Mastopexy After Massive Weight Loss: Dermal Suspension and Total Parenchymal Reshaping

Building on the work of others who have advocated securing breast tissue to adjacent structures to achieve better projection, the author presents a technique that eliminates the lateral axillary roll deformity while using this tissue to augment breast volume—a particular advantage in the patient with massive weight loss. The procedure, although requiring a longer operating time and resulting in a significant scar, produces a pleasing breast contour, is safe and reliable, and has a low complication rate. (Aesthetic Surg J 2006;26:214-222.)

Achieving aesthetically pleasing mastopexy results in patients who have undergone bariatric surgery and massive weight loss poses unique technical challenges. Severe volume deflation with distortion of shape and inelastic skin result in deformities that are difficult to correct. It is not surprising that there are many mastopexy techniques that do not yield good aesthetic results and durable breast shape in this patient population. Here, I describe a safe and reproducible breast-shaping technique, using the principles of dermal suspension and controlled parenchymal reshaping, which yields a youthful breast shape in patients with massive weight loss.

Breast Deformities After Weight Loss

Four features, manifested in various combinations, characterize breast shape in patients who have lost significant weight: (1) significant and sometimes asymmetric breast volume loss, with a deflated and flattened appearance; (2) dramatic loss of skin elasticity, as well as tremendous skin excess relative to the parenchymal volume; (3) nipple position that is overly-medial; and (4) a prominent axillary skin fold that blurs the border between the lateral breast and chest wall.1

Goals and Rationale

In the face of these deformities, the surgical goals for breast reshaping include using all available breast tissue and recruiting additional autologous tissue (as needed), addressing the nipple position, restoring superior pole projection, reshaping the skin envelope without relying on it for support, eliminating the lateral skin roll, and creating a breast shape with discrete lateral curvature.

An extended Wise pattern encompasses and eliminates lateral chest skin rolls, while providing additional tissue that may be used for volume augmentation. Depithelialization of the entire Wise pattern creates a broad dermal surface area that can be plicated to control breast shape precisely and suspended to the chest wall at multiple fixation points.

This technique applies principles of dermal suspension and parenchymal reshaping to the patient with weight loss, building on the work of other surgeons who have developed ways of securing breast tissue to adjacent structures to achieve better projection. Graf and Biggs2 used fixation of the breast tissue to pectoralis fascia in their technique. Frey3 fashioned a dermal brassiere and secured it to the anterior chest wall with nonabsorbable sutures, while eliminating the medial component of the inframammary scar. Qiao et al4 devised an approach involving superolateral resection of the glandular crescent with dermal fixation to the pectoralis fascia. Gulyas5 periareolar techniques also relied on manipulation of the “dermal cloak” to support and shape the breast. Lockwood6 achieved his results using the primary supportive element of nonabsorbable sutures in the superficial fascial system to decrease dermal tension and subsequent scarring. The concept of using redundant chest wall tissue for autologous breast augmentation is supported by Holmstrom’s7 lateral thoracodorsal transposition flap for breast reconstruction after mastectomy.

Patient Selection

Patients with mild breast deformities following weight loss may be suitable for traditional mastopexy techniques, including short scar approaches. However, when faced with profound breast volume loss—flattening of the parenchyma against the chest wall, a redundant, inelastic
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skin envelope, grade 3 nipple ptosis, medialization of the nipple areolar complex, and the presence of a prominent axillary skin roll—the technique of dermal suspension and total parenchymal reshaping described here provides the tools to achieve a good aesthetic result.

After weight loss, patients must first undergo a general medical and nutritional assessment. As with all patients undergoing breast reshaping, I take a thorough history, perform a physical examination for breast disease, and require that patients undergo mammography imaging consistent with the American Cancer Society screening guidelines. There are few contraindications for the use of this technique. Because of the extensive flap dissection involved, I have avoided performing this procedure on active tobacco users. Scars from previous breast surgery may be considered a contraindication if they pose a risk to perfusion of undermined tissues.

