



Body Contouring

Special Topic

Lessons Learned After 15 Years of Circumferential Bodylift Surgery

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Aesthetic Surgery Journal
2016, 1–12
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journals.permissions@oup.com
DOI: 10.1093/asj/sjv265
www.aestheticsurgeryjournal.com

OXFORD
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Abstract

Circumferential bodylift is a powerful procedure for achieving dramatic and natural body contouring changes in the massive weight loss patient. The care of these patients has raised our awareness of several important issues including safety, nutritional status, skin quality, recurrent laxity, surgical steps, and postoperative scars. Integration of this knowledge with various technical modifications over the last 15 years has improved our care for this cohort. We have not only seen a rise in the number of surgeries performed, but also the development of principles, techniques, and details that the authors feel necessary to share to achieve improved contour and more predictable outcomes.

Level of Evidence: 4

Accepted for publication December 16, 2015.



Among the most visible health trends of the last few decades has been the rising rate of obesity within the American population; one-third of Americans are considered obese.¹ As a result, there has been an increase in bariatric surgery with approximately 101,000 gastric bypass, gastric banding, and gastric sleeve procedures performed in the United States in 2011.² Postoperatively, these patients often present with significant skin excess. In a recent study, 68% to 85% of these patients desire body-contouring surgery to remove this additional skin.^{3,4} Concomitantly, we have seen a rise in body contouring surgeries, many of which have been related to the weight loss patient.⁵⁻⁷ During our training and initial years of practice, we had never seen procedures to address skin laxity and lipodystrophy of the arm, flank, lateral chest, back, or thigh. Our care of massive weight loss (MWL) patients has raised our awareness of important issues including safety, nutritional status, quality of skin, recurrent laxity, surgical steps, and postoperative care.

Among the panoply of body contouring options that plastic surgeons possess to address these post-bariatric sequelae is the circumferential bodylift. In 2014, a total of 10,666 bodylift procedures were performed, according to the American Society for Aesthetic Plastic Surgery—a

401.9% growth over the last 15 years.⁸ While the total number of lower bodylifts performed is much smaller than abdominoplasty or lipoplasty procedures, circumferential bodylift is one of the fastest growing procedures in aesthetic surgery. Our collective knowledge base has grown exponentially since these initial cases, and this population has been generally very accepting of the progress of our approach. These past 15 years have seen not only a rise in the number of surgeries performed, but also the development of principles, techniques, and details that the authors feel

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are helpful to achieving positive circumferential bodylift surgery outcomes.

NUTRITION

Nutritional status, especially that of a post-bariatric patient, is tantamount to achieving successful outcomes for the bodylift patient. Nutritional deficiencies and inadequacies can result from anatomical changes in the gastrointestinal tract or an alteration in the diet of those seeking weight loss. Furthermore, nutritional deficits may be the result of a net loss of energy consumption and expenditure; post-bariatric patients expend 1000 kcal/day and 38 g of protein at 6 months postoperatively and 1000 kcal/day with 60 g of protein at 12 months postoperatively, metabolizing well above the standard caloric and protein intake recommendations.^{9,10} This metabolic assessment becomes important as reshaping procedures are considered.

Protein deficiencies can slow fibroblast formation, collagen production, and angiogenesis.¹¹⁻¹³ Reduced protein intake has been associated with an excess loss of lean tissue and malnutrition.^{14,15} Protein-calorie malnutrition has also been associated with significantly lower healing rates among the MWL population, and studies have indicated that a minimum of 60 to 70 g/day of protein is necessary to forestall this protein-calorie malnutrition in the post-bariatric patient.¹⁶⁻¹⁸ With these nutritional deficiencies in mind, we routinely check liver function tests (LFT), albumin, and pre-albumin prior to surgery. We check labs early in the surgical planning process so that any inadequacies can be corrected prior to the future surgery date, especially as we routinely see pre-albumin below 15 mg per dL in our patients regardless of the method of weight loss (surgical vs non-surgical). While 1 to 2 g/kg of protein supplements are normally recommended for the standard population, we increase protein supplementation by 1.5 to 2 times greater than this standard for 2 to 4 weeks prior to surgery and for 1 month postoperatively; this intervention hopefully overcomes any deficiencies and prepares them for recovery following such an invasive procedure. A supplementation regimen similar to ours has been shown to significantly reduce wound healing complication rates in MWL patients undergoing abdominoplasty.¹⁹

Other nutritional deficiencies also exist; 9% to 35% of MWL patients have a folate deficiency, and 3.6% to 37% of MWL patients have a B₁₂ deficiency following bariatric surgery.^{20,21} We have, however, noticed that most patients are generally compliant with correcting any B₁₂ or folate deficiencies through supplementation. Up to 50% of MWL patients have iron deficiency (particularly the gastric bypass patients), which can lead to microcytic anemia affecting circulation in healing tissues. Iron deficiency can either be corrected through oral or IV supplementation.⁸ Patients must have a complete vitamin assessment and supplementation prior to any surgical intervention.

