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# Techniques in Cosmetic Surgery

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## Breast Augmentation: Choosing the Optimal Incision, Implant, and Pocket Plane

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A retrospective study of 220 patients was performed to review surgical design in breast augmentation. Three specific issues were studied: incision site, implant variables, and pocket plane selection. The influence of these three factors on aesthetic results in both primary and secondary cases was the focus of the analysis. No attempt was made to address long-term issues such as capsular contracture or saline implant deflation rates. In 77 primary augmentation patients and 80 unilateral augmentations for symmetry in breast reconstruction, there were the following untoward results: 11 revisions for unilateral malposition, change to a different implant shape, or change to a larger implant size; four deflations of saline implants requiring replacement; and four conversions of saline to silicone gel implants. In 63 secondary cases, there were two hematomas and two infections requiring implant removal and subsequent replacement. Operative technique in breast augmentation is described, as are recommendations for each of the options associated with the three variables studied. (*Plast. Reconstr. Surg.* 105: 2202, 2000.)

The design of breast augmentation procedures is almost entirely determined by three variables: the selection of incision location, the pocket plane for implant placement (either subpectoral or completely subglandular), and the appropriate implant. Implant-related variables include size, shape, shell texture, filler substance, and final implant fill volume in the case of saline implants. There is no incontrovertible evidence that supports the superiority of one combination of choices over another. However, certain anatomic configurations in primary cases as well as certain problems presented in secondary cases are best treated with a specific combination of options that may differ from a usual preferred approach. This study is a retrospective review that seeks to establish the optimal indications for each of

three variable options as they relate to specific types of augmentation problems.

### PATIENTS AND METHODS

A total of 220 patients underwent breast augmentation between 1991 and 1998. This included 77 primary augmentations performed for aesthetic purposes, 80 unilateral augmentations performed as symmetry procedures in breast reconstruction, and 63 aesthetic augmentation patients who required secondary removal and replacement of breast implants. The follow-up period ranged from 1 month to 6 years. A meaningful average follow-up period was difficult to determine because many patients did not return for follow-up after several postoperative visits. Therefore, no attempt was made to determine overall patient satisfaction or the incidence of capsular contracture, topics that are not the focus of this study and have been reported elsewhere previously.<sup>1-5</sup>

### Operative Technique

Preoperative preparation includes the administration of intravenous antibiotics, padding, securing the head to stabilize the patient for sitting up later in the procedure, and securing the arms either abducted on armboards (transaxillary approach) or taped across the lap (periareolar or inframammary incision approach). Monitored sedation anesthesia is typically used. The intercostal nerves are individually blocked with 0.25% bupivacaine. Each of the lateral intercostal nerves associated with ribs two through eight is injected at the lower edge of each rib, and also the interspace of ribs

two through six approximately 1 cm lateral to the sternocostal junctions. A total of 30 to 40 cc is used. This nerve block is not difficult because these patients are usually thin and the landmarks easily palpable. It contributes significantly to the patient's comfort postoperatively. The incision, the inframammary crease, and the soft tissue in the region of the inferomedial origin of the pectoralis major muscle are injected with 1% lidocaine with epinephrine.

After the incision is made and the pocket developed, the patient is placed in a sitting position, and a saline sizer is inserted. A sizer is critical to accurately determine the proper implant size. There is usually a narrow volume range that achieves the desired aesthetics, and this is established by adjusting the sizer volume and observing the effect. Exceeding the range that provides adequate augmentation without distortion results in a less natural appearance. Distortion results from a combination of excessive volume for chest and overall patient proportions, excessive implant diameter, and convex upper pole shape (Fig. 1). Selecting the corresponding implant size in the case of silicone gel implants must be precise because of

the fixed size of these devices. Selecting the most appropriate saline implant size should take into account whether or not filling the implant beyond its stated shell size is desired. In very thin individuals, round saline implants can be used with minimal rippling if they are "overfilled" as much as 15 percent higher than the stated implant size (Fig. 2). This is the maximum amount that will not cause the implant shape to be conspicuous or its consistency too firm. The implant size selected should take into account the amount of "overfill" desired so that the final volume approximates closely the sizer-determined volume. Shaped implants become even less "anatomic" with overfill and resemble more a lozenge than a "teardrop." Therefore, they should be filled beyond their stated shell size more conservatively if at all. Final fill volume with implants used for combined augmentation and mastopexy is less critical because these patients typically have enough native breast tissue to hide the implant well even if filled to less than the stated implant shell size.

The medial aspect of the pocket is developed as much as desired before the lateral aspect is enlarged. The latter is generally done conservatively to prevent lateralization of the im-



FIG. 1. Implant size (diameter) and fill volume are key determinants of breast appearance. (Left) A natural result with a flat upper pole was achieved by a modest submuscular augmentation using smooth-shell 200 cc round implants filled to 210 cc on both sides. Preexisting breast volume estimated at 80 to 100 g. (Right) A distorted and unnatural appearance is seen in this patient who had approximately 75 g of breast tissue preoperatively. Implant diameter is excessive and contributes to a tight appearance with a convex upper pole. Textured-shell 360 cc saline implants were used with a final fill volume of 390 cc.

