Aesth Plast Surg (2012) 36:349–354
DOI 10.1007/s00266-011-9796-7

Simultaneous Augmentation Mastopexy: A Technique for Maximum En Bloc Skin Resection Using the Inverted-T Pattern Regardless of Implant Size, Asymmetry, or Ptosis

Ted Eisenberg

Received: 27 March 2011 / Accepted: 7 July 2011 / Published online: 19 August 2011

Abstract
Background Simultaneous augmentation mastopexy for moderately to severely ptotic breasts presents the challenge of determining how much excess skin should be removed after implant placement to create symmetry and provide for maximal skin tightening without compromising tissue vascularization.
Methods Simultaneous augmentation mastopexy involves invagination and tailor tacking of the excess skin after implant placement and then making a pattern around the tailor-tacked tissues for previsualization of the total area to be resected. This contrasts with first making a pattern for the mastopexy, resecting the skin, and then tailor tacking the tissues together. Over a 7-year period, 55 women had simultaneous augmentation mastopexy with this approach. Saline implants were placed in the subpectoral dual-plane position before the mastopexy was started. All surgeries were performed with the patient under general anesthesia, and the patients were discharged the same day. In a retrospective chart review, breast implant size, degree of preoperative asymmetry, length of procedure, and complications were recorded. The patient follow-up period ranged from 3 months to 7 years (median, 9 months).
Results Symmetric, aesthetic results were achieved for all the patients. The range of saline implants used was 375–775 ml (average, 500 ml). Of the 55 women, 15 had two different size implants measuring at least 50 ml or larger, with the greatest size disparity in a patient being 225 ml (left breast, 700 ml; right breast, 475 ml). Six of the patients (10.9%) had small areas that healed by secondary intention, occurring mostly at the inferior junction of the inverted T. Only two patients (3.6%) had recurrence of breast ptosis, and only one patient (1.8%) had a mildly hypertrophic scar. There were no incidences of hematoma, infection, rippling, malposition of the nipple–areolar complex (NAC), NAC loss, capsular contraction, implant malposition, or dissatisfaction with implant size. The bilateral augmentation/mastopexy surgery time ranged from 2 h and 29 min to 4 h and 30 min (average, 3 h and 8 min).
Conclusions The described technique maximizes the amount of tissue to be resected in simultaneous augmentation mastopexy for moderately to severely ptotic breasts. Symmetry is more easily achieved with this approach regardless of the implant size used or the amount of skin to be resected. This technique minimizes the chance of tissue necrosis from devascularized skin edges. It also may shorten the inverted T scar and reduce the operative time.

Keywords Simultaneous augmentation mastopexy · Tailor tacking · Breast lift · Mastopexy · Augmentation mastopexy · Breast ptosis · Ptotic breast · Short horizontal scar

Introduction

Some physicians advocate a staged approach to augmentation mastopexy surgery, with the breast-lift performed first followed by breast augmentation at least several months later. The goal of simultaneous augmentation mastopexy for moderately to severely ptotic breasts [1, 10] is to remove as much lax skin as possible after placement of the implants without compromising circulation to the skin. The challenge comes in dealing with the opposing

T. Eisenberg (✉)
Nazareth Hospital, 2375 Woodward Street, Suite 102, Philadelphia, PA 19115, USA
e-mail: info@lookingnatural.com

tissue forces [14]: The skin is first stretched out by the implants, and then during the lift, it is removed and tightened to make the breasts as firm as possible.

For many years, I did one-stage, or simultaneous, augmentation mastopexy for moderately to severely ptotic breasts depending on common skin patterns [4, 9, 19] that had been developed to accomplish this goal. I drew a pattern, removed skin within the pattern, and then tailor tacked tissues together with skin staples [18]. This approach required multiple trimmings of skin—back and forth from one side to the other—to achieve maximum tightness and symmetry.

