

Post Bariatric Surgery Breast Reshaping:

The Spiral Flap

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## Abstract

**Introduction:** After massive weight loss, the breasts have poor shape, projection and skin elasticity. Breast reshaping is recognized as difficult and may require excess nearby tissues. As the senior author's approach evolved over the past 4 years, breast reshaping with the Spiral Flap became integral to an upper body lift.

**Materials and methods:** After the weight loss is stable, body contouring surgery has been performed on 53 patients over a three year period. Six patients had mastopexy and /or augmentation only. 18 patients had Spiral Flap breast reshaping as part of an Upper Body Lift. This lift is a reverse abdominoplasty that ends along the inframammary fold incision of the Wise pattern mastopexy and continues laterally to along the back roll. Excess tissue from the epigastrium and lateral back roll is deepithelialized and used for augmentation. These flap extensions of the central breast pedicle are spiraled around the breast for augmentation, shaping and suspension. When more tissue is needed, saline filled silicone implants have been used, preferably during a second stage.

**Results:** Follow up of this initial group ranged from 4 to 28 months with a mean of 11 months. In this initial effort 14 of the 18 were pleased. In three patients subsequent bilateral saline implants further augmented the breasts. Tip fat necrosis was evident by firmness of the tissues in 3 patients and resolved in all but one. That one patient had operative debridement of the distal 50 % of the flaps followed by saline filled silicone implants. One patient was disappointed with the back scar. Two patients dislike the shape and fill of their breast and have not returned for revision.

**Conclusion:** During three years of focused clinical activity, we have evolved the Spiral Flap reshaping with upper body lift into a comprehensive, effective, satisfying and safe aesthetic contouring of the breast and upper torso after massive weight loss. performed with an upper body lift.

Massive weight loss results in diverse patterns of undesirable skin laxity. This paper concerns our experience with the deformed and malpositioned breast. We present an innovative technique and a sampling of our initial three year experience using the Spiral Flap with an Upper Body Lift for recontouring the breast and chest.

Following catabolism of fat and supporting connective tissue, the full sized breast suffers reduced projection, flattening and flaccidity. Both nipples and inframammary fold (IMF) descend. Macromastia may dissolve into a disturbing pancake appearance. Constricted breasts become smaller and snout-like due to deficient inferior and superior poles. While some breasts need further reduction, most benefit from augmentation.

The breast deformity is complicated by nearby skin excess. When severe the cascading skin rolls, sweeping like a Viennese curtain from midline to lateral chest, overwhelms the diminutive breasts. (Figure 1) The sensuous feminine “S” like continuum from axilla to lateral breast, is replaced by a straight line bridging sagging breast and oversized axilla. Hyperaxilla is our name for the wrinkled, deep axilla with a descended posterior axillary and flattened anterior folds. The hyperaxilla leads to an upper arm with bizarrely hanging excess skin.

Breast deformity can be treated by traditional reduction, silicone implant augmentation or implant augmentation with mastopexy. (1-4) Regardless of the technique, we find that the reduced breasts do not maintain good projection. Likewise these breasts conform poorly to silicone implants. Even with a proper and firmly positioned IMF with near-normal surrounding tissue, the augmented and rounded breast transitions poorly. (Figure 2) In general, ignoring nearby chest, axillary and arm

deformity leads to aesthetic disharmony. The use of nearby excess tissue for breast enhancement has been suggested without giving technical details. (1, 2)

The innovative Spiral Flap with an Upper Body Lift effectively addresses all the components of the upper torso deformity. (4-6) The four intertwined operations of an upper body lift are (1) correction of epigastric looseness through a reverse abdominoplasty; (2) superior positioning of the inframammary folds; (3) elliptical excision of lateral chest and mid back skin rolls; and (4) reshaping the breasts with mastopexy with Spiral augmentation. The new L brachioplasty compliments the Upper Body Lift. (7)

The reverse abdominoplasty removes excess skin of the upper abdomen not treated by traditional abdominoplasty. A preoperative superior lateral push with effacement of the roll estimates the excess. When a Spiral Flap autogenous augmentation is planned, some of that excess skin becomes a deepithelialized extension along the inferior portion of the Wise pattern mastopexy. The remaining excess skin flap is advanced to be sutured about the sixth rib to firmly reestablish a more superior IMF. The reverse abdominoplasty extends laterally to the inferior tip of the scapula to correct the mid back rolls of skin excised along the anticipate brassiere line. With a planned Spiral Flap, the lateral chest and back excess is deepithelialized in continuity with the lateral aspect of the Wise pattern to be used as an augments and suspender of the breast.

