Supplemental Article

# Acellular Dermal Matrix Inlays to Correct Significant Implant Malposition in Patients With Compromised Local Tissues

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## Abstract

Breast implant malposition is an increasingly recognized complication of breast augmentation and implant-based breast reconstruction. Etiologic factors include technical imprecision during surgery with overdissection or inadequate dissection of the pocket, inappropriately large implant selection, and the compromise of the local breast tissues, which produces an inability of a patient's natural tissues to support an implant in the placed position. In this article, the author describes a series of 19 patients with significant breast implant malposition following staged implant breast reconstruction in the setting of locally compromised tissues. Given the results, the author believes that an effective technique in the correction of severe implant malposition is reconfiguration and reconstruction of the periprosthetic capsular space, with a combination of focal "mirror image" capsule excision and permanent suture repair to restore breast folds, along with an acellular dermal matrix inlay technique designed to confer structural support to this repair. This strategy merits consideration in patients who have significant implant malposition in the face of severely compromised local breast tissues.

## Keywords

breast implant malposition, implant stretch, implant pocket dissection errors, breast reconstruction, thin tissues

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Acellular dermal matrix (ADM) insertion had its initial impact in breast surgery procedures in the first stage of subpectoral implant-based reconstruction of the breast, where it was employed as an interposition substrate between the released origin of the pectoralis major muscle and the inframammary fold.[1] The advantages of ADM in these cases included immediate enlargement of the subpectoral space (allowing more volume instillation into the tissue expander at the initial stage), a decrease in the total number of expansions, and improved support of the lower pole of the breast with definition of the inframammary fold (IMF).[1,2] The technique has become widely accepted: Outcome analysis studies of this procedure have been published by Spear,[1] Langstein,[2] Chun,[3] and Nahabedian,[4] and these results have been highlighted by other authors as well.[5,6]

Since the initial reports, the role of ADM in implant breast surgery cases has evolved to a much broader application in both secondary implant reconstruction and revision of aesthetic breast augmentation surgery.[7] This report focuses on ADM for the correction of implant malposition in breast reconstruction patients. Breast implant malposition is an increasingly recognized complication following implant-based breast reconstruction and breast augmentation.[8,9] The etiology is multifactorial, but a frequent common denominator is the inability of the local breast and chest wall tissues to support an implant in its desired location.

Implant malposition may present with the implant exhibiting an excessive inferior, lateral, superior, or medial malposition, and some patients may exhibit several or all of these components. In my 15-year experience, inferior implant malposition and lateral implant malposition have been the most common. During the first 10 years of this period, smooth-surface saline implants were the predominant devices in the United States. The combination of the thin capsules generated by these devices (permitting tissue stretching), the anatomy of the chest wall, and the effects of gravity often led to inferior and lateral implant malposition. Superior implant malposition is more commonly seen with

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silicone gel breast implants, often as the result of inadequate inferior tissue release or capsular contracture. Medial malposition seems to be relatively infrequent and is related to technical imprecision at the time of implant placement.

Factors contributing to the pathogenesis of implant malposition include imprecise or excessive pocket dissection with either inadequate or excessive development of the periprosthetic capsular space (PPCS), which most often includes overrelease of anatomic structures such as the IMF and lateral breast folds and/or pectoralis major muscle tissues. Contributing factors can include the placement of excessively large implants (especially if they are smooth-surface with a volume of more than 450 cc) and compromised local tissues in the breast or anterior chest wall region. Compromise of local tissue quality in the form of attenuation or thinning of the tissues includes the skin, subcutaneous tissue, pectoralis major muscle, and capsular tissues. This can result from the tissue expansion process, surgical dissection (especially in the setting of repeated procedures), the breast implant (particularly large, smooth-surface devices), and local tissue factors intrinsic to particular patient's genetic makeup, including simply having thin tissues. The latter is a clinical diagnosis with no definite objective measurement system, but its appearance is well known to experienced clinicians.

It is likely that such local tissue changes alter and permanently impair the ability of capsule modification techniques alone to achieve long-term correction of implant malposition. Because of the tendency for recurrence after suture repair alone (capsulorrhaphy)[10,11] as well as when more intricate capsule flaps are employed to correct malposition,[12] I developed an approach of combining two modalities. The first part of the technique is a focal, precisely planned "mirror image" capsular excision of the anterior and posterior capsule and deeper tissues, with permanent suture repair to reconstruct and reset abnormal breast folds (inferior, lateral, medial, or combinations), thus restoring appropriate dimension and position of the PPCS.[13] The second maneuver is an inlay of ADM (AlloDerm or Strattice; LifeCell Corporation, Branchburg, New Jersey) to provide immediate additional sling and structural tissue support to the capsule repair. This report describes my experience to date in addressing implant malposition following implant-based breast reconstruction. Case studies of three patients treated at different junctures in their breast reconstruction process illustrate the utility of this combined approach.

## PERSONAL EXPERIENCE

### Patients

Over the course of 52 months from 2005 to 2010, I treated 19 patients with significant implant malposition following staged breast reconstruction with preliminary tissue expansion. The malpositions were unilateral in seven patients and bilateral in 12. The majority (n = 18) had undergone placement of smooth-surface implants. There was a preponderance of silicone gel implants (n = 14). There were 13 patients with combined inferior and lateral malpositions, two inferior only, two lateral only, and two with severe multidirectional malpositions (inferior, lateral, superior, and medial). Two reconstruction patients exhibited lateral malposition of a tissue expander at the completion of the tissue expansion stage of their breast reconstruction, but the remainder were treated at various intervals following implant placement.

