LIPOSUCTION IN LYMPHEDEMA PATIENTS – A 25 YEARS’ PROSPECTIVE STUDY WITHOUT RECURRENCE

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Lymphedema leads already within the first year – to deposition of subcutaneous adipose tissue. Lipo­succion for non-pitting chronic large lymphedemas is useful when patients have been optimally managed with conservative treatment in order to transform a pitting edema to a non-pitting edema. If the excess volume – now comprising of excess adipose tissue – is still bothering, liposuction is an excellent option leading to complete reduction. Just as after conservative treatment compression garments are needed postoperatively. Microsurgical reconstructions, although attractive as a physiological concept, cannot provide complete reduction in chronic large non-pitting lymphedemas because they do not eliminate the newly formed subcutaneous adipose tissue collections.

Introduction
Patients with chronic non-pitting lymphedema do not respond to conservative treatment or microsurgical procedures because the diminished lymph flow and inflammation result in the formation of excess subcutaneous adipose tissue, which cannot be removed by these methods. All patients had received conservative treatment before surgery without further reduction. All were wearing compression garments before surgery. Aspirate and leg volumes were recorded.

Materials and Methods
Arms: 158 women with non-pitting edema, a mean age of 64 (range, 39-89) years and a mean duration of arm swelling of 9 (range, 1-38) years underwent liposuction. Mean age at breast cancer operation, mean interval between breast cancer operation and lymphedema start, and duration of lymphedema were 52 years (range, 33-86), 3 years (range, 0-32), and 9 years (range, 1-38) respectively. Aspirate and arm volumes were recorded.

Legs: 96 patients with an age of 52 years (range, 17-76) and a duration of leg swelling of 14 years (range, 2-50) underwent liposuction due to non-pitting, chronic lymphedema. There were 29 primary (PL), and 27 secondary lymphedemas (SL) following cancer therapy. Age at cancer treatment and interval between cancer treatment and lymphedema start were 43 years (range, 20-65), and 3 years (range, 0-26) respectively. Age at onset of PL was 32 years (range, 4-63).

Results
Arms: Aspirate mean volume was 1768 ml (SD 634) with an adipose tissue concentration of 95% (SD 10) in the tourniquet fraction. Preoperative mean excess volume was 1528 ml (SD 734). Postoperative mean reduction was 103% (SD 27) at 3 months and 115% (SD 28) at 1 year, and more than 100% during 23 years’ follow-up, i.e. the lymphedematous arm was somewhat smaller than the healthy arm. The preoperative mean ratio between the volumes of the edematous and healthy arms was 1.5 (SD 0.2), rapidly declining to 1.0 (SD 0.1) at 3 months, and less than 1 after 6 months (Figure 1)

Legs: Aspirate volume was 3672 ml (SD 1675) with an adipose tissue concentration of 93% (SD 10) in the tourniquet fraction. Preoperative excess volume was 3775 ml (SD 1892). Postoperative mean reduction was 80% (SD 24) at 3 months and 101% (SD 22) at 1 year, and more than 100% during 13 years’ follow-up, i.e. the lymphedematous leg was somewhat smaller than the healthy one. The preoperative mean ratio between the volumes of the edematous and healthy legs was 1.4 (SD 0.2), rapidly declining to 1.0 (SD 0.1) at 1 year and less than 1 after one year (Figure 2)

Conclusion
These long-term results demonstrate that liposuction is an effective method for treatment of chronic, non-pitting lymphedemas in patients who have failed conservative treatment. Because of adipose tissue hypertrophy, it is the only known method that completely reduces excess volume at all stages of arm lymphedema. The removal of hypertrophied adipose tissue, induced by inflammation and slow or absent lymph flow is a prerequisite to complete reduction. The newly reduced volume is maintained through constant (24-hour) use of compression garments postoperatively
Fig. 1. A 57-years-old woman with a non-pitting secondary leg lymphedema of 4235 ml since 5 years following breast cancer treatment. Complete reduction 6 months after liposuction (below).

Fig. 2. Mean pre- and postoperative excess volume reduction following liposuction of arm lymphedema.
Fig. 1. A 32-years-old woman with a non-pitting secondary leg lymphedema of 7070 ml since 12 years following treatment of a synovial sarcoma in the right groin (left). Postoperative result 6 months after liposuction (right).

Fig. 4. Mean pre- and postoperative excess volume reduction following liposuction of leg lymphedema.