

The Delay Fill Technique: A Safer Approach to Combination Augmentation Mastopexy

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Abstract

Combining breast augmentation with mastopexy is a challenging procedure that has a relatively high revision rate in the literature. Some surgeons prefer a two-stage procedure to avoid the potential for skin flap or nipple–areolar complex necrosis that can occur with a one-stage procedure. The authors compared 101 patients who had subpectoral breast augmentation with immediate implant fill and mastopexy with 203 patients who had subpectoral breast augmentation with delayed (10–14 days) implant fill and mastopexy. They found the revision rate for immediate implant fill was 24%; in the delayed implant fill group, the revision rate was 10.3%. Patients had soft tissue-related complications in 16% of the immediate fill group and in 2% of the delayed fill group. Delaying implant fill in combined breast augmentation mastopexy significantly reduces the risk of soft tissue-related complications and revision procedures; the delay flap phenomenon is responsible for fewer wound-healing complications when implant fill is delayed during a combined augmentation mastopexy procedure.

Keywords

- ▶ augmentation mastopexy
- ▶ delayed implant fill
- ▶ breast revision

Combining mastopexy with augmentation is a technically demanding procedure, associated with relatively high revision rates and the potential for significant wound-healing complications that lead to poor results, high patient dissatisfaction, and litigation.^{1–3} The combination of two procedures on the breast simultaneously makes the ultimate outcome less predictable as tissue compliance is subject to the competing forces of the implant expanding the soft tissue, while the skin excision and breast lift compresses it.

This ultimately reduces vascularity to the skin flaps and the nipple–areolar complex (NAC), creating the potential for major wound-healing complications. In addition, as the implant settles and the skin envelope relaxes, there is a greater chance for recurrent ptosis, asymmetry, and implant malposition as compared with either procedure alone. In addition, in an effort to protect vascularity, there may be a more-cautioned approach to skin flap dissection and lifting, creating a greater potential need for a secondary lift as follow-up of

each patient progresses over enough time to allow soft tissue-compliance issues to manifest.

Numerous references in the literature highlight the higher risk associated with this procedure in an effort to caution the plastic surgeon before proceeding with this procedure without due respect for the potential adverse consequences.^{2–4} The cautionary language in publications such as “Augmentation/Mastopexy: Surgeon Beware” and “Secondary Mastopexy in the Augmented Patient: A Recipe for Disaster” is incisive and appropriate.^{1,2}

In a candid 3-year review of 166 combined augmentation/mastopexy cases, Spear reported a 17% complication rate in primary augmentation/mastopexy and a 23% complication rate in secondary augmentation/mastopexy.⁵ In another study, Stevens found a 14.6% revision rate in 321 patients with most attributed to implant-related issues rather than soft tissue complications.⁶ In a more recent study, Stevens reported a 16.9% revision rate in 615 patients evenly

distributed between soft tissue-related and implant-related complications.⁷ It is logical to predict that in the average plastic surgery practice, where fewer combination augmentation mastopexy procedures are performed and complications are not published, the complication rate for this procedure could be even higher.

In 2004, The Doctors Company reported that ~60% of liability claims involve the female breast, with the majority involving some type of breast lift or reduction procedure.⁸ In a thorough analysis of the special risk attributed to secondary mastopexy in the augmented patient, Handel provided a compelling review of the particular hazards, but did not distinguish between the subglandular and subpectoral implant patient.¹ There is a paucity of literature that specifically addresses the potential major wound-healing complications like NAC or skin flap loss with long-term outcomes and patient satisfaction after revision surgery in these patients.

Staging these two procedures sequentially, mastopexy followed by breast augmentation several months later, is a reasonable recommendation, yet most patients prefer a one-stage approach.⁹ This creates competitive pressure on plastic surgeons trying to accommodate their patients' preferences. A predictable and safe one-stage method with a low complication and revision rate is highly appealing, but elusive.

In our own practices, compromised vascularity of the NAC and/or skin flaps has occurred on numerous occasions in the past 20 years, necessitating implant deflation and suture removal for tissue release to preserve viability.

Centuries ago Plato observed "Necessity, who is the mother of invention." Hence, several years ago we began to leave implants partially filled when we perceived vascular compromise intraoperatively,⁴ filling them completely in 2 to 3 weeks when confident of good vascular flow to the skin flaps and NAC. This worked well for those patients who had easily identifiable venous congestion or impaired arterial inflow issues intraoperatively. A secondary implant fill could be easily performed in the office under local anesthesia.