Three patients in this series had undergone massive weight loss following bariatric surgery, three had a history of significant weight fluctuation, three were obese (body mass index > 30), seven had an extremely thin body habitus, and three had undergone previous radiation therapy with subsequent tissue expansion and implant placement. It is of note that 14 patients had one previous unsuccessful attempt at implant malposition correction and that three patients had undergone two or more previous surgical attempts to correct the problem with conventional capsule-altering techniques.

All patients were treated with a combination of periprosthetic capsule repositioning and reconstruction with preoperatively planned, precise, focal, mirror-image capsulectomies and permanent suture repair of the periprosthetic capsule tissues plus an immediate inlay of ADM into the repaired capsule space, as outlined in the technique section that follows.

### Case Studies

*Case 1: Multidirectional malposition*. The patient shown in Figure 1, who was actually the first patient treated in this series, illustrates an extreme form of multidirectional implant malposition in the setting of severe local tissue compromise due to massive weight loss, multiple breast surgical procedures, and the effect of 800-cc implants on her breast tissues. This 46-year-old woman presented with inferior, lateral, medial, and superior breast implant malposition following bilateral breast reconstruction with smooth-surface silicone gel breast implants. Her medical history was significant in that she had undergone a bilateral breast reduction in her 20s. Over the ensuing years, she gained significant weight; at age 38, she had a body mass index of 42. At that time, her height was five feet six inches (1.68 m), and her weight was 360 pounds. She subsequently underwent a gastric bypass and lost 160 pounds, resulting in significant redundancy of skin and subcutaneous tissue on her entire body surface. To address this, she underwent multiple body contouring procedures, including an extended abdominoplasty, excision of excess tissue from the bilateral back region, vertical thighplasty, and brachioplasty. Unfortunately, she developed breast cancer at age 44 and underwent a bilateral mastectomy with staged bilateral implant breast reconstruction, including the placement of tissue expanders at the time of her mastectomy. She then exchanged her tissue expanders for 800-cc silicone gel implants, after which she developed a marked implant malposition, as described earlier. Surgical

