# Decisions and Applications in Aesthetic and Reconstructive Breast Surgery

João Carlos Sampaio Góes, MD, PhD; Alan Landecker, MD;
Paulo Miranda Godoy, MD; Renata Sampaio Góes, MD

Aesthetic and reconstructive breast surgery can achieve excellent results using modern cohesive silicone gel implants, which have been extensively modified since their introduction in the early 1960s. Plastic surgeons now possess a myriad of options regarding their shape, design, surface, and filler material. These developments have minimized complications, increased safety, and improved the aesthetic results of these operations.

Cohesive silicone gel implants have a natural feel and low potential for capsular contracture, rupture, or rippling. These features have been improved by the latest technical refinements in the approaches, the incisions, and especially the pocket planes. The pocket plane is the most influential factor in the dynamics established between the implant and the soft tissues after surgery. An adequate pocket must be dissected accurately to avoid postoperative displacement of the implant and should have strong enough tissues to support the implant and conceal its borders.

The indications, benefits, and trade-offs of the subglandular, partial retropectoral, and completely submuscular pocket planes have been extensively analyzed in the literature. More recently the development of the subfascial approach (which uses the pectoralis major fascia as an extra unit for implant coverage) has offered more natural long-term outcomes. This conclusion derives from applying this technique in 341 primary and secondary patients since 1994 and the extensive experience of the senior author (JCSG) with ablation of breast cancer and breast reconstruction.

In this chapter we present the most important aspects of surgical technique, benefits, trade-offs, and outcomes of the subfascial approach in primary and secondary breast augmentation and in immediate breast reconstruction using silicone cohesive gel implants.

## ANATOMY

The pectoral fascia, a thin layer of tissue that lies over the pectoralis major muscle, is attached to the sternum and the clavicle; it is continuous with the fascia of the shoulder, axilla, and thorax inferolaterally. At the caudal border of the pectoralis major muscle the clavipectoral, pectoral, and serratus anterior fasciae become continuous and form suspensory ligaments that extend to the breast's inframammary fold and its in-

vesting fascia. The pectoralis fascia may be used as an additional coverage and stabilizing system for the upper pole of breast implants, offering more natural long-term outcomes.

## SUBFASCIAL APPROACH IN PRIMARY AND SECONDARY BREAST AUGMENTATION

Breast augmentation has enjoyed worldwide acceptance in the last few decades because of continued improvements of modern implants, refinement of surgical techniques, and cultural trends that emphasize exposure of the body. To optimize the outcomes of this operation, factors such as incision location, pocket plane, implant design, and individual tissue characteristics must be carefully considered. Satisfactory results depend on adjusting available options to each patient's requirements.

### Advantages and Disadvantages of Subfascial Augmentation

The subfascial breast augmentation technique using cohesive silicone gel implants offers excellent long-term aesthetic results because the dynamics between the implant and soft tissues have been optimized. Additionally, important aspects of this operation, such as morbidity and postoperative recovery, have been minimized. This technique is extremely versatile and may be used for primary breast augmentation and for patients requiring removal or replacement of implants.

The creation of a strong support system for the implant's superior pole is the technique's main feature. Displacement of the implant in the superior direction is avoided because its upper pole is placed between the muscle and the fascia, which constitutes a stronger supporting system than just the breast parenchyma and/or subcutaneous tissue in the conventional submammary approach. The subfascial technique also helps the implant's upper half retain its shape and position over time and helps conceal its borders. A natural outcome is generated because the skin and subcutaneous tissue in the upper half of the pocket are not directly in contact with the implant, allowing the skin and subcutaneous layers to move freely and independently as a separate system.

The subfascial technique enables the surgeon to combine the potential benefits of the subglandular approach (such as accurate control of both breast shape and inframammary fold position, rapid postoperative recovery, and lack of distortion during pectoralis muscle contraction) with an increased amount of tissue available to cover the implant's upper pole. Although the fascia offers less tissue for coverage than the pectoralis major muscle, we feel that some of the potential benefits of using the pectoralis major have been achieved. Also, trade-offs of the subpectoral approach, such as a tendency for lateral and superior displacement of implants over time, visible changes of breast shape during contraction of the muscle, increased morbidity in terms of pain and recovery, and less control over the inframammary fold's position, have been significantly reduced when compared with the subglandular approach.

Dissection of the entire pocket in the subfascial plane has several disadvantages. First, concealing the implant borders in the lower third of the breast may not be significantly enhanced in patients with a thin and fragile fascia in this area. Second, morbidity may be enhanced by factors such as extended operating time and increased potential for bleeding, because dissection of the pocket in the subfascial plane is slower than in the conventional submammary plane and requires more meticulous hemostasis. The use of a high-frequency electrocautery with a needle tip or an ultrasonic scalpel obviates this potential problem. In our experience, the benefits of the subfascial approach have been much more significant than these potential trade-offs.

# PLANNING

## Pocket Plane Selection

In breast augmentation, pocket plane selection is perhaps the most influential factor in the dynamics established between an implant and soft tissues after surgery. Before the development of the subfascial approach the most commonly employed pocket planes were subglandular, partial retropectoral, and totally submuscular. The indications, benefits, and trade-offs of these strategies have been extensively analyzed in the literature.

After performing numerous cohesive gel implant operations using the conventional submammary approach, we observed that the implant's superior border had a tendency to project in the anterior direction after variable time periods. This caused somewhat unnatural results in previously pleasing outcomes because the implant's border could be seen. Clearly a more stable coverage system was required to avoid this problem.

Use of the subfascial plane has become increasingly popular since it was reported by authors performing transaxillary breast augmentation. In general, the pectoralis major fascia tends to be thin and more fragile over the lower half of the pectoralis major muscle. The progressive thickening of the fascia along the upper half of the muscle constitutes the basis of the subfascial augmentation technique. The strong supporting system offered by the thickened fascia in the superior and medial regions of the breast gives excellent coverage and concealment of the implant borders in these areas, offering natural long-term outcomes. Therefore, in the subfascial approach, the anterior wall of the implant's pocket consists of the pectoral fascia, breast parenchyma, subcutaneous tissue, and skin.

## Incisions and Approaches

The operation is performed under general anesthesia without infiltration. The choice of approach and incision (or incisions) should be based on a thorough discussion with the patient regarding her preference and the advantages and trade-offs of each option. For patients desiring a periareolar approach, the incision location depends on whether a change in the position of the areola is anticipated and on the diameter of the areola. We find that the periareolar approach generally results in scars that are excellent and become inconspicuous after the maturation process. Another advantage is that it establishes a central easy access to all regions of the breast, which may be especially helpful in patients having secondary procedures that require capsulotomy or capsulectomy.

For patients whose areola is in a satisfactory position, the incision should be placed in the lower half of the areola. In patients requiring extensive elevation of the areola or breast tissues, the incision should be placed along the upper half of the areola and may be combined with a circumferential periareolar, vertical, or inverted T incision if necessary. Other approaches should be used when the diameter of the patient's areola is too small for the implant.

The inframammary approach offers advantages such as easy access, nondisruption of the breast's parenchyma, and allowing the use of virtually any type or size of implant. It also facilitates accurate dissection and hemostasis of the pocket. The incision is usually 4 cm long and should be located slightly lateral to the inferior projection of the nipple-areolar complex on the inframammary fold and approximately 0.5 cm above the anticipated new fold.

In the senior author's experience, the axillary and transumbilical approaches may not be appropriate when using cohesive silicone gel implants. The axillary approach may result in an unaesthetic scar that may be problematic in countries where exposure

of the body is frequent. Also, hemostasis is a challenge, it is difficult to create an accurate pocket, and there may be an increased tendency for superior displacement of the implant with time because of inaccurate release of the pectoralis major muscle at the inframammary fold area. Other disadvantages are that endoscopic instruments are frequently required, and it may be difficult to insert the bulky cohesive silicone gel implants through a relatively small and distant access site.

