Complete decongestive therapy (CDT) in lymphoedema/phlebo-lymphoedema

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Keywords
Complete decongestive therapy (CDT), prevention of progression of CVI, phlebolymphostatic oedema, medical compression stocking

Summary
In contrast to the scientifically recognised status of CDT (phases I + II) as first-line treatment in primary and secondary lymphoedema, initial decongestion of phlebolymphoedema (stages II + III a/b of CVI according to Widmer/CEAP IV-VI) on an outpatient basis is largely unknown. As prevention of the further progression of venous lymphostatic disease and the development of gravitational ulcer, the German Federal Committee of Physicians and Health Insurers (*Bundesausschuss Ärzte-Krankenkassen*) incorporated the decongestive phase (phase I of CDT) into the valid Federal Joint Committee Remedies Directive (*Heilmittelrichtlinien*), sections LY 1 and LY 2, as early as a decade ago. Provision of the indispensable medical compression stocking is only advisable after performing the daily phase I CDT for an average of 10 times up to a maximum of 15 times. Consistent further treatment as phase II CDT (maintenance phase) is only necessary in exceptional cases following corresponding medical findings.

Schlüsselwörter
Komplexe Physikalische Entstauungstherapie (KPE), Prävention der Progression der CVI, phlebolymphostatisches Ödem, medizinischer Kompressionsstrumpf

Zusammenfassung
Im Unterschied zum wissenschaftlich anerkannten Stellenwert der KPE (Phase I + II) in der Behandlung primärer und sekundärer Lymphödeme als Therapie der Wahl, ist die initiale Entstauung des Phlebolymphödems (Stadium II + III a/b der CVI nach Widmer / CEAP IV-VI) unter ambulanten Bedingungen häuft unbekannt. Als Prävention für das weitere Voranschreiten der veno-lymphostatischen Erkrankung und der Entwicklung des Ulcus cruris venosum wurde die Entstauungsphase (Phase I der KPE) bereits vor einem Jahrzehnt durch den Bundesausschuss Ärzte-Krankenkassen in die geltenden Heilmittelrichtlinien unter LY 1 und LY 2 aufgenommen. Erst nach einer durchschnittlichen 10- bis max. 15-malig durchgeführten täglichen KPE-Phase I ist die Versorgung mit dem unverzichtbaren med. Kompressionsstrumpf sinnvoll. Die konstante Weiterbehandlung als KPE-Phase II (Erhaltungsphase) ist nur in einigen Ausnahmefällen, nach entsprechendem ärztlichem Befund, notwendig.

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Complete decongestive therapy (CDT), as a physical two-phase therapy (1. decongestive phase/2. maintenance/optimisation phase), is recognised worldwide as first-line treatment in all forms of lymphoedema (primary/secondary).

In complete contrast to this, CDT is rarely prescribed in the treatment of phlebolymphoedema (Widmer stages II and III a/b/CEAP IV-VI) and it occupies an unjustifiably lowly position, particularly in outpatient care.

In addition to the main indications for CDT measures, i.e. primary and secondary lymphoedema of the extremities, preventive application of these measures has become established after breast cancer surgery during the past decade. When this treatment is prescribed by breast centres and as part of oncological follow-up treatment, its aims are: accelerated wound healing and improved regeneration of the regional lymphatic vessels to prevent seroma formation and breast/chest wall and arm lymphoedema (1) (▶Fig. 1, ▶Fig. 2).

The preclinical stage 0 and stage I (Widmer) of chronic venous insufficiency (CVI) are not indications for CDT. In stage I of CVI (CEAP IV), usually during the 2nd half of the day, a dynamic (high-volume) insufficiency develops in the still healthy lymph-vascular system, manifesting as swelling of the foot/ankle/lower leg region.

Regular wearing of a medical compression stocking, fitted when the oedema is not present, in association with ample exercise during compression can usually prevent further progression of the venous disease. In addition, the patient should be given detailed advice on lifestyle and supportive self-treatment (e.g. obesity, pro-

Fig. 1 Radical mastectomy, 2nd day post-surgery.

Fig. 2 Patient after 5 days of CDT.

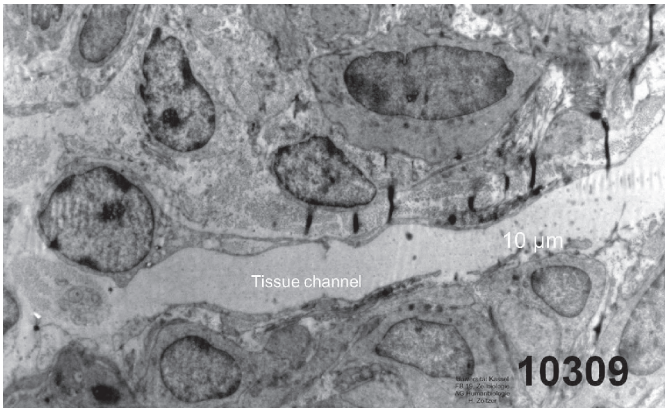

Fig. 3 Tissue channel (Prof. Dr. rer. nat. H. Zöltzer i.R., Uni-Kassel).

