

## CHAPTER 19

### BODY CONTOURING

*Ali A. Qureshi, MD and Sachin M. Shridharani, MD*

Body contouring is an umbrella term for aesthetic surgery of the body that includes the breasts, abdomen/trunk and upper and lower extremities. It is also used to describe a set of procedures for patients who have experienced massive weight loss either from bariatric surgery and/or diet and exercise. These patients often have a disproportionate amount of deflated skin secondary to volume loss from atrophy underlying subcutaneous fat/adipocytes. Body contouring involves liposuction, excisional surgery and more recently non-invasive methods like cryolipolysis to achieve the patient's aesthetic goals.

#### I. LIPOSUCTION

##### A. Suction assisted lipectomy (SAL)

1. Goal – to improve the contour of specific anatomic regions by surgically removing targeted/focal areas of fat.
2. Surgically removes fat, but will not address excess skin.
3. Not a weight loss procedure, but rather a contouring/sculpting treatment.
4. In recent years, energy sources have been added to the procedure in hope to break apart fibrous tissue and facilitate the destruction of adipocytes via thermal mechanism (LASER and ultrasound).

##### B. The total amount of fat in the body is fixed. However, individual adipocytes have the ability to get bigger or smaller. Liposuction can remove fat but the left over fat still can change with fluctuations in weight. Therefore, even if fat is removed, the remaining fat can change in volume and lead to loss of results.

##### C. Pre-operative evaluation

1. Ideal candidates are patients who have localized deposits of diet or exercise resistant fat with good overlying skin quality.
2. Caution in the male abdomen.
  - a. Women tend to have extra-abdominal fat meaning the fat deposits in the subcutaneous tissue OUTSIDE the abdominal cavity.
  - b. Men tend to have increases in intra-abdominal fat meaning the fat INSIDE the abdominal cavity can increase. Intra-abdominal fat is NOT the target of liposuction. Can be used in male pseudogynecomastia.
3. Markings are essential as well as discussion of any pre-existing asymmetries or contour irregularities that exist preoperatively.

4. An estimation of volume to be removed can help estimate how much wetting solution, “tumescent” will be needed and how much fat can eventually be removed.
- D. Setup: Liposuction involves two major components: tumescent of the areas to be treated and the device being used
- E. Tumescent: Doses of lidocaine with epinephrine can be as high as 70 mg/kg because of the large volume of distribution and slow absorption of anesthetic from fat. However, the peak plasma concentration is 10-12 hours after injection so patients after the procedure can experience lidocaine toxicity at home and they and family members should be warned about signs and symptoms to look out for post procedure. With this in mind, the accepted safe dose is typically 35 mg/kg-50 mg/kg.

<b>Tumescent Technique</b>	<b>Infiltrate</b>	<b>Estimate of Blood Loss (as a % of volume aspirated)</b>
Dry	No infiltrate	20-45
Wet	200-300 cc's/area	4-30
Superwet	1 cc / 1 cc aspirate	<1
Tumescent	2-3 cc infiltrate per 1 cc aspirate	<1

Table 1. Types of tumescent solutions

- F. Post-operative considerations
  1. Lidocaine toxicity
  2. Compression garments are key to providing comfort and helping obtain the final contour after surgery.
  3. Large volume liposuction: considered as liposuction > 5L of lipoaspirate in most states
    - a. Often warrants admission to the hospital for post-procedure monitoring.
  4. Patients can experience large volume shifts after surgery, so special attention should be made in patients with cardiac or renal disease.

## II. CRYOLIPOLYSIS

- A. New technology that cools pockets of fat using a non-surgical device and induces adipocytes to undergo apoptosis
- B. Non-invasive technology
- C. Relies on the body's own system of apoptosis and clearance for removal of fat

### III. EXCISIONAL BODY CONTOURING

Focuses on removal of excess skin in addition to fat and can involve the breast, abdomen, arms, thighs, upper and lower back and buttock area. Many patients have hygiene issues with chronic rashes and infections. In the breasts, patients may have associated back pain and cervical neck pain.

#### A. Breast

1. Goal: restore normal shape of breast +/- increase or decrease volume based on pre-existing volume of the breast
2. Often the massive weight loss patient's breasts are associated with distortion of normal anatomy
3. Breasts can have medially deviated nipples, loss of lateral breast border with excess axillary tissue, hollowing of the upper pole of the breast and a lax inframammary fold
4. May require either removal of breast tissue (reduction) or rearrangement of existing tissue in a mastopexy (breast lift)
5. Can also involve placement of an implant to restore volume of shape which can be placed behind the muscle, breast tissue or both (see chapter on breast augmentation).
6. Mastopexy in massive weight loss patients can use existing lateral breast tissue and rearrangement to restore the shape and preserve volume of the breast