I carefully evaluate parenchymal volume and asymmetry. I inspect the lateral breast region for a significant skin roll and assess the amount of tissue that may be mobilized from the lateral chest wall to perform autologous breast augmentation. If there is significant asymmetry, I will either selectively augment the smaller breast using lateral chest wall tissue or, if this is not possible, reduce the larger breast to match the smaller. I perform this mastopexy procedure safely in combination with abdominoplasty and other body contouring procedures.

Surgical Technique

This procedure is based on a Wise pattern marking and preservation of a central pedicle. First, reference the nipple position to the inferior mammary fold and move it to a more lateral position along a symmetrically drawn breast meridian. The vertical limb of the pattern is marked at 5 cm. Extend the lateral portion of the Wise pattern posteriorly to encompass the axillary skin roll and provide additional autologous tissue for breast volume. (The Wise pattern can be extended to the posterior axillary line and beyond, depending on the extent of the lateral skin roll and the amount of tissue desired for autologous breast augmentation.) The robust blood supply of the lateral thoracic region allows for a significant amount of tissue to be safely mobilized to the breast.
Mark the areola with a 42-mm cookie cutter and deepithelialize the entire region within the Wise pattern. Figure 1 demonstrates an important point: the area of skin resection needed to alleviate the lateral skin roll may extend beyond the portion of the Wise pattern that will be deepithelialized. In other words, a portion of the lateral wing of the Wise pattern may be deepithelialized and saved to assist in the reshaping and to add volume, whereas the remainder of the wing is simply excised to eliminate the skin roll. This flexibility in design provides for control of the skin envelope and control of the amount of lateral tissue to mobilize to the breast.

Then, completely deglove the breast parenchyma by raising a 1-cm thick flap overlying the breast capsule. Once the chest wall is reached, continue undermining above the pectoralis major fascia to the level of the clavicle. Mobilize medial and lateral flaps of breast tissue by undermining at the level of the chest wall fascia. These flaps represent the medial and lateral wings normally excised in a Wise pattern breast reduction. Take care to preserve significant perforating vessels that enter the tissue flaps near the base. Trim the lateral flap, as necessary. The nipple survives on a healthy central pedicle (Figure 2).

Next, suspend the central dermal extension to the chest wall, using a 0 braided permanent suture in a mattress fashion. Tack the dermis firmly to the periosteum of a selected rib along the breast meridian. This carefully placed suture must pass through the pectoralis muscle and relies on palpation of the rib with the nondominant hand to guide the needle pass (Figure 3). Choose the rib level for fixation, intraoperatively, based on the distance between the edge of the central dermal extension and the nipple (ie, how the nipple areolar complex position is affected by the height of suspension). The second rib is the level chosen most frequently. The suspension should raise the nipple level close to the final position intended.

Then suspend the lateral breast flap and secure it to the chest wall by tacking it to the rib periosteum in a similar manner. The lateral flap dermal suspension suture will be very close to the central suspension suture, although you may select a lower rib level to provide the desired shape. This will give the breast shape a discrete lateral curvature and replace the unsightly blending of breast tissue with the lateral chest. Then suspend the

**Figure 2.** The breast parenchyma is degloved by raising a 1-cm-thick flap. Medial and lateral flaps of dermis/breast tissue are mobilized from the chest wall.
medial breast flap and secure it to the chest wall, as with the lateral flap.

At this point, add additional suspension sutures adjacent to the sutures already placed to reinforce the fixation of the breast tissue. With the suspension points established, you will gain control of the parenchymal shape. To adjust the shape, meticulously plicate the broad surface area of dermis with running 2-0 absorbable sutures. To begin, approximate the lateral flap dermis to the central dermal extension (Figure 4). Then plicate the medial flap dermis to the central dermal extension, and plicate the inferior pole of the breast to shorten the distance from the nipple to the inframammary fold and increase projection (Figure 5).

To facilitate optimal symmetry, I have learned to perform each suspension and plication step simultaneously on both breasts, rather than completing one breast before I approach the other. After initial placement of plication sutures, fine-tune the work by adding additional plication sutures. I have found that the exact pattern of plication differs in each patient and is dictated by the desired breast shape. Moreover, there is no problem with adding plication sutures next to, or even overlying, previously placed sutures. As a next step, it is often necessary to secure the lateral breast flap dermis to the chest wall fascia (Figure 6). (It is not necessary to place these sutures into rib periosteum.) This keeps the breast parenchyma from bulging laterally and further increases projection.

