

The Outcome of Abdominoplasty Performed under Conscious Sedation: Six-Year Experience in 153 Consecutive Cases

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The use of conscious sedation is rapidly gaining acceptance and popularity in plastic surgery. At the present time, many procedures are performed using intravenous sedation and local anesthesia. The purpose of this article was to examine the safety and outcome of full abdominoplasties performed under conscious sedation at the authors' institution. Over a 6-year period from 1997 to 2002, 266 abdominoplasties were performed by the two senior authors. One hundred thirteen of these (42 percent) were performed under a general or regional anesthetic because a concurrent procedure was performed that precluded the use of conscious sedation (64 hysterectomies, 18 hernia repairs, six urogynecologic procedures, 10 breast reductions, and one laparoscopic cholecystectomy) or because of patient and surgeon preference (14 cases). One hundred fifty-three abdominoplasties (58 percent) were performed under conscious sedation using intravenous midazolam and fentanyl along with a local anesthetic. No patients had an unplanned conversion to deep sedation or general anesthesia. Eighty percent of these cases were performed with a concurrent procedure (80 liposuctions, 19 breast augmentations, 20 mastopexies, three capsulotomies, and 13 varied facial aesthetic procedures). In addition, 12 patients had concurrent hernia repairs (five ventral and seven umbilical) under conscious sedation. Mean follow-up was 10 months (range, 1 to 56 months). There were no intraoperative complications and no major postoperative complications. The minor complication rate was 11.1 percent (10 seromas requiring needle aspiration in the office, three superficial wound infections, two cases of marginal skin necrosis, one stitch abscess, and one pseudobursa requiring reexcision). Seven revisions were performed for suboptimal scars (5 percent). The results of this study demonstrate that abdominoplasties can be performed under conscious sedation in a safe and cost-effective manner for almost all patients. This type of procedure is well tolerated, has a low complication rate, and has high patient satisfaction. Increasing experience and small modifications in local anesthesia and surgical technique have strengthened the authors' conviction that conscious sedation is the preferred method of anesthesia for most

patients undergoing abdominoplasty. (*Plast. Reconstr. Surg.* 113: 1807, 2004.)

Conscious sedation is rapidly gaining acceptance and popularity among plastic surgeons.¹ For many years, it has been widely used in the fields of oral surgery, ophthalmology, gastroenterology, pulmonary medicine, and radiology. With the growth of office-based procedures and surgicenters, there has been a concomitant increase in the role of conscious sedation.² A recent task force of the American Society of Plastic and Reconstructive Surgeons was assembled to deal specifically with many of the issues related to conscious sedation.³ Currently, a variety of aesthetic procedures are performed using a local anesthetic combined with some form of intravenous sedation. These procedures include breast augmentation, breast reduction, mastopexy, abdominoplasty, rhytidectomy, rhinoplasty, blepharoplasty, and liposuction.⁴

Conscious sedation is defined as a depressed level of consciousness to the point that the patient is in a state of relaxation but maintains respiratory drive and the ability to protect the airway. The patient is also capable of responding to physical and verbal stimulation. This is in contrast to deep sedation, in which the patient is unable to respond to verbal stimuli, will only respond to painful stimulation with withdrawal, and has potential compromise of airway protection and respiratory drive. At our institution, we have found conscious sedation

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to be safe, to have high patient satisfaction, and to offer a number of advantages including cost savings. We have developed a straightforward protocol on the basis of selection of patients who are in a good overall state of health that makes them American Society of Anesthesiologists status I or II, effective local anesthesia, and incremental administration of a benzodiazepine/narcotic combination approved by our hospital's conscious sedation committee.

To date, there have been few large series of patients evaluating the safety and efficacy of abdominoplasties performed under conscious sedation.⁵ A previous study by the present authors determined that this procedure was safe and effective in a relatively small series of patients.⁴ The objective of this article is to review our cumulative experience over the past 6 years with performing full or complete abdominoplasties with the use of conscious sedation. With the exception of concurrent procedures requiring a general or regional anesthetic, 92 percent of the abdominoplasties performed over this 6-year period were performed using conscious sedation, and there were no unplanned conversions to general anesthesia intraoperatively. Only 8 percent of eligible patients chose to receive a general anesthetic rather than conscious sedation. The indications for performing abdominoplasty under conscious sedation, the adjunct procedures performed, the complication rate, and outcomes are evaluated, as are some improvements we have made in the technique of local anesthesia and conscious sedation that have enhanced our enthusiasm for this technique.