Fig. 4 [*Female*] patient with extensive phlebolymphoedema prior to CDT treatment (Peter Wörmann, Hanau).

longed sitting, clothing, sauna/hot and cold treatment, etc.).

The current studies by H. Schad, Munich Heart Centre 2009 (2), regarding the Starling hypothesis, have shown that, in contrast to the frequently prevailing scientific consensus, no venous absorption of the permanent flow of ultrafiltrate occurs at the blood capillaries of the extremities. His measurement results have shown that, even under physiological conditions, the entire ultrafiltrate is absorbed exclusively by the lymph-vascular system of the extremities.

In contrast to phases 0 and I, CDT is of major therapeutic significance in phases II and III a/b (CEAP IV-VI) with regard to displacement of the now protein-rich fluid in the oedematous lower leg/foot region. Brauer's lymphoscintigraphic findings show decompensation of the subfascial and epifascial lymph transport in the oedematous area (3). On this basis, fibrosclerosis and dermatoliposclerosis develop as typical secondary tissue changes. This means that, at these advanced stages, a combination of dynamic and mechanical insufficiency of the lymphatic system (combined insufficiency) develops in the oedematous region. In accordance with the laws of pathology, further progression of this venous-lymphostatic disease inevitably leads to necrosis, i.e. to the development of gravitational ulcer.

Effects of manual lymph drainage (MLD) in stages II and III a/b of CVI:

- Increased lymphoangiological uptake via the centrally stimulated, still functional lymph-collecting vessels (neck/venous angle, thoracic and abdominal lymph-vascular system and lymph-collecting vessels/lymph nodes of the thigh)
- Central displacement of the protein-rich oedema via the tissue gaps/prelymphatic channels (tissue channels – see ▶Fig. 3): proximally located oedematous areas are incrementally decongested before distally located areas.
- Easing of the secondary tissue changes within the oedematisation
- Individual mobilisation and decongestion of the wound edges, taking account of valid hygiene measures and modern wound management.

The central lymph-vascular system, stimulated by the MLD, functions as the body's own vacuum-assisted wound closure (VAC) system (▶Fig. 3). Successful recycling of the entire protein-rich oedema is the principal prerequisite for preventing the development of a gravitational ulcer and/or forms the main foundation for the healing of existing ulceration. For this reason, the German Federal Committee of Physicians and Health Insurers [*Bundesausschuss Ärzte-Krankenkassen*] incorporated this initial, indispensable decongestive phase of CDT into the valid Federal Joint Committee Remedies Directive (*Heilmittelrichtlinien*), sections LY 1 and LY 2, as early as a decade ago.

As in the decongestive phase (CDT I) of lymphoedema of the extremities, decongestive treatment of the patient in stages II and III a/b of CVI is ineffective without an individual lymphological compression bandage (LCB), which must be changed daily (▶Fig. 4, ▶Fig. 5).

The effect of the LCB in stages II and III a/b (CEAP IV-VI) of CVI:

- The integrated padding layer (e.g. foam bandage) and short-stretch bandages displace the protein-rich tissue fluid, exclusively via tissue channels, into the still functioning lymph-vascular system lying above knee level
- Micromassage (by means of individually shaped foam padding) and breakdown of the fibrosclerotic tissue changes including ulceration
- Maintains the decongested condition achieved with MLD until the next MLD treatment
- Improves tissue care and cleansing within the oedematous region
- Increases the venous flow rate
- Reduces venous pooling.

Individual cushioning within the entire LCB prevents the development of tourniquet effects/lateral grooves. Bandaging techniques without padded underlayers prevent displacement of interstitial fluid within the oedema! (▶Fig. 6, ▶Fig. 7, ▶Fig. 8)

Taking plenty of exercise while wearing the LCB and ensuring skin care to prevent skin dehydration are self-evident prerequisites for the efficacy of the LCB.

Fig. 5 [*Female*] patient after 3 weeks of daily outpatient CDT treatment (Peter Wörmann, Hanau).

Fig. 6 Toe bandage with special foam padding at the forefoot.

Most patients can wear the LCB overnight as a padded short-stretch bandage without any problem (▶Fig. 9). At the latest after getting up, the patient should don at least one class II medical compression stocking immediately after showering, in order to attend the next physiotherapy treatment as soon as possible. During the treatment-free weekends, the LCB can also be left on for two days.

