Transumbilical Breast Augmentation Is Safe and Effective

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ABSTRACT

Transumbilical breast augmentation (TUBA) has proved to be safe and effective. This article highlights the advantages, disadvantages, gives an overview of the technique, discusses complications, and provides factual information to counter false negative information about the procedure.

KEYWORDS: TUBA, transumbilical breast augmentation, breast implants

Transumbilical breast augmentation (TUBA), developed in 1993 by Johnson and Christ,¹ is now within the standard of care for breast augmentation²⁻⁶ and has proved to be safe and effective for patients⁷ and for implants.⁸ At the outset, I will emphasize that whereas it is not my intention to persuade anyone to learn the TUBA technique or to change their current augmentation philosophy in any way, I do intend to strongly counteract incorrect information⁹ that circulates among those uninformed about the procedure. I present here factual information toward that objective. My experience (1307 patients to date) has confirmed that TUBA is highly effective and very safe, provided that specific steps are followed in its planning and performance.¹⁰

ADVANTAGES

I use all four incision sites for breast augmentation and continue to note several benefits of the TUBA method. Like the transaxillary approach, with TUBA there is complete absence of any tension on the incision. The absence of tension permits use of our larger implant sizes without fear of dehiscence or edge necrosis and consequent infection, may be a factor in the low level of pain reported by patients, and is part of the rapid recovery after TUBA. Our anesthesiologists and our recovery

room staff continue to report that the prepectoral TUBA patients have significantly lower anesthetic and analgesic requirements than do patients with other incisional approaches. Because the pockets are formed by expansion, they conform to the shape of the implant, without dead space that could harbor infection or hematoma. Monitoring by external appearance the extent, position, and shape of the implant pocket as it is being created allows precise pocket dimensions, facilitates symmetry, assists in correcting moderate tubular-shaped breasts, and helps prevent symmastia. A minor advantage is the absence of concern over the possibility of retained sponges with TUBA, as none are inserted. I have seen no Mondor's cords after TUBA, nor have I seen any persistent abdominal passageway irregularity.

DISADVANTAGES

There are of course some disadvantages of the TUBA method, which include inability (as yet) to use prefilled implants, either saline or silicone, and the need for special equipment and intensive training. The TUBA method does not lend itself to trying several implant sizes intraoperatively. An upper ventral hernia would be a relative contraindication, although TUBA is routinely

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done in the presence of upper abdominal scars and umbilical hernias.

The need for intensive training warrants repeating a strong caveat: *It would be a mistake for a surgeon to attempt the TUBA procedure without a formal training course.* Published articles and books do not include all the tips for achieving a superior aesthetic result or the maneuvers that would be needed to compensate for unexpected findings or the details of postoperative care, all of which are included in a training course. Surgeons critical of my advocating an extensive training course have conceded that if such courses had been required for liposuction, the plastic surgery community would have seen fewer post-liposuction problems.

Unfortunately, just as with liposuction, a large number of inadequately trained doctors have been performing the TUBA procedure, and as a result there are many patients who have had problems and suboptimal results. I still am aware of no fatality from TUBA performed by any surgeon certified by The American Board of Plastic Surgery. Although I do not imply that the TUBA procedure is as difficult as craniofacial surgery, as the latter is unquestionably far more complex, I do firmly believe that an inadequately trained person should no more attempt TUBA than attempt craniofacial surgery.

TECHNIQUE

The details of the TUBA procedure are fully described elsewhere,¹¹ and although space does not permit such a detailed description, it can be outlined here. A right-handed surgeon will likely stand on the patient's right side with the video monitor on the patient's left. The patient's knees are kept flat with no pillow or other object behind them to avoid obstructing handling of instruments. I prefer general anesthesia (not nitrous oxide) for all breast augmentations. Long-acting local anesthetic is infiltrated superficially at the navel, but not for the tunnels. After the navel incision is made (the only cutting during the procedure), round-tipped scissors spread bluntly down to the surface of the rectus fascia. A large blunt scissors is used to begin each tunnel on the fascial surface, ~5 cm up, spreading minimally to avoid creating blind pockets. Direct vision confirms that the tunnel is directly on the fascia.

