Outpatient Extended Abdominoplasty in the Patient With Massive Weight Loss

Constance M. Barone, MD; Stanley A. Okoro, MD; Deowall Chatter-Cora, MD; and Eric R. Helling, MD

Background: Extended abdominoplasty in the patient with massive weight loss has traditionally been performed as an inpatient procedure. To date, there has been no report on the safety of outpatient extended abdominoplasty in the patient with massive weight loss.

Objective: The authors sought to evaluate the safety of outpatient abdominoplasty in this growing population of patients.

Methods: A retrospective chart review was performed of all the senior author’s (C.M.B.) patients with massive weight loss who underwent extended abdominoplasty from November 2004 to August 2006. Each case was evaluated for demographic information, patient weight (pre-gastric bypass, pre-contour), body mass index (pre-gastric bypass, pre-contour), weight of specimen, anesthesia type, estimated blood loss, operating room time, length of stay, and drain management. The complications were compared with historical control subjects.

Results: A total of 19 patients, 16 female and 3 male, underwent extended abdominoplasty after massive weight loss. The average weight loss was 142 pounds. The average pre-gastric bypass body mass index was 52 kg/m². The average pre-contour body mass index was 29 kg/m². The average operative findings were as follows: estimated blood loss, 130 mL; specimen weight, 3288 g; and operative time, 132 minutes. There was no perioperative blood transfusion. All patients (100%) were discharged the same day. Overall complications in 5 patients (26%) included stitch abscess (5%), partial umbilical necrosis (5%), superficial wound dehiscence (10%), and seroma and bleeding (5%) in the same patient.

weight loss who underwent extended abdominoplasty by the senior author from November 2004 to August 2006. The operating room records, demographic information, and complications were reviewed. Preoperative exclusion criteria for this procedure were patients with a current history of tobacco use, obstructive sleep apnea, pulmonary embolism (PE), thrombophlebitis, deep venous thrombosis (DVT), heart disease, anemia, and American Society of Anesthesiologists classification 3 or higher (Table 1). If a patient had varicose veins, a duplex ultrasound scan was obtained before surgery. In general, concomitant procedures were not performed; however, a few patients underwent simultaneous breast reduction, mastopexy, lipoplasty, or incisional hernia repair.

Each case was evaluated for demographic information, patient weight (pre-gastric bypass, pre-contour), body mass index (BMI) (pre-gastric bypass, pre-contour), weight of specimen, anesthesia type, estimated blood loss, operating room time, length of stay, drain management, and complications. Complications were subdivided into major and minor categories. A major complication required procedural intervention or hospital admission. A minor complication is one that did not require operative intervention or hospital admission. The data were tabulated and compared with historical data for inpatient abdominoplasty.

**Technique**

All patients had a normal preoperative hematocrit level, and all operations were performed in an accredited ambulatory surgery center associated with a hospital. Sequential compression devices were applied on all patients before the induction of general anesthesia. A board-certified anesthesiologist was used for all abdominoplasties. All operative procedures were performed with two surgeons working simultaneously. Patients were marked in the standing position before surgery and first positioned prone on the operating room table after preparation with povidone-iodine (Betadine).

The posterior and lateral gluteal hip excision was performed first, keeping a small amount of fat on the muscle. This excision began at the parasacral region and extended laterally to excise the hip region. The pannus was excised laterally, and a towel was temporally stapled to the side open wound. After the incision was closed with 2-0 Vicryl (Ethicon, Johnson & Johnson, Somerville, NJ) in the deep layer and the dermis, staples were used to close the skin. The dressing was applied with gauze and Hypafix (Smith & Nephew, Largo, FL) tape on the back.

The patient was then placed in the supine position. The draping towels were steriley removed, and the anterior abdomen was prepared with Betadine solution. The anterolateral abdominoplasty was then performed, preserving a layer of fat on the rectus fascia and undermining to the subxiphoid region. Electrocautery was used throughout the dissection. If a hernia was present, it was then repaired; the rectus muscle plicated with 0 Ethibond suture (Ethicon, Johnson & Johnson, Somerville, NJ), and Alloderm (LifeCell Corp., Branchburg, NJ) was placed on top of the rectus muscle. If no hernia was present, the rectus was plicated with interrupted 0 Ethibond. Deep 2-0 Vicryl was used in the deeper layers from the subcutaneous layer to the anterior rectus fascia. Two Jackson-Pratt drains (10-gauge) were placed anteriorly via separate wounds in the mons. Most patients also were provided with a 3-day pain pump (On-Q PainBuster; I-flow Corporation, Lake Forest, CA) with 0.25% bupivacaine delivered through Y tubing placed anteriorly via a separate insertion site above the Jackson-Pratt drains.

