

A Clinical Review of Total Body Lift Surgery

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BACKGROUND: Until 2001, body contouring surgery after massive weight loss was uncoordinated, with few patients achieving complete rehabilitation.

OBJECTIVE: The authors report a 5-year, retrospective, 75-case clinical review to determine the effectiveness, reliability, and safety of single and multistage total body lift (TBL) surgery.

METHODS: Between January 2001 and June 2006, 59 single-stage, 15 two-stage, and 1 three-stage TBL surgeries were performed, involving a total of 605 separate procedures. Outcomes and complications were compared among all TBL patients and a contemporaneous published series.

RESULTS: Three representative cases are described. Overall, in patients under 55 years of age with a body mass index of less than 30, there was no significant difference in the choice of procedure (ie, single-stage TBL [95% confidence interval, 1.236–2.302] or multiple-stage TBL [95% confidence interval, 1.687–4.892]; $P = .1882$). Although there was no significant association between major complications and the number of procedures performed in this cohort of patients, there were increased wound healing problems following multiple-stage TBL ($P > .5$). Single-stage TBL surgery averaged 8.4 hours. Two-stage surgery took 7.4 hours for the first stage and 4.6 hours for the second stage, for a total of 11 hours. Banked blood transfusions for single-stage surgery were 1.5 per single-stage case and 0.78 per multi-stage case. Seventy-six percent of the patients experienced complications, mostly related to wound healing. All preoperative and postoperative Pittsburgh rating grades improved. **CONCLUSIONS:** TBL is customized for individuals who desire a comprehensive approach to improvement of their loose skin. The rate of complications was high and comparable to other published series. There was no difference between the complications of the single- and two-stage patients. While there was an observable reduction in deformity and a high rate of satisfactory aesthetic outcomes, this high number of complications indicates a need to improve clinical performance. (*Aesthetic Surg J* 2008;28:294–303.)

After massive weight loss and with aging, patients suffer diffuse but variable skin laxity. While the pathophysiology is unclear, the treatment is removal of excess tissue, reshaping, and high-tension closure. In 1975, Zook¹ advocated the use of multiple teams to perform as many operations simultaneously as possible for the massive weight loss patient. In the 1980s, there were published reports of small, successful series of patients with single-stage body contouring of the lower and upper torso.^{2,3} The surgeons involved preferred sequential procedures, and kept their total operative time to under 6 hours.

Pitanguy⁴ has elaborated principles for the surgeon, anesthesia, team work, and patient selection when combining aesthetic procedures.⁴ Based on 12,000 cases, of which 13% lasted longer than 6 hours, he wrote that the surgeon should be skilled, efficient, and experienced in both the specific techniques and performance of multiple procedures. The anesthesiologist must likewise be experienced. The operative time is shortened by simultaneous operations and effective leadership. Healthy and well informed patients recovered remarkably well after long operations. Complications and wound healing problems did not differ between multiple- and single-stage patients, except for the greater number of transfusions necessary in single-stage surgery. Patient satisfaction was high and the associated costs were much lower for single-stage procedures. In his discussion of the Pitanguy paper, Courtiss⁵ questioned whether the benefits of multiple cosmetic procedures outweighed the risks but, if performed, he emphasized the need for a skilled surgeon leader and maintenance of an experienced team. Since

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then, the acceptance of multiple operations has increased.⁶⁻⁹

Until 2001, we performed mastopexy, brachioplasty, abdominoplasty, lower body lift, and thighplasty sporadically. Not only did we complete few surgical rehabilitations, but we failed to comprehend the integration of operations on the upper and lower torso and on the torso and extremities. Neither did we understand the most reliable means to efface mid-torso rolls, deepen the waist, establish an inframammary fold, autogenously reshape the breasts, or tighten male chest skin. Isolated operations favor tissue discard rather than a continuum of contouring.

