



## Transaxillary Subpectoral Placement of Textured Breast Prostheses

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*Textured breast implants are difficult to introduce through a small incision. We have developed two new retractors and a new positioning regimen that enables us to use the transaxillary subglandular or subpectoral approach for breast augmentation. These retractors enable us to bluntly dissect the plane beneath the gland or the pectoralis muscle and then adduct the arm so that the relaxed pectoralis or subglandular space can be retracted to allow atmospheric pressure, gravity, and the surgeon's finger to work in unison.*

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The company that manufactures the Misti textured silicone breast prosthesis and these new retractors is Bioplasty, Inc., in Minneapolis, MN. One of the authors (R.A.E.) is a shareholder in that public company.

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Since the first breast augmentation procedures described by Gerow and Cronin [5] in 1964, and others [7], many variations of the prosthesis and the procedure have evolved. The use of silicone breast prostheses in the reconstruction of the damaged or excised breast has become a routine procedure in most centers. Because of the frequency of scar contraction and the development of spherical contracture around the smooth silicone implants [1, 2, 8, 9, 12, 13], attempts have been made in recent years to texture the surface of these implants to decrease this scar contraction [3, 4, 6, 11]. These textured prostheses have a roughened surface that resists motion and makes their insertion through any incision far more difficult than the original smooth-surfaced silicone implants. The placement of the prosthesis under the pectoralis muscle has been described as safer and having a decreased incidence of capsular contracture [10]. The axillary incision has been advocated because this approach leaves no disfiguring scar on the breast or areola and interferes least with the function of the mammary gland. A variety of special retractors, urethral sounds, and other devices have been used to dissect the subpectoral pocket [14]. Those prior art devices, however, do not allow the adduction of the arm due to their length and do not provide precise development of the borders of the pocket. Therefore, we have developed a simple, improved technique for the placement of these textured prostheses and two new retractors to improve the dissection of the pocket and the precision of the placement.

### Position

#### *Pieopieative. Preparation*

The patient is placed in the crucifix position with both arms abducted at 90 degrees to the long axis of the body as seen in Figure 1. The arms are surgically prepared and then wrapped in stockinette or sterile towels, allowing freedom of motion so they can later be repositioned.

For definition of the lateral border of the pectoralis muscle, the patient must be in the standing position with the arms placed at the side. This border is the anterior limit of the incision beyond which it cannot go. A line is then marked, measuring approximately 3.5 cm in length, parallel to the skin folds and within the hair-bearing area of the axilla (Fig 2). Its distance is measured from the nipple, and then, the exact same incision is inscribed on the opposite side. This area in the axilla is then injected with 0.25%:1% xylocaine and 1:400,000 epinephrine. With a 22-gauge spinal



Fig 1. The patient is placed in the crucifix position and arms prepared in stockiaette, so that they are freely movable.



Fig 2. Preoperative markings define the pectoralis boidei, which is never crossed. The incision is planned parallel to the axillary folds, within the hair-bearing area.



Fig 3. After the surgical pocket is dissected, the arm is adducted to allow relaxation of the pectorals. Adducting the arm across the clavicle and rotating the patient 30 degrees places the incision uppermost. In this position, fluids can be poured into the pocket and the pectoralis is relaxed and easily retracted.

needle, 100 ml of this solution is then injected into the subpectoral plane along the costochondral junction and the inframammary crease.

### Operation

The incision is carried through the skin to the underlying fat of the axilla, and all the rest of the operation is performed by blunt dissection (Fig 3). Bleeding is controlled by electrocautery before the axillary dissection is begun, and here, with dissecting scissors or a blunt dissecting probe, the lateral border of the pectoralis muscle is identified with the patient in the crucifix position and the arm extended 90 degrees and abducted. The dissection is carried under the lateral border of the pectoralis muscle, and the finger is thrust into the space between the pectoralis major and pectoralis minor. This will usually result in a space extending to approximately the level of the nipple, lateral to the lateral border of the pectoralis and superiorly approaching the clavicle. There are minimal attachments of the pectoralis major muscle to the underlying structures except in the medial aspect where the muscle inserts into the costochondral junction and the sternum. Inferiorly, the fascia of the pectoralis is confluent with that of the serratus anterior and firmer attachment is noted at the level of the serratus anterior. Once the plane is developed, the U-shaped retractor with the upturned ski-tipped edge is inserted in this space (Fig 4). This upturned ski tip will allow the retractor to pass over the ribs and decrease the chance of piercing the intercostal membrane (Fig 5). By gently passing this ski-tipped edge of the retractor along the costochondral junction and inferiorly, most of the dimensions of the pocket are defined. Then, the U-shaped retractor is reversed, so that the dissecting surface is inserted. At this time, the precise definition of the medial and inferior portion of the pocket can be achieved. The two limbs of this retractor are exactly the same length (see Fig 5), so regardless of the amount of breast gland present or absent, and regardless of the thickness or thinness of the pectoralis muscle, the precise location of the dissection can be seen from the outer portion of the U-shaped retractor.