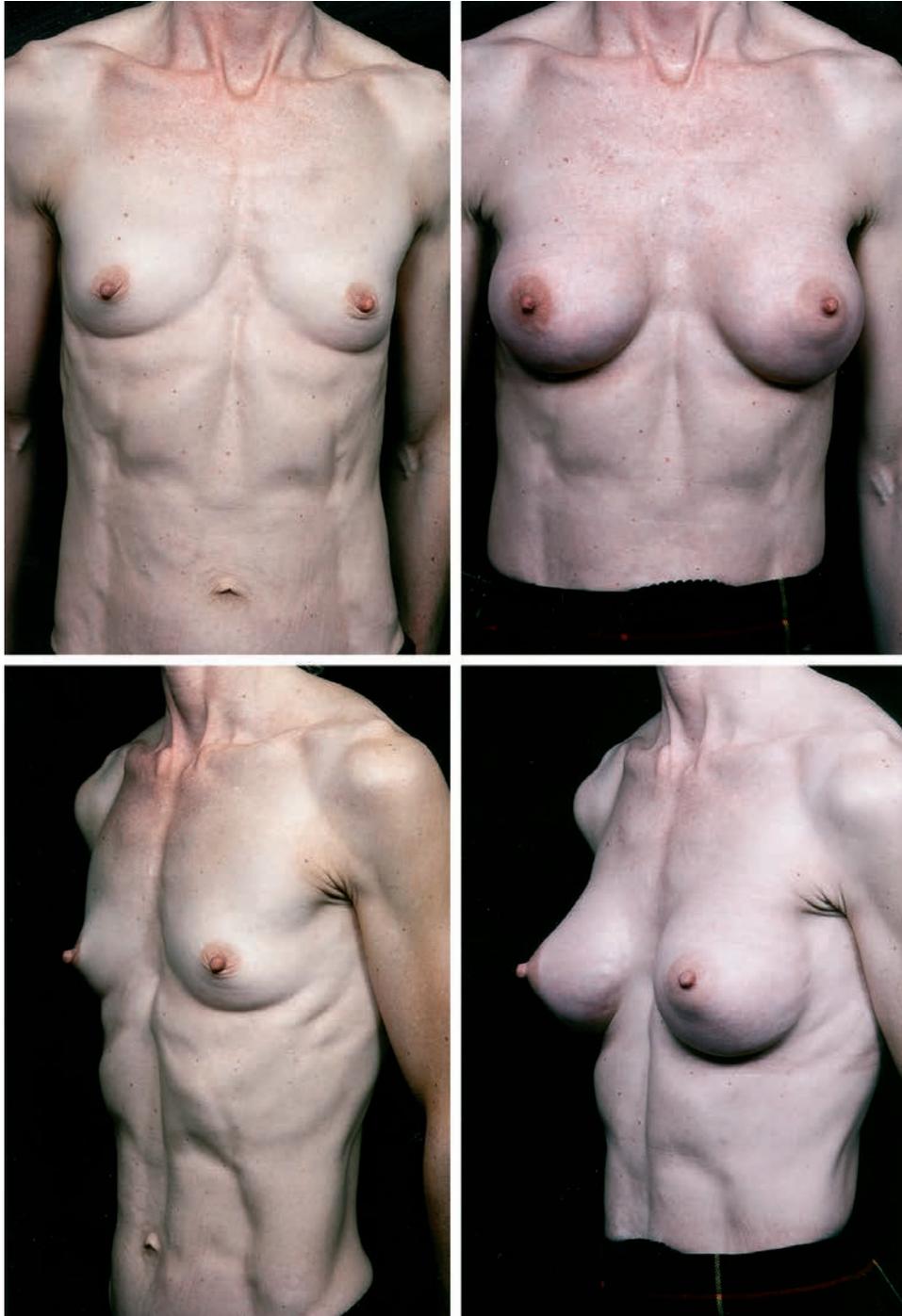


FIG. 2. Transaxillary submuscular breast augmentation in the extremely thin patient. Smooth-shell 250 cc round saline implants were placed with a final fill volume of 288 cc on both sides. A guideline of 15 percent volume overfill is reliable to provide maximum protection against postoperative rippling while retaining reasonably soft breast consistency. This patient subsequently requested an exchange for silicone gel implants, which did not yield a significantly different result.

plants. Subpectoral implant placement requires partial detachment of the pectoralis major origin. This is usually limited to the inferomedial aspect of the muscle. Excessive detachment superiorly can contribute to symmas-

tia or dimpling of the overlying skin with muscle contraction.

Placement of the implants usually requires lowering the inframammary crease. The crease should always be lowered enough so that the

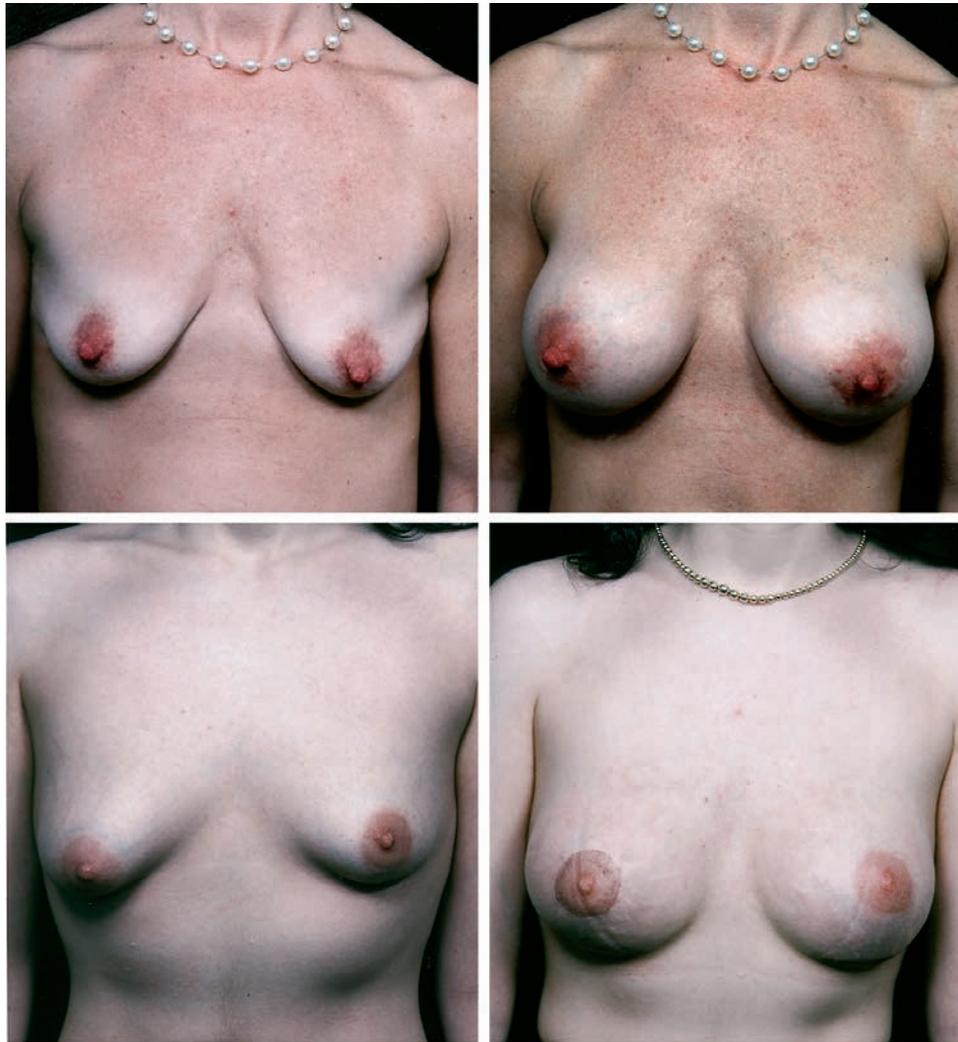


FIG. 3. Circumareolar skin excision with and without mastopexy as an adjunct in breast augmentation. (*Above*) Areolar repositioning was not elected in this patient who preferred mild asymmetry and ptosis to additional scars. Indications for mastopexy in borderline cases should be conservative, as most patients seem indifferent to areolar position asymmetry in the absence of true ptosis of the gland. (*Below*) Circumareolar skin excision of 5 cm in diameter was designed on the right side to raise the areolar position. It was combined with excision of 20 g of periareolar breast tissue in this case of mild tubular breast formation.