Patients who are non-compliant with either vitamin or nutritional supplementation may present at 7 to 10 days with wound breakdown. The etiology of this complication should be presumed nutritional until proven otherwise.

IDEAL SCAR POSITION AND SCAR CONTROL

Body contouring surgery for the MWL population is primarily focused on reducing skin redundancies and improving contour; however, scar visibility and quality still remain an important consideration for surgeons and their patients. Given the quality of these patients' tissues, predictability in scar quality and location can be particularly challenging.

We have found that preoperative marking is best performed in the office the day prior to surgery. The office environment is quiet with minimal interruptions and distractions, which helps put the patient at ease. Equally important, the surgeon is placed in a calm and uninterrupted environment so that he/she is not rushed and can take plenty of time to complete the markings. Given the degree of skin redundancy, the markings may be difficult and time consuming.

Marking of weight loss patients requires displacement of the tissues for the "lift and drop technique," which at times can be heavy and difficult to stabilize. Because of the significant displacement, photography allows the surgeon to confirm that the marks are in fact in a good place. These photographs can be reviewed the evening prior to surgery to review the operative plan. Given asymmetries in weight loss patients are noticeable and tough to revise, this preoperative assessment has greatly contributed to a more predictable operative plan.

We have noted that inferior markings are frequently much lower in the MWL patient than in the traditional patient; the incisions appear to lie over the thigh as opposed to the lower abdomen or femoral crease. Of note, the anteriomedial incision often lies directly over the femoral triangle, which may put these underlying structures and lymphatics at risk. Furthermore, the adherent zone anteriolaterally transitions superiorly into the area of greatest laxity, thus the lateral marking and subsequent incision location should include a "dip" so the resultant scar ultimately follows a better contour line.

Additionally, we feel the ideal scar in the midline sits 5 to 7 centimeters above the introitus. The umbilicus should be positioned approximately 12 to 15 centimeters above the pubic hairline. One-third of the distance between the labia and the umbilicus should be pubic hair, while the remaining two-thirds should be skin. The lateral extension of the scar should be two centimeters below the anterior superior iliac spine. This refined technique lowers the incision and subsequently the scar for improved visibility and aesthetic outcomes; the anterior incision should be in continuity with the posterior incision. The lateral extension of the scar

seems to vary with fashion, to some degree, and patients can bring undergarments to assist with markings and scar placement. Supplementary Figure 1 demonstrates ideal scar placement.

The Supplementary Video (available as Supplementary Material at www.aestheticsurgeryjournal.com) demonstrates appropriate markings in a sample patient.

SURGICAL PLANNING AND STAGING

Extreme makeover surgery (completing all procedures at one stage) should be approached with caution and its impact on patient safety reviewed. Most patients will require more than a single operation. We use our patient's goals to help mold the treatment plan, but our approach has evolved into a two-stage process for most of our patients seeking "global" change. About 5 years ago, the two senior authors simultaneously recognized that there might be a benefit to breaking up the circumferential lower bodylift procedure eliminating contradictory forces. Tension of the anterior closure and associated flexion has obvious ramifications on the posterior closure, and vice-versa. If the circumferential lift is broken into two stages, less opposing forces play a role in wound closure and healing. Additionally, separating the front and back of the trunk into stages provides an additional advantage of lifting the lateral thigh twice (an area of high relapse). For instance, the lateral thigh can be addressed (in part) from the anterior approach, but when the second, posterior stage is completed, the "dog ear" redundancy can be addressed by extending the excision into the lateral and anterolateral sites, which results in a second excision and lift. We choose to wait a minimum of 3 months between stages to allow the patients to fully recover, regain their mobility, and allow time for swelling to resolve. Finally, staging, this way, eliminates the need for a position change during the first stage. Supplementary Figure 2 demonstrates a preoperative and postoperative result of a staged circumferential lower bodylift.