The dermis was closed with buried 2-0 Vicryl, and the skin was closed anteriorly and laterally with 4-0 Vicryl. The umbilical stalk was delivered via a horizontal incision approximately 6 cm above the incision. Steri-Strips (3M, St. Paul, MN) were then placed, and an anterior dressing of gauze and Hypafix tape was placed and connected to the dressing on the back. At the end of the case, a postoperative hematocrit level was obtained.

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**Table 1. Selection criteria for body contouring**

<table>
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<th>Selection criteria</th>
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<tr>
<td>ASA I and II</td>
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<tr>
<td>No cardiac disease</td>
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<tr>
<td>No history of venous thromboembolic events</td>
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<tr>
<td>No varicose veins*</td>
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<tr>
<td>No current apnea†</td>
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<td>No tobacco use</td>
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<tr>
<td>Stable nutrition and comorbidity</td>
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<tr>
<td>Normal hemoglobin</td>
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<td>Stable weight</td>
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ASA, American Society of Anesthesiologists.

*Patient with varicose veins underwent preoperative duplex ultrasound scanning.

†Patients were retested with sleep studies if they had a history of apnea before gastric bypass.
Patients were discharged home when they met discharge criteria. These included the ability to safely ambulate, oral intake, and the ability to void, plus adequate pain control. If the patient was unable to urinate after 4 hours, a bladder ultrasound scan was obtained, a Foley catheter was inserted, and the patient was sent home with the catheter, to be removed in the office the next day. Postoperative pain management consisted of oral narcotics taken as needed in addition to the 3-day pain pump.

All patients were contacted by phone on the night of surgery to ensure adequate pain control and that the patient was ambulating as instructed. All patients were seen in the office within 24 hours after surgery. Drains were removed in stages. The first drain was removed on postoperative day 3, and the last when the output was less than 30 mL/24 h.

Results

A total of 19 patients, 16 female and 3 male, underwent extended abdominoplasty after massive weight loss. The average age of patients was 43 years, with a range of 30 to 59 years. The average weight loss was 142 pounds. The minimum and maximum weight loss was 75 and 266 pounds, respectively. The average pre-gastric bypass BMI was 52 kg/m², with a range of 40 to 72 kg/m². The average pre-contour BMI was 29 kg/m², with a range of 22 to 43 kg/m². The average preoperative hematocrit was 38.81% (range 32.64%-50%). The average time from bariatric surgery to extended abdominoplasty was 25 months (range 11-48 months). The mean follow-up was 4 months (range 1-12 months). Eight patients (40%) were still considered obese (BMI > 30 kg/m²), and 1 patient (5%) was morbidly obese (BMI > 40 kg/m²) (Table 2).

The estimated blood loss ranged from 50 mL to 350 mL, with an average of 130 mL. The specimen weight ranged from 564 g to 9611 g, with an average of 3288 g. The average operating time was 132 minutes, with a range of 62 to 234 minutes. There was no perioperative blood transfusion (Table 3).

Eight concomitant procedures were performed in 7 patients: breast reduction, mastopexy, thigh lipoplasty, and incisional hernia repair (Table 4). The average drain duration was 9 days. The average length of stay was 0 days. All patients (100%) were successfully discharged on the day of surgery.

Overall, there were 6 complications (Figure 1) in 5 patients (26%). Complications encountered were one episode of localized cellulitis from stitch abscess (5%) that was treated with antibiotics. A patient who underwent a concurrent repair of a larger umbilical hernia (15 cm × 4 cm) by the senior author experienced partial umbilical necrosis (5%), which was managed by local wound care. Two patients (10%) had minor superficial wound dehiscence (10%) treated with local wound care. One patient had a seroma (5%) that was treated with aspiration and seroma cavity sclerosis. Three weeks after surgery, he fell at home and required exploration and evacuation of a hematoma (Table 5). There were no DVTs or PEs. All patients had excellent aesthetic outcomes (Figures 2 to 4).