Approximately 7 years ago I decided to reverse this process after implant placement. With the reversed process, the tissues were maximally invaginated and tailor tacked first without tension. The perimeter of the skin staples used for tacking was marked with a skin scribe before their removal. The newly marked area within the staples, indicating a new pattern of tissue to be resected safely, was much greater than any pattern I had ever drawn. I was able to perform a single en bloc resection of the excess skin. The technique provided maximum tightening without compromising circulation to the tissues [7]. This has become my standard approach to simultaneous augmentation mastopexy for moderately to severely ptotic breasts.

Methods

Over a 7-year period, 55 women underwent simultaneous augmentation mastopexy with the described approach. The range of saline implants used was 375–775 ml (average, 500 ml). Of the 55 women, 15 had two different size implants measuring at least 50 ml or larger, with the greatest disparity in a patient being 225 ml (left breast, 700 ml; right breast, 475 ml). All the patients had general inhalation anesthesia in a hospital and were discharged the same day. In a retrospective chart review, breast implant size, degree of preoperative asymmetry, length of procedure, and complications were recorded. The patient follow-up period ranged from 3 months to 7 years (median, 9 months).

In each case, the new nipple position was marked with the patient in the sitting position. Lines measuring approximately 8–9 cm were drawn from the apex of the new nipple–areola complex (NAC) to either side of the existing areola. These guidelines eventually represented the vertical distance from the apex of the NAC to the inframammary crease (IMC): 4 cm for the NAC and approximately 4–5 cm from the base of the NAC to the IMC. The maximum medial and lateral edges of the horizontal IMC incision were found and marked with the patient's hands raised above her head. This was done to see where her breast would lie on her chest in order to hide and minimize the horizontal component of the inverted T.

The patient was placed in the supine position with her arms abducted 90°. First, breast implants were placed in the dual plane (subpectorally) [17]. Then, mastopexy began by placement of surgical staples (Weck Visistat 35W-Telefl ex Medical; Research Triangle Park, NC, USA) at the medial and lateral edges of the inframammary line and the apex of the new NAC to act as guidelines for invagination of skin. The distal point of the 8- to 9-cm line drawn to the medial aspect of the areola (Fig. 1) and then the distal point of the 8- to 9-cm line drawn to the lateral aspect of the areola (Fig. 2) were stapled to the middle of the newly drawn IMC. The redundant breast tissue was pulled and invaginated in an inferomedial direction and stapled from the lateral IMC staple to the middle of the IMC (Fig. 3) to create more medial breast fullness. The process was

Fig. 1 The distal point of the 8- to 9-cm line drawn from the apex of the new nipple–areola complex (*NAC*) to the medial aspect of the areola is stapled to the middle of the inframammary crease (*IMC*). This line represents the entire vertical component from the apex of the new NAC to the IMC of the inverted T

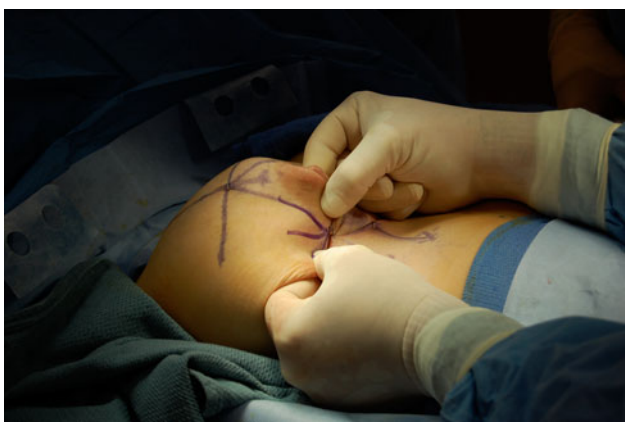

Fig. 2 The corresponding line drawn to the lateral aspect of the areola is stapled to the middle of the inframammary crease (*IMC*)

