INTRODUCTION
After massive weight loss, obese women experience laxity of the skin proportional to the excess localized adiposity. The change in the breast is profound but unpredictable, owing to the variable gland to fat ratio, genetics, and prior pregnancies. Smaller breasts deflate; larger breasts flatten. For many, a singularly proud and voluptuous feature has been ruined. Further distorted by neighboring rolls of upper torso skin, these breasts conform poorly to brassieres. These women are resigned to concealing their breasts. Hence, among their many aesthetic concerns, breast reshaping is a priority. When given a choice, most weight-loss patients prefer mastopexy with autogenous tissue augmentation rather than augmentation with a silicone implant.

Nevertheless, skin reduction pattern mastopexy with silicone implant augmentation for volume is commonly presented in plastic surgery meetings. When the senior author became active in post-bariatric surgery body in the late 1990s, he favored that approach, and both authors still use it when there is inadequate neighboring discard tissue available for augmentation. Mastopexy with an implant is expeditious, resulting in dramatically improved breast contour, symmetry, and position of the nipple–areolar complex (NAC). Nevertheless, it is a complicated procedure that fails to address chest deformity and suffers from deteriorating aesthetics. The many solutions suggested for preventing recurrent ptosis after mastopexy or breast reduction in the general population attests to its high frequency and difficulty.1–7

Not only is there glandular ptosis, enhanced by the weight of the implants, but the loose skin breasts conforms poorly to implants [Fig. 13.1]. The upper pole of the breast empties and the lower pole fills excessively, resulting in descent of the inframammary fold (IMF), an excessive distance between the IMF and the NAC, and an upward rise to the NAC. This deformity is treated with an upper body lift and repositioning of the implant [Fig. 13.1]. With mild skin laxity of the mid-torso one may pre-empt this unfavorable cascade of poor aesthetics with a secure permanent suture advancement of the IMF along the inferior implant space (Fig. 13.2). When there is adequate breast volume and minimal mid-torso laxity and breast descent, we advocate a mastopexy with dermal to rib suspension and internal shaping technique similar to that proposed by Rubin et al.9 In addition we secure the IMF during the mastopexy.

Massive weight-loss patients usually accept increased risk and operative time of autogenous flaps for a more aesthetic, long-lasting outcome. Use of neighboring excess tissue for breast reshaping was proposed by Zook in the 1970s.9 He placed de-epithelialized discard epigastric flaps beneath Pitanguy mastopexies. The inferior incision was carried around the trunk to correct undesirable rolls and bulk. Others used the Wise pattern and recruited skin folds below and lateral to the breasts to rebuild the breast.9–13 Successful use of a lateral thoracic fasciocutaneous flap for breast reconstruction by Holstrom has ignited considerable interest in this trans-serratus perforator flap for post-mastectomy, cosmetic augmentation, and massive weight loss.14–18

Spiral flap breast reshaping with an upper body lift evolved to correct glandular ptosis (bottoming-out), poor breast projection, and inadequate lateral and superior pole fill with neighboring excess tissue.19,20 The descended IMF is raised. The inferior pole of the breast is supported and augmented by the superior rotation of excess epigastric skin and fat. The lateral thoracic flap is tunneled under the superior breast to impart upper pole and lateral breast fullness and curvature. The operation combines well with the L brachioplasty21 [Figs 13.3–13.5]. Spiral flap refers to the invariable twisting and advancement under and around the breast of this compound superior epigastric and lateral thoracic flap. Previously presented in technical detail,22 the
FIGURE 13.1 (Left) Oblique anterior view show a 32-year-old 137-pound, 5 ft 4 in woman who lost 170 pounds and is marked for total body lift surgery, including lower body lift, abdominoplasty, vertical thighplasty and Wise pattern mastopexy with 350 mL saline-filled silicone implant augmentation. (Middle) Six months later she is pleased with her lower body and thighs, but her breasts bottomed out with descent of her IMF. Markings are drawn for revision of her mastopexy with a reverse abdominoplasty and an upper body lift, including raising her IMF. (Left) The result 2 years after her breast revision with an upper body lift, showing an excellent breast shape, nipple position, and maintenance of her IMF suspension.
FIGURE 13.2 These are the anterior and left oblique views before and 6 months after an abdominoplasty and augmentation mastopexy with 325 mL on the right and 390 mL on the left. Suture stabilization of her IMFs was performed through the inferior portion of her implant dissection. She was 40 years old, 5 ft 6 in and 135 pounds, having lost 130 pounds after gastric bypass surgery. Her breast shape and IMF have maintained position.
FIGURE 13.3–FIGURE 13.5 These are the preoperative and 1-year postoperative views of a 5 ft 4 in, 160 pound 42-year-old massive weight loss patient who had a single-stage total body lift followed by revisions of her right medial breast and central abdominal scars and vertical thighplasties. There is long-lasting correction of all her sagging skin and contour issues, with acceptably maturing scars. The considerable inferior extension of her breast flap onto the epigastrium is evident, as well as the lateral thoracic flaps. Both contributed volume and shaping to her breasts, which are symmetrical and firmly supported by IMFs. Her convex lateral breast transitions into a concave but rounded anterior axillary fold. The hanging arm skin is corrected with reduction of the hyperaxilla and no constricting bands.
FIGURE 13.4
FIGURE 13.5
SPIRAL FLAP RESHAPING

