Breast Augmentation and Augmentation-Mastopexy With Local Anesthesia and Intravenous Sedation

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Breast Augmentation and Augmentation-Mastopexy With Local Anesthesia and Intravenous Sedation

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Abstract

Background: Administration of intravenous sedation and intercostal nerve blocks has resulted in reduced postoperative nausea and faster recovery as compared to general anesthesia.

Objectives: The authors present their experience with intercostal nerve blocks and intravenous sedation in breast augmentation, with and without simultaneous mastopexy. Their protocol does not include propofol and thus can be administered by the surgeon and circulating nurse.

Methods: The initial dose of intravenous sedation was administered by the surgeon, starting with midazolam, fentanyl, and ketamine; additional doses (as needed) were given by the circulating nurse. Local anesthesia blocks were injected into Intercostal Spaces 3-7 at the midaxillary line. The anesthetic solution was injected at the lateral sternal boarder in varying amounts. A retrospective review was performed of 171 patients who underwent bilateral breast augmentation or augmentation-mastopexy with this protocol. The two groups were analyzed for age, body mass index, operating time, total amount of sedation/anesthesia, recovery room time, postoperative nausea, and complications.

Results: Of the 171 patients, 132 underwent augmentation and 39 had augmentation-mastopexy. All recovered well from anesthesia. The mean recovery room time was 49.9 minutes for the augmentation group and 52.9 minutes for the augmentation-mastopexy group. Postoperative nausea occurred in 14 (10.6%) patients who received augmentation alone and in five (12.8%) who underwent augmentation-mastopexy. There were no serious complications or hospital admissions.

Conclusions: Breast augmentation with or without mastopexy can be performed safely, with minimal discomfort and complications, by employing local anesthesia with intravenous sedation. Although augmentation-mastopexy requires more operating time than augmentation alone, the recovery times are comparable.

Level of Evidence: 4

Keywords

breast enhancement, breast enlargement, breast lift, mastopexy, minimally invasive plastic surgery, perioperative nausea and pain, risks, submuscular, subpectoral, implants

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Breast augmentation is one of the most common aesthetic procedures performed by plastic surgeons; according to statistics from the American Society for Aesthetic Plastic Surgery, 318,123 of these procedures were performed in 2010 alone.[1] A recent survey of members of the American Society of Plastic Surgeons demonstrated that 76% perform breast augmentations in outpatient surgery centers or offices with integrated operating rooms.[2] To meet patient demands, plastic surgeons have become innovators in developing techniques to make these procedures less invasive and less expensive.

For the past 30 years, local anesthesia with intravenous sedation has been utilized during breast augmentation[3,4] and other plastic surgery procedures, including abdominoplasty and breast reduction,[5-8] as well as surgery for breast cancer.[9,10] Paravertebral blocks[11] and epidural anesthesia[12] have both been employed in breast augmentation procedures. Techniques reported to decrease postoperative pain in patients undergoing breast augmentation have included irrigating the pocket with bupivacaine[13] or with bupivacaine and ketorolac.[14]

Over the course of 20 years of experience administering intercostal nerve blocks and intravenous sedation, the

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senior author (MLE) has observed that patients experience less intraoperative bleeding and postoperative nausea with this method than with general anesthesia. In the authors' practice, general anesthesia is administered only if breast augmentation (with or without mastopexy) is combined with large liposuctions or body contouring procedures, if the patient is obese, or if surgery is expected to last more than 4.5 hours.

When given the option of monitored sedation with intercostal nerve blocking, our patients generally prefer this technique to general anesthesia because of its safety, efficiency, and lower cost.

In this report, the authors present their experience with intercostal nerve blocks and intravenous sedation in the setting of breast augmentation, both with and without simultaneous mastopexy. The protocol described herein can be administered by the surgeon and the circulating nurse. It deliberately excludes propofol, which should be given only by a nurse anesthetist or an anesthesiologist. The authors also compare the two groups of patients—those who underwent augmentation alone and those who underwent augmentation-mastopexy—to analyze the efficacy of this anesthesia protocol with each procedure.

METHODS

A retrospective chart review was performed of 171 patients who underwent bilateral breast augmentation or augmentation-mastopexy from January 1, 2007, to October 30, 2009. All procedures were performed by the senior author (MLE) and employed a standard anesthesia protocol. Patients who underwent any additional procedure, including liposuction, were excluded from the review. All augmentations were performed in an American Association for Accreditation of Ambulatory Surgery Facilities–accredited outpatient surgery center in an office setting and were done for cosmetic purposes. All implants were placed in the subpectoral pocket. The incision site was either in the inframammary fold or the periareolar area, based on patient preference.