horizontal midaxis of the implant is centered on the nipple. It is obvious that the larger the implant diameter the more the crease will have to be lowered. Lowering the crease excessively to accommodate an overly large implant makes

inframammary crease asymmetry or a “double-bubble” deformity more likely to occur. Therefore, this should be taken into consideration in determining the best implant size and volume for a particular situation. An inframammary



FIG. 4. Adjustable straps are useful postoperatively to prevent upward migration of breast implants. They are indicated primarily in patients with submuscular implants placed through an axillary incision, although they are helpful in any patient in whom the inframammary crease requires significant lowering.

crease that is inadvertently lowered too much during a transaxillary approach can be corrected immediately by placing an external bolster suture(s) at the appropriate level while manually displacing the implant superiorly. This type of suture should include the deep soft tissue of the chest wall and is left in place for as long as 2 weeks postoperatively.

Antibiotics are placed in the implant but steroids are not.<sup>6</sup> The implant is rinsed with dilute betadine before insertion.<sup>7</sup> A closed system of fluid administration is used to fill the implants.

Certain adjunctive procedures are helpful to further improve aesthetic results. These include nipple reduction and adjustment of areolar diameter. Nipple reduction can be accomplished either by excising skin circumferentially as much as 50 percent of the nipple height. Simply closing the resultant defect decreases nipple projection. Nipples that are prominent and wide can be reduced by partial vertical excision. Patients must be advised about the possible impact on sensa-

tion of these techniques, although clinical experience has shown little adverse effect. Areolar diameter can be reduced by intra-areolar excision. However, circumareolar scars are an even trade at best for areolar diameter reduction, and this method is not recommended for routine use. It is best reserved for unilateral application in the rare case where there is a considerable side-to-side diameter discrepancy. Skin excisions that are less than 1 cm wide around the circumference of the areola usually are associated with excellent quality scars. Circumareolar skin excision, possibly combined with intra-areolar excision, is useful in cases of tubular breast hypomastia where there is considerable pseudoherniation anteriorly with prominence of the areola and associated gland ptosis. In cases of either circumareolar or intra-areolar excision, a pursestring suture of nonabsorbable material such as 2-0 clear nylon on a Keith needle (Ethicon) is recommended to stabilize the decreased areolar diameter.

Position asymmetry of the areolae is common preoperatively, and the placement of breast implants often magnifies any preexisting discrepancy following augmentation. The breast implants should always be placed symmetrically, even though the areolar position may be different on each side. Most patients tolerate naturally occurring asymmetry without concern so that correction, with its attendant scars, should not be advocated unless the degree of asymmetry is expected to be considerable (Fig. 3). It is possible to raise the areolar position slightly with a vertically eccentric skin excision design, although it becomes more challenging to precisely control areolar shape as the perpendicular diameters of the skin excision design increasingly differ. More significant areolar position issues such as ptosis may require concurrent mastopexy, a procedure beyond the scope of this discussion.

Postoperatively, it has proved useful in cases of submuscular augmentation to have the patient wear an adjustable strap across the upper pole of the breasts for as long as 6 weeks (Fig. 4). This prevents upward migration of the implants and ensures that the lowered inframammary crease remains at the desired height. This practice is most helpful in the case of transaxillary augmentation and should be used with caution when an inframammary incision has been used. The strap tension may require adjustment, and the patient should be seen at appropriate intervals to monitor implant posi-

TABLE I  
Incision Options\*

Factor	Axillary	Periareolar	Inframammary	Periumbilical†
Implant plane				
Submuscular	+	+	+	-
Subglandular	-	+	+	+
Implant type				
Saline round	+	+	+	+
Saline shaped	-	+	+	-
Silicone round/shaped	-	+	+	-
Preoperative breast volume				
High (>200 g)	+	+	+	+
Low (<200 g)	+	+	-	+
Preoperative breast base position				
High	+	+	+	+
Low	-	+	+	+
Breast shape				
Tubular	-	+	-	-
Glandular ptosis	+	+	+	+
Ptosis (grade I-II)	-	+	-	-
Areolar characteristics				
Small diameter	+	-	+	+
Light/indistinct	+	-	+	+
Inframammary crease				
None	+	+	-	+
High	+	+	-	+
Low	+	+	+	+
Secondary procedure	-	+	+	-

\* (+) indicates applicable; (-) indicates not generally recommended.

† Included for completeness but not generally recommended.

tion and strap tension. Patients are not instructed to massage the implants.

## RESULTS

The most common options selected for primary augmentation (both aesthetic and reconstructive) in this study included transaxillary approach, submuscular pocket plane, and smooth saline implants. Other combinations were far less common and were selected according to the guidelines described below. The most common options selected for secondary augmentation included periareolar incision, no change in pocket plane, and placement of textured silicone gel implants.

The significant number of secondary cases in this study support the notion that breast augmentation patients frequently pursue revisional surgery with another surgeon. Therefore, accurate follow-up of both primary and secondary cases is difficult, and the results reported here are likely to underestimate the true incidence of revisional surgery. The primary aesthetic breast augmentation patient group included seven that required adjustment of implant position on one side,<sup>3</sup> change from round to shaped implant,<sup>1</sup> or bilateral increase in implant size.<sup>3</sup> There were four patients who underwent exchange of implant(s) for prema-

ture deflation of saline implants, all occurring within 3 years of placement. This included one patient who had premature bilateral deflation of shaped implants with failure occurring at the superior-most aspect of the implant on both sides. There were two patients augmented with saline implants that opted for replacement with a silicone gel type. There were two primary congenital asymmetry patients who chose to have a second procedure years later for further improvement. In the unilateral augmentation group for breast reconstruction, there were four revisions to further improve symmetry. Two patients in this group also opted for exchange of saline implants for a silicone gel type. There were two hematomas requiring evacuation in the secondary aesthetic group, and both occurred in patients where the pocket plane was converted from subglandular to subpectoral. Two secondary patients required removal of implants for infection with later replacement.

