



Mastopexy After Massive Weight Loss: Dermal Suspension and Selective Auto-Augmentation

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Since ancient times, the female breast has been portrayed by artists on canvas and sculptures. This breadth of artistic rendering spans from the Paleolithic Period with Venus of Willendorf, 24,000 BC, to the more recent abstract paintings of Willem de Kooning. Despite changes in ideal concepts of beauty throughout the ages, a common thread is found among these images. The female breast has been depicted consistently as nonptotic, evenly contoured, and youthful. This image of youthfulness is equated with health and beauty in modern society. Patients who successfully undergo massive weight loss desire to shed the physical signs of a formerly obese person and adopt a renewed body image. Many patients are troubled by the breast deformities following weight loss and find that mastopexy has a positive impact on their body image. We describe a technique, which uses principles of dermal suspension and parenchymal reshaping, that allows for selective auto-augmentation of the breast with lateral chest wall tissue.

The nature of breast deformities after weight loss

The youthful breast is located between the second and fifth intercostal space. The inferior mammary

fold (IMF) is located below the nipple areolar complex (NAC). The IMF to nipple distance is 6 to 8 cm. The sternal notch to nipple distance usually measures 19 to 21 cm in a youthful breast. NAC represents the point of maximum projection on the breast at the midclavicular line.

Ptosis refers to inferior and lateral descent of the NAC in relation to the IMF and breast parenchyma, and a common classification system defines first-degree or mild ptosis as a nipple position within 1 cm of the IMF. In second-degree, or moderate, ptosis, the nipple is 1 to 3 cm below the IMF and on the anterior projection of the breast mound. In third-degree, major ptosis, the NAC is below the IMF and on the dependent portion of the inferior breast pole [1]. This classification system, however, falls short of defining the breast deformities that are seen after massive weight loss. Massive weight loss results in severe breast volume deflation with flattening and inelastic skin that deforms and distorts breast tissue. Additionally, nipple position becomes more medialized, and axillary skin rolls blur the borders between the lateral breast and chest wall. In the face of these changes, traditional mastopexy techniques are inadequate [2].

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Patient evaluation

Management of breast ptosis in patients with significant weight loss, as is seen in the gastric bypass population, can be challenging. The desired goals and expectations of the patient must be

investigated. Unrealistic goals and preconceived ideals need to be addressed before surgery. During the same consultation, a full history and focused physical examination are performed. We require mammographic imaging consistent with the screening guidelines of the American Cancer

