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Extended Fasciocutaneous Flaps for Autologous Augmentation Mastopexy With Upper Body Lift After Massive Weight Loss

An Early Experience

Nirav B. Patel, MD, MS, JD, and Michael S. Wong, MD

Introduction: Common upper body findings after massive weight loss (MWL) include breast ptosis, projection loss, flattening, inframammary fold descent, and back rolls. Although implants address volume loss, manifestations of circumferential excess (ie, back rolls) are ignored. We review our experience with extended lateral fasciocutaneous flaps incorporating circumferential excess tissue; typically removed in upper body lifts (UBLs), for autologous augmentation mastopexy.

Methods: We reviewed all cases of simultaneous autogaugmentation mastopexy and UBL, using extended lateral chest wall fasciocutaneous flaps, performed after MWL. Donor sites were designed with scars residing within the bra line (UBL) or midaxillary line [modified UBL (mUBL)]. We analyzed demographic, clinical indications, and complications.

Results: Between 2007 and 2013, 7 patients underwent 13 extended fasciocutaneous flap reconstructions for autogaugmentation mastopexy, combined with UBL or mUBL. All patients underwent procedures with flaps taken from the back or from the midaxillary line. Mean initial body mass index (BMI) was 30.1 kg/m² with a preoperative, post-MWL BMI of 28.5 kg/m², weight loss of 58 kg, and BMI decrease of 21.6 kg/m². Among 6 patients who underwent bariatric surgery, the average interval between gastric bypass and augmentation mastopexy was 41 months. Five patients underwent these procedures for aesthetic reasons, whereas 2 patients underwent breast reconstruction. Follow-up averaged 18 months. Complications occurred in 3 patients, with only 1 requiring reoperation.

Conclusions: Massive weight loss patients frequently present with breast volume loss and ptotic upper body soft tissue excess. Simultaneous mastopexy augmentation can be safely and reliably performed using extended fasciocutaneous flaps to autologously may be placed in aesthetically acceptable locations. Patients undergoing mUBLs with midaxillary line donor scars may conceal them with arms at their sides. Patients choosing back donor scars may conceal them within the bra line while having greater volumes available for augmentation. As is true with all flaps, one should assess distal tip perfusion before final inset, especially when using a flap extending to the midline back.

Key Words: breast reconstruction, fasciocutaneous flap, autologous, mastopexy, massive weight loss, upper body lift

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Received July 7, 2014, and accepted for publication, after revision, October 31, 2014. From the Division of Plastic Surgery, University of California, Davis, Sacramento, CA. Conflicts of interest and sources of funding: none declared. Reprints: Michael S. Wong, MD, University of California Davis Medical Center, 2221 Stockton Blvd, Room 2123, Sacramento, CA 95817. E-mail: michael.wong@ucdmc.ucdavis.edu. Presented at the 64th Annual Meeting of the California Society of Plastic Surgeons, May 25, 2014, Newport Beach, CA. Copyright © 2015 Wolters Kluwer Health, Inc. All rights reserved. ISSN: 0148-7043/15/7401–S041 DOI: 10.1097/SAP.0000000000000413

PATIENTS AND METHODS

A retrospective review was performed of 7 patients who underwent simultaneous mastopexy autogaugmentation and UBL, using an extended lateral chest wall fasciocutaneous flap, performed at UC Davis Medical Center after MWL.

Planning the Extended Fasciocutaneous Flap

UBL Donor Site

An UBL places the donor scar in the bra line. Preoperatively, standard Wise pattern mastopexy marks are made. Attention is turned to the back where the patient is placed in her bra to mark its borders in the standing position. This allows for accurate placement of the back scar within the confines of the bra line. Skin pinch around the anchor line from the back to the midaxillary line bilaterally allows for accurate estimation of what would normally be discarded in a standard completion UBL, or in this case, what becomes the extended fasciocutaneous flap. The patient is then turned laterally and the midaxillary excision is then blended anteriorly with the standard Wise pattern, completing the preoperative marks (Fig. 1).
mUBL Donor Site

With a mUBL, donor sites are designed such that the scar resides within the midaxillary line, resulting in smaller flaps and hence smaller volume enhancements. A Wise pattern mastopexy is modified laterally to create fasciocutaneous flaps extending laterally and superiorly into the axillary vault. The standard Wise pattern mastopexy marks are made first and then blended with a planned midaxillary line excision to end in the axillary vault. The extended flap is designed so the planned line of closure will lie within the midaxillary line. Anterior redundancy is pulled posteriorly to the midaxillary line and marked. Posterior redundancy is pulled anteriorly to the midaxillary line and similarly marked (Fig. 2).