The retractor is then removed and attention turned to the other side. A cotton gauze is placed in the axilla while the same procedure is performed on the opposite side (in the bilateral patient). Any unseen bleeding will be evident in the cotton gauze. Although it may be possible to inadvertently tear the pectoralis major or minor muscles, and although significant vessels course below and above this area of dissection, in more than 100 procedures performed as described

herein, we have never had any significant bleeding from this blunt dissection technique. Patients, of course, are informed preoperatively that should unexpected bleeding occur, it may be necessary to create a second inframammary incision to gain control of a significant vessel. This has not occurred in our experience to date. ◀m\*

### Repositioning

The U-shaped retractor is then placed within the incision and the patient gently rolled to place this incision as the uppermost part of the body. The arm is then adducted with the elbow placed across the face, so that the arm is nearly parallel to the clavicle. This, of course, relaxes the pectoralis muscle. An antibiotic solution and cortisone is then used to irrigate this space, and the excess fluid is expressed from the incision with the retractor held gently in position. By retracting the relaxed pectoralis muscle with these new retractors, a suction created by atmospheric pressure actually helps pull the prosthesis into place behind the muscle so that it can be put in quickly and safely. With the operator's hand over the pectoralis muscle holding the surgical space closed, the prosthesis is placed over the opening of the incision and gently inserted with one or two fingers. At this time, once a seal has been formed by the prosthesis in the incision, the retractor is elevated, retracting the pectoralis muscle anteriorly. At the same time, the prosthesis is pushed further into the wound by the operator's finger. This manipulation should be done slowly, deliberately, and with patience. The gel within the prosthesis may be viscous and move slowly. The textured surface may be lubricated with a bio-oncotic gel. Our most effective maneuver is to place the index finger on the prosthesis shell and to insert the finger into the incision, holding the shell with the tip of the finger as it is pushed therein. Once the finger is inserted most of its length, the operator's other hand is used to squeeze the portion of the prosthesis that is out of the incision, and in this way, the gel within the prosthesis follows the inserted shell into the incision and pocket. This maneuver is then repeated and the prosthesis gradually and slowly pushed into the surgical pocket. It is necessary that the operating surgeon keep his fingernails trimmed because, even through the surgical gloves, a palpable fingernail can become a cutting member for these tense, stretched, pressurized prostheses.

Once the prosthesis is within the pocket, it is of paramount importance with the textured prosthesis to be certain that the filling patch or nubbin is precisely

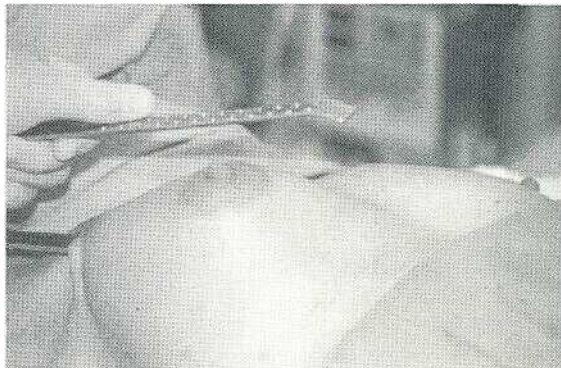


Fig 4. The predetermined distance between the tips of the U-shaped retractor allows precise measurement of the location of the other tip. The U-shaped retractor allows adduction of the arm.