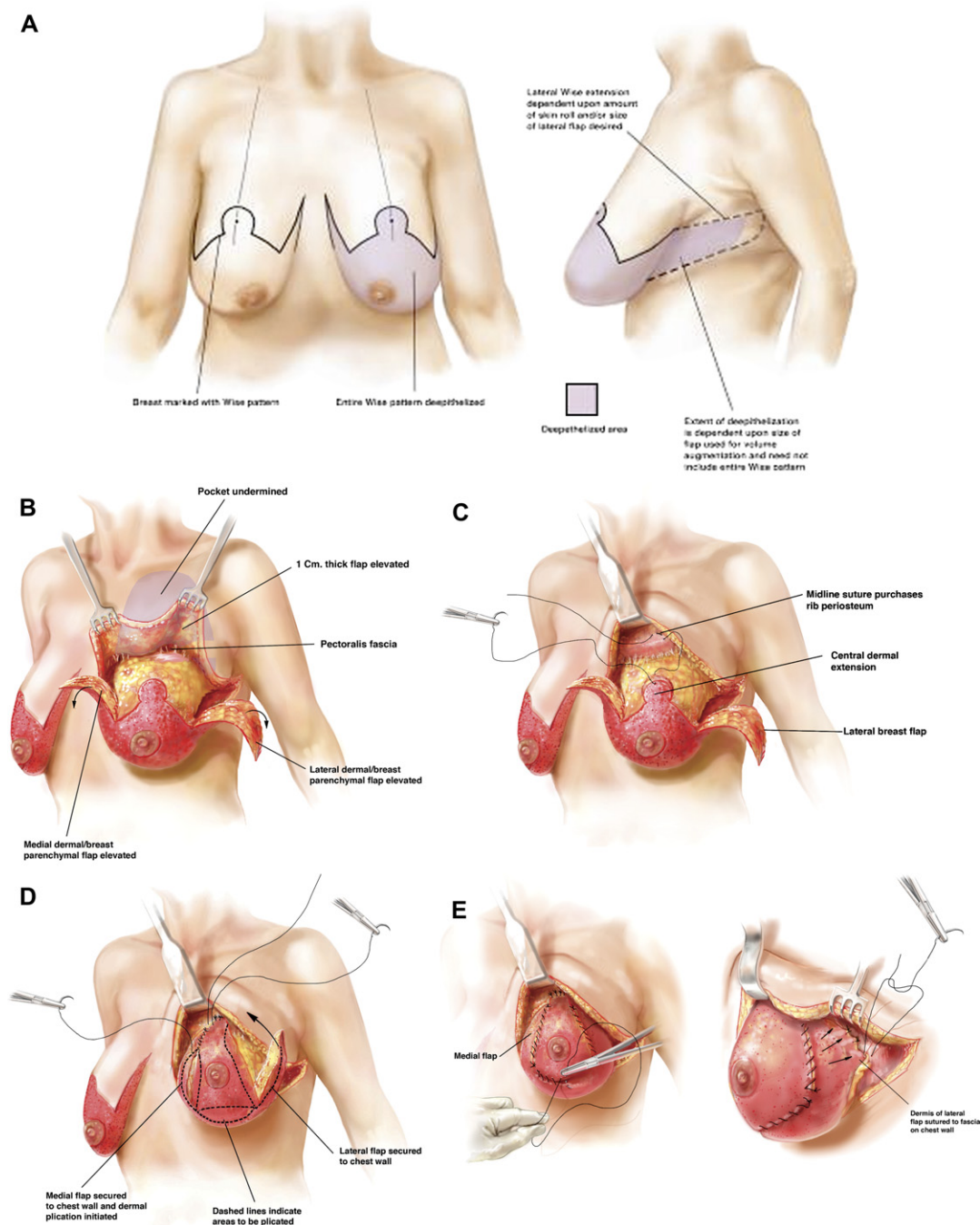


Fig. 1. (A–F) Operative sequence. (From Rubin, JP. Mastopexy in the massive weight loss patient: dermal suspension and total parenchymal reshaping. *Aesthetic Surgery Journal* 2006;26:214–22; with permission. Copyright © 2006 by The American Society for Aesthetic Plastic Surgery, Inc.)

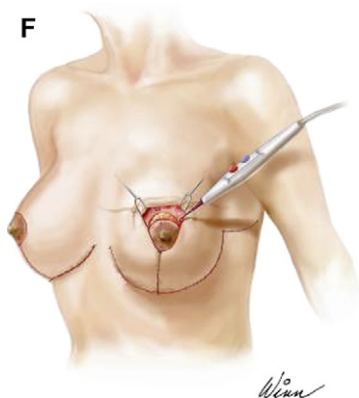


Fig. 1 (continued)

Society [3] and basic laboratory studies. The breast deformities should be defined precisely, with attention to laxity of the skin envelope, existing breast parenchymal volume, IMF position, presence of lateral skin roll, potential medial position of the nipple, and asymmetry. Relative contraindications to surgery include previous breast scars, severe fibrocystic disease, active severe intertrigo, and other active dermatologic conditions. We routinely exclude tobacco users. Consideration should be given to how the mastopexy procedure will fit into an operative plan involving multiple concurrent procedures or staged procedures.

Choice of technique

For patients with only mild deformities, many standard techniques can be used. A comprehensive review of the types of mastopexy is beyond the scope of this article; however, the following simple algorithm may be followed. Those who have mild ptosis and are content with their breast size may need only mastopexy with periareolar skin reduction [4]. Moderate ptosis and skin laxity require the NAC to be moved more superiorly, with excision of vertical skin from the NAC down to the IMF [5,6]. Severe ptosis requires an additional horizontal excision at the IMF, resulting in an inverted T incision.