INDICATIONS AND CONTRAINDICATIONS FOR SPIRAL FLAP RESHAPING (Boxes 13.1–13.3)

Indications
- Patient aversion to silicone implants
- Acceptance of risks and scars of flap reconstruction
- Severe excess skin and fat in the mid-torso
- Significant breast ptosis
- Inadequate breast volume

BOX 13.1 Indications
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BOX 13.2 Contraindications
- Smokers
- Unreasonable expectations
- Obese
- Underweight
- Minimal deformity

BOX 13.3 Optimizing outcomes
- Properly analyze the deformity and the volume of tissue available for auto-augmentation
- Select the appropriate mastopexy pattern and anticipate the extra skin to accommodate added breast volume
- Consider the sickle pattern modification of the spiral flap for less severe deformity or to avoid a back scar
- Master each of the component operations and their complex interplay
- Develop an obsessive marking technique that leads to confidence to commit full inclusion into flaps, pre-excision defatting, or expeditious excision
- Learn a rapid means of de-epithelialization, such as the use of an electric dermatome
- Minimize the use of electrocautery to make incisions that will be closed under tension
- Secure the IMF as firmly as possible
- Expect the closure tension of the reverse abdominoplasty and the breast mound to be high
- Further undermine the Wise pattern flaps, or remove some of the spiral flap if the closure tension is too high
- Develop a team of operators with confidence in each other

Contraindications
- Smoking
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- Obesity
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Spiral flap breast reshaping with an upper body lift is indicated in patients with suitable torso anatomy who are in good health and have a good understanding of the procedure. We give our patient-oriented book, Total Body Lift, to facilitate their comprehension and preparation for surgery.23 The patient needs to appreciate the value and difficulty of breast reshaping with upper body tissue discard (see video clip 00: 00–1: 04) The patient accepts flap donor site and mastopexy scars that may extend around the back. Accompanying brachioplasty scars lie along the medial arm, across the axilla, and down the mid-lateral chest. Obese patients with relatively poor vasculature and thick immobile flaps are generally poor candidates. Thin patients offer insufficient tissue. Patients who are medically and psychologically unstable, non-compliant, unreasonable, and using tobacco products are also generally poor candidates for these procedures.

Spiral flap reshaping successfully treats the empty breast that is associated with extreme NAC ptosis and glandular descent following massive weight loss. A variety of breast shapes, ranging from broad and flat to constricted, are amenable to these operations. Patients who have had prior breast reduction and implant augmentation are also treatable. In women with excess skin and fat in the upper torso in which the lateral volume is greater than the medial volume, the operation can be accompanied by a simultaneous upper body lift (UBL). UBL consists of a reverse abdominoplasty, excision of back skin excess, and creation of a raised IMF. The anticipated upper abdominal excess tissue is left attached inferiorly to the breast mound to be de-epithelialized and flipped over the inferior pole. The roll of lateral chest and back tissue is left contiguous to the central breast mound as a transverse lateral thoracic extension. For lesser back laxity without rolls of skin, the lateral flap extension is modified to ascend superiorly along the mid-lateral chest to the axilla, which is the subject of the accompanying video demonstration.