#### B. Arms

1. Goal: remove excess skin and fat from the axilla down to the forearm when necessary to improve the contour of the arm
2. Brachioplasty is an excisional body contouring procedure that removes skin and fat and can extend into the axilla and past the forearm when necessary
3. Liposuction can be used as an adjunct to help debulk the arm before removal of skin or to help smooth the contour proximally and laterally as well as circumferentially around the arm
4. A number of scars can be designed and are commonly posterior (straight vertical along the posterior arm) or low along the bicipital groove like the seam of a shirt so the scar is hidden with the arms at the side
5. Pinch test and "tailor-tacking" are key when determining amount of skin and fat that can be removed
6. Most common post-operative issue is a large, widened scar
7. There are several types of important anatomic structures deep to the fascia including branches of the medial antebrachial cutaneous nerve (MABC), which when damaged can lead to paresthesias along the proximal forearm or a painful neuroma
8. Some surgeons close the skin as they cut each segment to prohibit edema and inability to close the arm. This is a dreaded complication that may require skin grafting.
9. Post-operative care usually involves a compression garment

### C. Abdomen - Panniculectomy vs. Abdominoplasty

1. Goals: restore the normal contour of the abdomen +/- correction of rectus diastasis or widening of the medial edges of the rectus abdominus muscles
2. Panniculectomy - generally an infraumbilical wedge excision of excess skin and fat. Does not include rectus abdominis muscle plication. May or may not include umbilicoplasty (umbilicus is transposed into the newly mobilized abdominal tissue)
  - a. Usually performed to improve hygiene issues as tissue under panniculus can be frequently macerated, ulcerated or infected
  - b. Can be performed in a fleur-de-lis manner to excise not only vertical but horizontal excess
3. Abdominoplasty – usually infraumbilical and often supraumbilical excision of excess skin and fat. Often includes rectus plication to correct widely separated rectus muscles. Almost always involves umbilicoplasty with transposition of the umbilicus.
  - a. Important to rule out existing hernias (umbilical or ventral) that may need repair as well as previous incisions including C-section scars and open cholecystectomy or appendectomy scars
  - b. Commonly combined with lateral flank liposuction
  - c. Has high risk of DVT/PE and patients are often assessed for risk of clot formation with the Caprini score. Many patients are on post-operative chemical DVT prophylaxis
  - d. One of the highest risk cosmetic surgeries
  - e. More commonly being performed without a drain as a “drainless abdominoplasty” in which progressive tension sutures are placed to close down dead space and reduce the risk of seroma formation
  - f. Seromas are a common complication
4. Circumferential Abdominoplasty (Belt Lipectomy or Lower Body Lift):
  - a. Goals: excise excess skin and fat circumferentially including the posterior waistline and flank areas
  - b. Often begins with posterior excision then anterior excision
  - c. Can be staged as two different procedures or performed in one stage

### D. Medial Thigh Lift

1. Goals: removal of excess skin and fat from the medial thigh
2. Can be performed with a number of incisions placed in the medial thigh (inguinal crease) sometimes with a vertical extension down the medial thigh
3. Results improved with suspension of the superficial fascial system to Colles fascia along the pubic ramus
4. Liposuction can be used as an adjunct procedure to improve contour
5. Requires careful dissection over femoral triangle to preserve lymphatics and careful dissection medially to not injure the saphenous vein
6. Often requires drains but high risk of seroma formation
7. Involves compression garment post-procedure

### E. Back

1. Goals: excise extra skin and fat that can get be accentuated in clothes like bra's or dresses and improve the contour of the upper back

2. Direct excision of back rolls can be performed
3. Excisions can be combined with breast procedures as some patients have excess that courses laterally that is not breast tissue and is considered an “upper body lift”

F. Buttock

1. Goals: improve the contour and volume of the buttock
2. Commonly involves a posterior waistline scar with undermining into the gluteal area
3. The plane of dissection can be altered so that the tissue raised can be placed on top of the existing buttock tissue and used as a form of “auto-augmentation”
4. Gluteal implants, fat grafting and other purse-string suture can be used to augment the buttock which is often ptotic in massive weight loss patients

## REFERENCES

1. Achauer, BM, Eriksson, E, Guyuron, B, Coleman III, JJ, Russell, RC, and Vander Kolk, CA, Plastic Surgery Indications, Operations, and Outcomes, 5 vol. Mosby , 2000
2. Aston, SJ, Beasley, RW, and Thorne, CNM, Grabb and Smith’s Plastic Surgery, Vol. 5, Lippincott-Raven, 1997
3. McCarthy, JG, Galiano, RD, Boutros SG, Current Therapy in Plastic Surgery, Saunders, Elsevier, 2006
4. Shestak, KG (editor) Abdominoplasty, Clinics in Plastic Surgery, 31 (4) October 2004
5. Shridharani SM, Broyles JM, Matarasso A. Liposuction devices: technology update. Medical Devices: Evidence and Research. Med Devices. 2014 Jul 21;7:241-51.
6. Chase DD, Shridharani SM, Broyles JB. The Safety and Efficacy of Cryolipolysis: A Systematic Review of Available Literature. 2015 Aesth Surg Journ. 2015, Vol 35(7) 830–836.
7. Shridharani SM. Abdominoplasty with Liposuction. Plastic Surgery Education Network. 2016 February 1. (ePub).
8. Shridharani SM, Wang HD, Singh NK. Liposuction. Eplasty. 2013 Jan 15;13:ic4.
9. Shridharani SM, Bellamy JL, Mofid MM, Singh, NK. Breast augmentation. Eplasty. 2013 June 13;13:ic46.