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Discussion: Submuscular Breast Augmentation Using Tumescent Local Anesthesia

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In this article, the results using a technique of tumescent local anesthesia (TLA) along with intravenous midazolam-mediated intraoperative conscious sedation are reported in a series of 300 patients undergoing partial subpectoral pocket breast augmentation operated on over a seven-year time span. The details of the technique include a stage 1 preoperative infiltration of, on average, 520 cc of a tumescent solution containing 25 cc of 2% lidocaine with 1 mg of epinephrine and 8 mEq of bicarbonate in 1 L of 0.9% normal saline into the prepectoral plane of each breast while the patient is in the holding area. After 40 min stage 2 then consists of the patient being delivered to the operating room where, under monitored anesthesia care provided by an anesthesiologist, intravenous midazolam is administered as an amnestic agent, and after incision, an additional 180–240 cc of the same tumescent solution is placed in the subpectoral space, again in each breast. Technical steps including prospective hemostasis under direct vision using electrocautery and partial release of the pectoralis major muscle with no drain placement were used as basic operative technique. Total operative time for both stage 1 and 2 was reported to be 1 h 40 min. Textured silicone gel implants, both round and anatomic, ranging in volume from 225 to 420 cc were used in the patient cohort. Postoperative follow-up data showed a major complication rate of 3.3% (four hematomas, six seromas), and excluding "dystrophic scar" formation, an overall complication rate of 6%, including eight cases of implant "dislocation." No patient required conversion to full general anesthesia, and postoperative survey data showed that patients were "highly satisfied" with the operative experience with no patient reporting discomfort with either stage 1 or stage 2 of the overall procedure. With this as an overall summary of the data, certain points merit further comment.

The authors have demonstrated that their combined technique of TLA and intraoperative conscious sedation can be very effective at managing discomfort when performing breast augmentation in the partial subpectoral plane. Based on the data, the author's conclusion that the technique is safe, efficacious, and associated with a reasonable complication rate can be supported. As well, the authors should be commended, and I totally support their recommendation that an anesthesiologist be present to monitor the cardiovascular health of the patient intraoperatively. Over and above the usual risks of any type of medication administered during a surgical procedure, in this case the sedating effect of Midazolam, the additional considerations concerning the lidocaine dose and possible effects on cardiac function mandate expert cardiac monitoring. Such continuous attention to cardiac function is best provided by an anesthesiologist. If it is provided by the surgeon who is also focused on the procedure at hand, it may result in delayed or absent intervention when needed, resulting in potential surgical crisis. However, while accepting that this approach can be used successfully in breast augmentation, it is a reasonable question to ask if this is the best approach. The overall operative experience took an average of 1 h and 40 min which for many

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surgeons would be an inordinately long period of time. As well, an anesthesiologist is still required, and for most patients, the major general anesthesia side effect of post-operative nausea is uncommon and usually easily managed in many experienced outpatient clinics. Under general anesthesia, the airway is directly controlled, allowing for muscle paralysis if desired to facilitate accurate muscle release without electrocautery-induced muscle contraction. But beyond that, the swelling that is associated with the installation of, on average, 740 cc of tumescent fluid into the breast can make intraoperative assessment of breast size and shape inaccurate at best. In patients who present with breast asymmetry where implants of different volume may be used, the inability to directly assess breast size and shape could compromise the final result. As well, many surgeons go to the OR with a range of potential implants that might be used, with the final choice being influenced by the placement of sizers. Distortion of the breast with large amounts of tumescent fluid can make this approach less successful. It is also interesting to note that two of the complication categories noted by the authors relate to six seromas and eight cases of implant "dislocation". While not broken down by the data, anatomically shaped gel implants were variably used in this patient cohort, and one of the technical recommendations regarding the use of these devices is that the pocket dissection must match the dimensions of the implant to avoid rotation. If a seroma forms, this complimentary fit between pocket and implant can be lost leading to implant "dislocation" or rotation. It would be interesting to note how many cases of implant "dislocation" were anatomically shaped devices. Finally, the issue of hematoma formation is always a concern with tumescent anesthesia, whether it used in the face, abdomen, or as in this case, the breast. The possibility that divided blood vessels might not bleed at the time of surgery secondary to the epinephrine effect only to open up later on when the vasoconstricting effect has worn off is always there. It is a leap of faith to rely on the coagulation cascade to prevent this from happening, which is an assumption that makes many surgeons take pause. However, it is one that is supported by the author's data, as to experience only four hematomas in 300 patients fall within the realm of acceptable surgical risk.

To summarize, the authors are to be congratulated for demonstrating that TLA supplemented with intraoperative sedation monitored by an anesthesiologist is a safe and effective technique for patients undergoing breast augmentation. In particular, it might be an attractive option for patients historically prone to postoperative nausea and vomiting. It remains for each individual surgeon to decide whether this technique is appropriate in any given circumstance.

Compliance with Ethical Standards

Conflict of interest Dr Hammond has a consulting agreement with the Mentor Corporation, the Musculoskeletal Transplant Foundation, Nova Plasma, and Establishment labs.