The tip of the Johnson obturator (without its tube) is passed through the incision and up the tunnel in the plane between rectus fascia and subcutaneous tissue. It is important that this advancement be done in 4-cm increments only, and not in one continuous steady forward push as per the original article.¹ To facilitate this, the obturator is gripped along its shaft, ~4 cm from the incision, rather than by its handle; this prevents an improperly directed stroke from traveling any great distance. Care is taken when advancing to

Figure 1 Endoscopic view of a tunnel, subcutaneous fat above and rectus sheath below.

remain deep to the subcutaneous tissue to prevent any postoperative subcutaneous irregularity.

The obturator is then advanced farther. For subpectoral placement, the breast is deliberately lifted during obturator passage across the inframammary crease, but for prepectoral placement, one does not lift up on the breast, as this in turn elevates the pectoral muscle. As with any augmentation or reconstruction, contact with the ribs is avoided to minimize postoperative periosteal pain.

Next the combined Johnson tube and obturator are advanced through the passageway. The obturator is then withdrawn from the tube and an endoscope of choice used to verify the proper plane relative to the muscle as well as to confirm that there is no significant bleeding. The endoscope and tube together are then slowly withdrawn while inspecting the entire passageway. It is remarkable how little bleeding there is (Fig. 1).

The Johnson blunt right-angled instrument is used to begin separating the tissues for a limited distance medially and laterally, which for subpectoral placement should include detaching the caudal fibers of the pectoralis. To avoid symmastia, I stop the medial muscle detachment at the 4 o'clock and 8 o'clock positions. The reason that bleeding is minimal and brief in the transumbilical procedure is presumably because there is no sharp cutting of tissues.

Tissue expanders are introduced through the navel incision and advanced up the tissue tunnel, solely via external digital manipulation and without contact by any instrument. Note that neither the expander nor later the implant, are passed through, or have any contact with, the tube, the endoscope, retractors, or any other solid object. After the expanders are inside the pocket, a closed fill system is used to fill them with warm sterile saline from an intravenous bag, not air.

One great advantage of augmentation procedures using remote incisions is that the final shape of the breasts is actually observed intraoperatively. Manual

external pressure is used to control the development of the pockets, defining both shape and position as the expanders are filled. Considerable compressive force may be required to control the developing pocket, as well as to counter the natural tendency for tissues to expand where resistance is least.

The endoscope is again inserted to verify the proper plane, to locate any bands that require release, and to confirm proper release of any persistent muscle fibers, especially near the lower pole. Even moderately large vessels at the inframammary fold do not usually need division, but division of any such vessels should be done bluntly rather than sharply for any bleeding to cease quickly. It is often helpful during pocket development to use the blunt right-angle instrument to release small bands or restrictions. I inflate the chosen expander to 150% to 170% of the final desired volume of the implant for prepectoral placement and 150% to 200% for subpectoral placement. With larger implants, care is required to avoid medial overdissection that could lead to symmastia.

After a few minutes, the saline in the expanders is reduced to the final desired implant volume and the patient evaluated nearly upright, adjusting the volume as needed for symmetry. After the saline is evacuated, the expanders are removed by traction on their tubes when they are almost empty. The Johnson tube and obturator combination is then reinserted, the obturator withdrawn, the endoscope introduced, and the pockets inspected, again verifying absence of any significant bleeding (Fig. 2). If there is more bleeding than usual, it is at this point that I make the commitment to use drains, and I will later proceed with drains even if that bleeding has abated. It has not been necessary to cauterize within the implant pockets. In two early cases out of the 1307, after dividing large vessels that I would now not bother to divide, a bleeding point was seen, but by the time the equipment was prepared for cauterization, the bleeding had almost stopped; I cauterized it anyway.

Figure 2 Endoscopic view of a subpectoral pocket, muscle above and ribs below.

