

Augmentation Mammoplasty: Enhancing Inferomedial Cleavage

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Background: Typically, symmetrical markings are made to lower the inframammary fold (IMF) according to the surgeon's judgment. Because inferomedial fascial attachments of the IMF may at times compromise the proper seating of the implant in this area, causing excessive superior projection, asymmetrical lowering of the IMF is performed to allow for increased lowering of the inferomedial aspect of the fold.

Objective: A technique for enhancing inferomedial cleavage in augmentation mammoplasty is presented, and the frequency and value of the procedure in a series of patients is assessed.

Methods: A retrospective chart review was performed of 267 patients who underwent subpectoral augmentation mammoplasty using inflatable implants between November 2001 and March 2005. In cases involving lowering of the IMF, a combination of blunt and sharp dissection was performed to release the IMF in the inferomedial area and lower the inferomedial aspect of the fold, tapering to less lowering centrally and minimal to no change laterally.

Results: Among the 267 cases reviewed, 225 patients (84%) underwent some form of IMF lowering, of whom 191 (71%) underwent asymmetric lowering of the IMF to enhance inferomedial cleavage. Complications included 4 patients who required revision to correct bottoming out and 1 case of hematoma.

Conclusions: Increased lowering of the inferomedial portion of the inframammary fold is helpful in correction of constriction of the inferior pole and/or lateral flare of the breasts. This technique is also suitable for patients who desire to enhance the inferomedial cleavage area and is of value for patients requesting larger implants. (Aesthetic Surg J 2005;25:359-364.)

Breast fold lowering is one of the more challenging aspects of augmentation mammoplasty. The inframammary fold (IMF) has considerable impact on the appearance of the breast. A fold that is too lateral at the inferomedial portion of the breast may result in lateral flare of the breast, with excessive widening of the cleavage inferiorly. A high-riding fold may often contribute to constriction of the inferior pole of the breast or aggravate mammary ptosis.

Typically, symmetric markings are made to lower the IMF according to the surgeon's judgment. Tight fascial connections at the inferomedial aspect of the breast may at times compromise the proper seating of the implant in this area. This may result in excessive superior projection and inadequate rounding and cleavage of the inferomedial zone of the breast.

Asymmetric lowering of the IMF refers to the increased lowering of the inferomedial aspect of the fold, tapering to less lowering centrally and minimal to

no change laterally. This technique is especially helpful for patients who have lateral flare of the breasts or constriction of the inferior pole of the breast. It is also helpful, when large implants are planned, to help avoid excessive superior projection and "bottoming out" that may result from excessive lowering of the central portion of the IMF. This results in a rounder and fuller projection of the breast and implant along the lower border of cleavage. Because the pre-existing location and appearance of the IMF is highly variable, determination of the optimal location of the new fold with respect to the size of the implants to be placed presents a challenge to the surgeon.

To determine the frequency and value of asymmetric lowering of the breast fold in my own practice, a retrospective chart review of 267 patients who underwent augmentation mammoplasty using inflatable plants between November 2001 and March 2005 was conducted.

Table. Inframammary fold management in a series of 267 patients

Procedure	No. Patients	%
Asymmetric lowering		
Inferomedial	191	71
Central	5	2
Symmetric lowering	29	11
No lowering	42	16

Materials and Methods

Markings

The existing IMF was marked medially to laterally. The amount of breast fold lowering required varied from patient to patient according to the following considerations: (1) existing location of the IMF; (2) the patient's own natural slope of the fold; (3) the size of the implants; (4) the patient's desire for superior projection or the desire for a balanced result between the upper and lower poles of the breast; (5) whether or not a mastopexy was planned; and (6) the thickness of the inframammary tissues.¹ The inferomedial area was measured for a 0.75- to 2-cm lowering, tapering to 0.50 to 1 cm centrally and 0 to 0.50 cm laterally, depending on these considerations.