OPERATIVE APPROACH

Spiral flap reshaping depends on an understanding of the above-described geometric interplay of upper body lift and breast anatomy and aesthetics. One must preserve blood supply to both the breast and this complex flap, and be technically facile in de-epithelialization, harvesting, moving, and shaping these flaps using an appropriate mastopexy technique.

Our clinical and cadaveric laboratory experience proves that the vasculature of the breast, axial pattern and perforators of the lateral thoracic, thoracoacromial, internal mammary and intercostal vessels, emanates through suspending fascia about the fourth rib24 (Fig. 13–6). Accordingly, the elevation of the descended breast from the eight
to the sixth ribs does not disrupt this critical mid-thoracic blood supply. Likewise, the creation of a lateral supraperiostal opening and superior tunnel over the third rib avoids critical axial vasculature. The mastopexy pattern varies from circumareolar to Wise. Because undermining is in the deep subcutaneous plane, the vascularity of the NAC and parenchyma is preserved. Our experience with limited skin necrosis is related to excessive tension at closure.

The spiral flap consists of both a broad-based inferior flap extension of the central breast mound and a narrow-based lateral thoracic fasciocutaneous flap supplied by trans-serratus fascial intercostal perforators. The patient with massive weight loss has large subcutaneous tissue vessels which are readily identified and supply these flaps to the tip of the scapula.

Finally, the breast reshaping depends on a complex interplay of mastopexy and autogenous tissue filling, with flip-up of an inferior flap of epigastric tissue and turning, twisting, and advancement of a large flap of lateral chest tissue tunneled under the upper pole of the breast. Persistent projection and natural contour without bottoming-out depends on secure suturing of the flaps and the reverse abdominoplasty to the costal cartilages and fascia.

Preoperative planning for the breast reshaping and upper body lift begins with a final assessment. Some patients lose or gain substantial amounts of weight, or may have altered their priorities and expectations. If a single stage total body lift is planned, the lower body lift and abdominoplasty are drawn first, which is taken into consideration for the upper body lift. 31

Severe skin laxity of the upper torso is optimally treated with a complete upper body lift, a transversely oriented de-epithelialized back flap, and a Wise pattern mastopexy (see Figs 13.3-13.5. The upper body lift combines a reverse abdominoplasty with removal of the back rolls, elevation and fixation of the inframammary fold, and breast reshaping. For severe deformity a Wise pattern mastopexy is needed for elevation of the NAC, removal of excess breast skin, and the inclusion of de-epithelialized discard from the mid-torso.

In patients with mild to moderate upper body skin laxity, the upper lift is modified to give fewer and less conspicuous scars. Moderate breast ptosis may only need a circumareolar or vertical pattern mastopexy. Isolated lateral IMF descent responds to elevation only along the lateral chest wall. The transverse back excision for the lateral thoracic flap harvest can be exchanged for a wide lateral chest de-epithelialized sickle shape. The back and lateral chest skin is then advanced to the mid-axillary line, with suture fixation to the serratus fascia. The sickle-shaped bridges from the lateral breast to the short limb of the left brachioplasty.

For the following operation description refer to the accompanying video segments. Figures 13.6-13.8 show the preoperative surgical markings and the result at 4 months of the filmed patient. The preoperative and 2-weeks postoperative videos are 1: 04-2: 17.

Markings for the upper body lift begin with the patient standing, which allows the torso skin and breasts to descend. After the usual grid pattern is drawn, the ptotic breast is elevated off the chest wall to site and mark the current IMF along the nipple line. [video 2: 18-5: 20] This level is registered across to the lower sternum. The low breast is pushed up to the sixth rib, and if the patient consents that is the desired level this higher IMF level is sited and marked over the sternum. There will be a several but well-appreciated centimeter rise from the old IMF.

