

Free Transverse Rectus Abdominis Musculocutaneous Flap Breast Reconstruction in Patients with Prior Abdominal Suction-Assisted Lipectomy

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Liposuction, including suction-assisted lipectomy of the abdomen, is becoming increasingly popular. The American Society of Plastic Surgeons reports that 282,876 patients had liposuction in 2002 alone.¹ This trend toward abdominal contouring surgery poses a reconstructive dilemma in patients who subsequently desire breast reconstruction with a transverse rectus abdominis musculocutaneous (TRAM) flap: can a TRAM flap be reliably used after abdominal liposuction? The obvious concern is that the perforating vessels to the flap may have been significantly damaged by the prior suction-assisted lipectomy procedure and that subsequent transfer will lead to varying degrees of flap compromise. Moreover, the attendant undermining of previously suctioned abdominal tissue may predispose the patient to a higher risk of donor-site morbidity as a secure closure is attempted after flap harvest.

In women who have undergone abdominoplasty, a prospective study of Doppler ultrasound analysis of the perforators has demonstrated that the vessels gradually increase in patency and dimension, to a maximum of 40 percent of preoperative size 6 months after the procedure.² The experimental and clinical data on perforators in women who have undergone suction-assisted lipectomy, however, are sparse; theoretically, suction-assisted lipectomy may cause injury to the perforating vessels, albeit to a lesser degree than the frank transec-

tion that occurs during the elevation of abdominoplasty flaps. Anecdotal reports suggest that a notable percentage of patients who have TRAM flap breast reconstruction after suction-assisted lipectomy sustain flap compromise.³

The potential advantage of a microvascular TRAM flap breast reconstruction rather than a pedicled TRAM flap reconstruction is that the former has more robust vascularity. Thus, a free TRAM flap is less likely to have clinical manifestations of ischemia-induced fat necrosis.⁴⁻⁶

We report two cases of microvascular TRAM flap breast reconstruction in patients who had undergone suction-assisted lipectomy of the abdomen. To our knowledge, our small case series is the first to demonstrate the feasibility of performing microvascular TRAM flap breast reconstruction after suction-assisted lipectomy of the abdomen. We highlight preoperative considerations and key intraoperative technical details that will be valuable to surgeons embarking on free TRAM flap breast reconstructions in this setting.

CASE REPORTS

Case 1

A 54-year-old woman had a history of T1 N0 M0 infiltrating ductal carcinoma of the left breast. She initially underwent conservative breast surgery with segmental mastectomy and sentinel lymph node biopsy. Pathologic analysis of the mastectomy specimen revealed multifocal ductal carcinoma in

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situ with a second primary lesion, and the patient opted for a completion mastectomy. The patient wore a size 34B brassiere, and the anticipated skin defect encompassed the nipple-areola complex and a 7-cm superior-pole segmental mastectomy scar (Fig. 1).

The patient had undergone suction-assisted lipectomy of the abdomen 6 years earlier and two cesarean deliveries through a Pfannenstiel incision 19 and 21 years earlier. After discussion of her reconstructive options, the patient declared a preference for autogenous tissue breast reconstruction. She did not want any gluteal or back scars and preferred an abdominal donor-site scar with concomitant removal of abdominal tissue.

Preoperative assessment included a color Doppler ultrasound study to assess the presence and size of perforators from the deep inferior epigastric arteries. Several large perforators (>1 mm) penetrating the rectus fascia were seen (Fig. 2).

Accordingly, the patient underwent completion mastectomy with immediate free TRAM flap breast reconstruction. During flap harvest, both the lateral and the medial rows of perforators were visualized, and there was no gross evidence of vessel abnormality. The deep inferior epigastric vessels were similarly in good condition, and the TRAM flap was harvested with fascial preservation and dissection around the more robust perforators. Anastomoses were performed to the recipient thoracodorsal artery and vein. The TRAM flap was inset. Closure of the abdomen was performed without undue undermining of the abdominoplasty flaps—a particular concern in light of the potentially compromised tissue. Postoperative follow-up at 1 year showed no evidence of fat necrosis or skin loss of the reconstructed breast, and there were no donor-site complications (Fig. 3).