Our preference is to dedicate the first procedure to the arms, breasts, and abdomen. We recognize that if the lateral and/or posterior chest is addressed concomitantly there may be forces causing displacement of the breast that must be corrected. As such, the breast mound should be created and/or reshaped prior to any lateral excision; alternatively, we have found that three point lateral perichondrial fixation during lateral chest excision may stabilize the scar and prevent lateral breast migration. Alternatively, the lateral chest excision can be deferred to another stage.

In our two-stage plan, the second part includes the flank/hip resection followed by the thighplasty. We feel very strongly that if buttock augmentation with gluteal rotational flaps is planned, then a two-stage approach should be undertaken for the lower trunk. Trying to perform this procedure in combination with a lower bodylift may result

in further tension on the posterior closure as well as vascular compromise. Furthermore, these circumferential patients cannot lie on their side or anteriorly; thus, further tension and pressure would be placed on the posterior flaps and their overlying closure in a single procedure. Alternatively, fat grafting may be an option for these patients, especially as grafting can be repeated at the second stage. However, fat grafting to the buttocks requires turning and potentially adds significant, prohibitive time to the operative period. Additionally, patients that need the most fat grafting to the buttocks have the least amount of fat to be grafted.

When planning these multipart procedures, we allocate approximately 6 hours as our operative time. Based on a review of our own experience, surgeries > 3.1 hours in length have been associated with an increase in wound infection, dehiscence, and necrosis.²² We do not, however, advocate that surgeries be limited to 3.1 hours, as this would be time and cost prohibitive for both patient and surgeon. Surgical planning is an informed consent process; thus, given the knowledge that operations > 3.1 hours in length are associated with increased complications, we aim to accomplish operative goals within a reasonable time frame that maintains patient safety and achieves balance between the number of stages required to accomplish this goal and length of surgery.²²

We recognize that patients may have specific desires and priorities with regard to timing and staging. These requests are always considered. We do still frequently perform single-stage circumferential bodylifts in patients. Supplementary Figures 3 and 4 demonstrate preoperative and postoperative results of a single stage circumferential bodylift. There are a few procedures that we prefer not to combine. The vectors of pull of a lower bodylift or abdominoplasty and thighplasty directly oppose each other and may negatively impact what is done in the operating room and how the patient recovers. We also prefer not to combine brachioplasty and thighplasty at the same procedure as mobility is largely dependent on the extremities, and preservation of one pair of extremities helps to facilitate improved movement. However, there are always exceptions based on a number of factors including patient desire, body mass index (BMI), comorbidities, and sites affected by weight loss.

LIPOABDOMINOPLASTY

First described by Saldanha et al, lipoabdominoplasty—in our hands—allows for a number of improvements over traditional abdominoplasty; this approach achieves better aesthetic outcomes in circumferential bodylifts and decreases complications, mainly wound healing problems.²³ Lipoabdominoplasty allows for improved contour with less undermining. The Supplementary Video demonstrates typical undermining in a lipoabdominoplasty. Additionally,

after flap elevation, subscarpal fat can be removed directly from the abdominal flaps without vascular compromise while improving postoperative contour. After appropriate dissection, the rectus sheath is plicated and the epigastric area is advanced sequentially with progressive tension sutures achieving superior tension at the level of the umbilicus. The Supplementary Video demonstrates rectus plication and progressive tension sutures in a lipoabdominoplasty. This technique provides enhanced epigastric contour and decreased tension at the horizontal incision.^{24,25} In addition to our own observations, a recent meta-analysis indicated that lipoabdominoplasty in the outpatient setting was a safe procedure and had relatively low complication rates.²⁶ Furthermore, recent analysis utilizing the SPY laser fluorescence imaging system (Novadaq, Bonita Springs, FL) to measure tissue perfusion indicated that there is no statistically significant difference between lipoabdominoplasty and traditional abdominoplasty in terms of abdominal flap perfusion or complications.²⁷

Our technique differs slightly from that described by Saldanha. We elevate the superior flap below Scarpa's fascia leaving a fat layer on the deep fascia, which seems to help prevent seromas. At the level of the umbilicus, we reserve our undermining to a central tunnel spanning from medial rectus to medial rectus. This limited dissection protects the lateral row of rectus perforators maintaining vascularity of the flap. Of note, the degree of undermining is considerably less given the mobility of these lax tissues. Again, this focused dissection may lead to better preservation of the blood supply and less dead space to close. We only undermine what is required for midline plication and tissue advancement. (Supplementary Video). Despite this limited dissection and progressive tension sutures, we still use drains during our closure because of the high risk of seroma and potential wound breakdown in this patient population.