The transumbilical approach possesses most of the same disadvantages of the axillary approach, and insertion of cohesive gel implants through the umbilicus is virtually impossible.

## TECHNIQUE

### Dissection of the Subfascial Pocket

When the incision is in the lower hemisphere of the areola, dissection should be performed in the caudal direction parallel to the skin (as in skin-sparing mastectomies) for approximately 4 cm. After dissection, the breast's parenchyma is incised in a radial direction (perpendicular to the skin incision) and vertically until the muscle layer is reached (Fig. 1). This avoids any communication between the skin and the parenchymal incisions. After inserting the implant, closing the incised tissues establishes a relatively secure isolation of the implant from the atmosphere, reducing the risk of infection.

Additionally, radial dissection of the breast's parenchyma facilitates the adjustment of glandular flaps for breast shaping in patients undergoing tumor resection or when ptosis and insufficient upper-pole fullness are present.

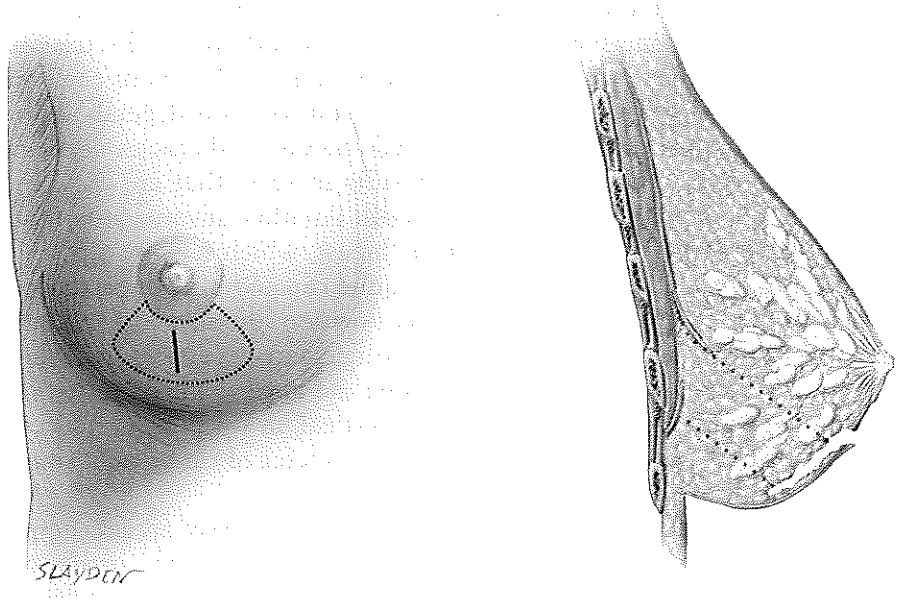


FIG. 1

After the pectoralis major muscle layer is reached, dissection of the implant pocket is performed in the subfascial plane using either high-frequency electrocautery with a needle tip or an ultrasonic scalpel. The anterior wall of the implant pocket using the subfascial approach should consist of pectoral fascia, breast parenchyma, subcutaneous tissue, and skin. The fascia is sufficiently thick in the superior and medial poles of the breast to offer an additional anatomic structure to cover the implant (Fig. 2).

It is very important to create a pocket with adequate dimensions that allow the implant to lie comfortably inside. An accurately sized pocket results in improved adherence between soft tissues and the implant's surface. A pocket that is too small may lead to compression of the implant, creation of folds, and unaesthetic distortions of the breast's shape. Excessively large pockets may cause displacement of the implant and accumulation of liquid.

If necessary, the inframammary fold should be lowered so that the horizontal middle axis of the implant is centered on the nipple. The amount of lowering correlates with the implant's diameter. When doing this, the attachments of the fascia to the skin at the level of the fold must be disrupted to avoid deformities such as high-riding implants and double-bubble contours in the lower breast. Undermining should not extend laterally beyond the lateral breast border to avoid injury to the fourth and fifth intercostal nerves that innervate the nipple-areolar complex. This also avoids lateral displacement of the implant after surgery.

After meticulous hemostasis has been achieved, the implants are bathed in cephalothin (Keflin) solution and inserted into the pockets. The preferred implants are anatomic cohesive gel implants with a textured surface. Layered wound closure is performed using Vicryl and Monocryl subdermal sutures and Monocryl intradermal sutures. Suction drains are inserted, usually through the axilla, and are removed when the output is less than 30 ml per day on each side. The suction system also helps maximize adherence between the pocket's soft tissues and the implant's surface.

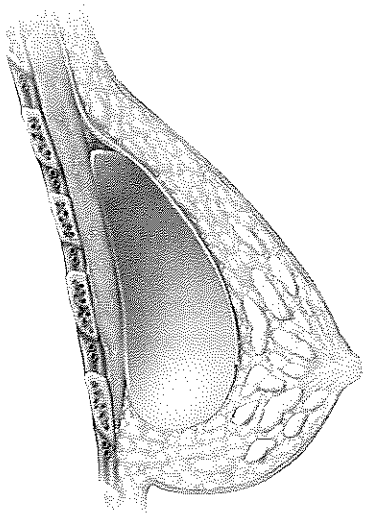

FIG. 2

At the end of the operation it is important to assess the positions of the implants in relation to each other and to the thoracic wall. In general, the distance between the areola's inferior border and the inframammary fold should be approximately 6 to 7 cm (called *x*). The distance between the areola's superior border and the uppermost point of the breast should be approximately 9 to 10.5 cm (or 1.5*x*). Two other important parameters are the distances between the implants and between each areola's medial border and the midsternal line. Appropriate distances are 2 to 3 cm and 9 to 10 cm, respectively.

## Dressing and Postoperative Care

At the end of the operation, adhesive dressings are placed around the breast in a triangular fashion (similar to a bra) to shape, support, and compress the soft tissues somewhat. These are removed after about 5 days. An elastic band or strap should be used over the superior poles of the breasts for 2 weeks to avoid superior displacement of the implants, keep the newly created inframammary fold in the desired position, and expand the tissues in the inferior pole of the breast. Massaging or moving the breasts should be avoided for at least 4 weeks to avoid detaching the soft tissues of the pocket from the surface of the implant, which may lead to an accumulation of liquid.

## Special Clinical Situations

### *Secondary Breast Augmentation*

During secondary breast augmentation, or for patients requiring removal of submuscular implants, new implants should be placed in the subfascial plane whenever possible. Capsulectomy and fixation of the pectoralis muscle to the thorax are routinely performed in these cases to avoid creating a pocket and accumulating liquid, which may be a source of infection and/or other complications.

### *Segmental Pectoralis Major Muscle Flap*

For very thin patients, for those requesting larger implants, and for patients who present with rippling, harvesting part of the pectoralis major muscle may be necessary to help conceal the implant's borders in the superomedial pole of the breast because the coverage offered by the subfascial approach alone may not be sufficient.

In these patients a segmental pectoralis major muscle flap, based on perforators located along the sternal border, is raised, placed along and over the implant's superomedial pole, and sutured to the underlying pectoralis muscle (Fig. 3). The flap is generally 15 cm long and 4 cm wide. With this approach lateral or superior dislocation of the implant resulting from contraction of the pectoralis muscle (frequently seen with submuscular augmentation) is avoided because only a strip of the muscle is used.