Nevertheless, in several patients with a favorable intraoperative vascular assessment, significant venous (most commonly) or arterial compromise developed in the early postoperative period (24–72 hours) requiring implant deflation and/or suture removal and incision release for salvage. Thus, we began the routine practice of partial implant fill in all patients undergoing simultaneous mastopexy and augmentation with saline implants, irrespective of perceived vascularity intraoperatively. This study provides a complication and revision-rate comparison of immediate and delayed implant fill in 304 consecutive patients undergoing this combined procedure with two experienced surgeons in our group practice.

Methods

Three-hundred four consecutive patients who underwent either primary or secondary mastopexy with simultaneous subpectoral augmentation (primary or secondary) over a 6-year period were evaluated. All patients who had previous subglandular implants represent a different vascular flow pattern and a higher risk category, and thus were subject to a separate analysis to be published in the future. The first 101 patients had augmentation and immediate complete fill of saline implants or placement of silicone implants at the time of the mastopexy, while the second group of 203 patients had augmentation with saline implants and completion of inflation after 10 to 14 days.

All patients in the DFG had only partial inflation ($\leq 50\%$ of base volume) of the implants at the time of placement, regardless of the intraoperative vascular assessment. In an ongoing study measuring subareolar tissue pressure in combined augmentation mastopexy, we determined that tissue pressures did not substantially reduce with less than 50% implant fill using implants ranging in size from 200 to 400 cc; therefore, $\leq 50\%$ fill was selected for our delay fill strategy (\rightarrow Fig. 1).

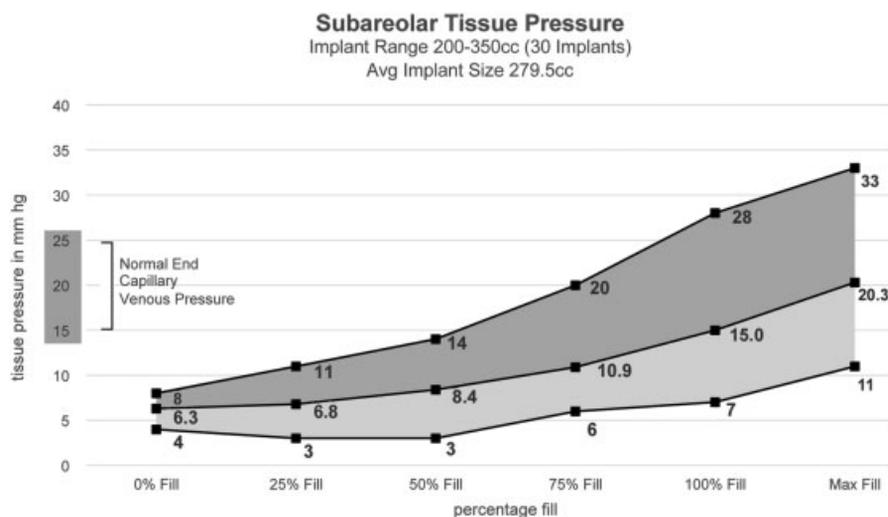


Fig. 1 Subareolar tissue pressure graph. This graph illustrates subareolar tissue pressures (average and range) measured with a pressure manometer (Stryker 295–1 Pressure Monitor) at sequential fill volumes for each implant after mastopexy is performed.

A subpectoral breast augmentation is performed through an inframammary approach and the saline implant is filled to the planned final volume. Attentive preservation of the internal mammary medial perforators along the sternal-chondral junction and the deep thoracoacromial artery on the undersurface of the pectoralis major is essential. With the saline implant filled to the planned final volume, the mastopexy is then performed utilizing a medial pectoralis perforator and central pedicle technique.

Confident in our “release valve” technique, an unrestrained mastopexy, with elevation of the flaps (medially, laterally, and superiorly), is performed to achieve the desired aesthetic shape and nipple position. A tight closure of the skin flaps over the fully filled implant is not uncommon, but also not avoided when a delay fill is planned. The ideal end point volume is then determined intraoperatively and recorded. Once the desired breast shape, size, implant position, and symmetry is determined, the implant is partially deflated to reduce skin tension on the incisions. The fill tube is capped (Luer lock) and buried in the subcutaneous tissue along the medial (preferred for patient comfort and ease of access) inframammary incision with a stabilization suture. A marker suture is placed around the valve and anchored to prevent the valve from wandering and allow effortless discovery. Prineo® (3M Dermabond®, 3M, St. Paul, MN) topical seal is applied to the incisions.

A minor office procedure (10–15 minutes) under local anesthesia is performed to complete the predetermined implant fill between 10 to 14 days postoperatively with removal of the fill tube and secondary wound closure. Implant displacement exercises are started 7 to 10 days after the initial procedure in the IFG and directly after the secondary implant fill procedure in the DFG. All patients in both groups receive perioperative antibiotics for the primary surgery and again for the secondary procedure in the DFG.