Surgery

A subpectoral approach via a 3.5-cm inframammary incision was used in all cases. A standard pocket was created according to the surgeon's usual technique. When approaching the inferomedial zone, the dissection continued inferior to the pre-existing IMF to the inferior line of the markings. A combination of blunt and sharp dissection was performed to release the IMF in this area. When additional release (more than 1 to 1.5 cm) was desirable, the subcutaneous fat could be visualized. Alternatively, it was often possible to maintain some of the fascial attachments in this area by careful blunt dissection.

An arterial vessel was often identified in the inferomedial zone of dissection, which at times is either a branch of the internal mammary artery or a perforator. It is important to stay high (as anterior as possible) during this dissection, because a retracted perforator in this area could be difficult to control. Careful blunt dissection in this area combined with selective cutting current and cautery helps control bleeding.

In the author's experience, it is necessary to avoid excessive dissection centrally into the poorly supporting

subscarpal tissues (areolar plane below the superficial fascial system) of the lower thorax to avoid "bottoming out." An intact fascial band centrally at the inferior edge of the lowered IMF could provide protection against bottoming out. This was accomplished by bluntly teasing away the posterior fascia of the pectoralis major from the serratus anterior fascia to maintain a fascial sling at the lower border of the preoperative markings just medial to the incision. In addition, the inferior flap below the skin incision was secured with 1 or 2 buried 3-0 PDS blocking sutures from the superficial fascial system to the serratus anterior at the level of the inferior markings. It is not yet known whether these maneuvers are protective against bottoming out; this is currently under investigation.

At the conclusion of the dissection, a variety of maneuvers were used to help determine proper symmetry between the 2 sides: Visually, if one implant appeared higher than the other, this indicated a possibility that the high-riding side had not been adequately released inferiorly. Internal palpation along the IMF, both before and after implant inflation, could help accentuate residual fascial bands that needed further release.

All patients were given indwelling catheters for pain control.²

Results

Among the 267 patients in this series, 191 patients (71%) underwent asymmetric lowering of the IMF to enhance inferomedial cleavage; 5 patients (2%) had enhanced lowering centrally to correct a "flattened IMF" to achieve more rounding centrally; 29 patients (11%) had symmetric lowering of the IMF; and 42 patients (16%) had no lowering of the IMF (Table). Thus, 84% of patients had some type of IMF lowering. Implant sizes were usually in the 250- to 375-cc range. Patients who received smaller implants (less than 225 cc), or had a satisfactory nipple-to-IMF distance, or mammary ptosis, underwent little or no lowering of the breast fold. Patient ages were typical of augmentation mammoplasty patients, ranging from early 20s to 40s. Patient age did not appear to affect the position of the IMF. Typical results are shown in [Figures 1](#) and [2](#).

Complications

In this series, 4 patients (1.6%) underwent revision surgery to correct bottoming out noted 3 to 5 months after surgery. One patient (0.4%) underwent evacuation of a unilateral hematoma. Three patients (1.1%) developed postoperative hepatitis—1 case caused by eating raw oysters, and 2 cases apparently secondary to



Figure 1. Correction of inferior pole constriction. **A**, Preoperative view of a 45-year-old woman with constriction of the inferior pole. The left breast is larger and more ptotic. **B**, Preoperative view with patient's arms uplifted to show markings for asymmetric lowering of the IMF 1.5 cm medially, 1 cm centrally, and 0.5 cm laterally, with a larger dissection inferomedially to enhance the inferomedial area of cleavage. **C**, Postoperative view 8 days after subpectoral placement of a 355-cc inflatable implant in the right breast and a 345-cc inflatable implant in the left breast. The implants are riding high and not yet seated in the lowered IMF. **D**, Postoperative view 6 months after implantation. Note the improved balance between the upper and lower poles because the implants are now correctly seated in the lowered IMF.

cephalosporin sensitization and the use of preoperative intravenous Kefzol. As described earlier, blocking sutures have been used in approximately 50 patients during the past year with no known complications.