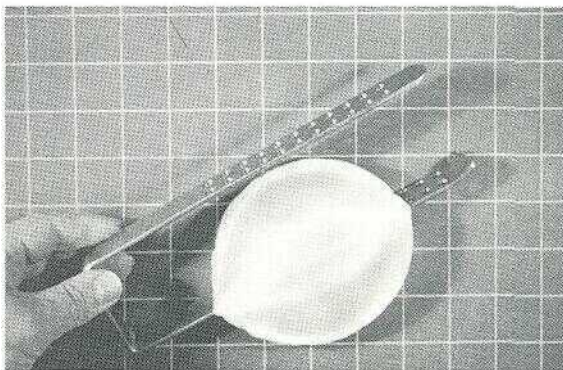


Fig 5. U-shaped retractor showing the upper periosteal elevator and bottom upturned ski tip; shown here with the prosthesis, to scale.

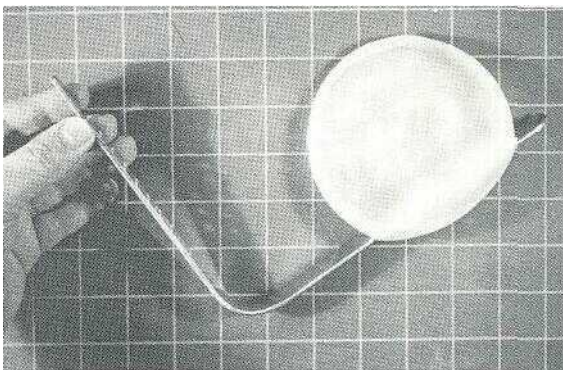


Fig 6. The L-shaped retractor with both blunt ends for sitting the prosthesis after it has been placed: shown here- with the prosthesis, to scale.

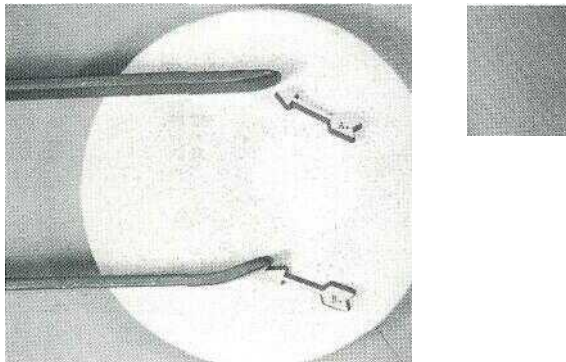


Fig 7. Close-up of the U-shaped retractor showing detail of the dissecting tips. (A) Semiblunt periosteal elevator for dissecting the pectoralis fascia. (B) Ski-tipped blade for "skiing" over the ribs to prevent any puncture of the intercostal membrane.

centered behind the nipple. If it is to one side or the other, it will cause rotation of this prosthesis. Because the textured surface resists motion, it is likely that it will cause a nonoval distortion of the breast as healing is completed. Therefore, the L-shaped retractor (Fig 6) may be used to gently shoehorn the prosthesis into each of the corners of the surgical pocket for precise placement, and we are able to have a rounded, anatomical, natural-looking breast augmentation. Before closure, the surgical pocket is rinsed with 10 mg of methylprednisolone and antibiotic solution.

#### Closure

The patient is then replaced in the crucifix position with the arm extended, and the shoulder is abducted at 90 degrees and the subcutaneous tissue closed with 5/0 polyglycolic acid sutures. The skin is then closed with a running 4/0 nylon subcuticular stitch and the ends left long. No knots are placed in this suture, and the wound edges are reinforced with Suture Strips (Genetic Laboratories Wound Care, Roseville, MN).

#### Postoperative Care

The patient is then placed in a special tubular, knitted, elastic support that has a double layer in the upper hemisphere to provide some definite but gentle force to keep the prosthesis in its anatomical position. Because the pectoralis muscle is dynamic, the perfectly placed prosthesis can become displaced within a few days and the surgical pocket may heal in the incorrect position. When this happens, of course, repeat surgery is necessary to reposition these prostheses. Patients are instructed to avoid strenuous activity or use of the arms for 1 week, at which time the sutures are removed. The wounds are then reinforced with Suture

Strips and the patient advised to begin gradual but minimal use of the arms over the next 3 weeks. Full activity is discouraged for an additional 3 weeks.

## Conclusion

Positioning to allow sterile abduction of the arm and using a U-shaped and L-shaped retractor recruits atmospheric pressure and the relaxed pectoralis to help push and pull the prosthesis into the subpectoralis pocket for textured surface prostheses.

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