Patients with mild ptosis and who are unsatisfied with their breast size require alloplastic augmentation, and this alone may correct the ptosis. Those with moderate to severe ptosis in addition to unacceptable breast volume also require augmentation with mastopexy. Consideration should be given to staging these procedures. Caution should be exercised when treating patients with previous breast augmentation presenting with ptosis. Explantation in conjunction with mastopexy and capsulotomy may compromise blood supply to the skin and nipple [7].

For patients with adequate parenchymal volume, but severe ptosis and flattening of the breast shape, we recommend a technique that allows for suspension of the breast tissue to rib periosteum to achieve

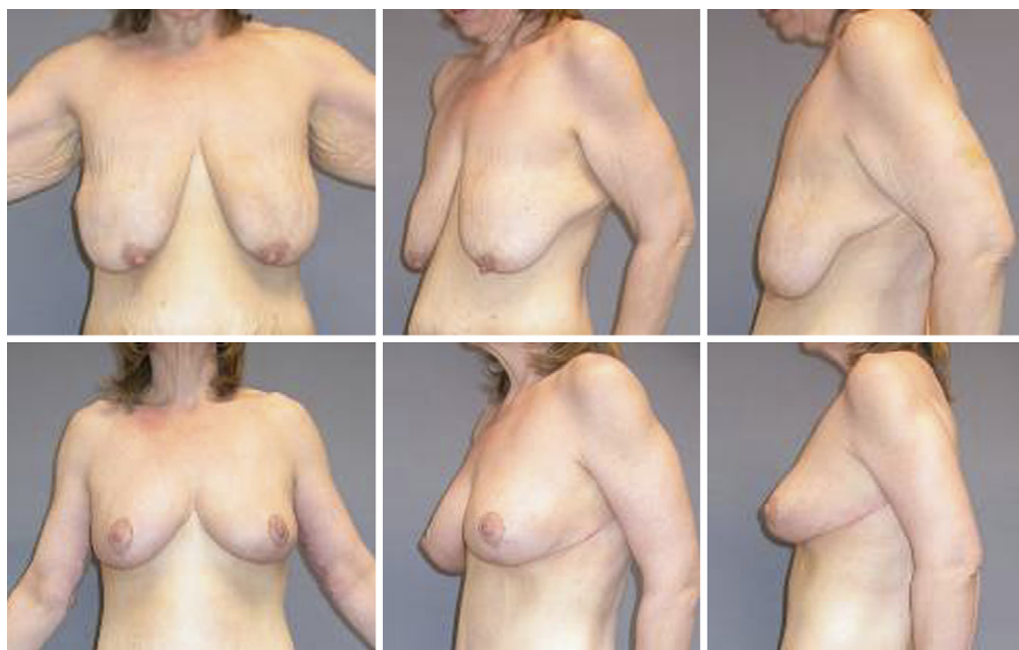


Fig. 2. 46-year-old woman after 160-lb weight loss. Postoperative results shown at 6 months.