Discussion

It was the challenge of treating patients with lateral flare of the breasts that encouraged me to alter the design of breast-fold lowering. In an effort to develop better cleavage in these patients, especially at the inferomedial margins, I began (somewhat tentatively) to develop a more pronounced dissection in this area.

Initially, I did not dissect this area sufficiently. With experience, I was able to achieve a more aesthetic breast augmentation, characterized by improved cleavage, especially at the inferomedial margins, and a better balance

between the superior pole and the resulting fuller, rounder inferior pole. This technique also proved to be helpful in patients with constriction of the inferior breast pole, in that the widened area of inferomedial dissection allowed for better seating of the implant into the newly dissected IMF. In addition, the described technique was helpful in planning the markings for larger implants, since it provided more space for the implants with less need for excessive central lowering or increased lateral dissection. At the present time, I use these asymmetric markings in approximately 75% of my patients because of the enhanced aesthetics achieved.

To date, little is understood regarding the anatomy of the IMF. A study of 10 female and 2 male cadavers by Muntan et al³ did not support the existence of a ligamentous structure that was previously noted by Bayati et al.⁴

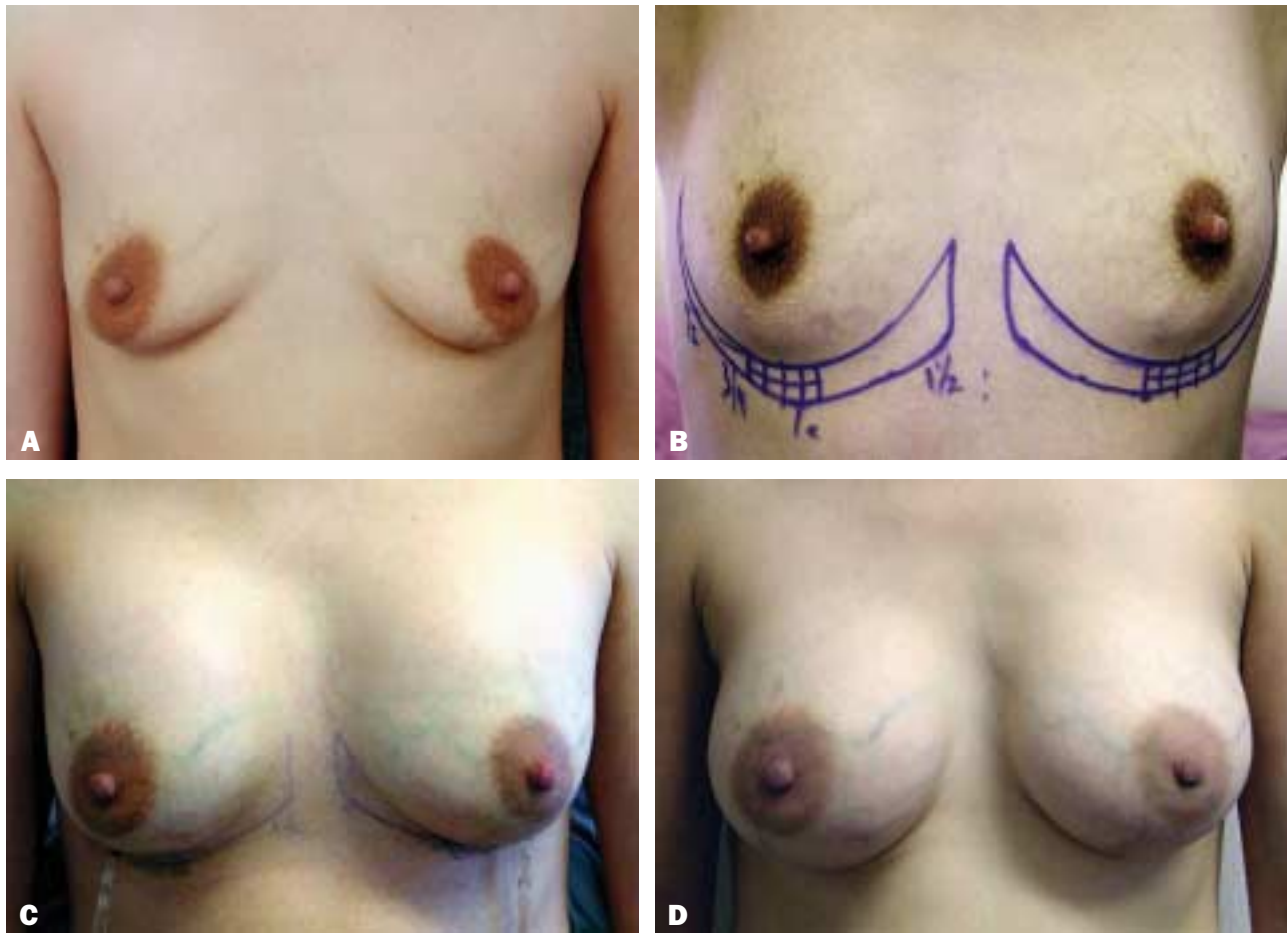


Figure 2. Correction of lateral flare of the breasts. **A**, Preoperative view of a 25-year-old woman with lateral flare of the breasts and widened inferomedial cleavage. **B**, Preoperative view with patient's arms uplifted to show markings for lowering of the IMF 1.5 cm medially, 1 cm centrally, and 0.5 cm laterally. **C**, Postoperative view 1 day after subpectoral placement of 375-cc high-profile implants. Implants are riding high, and the markings show that implants are not yet seated in new breast fold. Catheters for pain control are noted laterally. **D**, Postoperative view 4 months after implantation. The implants have settled into the new IMF with satisfactory superior projection and enhanced inferomedial cleavage.