At this point, I irrigate with 0.25% bupivacaine, 10 mL per side, for postoperative comfort.

The surgeon next inserts the implant through the navel incision, starting it up the passageway with the index finger. The surgeon then uses external manipulation alone to advance the implant, milking it up through the passageway. To facilitate this, the assistant applies slight negative pressure by a syringe attached to the fill tube to stiffen the implant. It is a hallmark of the current TUBA technique that the implants need touch nothing whatsoever other than the patient's soft tissues and the surgeon's gloves, specifically not the endoscope and not the tube. The implant is advanced, but before it is pushed all the way free of the tunnel into the pocket, its orientation is verified as correct using the endoscope *without the Johnson tube*. After complete advancement of the implant into the pocket, it is inflated to the predetermined volume via a closed system using warmed sterile intravenous saline. Minor volume adjustments are made as desired for symmetry. Each fill tube is removed by traction.

After final inspection, any remaining air is suctioned out from within the passageways to help prevent crepitus or other postoperative sounds, and then the navel incision is closed with a subcuticular absorbable suture. Sterile strips are applied, any navel jewelry is reinserted, and a small gauze applied, secured by a transparent film dressing. As is my practice for most breast augmentations, a 3-inch-wide elastic band stabilizes the upper half of the breasts for patient comfort. An elastic abdominal band provides support as well.

COMPLICATIONS

A hallmark of the TUBA method is the very low rate of complications. As of Dec 24, 2007, I have performed TUBA for a total of 1307 patients, 929 prepectoral and 378 subpectoral (I only began subpectoral transumbilical breast augmentation in May 1999), and the complication rate remains low. In Table 1 are listed my rates for those types of complications that have been reported after all augmentation incisions, and in Table 2 are listed my rates for those types of complications that might be of concern only after the navel incision.

It seems worthwhile to discuss each complication separately, with the focus on suggested reasons for the low complication rate. As Table 1 indicates, there have been no major anesthetic complications, which is not really surprising, as I require general anesthesia and an anesthesiologist, usually with a nurse-anesthetist as well. The absence of pulmonary embolism may be attributed to the facts that the procedure is of short duration, pneumatic stockings are used, and the patient is advised to avoid dependent leg positions for the first few postoperative days. Pneumothorax is a complication reported after other types of breast augmentation, whereas the

Table 1 Rates of Types of Complications Reported after All Augmentation Incisions (1307 Cases)

Anesthetic complications, 0 (0%)
Pneumothorax, 0 (0%)
Pulmonary embolus, 0 (0%)
Infection around implant, 0 (0%)
Hematoma, 0 (0%)
Distortion around incision, 0 (0%)
Incision keloid, 1 (0.1%)
Nipple numbness beyond 2 years, 9 (0.8%)
Chronic pain, explantation (subpectoral), 1 (0.1%)
Symmastia, 0 (0%)
Mondor's cords, 0 (0%)
Early capsule contracture (within 2 months), 2 (0.2%)
Reoperated (other than size/volume change, deflation, contracture), 2 (0.2%)

absence of pneumothorax in this transumbilical series is a reflection of the fact that with the TUBA method, no sharp instruments, cautery, or needles are used in the thoracic area, the pocket being formed entirely by blunt instruments and hydraulic expansion.

Infection around implants is uncommon after augmentation, so perhaps little can be concluded about its complete absence in this TUBA series. Nevertheless, if the rate of infection remains very low as more cases are documented, possible explanations should be considered. In my opinion, a reasonable hypothesis is that most periprosthetic infections after augmentation with the periareolar or inframammary incisions may begin as wound infections, which then extend deep to reach the nearby implant. Such wound infections can be caused or exacerbated by tension on the incision and abetted by circulatory compromise in the adjacent incisional skin due to vascular compression, both of which factors are irrelevant with TUBA. Both the transaxillary and the transumbilical incisions have the advantages that the implant cannot cause tension or vascular compromise to the skin at the incision site and that the implant is located at a considerable distance from the incision, especially so with the transumbilical route. It is also somewhat surprising to me that I have had no umbilical