Because raising the IMF lowers the NAC, the new NAC is positioned several centimeters higher than the new IMF along the nipple line. This point is also registered over the sternum. If there is excess skin and the breast needs to be narrowed, a Wise ‘keyhole’ pattern is drawn. To accommodate anticipated tissue fill, the descending vertical limbs are kept narrow and long.

The inferior incision line of the Wise pattern, which is usually placed about the current IMF, is positioned inferiorly onto the lower chest to include anticipated discard skin from the reverse abdominoplasty. To determine this additional area of skin, the patient should lift her breast mound to the anticipated higher level, then push the epigastric skin upwarde and laterally until the umbilicus moves slightly superior. The raised lower chest skin along the convergence of the nipple line and an imaginary horizontal extension of the new IMF are marked on the sternum with an ink dot. From the ink dot a rising line sweeps medially to the medial incision line of the Wise pattern near the sternum. From the nipple line inferior incision junction the line continues laterally and parallel to the lateral incision line of the Wise pattern. The advanced reverse abdominoplasty flap establishes the new IMF. Unless there is symmastia these upper reverse abdominoplasty incisions do not cross the anterior midline.
These are the preoperative and 3-months postoperative views of a 5 ft 6 in 175-pound, 37-year-old massive weight loss patient who had a single-stage total body lift. The upper body lift, spiral flap breast reshaping and L brachioplasty are demonstrated in the accompanying video. There is correction of all her sagging skin and contour issues, with acceptably maturing scars. Her breasts are symmetrical with adequate superior pole fullness and no glandular ptosis. Her convex lateral breast transitions into a concave but rounded anterior axillary fold. The hanging arm skin is corrected with reduction of the hyperaxilla and no constricting bands.
FIGURE 13.8
The next step involves determining the breadth and length of the transverse lateral chest and back skin roll to be removed, which was not performed in the patient in the video. (see figs 13.1–13.3). This excess tissue provides fill and shape as a de-epithelialized, laterally based fasciocutaneous flap. The width of the tissue to be removed is determined by gathering the local redundant skin. The shape of flap resembles a hemiellipse rather than an equal-sided ellipse, with the longer inferior line advanced laterally during closure, which slightly reduces transverse width to narrow the waist. The placement of this excision pattern results in a closure along the brassiere line.

Alternatively, when there is only mild to moderate skin excess in the mid-torso and back, and the patient objects to a back scar, a sickle-shaped excision is drawn by pushing this excess skin superior and lateral to the breast and gathering the excess along the lateral chest (see video clip 2: 18–5: 20. The lateral chest excision continues into the axilla as the short limb of the L brachioplasty. For most patients, the upper body lift is completed with an L brachioplasty. This complements the breast reshaping as it treats four intertwined deformities of the upper arm, axilla, and lateral chest. The brachioplasty corrects the canopy-like hanging skin, ptosis of the posterior axillary fold, oversized axilla, and lax lateral chest skin.

The L brachioplasty consists of a long-limbed hemielliptical excision of the inferior medial upper arm skin and a short-limbed vertical elliptical excision of the lateral chest connected by an inverted V excision through the axilla |see Figs 13.3, 13.4, 13.7 and 13.8, and video segment minutes 5: 20–7: 32 for details of the L brachioplasty markings. The superior incision line of the arm ellipse rises from the medial elbow along the bicipital groove to the deltopectoral groove. By gathering and pinching the excess skin of the arm, the inferior incision line extends from the medial elbow along the posterior margin of the arm to rise towards the deltopectoral groove. The second ellipse drops vertically from the deltopectoral groove to include approximately the lateral half of the axilla and excess lateral chest wall skin. The chest portion of this ellipse is coordinated with the removal of a back roll performed during an upper body lift, and expansion of the breast by auto-augmentation.

An inferiorly based triangular flap is formed as the inferior arm incision meets the lateral incision of the vertically oriented lateral chest ellipse. The ability to advance this triangular flap to the deltopectoral groove is established by pinch approximation. This maneuver elevates the ptotic posterior axillary fold, tapering the arm into the axilla.