## DISCUSSION

### *Incision Selection*

Incision choices in breast augmentation include axillary, inframammary, periareolar, and more recently, periumbilical. There are multiple factors that influence incision selection

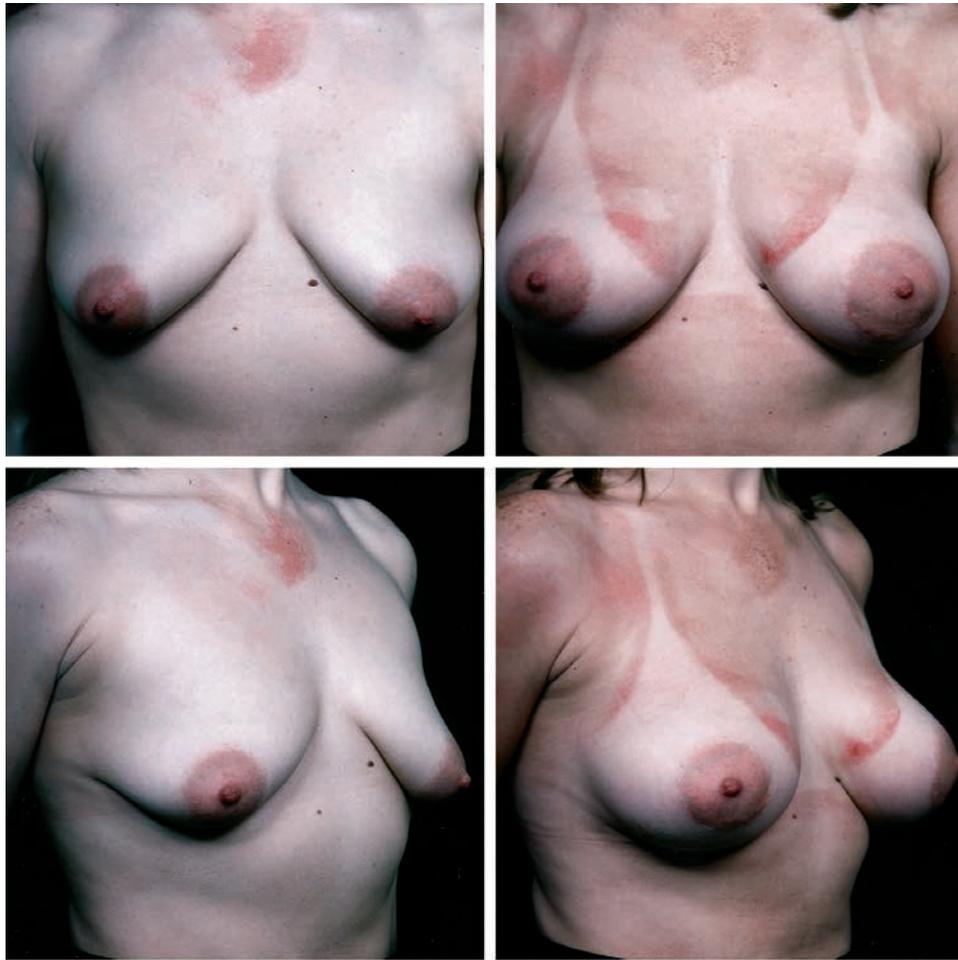


FIG. 5. Periareolar subglandular augmentation. Preoperatively, this patient exhibited grade II ptosis owing to an abnormally high inframammary crease. A periareolar incision provided central access to the implant pocket, allowing the inframammary crease to be lowered substantially but accurately. It was not obvious preoperatively which plane would be best. A subglandular plane was used after a trial submuscularly on one side proved aesthetically inferior. Smooth-shell 300 cc round saline implants were placed with a final fill volume of 320 cc on the right and 340 cc on the left. The patient's photosensitive skin is an unrelated issue.

(Table I). Each patient presents with certain anatomic variables that suggest one or more choices as superior options. It is best not to rely rigidly on one incision type.

Periareolar incisions are the most versatile.

They allow central access to the implant pocket and are compatible with either muscle plane and all types of implants. They are the best choice when it is necessary to lower the inframammary crease considerably (Fig. 5). They