PATIENTS AND METHODS

Patient Selection

Between January 1, 1997, and January 1, 2003, 266 consecutive abdominoplasties performed by the authors were reviewed. One hundred fifty-three of these patients received conscious sedation. The remaining patients underwent general or epidural anesthesia and were excluded (Table I). All of the subjects who underwent conscious sedation underwent a full history and physical examination before surgery and met the criteria of the American Society of Anesthesiologists status I or II. Therefore, they had no more than a single health problem, and this problem was well controlled.

TABLE I
Abdominoplasties Excluded from the Study*

Concurrent Procedure	No. of Patients
Hysterectomy	64
Hernia repair	18
Urogynecologic (e.g., pelvic sling)	6
Laparoscopic cholecystectomy	1
Reduction mammoplasty	10
Patient/surgeon preference for general or regional anesthesia	14
Total	113 (42% of all abdominoplasties)

* Abdominoplasties were excluded because of concurrent procedures that required a general or regional anesthetic, or based on patient and surgeon preference.

Anesthetic Technique

After informed consent was obtained and before the start of the procedure, patients were premedicated with intravenous diazepam (Valium; Hoffmann La Roche, Inc., Nutley, N.J.) administered in increments of 5 to 10 mg. The dose administered ranged from 10 to 50 mg, with the goal being adequate preoperative subjective relaxation of the patient, with slurred speech as the desired endpoint. All patients also received a single dose of preoperative antibiotics and an antiemetic, ondansetron (Zofran; Glaxo SmithKline, Philadelphia, Pa.). In the operating room, one nurse is responsible for continuously monitoring patient status using pulse oximetry, blood pressure, and cardiac monitoring. This is performed by a nurse with appropriate experience and background in continuous patient monitoring but no specialized anesthesia training. It is important to emphasize that this nurse has no other duties to perform during the procedure. The patient's oxygen saturation, blood pressure, heart rate, level of arousal, and respiratory status were checked every 5 minutes. Changes in vital signs, level of arousal, and the oxygen saturation were communicated to the surgeon every 5 minutes. In addition, the surgeon could make his own assessment of arousal on the basis of response to verbal stimulation. On the basis of these parameters, the patient would receive 0.5 to 3 mg of midazolam (Versed; Hoffmann La Roche). In addition, fentanyl was given in increments of 12.5 to 50 μ g. However, after local anesthetic was infiltrated, fentanyl administration was infrequently required, except in preparation for subsequent local anesthetic administration to a new surgical site. The total dose of fentanyl never exceeded 200 μ g over the course of the procedure. Toward the

end of the case, the amount of sedation was decreased to allow the patient to slowly return to a normal state of arousal and awareness. Early in our series, a few patients received supplemental oxygen, but with increasing experience and with lower doses of fentanyl, we found this to be unnecessary except as a potential backup. Foley catheters or sequential compression devices have not been used, the former because of the short duration of the procedures (4 hours or less) and the latter because of the light level of sedation, allowing for spontaneous shifting in position and contraction of the leg muscles during the procedure in which the patient alternated between light sleep and consciousness. Most patients usually had no memory of the procedure and no recollection of pain.⁴

Surgical Technique

The surgical approach used for abdominoplasties performed under conscious sedation does not differ significantly from those performed under general anesthesia, but it has evolved with increasing experience. After initial administration of intravenous sedation, local anesthesia is achieved along the incision sites initially with approximately 20 cc of 0.5% lidocaine (Xylocaine; Astra-Zeneca, Wilmington, Del.), with 1:100,000 epinephrine along the incision sites. Using a standard liposuction wetting solution (50 cc of 1% lidocaine and one ampule of 1:1000 epinephrine mixed in 1 liter of lactated Ringer's solution), the lower abdominal incision is infiltrated to achieve tumescence, allowing immediate achievement of a bloodless field. Next, the initial skin incision is made down to the abdominal fascia. At this time, the local anesthetic can be directed beneath Scarpa's fascia immediately over the abdominal fascia using approximately 2 liters of tumescent solution for the entire abdomen. Fifteen to 20 minutes should elapse between infusing the tumescent solution and beginning the abdominal dissection to allow for the full effect of the local anesthetic. Planned concurrent procedures, typically suction-assisted lipectomy to the hips, waist, and mons pubis, are performed during this waiting period, after these areas are infiltrated. The patient is turned into a lateral position for the liposuction, which is quite easy to perform under conscious sedation, as the patient can assist in turning himself or herself.