Results

One-hundred one patients, who had immediate saline implant fill, were compared with 203 patients who had delayed saline implant fill (10–14 days), all of whom had concomitant mastopexy. All patients in both categories had subpectoral

breast augmentation. Any patient with a history of previous subglandular breast augmentation was excluded from this study in view of the substantial difference in residual glandular blood supply in these patients and to ensure an accurate comparison. There were no significant differences in the demographic data between the two groups (– **Table 1**). The vast majority of patients in both groups were primary augmentation with primary mastopexy (IFG = 91%; DFG = 89%) (– **Table 2**).

The complications requiring revisions are summarized in – **Table 3** comparing the IFG and the DFG for soft tissue- and implant-related indications with *p* values for each category. There was a significant difference (*p* = 0.0021) in the overall revision rate between the two groups: 23.8% in the IFG and 10.3% in the DFG. When analyzing further the primary indication for revision, the IFG had eight patients, or 33% of revisions were performed for recurrent ptosis alone. In the DFG, one patient (0.5%) required revision for recurrent ptosis. In general, revisions for soft tissue-related complications were significantly less in the DFG, whereas revisions for implant-related indications were approximately the same for each group. The overall revision rate of 10.3% in the DFG was significantly improved (*p* = 0.0021) over the IFG (23.8%). There were no instances of implant failure (leak) in either group.

Pertinent Surgical Blood Supply and Surgical Implications

Review of the pertinent blood supply to the pectoralis major muscle and the overlying glandular breast and skin envelope is instructive for this demanding operation.^{10–13} The primary blood supply of the pectoralis major is derived from the medial internal mammary perforators, the second intercostal being the most dominant. In addition, the thoracoacromial artery, as a major branch of the axillary artery, enters the deep surface of the pectoralis major along the superior lateral portion. The primary vascularity to the breast is derived from the pectoralis perforators and the lateral thoracic artery (– **Fig. 2A,B**).

Laterally, the breast is fed by the lateral thoracic artery as it courses around the posterolateral edge of the pectoralis

Table 1 Demographic data

	IFG (n = 101)	DFG (n = 203)
Age (years)	Avg: 36.5 (19–58)	Avg: 37.1 (18–60)
Implant	Avg: 292.8 cc (150–550 cc)	Avg: 290.0 cc (150–550 cc)
Intraoperative volume	Avg: 292.8 cc (150–550 cc)	Avg: 140.5 cc (50–330 cc)
Final implant volume	Avg: 303.2 cc (150–550 cc)	Avg: 312.8 cc (150–630 cc)
% Intraoperative fill of total	100%	48.4%
# Days to secondary implant fill	N/A	13.9
Follow-up (months)	Avg: 13.2 (8–37)	Avg: 15.3 (9–39)

Abbreviations: IFG, immediate fill group; DFG, delayed fill group; Avg, average.

Table 2 Distribution of Primary and Secondary Procedures

	IFG <i>n</i> = 101	DFG <i>n</i> = 203
Primary breast augmentation Primary mastopexy	91 (91%)	181 (89%)
Secondary breast augmentation Secondary mastopexy	1 (1%)	0 (0%)
Secondary augmentation Primary mastopexy	5 (5%)	14 (7%)
Secondary augmentation Secondary mastopexy	2 (2%)	8 (4%)

Abbreviations: IFG, immediate fill group; DFG, delayed fill group.

major. Inferiorly, the anteromedial and anterolateral intercostal perforators provide supply to the inferior pectoralis major and inferior breast tissue. Within the pectoralis major, there is significant collateralization of these sources, all contributing to the supply of the overlying glandular breast and skin envelope.

The arterial blood supply to the overlying breast is derived from the internal mammary perforators (60%) to the superior and medial breast, the lateral thoracic artery (30%) to the superior and lateral breast, and the anterolateral perforator branches of the intercostal and thoracoacromial arteries (10%) to the inferior and lateral breast.