Table 2 Rates of Types of Complications That Might Be Thought Relevant to TUBA (1307 Cases)

Infection of wound or passageway, 0 (0%)
Track marks or tunnel deformity, 0 (0%)
Tunnel seroma (aspirated in office), 17 (1.5%)
Need to resort to alternate incision, 0 (0%)
Early return to surgery (unilateral edema, an early case), 1 (0.1%)
Penetration into abdominal or thoracic cavity, 0 (0%)
Implants placed in wrong plane, 0 (0%)
Implants placed in wrong position, 0 (0%)
Implants damaged, 0 (0%)

wound infections with the TUBA procedure. I give antibiotics preoperatively, and the navel prep is thorough. I have had one incisional keloid in a patient predisposed to keloids. There has been no instance of navel distortion or disfigurement.

Absence of hematoma in this series of transumbilical augmentations is also noteworthy, as I have had that complication with our other three incisional approaches. Regardless of the incision site, I have all my augmentation patients avoid blood-thinning medications, my threshold for short-term use of small drains is low, I irrigate the pockets with a dilute adrenaline solution, and I apply a light compression wrap postoperatively, so explanation for the absence of hematoma will have to be sought elsewhere. Two factors unique to the TUBA procedure remain as possible reasons. First is the fact that there is no sharp dissection in the TUBA procedure; only blunt processes are used. From replantation surgery we know that vessels stretched to parting will clot more readily than those sharply transected, so that may be relevant. The second explanation may be the fact that the passageways from the navel to the breasts can function as dependent reservoirs to remove any accumulating fluid from the peri-implant space, down to a location where it is easily detected and aspirated, as will be discussed below.

Sensory changes are a standard risk of all breast operations regardless of incision site. Just as in the study by Johnson,¹ my own experience has been that less than 1% of TUBA patients lose the sense of touch in a nipple, a lower rate than after my use of the other three incisions. One theoretical explanation offered is the absence of any cutting in the vicinity of the main nerves to the nipples, only stretching, and that hypothesis seems reasonable to me, as it is consistent with the observation that the larger the implants, the more likely it is that the patient will experience at least temporary numbness. We allow 2 years to elapse before concluding that the sensory loss is likely to be permanent. Chronic pain is rare after any type of augmentation, and I have no explanation for it. It is more frequent after subpectoral augmentations than prepectoral and is most often located in the region of detachment of the pectoralis origin along the costal margins. It has eventually subsided in all but one of my patients regardless of incision location, but in that one subpectoral TUBA patient, it resulted in the patient requesting explantation at about the 2-month point, at which operation there were no features found to explain the pain and nothing to suggest any specific relationship to the choice of incision site requested.

The paucity of problems of shape and position of the implant pockets will be discussed shortly, but it is noteworthy that the rare and troublesome complication of symmastia, which may be seen after all types of augmentation, has not occurred in these TUBA cases. I do not think it can be said that the incision location

itself can protect a patient from getting symmastia, yet I do believe that the fact the developing pockets are being viewed externally during expansion is a vitally important factor, as the surgeon can actually see any tendency for the breast pockets to encroach upon the presternal area and can take the steps necessary to prevent it, as I have had the opportunity to do in several cases.

A minor problem seen after all other incisional approaches to augmentation but absent from the transumbilical approach has been Mondor's cords. These I have seen most often after the inframammary and axillary incisions and occasionally after periareolar augmentation. Perhaps it is simply the absence of any incision transecting breast veins that accounts for the absence of Mondor's cords after the TUBA procedure.

