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Overview of Surgical Approaches to Correct Excess Skin and Fat from Different Body Parts

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Abstract: **Current study is aiming to evaluate the success of surgical approaches to correct excess skin and fat from different body parts after excessive weight loss whether this loss was Bariatric surgery intervention or diet. Also to determine the benefits and side effects of such surgical procedures. The literature search was then carried out on Medline, Embase, CINAHL, PsycINFO, Google Scholar, and the Cochrane databases from inception till December 2016 for studies on the topic of surgical procedures in correction of extra skin and fat of different part of the body following body contouring surgery in massive weight loss patients. Massive weight loss (MWL) patients present a difficult difficulty to the plastic surgeon for body-contouring treatments. These patients harbor numerous issues. They often battle mental instability, may have intertrigo and other skin problem, and are prone to substantially higher problem rate than the remainder of the population. They usually require excisional procedures. Body contouring of MWL patients is a process and not just a single treatment. With care of a devoted and committed group that keeps management safe yet aggressive sufficient to sculpt a normal contour, these patients achieve their goal of getting rid of their "weight problems preconception.**

Keywords: **Correct Excess Skin, Plastic Surgeon for Body-Contouring.**

1. INTRODUCTION

Obesity remains one of the leading health concerns in today's society and might lead to a reduction in the life expectancy in the United States [(1)]. The comorbid conditions connected with weight problems many and consist of coronary artery disease, type 2 diabetes, sleep apnea, cancer, and osteoarthritis [(2)]. The risk of obesity-related disease is even more increased by centrally dispersed adiposity [(3)]. Obesity has actually increased the life time risk of diabetes to 30% to 40% for a specific born in the United States, [(4)] and studies have actually shown that obesity causes about 300,000 deaths each year in the United States [(5)]. Defined as having a body mass index (BMI; weight in kg/height in m^2) [(6)] greater than 30, obesity has reached epidemic percentages primarily because of bad diets and sedentary way of lives. The occurrence of obesity amongst adults has actually increased 50% per decade, and it is now approximated that a minimum of 30% of Americans are overweight [(7)]. Morbid, or serious, obesity is now classified as a BMI of a minimum of 40 or a BMI of a minimum of 35 with comorbidities [(8)].

Shermak et al. defined massive weight loss (MWL) as 50% or higher loss of excess weight [(9)]. This typically leads to redundant tissues of the lower trunk, upper back, thighs, arms, and breasts. Loose skin frequently causes intertrigo, trouble in strolling, urinating, or carrying out sex, and ensuing low self-confidence. This demands various body contouring procedures, typically excisional, in these patients (**Figure 1**) [(10)].

The specific amount and circulation of this redundancy are related to the volume lost, the skin's adherence to the underlying fascia, and each patient's acquired pattern of fat deposition [(11)]. In the non-obese patient with a thin pannus and laxity of the stomach skin, a standard abdominoplasty is the preferred treatment. These patients generally do quite well and their incidence of problems is relatively low [(11)].

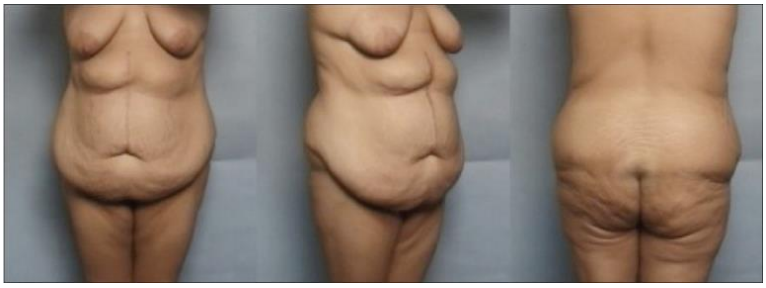

Figure1: A patient following massive weight loss with typical lower truncal deformities post-content [10]

Aim:

Current study is aiming to evaluate the success of surgical approaches to correct excess skin and fat from different body parts after excessive weight loss whether this loss was Bariatric surgery intervention or diet. Also to determine the benefits and side effects of such surgical procedures.