The blood supply to the NAC is formed by a plexus of vessels derived from both the lateral thoracic branches and the medial perforators from the internal mammary. The

venous drainage of the breast follows the arterial pathways, but in a somewhat different flow pattern, primarily emptying into the internal thoracic vein medially (90%) and the axillary vein laterally (10%).¹⁰

Vascularity when a Submuscular Implant and Concomitant Mastopexy Is Performed

The blood flow to the overlying breast when a submuscular implant is placed follows the same pattern as long as the lateral thoracic artery, the thoracoacromial artery, visible on the undersurface of the pectoralis major, and the medial internal mammary perforators are preserved during dissection. These are the nourishing vessels for the pectoralis major and ultimately the primary pedicle for the NAC when its

Table 3 Complications requiring revisions

	IFG (<i>N</i> = 101)		DFG (<i>N</i> = 203)		<i>p</i> value	Significance at $\alpha < 0.05$
	<i>n</i> ₁	<i>C</i> ₁	<i>n</i> ₂	<i>C</i> ₂		
Soft tissue related	16	15.8%	4	2%	<0.0001	Significant
Recurrent ptosis	8	7.9%	1	0.5%	0.0008	Significant
Major wound	8	7.9%	3	1.5%	0.0076	Significant
Dehiscence	2	2%	1	0.5%	0.2571	Not significant
NAC Loss	2	2%	0	0%	0.1096	Not significant
Atrophic wide scar	4	4%	2	1%	0.0969	Not significant
Implant related	8	7.9%	11	5.4%	0.2702	Not significant
Capsular contracture	5	5%	7	3.4%	0.3636	Not significant
IMF Failure	3	3%	3	1.5%	0.3163	Not significant
Lateral displacement	0	0%	1	0.5%	0.6678	Not significant
Infection	0	0%	3	1.5%	0.2963	Not significant
Hematoma	0	0%	3	1.5%	0.2963	Not significant
Overall	24	23.8%	21	10.3%	0.0021	Significant

Abbreviations: IMF, inframammary fold.

Notes. Null hypothesis: $H_0: C_1 = C_2$, where $C_1 = \%$ complications requiring revision from immediate fill and $C_2 = \%$ complications requiring revision from delay fill. Alternative hypothesis: $H_A: C_1 > C_2$ (except when $C_2 > C_1$, in which case $H_A: C_2 > C_1$). Calculation method: One-way test of significant difference between sample proportions. Method of calculating *p* values: Fisher's exact. Software package: Minitab Express (version 1.2.0). Analysis by Lon Roberts, PhD.

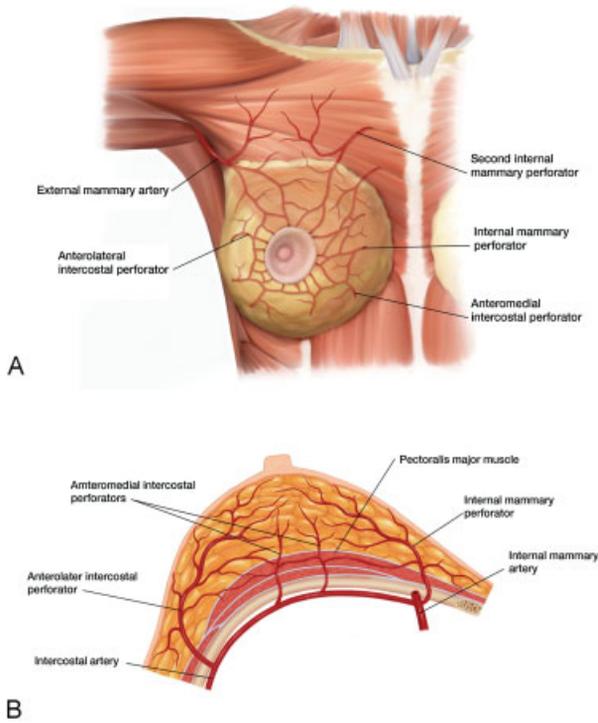


Fig. 2 (A) Anterior view. (B) Inferior view. Blood supply to the breast: vascular supply to the breast is primarily derived from the medial perforators of the internal mammary (60%) and the lateral thoracic artery (30%).

orientation is central, superior, or medial. When a concomitant mastopexy is being performed, preservation of the medial pectoralis perforators during subpectoral dissection for implant placement is particularly critical for venous return from the NAC because 90% of venous outflow occurs through this network of veins. This “perforator” pedicle, derived primarily from superior and medial sources, provides the most robust vascularity for the NAC.

Often, the inferior arterial sources, which are not dominant, can be sacrificed to properly position an implant in the lower pole. The primary concern during a combined procedure is interruption of arterial flow to or venous return from the NAC via compression of the subareolar plexus by the fully filled anterior dome of the implant even though the major vessels are preserved (► **Figs. 3A,B, 4A,B**). When the implant is deflated, the compressive force is released, particularly for venous drainage, which is primarily medial. We theorize that a 10- to 14-day delay in implant fill acts in the same way as the delay flap phenomenon.¹⁴