To minimize patient discomfort, the entire

dissection is performed using a scalpel, and hemostasis is achieved using bipolar cautery, thus minimizing pain from muscle and nerve stimulation. The hydrodissection obtained by tumescent infiltration allows for easy identification of the perforating nerve and vessels, and the dissection is essentially bloodless. The abdominal flap is elevated at the level of the anterior rectus fascia and undermined up to the level of the costal margins and xiphoid, with limited lateral dissection, as described by Lockwood.⁶ Occasional injections of 0.5% lidocaine with epinephrine are infiltrated directly into nerves as they perforate the rectus fascia if there is pain during cauterization of the accompanying vessels. However, if the tumescent infiltrate is effective, this is usually not necessary. Fascial imbrication is then performed as described elsewhere.⁶ There is no pain with the imbrication when using this technique of anesthesia because of the diffusion of the lidocaine through the fascia.

Supplemental Infiltration of Local Anesthetic beneath the Fascia Is Not Required

In 12 patients, a ventral or umbilical hernia was repaired, in 10 patients primarily and in two patients with Prolene mesh (Ethicon, Inc., Somerville, N.J.). The patients are then placed in a flexed position and the skin flap is pulled caudally, using variation of a lateral tension technique.⁶ An important modification has been to remove the dermis, including hair follicles, from a portion of the hair-bearing mons pubis to avoid the pubic hair being pulled superiorly. This allows for an appropriately low scar, overlap of the skin flaps to avoid scar depression, and minimization of concern over minor wound-healing problems at the "T" if the umbilical vertical scar cannot be totally excised. Scarpa's fascia is closed as a separate layer laterally to avoid scar depression. Scar widening is prevented by placement of a subcuticular polypropylene suture left in place for several months. The excess skin is removed and, before skin closure, the umbilicus is repositioned as previously described by one of the authors.⁷ At the end of the procedure, two suction drains are placed just inferior to the abdominoplasty incision.

Postoperative Care

At the conclusion of the procedure, patients are able to bypass the recovery room and proceed directly to the outpatient day surgery

area. Until they are ready for discharge, they are monitored according to routine for conscious sedation procedures. Some of the patients are admitted overnight for observation, largely on the basis of the patient's personal preference and the extent of the accompanying procedures performed. Occasionally, overnight admission is required because of postoperative nausea. Those who choose to go home on the day of surgery are required to meet criteria for discharge (e.g., ability to ambulate to a chair and the bathroom, maintain bladder control, and tolerate oral intake without emesis).

RESULTS

Over the 6-year period, 266 patients underwent an abdominoplasty by the authors. One hundred thirteen of these (42 percent) were performed under general or epidural anesthesia and were excluded from the study. This was primarily because of the performance of a concurrent procedure that required a general or regional anesthetic, as summarized in Table I. This included hysterectomy ($n = 64$), hernia repair ($n = 18$), urogynecologic procedures ($n = 6$), reduction mammoplasty ($n = 10$), and laparoscopic cholecystectomy ($n = 1$). In addition, 14 abdominoplasties were performed under general anesthetic and hence excluded from the data because of either patient or surgeon preference.

One hundred fifty-three abdominoplasties (58 percent) were performed under conscious sedation. Table II summarizes the patient data. All but five of the patients were women (96.7 percent). Patient age ranged from 25 to 70 years (mean, 43 years). Follow-up ranged from 3 to 56 months (mean, 10 months). Most of the

cases involved the performance of additional aesthetic procedures (Fig. 1). These included suction-assisted lipectomy ($n = 80$), breast augmentation ($n = 19$), mastopexy ($n = 20$), capsulotomy ($n = 3$), blepharoplasty ($n = 5$), rhytidectomy ($n = 2$), fat injection ($n = 2$), neck lift ($n = 1$), brow lift ($n = 1$), dermabrasion ($n = 1$), and chin implant ($n = 1$). Figures 2 through 5 show two patients who underwent abdominoplasty with supplemental liposuction to the hips and flanks.