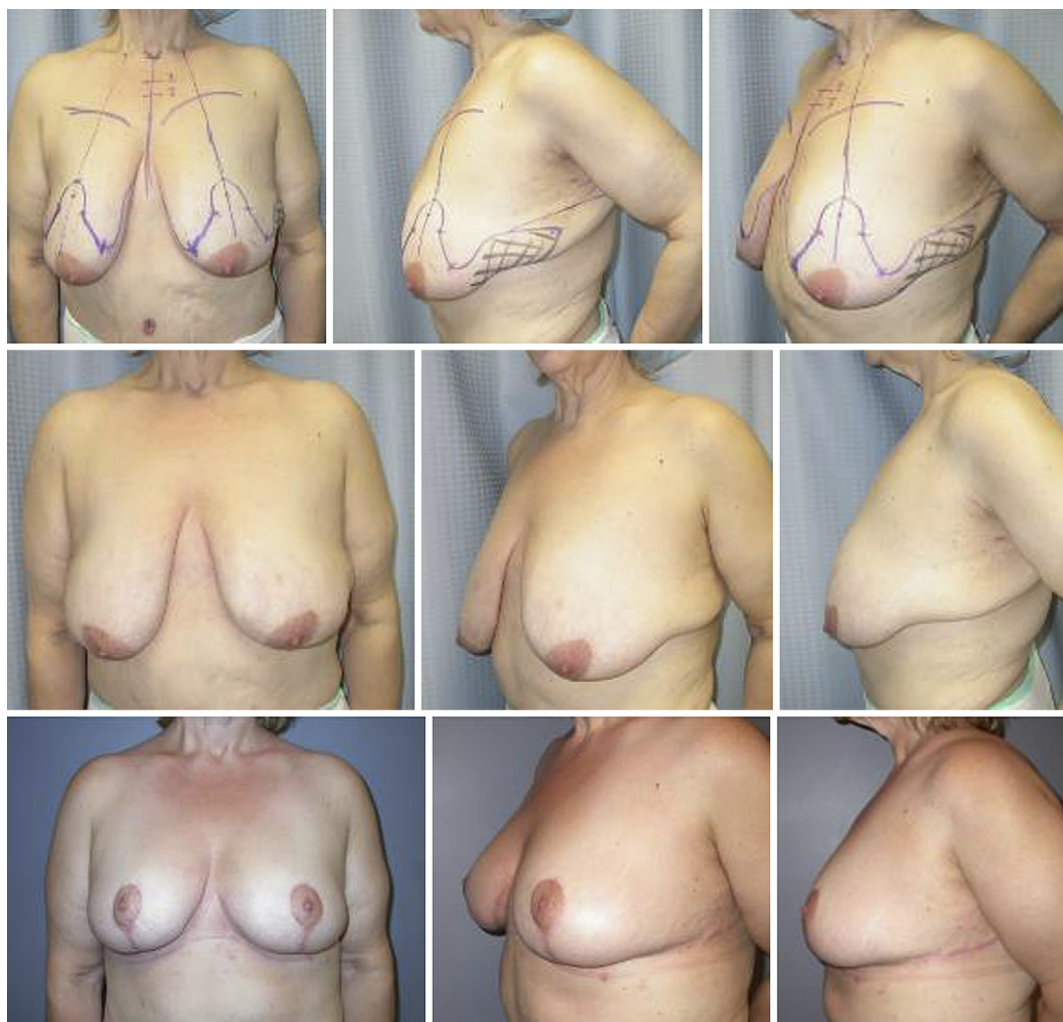


Fig. 3. 42-year-old woman after 140-lb weight loss. Postoperative results shown at 6 months.

superior pole fullness. A lateral chest wall flap is used to selectively add tissue to the breast mound while eliminating the lateral skin roll deformity [8]. Although this technique does involve more extensive scars compared with other mastopexy techniques, patients who are willing to accept the scars are satisfied with the procedure.

Authors' technique

We base our markings on an extended Wise pattern with preservation of the inferior and central pedicle. Nipple position is marked in relation to the IMF and often needs to be moved more laterally along a symmetrically drawn breast meridian. The vertical limb of the keyhole pattern measures 5 cm. The lateral marking of the Wise pattern is extended posteriorly to encompass the axillary skin roll. This serves

two purposes: it removes the unsightly lateral skin rolls, and it assists in autologous augmentation of the breast parenchyma. Robust perforators in the lateral thoracic region allow this flap to be mobilized. The areola is marked with a 42-mm cookie cutter. The purple shaded area shown in Fig. 1A is de-epithelialized. Of note, the area marked "lateral Wise extension" may be de-epithelialized completely or partially, depending on the amount of tissue needed for auto-augmentation. We recommend de-epithelializing the entire length of the roll, creating the flap, and then deciding if it needs to be trimmed.