Discussion

Most traditional abdominoplasty procedures performed in patients with massive weight loss have been

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<th>Table 2. Patient demographics</th>
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<tr>
<td>Characteristic</td>
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<tr>
<td>Female</td>
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<tr>
<td>Male</td>
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<tr>
<td>Mean age (range)</td>
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<tr>
<td>Mean BMI</td>
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<td>Mean preoperative hematocrit</td>
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<th>Table 3. Operative variables</th>
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<td>Variables</td>
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<tr>
<td>Mean EBL (range)</td>
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<tr>
<td>Specimen weight (range)</td>
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<tr>
<td>Mean OR time (range)</td>
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<tr>
<td>Blood transfusion (units)</td>
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<th>Table 4. Concomitant procedures</th>
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<td>Procedures</td>
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<tr>
<td>Breast reduction</td>
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<tr>
<td>Mastopexy*</td>
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<td>Thigh lipoplasty*</td>
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<td>Hernia repair</td>
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*Same patient.
performed as inpatient procedures. In an effort to decrease costs, some groups have attempted to perform this operation as an outpatient procedure in otherwise healthy patients.\textsuperscript{5-7} However, this is the first report on extended abdominoplasty done as an outpatient procedure in the patient with massive weight loss.

Our average operative time was just over 2 hours. We attribute this to the two-surgeon approach. Our mean preoperative BMI, specimen weight, follow-up, and complications are comparable to published in-patient series reporting on patients with massive weight loss.\textsuperscript{8,9} Recently Espinosa-de-los-Monteros et al\textsuperscript{9} reported their experience with combined lipoplasty and abdominoplasty procedures in 60 patients with only anterior abdominal redundancy after massive weight loss. In their series, all 25 patients (42%) who were treated as outpatients had a BMI <30 kg/m\textsuperscript{2}. Our series included patients with both anterior and posterior truncal redundancy. Additionally, 100% of our patients were managed as outpatients, even though 8 patients (42%) were obese (BMI > 30 kg/m\textsuperscript{2}) and 1 patient (5%) was morbidly obese (BMI > 40 kg/m\textsuperscript{2}).

Mast\textsuperscript{10} compared his inpatient and outpatient abdominoplasty experience in healthy patients. He found that there was little difference in the complication rates and concluded that safety and efficacy are not compromised in the outpatient setting. Even though our patients have had massive weight loss, their complications were comparable to his series.

The most commonly reported complications after abdominoplasty are seroma formation (10%-15%) and skin flap necrosis (3%-15%).\textsuperscript{11-14} Khan et al\textsuperscript{11} reported

\begin{table}[h]
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\caption{Complications}
\begin{tabular}{lll}
\hline
Patient & Complication & BMI (kg/m\textsuperscript{2}) \\
\hline
1 & Stitch abscess & 32 \\
2 & Partial umbilical necrosis & 34 \\
3 & Superficial wound dehiscence & 36 \\
4 & Superficial wound dehiscence & 28 \\
5 & Seroma/bleeding & 38 \\
\hline
\end{tabular}
\end{table}
a 12.6% seroma rate formation and a 1% wound necrosis rate. In an effort to minimize these complications, several technical modifications have been used by different groups. Khan et al\textsuperscript{11} compared the use of progressive tension sutures in 103 patients and found that their use decreased the rate of seroma formation and allowed for earlier suction drain removal. Sanger and David\textsuperscript{8} reported their experience with 18 massive weight loss patients undergoing body contouring surgery. They noted a 27% overall wound complication. Seroma (11%) was their most common complication. The BMI, operative data, and length of stay were not reported.

In our series, we had a 5% seroma rate. Our most common complication was superficial partial wound dehiscence (10%). No skin flap necrosis occurred. To minimize the risk of fluid collections in our series, a thin layer of fat was preserved on both the anterior and posterior fascia, and plication sutures were used from the deep dermis to the anterior rectus fascia. It is believed that preserving fat on the deep fascia maintains lymphatic drainage, hence decreasing the risk of seroma.\textsuperscript{15} Anterior drains were used and removed in stages. We believe that our seroma rate was lower than published series because of these modifications.\textsuperscript{8,11-14} Hensel et al\textsuperscript{16} reviewed their experience with 199 patients undergoing abdominoplasties. Thirty-two percent of the patients had some complication, with 94.7% (71/750) being minor wound complications that were managed on an outpatient basis with local care. Factors that were found to correlate with complications included smoking history, hypertension, and diabetes mellitus. These investigators suspect that small vessel disease was the likely cause of the wound complications. Espinosa-de-las-Monteros et al\textsuperscript{9} reported that increased weight of the pannus and BMI were factors associated with the development of complications.