For the severe deformity, the upper body lift with spiral flap reshaping begins in the prone position with the
harvesting of a lateral chest flap from mid-back excess. In mild to moderate situations the sickle flap modification is prepared in the supine position. In either case, the flap is de-epithelialized in situ (see video 7: 32–8: 45). As these flaps and the epigastric flaps are large areas, removal of thick, split-thickness grafts with an electric dermatome is preferred. A subsequent careful search for and removal of retained epithelium is essential to minimize cyst formation. The de-epithelialization commits the width of resection, so the surgeon must be accurate in preoperative marking. While the patient is prone in the severe cases, the perimeter incisions are made through the subcutaneous fat to the latissimus dorsi muscle. After undermining for several centimeters, the flap is elevated from the muscular fascia extending medial to lateral. The muscular fascia is included with the flap near the lateral border of the latissimus dorsi, as when the serratus anterior muscle is reached the dissection stops. Prior infiltration with epinephrine-containing solutions is recommended to reduce blood loss. The edges of the excision are aligned with towel clips for the two-layer closure.

The patient is wrapped in a surgeon’s gown and turned supine. The de-epithelialized lateral chest flaps remain attached to the serratus anterior and the central breast pedicle. When the width of the reverse abdominoplasty skin excision is confirmed, the extended Wise pattern is de-epithelialized. After marking the NAC with a 45 mm diameter cookie cutter, the Wise pattern mastopexy with its epigastric extension is de-epithelialized and extends to the previously raised lateral thoracic flap extension. This tedious process is expedited with the use of an electric dermatome set at 32 thousands of an inch. The medial, superior and lateral skin flaps of the Wise pattern are incised and undermined superficially as needed (see video 8: 46–9: 15).

If the sickle-shaped modification of the spiral flap is chosen, the de-epithelialized flap perimeter incisions are made and the flap is raised from the serratus fascia, starting from the axilla. The flap’s anterior limb incision is completed first (see video 9: 16–9: 39). With identification of the lateral border of the pectoralis major muscle near the fourth rib, dissection of a tunnel for the flap continues across the muscle (see video 9: 40–10: 53). Because the muscle is adherent to the skin, in thin patients it can be easily palpated along the anterior axillary line. The search for this junction is aided in heavier patients by incising to the anticipated level of the muscle and then retracting away. A dissection that is too deep tends to be associated with increased blood loss and may result in damage to major blood supply to the breast. Once the lateral border is identified, the dissection proceeds broadly over the anterior surface over the third and fourth ribs. A path from the base of the lateral thoracic flap to the window over the pectoralis muscle is created without injuring the large vessels overlying the serratus fascia. The pocket for the spiral flap is developed towards the parasternal region. The space is crescent shaped, extending under the superior pole of the breast from lateral border of the pectoralis muscle near the fourth rib to the sixth sternochondral junction. The tunnel is widened enough to accept the lateral thoracic flap.

The next step includes the posterior incision and completion of flap elevation. The fifth, sixth, and perhaps the fourth intercostal trans-serratus perforators are protected by awareness of the lateral border of the latissimus dorsi muscle and the ribs (see video clip 10: 54–12: 08). These vessels can be located by Doppler or direct visualization to the mid-axillary line. The lateral thoracic portion of the flap is nearly raised, but not until the entire breast is suspended, so the reverse abdominoplasty begins.

The long junction between the extended de-epithelialized flap and upper abdomen is incised from the parasternal region to the raised lateral thoracic flap (see video 12: 09–13: 15). The breast with its epigastric flap extension is undercut along the rectus muscle fascia from the lower ribs to the sixth rib (see video 13: 15–13: 44). The new IMF position, which has been registered over the sternum, guides this movement of the central breast pedicle. The termination of the tunnel for the lateral thoracic flap is completed under the medial flap of the Wise pattern parasternally about the sixth rib (see video 13: 45–14: 27).