In addition, 12 patients underwent simultaneous hernia repair by one of the authors. Five of these were ventral hernias and seven were umbilical hernias. Prolene mesh was used in two of the ventral hernias to reinforce a larger defect. All 12 of the patients who underwent simultaneous hernia repair under conscious sedation tolerated the procedure well without any additional difficulty; however, with ventral hernia repair, the patients were all observed overnight in the hospital. In total, 41 of the 153 patients (27 percent) were admitted for observation, and only three patients required admission beyond the 23-hour observation period. Of these 41 patients, 38 were planned admissions according to patient preference. This was often determined by the extent of accompanying procedures. For example, patients undergoing breast augmentation and mastopexy in addition to the abdominoplasty typically planned on spending one night in the hospital. In addition, some of the anticipated admissions were for cases that were scheduled to end very late in the day. Only three patients (2 percent) from our series had to be admitted for observation because of postoperative nausea and vomiting not relieved by the administration of Zofran and other antiemetics. It also must be noted that patients were only observed for 2 to 3 hours before the decision was made to admit them. If these cases were performed in an outpatient facility with longer observation periods, we do not believe any of these patients would have required admission. However, the option of admission was reassuring to the patients.

There were no significant intraoperative complications, including electrocardiographic changes, cardiac arrhythmias, respiratory depression requiring narcotic reversal, and acute hypertension or hypotension. Furthermore, no cases were aborted and none were converted to general anesthesia or deep sedation. The intervention of an anesthesiologist was never re-

TABLE II

Data for All Patients Undergoing Abdominoplasties Performed under Conscious Sedation from January 1, 1997, to January 1, 2003*

Year	No. of Patients
1997	7
1998	30
1999	33
2000	22
2001	32
2002	29
Total	153

* Sex: female 148 (96.7%); male, 5 (3.3%); all were American Society of Anesthesiologists status I or II; patient age ranged from 25 to 70 years (mean 43 years); and follow-up ranged from 1 to 56 months (mean, 10 mo).

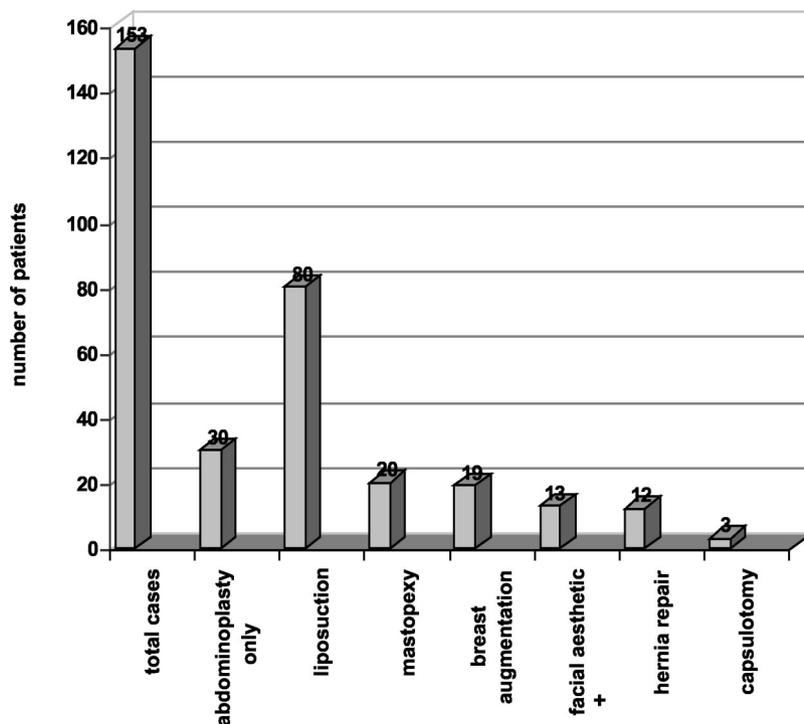


FIG. 1. A graphic representation of all abdominoplasties and the concurrent procedures performed under conscious sedation over a 6-year period. Note that some patients underwent more than a single concurrent procedure. +The facial aesthetic category includes five blepharoplasties, two face lifts, two fat injections, one brow lift, one neck lift, one dermabrasion, and one chin implant.

quired, although one was always immediately available. There were no major postoperative complications. The minor complication rate was 11.1 percent (Table III). These included seroma formation requiring one to two aspirations (6.5 percent), superficial wound infection (2.0 percent), skin necrosis (1.3 percent), a single case of stitch abscess (0.65 percent), and a single case of reoperation for excision of a pseudobursa (0.65 percent). Furthermore, the revision rate for a suboptimal scar was 5 percent, or seven cases.