The remaining breast parenchyma is degloved by elevating flap that are 1- to 1.5-cm thick (Fig. 1B). Upon reaching the pectoralis major fascia, continue undermining the tissue to the level of the clavicle to create a large pocket. Mobilize the lateral and medial flaps of the breast tissue down to the chest

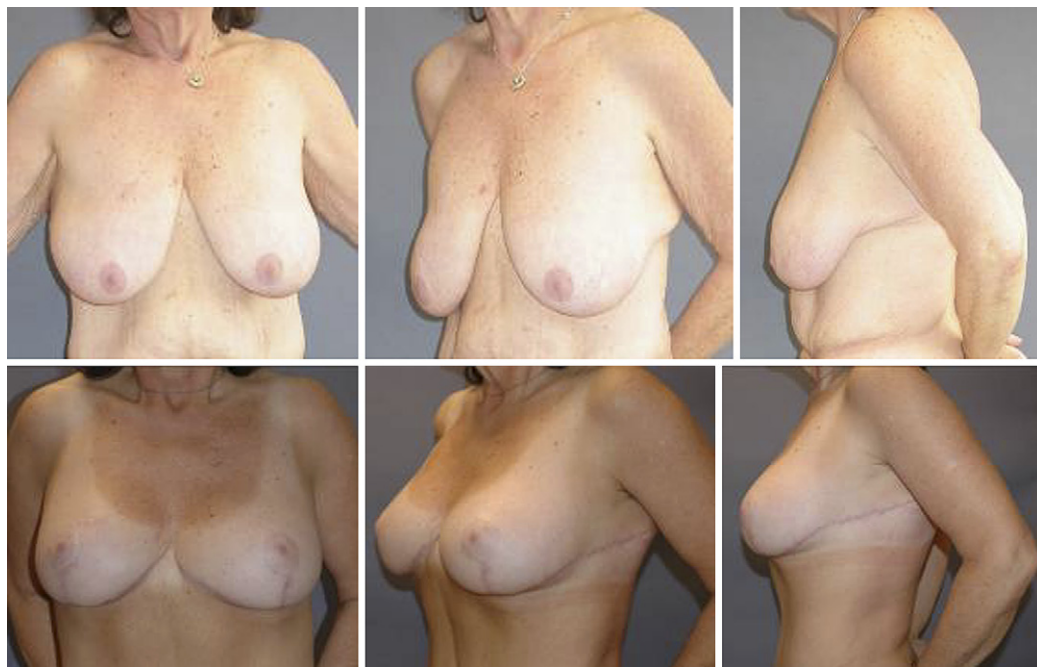


Fig. 4. 57-year-old woman after 130-lb weight loss. Postoperative results shown at 10 months.

wall fascia, taking care to preserve perforators at the base. These are the parts of the Wise pattern that ordinarily would be discarded in a breast reduction. The lateral flap may be extended to the posterior axillary line and beyond to add tissue to the breast. When dealing with an extended flap, check for healthy bleeding at the margin before mobilizing the flap into the breast mound.

Next, suspend the central dermal extension to the rib periosteum as shown in **Fig. 1C**. Identify the appropriate rib level, and mark the area along the breast meridian. The level is chosen based on the distance between the central dermal extension and the nipple. This usually is the second rib. With the nondominant hand, palpate the intercostal space above and below the selected rib level. Maintaining your fingers in the intercostal space ensures the correct path of the 0-braided suture into periosteum. A few extra moments spent on exposure along with ensuring a good purchase of the periosteum is invaluable. This ultimately places the nipple close to the final position intended. In a similar fashion, the lateral breast flap is secured to the chest wall by way of periosteal tacking sutures. The lateral flap may be sutured at the same or one rib level inferior to the central suspension. The medial flap is secured in a similar fashion. An additional two to three suspension sutures may be used for reinforcement. To shape the dermis, use 2-0 absorbable sutures to plicate the broad surface areas

of the flaps (**Fig. 1D**). Begin by approximating the lateral dermal flap to the central dermal extension. Next, plicate the medial flap in a similar manner.

To increase nipple projection and shorten NAC to IMF distance, plicate the inferior pole of the breast. This distance is set at 5 cm (**Fig. 1E**).