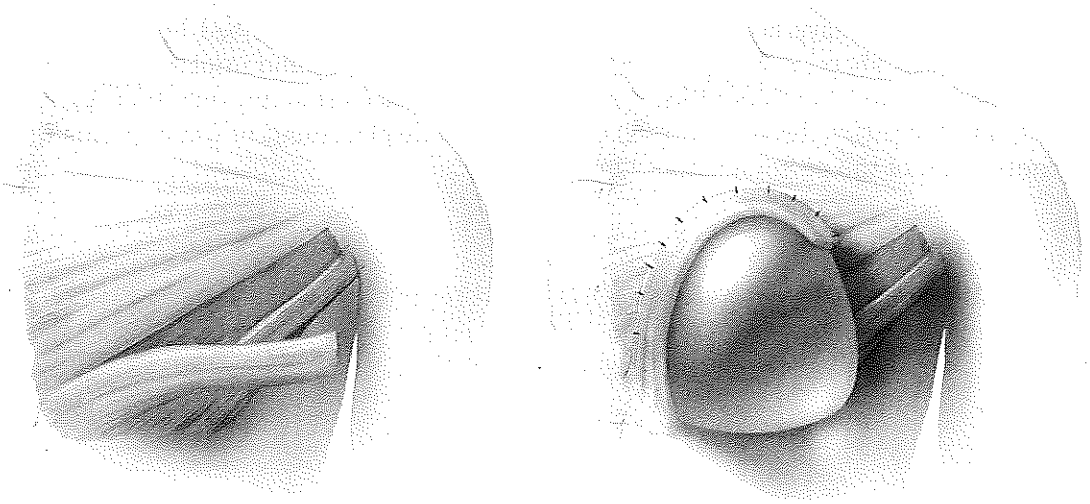

FIG. 3

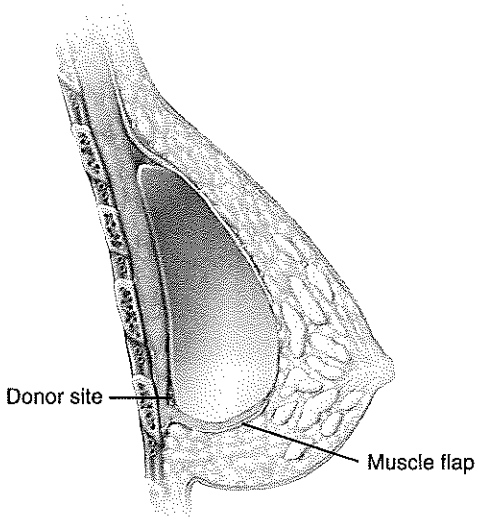


FIG. 4

### *Inferior Myofascial Flap*

The pectoralis major muscle fascia may be used to treat patients who have excessive caudal migration of breast implants. After removing the implants, the fascia and/or muscle 2 to 4 cm above the planned inframammary fold is dissected, creating a small inferiorly based flap (Fig. 4). Placing the implant under this flap strengthens the supporting system of the inferior part of the implant and may help secure the implant in place after fixation of the inframammary fold in its correct position.

## RESULTS

Pleasing results have been obtained using the techniques described here, including a natural breast shape, a smooth transition between soft tissue and implant in the supero-medial pole, and low morbidity. The rate of capsular contracture has been extremely low, and there have been no complaints regarding displacement of the implants during contraction of the pectoralis major muscle.

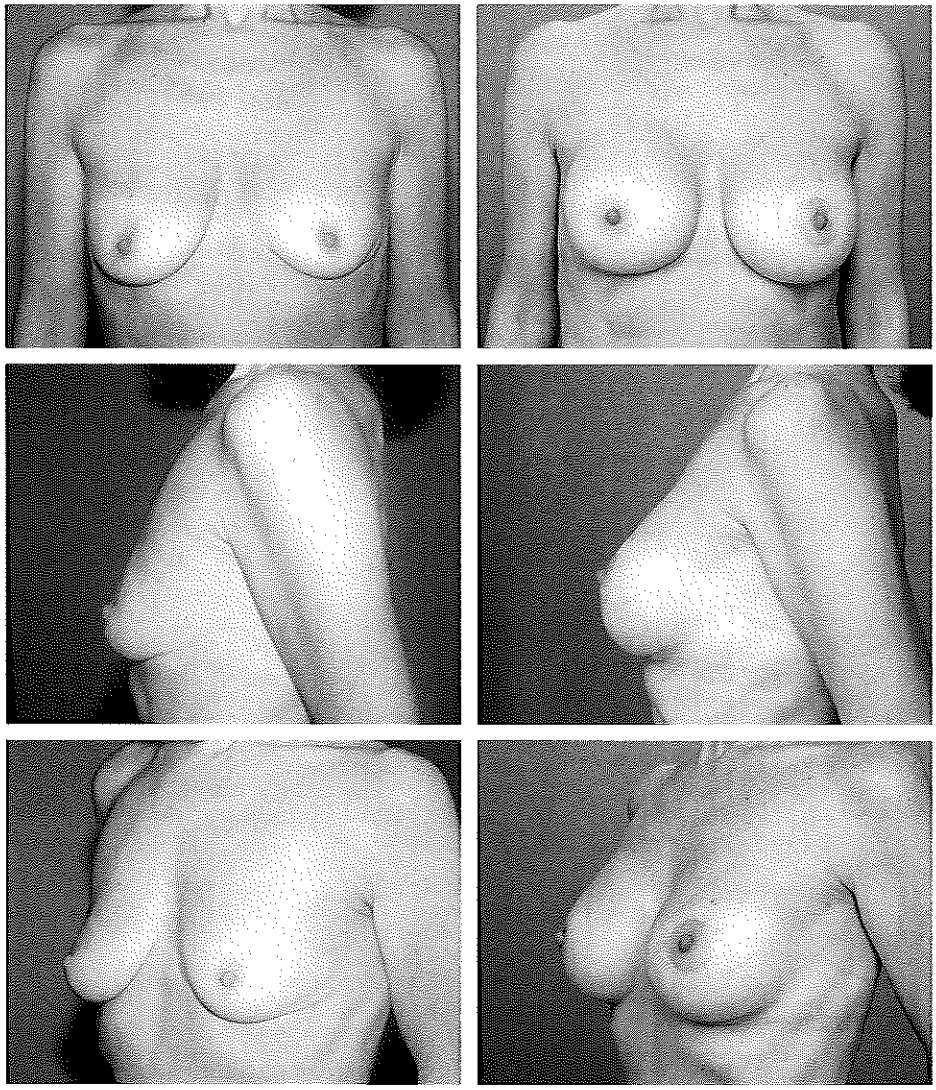

**FIG. 5**

This 36-year-old patient had breast augmentation with 280 cc anatomic implants in the subfascial plane using a periareolar approach. Her results are shown after 1 year. Augmentation produced satisfactory elevation of the areolas and filling of the skin envelope, achieving natural results.