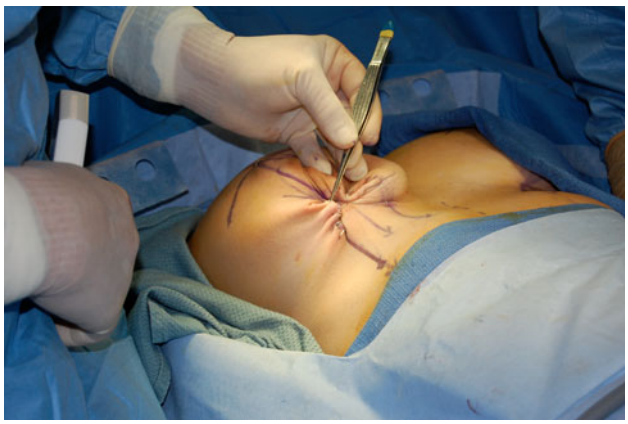

Fig. 3 Redundant tissue is invaginated in an inferomedial direction and stapled from the lateral inframammary crease (*IMC*) staple to the middle of the IMC

repeated from the medial staple to the middle of the IMC to create more breast projection.

Invagination and stapling then were performed from the apex of the new NAC in an inferior direction to the middle of the IMC (Fig. 4). The apex staple was pulled in an inferolateral direction and stapled. The same apex staple then was pulled in an inferomedial direction and stapled to reduce a dog ear at the apex of the NAC. The same sequence was followed on the opposite breast.

Next, the new NACs were marked with a nipple–areola marker (Fig. 5). The positions of both breasts and nipples were checked for symmetry. The outline of each staple was marked, and all staples were removed (Fig. 6). The skin of one breast was infiltrated with a local anesthetic containing a vasoconstrictor of epinephrine 1:400,000, and the skin within the new staple markings was removed in a one-piece en bloc resection inferiorly to superiorly with hemostats and a 20-blade scalpel (Fig. 7).

Fig. 4 Excess tissue of the breast mound is invaginated and stapled from the apex of the new nipple–areola complex (*NAC*) in an inferior direction to the middle of the inframammary crease (*IMC*)

Fig. 5 The new nipple–areola complex (*NAC*) is marked with a nipple–areola marker and checked bilaterally for symmetry

Fig. 6 After the perimeter of all the staples was marked, all the staples were removed

Fig. 7 The skin within the new staple markings was removed in a one-piece en bloc resection inferiorly to superiorly

Relaxing incisions in the dermis were made to allow for easier closure. The subcutaneous tissue was closed with 3–0 Vicryl suture (Ethicon) and subcuticular closure was performed with 5–0 Monocryl (Ethicon).

The incisions were dressed with dry sterile Suture-Strips (1/2 × 4-in. Suture Strip Plus; Derma Science, Princeton, NJ, USA), bacitracin-impregnated Adaptic gauze, and an ABD pad secured loosely with 3-in. paper tape. No drains were used. The patients were placed in their support bras in the recovery room.

Results

Of the 55 patients, 6 (10.9%) had small areas that healed by secondary intention, mostly at the inferior junction of the inverted T. Only two patients (3.6%) had recurrence of breast ptosis, and only one patient (1.8%) had a mildly hypertrophic scar. There were no incidences of hematoma, infection, rippling, malposition of the nipple–areolar complex, capsular contraction, implant malposition, or dissatisfaction with implant size. The bilateral augmentation/mastopexy surgery time ranged from 2 h and 29 min to 4 h and 30 min (average, 3 h and 8 min).

Discussion

Preoperative skin markings can stretch dramatically and be affected by larger breast implant sizes or implant position, rendering the markings obsolete [8]. I no longer have to rely on preoperatively drawn patterns to determine the extent of tissue to be resected. Although the final markings around the staples before skin removal do resemble patterns of the inverted T as described by Marchac [6], the area of skin to be removed is much larger.

I place patients in the supine position with their arms abducted 90° from their sides to create maximum stretch of the breast skin. I believe it is critical to do this so excessive skin is not resected.

