drug treatment.

- manual lymph drainage or "MLD", a technique not synonymous with "effleurage"

- or simple "massage". MLD functionally operates to enhance lymph drainage more proximally in both contralateral and ipsilateral truncal quadrants of the torso, then in the proximal limb and only thereafter from the distal to proximal portion of the edematous extremity (1).

- compression performed during the course of phase one encompasses a vigorous bandaging technique 1-2 times/day and in phase two is maintained by daily limb wrapping followed by wearing of elastic stockings or sleeves.

- remedial gymnastics.

If phase one is carried out in the early or "pitting stage" of lymphedema, it results in total remission of peripheral swelling. This beneficial effect is analogous to treatment of mild congestive heart failure with diuretic drugs in that peripheral edema disappears but treatment must be continued indefinitely. Phase two or the stage of conservation is comparable to maintenance treatment of ongoing heart disease. If therapy is initiated in a slightly more advanced (second) stage of lymphedema with moderate interstitial fibrosclerosis, or in a more advanced third stage (elephantiasis), combined physiotherapy during phase one only reduces but cannot eliminate swelling. For these later stages, however, phase two aims not only to maintain the initial response but also further improve edema with time. Over a 2-3 year period of phase two combined physiotherapy, limb fibroplasia gradually regresses and the extremity regains to a high degree a near normal appearance.

We have been urged repeatedly, often by reconstructive surgeons, to present the long-term results of combined physiotherapy. Although our lymphedema clinic treats in phase one approximately 2500 lymphedema patients per year, we unfortunately cannot provide a controlled clinical trial satisfying critical statistical analysis. (Note that there are no clinical trials demonstrating the benefit of operations for lymphedema either). Consider the following, however:

1. When we established our Lymphedema Clinic 15 years ago, combined physiotherapy was already well-accepted in Germany and physicians sent patients to be treated specifically by this non-operative method. Moreover, we already recognized that combined physiotherapy was highly effective and essentially free of side effects. It seemed, therefore, unethical to establish a "placebo" subgroup (i.e., untreated) or treat by another inferior method merely for purposes of comparison.

2. Combined physiotherapy is properly performed, as repeatedly emphasized, by skilled physiotherapists. Because most physiotherapists do not deviate from standard technique, a lymphedema patient assigned to a non-standard or control group (in the course of a double blind controlled trial for example) would be immediately apparent to physiotherapists and physician alike. A comparable situation exists with thermotherapy where one wishes to investigate whether combined physiotherapy in combination with heat (5) is better than combined physiotherapy alone. Here, too, we have been unable to establish a group treated by mild hyperthermia alone or to keep from knowing who received supplemental hyperthermia. Indeed, scarcely had we started such a study when an "over-conscientious" physiotherapist suggested to the patients that they were test subjects exposed to cancerogenic microwaves!

3. After patients leave the inpatient clinic (phase one) German health regulations prohibit them being recalled for a standard checkup. This statutory limitation means that patients return to us only if the primary care family doctor decides to send them. Several years ago my colleague E. Földi reported the clinical outcome of patients who had undergone phase one treatment 10 years before and were sent back by the family doctor to undergo phase two of combined physiotherapy. She was criticized that patient selection biased the results because only those who returned were studied while the others were neglected. An epidemiologist or statistician

ignores the obvious fact, however, that this involuntary selection actually works against subjective attempts to overstate the value of combined physiotherapy because only patients whose lymphedema worsened are sent back to the clinic. In other words, patients who are doing well do not return. In fairness, however, neither do patients return who die. After all, many have edema secondary to radical operations and irradiation that is often only temporarily successful in arresting cancer.

4. For inpatient treatment, we manage only patients with advanced lymphedema. Not only is the lymphedema itself often severe, but most of the patients have one or more associated problems such as congestive heart failure, hypertension and diabetes. Less complicated forms of lymphedema in Germany are usually treated at home by a skilled physiotherapist. Of 707 lymphedema patients treated by us between May 15 and June 27, 1993 only 113 or 16% had no other significant medical disorder. Thus, it is impractical to reconstruct a demographically homogenous population of patients to satisfy criteria for an accurate control clinical trial for management of lymphedema. It is also apparent from this brief review that no absolute indication for operation in managing chronic lymphedema exists except perhaps for the Stewart-Treves syndrome, a rare (lymph)angiomatous cancer that is usually rapidly fatal.

An important consideration of combined physiotherapy is that treatment success often depends on the training and working outlook of the physiotherapist. In our 140 bed clinic, we employ 35 physiotherapists and characteristically the patient with the most advanced lymphedema is assigned to the most accomplished physiotherapist. Sometimes a physiotherapist becomes discouraged, morale falters, or monetary rewards supervene and interfere with therapeutic programs and regimens. As my colleague E. Földi has lamented, sometimes she must pay more attention to the psyches of 35 physiotherapists than to the lymphedema of 140 patients! It

also would be so much easier and cheaper to prescribe drugs than use labor intensive manual lymph drainage and bandaging. Unfortunately, we have not found that the benzopyrones (6) can substitute for combined physiotherapy.