Vascularity when a Subglandular Implant and Concomitant Mastopexy Is Performed

In the subglandular augmentation (primary or secondary) patient, there is a more random distribution of blood flow to the NAC that creates a greater risk of ischemia. There are no medial perforator branches to nourish the pedicle through the pectoralis major. The thoracoacromial vessels also do not contribute. The NAC receives its vascular flow randomly via the base of the skin flaps and an attached superomedial dermal pedicle; therefore, only slight elevation of the medial and lateral skin flaps can be accomplished without significant

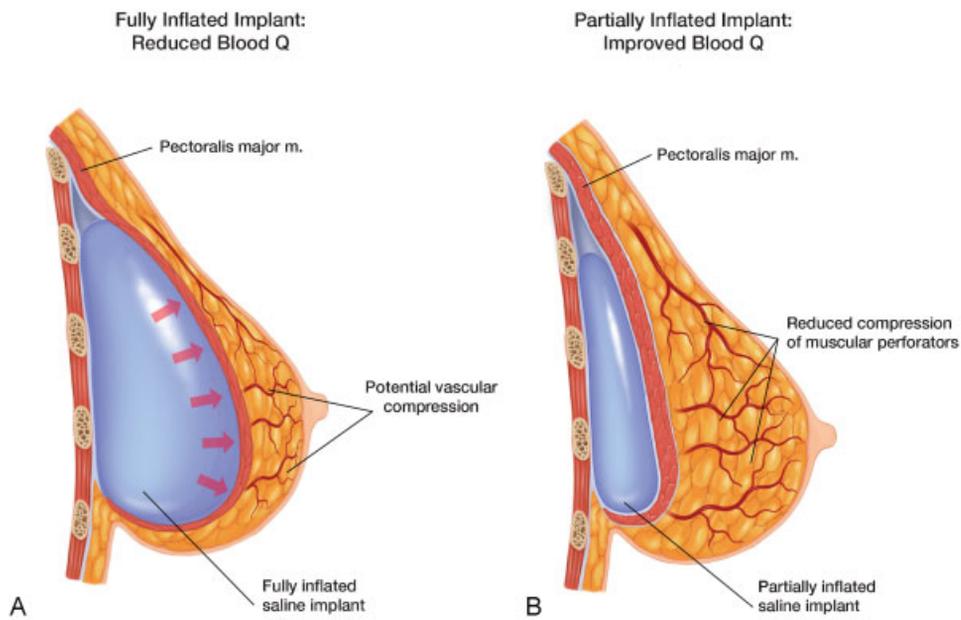


Fig. 3 (A) Fully inflated implant: reduced blood flow. The competing forces of a fully expanded implant against the soft tissue constriction resulting from reduction of the skin envelope may jeopardize vascularity. (B) Partially inflated implant: improved blood flow. Partially deflating the implant improves the blood flow by reducing soft tissue compression.

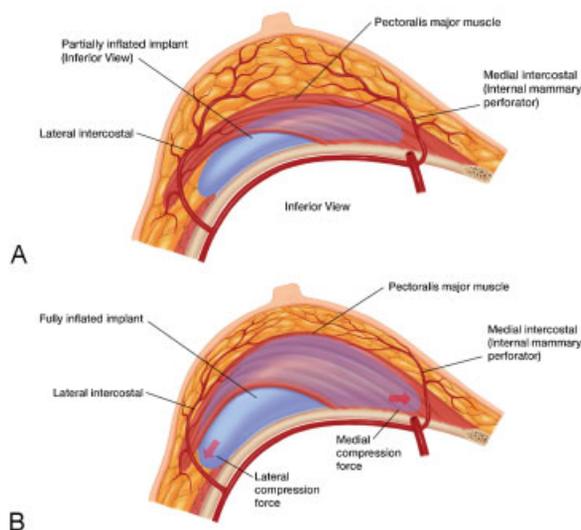


Fig. 4 (A) Inferior view: This figure illustrates potential compression of lateral intercostal and medial internal mammary perforators and the subareolar plexus with a fully-filled implant. (B) Inferior view: When the implant is partially deflated, flow in the subareolar plexus is re-established. The medial and lateral perforators are free from compression.

impairment of blood flow. Combined primary or secondary (pre-existing) subglandular augmentation with mastopexy carries a higher risk of devascularization to the NAC and should be analyzed in a separate category.

Discussion

Most would agree that combining breast lifting and implant augmentation is a challenging procedure fraught with potential problems both large and small. We have experienced most of the problems, if not all, at some point with this operation. The revision rate in the literature is relatively high, ranging from 13 to 23% or higher among well-qualified and experienced plastic surgeons who accumulate enough procedures to merit publication.^{1-3,5-7} It is possible that the nonpublished complication and revision rates are even higher for less-experienced plastic surgeons, particularly when this is not the predominant focus in their practice.