Total body lift (TBL) surgery was introduced as comprehensive and coordinated body contouring operations in the least number of stages possible.¹⁰ Along with procedural innovations, we embraced a paradigm shift towards comprehensive aesthetic rehabilitation.¹¹ Patient-inspired, single-stage TBL surgery is a complex, 7- to 12-hour operation, necessitating optimal patient selection, preoperative preparation, surgical and leadership skills, operating room organization, and extensive postoperative care.^{12,13}

METHODS

A retrospective clinical chart review was conducted of patients undergoing TBL surgery from January 2001 to June 2006 at the Hurwitz Center for Plastic Surgery by the senior author (DJH; 59 cases as the only surgeon, 16 cases with SA-M) and Dr. Agha-Mohammadi (4 cases as the only surgeon, 16 cases assisting DJH). An independent chronicler (KO) compiled the data from the first 75 patients who completed TBL surgical contouring with more than 1 year of follow-up. Mr. Unadkat statistically analyzed the data.

Fifty-two patients underwent previous Roux-en-Y bypass surgery. One received a gastric sleeve and 2 received adjustable lap bands. The remaining 20 patients lost weight without surgery. Patient age averaged 43.4 years (range, 21-68 years). The mean body mass index (BMI) of the 75 patients was 29.3 (range, 21.6-39). The mean BMI of the 16 multistage patients was 30.3. Thrombophlebitis prophylaxis consisted of alternating pressure stockings or medical anticoagulation for patients with more than two risk factors.

There were 59 one-stage, 15 two-stage, and 1 three-stage TBLs, involving 605 separate procedures, for an average of 8.2 procedures per patient (Table 1). The operations were performed under general anesthesia first in the prone, then in the supine position. All patients underwent abdominoplasty. The lower body lift was performed in the first stage in all but two of the 16 multistage patients. When adequate tissue was available, and the patient and surgeon desired, autogenous spiral flap augmentation of the breasts (44 patients) and, later in the series, fascial adipose augmentation of the buttocks (22 patients) were performed. Medial thighplasty was performed in 68

Table 1 Procedures performed for body contouring after massive weight loss

Procedure	No. (%)
Abdominoplasty	75 (12.4)
Reverse abdominoplasty	55 (9.1)
Hernia repair	15 (3)
Lower body lift	69 (11.4)
Fascial flap buttock augmentation	24 (4.6)
Upper body lift	63 (10.4)
Medial thighplasty	65 (10.7)
Bilateral spiral flaps	44 (7.3)
Bilateral mastopexy	66 (11)
Silicone breast implants	16 (2.6)
Bilateral L brachioplasty	68 (11.2)
Ultrasound-assisted lipoplasty	55 (9)
Gynecomastia correction	5 (1)
Total	605

patients, usually with a vertical component (62 patients). Independent location ultrasound-assisted lipoplasty (UAL) was performed in 55 patients.

The most frequent combination of single-stage operations was abdominoplasty, lower body lift, upper body lift, spiral flap reshaping of the breast with mastopexy, medial thighplasty, and brachioplasty. Thirty-one patients underwent this combination, of whom 19 also received UAL for excess fat and 4 underwent fascial fat flap augmentation of the buttocks. This combination was also most common for two-stage surgery, with seven of 15 patients receiving the full treatment. Most patients stayed their scheduled 3 days at a University of Pittsburgh Medical Center teaching hospital.

Delayed wound healing and seromas were the most common complications. Incision lines that dehiscd and/or suffered necrosis and failed to heal within 1 month of surgery were considered complications. Seromas were included if more than one needle aspiration of serum was needed or there was more than 2 weeks of indwelling suction drainage. In addition to the total complication rate for each identified group (such as multistage vs. single stage), the number of individual complications was compared to the total number of procedures performed. Major complications were defined as events that delayed return to activities for more than 2 months or necessitated an unscheduled return to the hospital.

Revision surgery concerns unacceptable aesthetics or unacceptable scarring after delayed healing. The magnitude of revision surgery is indicated by Type 1 for minimal procedure in the office or coincidental to

another major stage. Type 2 is a significant alteration of a procedure, often requiring the use of a hospital operating room. Type 3 is a completely new procedure that replaces the previous operation. When analyzing revision rates, one must recognize that recurrent laxity and weight fluctuations bedevil outcomes, and that excellent results beget a predilection for further cosmetic improvement, with requests for additional surgery, such as scar revision, lipoplasty, and buttock and breast augmentation, which may not imply a failure of the original operation.