The Spiral Flap is inferior and lateral deepithelialized fasciocutaneous flap extensions of a Wise pattern mastopexy. (Figures 3-5) Since the tissue is both a superiorly based epigastric flap and a medial based lateral mid thoracic it defies simple anatomical appellation. Since optimum positioning involves an upward flip of the inferior

portion and a twist, rotation and advancement of the lateral portion, the efficient description is Spiral Flap. We always spiral this compound flap and believe that geometry enhances breast projection. Spiral breast flaps are integral to from the Beisenberger to the Hall-Findlay breast reductions (8, 9).

The Lateral thoracic and perforating intercostal and pectoral vasculature supply this flap. (10,11) While an annoyance during dissection, the persistently enlarged vasculature of the weight loss patient lends prodigious length with reliability to these flaps.

### Technique

The patient is upright for planning the Spiral Flap and Upper Body Lift, allowing the breasts and torso skin to descend. (Figure 6, upper left) The ptotic breast is cradled to sight and mark the existing IMF about the seventh rib. That level is registered on the immobile skin over the lower sternum. The patient confirms the low position of her breast as she has to raise the entire breast when securing her brassiere. Together you push the breast up on the chest to its proper position. The new IMF is sighted along the nipple line and then transposed medially for its registering mark over the sternum. The new IMF is several centimeters above the existing IMF, about the sixth rib. Raising the IMF will slightly descend the nipple as if the breast was tipping over a ledge.

Factoring in this new IMF location, the new nipple position along the ideal mammary nipple line is marked. Where there is considerable autogenous flap fill available, a narrow-angled “key whole” pattern is drawn. The usual medial continuation to the parasternal region and lateral extension to the midaxillary line are then drawn. The

IMF incision line of the Wise pattern is dropped inferiorly onto the lower chest to include anticipated excess skin and fat that would be removed during the reverse abdominoplasty and raising the IMF to the new level. To determine this area have the patient lift her breast mound until the existing IMF rises to the new level registered on the sternum. This will take up some of the slack. Then push the remaining excess epigastric skin upward and lateral, until the umbilicus moves superior. Then ink dot the raised upper abdominal skin on the convergence of the nipple line and an imaginary horizontal extension of the new IMF marked on the sternum. From the ink dot a tapered line sweeps medially to meet the medial line of the Wise pattern near the sternum and laterally and horizontal to about the mid axillary line. This advanced reverse abdominoplasty flap establishes the new IMF.

Finally, the width and length of the transverse lateral chest and back skin roll removal is determined. The width of the tissue removed is determined by pinch and gathering of local redundancy. The alignment of the excision anticipates closure along the brassiere line. These two lines continue anteriorly into the previously marked expanded Wise pattern breast reduction. The lines are tapered posterior to close the ellipse near the tip of the scapula. We prefer to leave some mid back skin rather than carry the excision across the midline.

Unless there is symmastia and the breast reduction pattern takes us there, these reverse abdominoplasty incisions do not cross anterior midline, even though some epigastric midline laxity remains. Trans sternal scars are avoided because they are easily

seen and frequently hypertrophy. After marking the second breast, differences are reconciled due to patient asymmetry or drawing error.

Upper body lift usually begins prone with harvesting of the two lateral thoracic portions of the Spiral flaps. An electric dermatome is used to deepithelialize the demarcated flaps. The marked incisions are made through skin, fat and Latissimus Dorsi fascia. The tissue is elevated from posterior to anterior as a fasciocutaneous flap from over the Latissimus Dorsi muscle. Dissection stops at the anterior border of the muscle. After minimal undermining, the skin is closed in multiple layers of absorbable suture, leaving the flaps dangling for turning the patient supine.

Once supine, the excess skin and fat of the epigastrium is deepithelialized in continuity with the Wise breast pattern. (Figure 6, upper right) The reverse abdominoplasty incision is made along the inferior extent of the deepithelialization. The abdominoplasty flap is undermined as needed. The central breast and its attached Spiral flap is undermine to about the sixth rib. The medial breast is undermined over the Pectoralis Muscle fascia along the parasternal region and then over the superior pole of the breast to make room for the tail of the flap. Along the mid axillary line, dissection through the lateral limb of the Wise pattern deepens to the Serratus fascia and continues slowly cephalad and anterior to reach the lateral border of the Pectoralis Major muscle. The suprapectoral plane is rapidly opened over the superior pole of the breast. The dissection along the lateral border of the Pectoralis has to be wide enough to accommodate the lateral thoracic flap. The size of this crescent shaped pocket relates to the width and positioning of the lateral portion of the flap. After the distal flap is trimmed to adequate blood supply, a suture is placed there. The flap is flipped with the dermis side

down and pulled by that suture across the Pectoralis muscle, and then secured by it to the parasternal sixth intercostal cartilage. Just beyond its medial base, deepithelialized flap is sutured to the central deepithelialized breast mound to assist in breast shaping and avoid lateral drift of the flap. Finally, the broad epigastric flap extension of the deepithelialized Wise pattern is flipped up against the inferior breast and secured with absorbable sutures.