To ensure symmetry, it is advantageous to perform each suspension and plication simultaneously on both breasts, rather than completing one and performing the second based on recall. Additionally, the suspension and shaping is done with the patient in a sitting position. We have found that the pattern of plication is tailored to each patient. Thus, placement of additional plication sutures to attain the desired shape may be necessary.

Next, the edge of the lateral dermal flap is secured to the chest wall fascia (**Fig. 1E**). It is not necessary to secure this to the periosteum, but simply the fascia. This prevents lateral bulging and enhances nipple projection. This maneuver defines the lateral curvature of the breast. Constant redraping of the skin flap assists with any minor adjustments. Finally, skin closure is performed with buried interrupted and running absorbable sutures in the dermis. During closure, the nipple may be tethered or malpositioned. Using cautery, release the tethered dermis to allow the nipple to sit at the desired location (**Fig. 1F**). It is safe to release the dermis more than halfway around the circumference of the areola, given the robust central pedicle blood

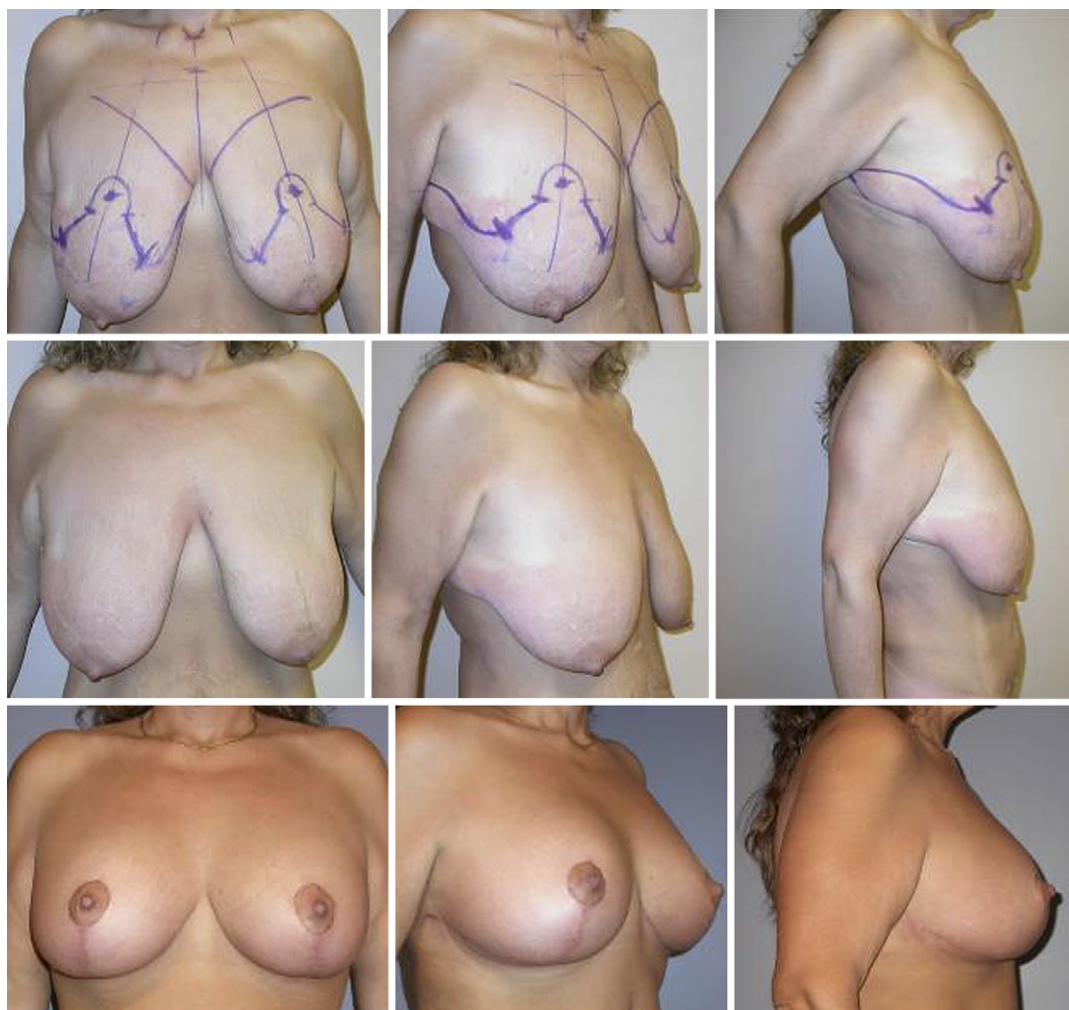


Fig. 5. 34-year-old woman after 135-lb weight loss. Postoperative results shown at 3 months.

supply. Nipple closure is performed with intradermal sutures, and suction drains are placed in each lateral breast.