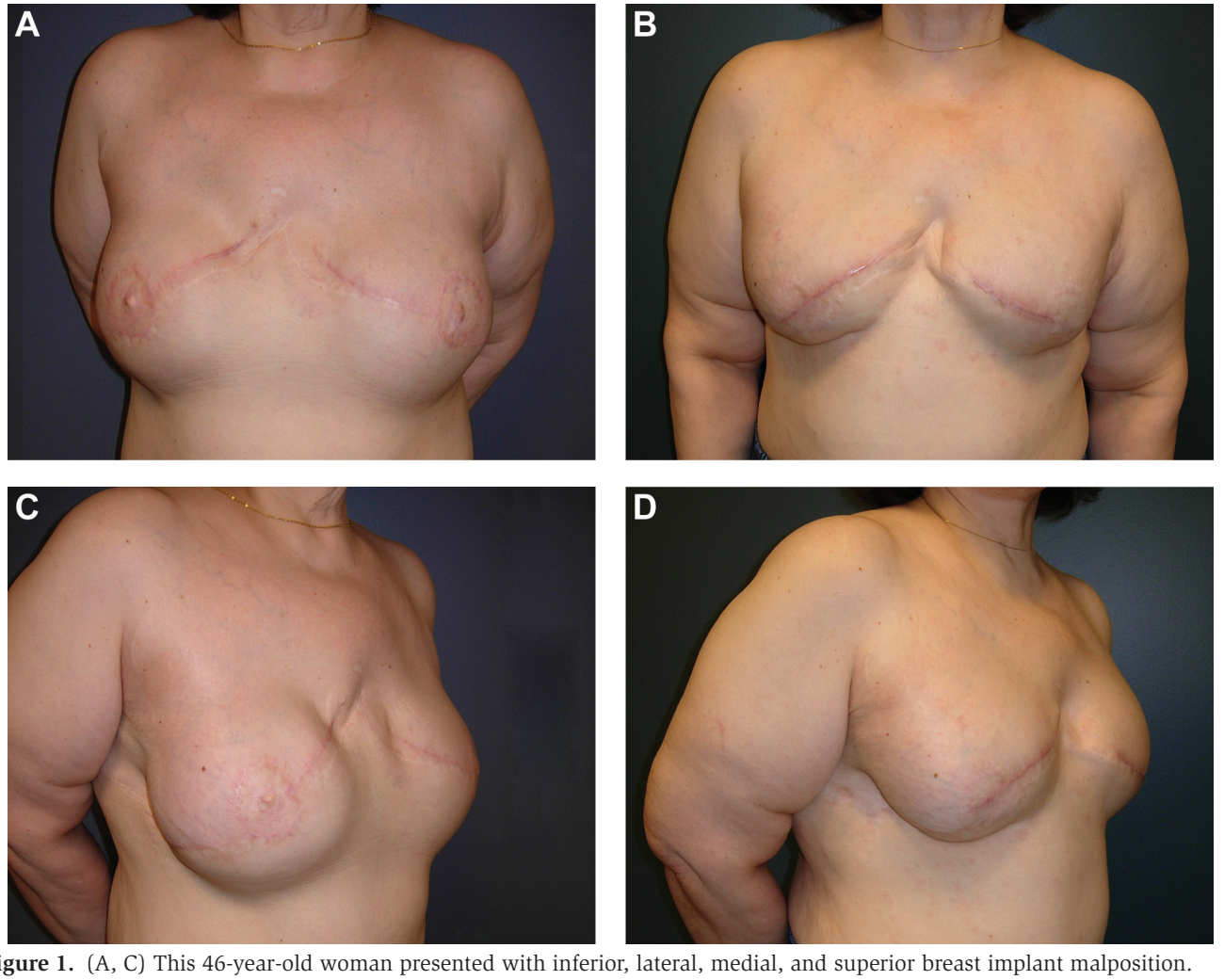


**Figure 1.** (A, C) This 46-year-old woman presented with inferior, lateral, medial, and superior breast implant malposition. She had undergone bilateral breast reduction about 20 years before, along with gastric bypass surgery approximately eight years before presentation. Massive weight loss of 160 lb (72.57 kg) was followed by extended abdominoplasty, excision of excess tissue from the bilateral back region, vertical thighplasty, and brachioplasty to address skin redundancy. Two years before presentation, she underwent a bilateral mastectomy with staged bilateral implant breast reconstruction, including the placement of tissue expanders at the time of her mastectomy. Her expanders were eventually exchanged. Previous surgical correction of the malposition was unsuccessfully attempted with a suture capsulorrhaphy revision procedure. (B, D) Fourteen months postoperatively, the patient demonstrates elevated and defined inframammary and lateral breast folds and an improved overall appearance of the breast. The patient was been downsized to 565-cc silicone gel breast implants.

correction was unsuccessfully attempted with a suture capsulorrhaphy revision procedure.

During consultation, the diagnosis of significant multidirectional implant malposition was readily apparent. She had a significant qualitative tissue deficiency in her breast region with loss of elasticity, thinning of the skin and subcutaneous tissue, and multiple scars related to her mastectomy and previous breast reduction. There was marked lateral malposition of the implants such that the entire medial aspect of the reconstructed breast in the parasternal region was "empty" with the patient in the supine position (Figure 2A). On examining the patient, the implants could be moved superiorly to the level of the clavicle and medially such that the medial margins of the implants were essentially touching in the midline (Figure 2B), producing synmastia. This was apparent when the patient wore a bra.

Preoperative planning for this type of patient involves locating the level of fold correction with the patient in the standing position. In these cases, the malpositioned implant can most often be displaced in a superior and medial direction from external digital pressure on the skin with the surgeon's finger tip (Figure 2C), which allows precise marking of the capsular reconstruction necessary for restoration of the inferior, lateral, and (where necessary) medial breast fold with dots on the patient's skin (Figure 2D). After the implant