In our study, the revision rates are similar to those found in the literature (24% IFG and 10.3% DFG). Even with consistent uncompromised vascularity in our DFG, the revision rate was still 10.3%, primarily due to implant-related complications. In our opinion, this is due to the unpredictability of final implant position when soft tissue compliance is challenged by the opposing forces of expansion of soft tissue by implant placement and reduction of the skin envelope over it by the mastopexy procedure. In fact, the implant-related revisions were predominantly required to correct asymmetry of implant position.

Although a relative implant position might be acceptable when evaluating each breast individually, the ultimate objective for almost all patients is “perfect” symmetry, especially with regard to upper pole fullness and NAC position. These two criteria are particularly sensitive to relative implant

position between the two breasts. In the DFG, revision surgery was needed to correct implant position in 6.4% of patients or ~50% of all revisions. These revisions were required to adjust asymmetrical implant position when either “riding” a little too high (superior malposition) or dropping too low (below the inframammary fold). Although slightly higher in the IFG (7.9% vs. 5.4% in the DFG), there was no statistically significant difference ($p = 0.2702$) in the revision rate for implant-related complications between the two groups.

The most significant finding in our study is attributed to the soft tissue-related complications requiring revisions. Most importantly, there were four patients (4%) in the IFG ($n = 101$) who suffered significant wound complications that included partial or complete NAC loss and/or skin flap loss that resulted in dehiscence and a prolonged healing process. This factor was our primary motivation for developing the delay fill strategy. Fortunately, there was only one patient (0.5%) in the DFG ($n = 203$) with partial soft tissue loss (vertical flap) requiring revision. There were no instances of NAC necrosis in the DFG.

In our own practices, in an effort to preserve vascularity, we have exercised a more cautious approach with a limited lifting technique when a fully filled saline or silicone implant is used with concomitant mastopexy. We believe that this is the primary reason for the higher revision rate for recurrent ptosis in the IFG. In our study, we found the revision rate for recurrent ptosis to be dramatically improved in the DFG (7.9% IFG vs. 0.5% DFG; $p = 0.0008$).

It is intuitive that the surgeon would be more restrained with skin flap dissection and NAC positioning when the placement of an implant, to some degree, reduces the residual vascularity of the breast tissue, particularly the NAC. We are certain that by using the implant deflation intraoperatively as a “pressure relief valve,” we are less restrained with skin removal, skin flap dissection, including superiorly, and NAC mobilization and positioning, thereby reducing the numbers of patients being “undertreated” with this combination procedure. We believe this to be the primary reason that reoperation for recurrent sagging is much lower in the DFG. Although soft tissue factors that result in revision surgery are not eliminated by the delay fill technique, there is a statistically significant reduction in the number of revision procedures for all soft tissue-related complications in this group (15.8% IFG vs. 2% DFG; $p = 0.0001$).

Combination augmentation mastopexy is essentially two separate procedures with opposing forces competing against each other. The source of wound-healing problems we see postoperatively are caused by the opposing forces generated by the fully filled implant expanding the soft tissue on the one hand and the reduced skin envelope from the breast lift on the other.

These competing forces can often compromise vascularity—venous or arterial—to the NAC or the skin flaps, leading to catastrophic complications that may have a negative impact on the patient–physician relationship and potential medico-legal consequences. We believe that the overall reduction in soft tissue-related complications and revisions in the DFG is

the direct result of a decrease in wound tension early after surgery, when the combination of a fully filled implant, a tightened skin envelope, and postoperative swelling create an environment where excessive wound tension can lead to skin flap necrosis, scar hypertrophy, or atrophic widening.

In our opinion, the delay fill technique provides several advantages, allowing more predictability of the healing process, and thus, the improved ultimate outcome by delaying implant fill (► Figs. 5A–D, 6A–D). First, the skin flap dissection and soft tissue mobilization is less restrained by vascular concerns, thus allowing a more thorough lift. Second, excessive wound tension in the critical, early postoperative period, when swelling and capillary leakage is most pronounced, is obviated by delaying implant fill. This leads to fewer wound separations, particularly at the fragile T-zones. Third, fewer adverse vascular issues, both major and minor, provide a healthier environment for wound healing.

Although we have not specifically addressed the quality of wound healing and scar appearance in this study (such a study would require one technique for one breast and another for the other breast), in our clinical judgement, the long-term scar appearance is superior when implant fill is delayed. This is not surprising given our prior base of knowledge regarding the effect of skin-closure tension on wound healing.^{15,16} Even when vascularity is adequate and short-term wound healing is uncomplicated in the immediate fill-combination-augmentation mastopexy procedure, excessive wound tension may result in hypertrophic or wide scars and patient dissatisfaction. In addition, far fewer minor wound-healing problems have resulted in simpler postoperative management and recovery of these patients with a reduction in anxiety for our patients and our staff.