Created from mid torso excess, the Spiral Flap is mobile enough to permit artistry in shaping, suspension and augmentation. The breasts are not only enlarged and bettered shaped, but are soft and shift naturally with change in body position. The constricted inferior breast is beautifully filled with redundant epigastric tissue. Sensual tapering of the lateral breast along the anterior axillary line into the axilla, creation of the “S” curve, is possible for the first time. The flat plane bridging descended breast and hyperaxilla axilla is gone.

The Spiral Flap is positioned only after the reverse abdominoplasty incision has been made and the central breast mound has been elevated to the sixth rib. Then the superior margin of the NAC is sutured to the apex of the keyhole pattern. The reverse abdominoplasty flap is then undermined so that it can comfortably reach the sixth rib. The inferiorly base abdominoplasty flap is then secured along the sixth rib with a dozen interrupted large braided sutures through large bites of the subcutaneous abdominal fascia to costochondral cartilage and nearby rib fascia. These sutures are gathered and then tied while the reverse abdominoplasty is firmly pushed into position. The infra axillary chest skin lateral to the breast, undermined for exposure of the pectoralis muscle and flap placement is suture quilted back in position to close this space. Finally the medial and lateral Wise pattern flaps are minimally undermined to be advanced over the enlarge

breast mound to the reverse abdominoplasty flap edge, which is the newly created inframammary fold. Suture closure is completed around the areola. (Figure 7)

#### Results:

Eighteen patients had upper body lift with Spiral Flap reshaping of both breasts. An L brachioplasty completed upper body correction in fifteen. Follow up of this initial group ranged from 4 to 28 months with a mean of 11 months. In three patients subsequent bilateral saline implants further augmented the breasts. Tip fat necrosis was evident by firmness of the tissues in 3 patients and resolved in all but one. That one patient had operative debridement of the distal 50 % of the flaps followed by saline filled silicone implants. One patient was disappointed with the back scar. Two patients dislike the shape and fill of their breast and have not returned for revision. Figures 1, 6 and 7 are examples of pleased patients.

#### Discussion:

The Spiral Flap with an Upper Body Lift is an innovated and reliable method to construct an artistic autogenous tissue augmentation and shaping of the breasts. In essence the Wise pattern mastopexy elevates the nipple and removes excess skin with brassiere-like coning of the breast. The inferior flap of excess epigastric tissue fills out deficient lower pole, while the flattened superior pole is filled with the lateral thoracic roll. Sandwiched between is the atrophic raised breast mound that is supported by the enlarged lower pole and fixed inframammary fold and suspended by the superiorly secured flap

This complex procedure is long but can be shortened to less than four hours if the considerable deepithelialization is mechanized. We favor the electric Padgett dermatome. The extraordinary length of the lateral chest extension is probably assisted by the generous subcutaneous vasculature found in the weight loss patient. The operation is satisfying, because it is dependable, logical, creative and artistic.

It takes experience to conceptualize the volume available from the mid thoracic roll. When there is little present than a breast implant is needed. Once the flaps are in position, there is rarely room under the breast skin for an implant for fear that the added tension will compromise the Spiral Flaps. Most weight loss patients prefer not to have silicone implants added to their body, especially when they learn of the long term malposition problems. They perceive the Spiral Flaps as an elegant and more natural means to an improved upper body figure.

Spiral Flap breast reshaping requires the appropriate patient anatomy. It appears that the worse the deformity the better is the result especially compared to implant reconstruction. The disadvantages are its complexity and occasional distal flap necrosis.

Conclusion:

During three years of focused clinical activity, we have evolved the Spiral Flap reshaping with upper body lift into a comprehensive, effective, satisfying and safe aesthetic contouring of the breast and upper torso after massive weight loss. Inadequate results appear to be poor patient selection or deficiencies in technique which are overcome by experience and care.