Surgical Procedure

Positioned prone for the UBL, all marks are confirmed with towel clamps to ensure the wound can be closed. The fasciocutaneous flaps are then elevated from medial to lateral. The donor site is closed, completing the UBL (Fig. 3A). The flaps are temporarily stapled closed, wrapped in lap pads, and covered with OpSite dressings. The patient is then positioned supine and re-prepared for de-epithelialization of the medial and lateral flaps. The mastopexy skin flaps are elevated and the flap elevation is continued until the lateral intercostal artery perforators are seen. The flap is inset by rotating the flap superiorly and medially over the breast, adding superior pole fullness (Fig. 3B). This superior medial transposition of the flap also improves the lateral...
underwent mastopexy autoaugmentation and mUBL had brachioplasty, whereas the other had reconstruction of her lumpectomy defect with transverse rectus abdominis myocutaneous flap breast reconstruction, breast cancer reconstruction. One had a unilateral mastopexy autoaugmentation with extended fasciocutaneous flap for aesthetic reasons, 2 patients underwent procedures for midaxillary line (2 patients, 4 flaps). Although 5 patients had these cutaneous flaps taken from the back (5 patients, 9 flaps) or from the abdomen. Only the hematoma constituted a major complication requiring additional surgical intervention. The remaining complications were minor and resolved with expectant, nonoperative management. 

RESULTS

Between June 2007 and August 2013, 7 patients averaging 54.9 years (range, 29–64 years) underwent 13 extended fasciocutaneous flap reconstructions for simultaneous mastopexy autoaugmentation, combined with UBL (9) or mUBL (4). All patients (1 unilateral and 6 bilateral) underwent mastopexy autoaugmentation with extended fasciocutaneous flaps taken from the back (5 patients, 9 flaps) or from the midaxillary line (2 patients, 4 flaps). Although 5 patients had these procedures for aesthetic reasons, 2 patients underwent procedures for breast cancer reconstruction. One had a unilateral mastopexy autoaugmentation from the back after undergoing contralateral pedicled transverse rectus abdominis myocutaneous flap breast reconstruction, whereas the other had her lumpectomy defect with bilateral mastopexy autoaugmentation and UBL. Both patients who underwent mastopexy autoaugmentation and mUBL had brachioplasty, one performed simultaneously whereas the other staged.

Mean initial body mass index (BMI) was 50.1 kg/m² (range, 43.3–69.1 kg/m²), with a mean preoperative, post-MWL BMI of 28.5 kg/m² (range, 23.1–34.7 kg/m²), mean weight loss of 58 kg (range, 28.9–101 kg), and mean BMI decrease of 21.6 kg/m² (range, 10.6–39.3 kg/m²). One patient had comparable weight loss and BMI changes after diet and exercise alone. Among the 6 patients who underwent bariatric surgery, all had laparoscopic Roux-en-Y gastric bypass, and the average interval between bariatric procedure and mastopexy autoaugmentation was 41 months (range, 19–101 months). Sternal notch to nipple distance ranged from 23.5 to 29.5 cm preoperatively and 20.5 to 27 cm postoperatively, with no greater than a 1.5-cm discrepancy between postoperative breasts. No patients were diabetic or smokers, although 1 patient had a remote history of smoking 36 pack-years (Table 1).