The two groups (augmentation alone and augmentation-mastopexy) were analyzed with respect to age, body mass index, operating time, total amount of sedation, total amount of local anesthesia, length of stay in recovery room, and complications. Statistical analysis was performed with GraphPad Software (San Diego, CA).

Sedation/Anesthesia Technique

The first dose of intravenous sedation was administered by the surgeon, starting with 1 mg of midazolam, 50 µg of fentanyl, and 10 mg of ketamine. Additional doses were given, as needed, by the circulating nurse, under the direction of the surgeon. Local anesthesia solution, consisting of equal parts of 0.25% bupivacaine and 1% lidocaine with 1:100,000 epinephrine, was injected into Intercostal Spaces 3-7 at the midaxillary line (2 mL per costal interspace) (Figures 1 and 2). The solution was then injected at the lateral sternal border to provide a lateral and medial block to the breast (Figure 3).

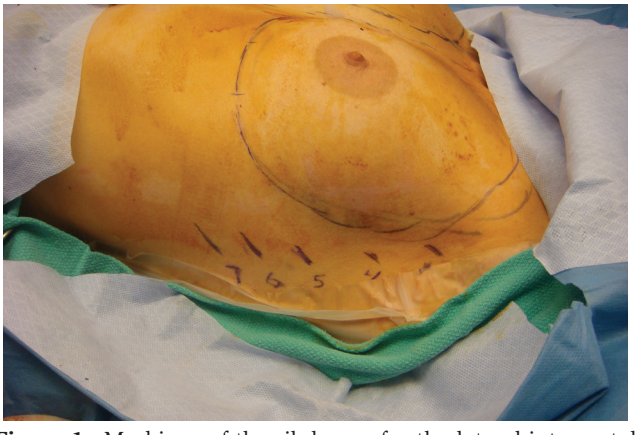

Figure 1. Markings of the rib bones for the lateral intercostal blocks. Ribs 3-7 are marked at the midaxillary line.

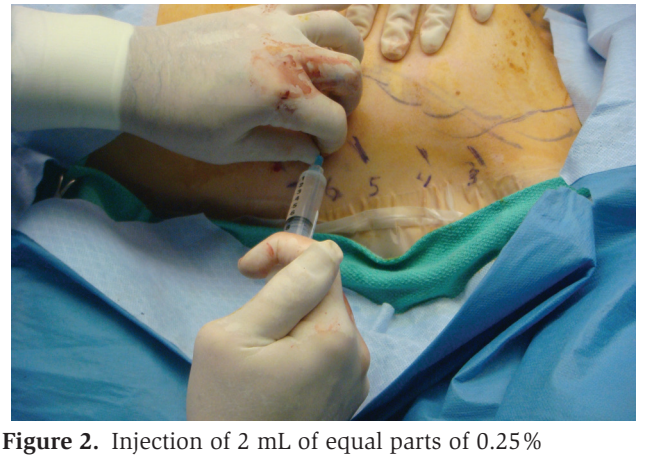

Figure 2. Injection of 2 mL of equal parts of 0.25% bupivacaine and 1% lidocaine with 1:100,000 epinephrine. The injection site is the intercostal space, inferior to the rib bone above it.

The solution also was injected in varying amounts into the operating field during dissection. The total amount administered was based on the patient's feedback of sensation during the operation.

RESULTS

Of the 171 patients included in the study, 132 underwent breast augmentation alone and 39 had breast augmentation-mastopexy. Mean values for the augmentation-only group were as follows: age, 31.7 years (range, 17-66 years); body mass index, 21.5 (range, 16.4-28.7); operating time, 63.8 minutes (range, 42-120 minutes); ketamine usage, 19.3 mg (range, 0-60 mg); midazolam usage, 5.7 mg (range, 0.5-11 mg); fentanyl usage, 160.5 µg (range, 25-300 µg); total amount of 0.25% bupivacaine and 1% lidocaine with 1:100,000 epinephrine, 79.6 mL (range, 25-120 mL); and length of stay in recovery room, 49.9 minutes (range, 16-116 minutes). Fourteen patients in this group experienced