I agree with those colleagues who consider any capsular contracture occurring within the first 2-month period to be a complication of the surgical procedure and who consider any capsular contracture that occurs more than 2 months after augmentation to not be a surgical complication. The rate (0.2%) of early contracture in this series is very low, and I cannot fully account for it. My best speculation is that perhaps some of the factors known to incite early contracture simply do not occur as often: less bleeding; a route of exit for seroma or hematoma; and possibly less bacterial colonization within the pocket. The explanation will likely never be known. It should be mentioned that I put no steroids, antibiotic, or iodophors inside the implants and pockets, and all my prepectoral augmentation patients do compression massage daily. My long-term rate of capsular contracture has been only very slightly lower (at this point not statistically significant) after TUBA than after other incisions.

Patients are sometimes incorrectly told that if reoperation is ever needed, such as for replacement of a deflated implant, a different incision would be required. Actually, replacement of implants through the navel is quite straightforward, as is changing to a smaller-volume implant. The techniques for such endoscopic replacement have been published previously.¹² Using those same techniques, minor degrees of capsular contracture can be corrected via the navel as well. However, in my opinion, neither correction of severe capsular contracture nor revision with much larger implants would be appropriate using current transumbilical techniques. My reoperation rate has remained low. Other than those for capsule contracture, change of size, implant deflations, and the one explanted patient noted above, there have only been two other patients reoperated; both of them complained of rippling after severe weight loss, and incision location could not be considered a causative factor.

Table 2 lists those types of problems that might be thought specifically relevant to the TUBA approach. It is

again worth stressing that to date, I have had no infections of the navel incision or of the passageways leading from the navel to the breasts. All of the factors previously discussed may contribute to this, but it is worth noting that many of these patients did have navel jewelry piercings. A very important observation along these lines is that there has not been even a single instance of a persistent track deformity, tunnel irregularity, or any other sign that the passageways had been used. I have heard anecdotally about this, yet no surgeon or patient has ever produced for me a photograph of this elusive phenomenon. I do not doubt that it could occur, but I think the creation of such deformities would be unlikely if proper technique were followed and will reserve judgment until I receive a photograph.

Seroma in the passageway (17 patients) is difficult to categorize. Does this seroma represent a complication or does it represent a means of avoiding a complication? Plastic surgeons with whom I have discussed this are divided on the question. The facts are that these seromas have been less than 30 mL, only bloody in one patient, have been dealt with easily by needle aspiration in the office, and would likely have been undetectable surrounding the implant if there had been no dependent reservoir to receive the seroma. The only bloody accumulation occurred 8 days after operation, and although it was only 30 mL (too small to be detectable had it remained around the implant), in my opinion it might otherwise have been a subclinical peri-implant hematoma that conceivably might have led to early capsular contracture. Is a tunnel seroma to be considered as a complication or is it rather to be considered as an advantageous characteristic of the TUBA procedure, alerting the surgeon to an otherwise occult complication, facilitating its treatment without operation, and thereby avoiding contracture? I leave it to the reader to decide.

Some doctors dissuade patients away from TUBA by telling them incorrectly that an alternate incision would be likely. Thus far, in these 1307 cases, it has not yet been necessary to resort to an alternate incision to place the implants. We often tell rhinoplasty patients that it may be necessary to add external incisions in the columella or alar bases, yet that is not a reason to dissuade the patients from the procedure. Very early in this series, I did have one patient who I took back to the operating room early to explore a size disparity that I wrongly interpreted as a hematoma but which proved to be only unilateral edema—a judgment error I would not be likely to make today. Frequently mentioned by those seeking to disparage the TUBA technique is speculation that there would be difficulty placing the implants in the right position or the correct plane. I consider myself fortunate in having had a first-rate training as a plastic surgery resident, plus considerable experience in breast surgery prior to undertaking excellent TUBA training. It

Table 3 Implant Longevity Statistics (Actuarial Method) by Mentor, Inamed, and the Author

Years	1	2	3	4	5	6	7
Mentor, % (N= 725)	0	0.3	0.3	0.8	2.0	3.4	3.7
Inamed, % (N= 729)	0.33	0.60	0.89	1.21	1.57	1.84	2.07
Author, % (N= 1993)	0.1	0.3	0.5	1.0	1.2	1.2	1.3

is to that training I credit the fact that I have not yet had any implants in the wrong place.