Average length of follow-up was 18 months (range, 3–48 months). Complications occurred in 3 patients: a small (1 × 1 cm) chest wall dehiscence; a small (3 × 1.5 cm) unilateral breast dehiscence, with a small (1 mL) volume of distal flap necrosis; and one immediate postoperative, unilateral hematoma (after bilateral mastopexy autoaugmentation with completion UBL) that was promptly treated with operative evacuation and drain placement. The patient with both dehiscence and distal flap necrosis was prone to poor scar formation, as evidenced by hypertrophic scarring involving the left breast, umbilicus, and abdomen. Only the hematoma constituted a major complication requiring additional surgical intervention. The remaining complications were minor and resolved with expectant, nonoperative management.

### TABLE 1. Patient Characteristics and Outcome

<table>
<thead>
<tr>
<th>Patient Age, y</th>
<th>History</th>
<th>Procedure</th>
<th>Gastric Bypass and Initial BMI, kg/m²</th>
<th>Post-MWL Weight Loss, kg</th>
<th>Postoperative SN-N, cm</th>
<th>Complications/Comments</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>63</td>
<td>Lap GB</td>
<td>B UBL</td>
<td>69.1</td>
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<td>2</td>
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<td>B UBL</td>
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<td>30.2</td>
<td>21.0 R, 22.0 L</td>
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<tr>
<td>3</td>
<td>57</td>
<td>Diet and exercise</td>
<td>B UBL</td>
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<td>25.7</td>
<td>N/A</td>
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<tr>
<td>4</td>
<td>29</td>
<td>Lap GB</td>
<td>B UBL</td>
<td>43.3</td>
<td>23.1</td>
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</tr>
<tr>
<td>5</td>
<td>54</td>
<td>Lap GB; ALND; XRT; lap GB</td>
<td>B UBL</td>
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<td>24.3</td>
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</tr>
<tr>
<td>6</td>
<td>55</td>
<td>Lap GB; TRAM</td>
<td>R UBL</td>
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<td>34.7</td>
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<td>B UBL</td>
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<td>31.8</td>
<td>N/A</td>
</tr>
</tbody>
</table>

ALND indicates axillary lymph node dissection; B, bilateral; L indicates left; lap GB, laparoscopic gastric bypass; LBL, lower body lift; N/A, not applicable; NR, not recorded; R, right; SN-N, sternal notch to nipple distance; TRAM, transverse rectus abdominis myocutaneous flap; XRT, radiotherapy.
Case 1

A 63-year-old woman presented with history of morbid obesity. She was treated by the bariatric surgery service with laparoscopic Roux-en-Y gastric bypass. She subsequently experienced a weight loss of 101 kg with BMI decrease of 39.3 kg/m². She was evaluated by our service approximately 8½ years after her bypass and deemed an appropriate candidate for bilateral autoaugmentation mastopexy with UBL, using extended fasciocutaneous flaps with donor-site scars placed in

FIGURE 4. Patient 1, a 63-year-old woman presenting for autoaugmentation mastopexy via UBL, approximately 8½ years after undergoing laparoscopic gastric bypass, anterior (A) and posterior (B) views. Patient 1, 12 months after undergoing UBL with autoaugmentation mastopexy, anterior (C) and posterior (D) views.

FIGURE 5. Patient 2, a 64-year-old woman presenting for autoaugmentation mastopexy via mUBL, 19 months after undergoing laparoscopic gastric bypass, anterior (A) and left oblique (B) views. Patient 2, 7 months after undergoing autoaugmentation mastopexy with mUBL and 5 months from a subsequent bilateral brachioplasty, anterior (C) and left oblique (D) views.
perforator-based flaps can be used for breast reconstruction.\(^6\) Extended the patient.

addition, results of autologous techniques can age more naturally with and redundant lateral, and often circumferential, thoracic soft tissue. In alternative, particularly in the post-MWL patient with generalized ptosis these implant-related complications, and thus provides an appealing al-

mounds. Implant-based volume replacement is often an attractive option for both patients and practitioners. It is generally less technically chal-

lenging, requires less operative time when compared to autologous techniques, and has more rapid postoperative recovery while avoiding donor-site morbidity.