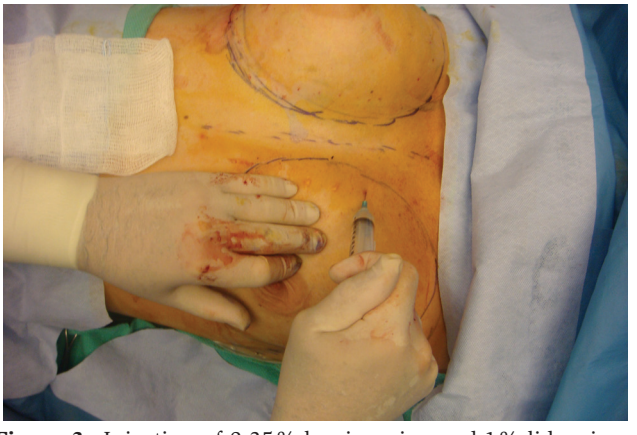

Figure 3. Injection of 0.25% bupivacaine and 1% lidocaine with 1:100,000 epinephrine to the lateral sternal border.

postoperative nausea (10.6%). Mean values for the augmentation-mastopexy group were as follows: age, 34.5 years (range, 20-54 years); body mass index, 22.8 (range, 17.2-32.0); operating time, 134.7 minutes (range, 56-210 minutes); ketamine usage, 18.2 mg (range, 0-40 mg); midazolam usage, 7.3 mg (range, 4-10 mg); fentanyl usage, 180.8 µg (range, 100-300 µg); total amount of 0.25% bupivacaine and 1% lidocaine with 1:100,000 epinephrine, 90.9 mL (range, 45-144 mL); and length of stay in recovery room, 52.9 minutes (range, 17-107 minutes). Five patients experienced postoperative nausea (12.8%) (Table 1).

There were no deaths and no serious complications, such as deep venous thromboses, pulmonary emboli, hematomas, reoperations, pneumothoracies, or intubations (Table 2). There were no adverse reactions to ketamine, and no patients were admitted to the hospital. Clinical results are shown in Figures 4 and 5.

Table 1. Results

	Augmentation	Augmentation-Mastopexy
Patients	132	39
Mean age, y	31.7	34.5
Body mass index	21.5	22.8
Total ketamine, mg	19.3	18.2
Total midazolam, mg	5.7	7.3
Total fentanyl, µg	160.5	180.8
Total solution,[a] mL	79.6	90.9
Operating time, min	63.8	134.7
Length of stay in recovery room, min	49.9	52.9
Postoperative nausea, %	10.6	12.8

[a] Solution: 0.25% bupivacaine and 1% lidocaine with 1:100,000 epinephrine.

Table 2. Complications

	Augmentation	Augmentation-Mastopexy
Deep venous thrombosis	0	0
Pulmonary emboli	0	0
Hematomas	0	0
Reoperations	0	0
Pneumothoracies	0	0
Intubations	0	0
Deaths	0	0
Admissions to the hospital	0	0

DISCUSSION

The present study supports the utility of intercostal blocks and intravenous sedation for breast augmentation. Our overall incidence of complications was low, as was the rate of postoperative nausea (11%). There were no serious complications or hospital admissions. Length of time in the recovery room ranged from 16 to 116 minutes and was similar for the two groups. Both groups received similar doses of intravenous medications, but the augmentation-mastopexy group had a significantly longer mean operating time than the augmentation-only group: 134.7 minutes versus 63.8 minutes ($P < .001$). However, the mean length of stay in the recovery room was similar: 49.9 minutes for augmentation alone and 52.9 minutes for augmentation-mastopexy ($P > .05$). We attribute this similarly-quick recovery to the effectiveness of the block technique employed.

Jabs et al reported control of postoperative pain following breast augmentation in which tumescent infiltration of the breast pocket was performed before dissection.[15] In their study, the mean recovery time was 103 minutes—similar to results from a control group that did not receive tumescent fluid. This recovery time is greater than the time observed for our patients who received the block protocol. Jabs et al did note decreases in the degree of reported postoperative pain and narcotic usage in their study group. Like our patients, all of their implants were placed in the subpectoral pocket; however, their patients also received general anesthesia.

In a study by Eldor et al, two groups of patients were compared: those who received breast augmentation under general anesthesia and those who received it under monitored anesthesia care (fentanyl, propofol, and superficial local anesthesia via injection).[16] They reported a statistically-significant decrease in postoperative hospitalization time and nausea. Although they did include six patients who underwent mastopexy, they included patients who received subglandular placement of implants, whereas all patients in our study had their implants placed submuscularly. Their protocol for sedation differed from ours in that it did not include intercostal blocks but did include propofol.