Constant redraping of the skin flap during the shaping process helps guide both major and minor adjustments to breast form. If the abdominal wall tissues are very loose, you may decide to secure the superficial fascial system layer of the dissected edge of the abdominal wall to the periosteum of the fifth rib. This will restore the inframammary fold position. For skin closure, place buried interrupted and running absorbable sutures in the dermis. During the skin closure, you may note that the nipple is tethered in an inappropriate position and/or points in an undesirable direction. At this time, you can use the cautery to incise the dermis part way around the nipple to release the tethering and allow the nipple to point forward (Figure 7).

Figure 3. The central dermal extension is elevated and secured to the chest wall rib periosteum using braided nylon suture. The second rib is used most frequently, but this can vary based on the patient’s anatomy.
**Figure 4.** The lateral breast flap is elevated to create the lateral curvature of the breast mound, and the dermis is secured to the chest wall near the previous fixation point. The lateral flap can be extended posteriorly on the chest wall to provide extra tissue for autologous volume augmentation. The dermal edge of the medial breast flap is fixed to the chest wall. A running braided suture is used to approximate the dermal edges of the lateral flap and central dermal extension. The dermis of the medial breast flap is approximated to the central dermal extension using a running suture.

**Figure 5.** The dermis on the inferior pole of the breast is plicated with a running suture to shorten the distance between areola and inferior mammary fold. Additional “fine tuning” plication sutures are added (as needed) to further adjust shape.
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**Figure 6.** The lateral breast flap dermis is sutured to the chest wall fascia to keep the breast parenchyma from bulging laterally. This also increases projection.

**Figure 7.** The dermis surrounding the nipple is scored along part of the circumference, as necessary, to allow the nipple to point forward. The breast skin flap is redraped and closed with absorbable intradermal sutures over a drain.
Figure 8. A, B, Following a 130-lb weight loss, this 57-year-old woman is marked with an extended Wise pattern that encompasses the lateral skin roll and moves the nipples to a more lateral position. C, Intraoperative view demonstrates control of parenchymal shape and fixation of tissues to chest wall. D, F, H, Preoperative views. E, G, I, Postoperative views 6 months after mastopexy using dermal suspension and total parenchymal reshaping. She also underwent abdominoplasty.
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**Figure 9.** A, B, Intraoperative views demonstrate medial and lateral dermal/parenchymal flaps elevated and folded into their intended position. The size of the lateral breast flap may vary based on the size of the lateral chest skin roll. C, E, G, Preoperative views of a 46-year-old woman following a 150-lb weight loss. D, F, H, Postoperative views 4 months following mastopexy using dermal suspension, total parenchymal reshaping, and fleur-de-lis abdominoplasty.
Then use intradermal sutures to complete the nipple closure and place suction drains in each lateral breast. Place a lightly compressive breast dressing, and remove it on the fourth or fifth postoperative day. Remove the drains when output is less than 30 mL per day.

Complications have included minor wound dehiscence with delayed healing at the triple point in less than 5% of patients. One patient has undergone unilateral revision of the medial inframammary fold scar and another underwent excision of dog ears at the end of the lateral chest scars. These revisions were performed in the office. I have seen no cases of nipple loss, skin loss, or detectable fat necrosis. Patient satisfaction has been high. Representative clinical cases appear in Figures 8 and 9.

Conclusion

This technique has the advantage of not only correcting the severe breast deformities associated with weight loss, but also achieving this result with a low complication rate. Notably, the deformity of a lateral axillary roll can be eliminated and used to augment breast volume. The disadvantages of this technique include a lengthy scar, considerable time in the operating room for the extensive deepithelialization, and much intraoperative tailoring that cannot be preoperatively marked. Despite the disadvantages, this technique is safe and reliable for restoring a youthful breast shape in the patient with massive weight loss. Great control over skin envelope and parenchymal shape may be gained with this procedure.

References