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## Figures

Figure 1 The left photograph is a left oblique view of a severe presentation of the breast, and upper body in a 240 pound, 5' 6" woman, who lost 300 pounds after gastric bypass. The breasts are flat and sagging. The torso rolls are large and asymmetrical. The arm skin is sagging and wrinkled. The right photograph show her two years after her Spiral Flap breast reshaping, upper body lift and L brachioplasty.

Figure 2 This is the before and 8 month post operative result of a 350 cc. silicone gel implant and concentric ring mastopexy in a 32 year old 5'5" 130 pound woman , who lost 90 pounds through dieting and exercise. Her limited upper body laxity and firmly positioned IMF made her a good candidate for augmentation mastopexy. However her rounded breast transitions poorly to the chest wall.

Figure 3 The incisions are diagramed for the Wise pattern and Spiral Flaps with a cut out of the nipple areolar complex (NAC). There is an inferior flap extension for the epigastric excess and a lateral extension for the back roll. The flap excision is positioned so that the closure will lie along the bra line. The new inframammary fold is established as the raised boarder between the reverse abdominoplasty and the mastopexy.

Figure 4 Except for the NAC, the breast and extensions are deepithelialized for mastopexy and spiral flap harvest. The lateral thoracic portion has been elevated from the Latisimuss Dorsi muscle. There will be discontinous undermining of the reverse abdominoplasty flap.

Figure 5. The lateral extension has been flipped with the dermis side down and tunneled over the Serratus, and Pectoralis Major muscles. Its position under the superior pole of the breast is secured with a lateral parasternal suture attachment and suturing about the

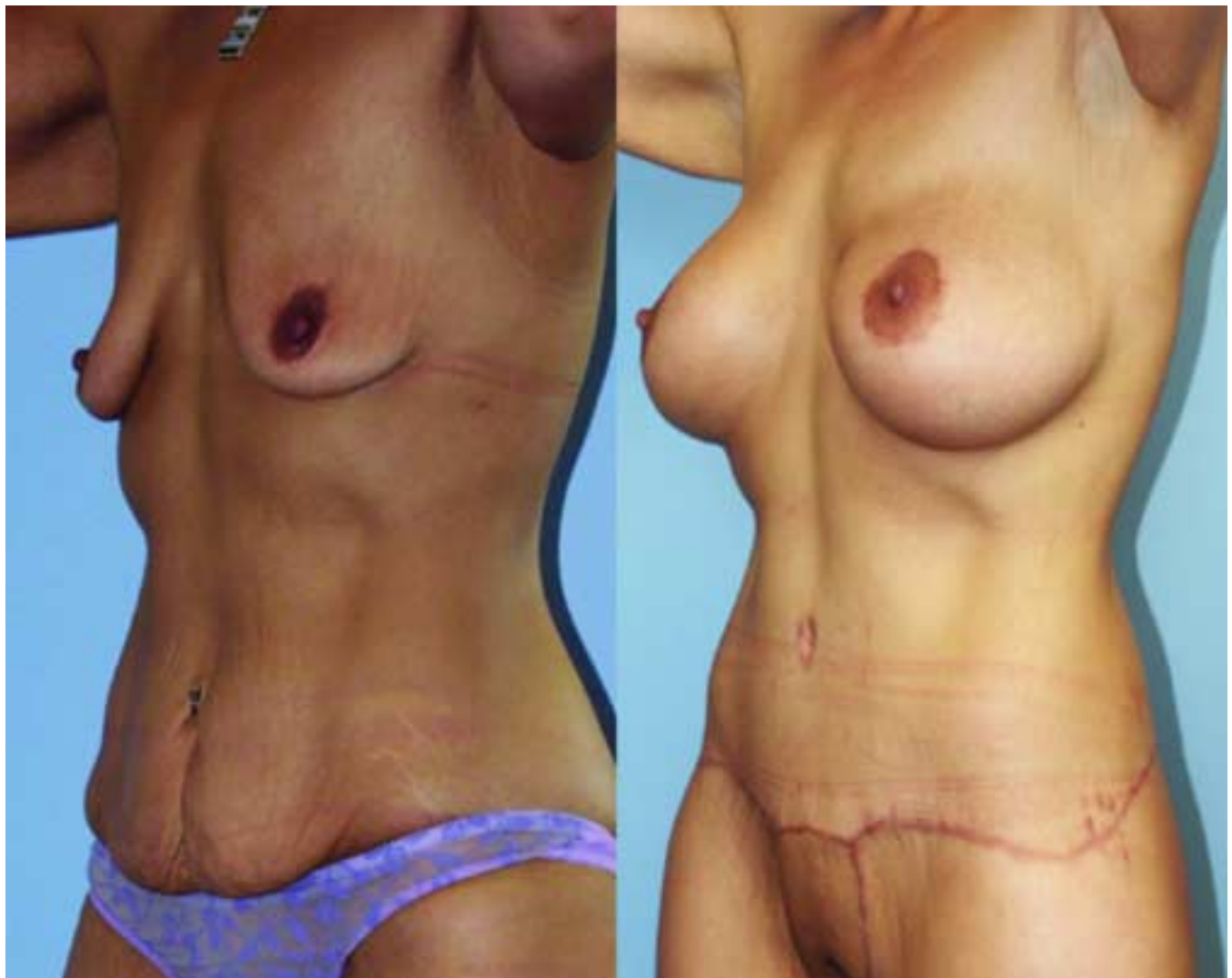
lateral border of the Pectoralis Major muscle. The epigastric flap is flipped up to augment the inferior pole of the breast.

