

# Manual lymph drainage without compression therapy can reduce chronic oedema: a case study

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## Key words

Compression stockings, fibrosis, lower extremity, manual lymph drainage, oedema

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*Declaration of interest: None.*

**T**reatment for lymphedema using combined decongestive therapy (CDT) has proven effective in reduction of chronic oedema (International Society of Lymphology [ISL], 2016). Optimal volume reduction is attained using the core components of manual lymph drainage (MLD), compression bandaging and/or compression garments, exercise and skin care. Recently, questions have arisen as to whether MLD without compression therapy is effective in reducing volume in lymphoedema, or if MLD is even necessary.

In this case, the patient was a 68-year-old Caucasian male who had suffered damage to the lumbar nerve root plexus resulting in partial paraplegia of both legs after spinal surgery when he was 48. Although he was able to use crutches, he more frequently used a wheelchair. He had been referred by a registered massage therapist (RMT) due to concerns about the volume of fluid accumulating in the distal lower extremities. The RMT was addressing muscular hypertonicity in the back, shoulders and arms from extended crutches and wheelchair use.

## Abstract

Best practice in the management of lymphoedema involves manual lymph drainage (MLD), skin care, exercise and compression therapy. Omission of any component, especially compression therapy, is not expected to achieve sustainable reduction in oedema volume. Evidence for the necessity to include MLD is inconsistent, however. This case study on leg lymphedema secondary to orthostasis shows an unexpected and sustained volume reduction using MLD in a patient who could not use compression therapy.

## Methods

### Initial assessment

Visual examination of the skin and palpation of the tissues was used to determine the stage and state of lymphoedema present. Height and weight and subjective reported symptoms were elicited through questioning.

### Volumetry

Circumference measures were recorded using a tape measure with the patient supine, the leg extended on a measuring board and the foot dorsiflexed to 90°. A zero point for each leg was determined by the length from the plantar surface of the heel to the lateral malleolus, and this point was used as the starting point for all measures. The circumference of the limb was recorded at 4 cm intervals from the zero point to the inferior patella and used to calculate the volume of this portion of the limb, according to Kuhnke (1978). Circumference measures were also taken below the zero mark over the dorsum of the foot at 4 cm intervals and these measures were used as raw circumference values. All measures were

taken between January 2015 and October 2016 immediately prior to any treatment. Follow-up measures were recorded at 14 and 34 weeks, and 21 months.

### Treatment protocol

Treatment as per the Dr Vodder protocol (Wittlinger, 2011) was applied once per week and each session lasted 75 minutes. With the patient lying supine, cylindrical pit packs (JOBST® JoViPads (pitpak), BSN Medical) were applied from the base of the toes, over the ankles to the mid-shin and temporarily (10–15 minutes) held in place with long-stretch bandages. One of two therapists trained in the original Dr Vodder method of MLD applied a standard routine of clearance to the neck and deep abdominal lymphatics (10 minutes) and the anterior thighs and legs (20 minutes per leg, including removal of the pit packs). The patient then turned to the prone position for treatment of both posterior thighs and legs (15 minutes per leg).

### Home care

The patient was advised to perform Tai

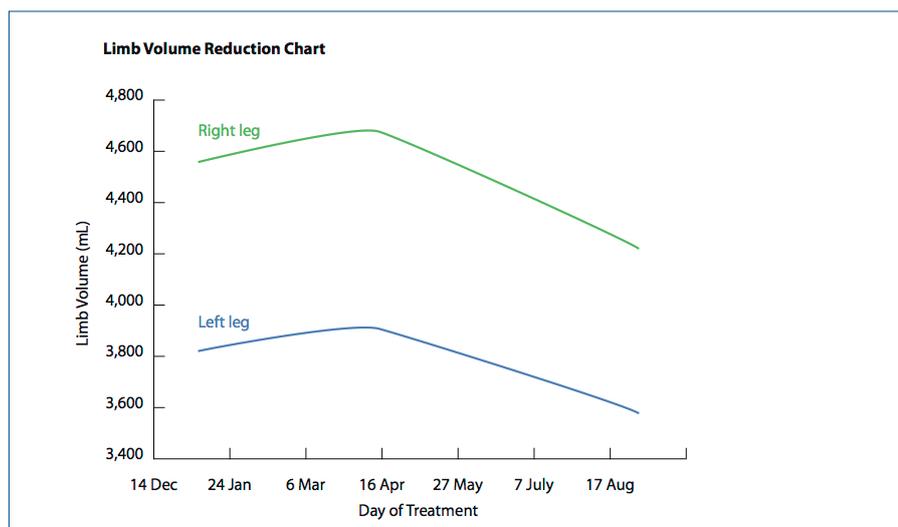


Figure 1. Volume (mL) of each leg during 9 months of weekly manual lymph drainage.