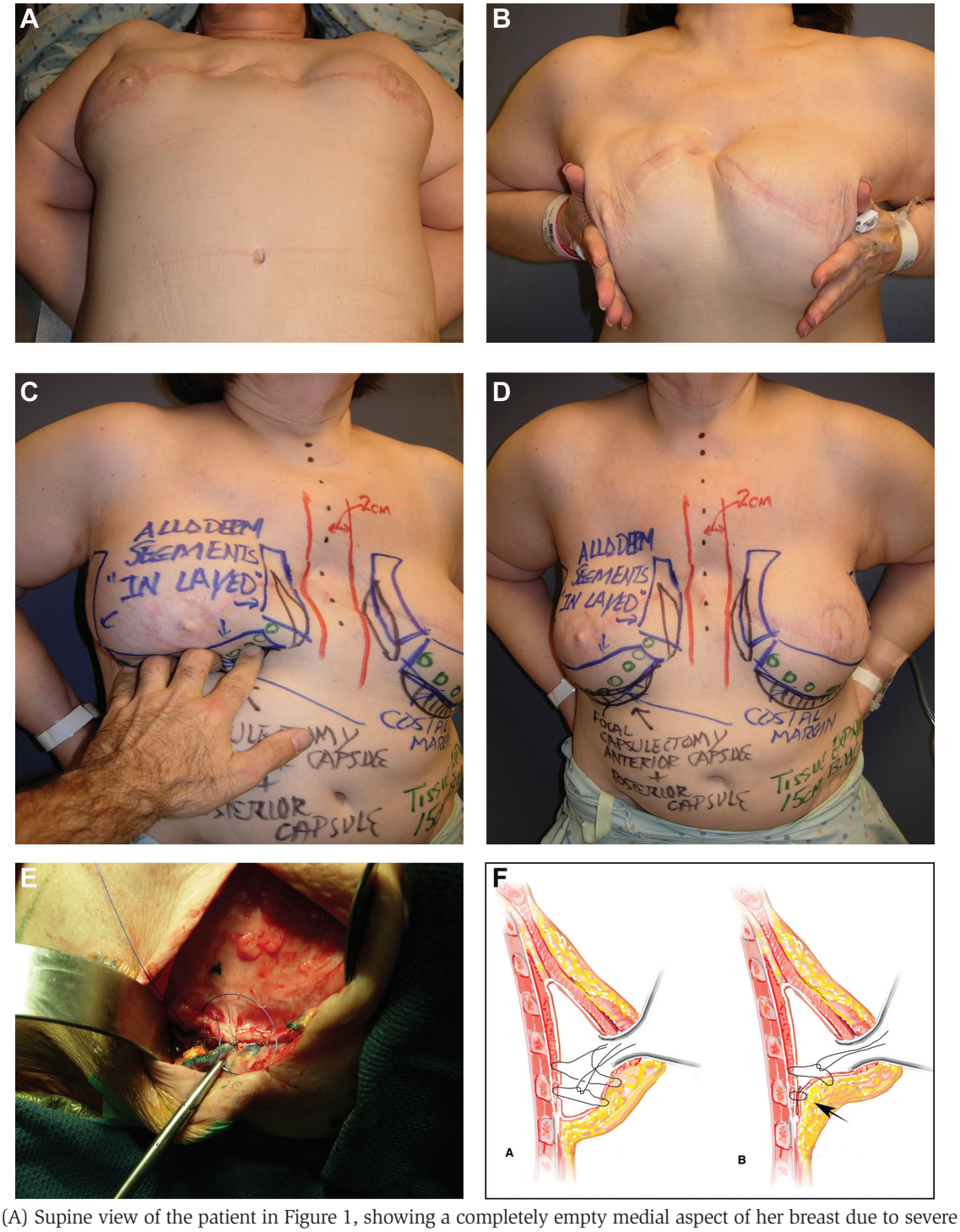


**Figure 2.** (A) Supine view of the patient in Figure 1, showing a completely empty medial aspect of her breast due to severe lateral implant malposition. (B) The patient also demonstrates severe medial malposition, or synmastia. (C) The correction is planned with manual simulation of the new inframammary and lateral breast folds by moving the implant into the desired position and marking the precise site of correction on the skin. (D) Markings for suture placement are inscribed on the skin, and the outline of the ADM inlay is marked. (E) Repair of capsulectomies is achieved with 2-0 Prolene sutures (Ethicon, Inc.). The sutures are shown with purchase on the capsule and deeper tissue (capsule tissue alone is inadequate). Excessive dimpling of the skin flap can be avoided with anterior suture placement. (F) Diagram depicting the mirror-image capsulectomies performed on the anterior and posterior capsule. In this patient, two ellipses were resected. Closure yielded four suture lines in series, which allowed intrinsic collagen deposition. (G) The ADM is folded on its long axis and is inlaid into the fold created by the suture placement. The superficial surface of the capsule is decorticated with the coagulation current from electrocautery. The ADM is placed with the deep side against this decorticated capsule. (H) The ADM is sutured to the anterior capsule, the posterior capsule, and directly into the new fold.

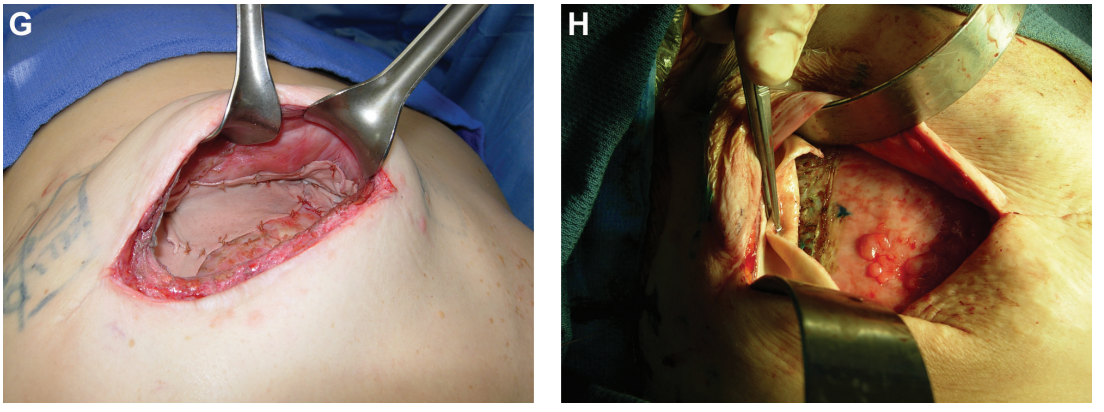


**Figure 2. (continued)** (A) Supine view of the patient in Figure 1, showing a completely empty medial aspect of her breast due to severe lateral implant malposition. (B) The patient also demonstrates severe medial malposition, or synmastia. (C) The correction is planned with manual simulation of the new inframammary and lateral breast folds by moving the implant into the desired position and marking the precise site of correction on the skin. (D) Markings for suture placement are inscribed on the skin, and the outline of the ADM inlay is marked. (E) Repair of capsulectomies is achieved with 2-0 Prolene sutures (Ethicon, Inc.). The sutures are shown with purchase on the capsule and deeper tissue (capsule tissue alone is inadequate). Excessive dimpling of the skin flap can be avoided with anterior suture placement. (F) Diagram depicting the mirror-image capsulectomies performed on the anterior and posterior capsule. In this patient, two ellipses were resected. Closure yielded four suture lines in series, which allowed intrinsic collagen deposition. (G) The ADM is folded on its long axis and is inlaid into the fold created by the suture placement. The superficial surface of the capsule is decorticated with the coagulation current from electrocautery. The ADM is placed with the deep side against this decorticated capsule. (H) The ADM is sutured to the anterior capsule, the posterior capsule, and directly into the new fold.

is removed—most often through a previous incision—the skin marks act as guidelines for focal excision of the capsule in the areas outlined by the dots on the external skin flap side and the deeper chest wall side in a mirror-image fashion. A repair is performed with 2-0 Prolene sutures (Ethicon, Inc., Somerville, New Jersey) on a tapered needle to reestablish the necessary folds of the breast and close off the excess capsular space. The incised capsule edges are reapproximated with permanent monofilament sutures, taking care to engage not only the capsule tissue but the deeper tissues of the anterior breast skin flap and chest wall tissue deep to the posterior flap with the suture repair (Figure 2E). This maneuver allows the surgeon to reconfigure and reposition the PPCS, restoring more appropriate dimensions to the space and shifting it superiorly and medially.

To address the marked malposition in the patient described here, a focal capsule resection and repair was performed at two levels in series, inferiorly and laterally. A total of four suture lines in each area were placed in this patient because of extreme inferior and lateral recesses of the PPCS (Figure 2F). This restored the correct position of the inferior (neoinframammary) fold and lateral breast folds, as well as the appropriate dimension of the PPCS on the chest wall. To reinforce this repair, we elected to perform an inlay of AlloDerm. In this patient, we placed three separate pieces of thick AlloDerm cut from one 16- × 6-cm piece (Figure 2G). This AlloDerm was folded along its long axis (Figure 2H) with the fold in the new inferior, lateral, and medial recesses of the PPCS such that half the width of the AlloDerm was laid on the anterior, lateral, and medial capsule, with the other half of each segment placed against the chest wall. In this way, the AlloDerm would not only provide new tissue structure but also confer immediate "sling" support to the repair.