Figure 6. These are the completed surgical markings and selected intraoperative photographs for an Upper Body Lift, Spiral Flap breast reshaping and L Brachioplasty in a 170, 5' 5" pound 48 year old woman, who lost 160 pounds after gastric bypass. She has small constricted breasts, hanging lateral chest rolls and excess arm skin. The extended abdominoplasty and vertical thighplasty portions of her single stage Total Body Lift are not seen. The numbering in the left upper photo follows: **1** is the registered mark for the new IMF; **2** is the new nipple location; **3** is the long lateral limb; **4** is the border line of the extended Wise Pattern and the reverse abdominoplasty; **5** and **6** are extensions enclosing excess skin with the lateral thoracic portion of the Spiral flap. (Upper right) The deepithelialized and raised Spiral Flap is seen *in situ*. (Lower left) There is a retractor in the submammary space over the Pectoralis muscle opening the space made for the lateral thoracic flap portion. (Lower right) The Spiral Flap is rotated into the submammary space and folded against the inferior pole of the breast. Next the reverse abdominoplasty flap will be sutured along the sixth rib.

Figure 7 These are the preoperative and 18 month post operative frontal and oblique views of the patient presented in figure 6. Not only is the breast well shaped and sized but there is a harmonious and natural appearance to the upper body and arms.

Figure 8. These are the before and one year after Upper Body Lift, Spiral Flap reshaping and L brachioplasty frontal and left oblique views in a 33 year 5'4" 146 pound woman, who had lost 140 pounds by dieting and exercise. She is pleased by the size and shape of her breasts as well as relief from surrounding skin laxity.

**Figure 2**  
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**Figure 3**  
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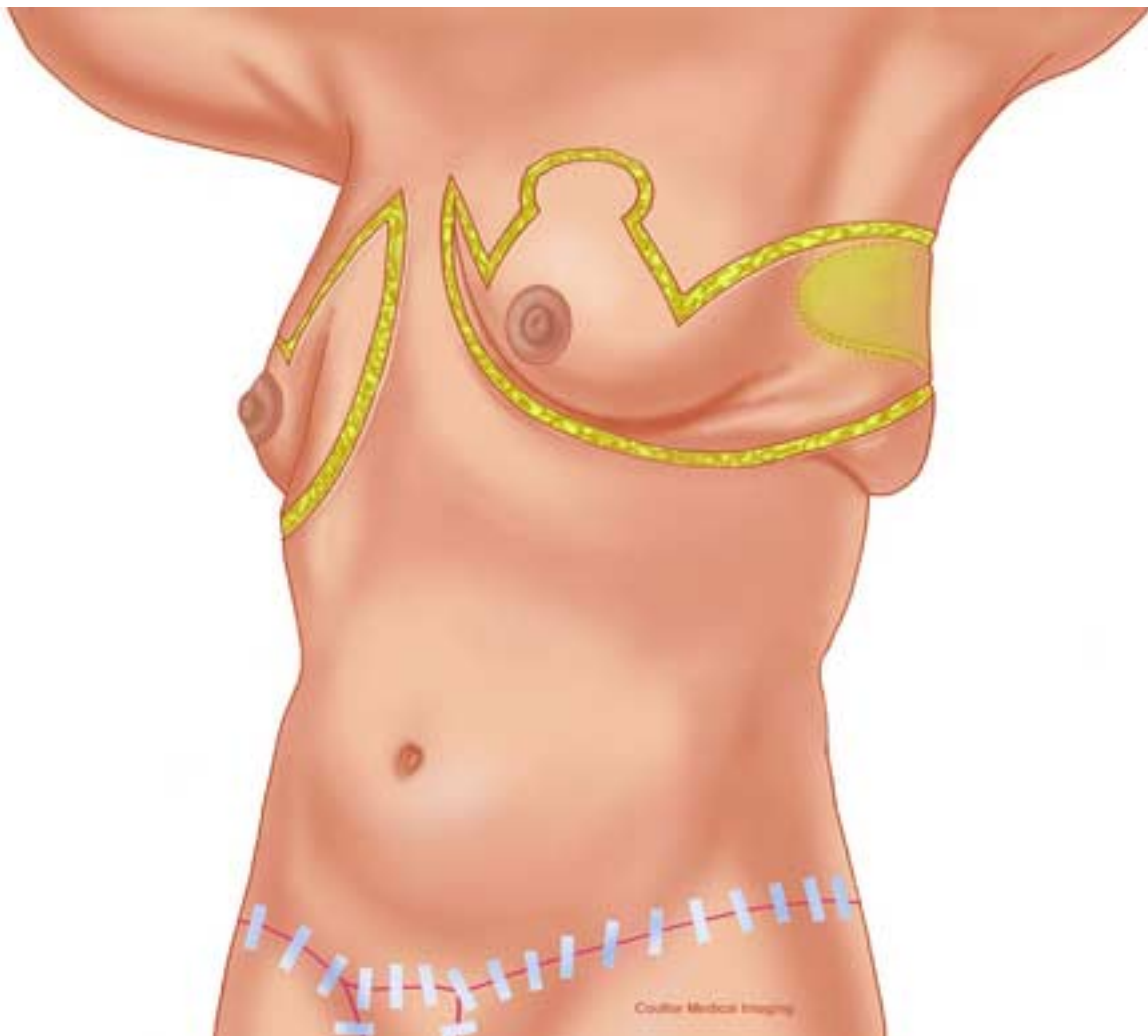