After flap dissection, the anterior abdominal skin is marked for resection. The patient is flexed at the waist, and the fasciocutaneous flap of the anterolateral thigh is stretched to an ideal scar position, 2 cm below the anterior superior iliac spine. The thigh position is transposed anteriorly to the abdominal fasciocutaneous flap, and the pattern of resection is outlined. The Supplementary Video demonstrates markings for abdominal flap resection.

VERTICAL ABDOMINOPLASTY

Epigastric laxity may be dealt with primarily or often secondarily following anterior abdominal contouring in the MWL patient. Excess horizontal laxity can be addressed either through midline vertical excision or lateral torso excision. There are merits to both interventions; however, incision choice depends on a prior scar, location of laxity, and the patient's body habitus. A midline excision can be

completed at the time of the original anterior resection or secondarily; a lateral excision is completed only at a second stage because of vascular compromise. We prefer not to use a fleur-de-lis skin excision pattern; this resection constricts the waist because of the disparity in length of the upper and lower limbs. To address this issue, we have adopted Dr. Alex Moya's resection technique, a vertically oriented skin pattern excision or "corset abdominoplasty."²⁸ This surgical approach allows for an aggressive vertical excision to remove the horizontal skin laxity and reserves the transverse skin excision to remove the resultant "dog ears" after the vertical resection. Figure 1 demonstrates preoperative and postoperative results in a corset abdominoplasty. This transection adds a more visible, vertical, abdominal scar but is accepted by most weight loss patients. Additionally these patients are at increased risk for wound healing problems at the "T" juncture. Furthermore, the horizontal and vertical vectors may distort the mons region in some.

Conversely, one may consider a lateral resection in the secondary patient. This intervention does improve the epigastric contour but is remote from the point of action, and in our opinion, is not as aggressive. Furthermore, this approach may result in breast displacement laterally and widened, lengthy scars.

BUTTOCK LIFT

Autologous augmentation of the gluteal area with flank tissue (normally discarded) is an excellent way to shift tissue from a place of excess to one of need. Historically, we routinely incorporated this flap in our circumferential lower trunk procedures for nearly a decade. Excellent publications by Hunstad et al describe a variety of ways to accomplish this augmentation;²⁹⁻³² however, over the years, we became more realistic and pragmatic as we critically reviewed our results.

Of note, when planning a rotational, gluteal flap, one has to recognize that the design of the flank excision (donor site for the flap) must be lowered to accommodate the rotation into the point of maximal projection of the buttock. This positioning may compromise the outcome of the flank excision and displaces the scar to a less anatomic position. A reverse Gilles technique will help with the design and determine what tissue should be maintained. Typically, the lower incision is made first. The flap is de-epithelialized and then elevated laterally and then the fascia is circumferentially incised to help facilitate rotation. As one releases the flap, care should be taken so only what is necessary for the rotation is performed to help ensure an adequate blood supply. Figure 2 illustrates the steps of gluteal flap auto-augmentation.

This procedure is associated with a significantly higher morbidity in our hands. Potential etiologies for these outcomes include each of the following:



Figure 1. This figure demonstrates a staged procedure with a vertical (corset) abdominoplasty on a 34-year-old woman. Preoperative photographs without (A, D, G) and with (B, E, H) markings, and postoperative photographs (C, F, I) from 12 months after the corset and 9 months postoperative after a medial thighplasty.