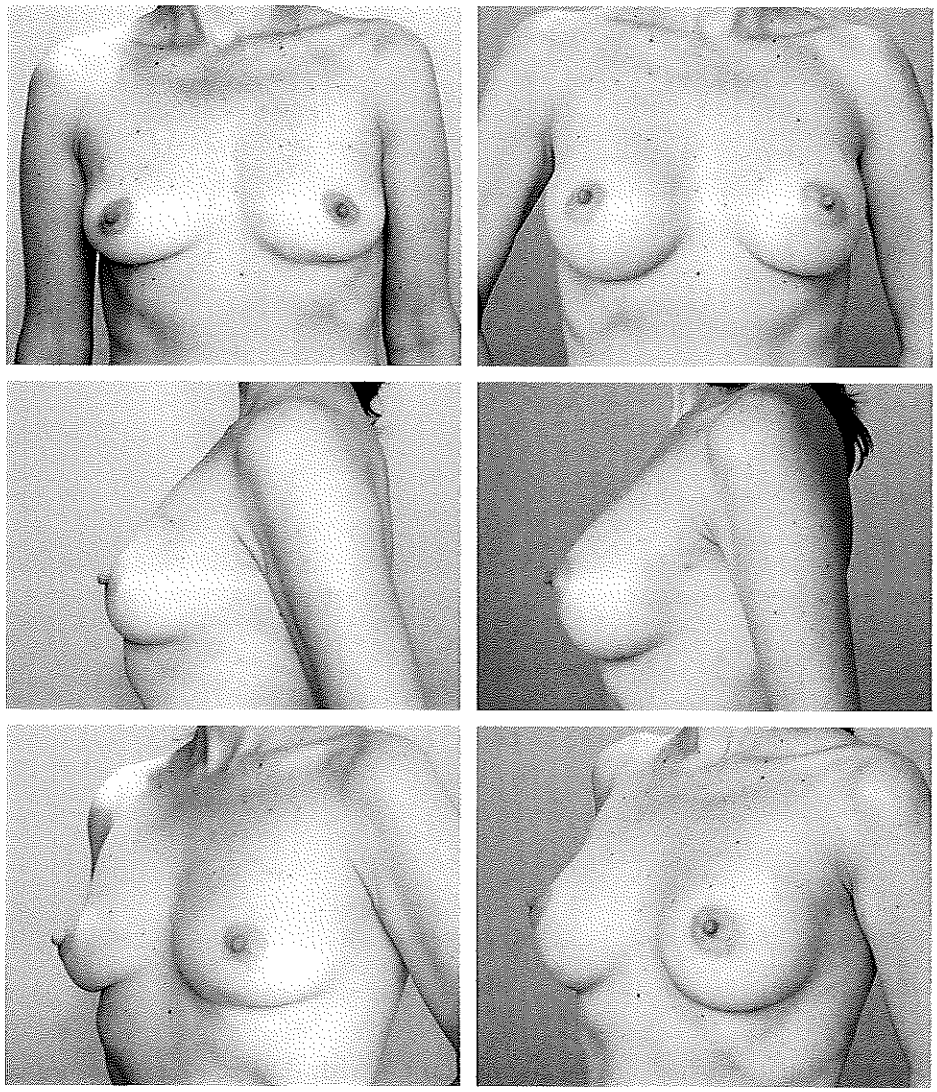

FIG. 6

This 31-year-old patient had breast augmentation with 270 cc anatomic implants in the subfascial plane using an inframammary approach. Her results are shown after 1 year. The subfascial approach allowed concealment of the implant's superomedial border bilaterally.

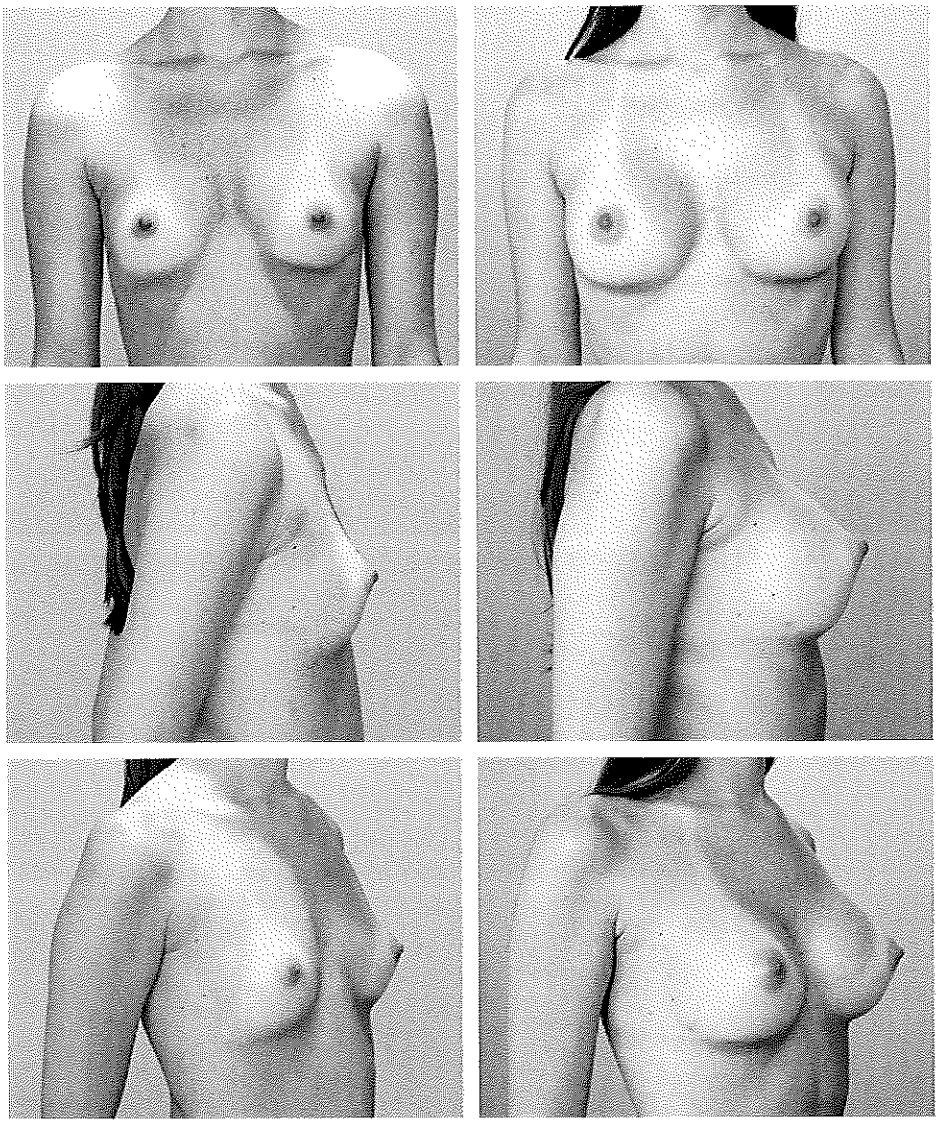

FIG. 7

This 29-year-old patient had breast augmentation with 320 cc anatomic implants in the subfascial plane using an inframammary approach. Results are shown after 1 year. With thin patients relatively larger implants can achieve excellent results using the subfascial approach.