Figure 4  
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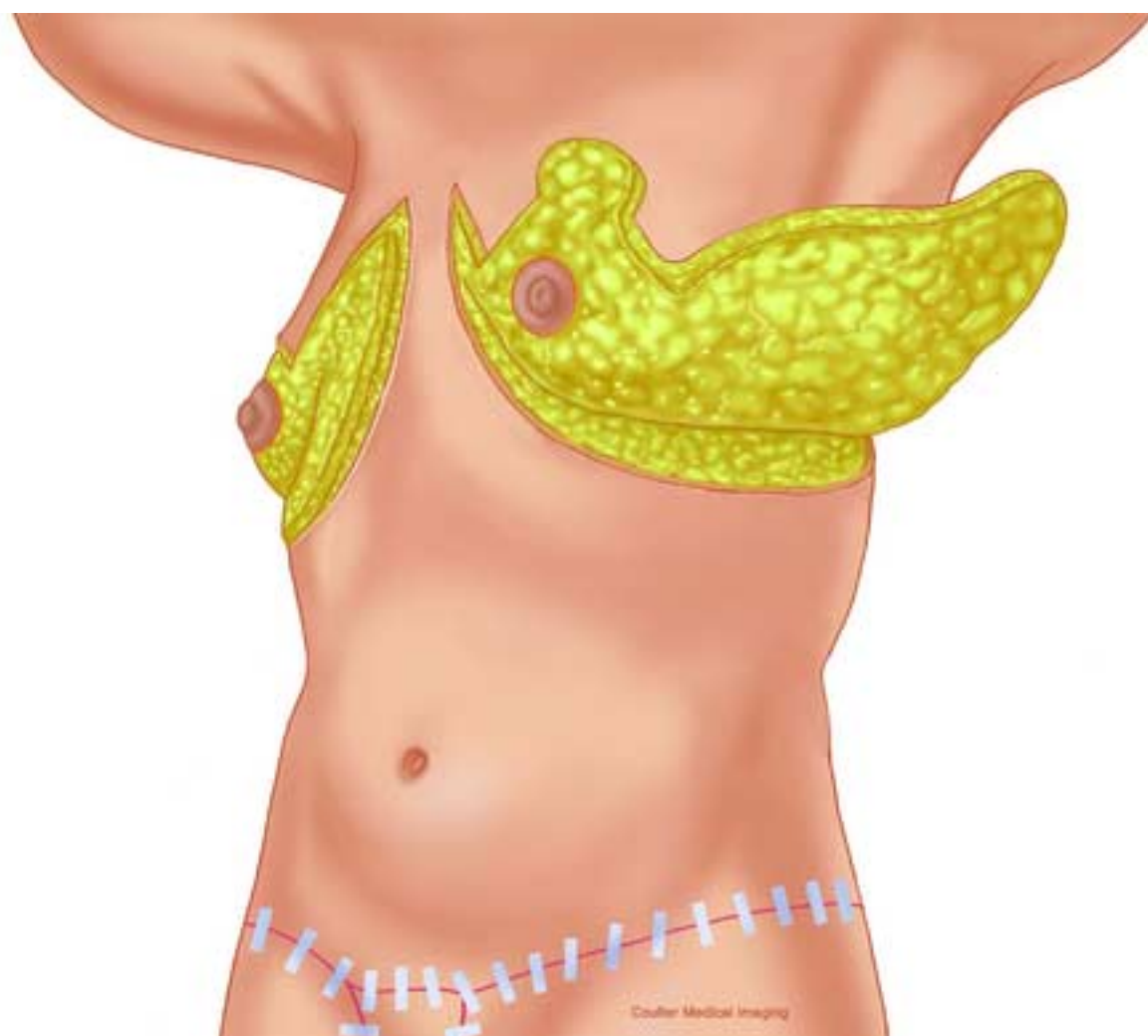


