

Ambulatory Abdominoplasty Tailored to Patients With an Appropriate Body Mass Index

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Background: The office-based surgery setting potentially offers advantages to both the patient and the plastic surgeon, but some patients may not be considered good candidates for abdominoplasty or combined abdominoplasty/lipoplasty performed in the ambulatory setting.

Objective: We conducted a retrospective case review of 22 patients who underwent ambulatory abdominoplasty to correct diastasis recti during a 1-year period to evaluate the utility of body mass index (BMI) in patient selection for office-based abdominoplasty procedures using a tumescent technique.

Methods: Patients selected for ambulatory abdominoplasty in an office-based setting had BMIs ranging from 22 to 34, with an average BMI of 27, and were American Society of Anesthesiologists (ASA) class I or II. Patients with a BMI that placed them in a "morbidly obese" category (BMI of 35 or above) received general anesthesia with an overnight hospital stay. In borderline cases involving obese patients, a qualified anesthesia provider was consulted to determine whether ambulatory surgery was appropriate, based on the patient's airway and an overall evaluation of the patient's history and physical examination. Patients who underwent ambulatory abdominoplasty received a tumescent anesthetic solution of 50 mL 1% lidocaine with 1 mg epinephrine per liter of normal saline, up to 35 mg/kg body weight. Lipoplasty of the lateral and epigastric regions was routinely performed at the end of all abdominoplasties. The length of surgery was 3 hours to 5.5 hours, depending on the number of regions undergoing lipoplasty.

Results: There were no reportable surgical or anesthetic complications in any of our patients. Patients reported a high level of satisfaction with the results.

Conclusions: BMI evaluation, and in some cases additional risk assessment by a qualified anesthesia provider, can be helpful in determining proper candidates for ambulatory abdominoplasty and combined abdominoplasty/lipoplasty procedures. (*Aesthetic Surg J* 2005;25:132-137.)

The office-based surgery setting offers a number of potential advantages for both the patient and the plastic surgeon, including greater control over scheduling, increased convenience and privacy for the patient, a high level of efficient, consistent service by nursing staff and support personnel,¹ and, often, reduced cost. However, despite the high level of safety afforded by accredited ambulatory facilities, there are some patients who often have been regarded as better candidates for hospital-based surgery. In this retrospective study, we report on the use of body mass index (BMI), and in some cases, additional risk assessment by a qualified anesthesia provider, to evaluate patients for abdominoplasty in an office-based setting.

Members of the American Society of Plastic Surgeons (ASPS) and the American Society for Aesthetic Plastic

Surgery (ASAPS) must perform their surgeries in facilities that are accredited, state-licensed or Medicare-certified. In accordance with these requirements and advisories, all abdominoplasty and lipoplasty procedures reported in this article were performed in an ambulatory surgery center licensed by the state and accredited by nationally recognized accrediting organizations.¹

Materials and Methods

The charts of 22 patients who were treated for diastasis recti with redundant abdominal wall tissue by abdominoplasty in the outpatient setting between October of 2002 and June 2003 were reviewed retrospectively. In 10 of our 22 patients, lipoplasty of the back was performed in conjunction with the primary procedure to improve overall truncal contour. The aver-

age of the patients undergoing outpatient abdominoplasty was 40 years.

The BMIs of our patients ranged from 22 to 34, and the average BMI was calculated as 27. None of the patients had experienced recent massive weight loss through diet or bariatric surgery; therefore, the reported BMIs were a true representation of their body habitus and could be used for preoperative evaluation. All patients were classified as American Society of Anesthesiologists (ASA) class I or II, based on having no health concerns or one health matter that was well controlled.

Preoperative planning

The initial consultation was used to introduce patients to the surgical options that were available as well as to decide what was best suited to their body contour and goals. Each patient's prior medical history was reviewed thoroughly for major medical conditions, allergic reactions to medications, history of previous surgeries, and social habits to help prevent any unknown factors from complicating the procedure. Patients underwent physical examination of the abdomen, including assessments of skin laxity, abdominal muscle conditioning, and excess fatty tissue. The typical diagnosis was diastasis recti with redundant abdominal wall tissue. At that time, patients were informed whether they would be acceptable candidates for surgery in an outpatient ambulatory setting versus undergoing general anesthesia in a hospital. In cases in which patients were classified as "obese" according to their BMI and consequently were considered "borderline" for general anesthesia, a qualified anesthesia provider was consulted to evaluate whether such patients were appropriate candidates for ambulatory surgery with intravenous sedation. This evaluation was based on an assessment of the patient's airway, as well as the overall evaluation of the patient's history and physical examination.