The surface of the periprosthetic capsule was superficially decorticated with an electrocautery device; then, the deep surface of the AlloDerm was placed against this fulgurated or decorticated capsule surface (Figure 2H). The AlloDerm was tacked into position with 3-0 Vicryl sutures (Ethicon, Inc.) at its periphery and into the exact recesses of the new folds, thus creating a "three sides of a box" configuration in the reconstructed capsule. (Note that in cases of inferior and lateral malposition, such as those described in Cases 2 and 3, this becomes a "two sides of a box" configuration.) Because of the extremely compromised tissue conditions and previously failed repair, was placed a 14-cm low-height tissue expander to reshape and remold a new PPCS in a gradual fashion with sequential fills of the tissue expander. A suction drain was placed inside the PPCS and maintained until it drained at less than 30 cc in a 24-hour period.

Interestingly, at eight weeks following surgery, the patient sustained a deflation of the right tissue expander. This required an unanticipated reexploration and replacement of the tissue expander. During this procedure, we were able to identify the AlloDerm, which showed good incorporation. The patient's periprosthetic capsular tissues were extremely stout and almost rigid. This was a surprising but welcome observation. However, the lateral tissue rigidity had caused the lateral aspect of the tissue expander to fold back on itself, making it vulnerable to deflation. The patient went on to complete successful tissue expansion and then undergo breast reconstruction with 575-cc silicone implants. Although not an outstanding aesthetic

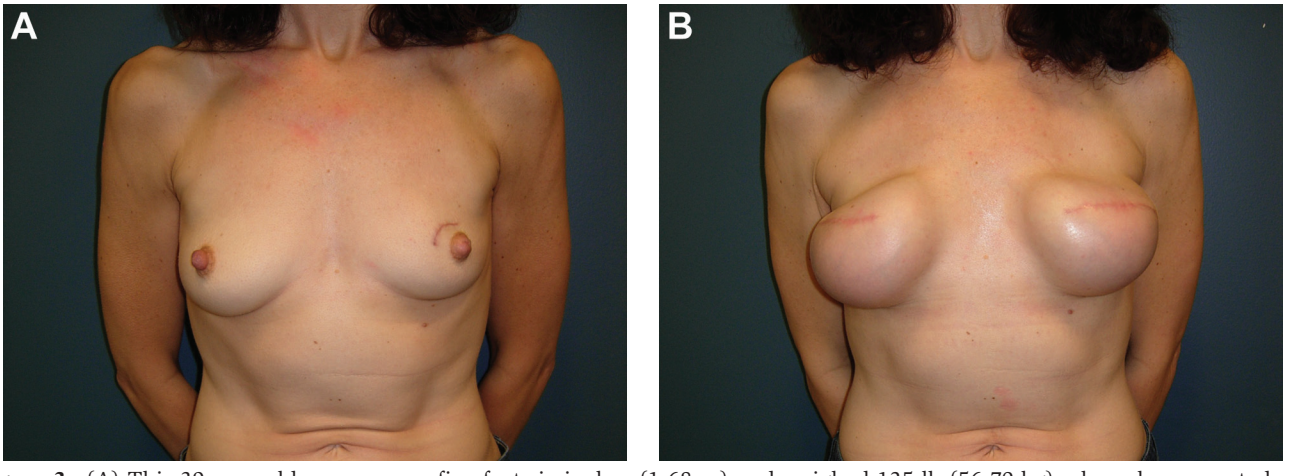


**Figure 3.** (A) This 39-year-old woman was five feet six inches (1.68 m) and weighed 125 lb (56.70 kg) when she presented. Before her mastectomy, she wore a 36B bra, and her breasts were widely displaced. (B) Following the first stage tissue expansion the patient exhibits significant lateral malposition or her right breast tissue expander.

outcome due to her multiple breast scars, there was no reoccurrence of her malposition in any direction at 52-month follow-up. Her results are shown alongside the preoperative photographs in Figure 1.

Of note, all patients are asked to wash with a Betadine sponge the night before and the morning of surgery. Each patient is given prophylactic (preoperative and perioperative) antibiotic coverage with a second-generation cephalosporin (either penicillin or clindamycin). Jackson-Pratt drains are placed in every case, inside the capsule, where all of surgery takes place. Patients are given detailed postoperative instructions for monitoring drain output. As with the patient described here, all drains remain in place until they yield less than 30 cc in a 24-hour period. Patients are maintained on antibiotic therapy until the drains are removed.

After performing the first eight repairs in this series with AlloDerm, the remainder of patients received Strattice because it is stiffer and has substantially lower elasticity. The technique of folding the matrix along its length and tacking it into the "neofold" maximally leverages the tensile strength of the ADM, and this immediately confers optimal strength to the repair. The Strattice is bathed in an antibiotic solution containing 1 g of cefazolin, 100 mg of gentamicin, and 100,000 U of bacitracin per liter of normal saline.

*Case 2: Inferior and lateral malposition*. A similar strategy for the technique described in Case 1 was used in Case 2 to correct significant inferior and lateral malposition of a right subpectoral tissue expander placed as the first stage of a bilateral implant-based breast reconstruction. This 39-year-old woman was five feet six inches (1.68 m) tall and weighed 125 lb (56.70 kg) when she presented. Before her mastectomy, she wore a 36B bra, and her breasts were widely displaced (Figure 3). She underwent the placement of bilateral low-height tissue expanders with full muscle coverage. It became apparent during the expansion process that her right-side tissue expander was 2.5 cm lower along the horizontal axis and more laterally positioned than the device in her opposite breast (Figure 4A). Her expansion was completed and the plan was to place 475-cc high-profile, smooth-surface silicone gel breast implants with a 12.7-cm base width (Figure 4B).