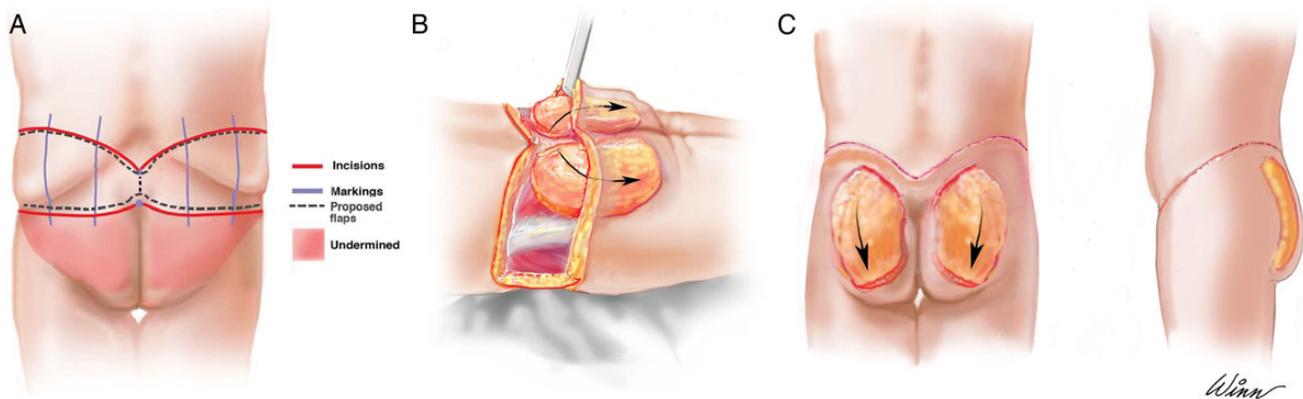


Figure 2. These illustrations demonstrate the steps of gluteal flap autoaugmentation. (A) Markings, incisions, proposed flaps, and undermined areas. (B) De-epithelialized flap, elevated laterally, then rotated inferiorly. (C) Flap inset posterior view (left) and left lateral view (right).

- Counteracting forces from an anterior and posterior lower trunk closure.
- Additional volume in a posterior closure increasing tension in this area.
- Undermining of the posterior skin flap to accommodate the adipofascial flap results in a decrease in vascularity of the posterior skin flap.
- Releasing of the adipofascial flap to allow for a 90-degree rotation may further compromise the sacral perforators supplying the flap.
- Precise planning of the flap results in further compromise of gluteal aesthetics including scar position and may diminish outcomes in the hip region.

For these reasons, we have become more selective in choosing this form of gluteal augmentation. We limit the patient's BMI to 32 kg/m² or lower and prefer to stage the circumferential bodylift. This stepwise approach allows the patient to remain upright during the posterior procedure, decreasing tension in this area as well as permitting the patient to lay on their stomach or sides with ease. These criteria help eliminate some of the previously described risks.

Supplementary Figure 5 demonstrates preoperative and postoperative results in a pedicled autologous gluteal augmentation.

Many have reported the use of autologous fat transfer to enhance the shape of the buttock;³³⁻³⁸ however, several issues should be considered and addressed before considering this approach. Many of the patients that would ostensibly be the best candidates for autologous fat transfer lack adequate fat to complete the transfer. Overzealous fat removal from donor sites in the MWL population can leave skin with more laxity and deformity. Multiple graftings may be required to get optimal transfer volume. Additionally, fat grafting should only be considered for patients who can tolerate prolonged prone positioning during the postoperative course. Most importantly, fat augmentation alone will not

address the laxity of the gluteal tissues and typically these patients all require a lift.

Finally, gluteal augmentation with a prosthesis may be a viable option to enhance the buttock;^{39,40} however, we have a very limited experience with this intervention in the MWL cohort. Our group, as well as others hope to explore this option in select individuals; of note, the same principles discussed above should be applied.

LATERAL THIGH

In the MWL patient, the redundancy of the lateral thigh tissues is often accentuated by the adherent area directly caudal to the lateral thigh fullness. Supplementary Figure 6 demonstrates preoperative and postoperative results of a lateral thigh poorly addressed in a circumferential bodylift. Mild to moderate laxity can be addressed with liposuction and discontinuous undermining during flank excision; this approach releases the adherent area and facilitates mobilization. Moderate to more severe thigh laxity requires direct undermining, described first by Le Louarn and Pascal.⁴¹ Once dissected, the lateral thigh is then secured to the deep fascia and possibly periosteum in a series of rows using a longer lasting absorbable suture. The Supplementary Video demonstrates direct undermining and fixation of the lateral thigh. While our undermining is more conservative than described, we have found that this technique does allow better mobilization, lift, and control of the lateral thigh with better long-term results. Figure 3 demonstrates preoperative and postoperative results of the lateral thighlift in a circumferential bodylift.

The lateral thigh deformity may be accompanied with a variable degree of fat. This thickness can be most easily addressed with liposuction. Care should be taken to avoid superficial and overzealous suctioning of this area; both may lead to visible contour irregularities.