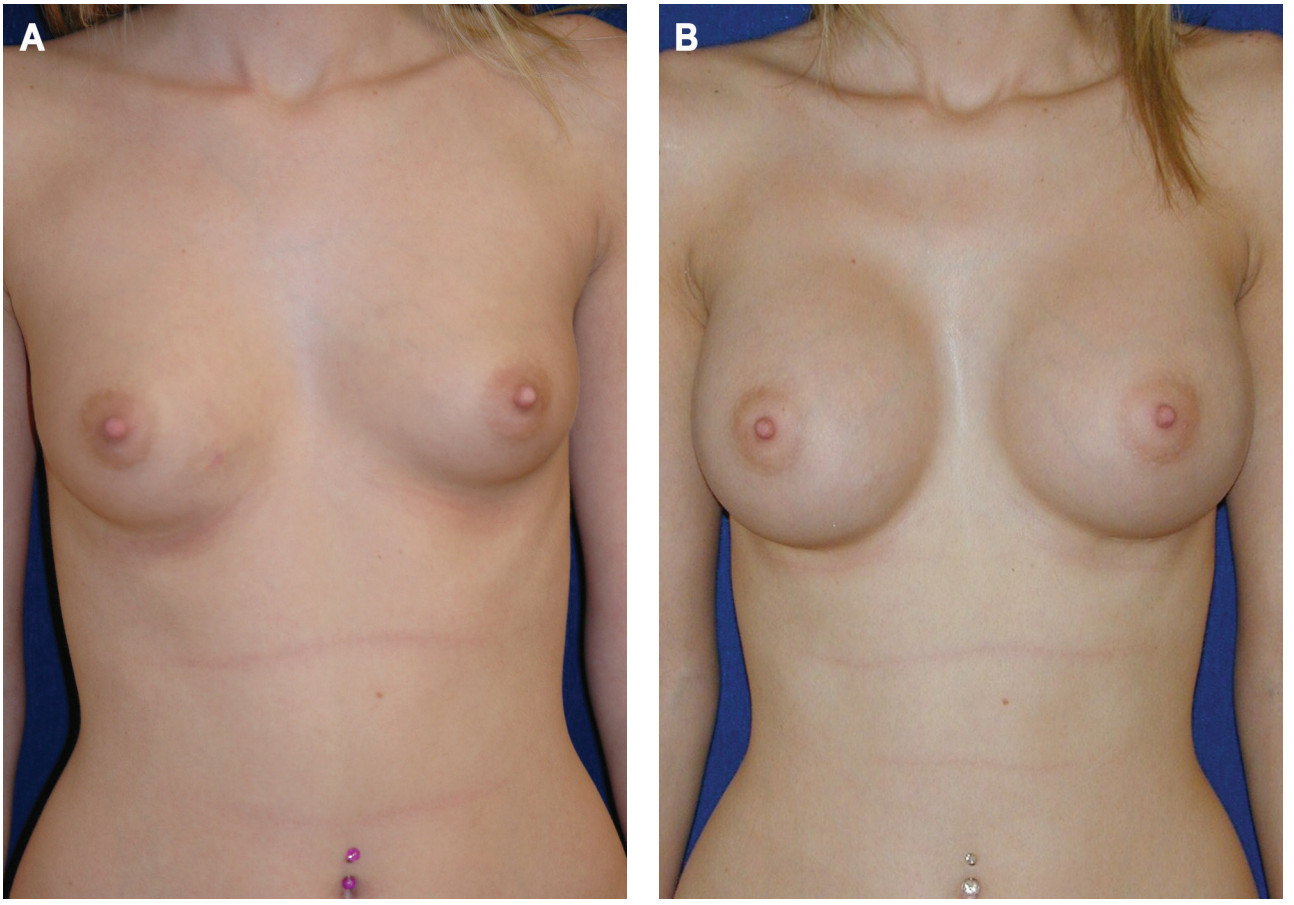

Figure 4. An 18-year-old woman is shown (A) before and (B) 10 months after primary breast augmentation with 360cc saline implants (Allergan, Inc; Irvine, CA).