Breast implants, however, do have shortcomings. Over time, im-

plants can develop capsular contracture, rippling, implant migration, asymmetry, and implant rupture. Autologous reconstruction may avoid these implant-related complications, and thus provides an appealing alter-

native, particularly in the post-MWL patient with generalized ptosis and redundant lateral, and often circumferential, thoracic soft tissue. In addition, results of autologous techniques can age more naturally with the patient.

Anatomic studies have demonstrated that lateral intercostal perforator-based flaps can be used for breast reconstruction.\(^5\) Extended fasciocutaneous flaps may be designed, taking advantage of large inter-

costal perforators often present in MWL patients, to perform autologous mastopexy augmentation safely and reliably while simultaneously im-

proving circumferential upper body contour.\(^2,\)\(^3\)\(^4\)\(^5\)\(^6\)\(^7\) Lateral intercostal ar-

tery perforators are based on the costal segment, and can facilitate design of a shorter flap for use in mastopexy. Both options minimize the donor-site morbidity attached to myocutaneous flap reconstruc-

tions requiring sacrifice of underlying muscles such as the latissimus dorsi.

Techniques to date have described use of shorter fasciocuta-

neous flaps.\(^5\)\(^6\)\(^7\) Although a viable reconstructive option in the MWL population, these described techniques limit the volume harnessed for autoaugmentation mastopexy. By contrast, the primary benefit of our extended fasciocutaneous flap is the ability to incorporate greater vol-

umes for autoaugmentation. In what we refer to as a UBL approach, we have extended the fasciocutaneous flap into the axilla. In addition, patients have the option of choosing an UBL donor scar on the back, enabling concealment within the bra line and providing additional tissue for volume enhancement.

Combined with an UBL, these lateral fasciocutaneous flap re-

constructions can more completely address components of the upper torso deformity seen in the post-MWL population. The UBL corrects epigastric laxity, repositions the IMF more superiorly, excises lateral chest and mid-back skin rolls, and combined with mastopexy, reshapes the breast. Moreover, donor scars may be placed in aesthetically accept-

able locations. Patients undergoing UBL with the donor scar placed in the midaxillary line may conceal their scars with arms positioned at their sides while allowing this scar to blend into a brachioplasty scar. Patients choosing a donor scar on the back may conceal their scar with their bra while concomitantly having a greater volume of tissue available for augmentation. As with any flap, one should assess distal tip perfusion appropriately before final inset, especially when using the entire flap extending to the midline of the back.

**Limitations**

Generalizing the results of this case series of 7 patients should be met with caution. In thinner patients with little excess circum-

ferential volume, the potential for large volume autoaugmentation is limited. For these patients, a significant augmentation will require breast implants. Our preference is to perform autoaugmentation mastopexy, thus providing maximal soft tissue coverage to better camouflage ultimate placement of implants. The initial autologous augmentation enables use of smaller implants without the need for additional scars. Thus far, none of the patients we have described sought additional implant-based aug-

mentation, and all are satisfied with the volume of autoaugmenta-

tion achieved. Caution is warranted in extrapolating this extended fasciocutaneous flap to the non-MWL population as the lateral intercos-
tal perforators may not be robust enough to carry these larger flaps.

**CONCLUSIONS**

Mastopexy augmentation, coupled with simultaneous upper body lift, can be safely and reliably performed by using extended fasciocu-

taneous flaps to autologously augment the breast while improving cir-

cumferential upper body contour in MWL patients. Donor scars may be placed in aesthetically acceptable locations. Patients undergoing UBLs with midaxillary line donor scars may conceal them with arms at their sides. Patients choosing a back donor scar associated with a complete UBL may conceal it within the bra line while having greater volumes available for augmentation.

Although the midaxillary donor-site technique is established, use of an extended fasciocutaneous flap is novel, and this preliminary study is the first to describe it in the plastic surgery literature. As is true with all flaps, one should assess distal tip perfusion before final inset, espe-

cially when using a flap extending to the midline back. Although the au-

thors currently assess the UBL and mUBL flaps by trimming them until encountering bleeding tissue, intraoperative adjuncts such as SPY, that is, laser-assisted indocyanine green fluorescent dye angiography, may prove useful in assessing distal flap viability for subsequent patients un-

dergoing these approaches to breast reconstruction.

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