At the time of her expander exchange, she underwent the same procedure described in Case 1. The periprosthetic capsule space was repositioned in a superior and medial direction, with mirror-image excisions of the periprosthetic capsule tissue and suture repair with 2-0 Prolene. Next, a thick layer of Strattice ADM (Figure 4C) was placed as an inlay graft to provide additional sling support for the implant. (As mentioned previously, patients now receive Strattice instead of AlloDerm for cases of implant malposition, due to greater stiffness and reduced elasticity. A single piece of 16- × 8-cm Strattice can be cut to provide either two or three pieces of ADM to position in the breast folds.) This technique achieved an excellent correction of her implant malposition at the time of surgery (Figure 4D). She continued to exhibit excellent breast appearance (shape and symmetry) in the early postoperative results at three months. Her results are shown alongside the preoperative photographs in Figure 3.

*Case 3: Inferior and lateral malposition*. The final case study involved a 44-year-old woman who also experienced massive weight loss. She had lost 135 pounds over two years following laparoscopic band placement. Unfortunately, she developed breast cancer and subsequently had a bilateral mastectomy. Four years later, she underwent a delayed breast reconstruction with the placement of tissue expanders and subsequent placement of 800-cc smooth-surface silicone gel breast implants. She noted significant inferior and lateral malposition soon after surgery and underwent an unsuccessful attempt at correction with suture capsulorrhaphy. She then presented for correction.

On examination, the lower aspect of her implant was just above the costal margin bilaterally, and she demonstrated significant lateral malposition of her implants (Figure 5). She underwent a reconfiguration and reconstruction of her PPCS

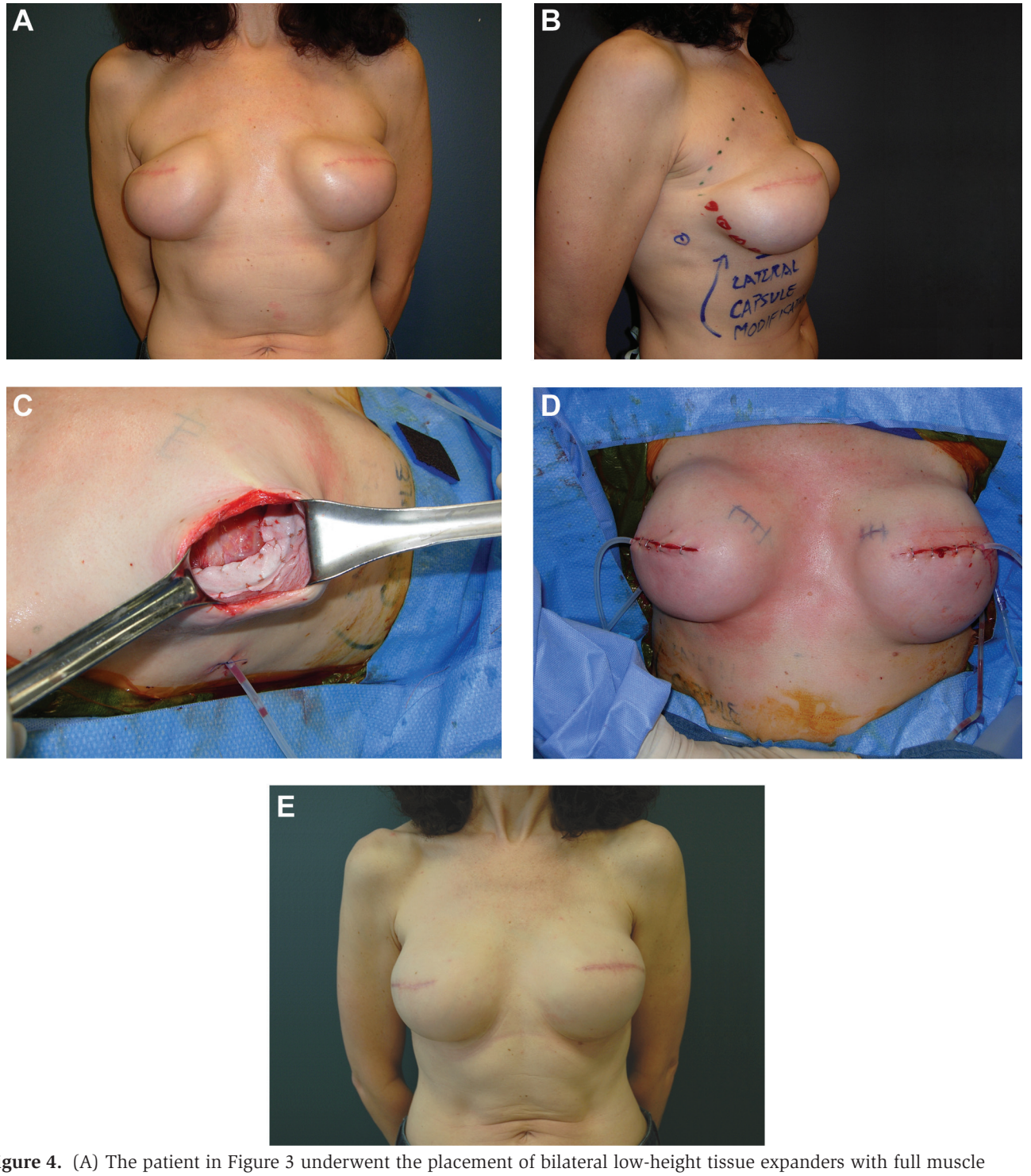


**Figure 4.** (A) The patient in Figure 3 underwent the placement of bilateral low-height tissue expanders with full muscle coverage after bilateral mastectomy. It became apparent during the expansion process that her right-side tissue expander was 2.5 cm lower along the horizontal axis and more laterally positioned than the device in her opposite breast. (B) The patient is shown preoperatively with markings for fold correction. With the tissue expanders in place, the asymmetry of the inframammary folds and the inferior/lateral malposition of the right tissue expander is evident. (C) Intraoperative appearance of ADM (Strattice) placed laterally and inferiorly to provide sling support for the reconfigured and repositioned periprosthetic capsular space. (D) Immediate intraoperative correction of the patients' breast appearance is shown at the time of implant exchange for the expanders. (E) Four months postoperatively, the patient demonstrated good symmetry of her inframammary and lateral breast folds and an excellent overall appearance of her breasts.