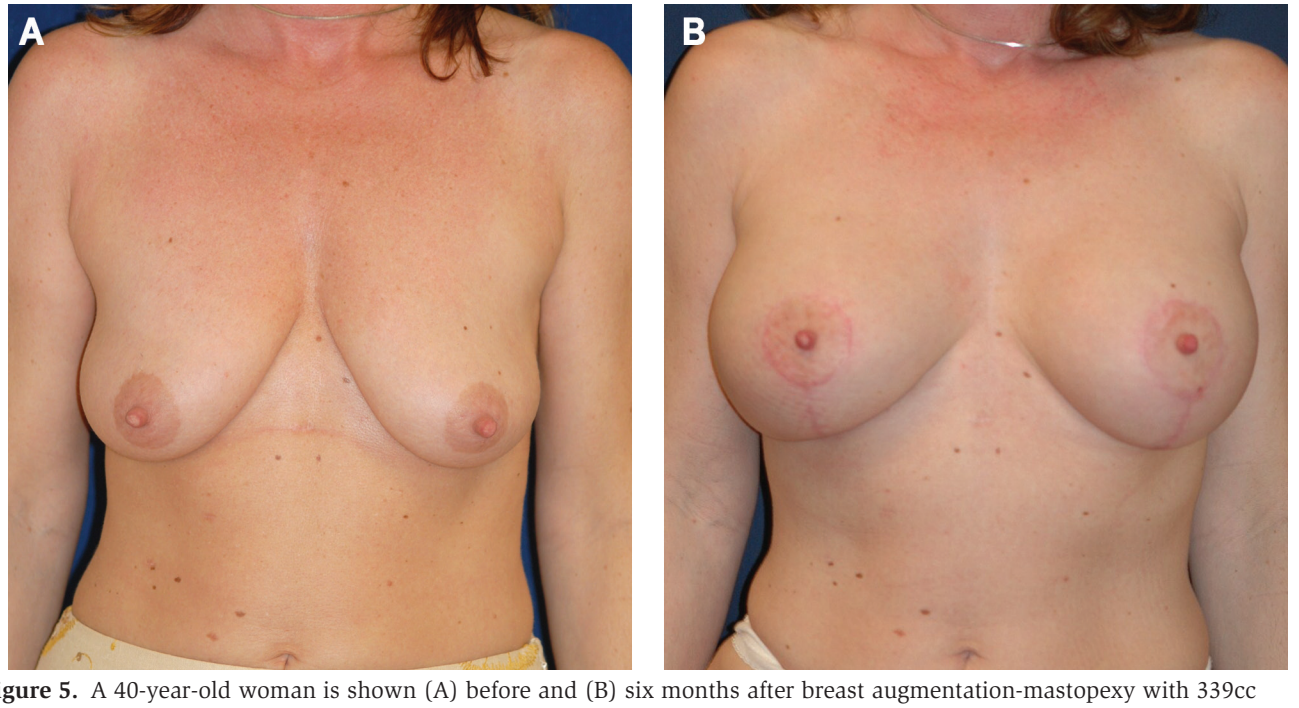

Figure 5. A 40-year-old woman is shown (A) before and (B) six months after breast augmentation-mastopexy with 339cc silicone gel implants (Allergan, Inc; Irvine, CA).

Rezai and Singh reported their experience with patients who underwent breast augmentation with local block sedation.[17] Their report did not include patients who underwent mastopexy; they demonstrated a short recovery time of 30-60 minutes. No cardiopulmonary complications occurred. Their protocol differed from ours; they administered intercostal blocks laterally from the second to eighth rib, as well as medially to Intercostal Spaces 2-6. Their sedation protocol also included propofol, which in the United States requires administration by an anesthesia health professional.

Our technique differs from previously published reports in that we employed surgeon-directed intravenous anesthesia. Our protocol was specifically designed to avoid propofol and therefore does not require an anesthesiologist or nurse anesthetist. The results of this report show this protocol to be safe. Although we did not compare costs between this technique and general anesthesia, our technique is less expensive to the patient because it does not require the services of an anesthesiologist or nurse anesthetist.

With increasing frequency, practitioners who are not trained in plastic surgery are performing aesthetic procedures and have been gaining notoriety in the press.[18] Although these individuals are not certified to perform the procedures in a hospital-based setting, they can legally perform them in an outpatient or office setting. As the number of office-based cosmetic procedures continues to grow, we as plastic surgeons must be at the forefront of the movement to ensure that our patients' needs are met, their safety remains uncompromised, and their outcomes are optimal.

CONCLUSIONS

Breast augmentation with or without mastopexy can be performed safely with local anesthesia and surgeon-directed intravenous sedation in an American Association for Accreditation of Ambulatory Surgery Facilities–certified facility, accompanied by minimal discomfort and minimal complications. Although augmentation-mastopexy procedures required a longer operating time (vs augmentation alone) in the present study, the length of stay in the recovery room was not lengthened. This may be attributable to the effectiveness of the intercostal nerve block for postoperative pain control. This retrospective review adds to the history and supports the utility of intravenous sedation for a variety of plastic surgery procedures.

Disclosures

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