Outcome was assessed by examining the amount and magnitude of revision surgery and the improvement in skin deformity as graded in photographs using the Pittsburgh rating scale.¹⁴ The Pittsburgh rating not only classifies by magnitude of deformity but also allows for numerical comparison of the preoperative state to the surgical outcome.

Time to complete either single- or multistage TBL surgery following weight loss was compared using the Wilcoxon signed rank test. The single- and multistage TBL groups were compared for development of complication after surgery using the Kaplan-Meier analysis. Complications between the 2 groups were compared using the Student *t* test or Kruskal-Wallis analysis. All statistical analyses were performed using GraphPad Prism (v. 4.00 for Macintosh; GraphPad Software, San Diego CA).

RESULTS

Single-stage TBL surgery averaged 8.2 hours. Two-stage surgery took 7.4 hours for the first stage and 4.6 hours for the remaining stage, for a total of 11 hours. Banked blood transfusions for single-stage surgery were 1.5 per single-stage case and 0.78 per multistage case. Three demonstrative cases are presented, followed by a tabulation of the complications and outcomes.

Case 1

A 49-year-old, 5' 6" woman underwent single-stage TBL surgery with coincidental laparoscopic-assisted oophorectomies 2 years after going from 314 pounds to 160 pounds following Roux-en-Y bypass surgery (Figure 1). Constipation persisted for 6 weeks but responded to enemas and cessation of narcotics. A tender right medial thigh lymphocele responded to multiple aspirations. Small presacral, umbilical, and right groin and gluteal fold wounds healed following superficial debridement and dressing care. Mild edema of the legs resolved over 6 months with compression bandages. Concern over her thick breast scars led to the resolution with silicone sheeting. Three months after her TBL, she underwent L brachioplasties, endoscopic-assisted brow lift, and a face lift. A small wound in the right axilla healed after debridement and 3 months of dressing care. Benadryl relieved her scalp pruritis. Thickening and radiographic calcifications within the distal end of her right breast flap led to a core biopsy that revealed fat necrosis.

Fifteen months later, in the office, she underwent lipoplasty of her neck and further neck suspension, as well as limited excision of redundant skin from her left upper inner thigh.

Case 2

A 41-year-old, 5' 6" woman, who went from 301 to 160 pounds after Roux-en-Y bypass surgery, underwent single-stage TBL surgery followed by bilateral breast augmentation and further arm reduction 2 years later (Figure 2). Her early postoperative course was complicated by constipation, a small area of delayed healing of her right groin, and spitting monofilament absorbable sutures.

Case 3

A 47-year-old, 5' 6" woman, who went from 427 to 205 pounds after gastric bypass surgery, underwent two-stage TBL surgery. Her 33.1 BMI and large lower body and thighs prompted a first stage of abdominoplasty, lower body lift, and L thighplasty with UAL (Figure 3). Some disruption of the upper inner thigh closures led to delayed healing over 3 months. Five months after her first stage, she underwent an upper body lift with breast reshaping using the spiral flap and L brachioplasties, as well as further excision of medial thigh skin, revision of the mons pubis, and lower body UAL. There was again some delayed inner thigh healing and also mild separation of her right nipple-areolar complex and right inframammary fold. With debridement and dressing care, all wounds healed over the course of 1 month.

Complications

Seventy-six percent of the patients experienced complications, mostly related to wound healing. These data are comparable to a recently published study (Table 2). The same set of complications as related to number of procedures yields an 11% incidence. Major complications occurred in 21 of the 75 patients (28%; Table 3). There were no deaths. While there was no documented evidence of thrombophlebitis, there was one case of nonfatal pulmonary embolism. All patients with complications had severe deformity by the Pittsburgh scale except for one moderate grade. Elective readmission for scar or contour revision was independently categorized and was not considered a major complication.

Fifteen of the 60 single-stage patients suffered major complications (2-month delay or an unscheduled return to the hospital). Six of the 16 (approximately 40%) multistage TBL patients (60%) had major complications and 15 of the 59 (approximately 25%) single-stage TBL patients experienced major complications.

Two patients had minor (Type 1) contour revisions. Nineteen had significant (Type 2) revisions. Five complete revisions (Type 3) were performed. Forty-eight of the 75 patients had no revision procedure. Scar revision was performed to correct delayed healing and poor aesthetics. Twenty-four patients had minor scar revisions in