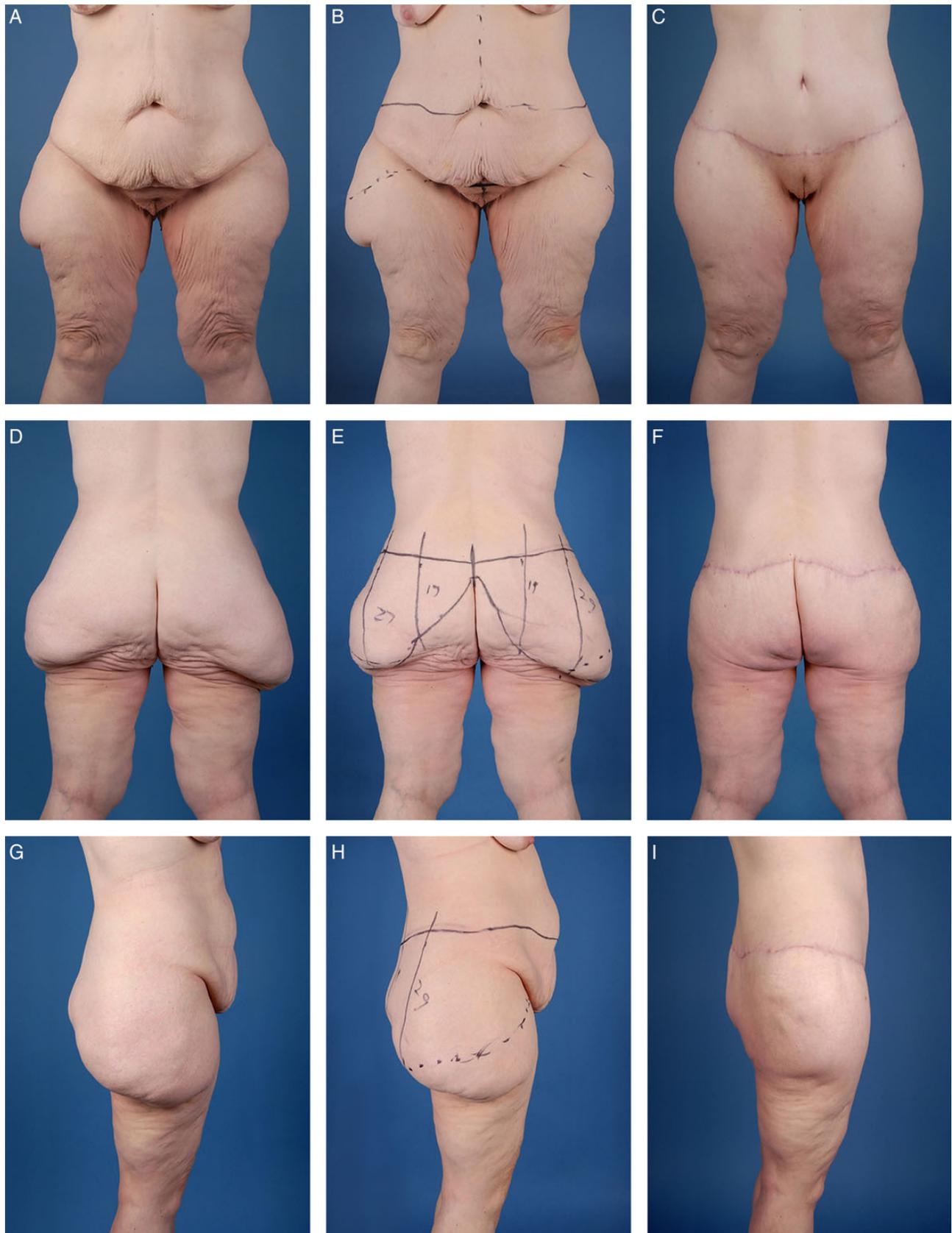


Figure 3. This figure demonstrates a single-stage circumferential bodylift with lateral thigh undermining and tacking sutures on a 52-year-old woman. Preoperative photographs without (A, D, G) and with (B, E, H) markings, and postoperative photographs (C, F, I) taken at 12 months.