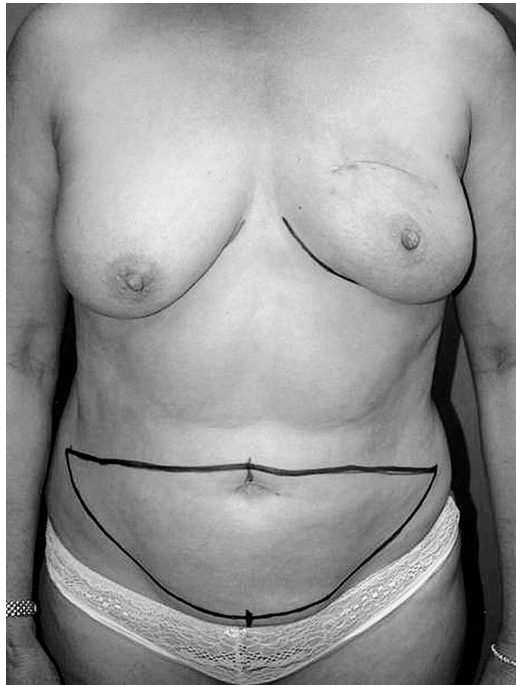


FIG. 1. Preoperative view of a patient with a left segmental mastectomy scar. Also marked is the proposed area of the free TRAM flap.

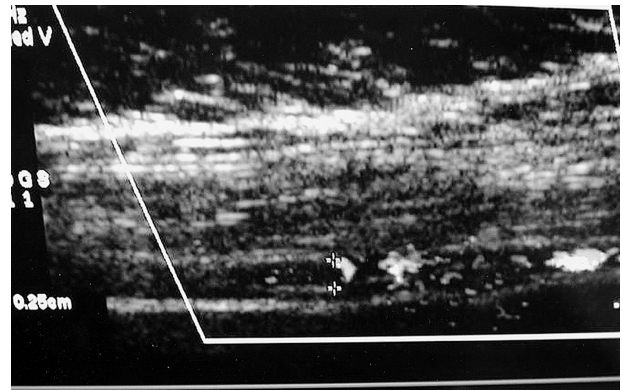


FIG. 2. Doppler study demonstrating 1.2-mm perforating vessels in the lower abdominal wall.

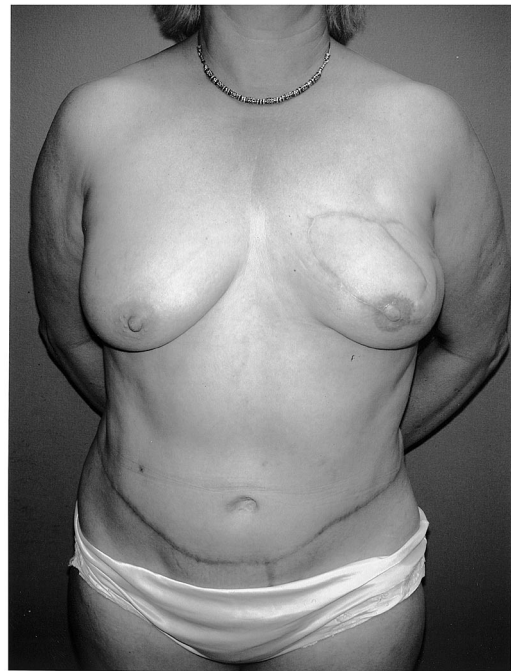


FIG. 3. Postoperative view at 1 year after free TRAM flap breast reconstruction.