Human shortcomings also need to be considered if combined physiotherapy is performed by unskilled physiotherapists. Whereas most trained physiotherapists perform in an outstanding fashion, there are poorly trained therapists who perform massage (effleurage) rather than multimodal combined physiotherapy and in their hands lymphedema can worsen. Because neither the discipline of lymphology nor combined physiotherapy are taught to most physicians, the referring doctor may indiscriminately conclude that persistent lymphedema patients treated by self-proclaimed but poorly trained physiotherapists is evidence for failure of combined physiotherapy!

Another potential shortcoming of combined physiotherapy is that shared by all other chronic diseases and that is a need for long-term commitment. In other words, full compliance by the patient is mandatory for a satisfactory outcome. During phase one, for example, bandage wrappings have to be worn throughout the day and night for effective regression of edema. Combined physiotherapy is a multistage regimen, and it cannot be truncated.

Do "physiologic" operations (lymph nodal-venous shunts, transplantation of lymphatics or veins) offer an alternative to combined physiotherapy in the treatment of lymphedema in the earlier stages? (At this stage, nobody recommends these operations for treatment of elephantiasis.) My answer is unequivocally no. The reasons are as follows:

1. In the few medical centers which perform these operations, no more than 10-20 patients per year are operated upon. This number is a mere droplet in the vast bucket of patients with lymphedema.
2. The results of these operations are by no means better than those of combined

physiotherapy, but I will acknowledge that no controlled clinical study has compared the long-term results of either of these treatment modalities.

3. Multimorbidity, as often co-exists in these patients, often precludes operative treatment. Moreover, due to the often shortened life expectancy of many patients with secondary lymphedema undergoing treatment for cancer, subjecting them to more surgery is usually discouraged.

I also wish to address the prerequisites other than climate and economy which need to be fulfilled to establish a combined physiotherapy clinic. Many physicians outside Germany visit our clinic for several days. They are generally impressed by what they see, assume combined physiotherapy is a simple skill and that they can establish a similar clinic for lymphedema treatment in their medical center by just enticing away some of our physiotherapists. In the interest of patient care I advise against this tactic. Even an otherwise competent surgeon, internist, dermatologist, or general practitioner may be unfamiliar with the nuances of clinical lymphology and is often not knowledgeable about the subtleties of combined physiotherapy. A specialist in oncology also preferably needs a two-year apprenticeship working in a busy lymphology clinic before (s)he is qualified to supervise a well-trained physiotherapist. It is thus unwise to create an upside-down arrangement whereby the "imported physiotherapist" becomes the foremost authority and ends up leading and directing the physician. Even the best physiotherapists in our Clinic continue to get close supervision regarding the medical management of each patient during the course of phase one treatment.

Physicians and surgeons specializing in vascular diseases have drafted consensus regimens regarding the treatment of peripheral arterial insufficiency and the postphlebotic syndrome. Whereas to develop such protocols for the treatment of lymphedema is laudable, it is probably not practical at this time. Each physician who

treats peripheral lymphedema has a preferred program and thus far controlled trials are lacking. On the other hand, to simply let practitioners vote on the treatment method of choice is equally naive and inappropriate. To paraphrase Schiller, "scientific truth cannot be assessed by the vote of the majority "(7).

REFERENCES

1. Földi, E, M Földi, L Clodius: The lymphedema chaos: A lancet. Ann. Plastic Surgery 22 (1989) 505.
2. Barinka, L: In: *Lymphedema*. Clodius, L (Ed.), George Thieme, Stuttgart, 1977, p.139.
3. Aharony, A, J Feder: *Fractals to physics: essays in honour of Benoit B. Mandelbrot*. Elsevier, 1990.
4. Van der Molen, HR: Die Konservative Behandlung des Lymphödems. Folia Angiol. 21 (1973), 297.
5. Ti-sheng, Z, H Wen-Yi, H Liang-Yu, et al: Heat and bandage treatment for chronic lymphedema of extremities: Report of 1,045 patients. Chinese Med. J. 97 (1984), 567.
6. Casley-Smith, J: Treatment of lymphedema of the arms and legs with 5, 6 Benzopyrone. New Eng. J. Med. 329 (1993) 1158
7. Schiller, F: *Maria Stuart*. Wittkowski, W (Ed.), Waveland Press, IL, 237p, 1992.

Prof. Prof. h.c. Dr. med Michael Földi
Abrichstr. 4
7800 Freiburg-Hochdorf
GERMANY