In a follow-up survey previously reported by the authors, the majority of the patients described having total or near-total amnesia of the surgery. Ninety percent considered the experience to be either satisfactory, good, or excellent and stated that they would likely undergo conscious sedation again if the choice arose.⁴ This latter statement has been confirmed by the fact that among the 67 patients who underwent a cosmetic procedure at a later date, 62 (93 percent) chose to do so under conscious sedation when this was an option. No patient has expressed dissatisfaction with the technique, and many patients have specif-

ically sought out this technique for its perceived safety (versus general anesthesia).

DISCUSSION

During this 6-year period, 153 full abdominoplasties under conscious sedation were performed, the majority of which involved one or more concurrent aesthetic procedures, liposuction being the most common. Of particular interest, 12 patients underwent simultaneous hernia repair (five ventral and seven umbilical), all of which were well-tolerated. Overall, there were no intraoperative complications, and the minor postoperative complication rate was 11.1 percent, slightly less than the average reported rate of 15 percent (range, 6 to 33 percent).⁸⁻¹¹ The scar revision rate reported in this review was 5 percent, which is also within the lower limits reported in the literature.^{11,12} When we compared both our minor complication and scar revision rates to that of abdominoplasties performed under general or regional anesthesia by the same surgeons, we found no significant difference. The results support the use of local anesthesia combined with intravenous sedation as a routine method



FIG. 2. Preoperative photographs of a 49-year-old patient who underwent abdominoplasty under conscious sedation with supplemental liposuction to the hips and flanks.

of anesthesia for abdominoplasties using the described protocol.

The most important consideration facing a surgeon contemplating the use of conscious sedation is the issue of patient safety. None of the patients in this 6-year review suffered any morbidity or mortality related to the use of conscious sedation. The main risk associated

with conscious sedation is respiratory depression. We have never had a case of respiratory depression that was not resolved by simple stimulation of the patient. Supplemental oxygen is rarely necessary, and we find the ability of the patient to maintain an oxygen saturation over 95 percent without supplemental oxygen to be a useful guideline for avoiding overseda-



FIG. 3. Three-month postoperative photographs of the same patient shown in Figure 2.

tion (crossing from conscious to deep sedation). The responsible surgeon and monitoring nurse or nurse anesthetist should be able to identify and handle patients who briefly slip into deep sedation with stimulation or who require supplemental oxygen, jaw thrust, mask ventilation, or narcotic reversal. In practice, with small incremental doses of midazolam, limited use of narcotics, and effective local anesthesia, brief stimulation and very rarely jaw

thrust or supplemental oxygen have been all that have been necessary. With short-acting agents, the occasional periods of deep sedation have only lasted a few minutes at most. In our series, there were no intraoperative complications such as cardiac arrhythmias, respiratory depression, acute hypertension or hypotension, or the need for narcotic reversal with naloxone. Nevertheless, as a safety measure, the capability to convert to general anesthesia