With the breast mobilized and the submammary tunnel completed, the lateral thoracic flap is prepared for augmentation by trimming back the distal tip until bright red bleeding is appreciated. A suture is placed through the distal end of the flap, followed by the insertion of a long clamp through the parasternal site. This is grasped and the back flap rotated along the lateral border of the pectoralis muscle, into the submammary space (see video clip 14: 28–16: 30). This pulling suture is then stitched to the sixth costochondral junction, which holds the medial position of the flap. While in situ, the flap is tailored to optimally augment and reshape the breast. Generally the flap lies flat, but it may be rolled or further advanced on itself. The spiral flap is stitched to the lateral border entrance of the pectoralis major muscle (see video 16: 31–17: 24). The breast usually slopes laterally with inadequate projection. Centralizing the breast requires suture suspension of the de-epithelialized flap, catching mid-epigastric flap dermis and pulling it medially by approximating it to the sixth rib cartilage (see video 17: 25–18: 18).

The next step is to align the NAC and superior portion of the Wise pattern vertical flaps (see video 18: 18–18: 59). The inferior epigastric extension is rotated upward and sutured to shape and project the mound (see video 19: 0–20: 23). Attention is again directed to the reverse abdominoplasty component. The inferior pedicle abdominal skin flap is directly undermined for several centimeters, and with the aid of graduated Brazilian dissector dilators the flap is discontinuously undermined over the rectus abdominis fascia beyond the costal margins (see video 20: 24–22: 07). The breast pedicle is repositioned superiorly and the inferiorly based abdominal flap is advanced to the new IMF, which is usually at the fifth and sixth ribs. Appropriately 12 interrupted 0 braided polyester sutures are placed in the subcutaneous fascial portion of the flap and along the sixth rib cartilage and periosteum (see video 22: 07–24: 27). With the modified upper body lift and sickle
flap, the advancement of the reverse abdominoplasty is in continuity with the lateral chest skin flap as shown in the last video.

With the abdominal flap pushed firmly upwards, the sutures are sequentially tied [see video clip 24: 27–26: 37]. The closure of the reverse abdominoplasty forms the new inframammary fold, hidden under the breast.

The medial and lateral Wise pattern breast flaps are advanced over the breast mound and sutured together and along the IMF to complete the restoration of the breast [see video 26: 38–27: 08]. The added flap volume creates additional tension on the closure of the Wise pattern flaps. A high-tension closure of the lateral thoracic flap donor site from the axilla to the IMF appropriately flattens this area, emphasizing the newly created lateral breast fullness and projection. The lateral chest donor site closure is continuous with the advanced and stabilized new IMF. A firm fold also improves breast projection and eliminates bottoming-out. A matching procedure is performed on the contralateral breast.

The reverse abdominoplasty is closed in three layers. After the interrupted large braided permanent sutures, there are running absorbable sutures placed in the subdermal and monofilament sutures placed in the dermis. During this closure, the L brachioplasty begins with thorough liposuction under the skin destined for resection [see video 27: 08–27: 20]. Ultrasound-assisted lipoplasty (UAL) with additional UAL of the arm is preferred and performed as needed. The posterior incision is followed by the anterior incision [see video 27: 20–27: 56]. The L-shaped strip of skin with very little fat is excised, leaving demuded vasculature and sensory nerves [see video 27: 56–28: 50]. Closure of the brachioplasty begins with deep suture advancement of the posterior axillary fold triangular flap across the axilla to the Deltopectoral groove with 2/0 braided suture [see video 28: 52–29: 30]. Towel clips are used to align the skin closure. Closure is performed in two layers using an absorbable suture. Our experience with the speed, ease, and holding power of the Quill 0 double-armed barbed suture has been favorable [see video 29: 30–32: 45]. Quill 2/0 sutures can also be used for the dermal closure [see video 32: 35–33: 14]. The ipsilateral breast can be closed concurrently with the de-epithelialization on the contralateral breast [see video 33: 15–33: 45].

The final intraoperative video and the results 2 weeks postoperatively are shown in the video atlas 33: 45–34: 38. As the skin tension begins to equilibrate, the brachioplasty scar courses from the medial epicondyle along the medial arm, just inferior to the bicipital groove, coursing to the axillary dome before descending vertically and terminating on the chest, forming an inverted L. The inferior contour of the arm drops slightly at the mid-humerus and then rises distinctly to a superiorly positioned posterior axillary fold. The suspended posterior axillary fold skin conforms well to the axillary hollow. The brachioplasty scar zigzags through the axilla, descending and curving around the lateral breast, similar to the lateral brachiotoracoplasty of Pitanguy. The mid-torso laxity has been corrected, and the breasts are raised, with improved fullness and shape.