Representative clinical cases are shown in **Figs. 2–6**.

Discussion

Morbid obesity in the United States has reached startling proportions. It is estimated that 144,000 gastric bypasses were performed in 2004 [9]. As the number of bariatric cases increase, there will be an equally increasing demand for body contouring after weight loss. The actual weight loss and the body-contouring surgery after weight loss have beneficial effects on self-esteem and body image [10]. In particular, breast reshaping is a popular focus for the patient who has lost weight.

The breast deformities that are seen in patients with massive weight loss are not addressed with traditional mastopexy techniques. Our approach eliminates the lateral skin rolls, while providing volume augmentation to the breast. Suspension of breast parenchyma to pectoralis fascia has been supported by other investigators [11,12]. Recurrence of ptosis is less likely with suspension to rib periosteum.

Major complications have included one hematoma requiring operative drainage and two cases of wound dehiscence treated with dressing changes until healed. Minor wound dehiscence at the triple point has been observed in 5% of our patients. There have been no cases of nipple loss, major tissue loss, or detectable fat necrosis. Flap viability is confirmed with brisk intraoperative bleeding at the tip. Similar transposition flaps have been used with success in breast surgery [13].

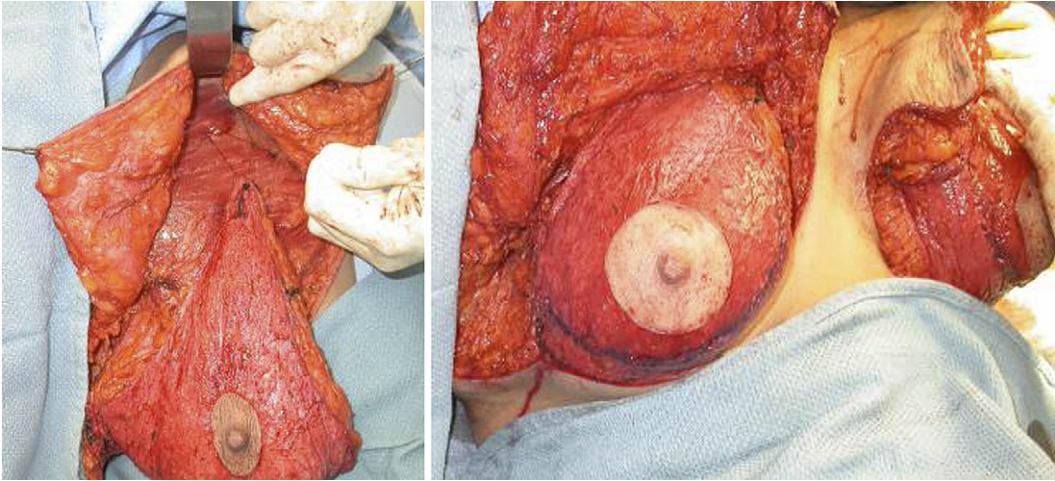


Fig. 6. Intraoperative photographs of patient in Fig. 5, demonstrating dermal suspension and breast shape after suspension and placement, but before breast flap is closed. Note that the patient is in a sitting position, and the breast tissue is secured firmly to the chest wall.

Summary

The technique that we outlined is extremely versatile for restoring an esthetic and youthful breast shape in the patient who has lost a massive amount of weight. Overall, complication rates have been low. Despite the disadvantages of a lengthy scar and the need for extensive intraoperative tailoring (which may increase operative time), this operation carries an extremely high rate of patient satisfaction.

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