Instead, they observed that the superficial fascia was connected to the dermis in the fold region in a variety of configurations. In his discussion of the Muntan article,³ Ryan also noted that he could not identify a ligamentous structure. This has also been my experience in my own surgical dissections. Women with breast ptosis have a well-established IMF, so much so that if one attempts to lower the breast fold excessively in a patient with considerable ptosis, a “double bubble” may form regardless of the various planes released. A “double bubble” becomes the surgeon's problem, whereas ptosis is the patient's problem. For these reasons, I perform little or no lowering of the IMF in patients with ptosis and prefer to perform a mastopexy.

Millan Mateo⁵ described lowering of the breast fold with the maximum lowering laterally to the “mid-axillary line.” Although dissection to the mid-axillary line is

entrenched in our literature and discussions, in my opinion it extends too far laterally, resulting in “lateralization” of the breast mound with less medial projection, and the rubbing of the inner arm against the augmented breast. In addition, the fourth intercostal nerve is more prone to injury with this degree of lateral dissection. My own markings end at the anterior axillary line (Figure 3), which is usually where the natural breast ends. In my experience, one rarely sees a breast extend as far as the mid-axillary line except in cases involving macromastia and an enlarged tail of Spence. Further, fascial attachments tend to end at the level of the anterior axillary line, and violation of the subscarpal fatty layer with dissection to the mid-axillary line may result in further migration of the implant laterally. “Lateralization” of the implant appears to have similar dynamics to that of “bottoming out.”

Controversy exists regarding surgical lowering of the IMF. Rohrich⁶ argued that the IMF should not be