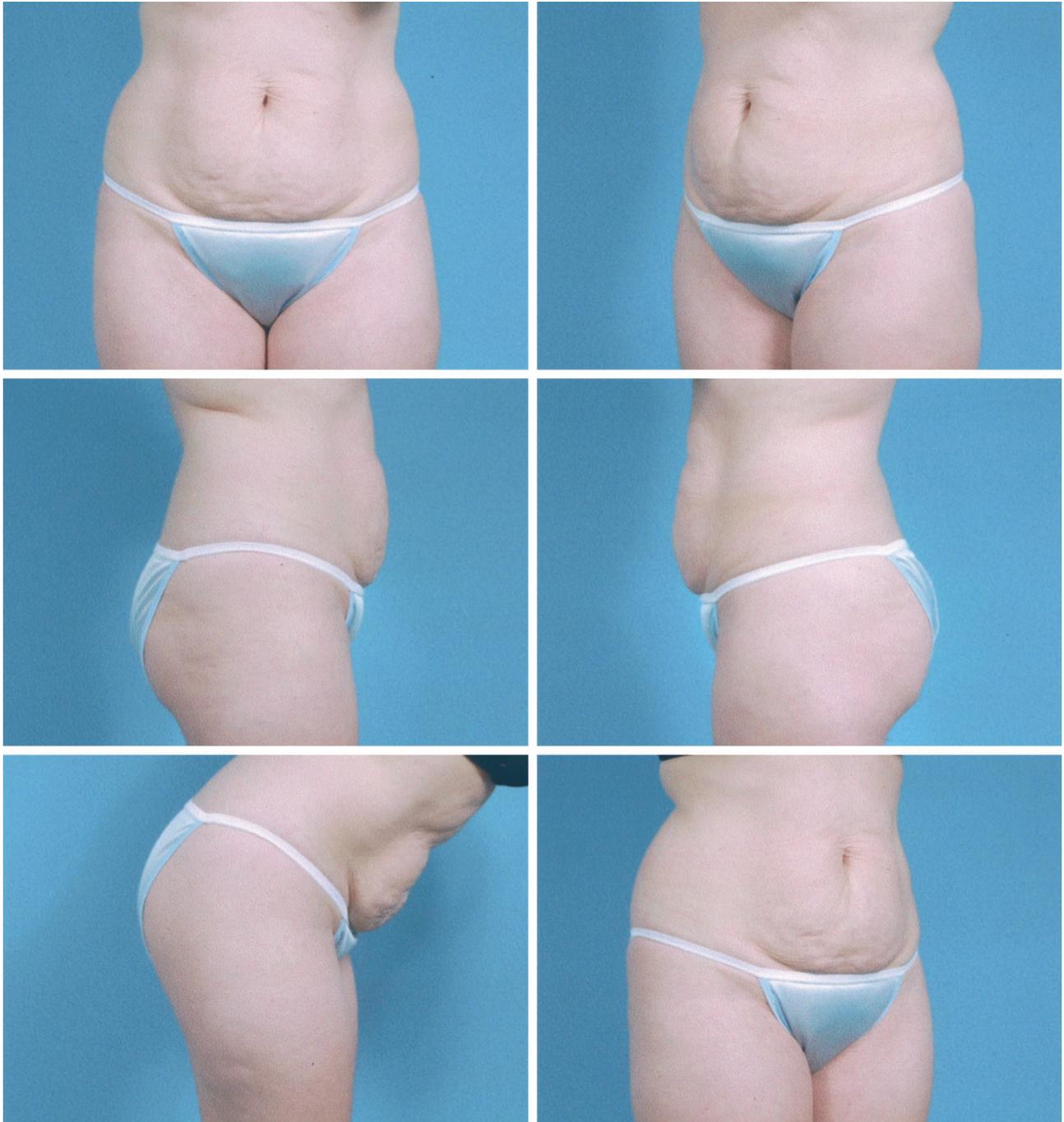


FIG. 4. Preoperative photographs of a 44-year-old patient who underwent abdominoplasty under conscious sedation with supplemental liposuction to the thighs, hips, and flanks.

or immediate anesthesia assistance is always available at our institution.

There are a few other key points to consider when using conscious sedation. First, patient selection is important.¹³ Patients with moderate to significant cardiopulmonary disease are not good candidates. We recommend that patients with comorbid conditions who do not meet the criteria for American Society of An-

esthesiologists status I or II (see Patients and Methods section) receive monitored anesthesia care by an anesthesiologist. Patients with anxiety disorders and extreme fear of the operating room may benefit from monitored anesthesia care or a general anesthetic.

A second safety point is the importance of surgeon familiarity with the medications used for conscious sedation. There are a variety of