Penetration into the abdominal or thoracic cavity would be a serious problem, which neither I, nor to my knowledge any board-certified plastic surgeon properly trained in the TUBA technique, have ever seen, and which would seem to be as unlikely as penetrating the brain during rhinoplasty. The specific maneuvers to prevent this occurrence have been clearly defined.⁷

During breast augmentations, implants may suffer damage from several causes: use of an implant as a tissue expander, contact with sharp-edged instruments, rupture during forceful insertion of partially filled implants, and needle puncture during closure. These modes of injury cannot occur with the TUBA technique, in which the implants are not used as expanders, the implants do not contact instruments, the implants must be inserted empty, and closure sutures are distant from the implant. Accordingly, I have not had any implants suffer damage during the TUBA procedure. Two modifications of the originally published technique have been well documented,⁸ first that the implants are no longer used as the pocket expanders, and second that no object is used to push the implant up the passageway. That the implants have not sustained any damage during TUBA is perhaps best confirmed by looking at my actuarial implant longevity statistics (Table 3), which reveal that the implant survival for these TUBA implants is not worse, and in fact is actually slightly better, than the official figures published by the two major U.S. manufacturers for the other incisions. Of course, the manufacturers' data included no TUBA implants, and therefore all their implants were vulnerable to the four types of trauma listed above.

There are some postaugmentation sequelae that I do not classify as complications but which I include here for completeness. The first is "bottoming-out," in which the lower breast tissues stretch and descend, whereas the nipple itself does not. I have had three TUBA patients (two subpectoral) develop this shape bilaterally after more than a year postoperatively, the same proportion as after other incisions. The second type of unfavorable appearance is "double-bubble," in which the subpectoral implants have a degree of capsular contracture, and the breast tissue has descended to a lower position. There were two subpectoral TUBA patients who developed this appearance more than a year postoperatively. Not only do I consider these shapes to be the long-term result

of the nature of a patient's tissues rather than a complication of augmentation, but also these have not occurred more frequently with the navel incision than after other incisions.

I have reviewed TUBA cases done by others in which problems occurred that could have been avoided had the steps listed in the literature been followed. Endoscopic video monitoring is a key to a successful, high-quality outcome. Of course, the procedure can be performed without an endoscope, but I still use it on every case, and I continue to learn from doing so. It warrants emphasizing that the technique involves no sharp dissection or cutting in the chest area, and no attempt is made to observe through the endoscope while the pocket is being formed.

DISCUSSION

One might ask, why have not more surgeons learned how to perform the TUBA procedure if it has so many advantages? Surgeons may be afraid to learn something new or may be wary of something unfamiliar, and they may see no justification for changing their current practice methods in light of the cost of the equipment and the time needed to learn the technique. It has been suggested that some surgeons may be unwilling to admit that there exists an excellent method that they personally do not offer. As Thomas Szasz stated: "Every act of conscious learning requires the willingness to suffer an injury to one's self-esteem."¹³ It is noteworthy that similar negativity attended the introduction of endoscopic methods of performing other traditionally open procedures, such as cholecystectomy, hernia repair, appendectomy, and splenectomy.

A lack of the requisite endoscopic ability may be a possible explanation for reluctance to learn the TUBA method, or at least a lack of understanding of the way the endoscope is used for TUBA. In any breast enlargement technique, there must be adequate visualization to ensure that the critical portions of the procedure are done safely and correctly. In some techniques, this is accomplished by direct vision using lighted retractors, and in other techniques this visibility is enhanced by use of endoscopes. If the navel is chosen, only the use of an endoscope can verify implant plane and orientation, absence of bleeding, adequacy of pocket formation, and valve integrity. Proper performance of the TUBA procedure requires that the surgeon possess strong endoscopic skills. It is important to note that, in contrast with every other endoscopic

Figure 3 Before-and-after views of a representative TUBA patient (subpectoral).

breast procedure, in the transumbilical augmentation the endoscope is not used during pocket formation, for which internal hydraulic expansion is used instead, with pocket judgments being monitored externally by observing the position and shape of the breasts themselves, the endoscope used only to verify progression. Some surgeons perform the TUBA procedure without an endoscope, which may decrease the operating time, but in my opinion that is inadvisable. I also believe that it would be a mistake to change the procedure to one involving sharp dissection under endoscopic visualization, as has been suggested from time to time by various surgeons not thoroughly familiar with the TUBA technique.