Case 2

A 60-year-old woman had a history of a T3 N0 M0 invasive lobular cancer of the left breast. She had been treated with four cycles of preoperative chemotherapy and had undergone a modified radical mastectomy followed by postoperative radiation therapy. She presented with a desire for a prophylactic simple mastectomy of the right breast and bilateral breast reconstruction (Fig. 4). Ten years previously, she had undergone suction-assisted lipectomy of the abdomen. The patient wished for her reconstructed breasts to be large, and she did not wish to have scarring on her back. She expressed a preference for TRAM flap breast reconstruction. Given the patient's desire for large breasts but her history of irradiation of the left side of chest wall, the option chosen was to reconstruct her left breast with a microvascular TRAM flap and to use an expander implant to reconstruct her right breast.

A preoperative Doppler ultrasound study showed patent

abdominal perforating vessels. The patient underwent a free TRAM flap reconstruction of the left breast with preservation of the medial and lateral rows of perforators. The abdominal donor site was closed without difficulty. The right breast was reconstructed with an expander, which was later exchanged with a silicone gel breast implant. Postoperative follow-up at 7 months showed no evidence of fat necrosis or skin loss of the reconstructed left breast, and there were no donor-site complications (Fig. 5).

DISCUSSION

These two cases illustrate the successful use of microvascular TRAM flap transfer for breast reconstruction after suction-assisted lipectomy of the abdomen. As aesthetic surgery becomes more popular, increasing numbers of patients who present for autogenous tissue breast reconstruction will have had prior abdominal surgery in the form of abdominoplasty or suction-assisted lipectomy. The theoretical concern over the viability of TRAM flaps after such surgery is predicated on the uncertain status of the perforating vessels. Experimental studies have shown limited regrowth of moderate-sized perforators after abdominoplasty; however, the ultimate size and quantity of these vessels may or may not be sufficient to hazard an entire flap transfer.³ We may assume that the magnitude of injury may be less after suction-assisted lipectomy because the frank transection of the perforators typical of abdominoplasties does not occur in suction-assisted lipectomy. The same may be said of miniabdomi-

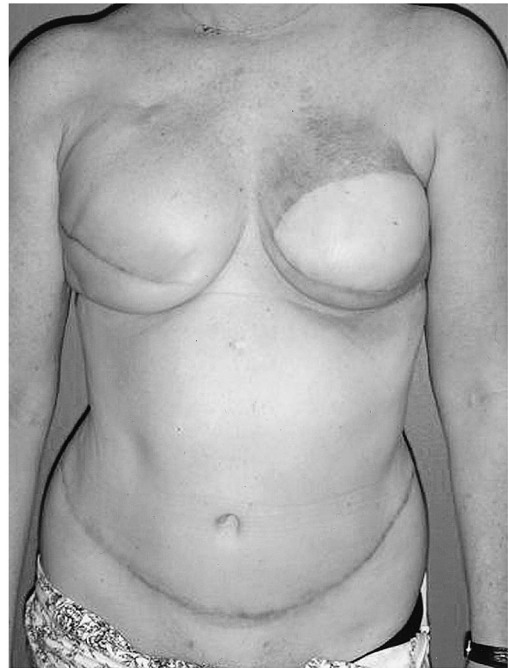


FIG. 5. Postoperative view at 7 months after left free TRAM flap breast reconstruction and right expander implant breast reconstruction.