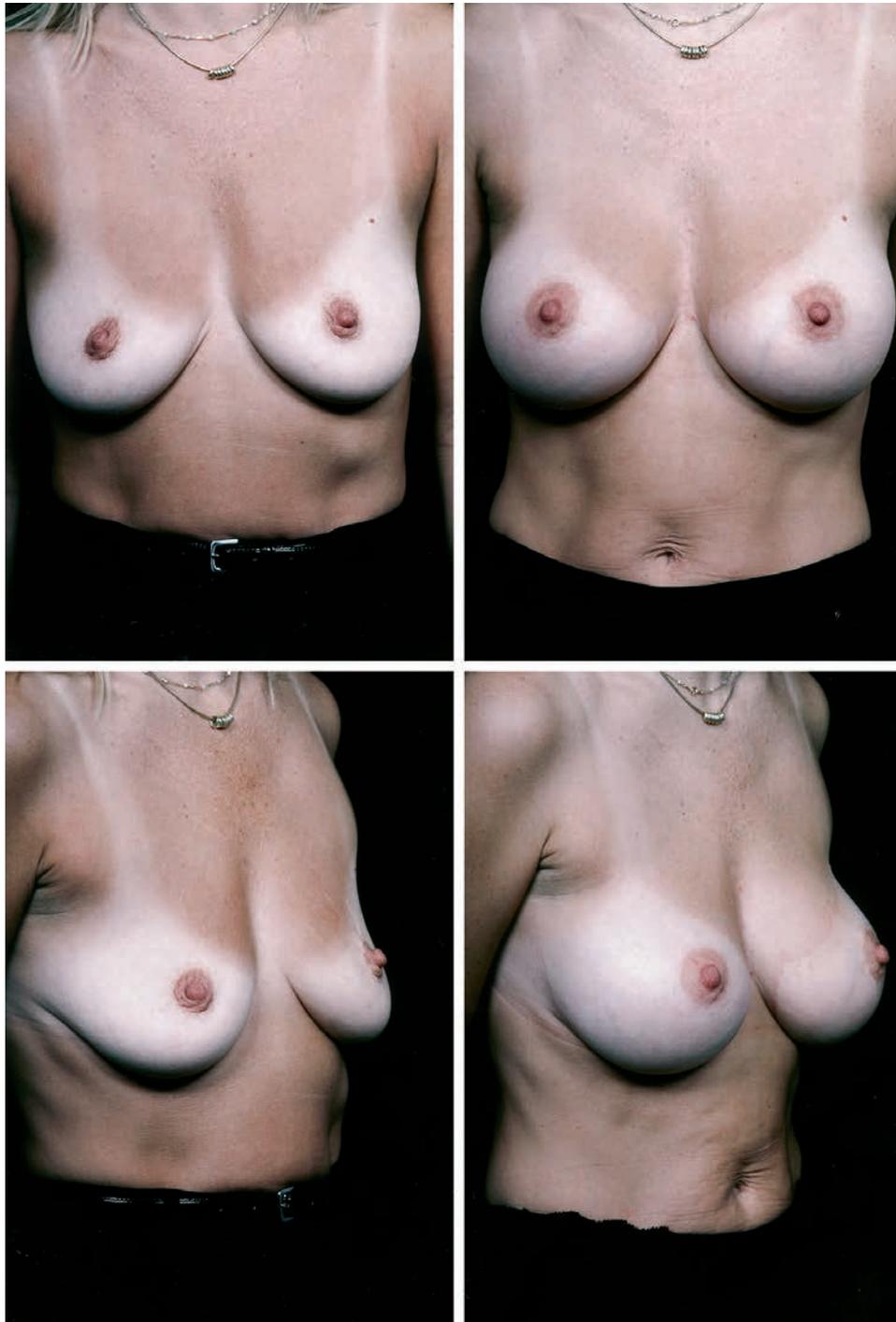


FIG. 6. This patient with low breast position, glandular ptosis, postpartum atrophy, and significant preoperative breast volume proved an ideal candidate for subglandular augmentation through an inframammary crease incision. Smooth-shell 350 cc round saline implants were used with a final fill volume of 375 cc on the left and 350 cc on the right.

are a logical choice when concurrent mastopexy may be required but is not certain preoperatively. In these patients, a sizer is typically placed and the breast shape previewed. This may prove to obviate the need for additional incisions that a mastopexy would require, but if

not, the periareolar incision is simply incorporated into the design. A periareolar incision is also the best choice for cases of tubular breast hypomastia because it allows circumareolar skin and parenchymal excision should this prove necessary. It is the incision of choice in

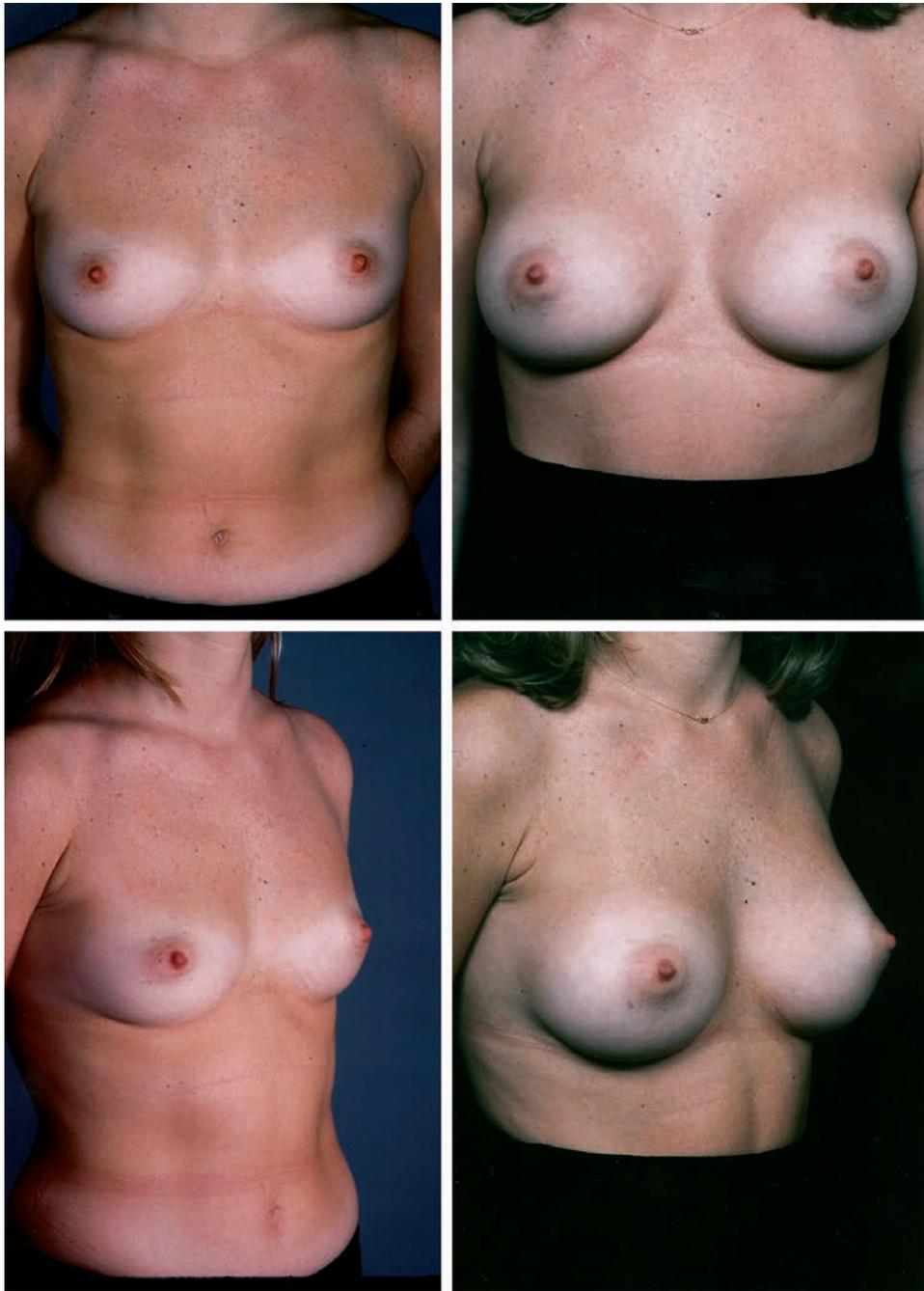


FIG. 7. Transaxillary submuscular breast augmentation without endoscopy. Smooth-shell 275 cc round saline implants were placed with a final fill volume of 300 cc on both sides. Note that shaped implants are *not* required to establish a desirable upper pole contour. Most patients seeking breast augmentation are good candidates for this approach.

secondary procedures that require either capsulectomy and exchange of old implants or capsulorrhaphy to correct implant malposition. The few contraindications to a periareolar incision are small areolar diameter or a very light areolar color with indistinct margins. A variant of the periareolar scar method not commonly practiced is a small incision at the

base of the nipple. Although there may be a scar-concealing advantage to this approach, exposure is quite limited.