**OPTIMIZING OUTCOMES**

- Properly analyze the deformity and the volume of tissue available for auto-augmentation.
- Select the appropriate mastopexy pattern and anticipate the extra skin to accommodate added breast volume.
- Consider the sickle pattern modification of the spiral flap for less severe deformity or to avoid a back scar.
- Master each of the component operations and their complex interplay.
- Develop an obsessive marking technique that leads to confidence to commit full inclusion into flaps, pre-excision defatting, or expeditious excision.
- Learn a rapid means of de-epithelialization, such as the use of an electric dermatome.
- Minimize the use of electrocautery to make incisions that will be closed under tension.
- Secure the IMF as firmly as possible.
- Expect the closure tension of the reverse abdominoplasty and the breast mound to be high.
- Further undermine the Wise pattern flaps, or remove some of the spiral flap if the closure tension is too high.
- Develop a team of operators with confidence in each other.

**COMPLICATIONS AND SIDE EFFECTS**

Moderate incisional pain may linger for several weeks along the reconstructed IMF. Oral medication with narcotics is usually adequate. In cases where pain is protracted, an intercostal nerve block may be useful. Breasts in which the swelling and edema is moderate to severe generally relax and become ptotic, usually over the course of 1 month. Diffusely swollen upper extremities require higher elevation and more complete elastic wrapping.

The most common complication is distal flap necrosis of the lateral thoracic extension. Experience has demonstrated that some firmness may be palpable in about 20% of cases. This will generally resolve without treatment. From over 100 cases, inclusion cysts necessitating a biopsy or aspiration have been performed in only four. One patient suffered skin edge necrosis of the reverse abdominoplasty flap and cellulitis 1 week after an upper body lift. She had resumed cigarette smoking immediately after her surgery. Healing was by secondary intention. Scar revision restored an aesthetic result.

Some patients have experienced a diminution of superior pole fullness over time. Others have developed lateral breast fullness at the base of the lateral thoracic flap. In two patients the lateral breast was further advanced along the serratus fascia to correct this malposition. In the occasional case of breast size asymmetry, the fault lay in failing to consider the preoperative size discrepancies. Lateral IMF descent was significant in five breasts, probably owing to the large size of the flaps. This descent was corrected with readvancement of the lateral breast.

The L brachioplasty triangular flap across the axilla has a tenuous blood supply and may suffer necrosis, particularly if there is direct pressure. A small area of skin loss may
lead to a large wound that may need to heal by secondary intention.

**POSTOPERATIVE CARE**

The incisions are usually covered with a skin glue together with a light gauze dressing and a surgical bra. No constricting binder is placed across the mid-abdomen, although a long-leg elastic lower body garment is used. Patients are admitted for a single night’s observation and care. The brachioplasty incisions are covered with large gauze pads and placed in an ACE wrap. These are replaced by elastic sleeves several days later. No direct pressure is placed on the triangular flap in the axilla as it is vulnerable to ischemic necrosis. As previously stated, considerable incisional pain may linger along the IMF, which may require and responds well to intercostal nerve blocks.

The scars may take years to mature, especially along the distal arm. Minor contour deformities of the breast are successfully treated with lipoaugmentation in the subcutaneous plane.

**CONCLUSION**

There are a variety of operations to reshape the breast after massive weight loss. It is the primary author’s feeling that options using autologous tissue are preferable to those that use prosthetic devices, and therefore these flaps have become the treatment of choice. A compound flap that includes an epigastric and a lateral thoracic extension to the central breast mound has been designed and termed a spiral flap based on the manner of usage. The spiral flap has been successfully combined with an upper body lift and L brachioplasty in over 100 patients. The saddle-shaped modification is demonstrated on video for this atlas.

**REFERENCES**

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NCR013
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37. ED: **
38. AU: pls indicate where the boxes are to be placed.
39. AU: please resupply figure 13.8A as the file was corrupt
40. AU: pls supply Figure 13.4d