Surgical technique

The patient was placed in the operating room with compression devices applied to the legs. Once admitted to the operating room, 2 mg of midazolam hydrochloride, 100 mcg of fentanyl citrate, 10 mg of metoclopramide hydrochloride, 0.2 mg glycopyrrolate and prophylactic antibiotics were administered by the anesthesia provider—in this case, a certified registered nurse anesthetist (CRNA). After the propofol drip was initiated, the anterior abdomen and pubic region were prepped with antiseptic solution. Using local anesthesia at the

puncture site, the tumescent solution was infiltrated into the subcutaneous tissue of the abdominal wall. Lipoplasty was routinely performed at the end of all abdominoplasties in the lateral and epigastric regions of the abdomen.

The tumescent anesthetic used resembled that described in the Hunstad formula with a warmed solution consisting of lidocaine and epinephrine.² Its exact contents were 50 mL of 1% lidocaine with 1 mg of epinephrine per liter of normal saline, which was an acceptable dilution.³ The limits of its use were up to 35 mg/kg body weight, which is accepted as safe when injected into subcutaneous fat with solutions containing epinephrine.¹ The tumescent technique uses the largest volume of infiltrate and involves infusing 3 to 4 mL of the infiltrate solution for each planned milliliter of aspirate. Estimated blood loss with the tumescent technique is approximately 1% of the aspirate.¹ In our experience, we found no difficulty with the use of the tumescent solution because it was carried out below the subcutaneous tissue at the level of the fascia.

Once the patient was sedated and the tumescent anesthetic had achieved distribution through the abdominal wall, a standard full abdominoplasty was performed. A 3-layer incision was performed that included Camper's fascia. When the superior flap was brought down, the patient was placed in a flexed position and remained in that position during transport. The patient was required to sleep with 3 to 4 pillows behind the back while recovering.

Anesthesia with propofol was administered through an infusion pump, preferably at approximately 750 mg per hour. An estimated 250 mcg of fentanyl on average was administered to each patient. An antiemetic was administered at the end of each surgery and worked in conjunction with the antiemetic effects of the intraoperative propofol. The length of each procedure ranged from 3 hours to 5.5 hours, depending on the number of areas undergoing lipoplasty.

Postoperative care

Each patient was closely monitored in a recovery suite by a postanesthesia care unit (PACU) nurse. Patients were given prescriptions for hydrocodone plus acetaminophen for pain control, cephalexin for antibiotic prophylaxis, and trimethoprim-sulfamethoxazole for possible postoperative nausea. Our patients spent from 40 minutes to 75 minutes recovering and were discharged to the care of a responsible adult after meeting discharge criteria. The list