Inframammary crease incisions are popular and almost as versatile as periareolar incisions. They are an ideal choice in patients who have significant breast volume preoperatively and exhibit either postpartum atrophy or just glan-

dular ptosis (Fig. 6). These patients usually have a breast base of appropriate diameter so that the incision will not end up displaced from the inframammary crease following implant placement. In most cases, the final scar is well concealed in a deep crease below a slightly ptotic breast. This incision is usually a secondary choice when the inframammary crease is either high or nonexistent. It is also not indicated in tubular breast hypomastia unless the areolar deformity is minimal and it proves necessary to add a skin flap to widen the breast base at the inframammary crease.<sup>8</sup>

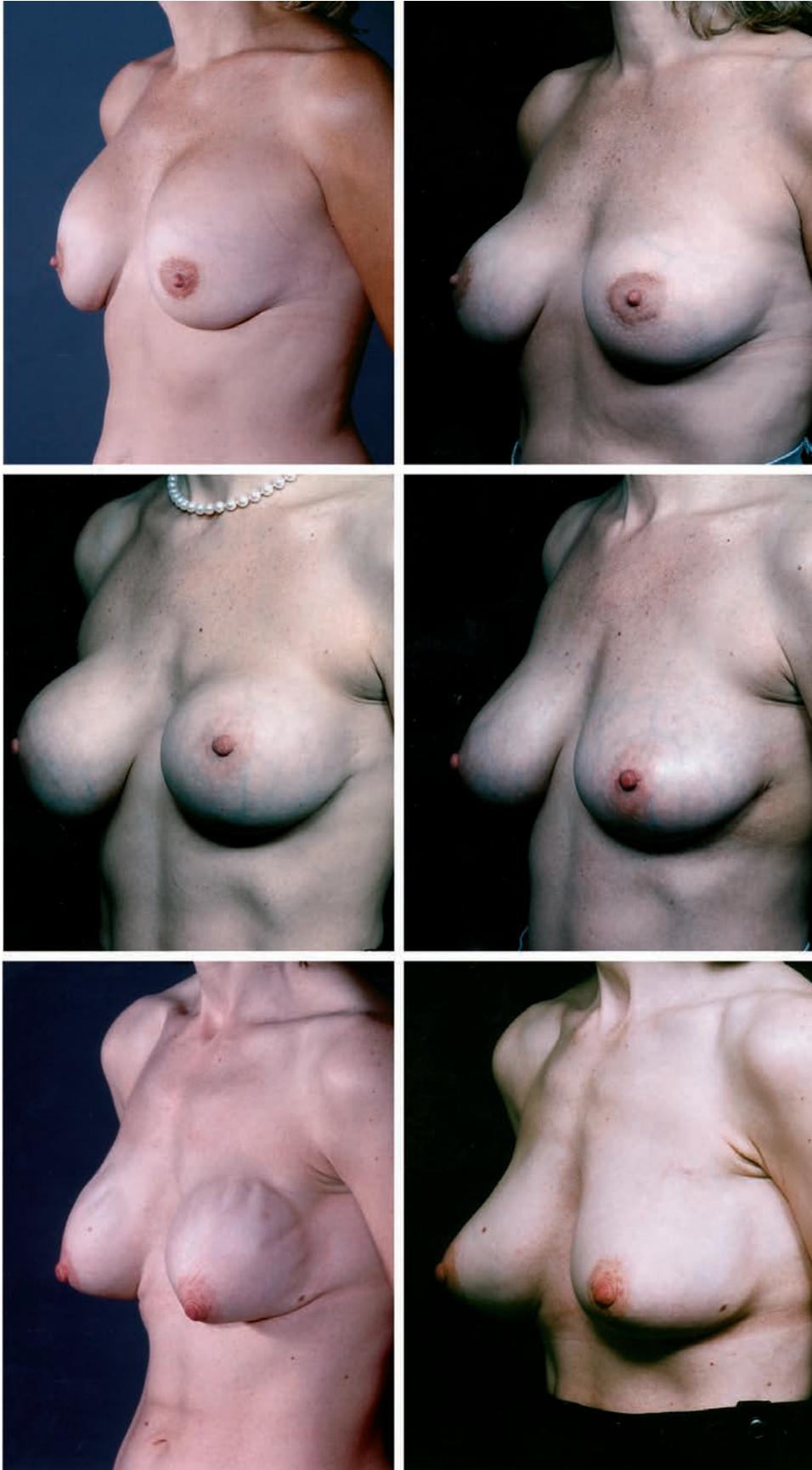
The inframammary crease incision is not as good as a periareolar incision in secondary cases requiring capsulectomy or closing down the superior portion of the pocket because it is at the periphery of the pocket as opposed to its center. In addition, wound closure is more precarious in terms of either implant puncture during closure or exposure postoperatively given that the weight of the implant presses against it and the soft-tissue covering at the incision may be minimal. It is not unreasonable in some secondary cases where there are preexisting inframammary incisions and either thick capsules or severe deformity to consider a periareolar incision to optimize exposure and

thereby improve control of the procedure. The inframammary incision is also not the best choice for patients undergoing unilateral augmentation as a symmetry procedure in breast reconstruction. In these cases, it increases the overall scar burden on the chest and may compromise lower skin-flap circulation should a mastectomy be required on the augmented side in the future.

The axillary incision is applicable to most cases of hypomastia that do not have more than grade I ptosis (Fig. 7). Its obvious appeal is that there is no scar on the breast.<sup>9-11</sup> This approach does not require endoscopy, although there is evidence to suggest that the procedure is more accurate when it is used.<sup>12</sup> Whereas many patients require reassurance that the axillary scar will not be visible and will be of good quality, this routinely occurs. It is an ideal choice in patients having a low preoperative volume and high breast position on the chest wall, those with small diameter areolae, and those with no inframammary crease. Like the inframammary crease incision option, an axillary incision is an excellent choice for women with high preoperative breast volume who only require a small implant primarily to improve the upper breast contour. This inci-



FIG. 8. This patient presented with previously placed shaped implants (McGhan style 468). (Left) Although subglandular location contributed to the odd appearance, this photograph illustrates that "anatomic" implants do not guarantee a natural result. Implant size, fill volume, muscle plane, and implant volume together are more important variables than implant shape in most cases. (Right) Postoperative appearance following submuscular placement of textured round silicone gel implants through a periareolar incision.



sion is not practical for subglandular augmentation; fortunately, breast characteristics that suggest a subglandular approach usually favor other incision choices. An axillary incision is more challenging in patients with long chests and low breast position, but this scenario does not constitute a contraindication to this choice. Tubular breast hypomastia is a contraindication for an axillary approach unless the deformity is truly minimal.