2. METHODS

The literature search was then carried out on Medline, Embase, CINAHL, PsycINFO, Google Scholar, and the Cochrane databases from inception till December 2016 for studies on the topic of surgical procedures in correction of extra skin and fat of different part of the body following body contouring surgery in massive weight loss patients. The keywords used are shown in (**Table 1**). The terms in each column were combined with the Boolean operator "OR" while terms in between columns were integrated with "AND." The output was restricted to citations in the English language. Reference lists of identified studies were then hand searched for extra reports.

Table 1: Search terms used with the Boolean operation AND to combine terms.

Body contouring	AND	Massive weight loss/MWL
Abdominoplasty	AND	
Panniculectomy	AND	Post-bariatric
Torsoplasty		Weight reduction
Thoracoplasty	AND	
Brachioplasty/arm lift		
Thigh lift		

3. RESULTS

Abdominoplasty after massive weight loss:

Traditional surgical correction of excess abdominal skin and fat included a panniculectomy, as first reported in the United States by Kelly [12,13]. Modifications occurred in the early 20th century consisting of a variety of incision styles, extensive undermining [12], and umbilical transposition [13], however it was Pitanguy's report [14] on his series of 300 stomach lipectomies that supplied ample justification for the modern abdominoplasty. Today, abdominoplasties are categorized according to the type of incision utilized: transverse [15,16,17,18,19], vertical [20,21], or combined [22,23]. In the experience of the authors, transverse cuts are most appropriate in the patient with huge weight-loss. Integrated excision of midline vertical scarring is prevalent. In addition to extensive weakening at the level of the loose areolar tissue overlying the anterior rectus sheath, plication of the rectus muscle or the use of external oblique flaps to contour the stomach girdle is a differentiating feature of the modern abdominoplasty. These abdominal wall maneuvers are lesser in the patient with a consistent thick pannus. Undermining must extend superiorly to the costal margin and xiphoid procedure. The shallow vascular supply of the stomach skin includes the shallow inferior epigastric, shallow pudendal, and shallow circumflex iliac arteries [24]. Sacrifice of this vascular network on preliminary cut and dissection makes the abdominal flap depending on the exceptional epigastric and intercostal perforators [25]. Plication of the rectus abdominis muscle for patients with diastasis recti is carried out using a two-layer imbrication of anterior rectus sheath. This offers a double layer of closure for those with incisional hernia. A simple disrupted layer utilizing a 2-0 or 3-0 nonabsorbable stitch ought to be followed

by a running layer of absorbable suture. Alternatively, tightening of the waist may be performed utilizing 2 vertical fusiform plications at the lateral margins of the rectus [26]. This method, although inadequate by itself for cases of marked average diastasis, might serve as an effective adjunct in the enormous weight reduction patient however just when the advancing flaps are thin. Another approach that has been explained to contour the abdominal girdle involves the use of external oblique muscle flaps superimposed at the midline [27,28]. Vertical laxity of the abdominal wall might be fixed utilizing a horizontal plication on either side of the umbilicus in a way extremely just like vertical plication [29]. Remediation of the median raphe, although hard in the huge weight loss patient, may be tried by midline resection of fat to the level of Camper's. Due to the fact that of the frequent presence of a midline scar, this maneuver is unusual in the weight loss patient as it even more jeopardizes blood supply and. Without a doubt, our most common treatment stays a two-layered rectus plication over subcutaneous redundancies from a low transverse incision with vertical scar excision (**Figure 2**) [30]. The umbilicus is left in its midline position on an umbilical stalk and skin shifted around it. Two hemispherical excisions in advancing skin flaps make place for its transposition. Numerous basting stitches are utilized to secure the advancing subcutaneous tissue to the anterior abdominal wall fascia to close dead space and assistance prevent seroma formation [30].