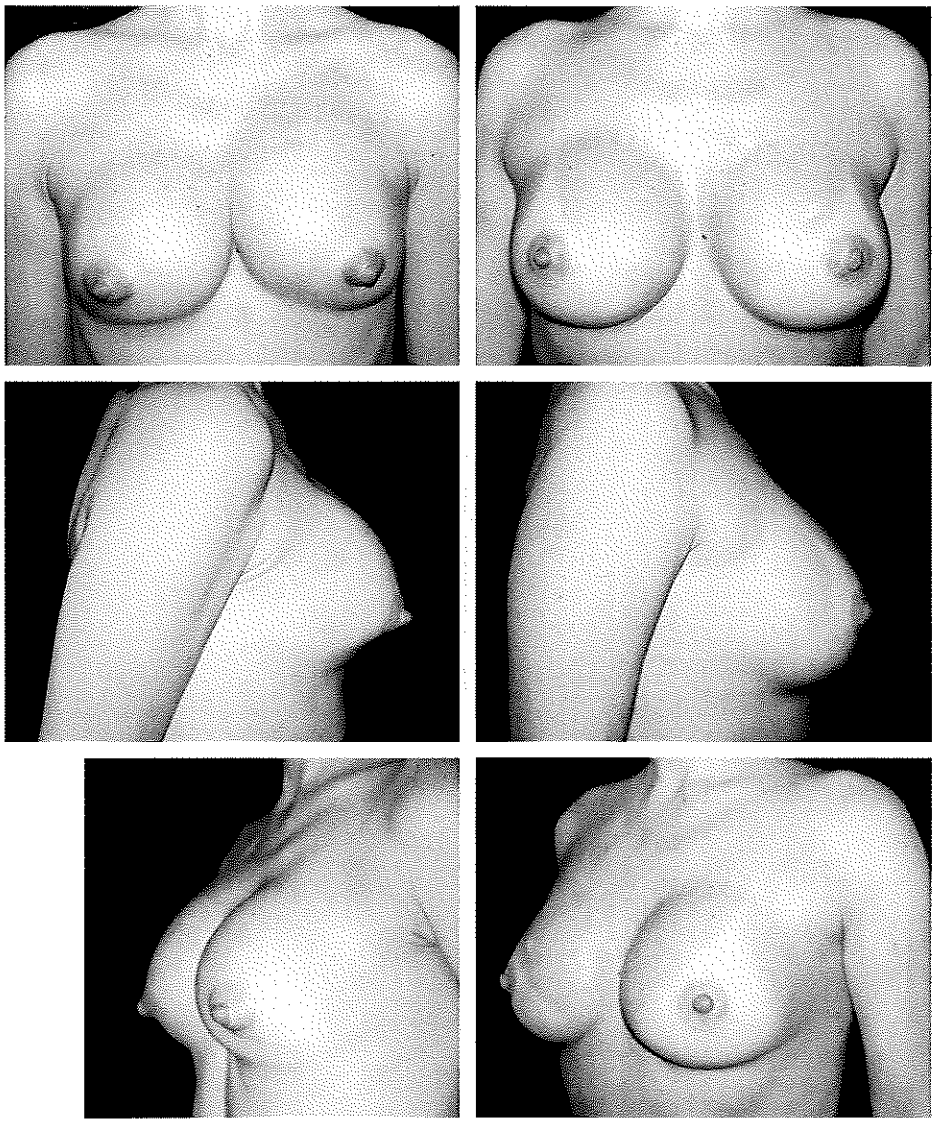

**FIG. 8**

This patient presented with significant capsular contracture. Her implants were removed and new 270 cc anatomic implants were placed in the subfascial plane. A segmental pectoralis major flap was used to protect the implant's upper pole. Results are shown after 6 months. Improved symmetry of the inframammary folds and areolas was obtained, as well as correction of the symmastia.

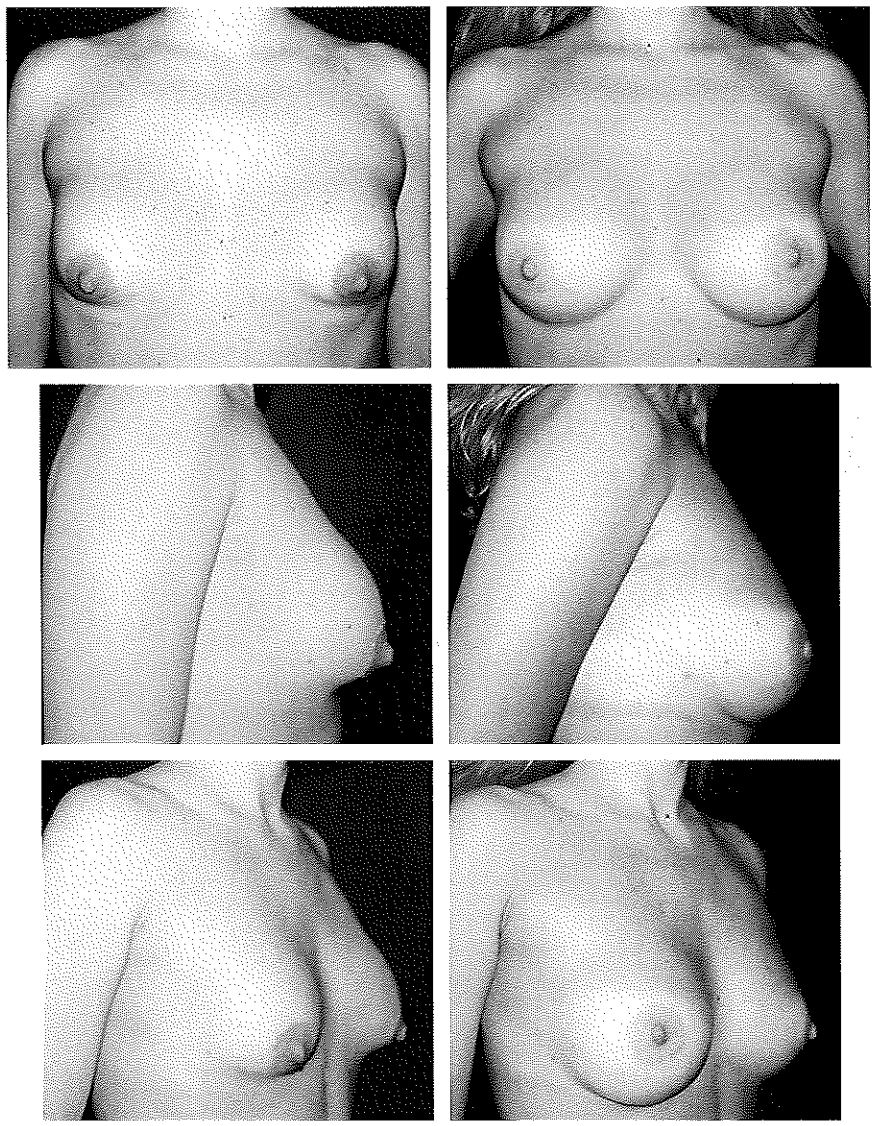

FIG. 9

This patient presented with displacement of submuscular breast implants. The original implants were removed and new 270 cc anatomic implants were placed in the subfascial plane. Results are shown after 6 months. The inframammary fold was lowered into the correct position, which corrected the Snoopy deformity by elevating the areolas.

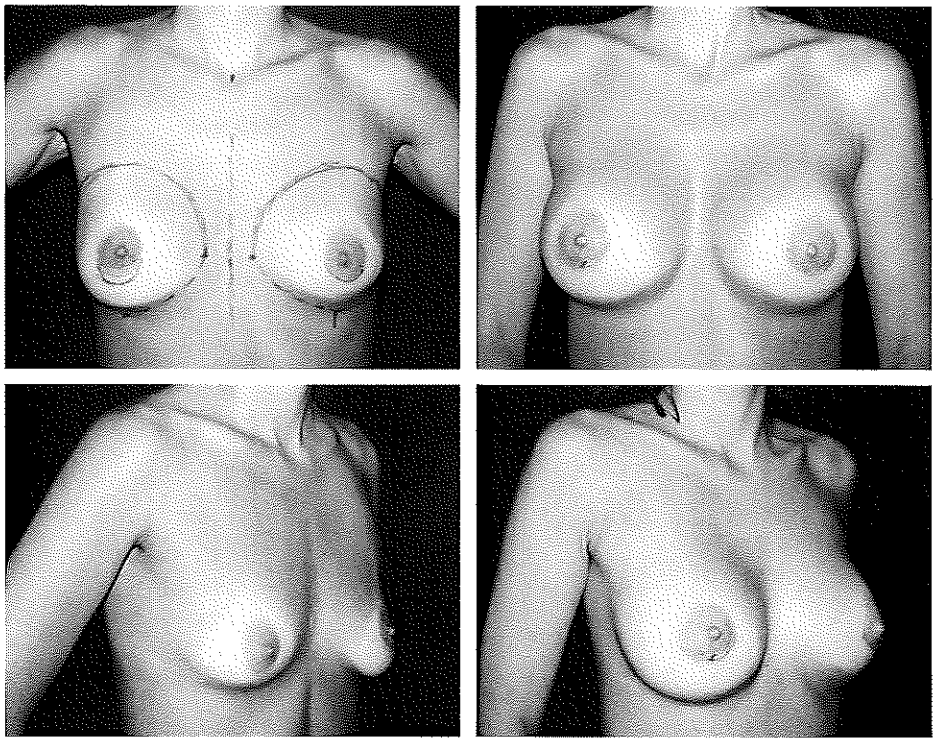

**FIG. 10**

This 36-year-old patient had breast augmentation with 270 cc anatomic implants in the subfascial plane using an inframammary approach. Results are shown after 1 year. Satisfactory augmentation was obtained by concealing the implants' borders in the superomedial regions of the breasts.