A mild learning curve is required to determine the extent and directions of tissues to be invaginated. When the redundant breast tissue is pulled and invaginated in an inferomedial direction and stapled from the lateral IMC staple to the middle of the IMC, maximum lateral tightening is allowed and maximum medial breast fullness is maintained. Repeating this process from the medial staple to the middle of the IMC allows for the greatest projection of the breast mound.

There is a temptation to invaginate skin only laterally or medially, ignoring the inferior vector, an action that can flatten the breast in this area. During the learning curve, the surgeon can remove the staples and start again or return to his or her preferred pattern.

The described approach shows the maximum degree of skin tightening, giving the surgeon reassurance that the tissues will come together and that the vascular supply of the skin edges will not be compromised [7]. It also allows for previsualization of symmetry before a one-piece skin resection. Furthermore, by eliminating the need for multiple skin trimmings, the procedure may be quicker.

I used a combination of deskinning and deepithelialization during the removal of excess skin for every patient reviewed in this report. I have found that the dermis at the inframammary crease (for approximately 4–6 cm) is extremely thin and that it thickens superiorly. As the resection progresses from inferior to superior, I first deskin and then deepithelialize. The depth of resection will not compromise the circulation to the NAC because its circulation comes from the chest wall through the breast parenchema and not the dermal bridge [5]. Deskinning is as effective as deepithelialization and significantly more expedient, with no added risk to the patient [2]. No nipple–areola tissue loss was experienced by any of my 55 patients.

The final closure resembles that of the inverted T, which I prefer because it allows for adequate vertical raising of the NAC and horizontal shortening of the lower breast. An American Society for Aesthetic Plastic Surgery survey of its members found that the inverted T was the most popular mastopexy approach [11]. Another study reporting a patient satisfaction rate of 92% for the inverted T found that this technique achieved a better aesthetic result because it compensated for the excess skin laterally in the inframammary fold and significantly corrected the mammary tissue in both the superior and inferior mammary poles [1].

The downside of this closure is that it is not uncommon to have a small area of dehiscence at the juncture of the inverted T. In my six patients for whom this occurred, the largest area measured approximately 1 cm and spontaneously healed within a couple weeks with the use of topical Silvadene. I attribute this complication to the fact that I was more aggressive in the initial surgeries with the skin resection. By following the inside lines of the new marking made around the staples rather than the outside lines, excessively tight closures can be minimized. Placing the arms in abduction also may help to minimize this complication. Only one patient had thickened scars. Healing usually is quite good and largely accepted by my patients.

One study suggests that major complications such as skin flap or nipple loss can occur with simultaneous augmentation mastopexy [12]. The most common complications reported in one series of 186 augmentation mastopexy patients [15] reviewed were saline implant deflation (5.9%), areola asymmetry (2.7%), recurrent ptosis (1.9–2.2%) [16], capsular contracture (2.2%), and poor scarring (2.2%), and the overall revision rate during a

42-month follow-up period was 16.6%. The revision rate for 150 mastopexy-only patients during a 3-year follow-up period was 8.6%. The authors concluded that this procedure is safe and effective.

I had no incidences of nipple–areolar malpositioning. I believe this is because the described approach allowed for previsualization, which assists in creating more symmetry. I also had two cases of recurrent ptosis.

Some surgeons have expressed concern that removing skin only for the mastopexy may not provide enough support to the lifted breast and might possibly allow for "bottoming out." In fact, it has been suggested that interpositioning of a dermal graft might minimize or eliminate recurrent ptosis [3]. I have found this "bottoming out" to be minimal and suggest that perhaps the current methods and patterns do not permit the maximum resection of tissues. I believe that maximum resection is needed to compensate for the natural limited stretching of the vertical component (or NAC-to-IMC distance), which is the culprit area of recurrent ptosis or "bottoming out." I advise patients that when their initial ptosis is very severe, secondary revision may be needed for retightening.