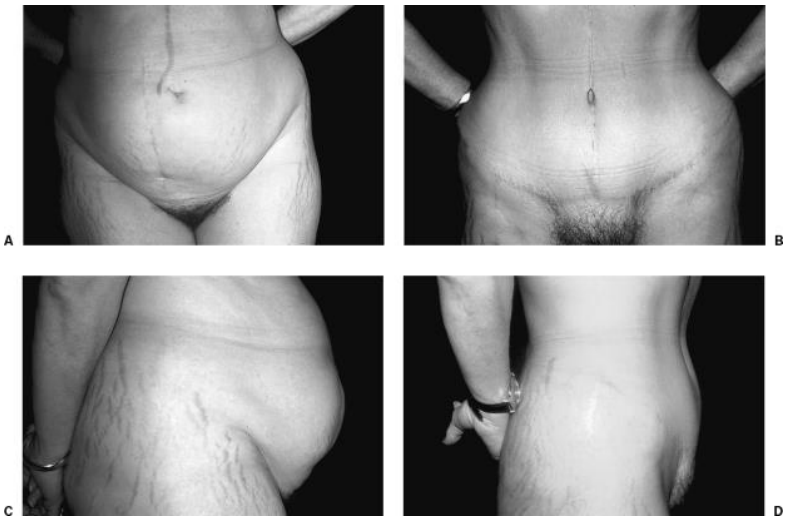

Figure 2: (A,C) Preoperative patient after gastric bypass with large midline abdominal wall defect and thin pannus. (B,D) Postoperative, dramatic improvement with standard abdominoplasty including rectus plication. [30]

Surgical options:

As the defects after massive weight loss (MWL) are circumferential in nature, the treatment should likewise be circumferential to deal with the trunk as a unit [35]. Most of the MWL patients looking for enhancement of their lower body would require a circumferential body lift along with gluteal contouring, mons reduction, excision of the flanks and a thigh lift. Anterior resection just, might be selected as part of a staged procedure or when the circumferential treatment is not a choice. Standard thigh lift, buttock lift, abdominoplasty and so on fall short of achieving the ideal outcome and are typically stretched to their limits in MWL patients. Efforts to manage the patient who has gone through bariatric surgery with abdominoplasty and liposuction alone are likely to result in an unsatisfactory outcome. Unsightly scars, 'dog-ears' or flattening of the body curves happen. Due to these restrictions, different techniques have actually been explained to treat post-bariatric lower abdominal area circumferentially. These include circumferential belt lipectomy[36,37], circumferential torsoplasty [38], lower body lift [39] and body lift [40]. They have various names, each involves a simultaneous abdominoplasty and a thigh and butt lift. The main disadvantages of circumferential procedure are that the operating time is prolonged as the tissue resection and the incision length are doubled, and the patient needs to be rearranged intraoperatively. If increased surgical time or patients' medical condition presents a considerable risk, the treatment needs to be staged into an anterior dermolipectomy followed by a butt lift/gluteal contouring and thigh lift at a later date [39,40].

Circumferential stomach lipectomy is an extended abdominoplasty operation without buttocks and thighs weakening. The incision course extends into the buttock and the back areas on both sides. This serves solely to prevent canine ears and does not produce any tightening results on the back or butts. There is much scarring with unacceptable result specifically in the back locations. Circumferential belt lipectomy is fairly more substantial operation in which excision of the redundant and excess tissue is carried out circumferentially directly at the hip, back and anterior abdominal region [35,36].

The excised wedge is more comprehensive and broader. The operation is performed with the patient first in supine and after that in both lateral decubitus positions. It results in a relatively high circumferential scar above the iliac crest, the tightening up effect at the back particularly in the waist area is far remarkable compared to the circumferential stomach lipectomy. It produces a more specified waist and has lesser effect on the thighs. Lower body lift involves more extensive weakening and aggressive resection [39]. The operation is finished with the patient in susceptible and after that the supine position. Alternate cannula weakening and adjunctive ultrasound helped liposuction of back, hips, sides and epigastrium are added to provide better shapes. It worries the significance of precise handling of superficial fascial system (SFS) and approximating the SFS with permanent sutures to keep the soft-tissue contours and to take full advantage of the scar quality over the long-term [32,31].