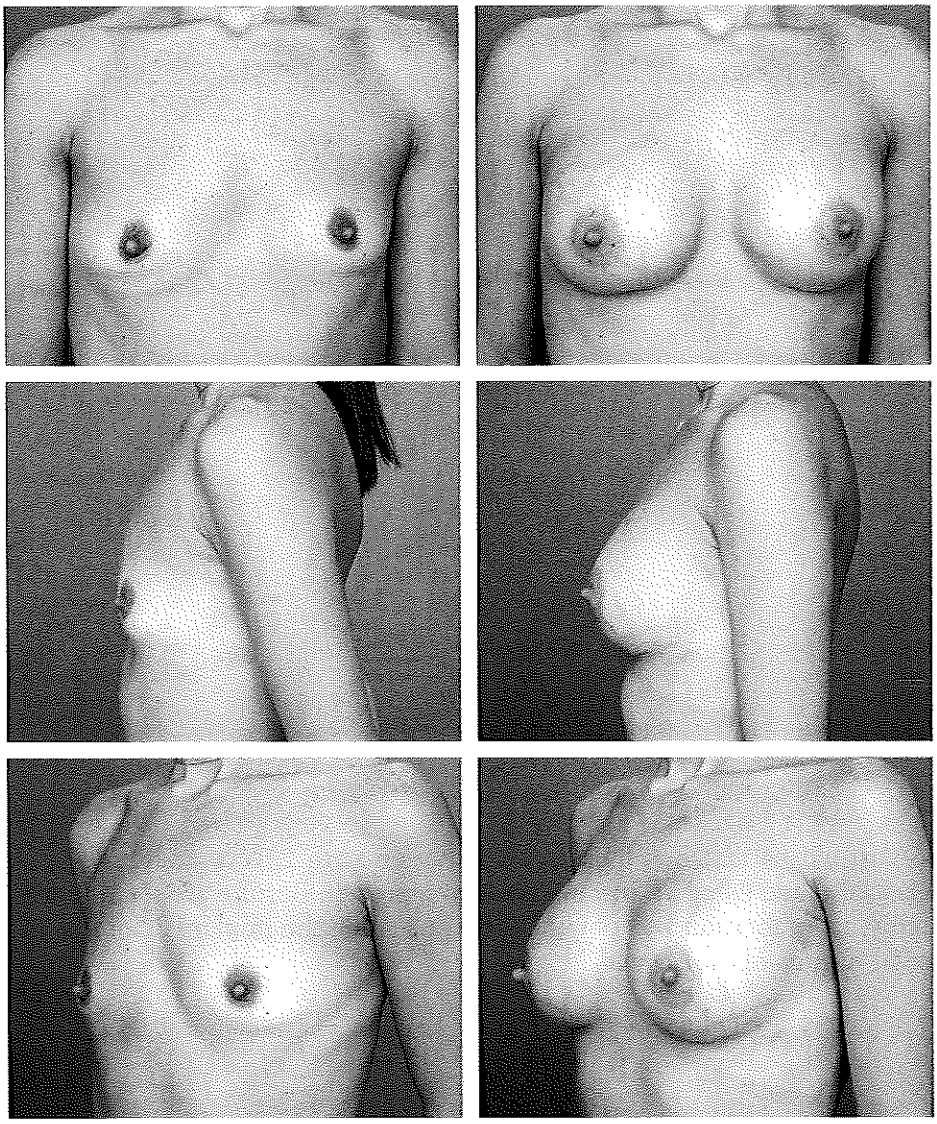

FIG. 11

This 42-year-old patient had breast augmentation with 280 cc anatomic implants in the subfascial plane using an inframammary approach. Results are shown after 1 year. The implants filled the redundant skin envelope with natural results.

## BREAST RECONSTRUCTION WITH COHESIVE GEL IMPLANTS

In breast reconstruction with cohesive gel implants the greatest challenge is to offer patients satisfactory long-term aesthetic results. These results depend greatly on the type, quality, and amount of tissue available to cover the implant. Unfortunately, long-term outcomes such as visible implant borders, capsular contracture, and unnatural shape are relatively common. This occurs because the amount of local tissue available to cover an implant is reduced by removing glandular tissue and the pectoralis major fascia during the mastectomy procedure. Additionally, local tissues have a remarkable tendency to thin out over time, decreasing the quality of coverage.

These problems have led us to recognize a need to harvest additional tissue to improve coverage. Most traditional techniques include using autologous flaps for coverage, but these flaps create additional (and often significant) donor site morbidity. Although results often look natural, the consistency of the new tissue is not always similar to breast tissue.

To address these problems, the senior author began using laparoscopically harvested omental flaps for breast reconstruction in 1995. In this technique, the omentum on the right gastroepiploic pedicle is mobilized laparoscopically through a 4 cm midline incision in the aponeurosis of the superior epigastric region. The aponeurosis is also opened laparoscopically, obviating the need for an external epigastric incision and further reducing donor site morbidity. The omental flap is tunneled subcutaneously toward the mastectomy site where it can be used to restore the breast's volume.

Since this technique was first used, it has been adapted and refined to help cover cohesive gel implants in most patients undergoing this type of reconstruction. The omental flap serves as a substitute for the removed breast parenchyma. It can be used exclusively or with synthetic mesh when a partial submuscular technique is used.

### Operative Procedures

#### *Exclusive Omental Flap Coverage*

The exclusive omental flap coverage technique is used most frequently in previously augmented patients who have developed breast cancer. These patients require autologous tissue to replace the breast parenchyma after it is excised through a periareolar mastectomy. During the ablative procedure, the implant's capsule should be left intact whenever possible (unless removal is indicated for oncologic reasons), because it helps support and maintain the implant in position. This is important because the omentum alone does not offer enough tissue to completely cover and support an anatomic cohesive gel implant.

Restoration of the breast's volume is accomplished by covering the original implant and capsule using the pedicled omentum and the native breast skin. This is performed by folding the omentum over itself until it resembles the breast cone and fixing it to the inframammary fold and underlying muscle with 3-0 Monocryl sutures. It is important to ensure that the entire implant is adequately and securely covered by the omentum, which has replaced the breast parenchyma (Figs. 12 and 13).