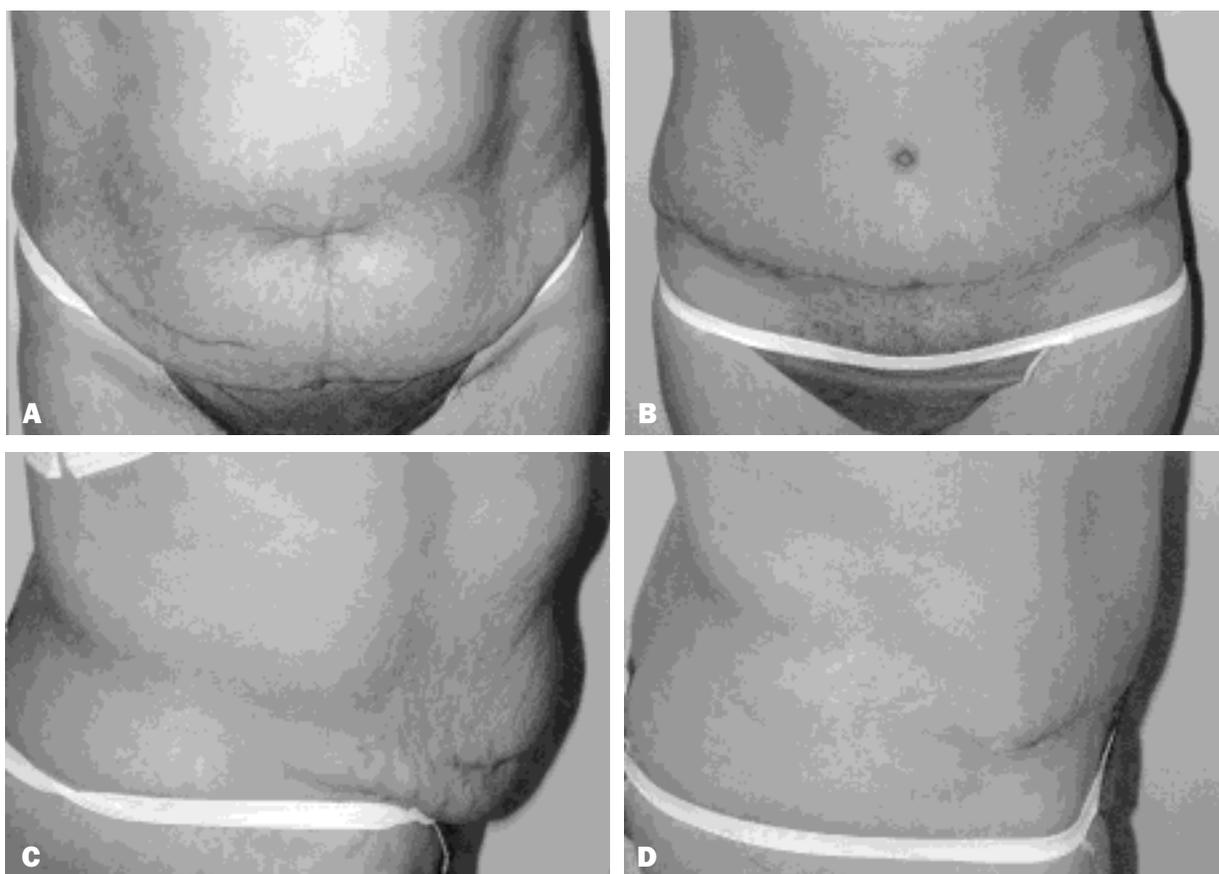


Figure 1. A, C, Preoperative views of a 44-year-old patient classified as obese according to BMI criteria (BMI = 33). **B, D,** Postoperative views 3 months after ambulatory abdominoplasty using a tumescent technique.

of criteria used to determine patient readiness for discharge specifies that the patient should be alert and oriented, must have stable vital signs with an absence of respiratory distress, abdominal dressings without an excessive amount of drainage, an absence of nausea or vomiting, and the ability to ambulate without excessive discomfort.

Routine postoperative care included specific instructions on activity and wound care. Patients were instructed to walk in a slightly flexed position and to sleep with the head of the bed elevated 45 degrees. They received postoperative telephone evaluation the following day. Jackson-Pratt drains were removed between postoperative days 3 to 5. Subsequent office evaluation occurred 7 days after surgery. Usually, patients returned to work in 3 to 4 weeks.

Postoperative photos were taken 3 months after surgery (Figures 1 and 2). All of the patients included in the study expressed a high level of satisfaction. There were no reportable surgical or anesthetic complications;

this is particularly significant considering that this procedure is usually performed in a hospital with at least 23 hours of observation.