Body-contouring procedures:

For function of description of many types of body-contouring treatments following **M**assive weight loss (MWL), they have actually been divided into lower body lift/belt lipectomy, thigh lift, brachioplasty, upper body lift, and breast reshaping. Panniculectomy or abdominoplasty might ready procedures to take on intertrigo but do little to enhance body shape in the massive weight loss patient and therefore will not be gone over in this short article. This is in spite of high lateral stress abdominoplasty [31] improving the shape of the waist, buttocks, and thighs. The superficial fascial system (SFS) designed by Lockwood is the essential to all modern-day excisional lifts in these patients [32]. While he advocated nonabsorbable stitches for better rejuvenation, a lot of employees today utilize enduring absorbable stitches such as polydioxanone. In patients undergoing treatments on the trunk and the lower body, an epidural catheter is vital in post-operative pain management and may likewise reduce the occurrence of deep venous thrombosis (DVT) and its sequelae. The personnel time needs to preferably be kept under 6 hours or listed below to reduce issues. If vectors of pull at surgical treatment remain in opposite directions, such as in an upper body lift and a belt lipectomy/lower body lift, these treatments must be carried out independently for apparent reasons. Hernias should be fixed at the same time of lower truncal body-contouring treatments in a lot of instances. Scars of previous surgeries, especially chevron cholecystectomy scars, present possible problems with body-contouring procedures that involve the abdominal area. When dealing with these scars [10].

Lipectomy procedure:

The circumferential excisional wedge is located more superiorly, as compared with a lower body lift. The lower truncal subunit is particularly highlighted in addition to elevation of the lateral thighs and buttocks. There is no effort to raise the tissues all the way from the knee unless the patient provides with an excellent translation of pull. As the zones of adherence are not purposefully and completely ruined in a belt lipectomy, scar position at a superior level can be kept [30]. The designated final scar position is at the natural junction in between the butts and lower back. The scar is located just above the largest aspect of the pelvic rim and this equates into cinching at the waist and enhancing the ptotic butt contour [10].

Medial thigh lift technique to remove exceeded skin:

The trunk is the foundation of the thighs and they are both linked aesthetically. MWL patients who have typical thigh contour and only a minor anterior thigh descent can be dealt with by belt lipectomy/body lift alone. Liposuction alone also usually does not work in these patients. In many patients, anteromedial thigh laxity is brought on by a descent of un-winded lower inguinal and abdominal tissues after MWL. Typically, the trunk along with the lateral thigh is attended to initially by the lower body lift/belt lipectomy, which may minimize the quantity of subsequent thigh surgical treatment. This is then followed by the excisional thigh lift. Lockwood transformed median thigh lift by anchoring it to the Colles' fascia [33]. In the MWL patient, the large quantity of tissue movement and anchoring that should occur can lead to spreading of the labia, a really challenging issue to deal with, regardless of correctly anchored tissues. Thus the authors choose to limit their excision to a vertical resection, avoiding any capacity for labial dispersing (**Figure 3 & 4**) [10] Should the cosmetic surgeon choose to integrate a horizontal and vertical resection, it is best to create most of the stress on the vertical closure. Regardless of all preventive measures being taken, the patient needs to be cautioned about the possibility **of labial dispersing.**

Figure 3: An massive weight loss patient prior to a medial thigh lift [10]

Figure 4: The same patient as in Figure 3 following medial thigh lift. The lower part of the operative scar is seen on the medial aspect of the popliteal crease bilaterally [10]

4. CONCLUSION

Massive weight loss (MWL) patients present a difficult difficulty to the plastic surgeon for body-contouring treatments. These patients harbor numerous issues. They often battle mental instability, may have intertrigo and other skin problem, and are prone to substantially higher problem rate than the remainder of the population. They usually require excisional procedures. Body contouring of MWL patients is a process and not just a single treatment. With care of a devoted and committed group that keeps management safe yet aggressive sufficient to sculpt a normal contour, these patients achieve their goal of getting rid of their "weight problems preconception." The careful and exact markings based on the procedure picked are the foundations to attain the successful outcome. Lower body contouring should be performed initially followed six months later on by breast, lateral chest and arm treatments. Thighplasty is generally undertaken at the end. Body contouring operations are staged at couple of months' intervals and frequently lead to long scars. Staging is very important as each treatment can have favorable impact on nearby areas of the body.

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