In a secondary study that is currently underway in our practice, subareolar soft tissue pressures are measured at various implant fill volumes after mastopexy is performed during a combined procedure. Preliminary data suggest high soft tissue pressures in the critical subareolar glandular area, exceeding minimum venous pressure to allow venous outflow, may be a significant factor giving rise to necrosis of the NAC or skin flaps. Average normal end capillary venous pressure may range from 15 to 25 mm Hg, depending on the specific tissue being measured.¹⁷

We theorize that the dome of a fully filled implant, even at small volumes, projecting anteriorly, compresses the subareolar venous plexus, potentially compromising venous return. In 30 implants (average 279.5 cc) measured at increasing volumes, subareolar pressure ranged from 4 mm Hg (0% fill) to 33 mm Hg (maximum fill per manufacturer). Tissue pressure in excess of 25 mm Hg exceeds the maximum end capillary venous pressure, creating the potential for venous congestion that may affect the viability of the NAC.

We have developed an overview risk assessment for patients undergoing combined augmentation mastopexy that corresponds to our experience (► Table 4). In our opinion, the highest risk category is the patient with pre-existing subglandular implants (random pedicle for NAC) and the patient with a tubular deformity, wide NAC, and tight skin envelope. Any pre-existing flap dissection or periareolar incisions without a known pedicle or a history of multiple surgical procedures for complications of breast augmentation require a “proceed with caution” attitude when planning a combined procedure. Likewise, patients with pre-existing systemic diseases, including diabetes, hypertension, or peripheral cardiovascular disease, present additional risks

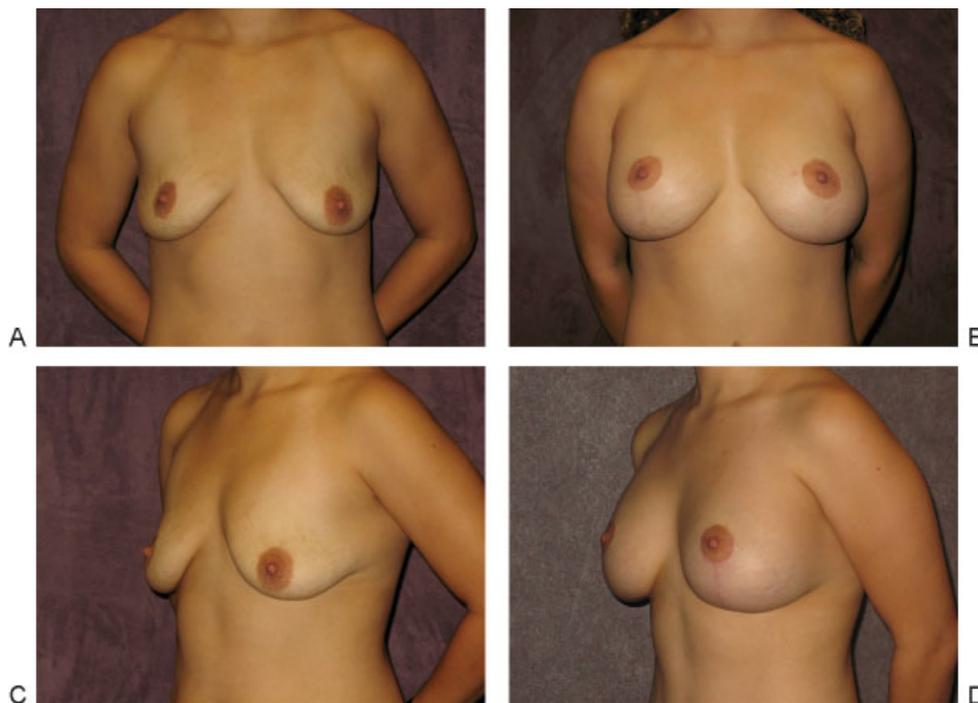


Fig. 5 (A–D) This patient underwent combined augmentation mastopexy with the delay fill technique. After views are 4-year postoperative.