Secondary procedures in breast augmentation are usually a contraindication to an axillary incision approach. A simple exchange of implants through the original axillary incision requires endoscopy and can be challenging because multiple capsulotomies are often required.<sup>13</sup> A second incision, such as a periareolar type, is well tolerated as an alternative by patients because it still constitutes the first scar on the breast. However, endoscopy is preferred by some for both primary and secondary transaxillary breast augmentation. Its proponents claim that the additional time involved with use of the endoscope is not significant once experience is gained, and that implant malposition problems in primary cases are less frequent when an endoscope is used.<sup>14</sup>

The periumbilical approach has been developed recently with its chief advantage being a single inconspicuous scar located at a distance from the breasts.<sup>15</sup> This method has many disadvantages, which include poor access to the implant pocket, inability to create a subpectoral pocket, inability to use a silicone gel prosthesis, inability to use a shaped prosthesis, and the need for a second incision for revision or implant replacement. It is not applicable to more complex conditions such as tubular breast hypomastia or other situations requiring alteration of nipple-areola complex position or shape. Its true value in breast augmentation remains to be established.

#### *Implant Selection*

Implant variables include filler type, shape, surface texture, and volume. Silicone gel im-

plant use in the United States is restricted to secondary applications and very selected primary cases. The latter includes patients requiring concurrent mastopexy or undergoing treatment for a congenital deformity. The majority of women who seek primary augmentation are therefore currently not candidates for silicone gel implants.

Silicone gel implants are commonly used to replace old silicone gel implants. Most patients who have had these devices for a long time are less concerned about alleged safety issues and are generally not pleased with the consistency of saline implants nor as accepting of their spontaneous deflation risk. Silicone gel implants are also used to convert saline-implant augmentation patients who have unacceptable results because of their thin body habitus, which makes the implant shape and ripples obvious. Silicone implants are available with more "anatomic" shapes, but these are likely to prove more useful for breast-reconstruction applications.

All implants are available with either smooth or rough shell texture. There are several studies that support the claim of decreased capsular contracture with textured implants.<sup>1,7,16-19</sup> Most practitioners prefer this surface type with silicone gel implants, but it is believed that ripples are more common and more extensive in textured saline implants compared with smooth shell types.<sup>20</sup> Therefore, smooth shell saline implants are usually selected for primary augmentation in thin patients, the most common type. Textured saline implants can be used without disadvantage in patients with higher preoperative breast volume, such as those undergoing augmentation with mastopexy. Another good indication is a small volume augmentation intended primarily to fill out a flat or depressed upper pole in patients with otherwise satisfactory breast volume.

Adjustable implants offer the prospect of changing implant volume postoperatively.<sup>21</sup> Although this is an attractive feature, it should

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FIG. 9. Secondary augmentation. (*Above, left*) Typical appearance of submuscular augmentations with capsular contracture. The breasts are full superiorly, and flat and ptotic inferiorly. (*Above, right*) The appearance is improved following replacement of nine-year-old silicone gel implants with slightly larger textured-shell round saline implants in the same submuscular pocket following capsulectomy. (*Center, left*) Typical appearance of subglandular implants with capsular contracture. The implants remain low, but there is a characteristic shelf effect where the implant meets the chest wall superiorly. (*Center, right*) The appearance is improved following replacement of 10-year-old stacked polyurethane-covered gel implants with a slightly larger size silicone gel implant placed in the same subglandular plane following capsulectomy. (*Below, left*) Visible subglandular saline implants with rippling. (*Below, right*) Appearance following conversion to a submuscular plane and exchange of saline implants for silicone gel type.

not be necessary in most cases because it is possible to accurately select the appropriate implant volume with the use of a sizer intraoperatively. It would tend to make postoperative care unnecessarily complex if this option were to be routinely offered to all patients. There is also the need to remove a subcutaneous remote valve later.

These devices may be appropriate for the unusual situation where a wide range of volume looks appropriate and the patient cannot clearly communicate her goals preoperatively. In this study, only a few patients required an additional procedure to change implant size.

Shaped or "anatomic" implants may have more conceptual superiority to round implants than they actually offer in practice. The type that is applicable to breast augmentation has a vertical axis longer than the horizontal axis and has been successfully marketed by the manufacturer to prospective patients as having a natural, "teardrop" shape. The majority of breast augmentation patients are still best served by conventional round implants, although shaped implants are very successful when applied to the quite different setting of breast reconstruction. A flat upper pole of the breast can be consistently achieved with round implants when the appropriate size and final fill volume are selected (Figs. 5 through 7). A patient with a long chest and low breast position may constitute one of the better indications for these particular devices. In most cases, the choice of shaped versus round implant is not a dominant variable in the design of the procedure. Selection of a shaped implant does not guarantee a successful outcome when other important factors are ignored (Fig. 8). Shaped implants should be used with caution in secondary cases where there is an established implant cavity with a retained capsule. In these cases, the implants may rotate on their axis during the postoperative period and result in asymmetry requiring further surgery. It is also not clear whether the stress forces that ultimately result in implant failure are equally distributed in shaped implants compared with round implants. Bilateral premature failure was observed in shaped implants at the top of their vertical axis in one patient in the study group.

#### *Pocket Plane Selection*

Subpectoral implant placement refers to partial muscle coverage underneath the pectoralis

major muscle. The implant is subglandular in its lower portion to a variable degree in these cases. Complete submuscular coverage involving mobilization of the serratus anterior muscle and anterior rectus sheath is useful for tissue expanders in breast reconstruction but not appropriate for aesthetic breast augmentation. Placement below the muscle is believed to contribute to a decreased incidence of capsular contracture.<sup>22-24</sup> It is unequivocally helpful in most patients to obscure superior pole implant shape and minimize the potential for perceptible ripples with saline implant use. Previously, with the widespread use of silicone gel implants in primary augmentation, subglandular placement was popular because it simplified the procedure and minimized postoperative patient discomfort and recovery.

It has also been claimed that subpectoral implant placement is advantageous for breast cancer monitoring, although the ratio of implant volume to breast tissue volume is likely a more important variable.<sup>25,26</sup> Large implants with a small native breast volume stretched in front impair mammogram interpretation far more than the difference in effect between subglandular and subpectoral placement of an average size implant.

Subpectoral implant placement is indicated in most cases of primary breast augmentation except for patients with normal body habitus (not excessively thin) who present with significant postpartum atrophy and exhibit loose breast skin, glandular ptosis, and significant residual breast volume (more than 200 g per side). Subglandular augmentation in these individuals more effectively restores shape without the risk of visible implant shape. Subpectoral implant placement in these individuals may fail to correct ptosis completely, which may result in an abnormal double breast contour.

Patients who present for secondary augmentation with capsular contracture often have a characteristic appearance based on whether their implants are subpectoral or subglandular in location. Breast appearance with capsular contracture and subpectoral implant placement usually has a convex upper pole owing to superior displacement of the implants. The breast is flat anteriorly and the native tissue often ptotic (Fig. 9, *above*). Patients with capsular contracture and subglandular implant location often maintain implant position but exhibit a sharp shelf-like contour deformity of

the upper pole of the breast, which is often quite striking (Fig. 9, center). In general, subpectoral implant location influences breast appearance less than subglandular location when contracture is only mild.