Many surgeons are under the misconception that using endoscopic techniques might void the implant warranty. This is false but is an understandable error that originated from the implant brochures, which state that the manufacturers do not recommend the transumbilical or any other endoscopic method (which therefore precludes endoscopic transaxillary as well). A little history is in order concerning that unfortunate implant brochure wording. At the U.S. Food and Drug Administration (FDA) implant-approval hearings, the TUBA procedure was discussed briefly. Although there were two plastic surgeons present, neither of them were knowledgeable about TUBA. Because of the absence of information, the FDA committee members heard a false statement to the effect that implants are "wadded up and shoved in through an endoscope,"¹⁴ and as a result it was suggested by one of the plastic surgeons that the FDA not approve endoscopic methods. Of course, it never was recommended to pass the implant through any instrument, the erroneous FDA testimony to the contrary. The FDA nonapproval led to the inappropriate wording in the brochures, with the result that TUBA is an "off-label" use of implants. Federal law prohibits the manufacturer from recommending that any product be used "off-label" (i.e., in any manner not approved by the FDA). Because the manufacturers cannot recommend the transumbilical approach, one might think that the plastic surgeon is barred from using the TUBA or endoscopic axillary approaches. But in fact, there is no legal obstacle to a doctor using any product in an off-label application.¹⁵ Therefore, there are no legal limitations placed upon plastic surgeons regarding the TUBA procedure. When performed properly, there would be no basis for voiding the warranty; and, in fact, the manufacturers have continued to honor their warranties. More to the point, both of the U.S. manufacturers whose implants are FDA approved have provided written assurance that their implant warranties are in full effect after using the transumbilical approach.¹⁶

The TUBA method has been the subject of a variety of other misunderstandings that will be clarified here.⁹ The entire TUBA procedure takes place in the subcutaneous plane external to the anterior rectus fascia

and does not involve abdominal muscles, the abdominal cavity, or internal organs. Behind or within the breast no actual cutting takes place, and I find implant pocket creation easier and more precise than with other methods. The TUBA method facilitates correction of breast asymmetry and modest degrees of tubular breasts as well, in part because of the ability to pressure expand the skin without fear of dehiscence.

Surgeons who offer the TUBA method must be able to counter with factual information all the false criticisms that patients may have heard. Such criticisms are usually just an indication of ignorance about the procedure, although in some instances they may be the result of an overt desire to discredit the TUBA method. For example, some surgeons disparage this blunt expansion technique by describing it using negative, emotionally charged terms intended to alarm patients. They use terms such as "avulsing" or "tearing" or "ripping," despite the time-honored role of blunt techniques in our other commonly performed procedures such as facelift, abdominoplasty, rhinoplasty, and liposuction, in connection with which those same surgeons do not use such pejorative terms. Some may attempt to cast aspersions on the TUBA method by saying that it is a "blind" technique, therefore bad, ignoring the fact that we perform without difficulty other blind techniques such as rhinoplasty and liposuction, with accurate progress assessed externally. Patients will need clear information to counteract these misguided influences.

CONCLUSION

Of all the breast augmentation techniques that I perform, I find that the TUBA patients experience the least pain, especially when placed in a prepectoral position. The TUBA method has been documented to have the lowest rate of complications,¹ and my own experience certainly has corroborated all of these points. TUBA is a safe augmentation procedure (Fig. 3), provided all precautions are taken as outlined here, starting with the proper skills, qualifications, certification, and training of the surgeon and extending to proper equipment and attention to details of technique.

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