![Preoperative views](image1.png)

![Postoperative views](image2.png)

**Figure 2.** A, C, E, Preoperative views of a 44-year-old woman who had undergone bariatric surgery. B, D, F, Postoperative views 4 months after outpatient abdominoplasty. This patient also underwent mastopexy, brachioplasty, and medial thigh lift in the interval between abdominoplasty and the postoperative photographs.
Figure 3. A, C, Preoperative views of a 46-year-old woman who had undergone bariatric surgery. B, D, Postoperative views 4 months after outpatient abdominoplasty. This patient also underwent limited abdominal lipoplasty, brachioplasty, and medial thigh lift in the interval between abdominoplasty and the postoperative photographs.

Figure 4. A, C, Preoperative views of a 53-year-old woman who had undergone bariatric surgery. B, D, Postoperative views 8 months after outpatient abdominoplasty. This patient also underwent brachioplasty, medial thigh lipoplasty, and medial thigh lift in the interval between abdominoplasty and the postoperative photographs.
With Massive Weight Loss

Outpatient Extended Abdominoplasty in the Patient

Vastine et al\(^{17}\) retrospectively reviewed the records of 90 patients undergoing abdominoplasty to determine the effect of obesity on the incidence of complications after this surgery. The study patients were divided into 3 groups—obese, borderline, and non-obese—on the basis of the degree to which their preoperative weight varied from their ideal body weight. A history of previous bariatric surgery was also analyzed to determine what impact that might have on subsequent abdominoplasty. Their results showed that 80% of obese patients had complications, compared with the borderline and non-obese patients, who had complication rates of 33% and 32.5%, respectively. On the basis of these findings, they concluded that previous gastric bypass surgery had no significant effect on the incidence of post-abdominoplasty complications and that obesity at the time of abdominoplasty has a profound influence on the wound complication rate after surgery, regardless of any previous weight reduction surgery. These results are consistent with our study, where 4 of 5 patients with complications were obese with BMI greater than 30 kg/m\(^2\). In this study, obesity at the time of body contouring is associated with increased risk of complications. The cause of our one major complication (hemorrhage) is unclear. It could have been secondary to the doxycycline (100 mg) used as a sclerosant for his seroma.

In an effort to minimize the risk of thromboembolic disease in this group of patients, all patients were extensively counseled before surgery about ambulating immediately after surgery. There were no patients with a history of thrombophlebitis, DVT, or PE. If a patient had a history of varicose veins, a duplex ultrasound scan was obtained to rule out DVT. Sequential compression devices were placed before induction of general anesthesia, and patients were expected to walk relatively soon after surgery. All patients were required to ambulate before discharge. To ensure compliance, all patients were contacted by telephone on the night of surgery to emphasize the importance of ambulation and to see if pain control was adequate. There were no thromboembolic events in our series.

Our low complication rate may relate to patient selection. It is important to recognize that patients undergoing bypass may differ from patients who lost weight by diet and exercise. Patients who attain massive weight loss by diet and exercise have had strengthening of their cardiopulmonary status over time. Patients who attain massive weight loss by bariatric surgery may have dietary and metabolic derangement requiring preoperative evaluation and management.\(^{8}\) All of our patients were evaluated before surgery and were cleared for surgery by their primary care physician. Patients who were current tobacco users and had complex medical conditions were not selected for surgery.

Extended abdominoplasty has been denied by some insurance companies, thus making the patient ultimately responsible for the financial expense of the operation. Most of the health care cost associated with abdominoplasty in these patients is related to lengthy hospitalization. If the cost of hospitalization could be eliminated, we believe that more patients would present for body contouring after massive weight loss.

Conclusion

With appropriate patient selection and operative techniques, extended abdominoplasty after massive weight loss can be successfully performed on an outpatient basis with minimal morbidity and a complication rate comparable to existing literature on inpatient procedures. Moreover, this can allow cost savings that can be passed to the patient.

References


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