

## CORRESPONDENCE



## Liposuction for Swelling in Patients with Lymphedema

**TO THE EDITOR:** Lymphedema is a progressive, noncurable condition that is caused by anomalous development of the lymphatic system or trauma to lymphatic vasculature. The disease most commonly affects the limbs because of injury to or removal of lymph nodes. Fluid accumulates in the interstitial space, which causes inflammation and subcutaneous deposition of adipose tissue; the limb then enlarges. Approximately 200 million people are affected by lymphedema worldwide.<sup>1</sup> Complications include functional disability, lowered self-esteem, infection, skin changes, and, rarely, malignant transformation. Operative intervention in patients with lymphedema is classified into two categories: physiological procedures that attempt to improve lymphatic drainage (e.g., vascularized lymph-node transfer and anastomosis of lymphatic vessels to veins) and excisional operations that remove overgrown subcutaneous fibroadipose tissue (e.g., suction-assisted lipectomy [also known as

liposuction] and staged excision of skin and subcutaneous tissue).

We describe three patients who underwent liposuction to reduce the size of their limb affected by lymphedema. The diagnosis of lymphedema was confirmed in the patients with the use of preoperative lymphoscintigraphy; the findings included delayed transit of radiolabeled tracer to the axillary or inguinal nodes, dermal backflow (tracer accumulation in the dermal lymphatics), or both.<sup>2</sup> Results from preoperative physical examination showed that the patients had a positive Stemmer's sign (i.e., inability to pinch the dorsal skin of the distal limb).<sup>3</sup> One patient had primary lymphedema affecting the leg, and two patients had secondary lymphedema affecting the arm after treatment of breast cancer. Liposuction was performed to remove subcutaneous adipose tissue circumferentially from the limb, excluding the hand or foot (2800 ml were removed from the leg in the patient with primary lymphedema and 1200 ml and 1900 ml were removed from the arm in the patients with secondary lymphedema). The mean duration of follow-up after liposuction was 39 months (range, 16 to 65). The patients reported that the swelling of their hand or foot decreased considerably after liposuction, even though their distal limb had not been treated surgically. The results from postoperative physical examination showed that the positive preoperative Stemmer's sign had changed to a negative finding (i.e., the dorsal skin of the distal limb was able to be pinched). Postoperative lymphoscintigraphy revealed that two of the patients had reduced dermal backflow and one had new transit and uptake of tracer to epitrochlear nodes (Fig. 1, and Fig. S1 in the Supplementary Appendix, available with the full text of this letter at

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**Figure 1. Lymphedema in the Left Leg before and after Liposuction.**

Panel A shows a 51-year-old woman with primary lymphedema in the left leg. A lymphoscintigram (2 hours after injection of tracer) shows reduced uptake of tracer to inguinal nodes and diffuse dermal backflow (tracer accumulation in the dermal lymphatics) involving the entire leg (arrows). Panel B shows the patient at 15 months after liposuction of the leg between the ankle and thigh (the foot was not operated on); limb volume was reduced and edema in the foot had resolved (note the visible subcutaneous vein). A lymphoscintigram (2 hours after injection of tracer) that was obtained 4 years after liposuction shows considerably reduced dermal backflow.

NEJM.org). The patients continued their postoperative compression regimens because although the findings from their imaging studies showed improvement, they remained abnormal.

Our results show that liposuction, which reduces the size of a lymphedematous limb through removal of subcutaneous adipose tissue, may have a physiological benefit. Liposuction reduced swelling in the distal limb and changed the transit of radiolabeled sulfur colloid through lymphatic vasculature. This effect might explain the favorable long-term outcomes of liposuction that have been observed, including minimal recurrence of subcutaneous deposition of adipose tissue and reduced risk of infection.<sup>4</sup> Possible explanations for reduced edema and improved imaging findings after liposuction include increased blood flow to the limb,<sup>5</sup> reduced lymph production because of less subcutaneous adipose tissue, connections between lymphatic vessels and veins, and openings in the muscle fascia that allow drainage of lymph from the superficial to the deep lymphatic system.

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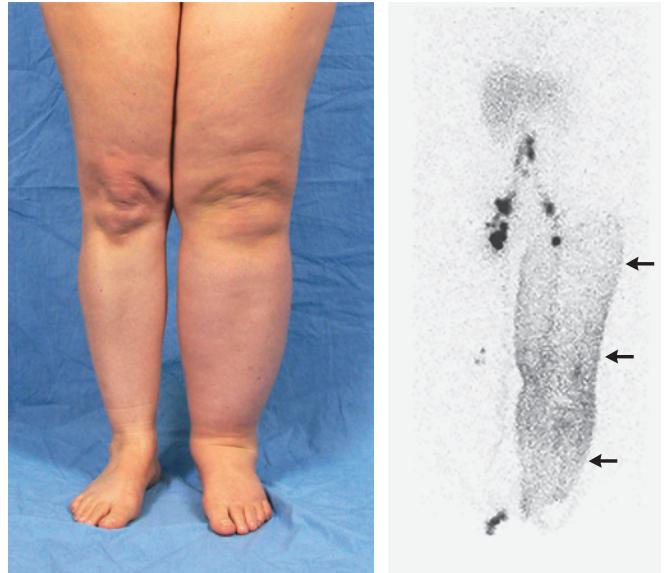
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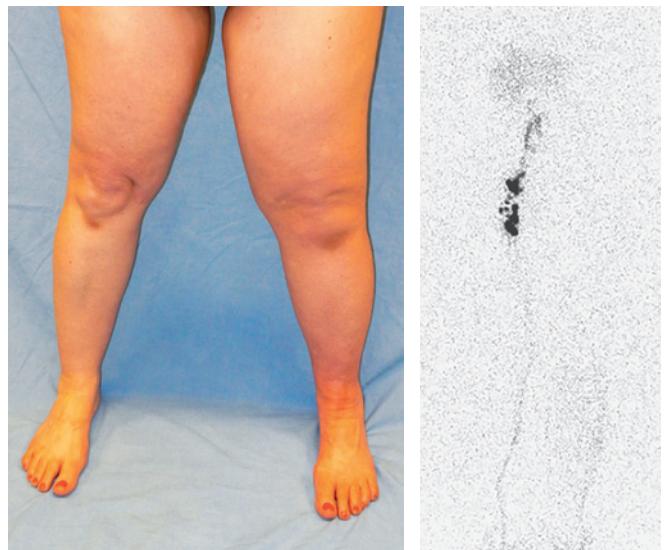
Disclosure forms provided by the authors are available with the full text of this letter at NEJM.org.

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**A Before Liposuction**



**B After Liposuction**



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4. Brorson H, Svensson H. Liposuction combined with controlled compression therapy reduces arm lymphedema more effectively than controlled compression therapy alone. *Plast Reconstr Surg* 1998;102:1058-67.

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DOI: 10.1056/NEJMc1709275