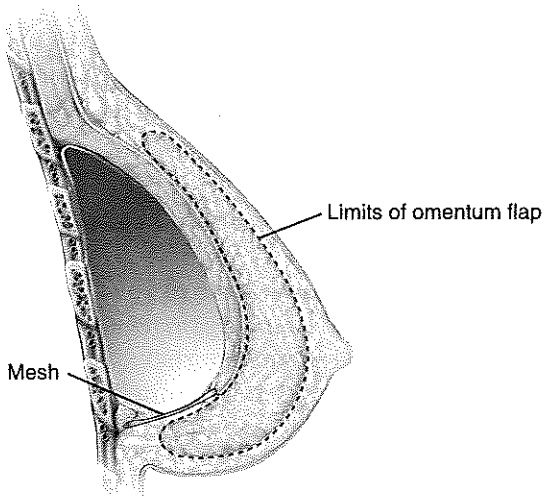


FIG. 12

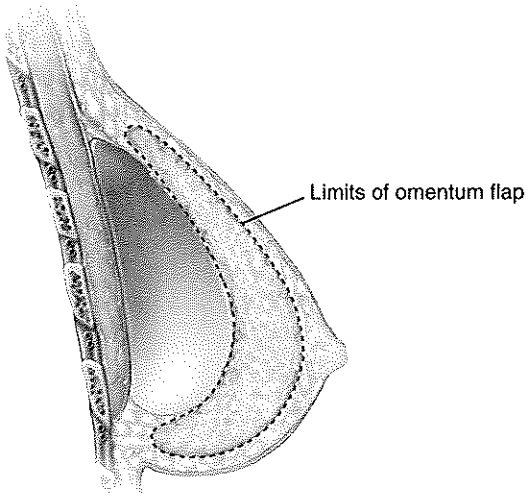


FIG. 13

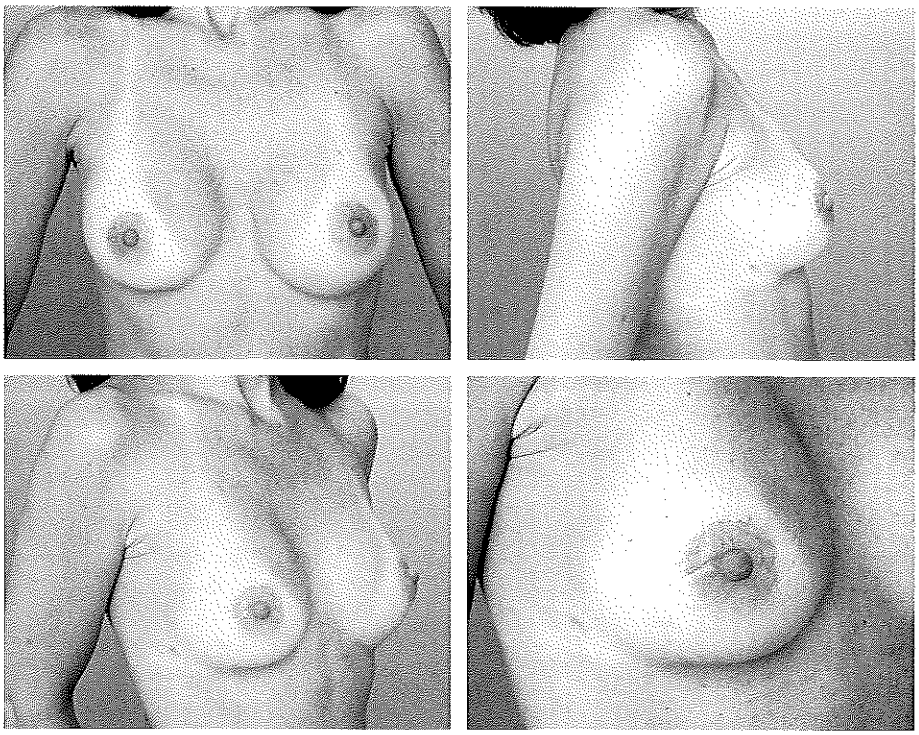

FIG. 14

This 34-year-old patient underwent an exclusive omental flap reconstruction technique on the right breast. She is shown postoperatively.

### *Partial Submuscular Technique With Synthetic Mesh and Omental Flap Coverage*

The partial submuscular technique using synthetic mesh and omental flap coverage may be used in patients whose primary breast reconstruction is to be performed using anatomic cohesive gel implants. It may also be used in patients who have small omental flaps or who require bilateral reconstruction, because the omentum alone may not offer sufficient tissue for adequate and secure coverage of the anatomic cohesive gel implants. This technique may also be used with previously augmented patients who require removal and replacement of implants and their capsules for oncologic reasons.

In this technique the upper two thirds of the implants should be placed in the submuscular plane. A customized piece of synthetic Vipro II mesh is sutured to the inferior border of the muscle and then to the inframammary fold using 4-0 nylon sutures so that the lower third of the implant is entirely covered and supported (see Fig. 13). Using mesh in the stabilizing system helps maintain the implant in position and avoids some of the problems commonly seen in patients who have undergone submuscular breast augmentation: retraction of the pectoralis muscle in the superior direction during contraction, lateral and superior displacement of the implants over time, and visible changes of breast shape during contraction of the muscle. The coverage system is completed using the omentum, which is divided so that approximately half of the flap covers each implant in bilateral reconstruction cases, and native breast skin, as described previously.

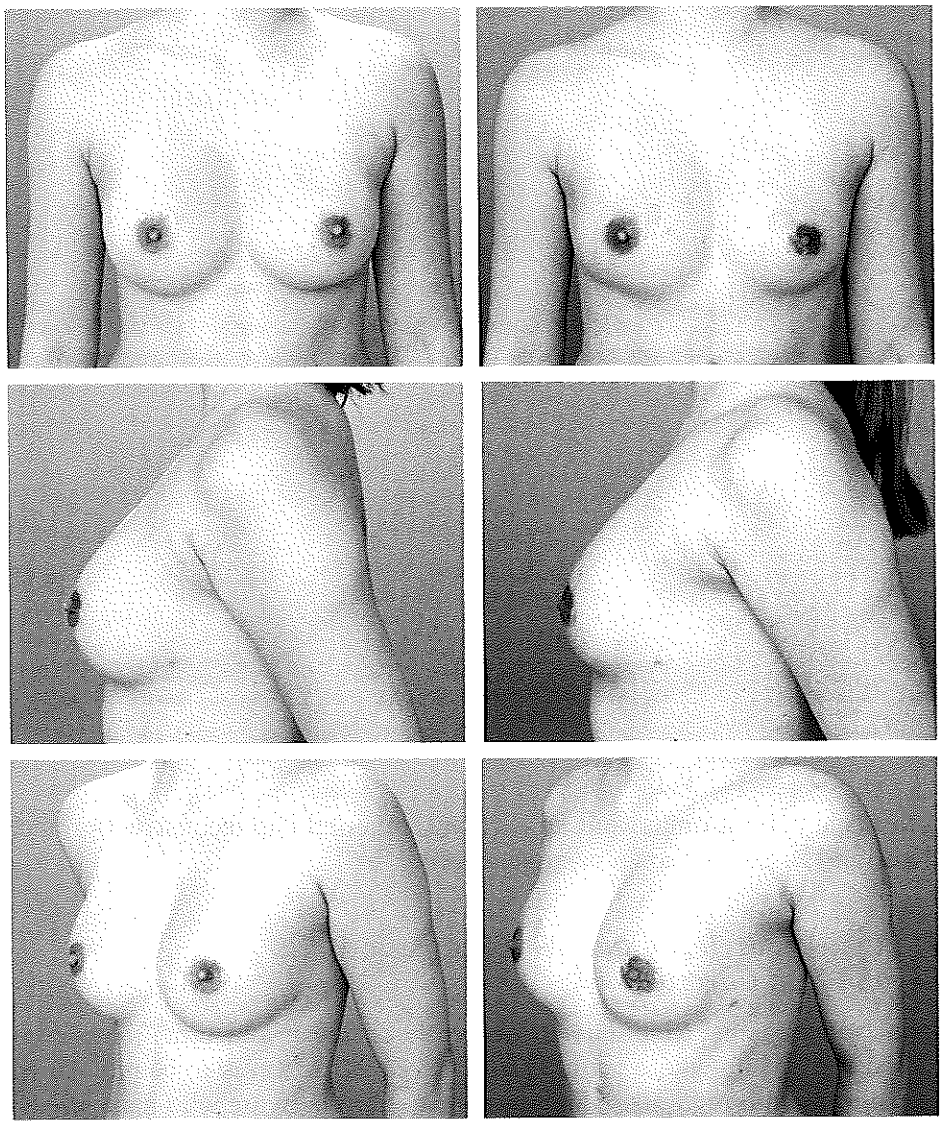

FIG. 15

Here may be seen preoperative and 1-year postoperative views of a 34-year-old patient who underwent bilateral breast reconstruction using the partial submuscular technique with synthetic mesh and omental flap coverage.

The technique for breast reconstruction using anatomic cohesive gel implants and the omental flap has significant advantages. First, the omentum is a pedicled flap with an abundant and safe blood supply. The pedicle's length (approximately 12 cm) ensures that the flap reaches the mastectomy site without tension. Second, the omentum provides efficient coverage for the implant and has a consistency similar to the breast parenchyma. These factors are responsible for extremely reliable and natural long-term outcomes. Third, donor site morbidity is significantly reduced by harvesting the flap

laparoscopically, which leaves the patient only with the scars related to the laparoscopy procedure. In the recipient site, only a periareolar scar remains in most patients because periareolar mastectomy (which preserves the native breast skin) is the preferred ablative approach. These factors ensure a less-aggressive operation with a shorter hospital stay and a more comfortable postoperative recovery. The few disadvantages include the learning curve, need for laparoscopic equipment, and the risks related to intraabdominal operations.