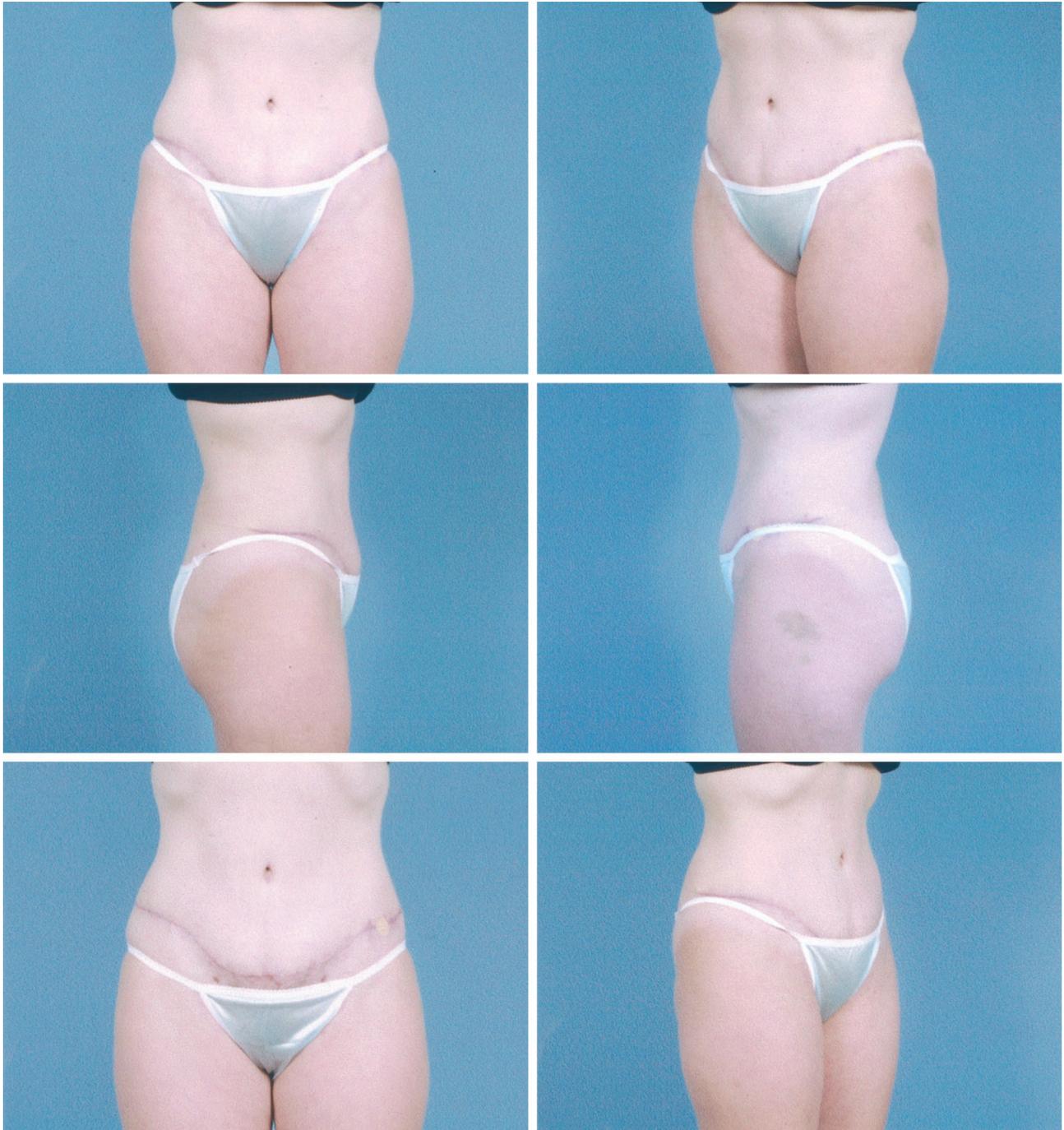


FIG. 5. Three-month postoperative photographs of the same patient shown in Figure 4.

intravenous sedation regimens. At our institution, we use a combination of midazolam and fentanyl. The advantage of using this combination is that midazolam has excellent anxiolytic and amnestic effects, whereas fentanyl is an excellent, short-acting analgesic. A recent multicenter, randomized study demonstrated that the combination of fentanyl and midazolam is superior to midazolam alone in decreasing the

patient's subjective report of pain and anxiety.¹⁴

The main drawback of fentanyl is respiratory depression; however, it does have a very short half-life. Midazolam, in contrast, has minimal effects on the respiratory system except in some older patients, in which lower doses must be used. We recommend continuous oxygen saturation monitoring and checking the pa-

TABLE III
Postoperative Complication Rate for Abdominoplasties
Performed under Conscious Sedation ($n = 153$; mean
follow-up, 10 mo)*

Complication	No. of Patients	%
Seroma requiring aspiration	10	6.5
Superficial skin infection	3	2.0
Skin necrosis	2	1.3
Stich abscess	1	0.65
Pseudobursa excision	1	0.65
Overall complication rate	17	11.1

* All of the complications listed refer only to the abdominoplasty and not to other concurrent procedures; seven scar revisions are not included.

tient's respiratory status and other vital signs every 5 minutes. Medications are only administered in small doses at each 5-minute interval (no more than 50 μg of fentanyl and 2 mg of midazolam at a time). This helps achieve a steady-state effect. Both of these medications have antagonists that are able to reverse their effects. Flumazenil (Mazicon; Roche, Nutley, N.J.) and naloxone (Narcan; DuPont Pharmaceuticals Company, Wilmington, Del.), the antagonists of midazolam and fentanyl, respectively, should be readily available in the operating room. The surgeon should be familiar with their dosage and administration. These medications are discussed in greater length elsewhere.^{3,4} Finally, at our institution, an anesthesiologist is always available in case of emergency. An excellent summary of some recommended guidelines for safe use of conscious sedation can be found in the report of the task force of the American Society of Anesthesiologists for guidelines on sedation and analgesia by nonanesthesiologists.¹³