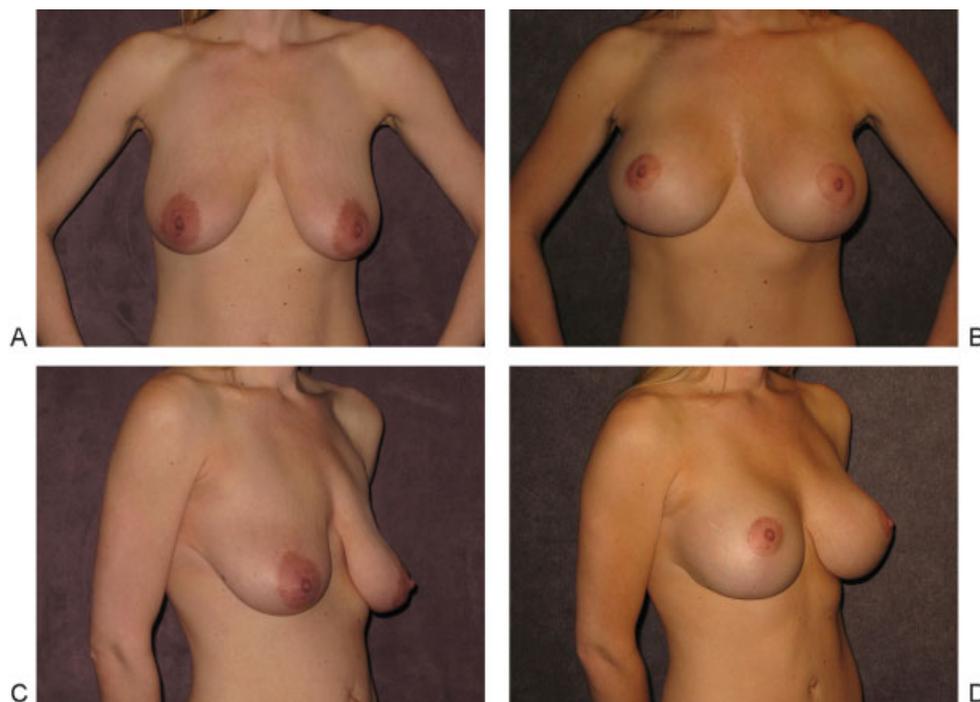


Fig. 6 (A–D) Combined augmentation mastopexy with the delay fill technique was performed on this patient to give her breasts volume and lift. After views are 1-year postoperative.

Table 4 Combined augmentation/mastopexy (CAM): Risk assessment

CAM I Low risk	Pre-existent submuscular augmentation with compliant skin envelope and no secondary procedures
CAM II Moderate risk	Pre-existent submuscular augmentation with noncompliant skin envelope Primary augmentation with compliant skin envelope
CAM III High risk	Primary augmentation with noncompliant skin envelope Prior mastopexy with unknown nipple–areolar complex, pedicle type Large implant ≥ 350 cc
CAM IV Very high risk	Pre-existent subglandular implant Tubular breast with noncompliant skin envelope and short horizontal distance Multiple prior breast procedures Wide nipple–areolar complex diameter $> 50\%$ of breast width with noncompliant skin envelope

requiring preoperative management. Systemic diseases necessitating chronic steroid use, smokers, and obese patients are poor candidates for this procedure. We believe the lowest risk category to be the patient with a compliant skin envelope who has had a prior uncomplicated breast augmentation procedure with submuscular implant placement (essentially a “delay flap” phenomenon) and no subsequent procedures.

Given our prior experience with breast lift and augmentation, which could easily be described as “surgeon beware,” we had the need for another way to do it.² Although staging is certainly an acceptable alternative (mastopexy followed by breast augmentation), it is somewhat inconvenient and does not preclude the possibility of a revision as a third stage. So, if “necessity is the mother of invention,” then the mother in our practices has been wound-healing complications and high revision rates with this operation. The delay fill strategy has

substantially reduced the soft tissue complications and revision procedures for this challenging operation. In our opinion, the delay fill technique provides a safer and more predictable option for one-stage augmentation mastopexy.

Conclusions

Our purpose was to eliminate the intraoperative decision making regarding vascular compromise and ultimately eliminate or reduce the number of wound-healing problems postoperatively. The delay fill technique accomplishes this goal and provides us with a safer approach to accomplish a single-stage combined augmentation mastopexy. We do not anticipate revisiting our prior method of completing implant fill at the initial procedure. Because there is no perceptible advantage when using a saline implant. For those patients

who prefer a silicone implant, a candid conversation regarding the higher potential risk is necessary. We have no reservation in saying that delayed implant fill is a safer technique for combination breast lift and augmentation.

Acknowledgments

We have presented this technique at the Texas Society of Plastic Surgeons 2008 Annual Meeting, November 2008, San Antonio, TX; The Breast Surgery Panel at the American Society of Aesthetic Plastic Surgery 2009 Annual Meeting, May 2009; Las Vegas, NV; the Houston Society of Plastic Surgeons, October 2009, Houston, TX; and the Texas Society of Plastic Surgeons 2012 Annual Meeting, September 2012, San Antonio, TX.

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