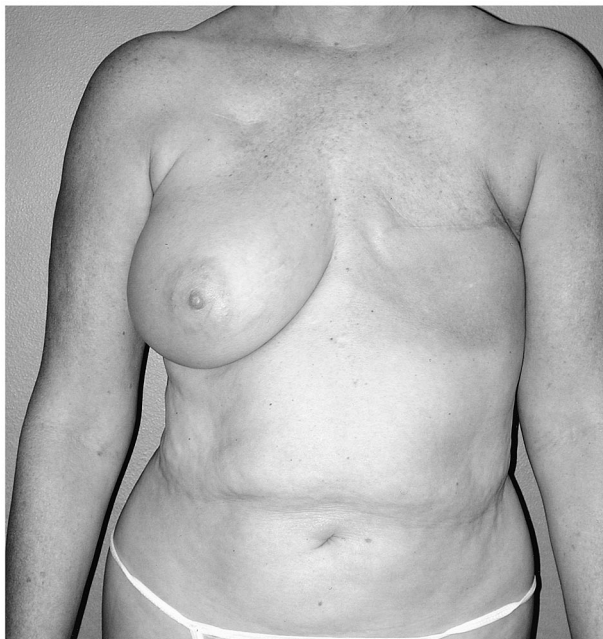


FIG. 4. Preoperative view of patient presenting for delayed left breast reconstruction and immediate breast reconstruction after prophylactic right mastectomy.

noplasties, in which limited undermining is performed and the umbilicus is not transposed. Certainly, the degree of perforator damage done during the suction-assisted lipectomy procedure may depend on various factors, including the technique, the size of the cannula, the amount of the fat removed, and the use of the tumescent solution. It is uncertain whether ultrasonically assisted lipoplasty causes less or more damage to the perforators.

Therefore, a judicious approach to TRAM flap breast reconstruction after suction-assisted lipectomy, including the use of a preoperative Doppler ultrasound study, is advised to determine the existence and quality of perforating vessels. Alternatively, May et al.³ have advocated perfusion mapping of the perforators to accurately assess flap vascularity. Even when a preoperative Doppler study shows good perforators, in patients with prior suction-assisted lipectomy of the abdomen, one can be never certain that a TRAM flap will have adequate perfusion once it is raised. Therefore, it would be prudent to make sure that each patient is fully aware of this risk and to have an alternative plan that has been discussed with the patient preoperatively.

Intraoperatively, the surgical technique should focus on maximizing perfusion to the

TRAM flap. This approach includes the inclusion of both medial and lateral rows of perforators, and also avoiding aggressive undermining of the TRAM flap from the fascia. An attempt should be made to include even the smallest perforators so that the TRAM flap is not dependent on the major perforators only. Although Ribuffo et al.² contend that the vertical rectus abdominis myocutaneous flap pattern is preferable to the traditional TRAM flap in the setting of prior abdominoplasty, the empiric underpinnings of choosing one pattern over the other are still unclear.

In patients with prior suction-assisted lipectomy of the abdomen, microvascular TRAM flap breast reconstruction may be reasonably considered an alternative to a pedicled TRAM flap reconstruction by virtue of the potential augmentation of vascularity. Indeed, May et al.³ quote Hartrampf as communicating a nearly 50 percent incidence of flap compromise when pedicled TRAM flap reconstructions are preceded by abdominal liposuction.

There is a paucity of experimental data regarding abdominal perforator compromise—and regrowth—after suction-assisted lipectomy. Thus, important issues such as the safe waiting period between suction-assisted lipectomy and TRAM flap reconstruction, the relationship between the extent of suction-assisted lipectomy and flap compromise, the optimal flap pattern to use, and the need to perform vascular imaging require additional study, in experimental models and in clinical trials.

To our knowledge, our small case series is the first to demonstrate the feasibility of performing microvascular TRAM flap breast reconstruction after suction-assisted lipectomy of the abdomen. Doppler ultrasound was used to confirm the patency of the perforating vessels of the abdominal wall. In addition, both the medial and lateral rows of perforators were incorporated into the

flap to render it more robust for transfer. Our patients did not have any complications related to the reconstruction.

SUMMARY

The safety of TRAM flap breast reconstruction in patients who have undergone prior aesthetic surgery of the abdominal wall has been an ongoing concern. Our small case series demonstrates the successful use of previously suctioned abdominal tissue for breast reconstructions. Careful preoperative evaluation and refinements in harvesting technique are paramount to promoting a successful outcome.

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