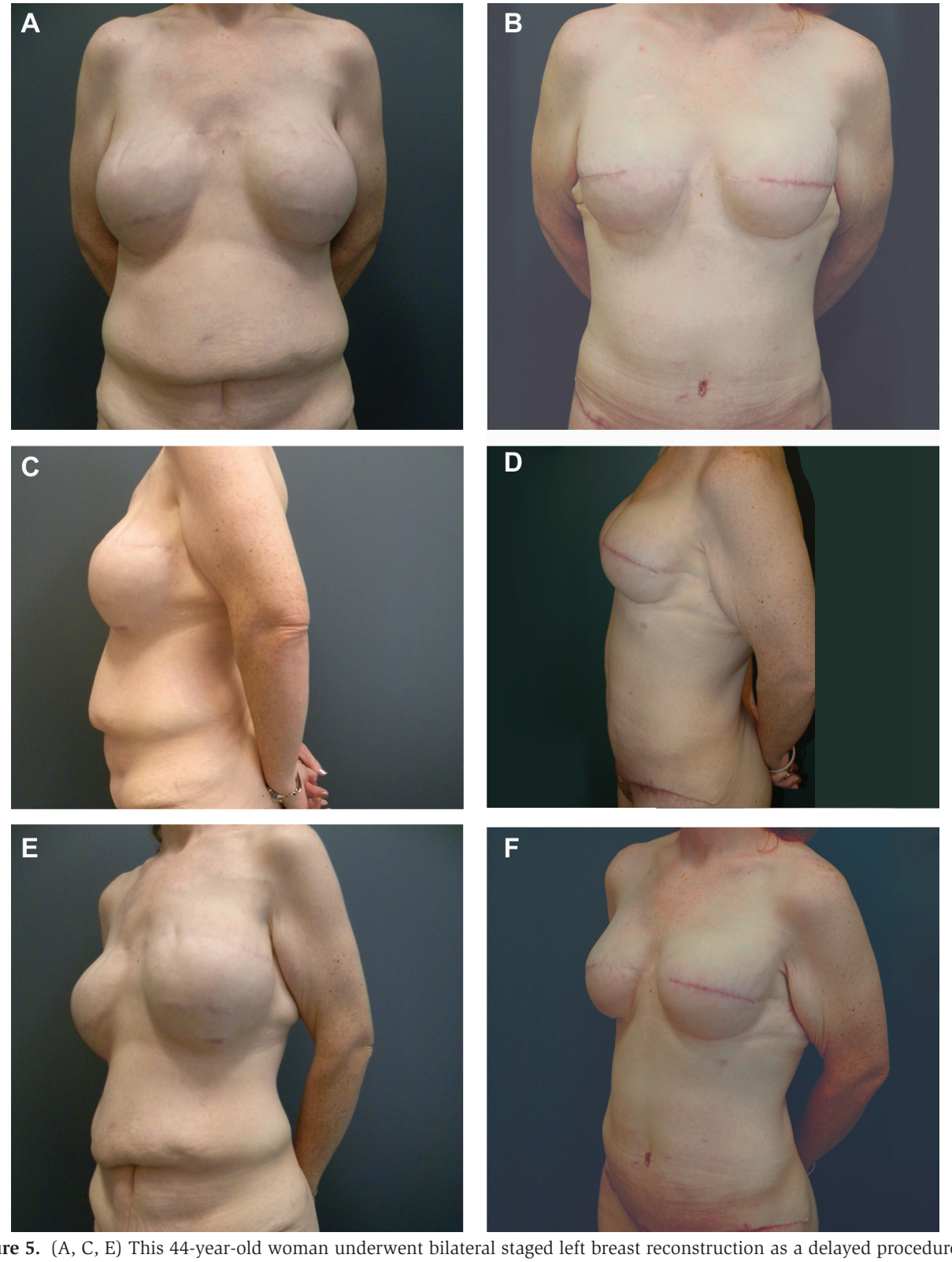


**Figure 5.** (A, C, E) This 44-year-old woman underwent bilateral staged left breast reconstruction as a delayed procedure with tissue expanders and 800-cc silicone gel breast implants. Four years before presentation, she had undergone a laparoscopic band procedure that produced a 135-lb (61.23-kg) weight loss. The patient had undergone one unsuccessful revision procedure (suture capsulorrhaphy) and presented for correction of significant inferior and lateral implant malposition. (B, D, F) Eight months after ADM-assisted correction inferior and lateral implant malposition, with "downsizing" of the patient's implants to high-profile 550-cc silicone gel devices.

with the technique described for the previous cases. Her implants were also downsized to 550 cc. She had a concomitant bodylift and medial thighplasty in a two-team approach. She demonstrated an excellent maintenance of the correction at eight months postoperatively (Figure 5).

## RESULTS

All repairs for the patients in this retrospective series were performed in a single stage, with the exception of the patient described in Case 1. The implants removed ranged in size from 450 to 800 cc, with a mean precorrection volume of 600 cc. The procedure described here decreases the volume of the PPCS; as such, the mean postprocedure implant volume was 520 cc (range, 450 to 650 cc). The mean follow-up in this series was 28 months (range, four to 52).