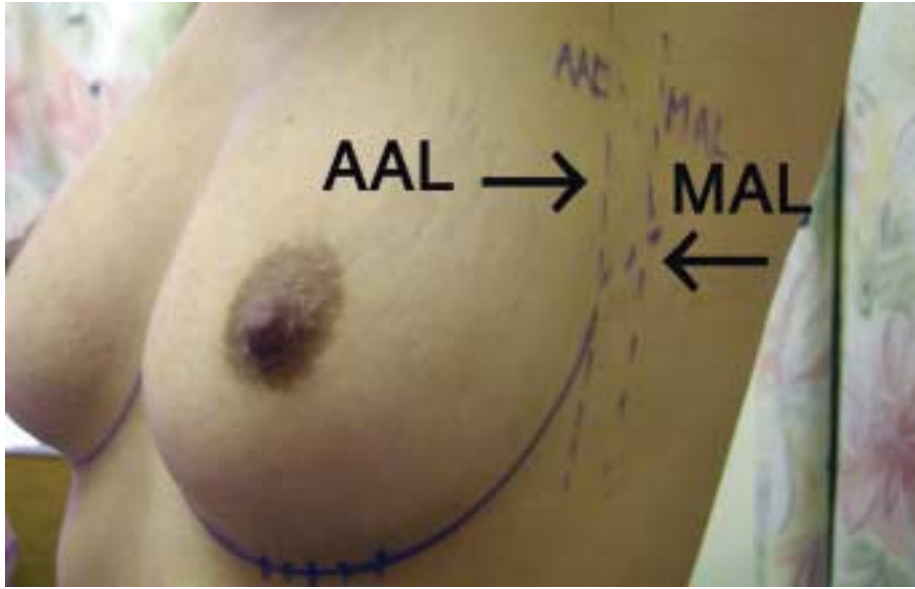


Figure 3. Preoperative markings in a patient with a preoperative C bra cup, with the lateral breast ending at anterior axillary line. AAL, Anterior axillary line; MAL, midaxillary line.

violated unless significant inframammary fold abnormalities exist, as in tuberous breast deformity. In contrast, Tebbetts,^{1,7} in his description of dual-plane breast augmentation, routinely divided the pectoralis origins across the inframammary fold, stopping at the medial aspect of the IMF. The fold was released sufficiently for visualization of the subcutaneous fat, except in those patients who had a soft-tissue pinch thickness at the IMF of less than 0.4 cm. It was Spear's opinion that "there exist few if any indications for not releasing the pectoralis major muscle inferiorly. Failure to do so predictably results in superiorly malpositioned implants."⁸

I have reservations about the complete release of the IMF and visualization of the subcutaneous tissues because of the increasing prevalence of bottoming out. I am in agreement with Hammond⁹ that violation of the "loose subscarpal fatty layer" may result in varying degrees of "bottoming."

A recent paper by Schusterman¹⁰ emphasized the importance of lowering the inferomedial margin of the IMF and corroborated many of my own findings.

It is my observation that most implants tend to ride high initially but descend to the proper position with time and implant mobility exercises. Hammond⁹ believed that excessive superior fullness during the first 6 weeks was caused by swelling of the pectoralis major muscle. This may be true; however, the areolar plane between the pectoralis major and pectoralis minor muscles is easy to

dissect, and there seems to be little trauma to the muscle. I believe that a more important component of early excessive superior projection is inadequate "seating" of the implant as a result of the "memory" of the IMF. This can be seen in postoperative photos in which the implant is not yet seated in the marked area (Figures 1, C and 2, C). Later, when the implant does seat itself into the dissected area, the contour of the breast takes on a more natural appearance without excessive superior pole projection (Figures 1, D and 2, D).

Although the most profound results of asymmetric lowering of the IMF can occur in patients with constriction of the inferior breast pole or lateral flare of the breasts, benefits are also noted for many patients who require an overall lowering of the breast fold to achieve enhanced cleavage and the resultant rounding of the inferomedial area.

Conclusion

Increased lowering of the inferomedial portion of the inframammary fold is helpful in enhancing the inferomedial cleavage area, and also benefits patients with constriction of the inferior pole and those who present with lateral flare of the breasts. Additionally, use of the described technique can help avoid excessive superior projection of the breasts, especially when larger implants are planned. The risk of either "bottoming" or "lateralization" of the implant is reduced, while achieving more aesthetic inferomedial breast fullness. ■

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Accepted for publication April 18, 2005.

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1090-820X/\$30.00

doi:10.1016/j.asj.2005.05.014