With regard to the joint-stiffening processes typical of the advanced stages of CVI, additional physiotherapy measures, such as manual therapy (ankle joint) and gait training, should also be prescribed.

When starting the decongestive phase, contact should be made with an orthopaedic retail outlet with expertise in venous/lymphatic disease. Ideally, there should be co-operation with the physiotherapy practice, with the experienced therapist involved in determining the type of hosiery. In the rare event of any sudden pronounced reductions in vascular diameter within the oedematisation, at the end of phase I of CDT, provision may be possible with only flat-knit compression hosiery (with permission from the health insurance scheme covering the costs). This should then be available immediately after the de-

Fig. 7 Individual cushioning of the retromalleolar area /lower leg and tibial margin

Fig. 8 Foam bandage for cushioning and to increase the resting pressure.

Fig. 9 Complete lower leg dressing with short-stretch bandages.

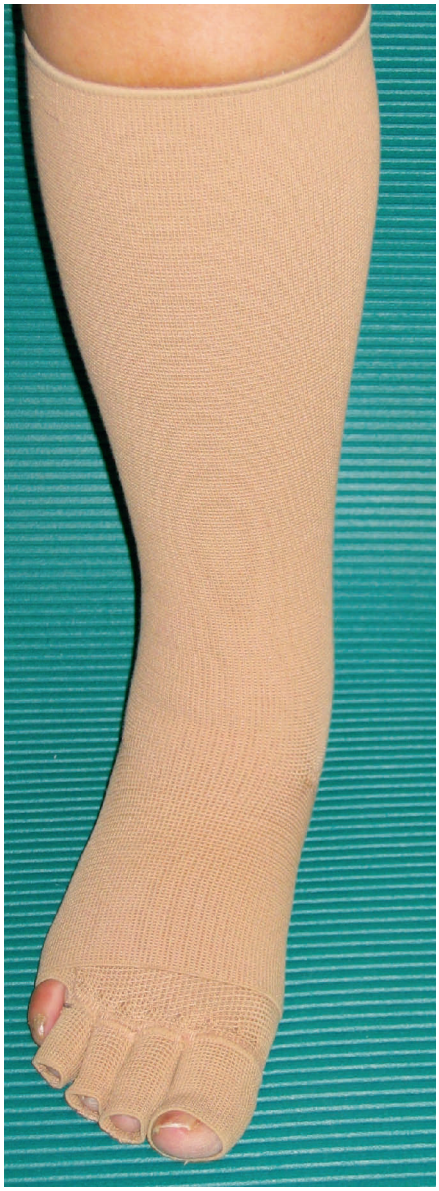

Fig. 10 Flat-knit compression stocking in phlebolymphoedema with toe compression.

congestion, as with the mass-produced round-knit compression stocking (▶Fig. 10).

A suitably qualified wound manager should be included in the treatment of patients with CVI III b (CEAP VI).

During phase I of CDT, patients with additional severe polyneuropathy, congestive heart failure or advanced peripheral occlusive disease should only be treated in medical clinics specialising in venous-lymphological treatment.

CDT measures (MLD, LCB and decongestive exercise treatment) can be prescribed by self-employed doctors using the two valid ICD codes (R 60.9 and I 89.0 with elephantiasis) as long-term approval without risk of recourse. Prescribing a medical compression stocking without a prior decongestive phase (CDT I) as initial treatment of phlebolymphoedema (CVI II and CVI III a/b/CEAP IV-VI) constitutes a medical error.

Statistics from specialist medical and physiotherapy practices (e.g. J. Berger, Netzwerk Augsburg; H. Pritschow specialist lymphology practice, Waldkirch) show that scarcely more than 10 CDT treatments, up to a maximum of 15, are necessary (2–3 weeks of daily treatment) for a decongestive phase. In the event of existing ulceration, it is sometimes necessary to continue phase I CDT until the ulceration has healed.

Continuous long-term treatment, as in lymphoedema, is only rarely necessary. The prerequisite for this is that the medical compression stocking is worn on a daily basis.

Repeat prescription of phase I CDT is only necessary in the event of re-oedematisation or recurrence of a gravitational ulcer.

Intermittent pneumonic compression (IPC) with costly multi-chamber equipment is only advisable as a supportive measure, at best during the maintenance phase (CDT II).

Moreover, in wound care in plastic surgery, oedema treatment plays a major role even prior to the procedure (split-skin graft, flap graft), as CDT provides the best preconditions for uncomplicated wound healing.

Nowadays, teamwork among the groups of medical professionals involved can be organised successfully without any problems, including on an outpatient basis. This is shown by the results achieved by well over 500 physicians with further training in lymphology, who co-operate closely with the other medical professions in over 70 lymph networks.

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