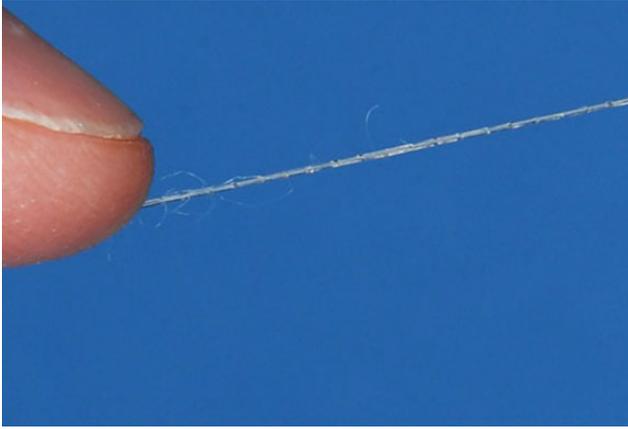


Figure 4. This figure demonstrates fibers attached to a barbed suture.

CLOSING THE INCISION AND SURGICAL MATERIAL

Fifteen years of experience have given us insight into what sutures and other surgical material can be implemented to achieve better outcomes and decrease surgical time.

We incorporate three-point sutures in our closure. In our hands they allow for better scar control by anchoring the superficial fascial system to the deep fascia. Posteriorly, these sutures lift and elevate the caudal flap to the upper incision and fixate the scar in the desired position. Conversely, on the anterior side, the cephalic flap is advanced and anchored to the lower flap. Additionally, these sutures help eliminate potential dead space in the area and secure the anterior scar position. The Supplementary Video demonstrates the three-point suture closure technique. As previously discussed, quilting three point sutures during flap inset are often used to help advance tissue and eliminate dead-space.^{42,43} Additionally, these sutures can surround the umbilicus at the 3 o'clock, 6 o'clock, and 9 o'clock position to create an aesthetically dimpled mid-abdomen with appropriate umbilical hooding.

Barbed sutures, both Angiotech's Quill (Vancouver, BC, Canada) and Covidien's V-Loc (Dublin, Ireland), have proven helpful to our bodylift procedures since we began using them nearly six years ago. We have previously shown no statistically significant difference in wound complications when using one brand over the other.⁴⁴ Additionally, our personal experience with these barbed sutures has resulted in reduced operative time, by up to one hour in some circumferential lower bodylift patients. Of note, we use barbed sutures for rectus plication, superficial fascial approximation, and dermal closure. The Supplementary Video demonstrates our layered closure. We have not, however, quantitatively assessed whether scar quality is better using barbed sutures; our experience has not

identified a dramatic difference in better scar quality between the two cohorts. Anecdotally, we do feel there may be an advantage to using a "knotless" suture material.

Of note, barbed sutures placed in the more superficial dermis have higher incidence of wound manifestations, in our hands. These complications include minor healing problems that improve once the foreign body is removed. Furthermore, these sutures are like "magnets" to any foreign particles from the drapes or laparotomy pads. Minor filaments on the suture, as seen in Figure 4, can be incorporated in the wound closure and result in a foreign body reaction. In order to mitigate the foreign body risk associated with barbed suture, we attempt to keep the suture in its packet as long as possible and only have the suture touch the skin or wound.

Although we maintain no financial interest in Johnson and Johnson's product, Prineo tape (New Brunswick, NJ), we have found it useful for supporting two-layer closures. Prineo has proved especially helpful with areas prone to dehiscence—the arms in brachioplasty and the thighs in thighplasty as well as the flanks in truncal contouring. The Supplementary Video demonstrates dressing placement.

MALE LOWER BODYLIFT

Male patients undergoing MWL are treated very similarly to their female counterparts; however, some fundamental differences must be discussed. Males typically have more truncal laxity, sparing their extremities. Their mons area often has a heavy component of vertical and horizontal skin laxity as well as lipodystrophy.

In planning these cases, we often make the anterior incision slightly higher than 5 to 7 cm so that the incision is more straight rather than curvilinear. Straighter incisions are more masculine than curved incisions. Technically, the mons requires fatty debulking. We often perform this resection under direct vision below the level of Scarpa's fascia but the debulking may be performed with liposuction as well. Stabilization of the mons is essential to help decrease the incidence of recurrent laxity in this area. Even with suspension and stabilization, a horizontal component of the laxity may need to be addressed concomitantly or in a staged fashion. Likewise, the posterior incision should not be arched but straight, which is less feminizing. The position of the posterior incision often is higher than the belt or waistline in men as this placement is where the excess is located. This location should be shown to the patient in the preoperative planning period. Lower, less visible incisions may result in inadequate contour change. Finally lateral three-point suture fixation and liposuction should be minimized to limit a feminizing postoperative "hour-glass" appearance. Figure 5 demonstrates preoperative and postoperative results of a male circumferential bodylift.