Discussion

In current practice, BMI has been used in many applications. In the adult population, BMI is gender independent and therefore applicable to both men and women.⁴ For our purposes, BMI was the first criterion used to delineate which of our abdominoplasty candidates could safely undergo abdominoplasty on an outpatient basis using the tumescent technique.^{3,5,6}

Utilizing BMI as a criterion can be efficient and cost effective. BMI relies on the fact that body surface area is directly proportional to height squared. Body surface area is essentially independent of weight.⁴ BMI can be calculated with the formula (W/H^2) in metric units of kilograms and meters.⁷ In our practice, each patient's weight and height were recorded during the preliminary office visit. Routine history and physical examination

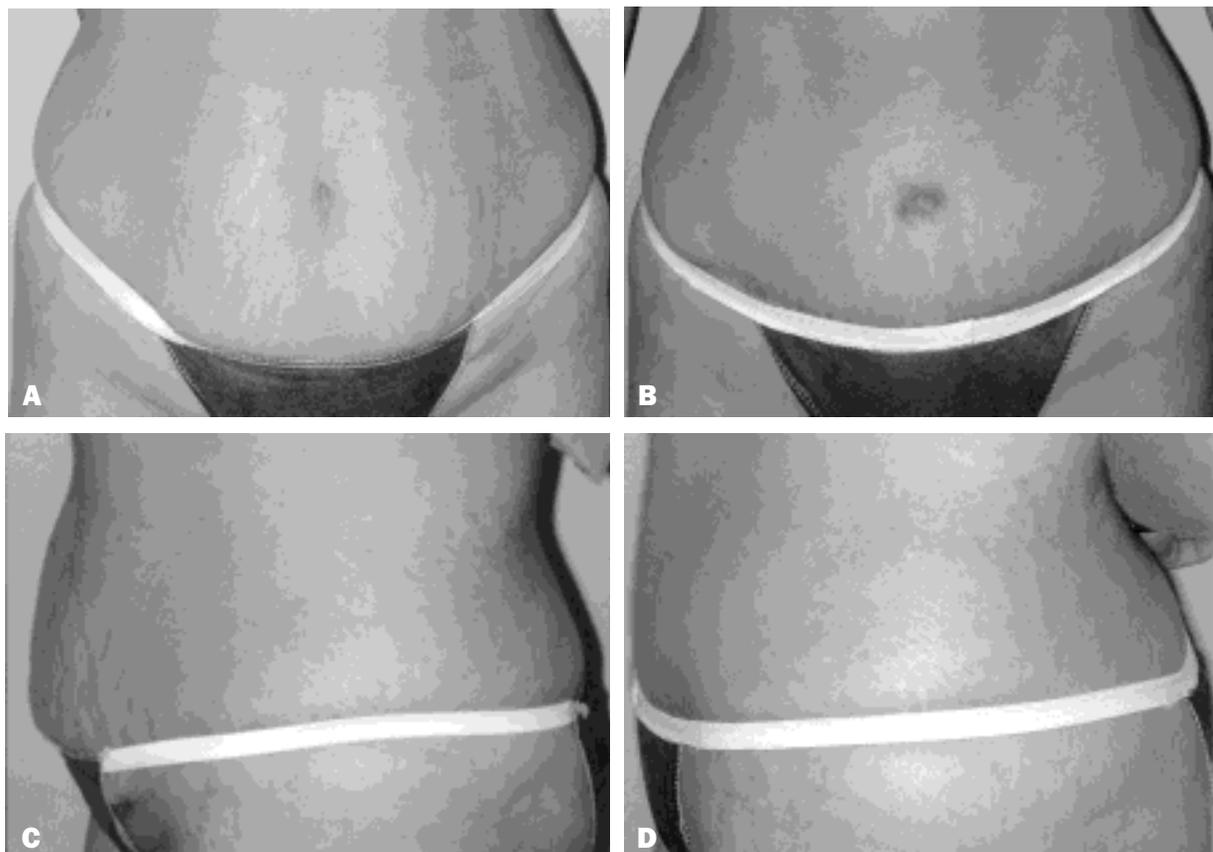


Figure 2. A, C, Preoperative views of a 36-year-old woman classified as overweight according to BMI criteria (BMI = 26). **B, D,** Postoperative views 3 months after ambulatory abdominoplasty using a tumescent technique.

charting gathers the pertinent information that is needed. The recordings could be easily grafted using tables or nomograms issued by the National Heart, Lung, and Blood Institute or by life insurance companies.⁸ These methods are more than sufficient for clinical purposes, and extensive calculations are not required.