## SUGGESTED READINGS

Abbes MJL, Richelme H, Demard F. The greater omentum in repair of complications following surgery and radiotherapy for certain cancers. Int Surg 59:81, 1974.

Argenta LC. Reconstruction of the breast by tissue expansion. Clin Plast Surg 11:257, 1984.

Arnold PG, Hartrampf CR, Jurkiewicz MJ. One-stage reconstruction of the breast using the transposed greater omentum: Case report. Plast Reconstr Surg 57:520, 1976.

Barnett A. Transaxillary subpectoral augmentation in the ptotic breast: Augmentation by disruption of the extended pectoral fascia and parenchymal sweep. Plast Reconstr Surg 86:76, 1990.

Biggs TM, Yarish RS. Augmentation mammaplasty: Retropectoral versus retromammary implantation. Clin Plast Surg 15:549, 1988.

Bostwick J III, Nahai F, Wallace JG, et al. Sixty latissimus dorsi flaps. Plast Reconstr Surg 63:31, 1979.

Bostwick J, Vasconez LO, Jurkiewicz MJ. Breast reconstruction after a radical mastectomy. Plast Reconstr Surg 61:682, 1978.

Cort DF, Collis JL. Omental transposition in the treatment of radionecrosis. Br J Surg 60:580, 1973.

Dempsey WC, Latham WD. Subpectoral implants in augmentation mammaplasty: Preliminary report. Plast Reconstr Surg 42:515, 1968.

Dowden RV, Horton CE, Rosato FE, et al. Reconstruction of the breast after mastectomy for cancer. Surg Gynecol Obstet 149:109, 1979.

Dupont C, Menard Y. Transposition of the greater omentum for reconstruction of the chest wall. Plast Reconstr Surg 49:263, 1972.

Elliott LF, Beegle PH, Hartrampf CR. The lateral transverse thigh free flap: An alternative for autogenous-tissue breast reconstruction. Plast Reconstr Surg 85:169, 1990.

Elliott LF, Hartramph CR. Breast reconstruction: Progress in the past decade. World J Surg 14:763, 1990.

Erol OO, Spira M. Reconstructing the breast mound employing a secondary island omental skin flap. Plast Reconstr Surg 86:510, 1990.

Góes JCS. Breast reconstruction following mastectomy: Who, when and how. Breast Diseases 5:4, 1979.

Góes JCS. Periareolar mammaplasty: Double skin technique. Breast Dis 4:111, 1991.

Góes JCS, Landecker A. Optimizing outcomes in breast augmentation: Seven years of experience with the subfascial plane. Aesthetic Plast Surg 27:178, 2003.

Graf RM, Bernardes A, Auersvald A, et al. Subfascial endoscopic transaxillary augmentation mammaplasty. Aesthetic Plast Surg 24:216, 2000.

Gray H. Gray's Anatomy, 37th ed. London: Churchill Livingstone, 1989.

Hidalgo DA. Breast Augmentation: Choosing the optimal incision, implant, and pocket plane. Plast Reconstr Surg 105:2202, 2000.

Mahler D, Ben-Yakar J, Hauben DJ. The retropectoral route for breast augmentation. Aesthetic Plast Surg 6:237, 1982.

Papillon J. Pros and cons of subpectoral implantation. Clin Plast Surg 3:321, 1976.

Puckett CL, Croll GH, Reichel CA, et al. A critical look at capsular contracture in subglandular versus subpectoral mammary augmentation. Aesthetic Plast Surg 11:23, 1987.

Regnault P. Partially submuscular breast augmentation. Plast Reconstr Surg 59:72, 1977.

Tebbetts JB. Dual plane breast augmentation: Optimizing implant-soft-tissue relationships in a wide range of breast types. Plast Reconstr Surg 107:1255, 2001.

Tebbetts JB. Transaxillary subpectoral augmentation mammaplasty: Long-term follow-up and refinements. Plast Reconstr Surg 74:636, 1984.

## *Editorial Commentary*

Dr. Góes and his colleagues feel that placing an implant in the subfascial plane, having dissected a pocket above the pectoralis, optimizes the dynamics between the implant and the soft tissues. They feel that the morbidity and the postoperative recovery period are decreased, and that there is a very strong support system between the muscle and overlying fascia. One of the points they emphasize is that a more subtle superior pole can result. They also feel that the borders of the implant are rather more concealed.

It is interesting that here is a group that has come from preferring the submuscular position to preferring a supermuscle subfascial position. This is where the cohesive gel implant of the right shape can give a very acceptable result, as opposed to previous saline-filled or silicone-filled implants. Being able to place an implant in a more superficial position and end up with excellent results, as these authors show, illustrates the dependability of shape and position of these implants when used as directed.

There are times, as we would all agree, that the cover for our implant varies according to the patient's breast and what we want to achieve. The information provided by this group of authors helps greatly in terms of this decision-making. It is reassuring to know that the implants may be covered with omentum or synthetic mesh, or in this case Vicryl mesh. I believe in the latter situation we might well want to consider the use of Alloderm (LifeCell Corp, Branchburg, NJ). The authors have used a periareolar approach when indicated, but they point out, as we know, that this cannot always be used. The situation when they have attempted to use an axillary approach is similar.

In this article, using cohesive gel implants in reconstruction for postmastectomy patients is considered. I have no doubt that this technique is successful.

**Ian T. Jackson, MD**

Dr. Góes and colleagues discuss the relationship between implant position and outcome, making a convincing argument that subfascial augmentation has benefits despite having a slower dissection with more potential bleeding. The overall benefits include better support for the upper pole as well as better overall shape and breast dynamics during patient movement. I use the subfascial approach regularly for primary augmentations in selected patients. It is my experience that the main advantage of the subfascial approach is that the edge of the device in the upper pole is well hidden. This is because the fascia is tightly held to the pectoralis muscle by vertical fibers that intermingle with the muscle fibers. These fibers contain many small blood vessels, making this dissection quite tedious and prone to more bleeding than the relatively quick and avascular subpectoral dissection. However, the surgeon is rewarded because the nonextensile fascial layer applies some mild compression at the edge of the upper pole and prevents soft tissue retraction. This provides control for the edge of the device so that the skin does not curve under the edge of the implant, thus preventing the "Baywatch breast." The subfascial approach should not be used if there is insufficient tissue coverage for submammary augmentation. If sufficient tissue is not present, then a submuscular approach is mandatory, because a subfascial approach will not prevent deformities. A range of tissue thickness is usually suggested, because part of the decision for using submuscular versus submammary placement involves measurements that are accurate only to within several millimeters. There is also a difference in the quality of tissues—whether thin

and stretched with striae distensae or thick and never having been stretched—so that there is always room for sound clinical judgement. Also a word of caution that these techniques were developed with appropriately sized devices matched to patient measurements. If oversized devices are used, it is likely that the deformities will occur. Dr. Góes' group describes pectoralis flaps that may be useful to a surgeon dealing with thin atrophic tissues, such as with the unfortunate sequelae from overprojecting implants. These flaps are also useful for aesthetic surgery patients who have complications requiring soft tissue coverage either at the implant border or inferiorly, when a vascularized muscle flap can bring tissue where it is needed to achieve a good result. These authors also describe their experience using omentum to replace breast parenchyma removed to treat malignancy. Finally, they discuss the use of alloplastic mesh material for support, which may be used in combination with the other techniques. I have no personal experience with these methods.

**Claudio De Lorenzi,** BA, MD