Postoperative complications were encountered in two patients. This included the tissue expander deflation described in Case 1, as well as a partial relapse of correction in a laterally malpositioned tissue expander in one patient seen four months after exchange of her tissue expander for a 600-cc silicone gel implant. She has not requested revision thus far. There was also one unplanned reoperation in a patient who had a repair of a bilateral inferior tissue expander malposition at the time of her second-stage reconstruction with different techniques. She underwent an ADM-assisted (Strattice) inlay repair with good correction on the right and a "neo-subpectoral flap repair"[14] on the left, which was judged to be satisfactory at surgery. Her reconstruction involved the placement of 425-cc high-profile silicone gel implants. At two months after surgery, the left inframammary fold was low, and the patient exhibited inadequate fullness in the upper poles of her reconstructed breasts. No additional correction was needed for the inferior PPCS on the right. The left-side inferior fold malposition was addressed with the ADM-assisted approach outlined previously, and her implants were converted to bilateral 550-cc high-profile silicone gel with a satisfactory outcome. In this series, there were no instances of infections, seroma formation, or wound healing problems.

## DISCUSSION

Implant malposition is an increasingly recognized complication of breast implant placement for breast augmentation and breast reconstruction.[8-13] The pathogenesis is usually multifactorial and includes technical factors, factors related to the implant, and factors related to intrinsic local breast tissue compromise.

Compromised local tissues in the breast and chest wall region are a contributing factor to implant malposition in many patients. Predisposing factors include loss of tissue elasticity due to obesity, fluctuations in a patient's weight, and previous surgical procedures (most notably, those involving an implant, especially if these have been multiple), or malposition may be related to the effects of tissue expansion itself. The correction of implant malposition has classically involved manipulations of the periprosthetic capsular tissues in the lower and lateral poles of the breast through capsulorraphy,[10,11] capsular flaps,[12] or other manipulations.[13]

The placement of capsule sutures to treat malpositioned breast implants without capsular contracture was probably first suggested by Spear and Little in 1988.[10] In 2005, Chasan[11] revisited the capsulorrhaphy technique described by Spear and Little, asserting its versatility in rectifying implant malposition. Subtle modifications in technique were presented. For example, in the difficult case of medial implant malposition, Chasan recommended securing the nonabsorbable running suture line to the parasternal periosteum. The problem with that approach is the extreme paucity of secure tissue that can be purchased by sutures in the parasternal region of the chest wall. The dissection of a capsular flap to correct breast implant malposition was proposed by Voice and Carlsen in 2001.[12] This technique is cumbersome for the patient, and I have found it to be unpredictable.

Reflection on the placement of AlloDerm regenerative tissue matrix for breast reconstruction and observations made at the time of implant exchange led me to consider an AlloDerm-assisted inlay to further "rebuild and reinforce" the PPCS. This approach was described in a different fashion by Baxter,[15] but my technique differs significantly from the one that Baxter described. Unlike Baxter's, my technique employs a combination of (1) suture repair of excised capsule edges and the tissue beneath the capsule on the external side (breast tissue flap) and deep (chest wall) surfaces[13] and (2) inlay of ADM over superficially decorticated capsular tissue. The suture technique reestablishes the correct level of the inferior, lateral, and medial chest folds as necessary and moves the periprosthetic space to a more aesthetic position with appropriate dimension. The ADM placement provides additional "sling" support for the implant and acts as a scaffold for additional collagen ingrowth at the site of the repair.

Anatomically speaking, cases of implant malposition result in a capsular recess, or "cul-de-sac," in the location of the malposition. This recess must be closed to achieve a correction of the implant level. With that in mind, why do we not simply resect this capsule and directly interpose a segment of ADM between the incised edges of the capsule? I believe that focal resection of this capsular tissue with suture repair is more secure, since in the event of total failure, the malposition may be potentiated. In addition, focal mirror-image capsulectomies provide the opportunity for new collagen deposition into this wound space as healing occurs, potentially increasing the long-term durability of the repair.

Another important difference between my technique and Baxter's[15] is the placement of the ADM with the inlay technique. With an electrocautery device set on the coagulation mode, the surface of the reconstructed capsule is superficially decorticated or fulgurated exactly where the deep surface of the ADM will be applied. This is done in an attempt to promote maximal vascular ingrowth into the

ADM. Perhaps most important, however, is the orientation of the ADM substrate to the reconfigured periprosthetic capsule recesses. By folding the ADM along its long axis and fixing it to the new, deep recess of the capsule exactly in the new fold and to the deep and superficial aspect of the capsule, the ADM can provide sling and structural tissue support to the capsule tissue surfaces and the implant. This configuration has been referred to as a "gutter," but we refer to it as forming either a "two" or "three sides of a box" configuration. This construction provides immediate additional stability.

Finally, in virtually all recent cases of malposition correction (including the last 11 patients in this series), I have switched to thick Strattice, a porcine-derived material that is less elastic than AlloDerm. I and others[4] believe that this may confer an additional advantage in terms of imparting stability to malposition corrections. The dimensions needed for these corrections commonly vary between 5 × 4 cm and 7 × 4 cm.

While the data reported here are limited by the small number of patients in this series, nearly-uniform success was achieved in correction of multidirectional, sometimes dramatic implant malposition in the face of compromised local tissue. This success is most likely due to the ADM-assisted nature of the technique.

## CONCLUSIONS

Combined focal mirror-image capsule excision and permanent suture repair for fold reconstruction and reconfiguration of the PPCS, combined with an inlay of ADM, is a technique for consideration in patients who have significant malposition and severely-compromised local tissue quality, especially when a large implant is needed (as is the case for many breast reconstructions). This relatively new technique allows plastic surgeons to more confidently address this difficult problem.

### Disclosures

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