As mentioned, our patients selected for abdominoplasty with intravenous sedation had a BMI in the range of 22 to 34, with an average BMI of 27. Therefore, the group that we found as appropriate would be classified as normal to obese, but upon clinical evaluation, they were all considered acceptable candidates for outpatient surgery. Patients with a BMI that placed them in the Class II “morbidly obese” category were assigned to undergo general anesthesia with an overnight hospital stay (Table). Patients with a BMI that classifies them in the range of morbidly obese to extremely obese often require more pain-controlling agents intra-operatively.^{9,10} In recent studies, the level of the analgesic fentanyl administered intra-operatively has been found to notably

increase the length of PACU stay for patients recovering from intravenous sedation.¹¹ This could lead to complications or admission to the hospital.

If the patients were identified as obese according to the BMI chart, it was our policy to consult a qualified anesthesia provider before making arrangements to perform abdominoplasty in an outpatient surgical suite. Patients who appeared to have an unmanageable airway were not candidates for surgery in this type of setting. Evaluation of an unmanageable airway involved systematically screening the following variables according to the modified Mallampati classification system: the presence of a short or muscular neck, receding mandible, the faucial pillars (palatoglossal and palatopharyngeal arches) and uvula not visualized in a patient sitting with the tongue protruding, inability to visualize the base of the tongue, a limited temporomandibular joint mobility range (< 40 mm), limited cervical spine mobility, and the distance from the mandible to the hyoid bone measuring less than two finger’s breadth in an adult.¹² Mallampati designa-

Table. Clinical classification of BMI*

BMI (kg/m²) range	Descriptive designation	Subclassification
Less than 18.5	Underweight	
18.5 – 19.9	Lean	
20 – 25	Optimal/normal range	
25 – 29.9	Overweight	
30 – 34.9	Obese	Class I obesity
35 – 39.9	Morbidly obese	Class II obesity
40 – greater	Extremely obese	Class III obesity

*BMI, Body Mass Index.

Modified from Table ES-2 of "Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults." National Institutes of Health, 1998.⁸

tion as class I-IV was taken into account by the anesthesia provider to determine whether the potential for a difficult airway existed in patients requesting surgery with intravenous sedation. If the airway was deemed difficult, the anesthesia provider would recommend that the surgery for that particular patient be performed in a hospital, which has more extensive airway-management equipment and ancillary support personnel available.

Difficult intubation can be a risk factor for postoperative complications. Obesity is significantly related to difficult intubation, and patients with an increased BMI often have obstructive sleep apnea-hypopnea syndrome (SAS).¹³ Studies have revealed a statistically significant correlation between the apnea-hypopnea index and BMI ($P < .000$) and modified Mallampati classification ($P < .002$).¹² SAS has been associated with chronic conditions such as arterial hypertension, diabetes mellitus, and gastroesophageal reflux disease.^{13,14}

We found our complication rate to be exceptional. There were no reportable complications as a result of the anesthesia or operations performed in our 22 patients during the 1-year follow-up period. This is a considerable achievement, given that abdominoplasty performed in any setting can potentially be associated with complications, including infections, seromas, deep vein thromboses, pulmonary emboli, and incidences of wound dehiscence.¹⁴⁻¹⁶

Studies have been published to analyze the direct effect of obesity on the incidence of complications after abdominoplasty. One such study revealed that BMI could

be used to group patients as obese, borderline obese, and non-obese. According to that grouping, the results showed that 80% of obese patients had complications compared with the 33% of borderline patients and 32.5% of nonobese patients.¹⁷ We believe that by applying BMI criteria in combination with a thorough history and physical examination, as well as receiving insight from anesthesia consultants, lower complication rates can be attained for abdominoplasty patients, including those with Class I obesity (BMI of 30 to 34.9).

Conclusion

As cosmetic surgery continues to rise in popularity, more and more procedures will be performed on an outpatient basis and in office-based surgical facilities. Further development of guidelines for assessment of patients will be necessary to help determine which patients are appropriate candidates for this type of setting. Calculation of BMI and additional risk assessment by a qualified anesthesia provider can be reliable methods to help determine proper candidates for outpatient office-based surgery. Using strict criteria, we can avoid many of the complications that have been associated with abdominoplasty, including combined abdominoplasty/lipoplasty procedures, and provide patients with the option of having their surgery performed safely in the outpatient setting. ■

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