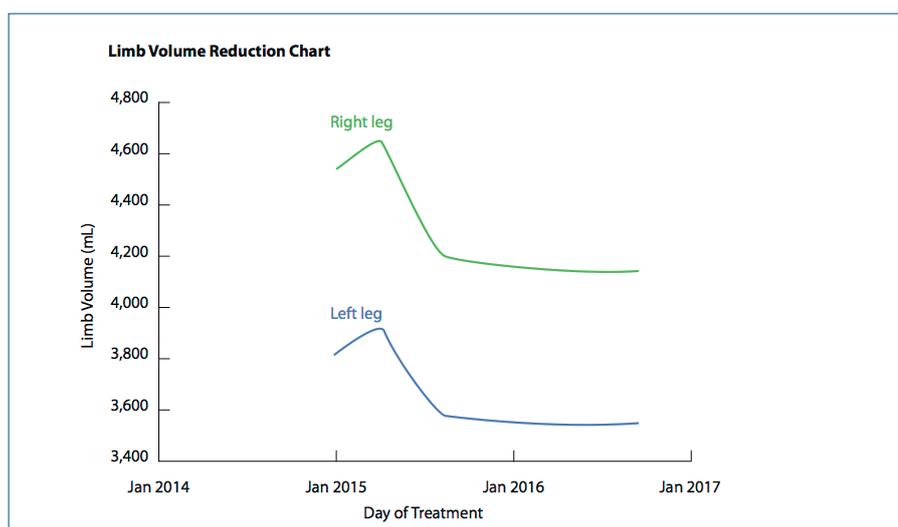


Figure 2. Volume (mL) of each leg during 21 months of weekly manual lymph drainage.

chi style breathing exercises (Moseley et al, 2005) and apply moisturising cream to the legs daily. He was visited by a foot care nurse every 4 weeks and referred to a vascular specialist for ankle brachial pressure index (ABPI).

## Results

### Patient history and presentation

The patient self-reported his height as 5 feet 10 inches and weight as 215 pounds. He had been treated surgically for encapsulated malignant tumor on the spine in 1974 and further interventions included: spinal surgery to relieve urinary incontinence (1984), spinal irradiation for suspected malignancy (1985) and total arthroplasty of the right knee (1999). An ingrown toenail had been reduced surgically in 2011. He was prescribed ongoing oral medication

for neuropathic pain (acetaminophen and codeine/opioid analgesic), cholesterol (statin), hypertension (Trandolapril) and low-dose antibiotics for protracted urinary tract infection (Nitrofurantoin). Type II diabetes was managed both orally (Metformin) and sub-dermally (Humulin), and ibuprofen and anti-diarrheal (Loperamide) taken as needed. There was no change to any medication throughout the course of treatments.

On presentation, the patient was slightly overweight with a body mass index of approximately 30.5 (kg/m<sup>2</sup>) and a moderately distended abdomen, but no pannus. The distention was apparent whether the patient was upright on crutches or supine on the table. Surgical scars were visible on the lumbar spine and right knee, all thigh muscles were flaccid and the skin

of the lower legs was dry. There was an old wound visible on the lower right leg where the skin was discoloured and flaking. The first toenail on the left foot was deformed from the 2011 surgery and there was a very mild fungal infection under the first toenail on the right foot. Skin over the plantar surface of both feet was soft and intact.

There was a moderate, stage II lymphoedema below the knee on both legs extending from the inferior patella over both malleoli and a positive Stemmer's sign (ISL, 2016) at the base of the toes on both feet. The oedema on the lower legs and feet was soft and pitting, and there was moderate fibrotic induration above, behind and below each malleolus. The skin of both lower legs was fragile, shiny, felt cool to the touch and the patient reported that minor injury to his legs resulted in bruises that resolved slowly, frequently lasting for several weeks. Although the ABPI results had indicated that class two (20–30 mmHg) compression would be safe and custom compression garments were supplied, the patient did not use them.

The patient reported a tingling sensation in the legs during MLD and after the first treatment oedema was slightly softened and the malleoli more distinct. At 14 weeks, there was a slight increase in limb volume of 111 mL in the right leg and 86 mL in the left leg and fibrosis around the malleoli had softened. At 34 weeks, there was a reduction from baseline of 336 mL in the right leg and 424 mL in the left leg. Leg volume continued to reduce and at 21 months, reduction from baseline was 401 mL and 268 mL in the right and left legs respectively. Small changes in foot circumference ranging between 0.5cm–1.5cm at the 8cm and 4cm mark, respectively, were recorded on the right foot and there were no increases in circumference at any point on either foot. The patient reported that bruising had disappeared more quickly than previously and the therapists noted increased warmth of the skin on the lower legs without hyperemia. *Figures 1&2* show the volume measurements of the legs from baseline to 34 weeks and 21 months, respectively.

## Discussion

When performed by a trained therapist, the Dr Vodder MLD can stimulate the lymphatic system, soften fibrosis and reduce oedema volume. Compression therapy using bandages or garments

## Case report

are usually required to prevent refill between treatments. In this case, despite trying several donning and doffing aides, compression garments could not be managed independently and were not be used. Nevertheless, a significant reduction in total leg volume below the knee of 9% on the right and 7% on the left was achieved, and wound healing was improved.

In addition to mobilising trapped fluid in the distal tissues, attention to clearing the proximal lymphatic pathways reinforced by the daily home practice of deep breathing exercises, ensured that mobilised fluid was returned fully to the venous system and not permitted to reflux back into the legs. The brief use of pit packs

to soften the fibrotic induration around the ankles allowed greater movement of the skin over the affected area during MLD and increased the effectiveness of the treatment in these areas.

### Conclusion

This case study has shown that where compression therapy is not possible, MLD, skin care and exercise should still be considered. In the presence of an intact, albeit not fully functioning lymphatic system, it is possible that the application of MLD, which is known to stimulate lymphmotoricity of the collector vessels, led to some recovery of function in these vessels.

### Acknowledgements

*Lene Tonnisen, BA (Hons) PE, certified Vodder CDT therapist, performed approximately one third of the treatments and collated the data. Jan Douglass BHSc (Hons) provided editorial advice.*

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