Secondary breast augmentation frequently includes the option of changing subglandular implants to a subpectoral location. This is generally advisable in patients who have been previously augmented with saline implants and present with visible implant contour with or without ripples (Figs. 8 and 9, below). These individuals are commonly thin and may also be best served with a conversion to silicone gel implants at the same time to minimize the possibility of residual deformity requiring yet another procedure. Patients with old silicone gel implants commonly present with capsular contracture, distortion, and a history of original subglandular placement. It is not necessary to convert these patients to a submuscular plane in most cases. Plane conversion prolongs surgery, adding only questionable benefit, contributes to a more difficult recovery, and is more prone to postoperative complications such as hematoma. The procedure is tedious because the subglandular pocket must be obliterated superiorly with sutures, and this is added to a procedure that may already be lengthy because of the need to perform almost a complete capsulectomy.

In summary, a standardized approach to breast augmentation may be suitable for most patients. However, optimal results will be consistently achieved if flexibility is retained in surgical design and if the combination of incision, pocket plane, and implant is customized when one is presented with specific anatomic variants and secondary problems.

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#### REFERENCES

- Asplund, O., Gylbert, L., Jurell, G., and Ward, C. Textured or smooth implants for submuscular augmentation: A controlled study. *Plast. Reconstr. Surg.* 97: 1200, 1996.
- Handel, N., Wellisch, D., Silverstein, M. J., Jensen, J. A., and Waisman, E. Knowledge, concern, and satisfaction among augmentation mammoplasty patients. *Ann. Plast. Surg.* 30: 13, 1993.
- Rheingold, L. M., Yoo, R. P., and Courtiss, E. H. Experience with 326 inflatable breast implants. *Plast. Reconstr. Surg.* 93: 118, 1994.
- Strom, S. S., Baldwin, B. J., Sigurdson, A. J., and Schuster, M. A. Cosmetic saline breast implants: A survey of satisfaction, breast-feeding experience, cancer screening, and health. *Plast. Reconstr. Surg.* 100: 1553, 1997.
- Young, V. L., Nemecek, J. R., and Nemecek, D. A. The efficacy of breast augmentation: Breast size increase, patient satisfaction, and psychological effects. *Plast. Reconstr. Surg.* 94: 958, 1994.
- Burkhardt, B. R., Fried, M., Schnur, P. L., and Tofield, J. J. Capsules, infection, and intraluminal antibiotics. *Plast. Reconstr. Surg.* 68: 43, 1981.
- Burkhardt, B. R., and Eades, E. The effect of Biocell texturing and povidone-iodine irrigation on capsular contracture around saline-inflatable breast implants. *Plast. Reconstr. Surg.* 96: 1317, 1995.
- Dinner, M. J., and Dowden, R. V. The tubular/tuberous breast syndrome. *Ann. Plast. Surg.* 19: 414, 1987.
- Hoehler, H. Breast augmentation: The axillary approach. *Br. J. Plast. Surg.* 26: 373, 1973.
- Tebbetts, J. B. Transaxillary subpectoral augmentation mammoplasty: A 9-year experience. *Clin. Plast. Surg.* 15: 557, 1988.
- Tebbetts, J. B. Transaxillary subpectoral augmentation mammoplasty: Long-term follow-up and refinements. *Plast. Reconstr. Surg.* 74: 636, 1984.
- Price, C. I., Eaves, F. F., III, Nahai, F., et al. Endoscopic transaxillary subpectoral breast augmentation. *Plast. Reconstr. Surg.* 94: 612, 1994.
- Howard, P. S., Oslin, B. D., and Moore, J. R. Endoscopic transaxillary submuscular augmentation mammoplasty with textured saline breast implants. *Ann. Plast. Surg.* 37: 12, 1996.
- Smith, J. W., Shaw, L. W., and Friedland, J. A. Endoscopic transaxillary subpectoral augmentation mammoplasty: A comparative analysis of endoscopic versus non-endoscopic transaxillary subpectoral augmentation mammoplasty using smooth saline implants. *Plast. Surg. Forum* 21: 127, 1998.
- Johnson, G. W., and Christ, J. E. The endoscopic breast augmentation: The transumbilical insertion of saline-filled breast implants. *Plast. Reconstr. Surg.* 92: 801, 1993.
- Ersek, R. A. Rate and incidence of capsular contracture: A comparison of smooth and textured silicone double-lumen breast prostheses. *Plast. Reconstr. Surg.* 87: 879, 1991.
- Pollock, H. Breast capsular contracture: A retrospective study of textured versus smooth silicone implants. *Plast. Reconstr. Surg.* 91: 404, 1993.
- Burkhardt, B., and Eades, E. The effect of Biocell texturing and povidone-iodine irrigation on capsular contracture around saline-inflatable breast implants. *Plast. Reconstr. Surg.* 96: 1317, 1995.
- Coleman, D. J., Foo, I. T. H., and Sharpe, D. T. Textured or smooth implants for breast augmentation? A prospective, controlled trial. *Br. J. Plast. Surg.* 44: 444, 1991.
- Handel, N., Jensen, J. A., Black, Q., et al. The fate of breast implants: A critical analysis of complications and outcomes. *Plast. Reconstr. Surg.* 96: 1521, 1995.
- Becker, H. Breast augmentation using the expander mammary prosthesis. *Plast. Reconstr. Surg.* 79: 192, 1987.
- Biggs, T. M., and Yarish, R. S. Augmentation mamma-

- plasty: Retropectoral versus retromammary implantation. *Clin. Plast. Surg.* 15: 549, 1988.
23. Gylbert, L., Jurell, G., Asplund, O., and Olenius, M. Results of subglandular breast augmentation using a new classification method: 18-year follow-up. *Scand. J. Plast. Reconstr. Surg. Hand Surg.* 23: 133, 1989.
  24. Puckett, C. L., Croll, G. H., Reichel, C. A., and Concannon, M. J. A critical look at capsular contracture in subglandular versus subpectoral mammary augmentation. *Aesthetic Plast. Surg.* 11: 23, 1987.
  25. Grace, G. T., Roberts, C., and Cohen, I. K. The role of mammography in detecting breast cancer in augmented breasts. *Ann. Plast. Surg.* 25: 119, 1990.
  26. Leibman, A. J., and Kruse, B. D. Imaging of breast cancer after augmentation mammoplasty. *Ann. Plast. Surg.* 30: 111, 1993.