It is worthwhile to note that there are other popular methods of intravenous sedation, such as the use of propofol in combination with an opiate and benzodiazepine. The disadvantage of this combination is the higher risk of respiratory depression and the lack of a reversing agent for propofol. However, the fact that a deeper level of sedation can be maintained makes this technique preferable for selected patients who are very anxious. We feel strongly that this necessitates a higher degree of experience and training in anesthetic technique, including the ability to intubate the patient. A recently published series of abdominoplasty with sedation using propofol used monitored anesthesia care by an anesthesiologist or nurse anesthetist.⁵

There are a number of obvious benefits to

the use of conscious sedation instead of general anesthesia or deep sedation. First, the complications associated directly with the administration of a general anesthetic are avoided. These are not negligible, and include adverse cardiopulmonary effects, airway injury, postoperative nausea and vomiting, and positional nerve injuries. Such complications occur in approximately 1 to 2 percent of abdominoplasties under general anesthesia.^{11,12} Second, the risk of developing deep vein thrombosis as a result of blood pooling in the lower extremities during general anesthesia is substantially reduced. At our institution, there has never been a diagnosed case of deep vein thrombosis with symptoms to date as a result of a procedure performed under conscious sedation. Although we cannot rule out an asymptomatic case of subclinical deep vein thrombosis, we feel the risk is so much smaller because of spontaneous shifting of the patient during the procedure with leg muscle activity. We attribute the benefit to avoiding the immobility and muscle relaxation seen with general anesthesia and, to a lesser extent, with deep sedation.

Patient satisfaction is a critical issue for plastic surgery procedures. Since first performing abdominoplasty under conscious sedation in the mid 1990s, our annual volume has increased and reached a steady state over the past few years. We feel that this indicates continued patient satisfaction with this procedure. At our institution, 90 percent of patients did not consider the experience to be unpleasant, and rated it as satisfactory, good, or excellent.⁴ In fact, most had complete or near-total amnesia of anything related to the actual surgery, primarily because of the excellent amnestic effects of midazolam. Furthermore, 62 of 67 patients (93 percent) who underwent subsequent cosmetic procedures chose to do so under conscious sedation. We believe that for most abdominoplasty patients, conscious sedation is very well tolerated and should always be addressed in the preoperative discussion.

One of the most unpleasant parts of any surgical experience for patients is postoperative nausea and vomiting. We routinely administer prophylaxis with the antiemetic ondansetron (Zofran), on the basis of a randomized, prospective study demonstrating its efficacy in reducing the incidence of postoperative nausea and vomiting.¹⁵ Controlling postoperative nausea and

vomiting has been shown to help eliminate many unintended postoperative admissions.¹⁶ In our series, only three patients (2 percent) required an overnight stay in the hospital because of postoperative nausea and vomiting that resolved within 24 hours of the procedure. Unintentional admission postoperatively is also related to greater procedure length and a higher total dosage of intraoperative midazolam/fentanyl.⁵ Therefore, patients undergoing lengthier combined procedures such as abdominoplasty along with breast augmentation and mastopexy often planned on spending the night in the hospital for observation and were warned about that possibility. The decision to admit the patient was made after 2 to 3 hours of observation in cases of unplanned admission, and it is highly likely that longer periods of observation could have averted those admissions, but that was not our goal.

CONCLUSIONS

Our enthusiasm for conscious sedation with full abdominoplasty has increased because of our enhanced ability to achieve effective local anesthesia. This has been the result of increased care to place the local anesthetic at the fascia-fat interface under direct vision, and allowing a full 15 to 20 minutes to elapse before cutting major perforators that have accompanying nerves. We perform liposuction during this time period along the hips and waist, most often while the patient is in a lateral position. The small increase in time required for local anesthetic infiltration is balanced by the savings in time for induction and extubation under general anesthesia. The results of the present study support the routine use of conscious sedation for abdominoplasty, even in cases when a concurrent cosmetic procedure is planned. This series showed no intraoperative complications related to the use of conscious sedation at our institution. The postoperative complication rate was no higher than that of abdominoplasties performed by the authors under general anesthesia. Careful patient selection, a comprehensive understanding of the medications, and close intraoperative monitoring can make conscious sedation a safe, well-tolerated, and cost-effective method of anesthesia for abdominoplasty.

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