Figure 5  
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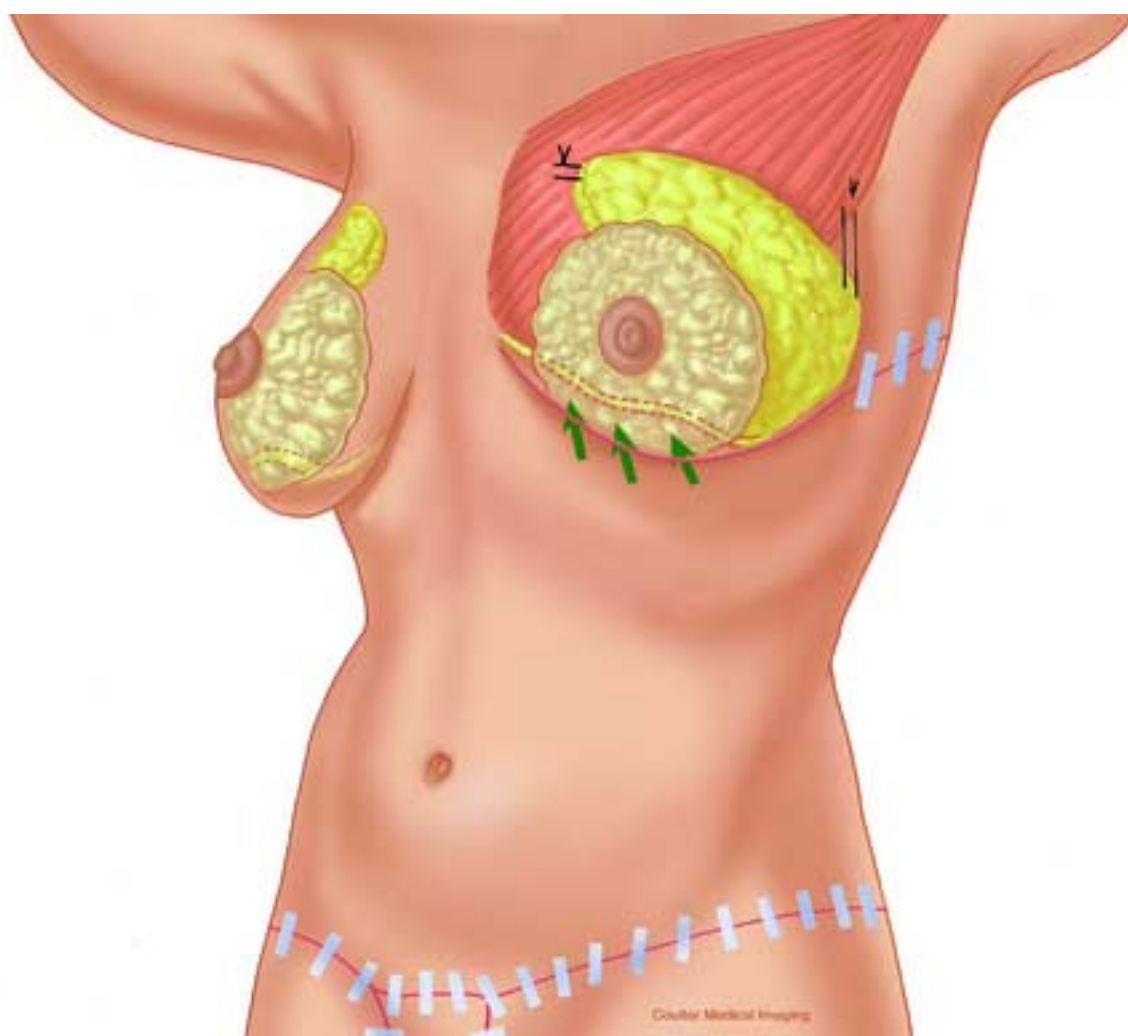
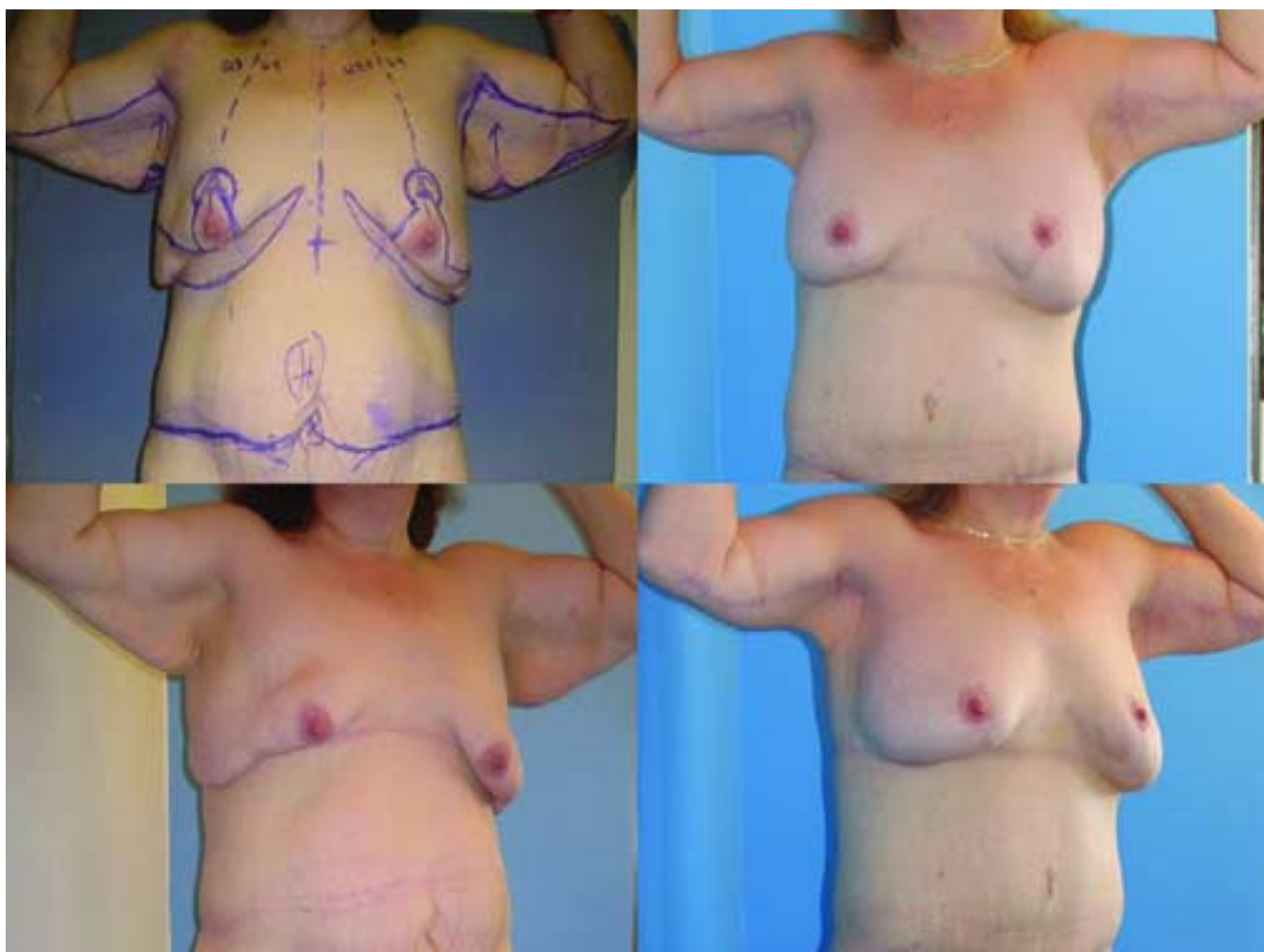


Figure 6  
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Figure 7  
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**Figure 8**  
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