Figure 5. This figure demonstrates a single-stage male circumferential bodylift and medial thighplasty on a 47-year-old man. Preoperative photographs without (A, D, G) and with (B, E, H) markings, and postoperative photographs (C, F, I) taken at 12 months.

POSTOPERATIVE CONSIDERATIONS

Our patients stay in an overnight facility for one to two nights following lower bodylift procedures. This hotel-style facility has 24-hour nursing care, which encourages early ambulation as well as administers anti-coagulation therapy, 40 U of subcutaneous Lovenox (Sanofi, Bridgewater, NJ) eight hours postoperatively, when indicated. This facility also continually serves to educate patients on proper care techniques as well as appropriate expectations in their recovery.⁴⁵

Recently, we have found the use of liposomal bupivacaine as well as 24 hours of IV acetaminophen to be very helpful in our patients' acute recovery. Anecdotally, the patients are ambulating earlier and more independently, and recent literature indicates that there may be reduced pain for patients using liposomal bupivacaine.⁴⁶

Our circumferential procedures are closed over 2 drains. We use the guideline of 30 cc/24 hour period and often remove them between 7 to 10 days. If an abdominoplasty is performed we still place a single drain at the site but are transitioning to drainless procedures in BMI < 30. We begin compression immediately after surgery and reinforce this with an overlay of foam to help facilitate this. Our patients wear the compression for at least one week after the drains are removed to ensure adequate tissue adherence. Many of our patients feel better incorporating support for 4 to 6 weeks.

Once the surgical tape is removed at 2 to 3 weeks, we begin using a topical silicone gel or scar cream. Our preference is to use this with gentle massage for 6 months. Our patients begin walking 4 hours after surgery. We allow them to begin to increase their heart rate at 3 weeks, focusing on range of motion as well. Once motion is obtained we allow the patients to add more weight based exercises to their activities.

DISCUSSION

Complications for the MWL patient are frequent ranging from delayed wound healing to dehiscence to seroma.⁴⁷ MWL has been shown to be a significant predictor for wound complications in body contouring surgery, as one study noted a 30.6 percent complication rate in MWL patients undergoing body contouring procedures. The same study indicated a 2-fold increased risk of complications conditional on the amount of weight loss in this patient population.⁴⁸ Furthermore, regardless of weight-loss method (diet and exercise, gastric banding/sleeving, or gastric bypass), MWL patients had a statically significant increased risk of complication compared to traditional body contouring patients.⁴⁹ This patient population's increased risk of wound complication is likely multifactorial with abnormal collagen, elastic fiber, and tissue protein differences from the standard

population.⁴⁹ When we do encounter complications in our procedures, we ascribe to standards of care to manage them.

Our current technique has manifested itself after 15 years of experience for the senior authors. Previously, this field and patient type were unique, and most plastic surgeons had little experience. Constant dialogue and exchange helped us gravitate towards the technique presented in this manuscript; however, our approach may not be optimal for other plastic surgeons. This article serves as a roadmap for how we perform the circumferential bodylift. We acknowledge that there is no "right" way to execute these procedures and are merely trying to share our evolution in technique.

CONCLUSIONS

Circumferential bodylift is a powerful procedure for achieving dramatic and natural body contouring changes in the MWL patient. Given that the recoveries are very similar to traditional abdominoplasty procedures, when appropriate, lower bodylift can be discussed with patients as a viable option for their body contouring needs or desires.

Technical modifications over the last 15 years have improved contour and allowed for more predictable outcomes. We continue to be challenged by the variable nature of patient's tissues, especially in the MWL population; however, this population represents a unique cohort with differing expectations regarding the outcomes of their surgeries, and thus, are a great population to try newer techniques.

Supplementary Material

This article contains supplementary material located online at www.aestheticsurgeryjournal.com.

Disclosures

Dr Kenkel is a consultant for Kythera Biopharmaceuticals (Westlake Village, CA), an investigator for Solta Medical (Hayward, CA), and receives honoraria from Merz Aesthetics (Raleigh, NC) and ZO Medical (Irvine, CA). The other authors have nothing to disclose.

Funding

The authors received no financial support for the research, authorship, and publication of this article.

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