The implant should always be placed before any tissue is removed for mastopexy [13]. I have found, and it has been reported, that at times after implantation, there is a false sense of adequate lifting of the NAC and breast when the patient is supine rather than sitting up. The preoperative ptosis reappears during sitting if not corrected. The surgeon should not let the implant placement change his or her mind about proceeding with the preplanned mastopexy [1].

I placed all implants in the dual-plane position. It is possible that this placement preserves circulation to the NAC and that subglandular placement might disrupt perforating vessels and compromise circulation to the NAC. Further research on this approach would be useful. In addition to the 55 women who had bilateral augmentation/mastopexy with the described approach, it was used for 12 women who had bilateral mastopexy only and for 9 women who had some combination of augmentation and mastopexy, whether unilateral or bilateral.

Conclusion

The described approach predetermines the maximal amount of tissue to be resected for simultaneous augmentation mastopexy in moderately to severely ptotic breasts and minimizes the chance of tissue necrosis from devascularized skin edges [7]. Symmetry is more easily achieved regardless of the implant size used or the amount of skin to be resected (Fig. 8). This approach also shortens the inverted T scarring in the inframammary fold area and may reduce operative time. The technique might prove useful in other areas of cosmetic surgery, such as brachioplasty, in which bilateral symmetry is the goal (Figs. 9, 10, 11).

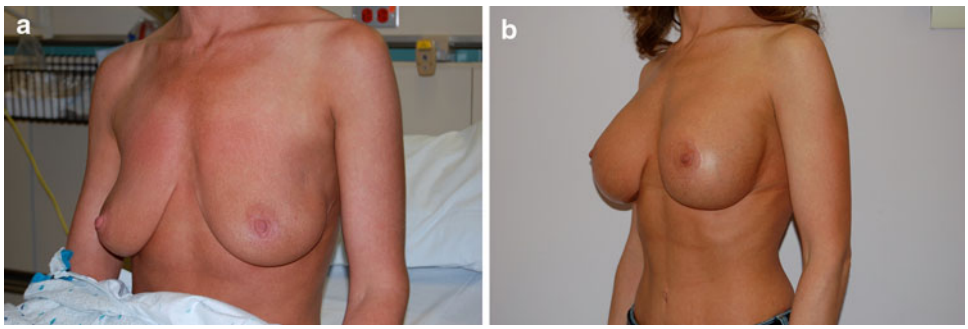

Fig. 8 Views before and after simultaneous augmentation mastopexy. *Before* this 40-year-old, 5-ft 7-in., 120-pound woman had a bilateral augmentation mastopexy with 425-ml saline implants placed subpectorally. *After* view 9 months later

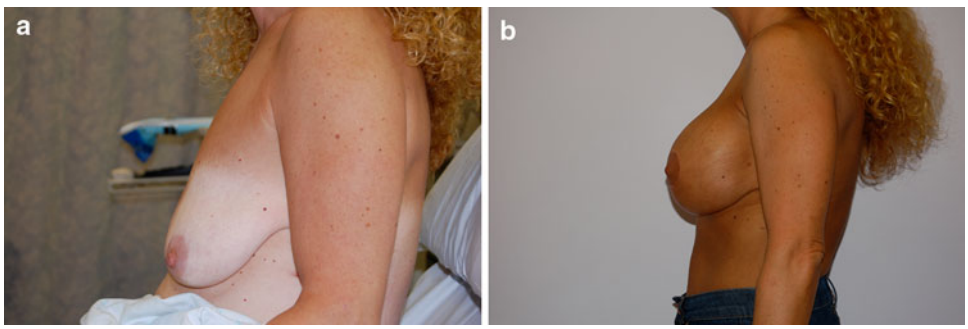

Fig. 9 Views before and after simultaneous augmentation mastopexy. *Before* this 40-year-old, 5-ft 2-in., 126-pound woman had a bilateral augmentation mastopexy with 575-ml saline implants placed subpectorally. *After* view 9 months later

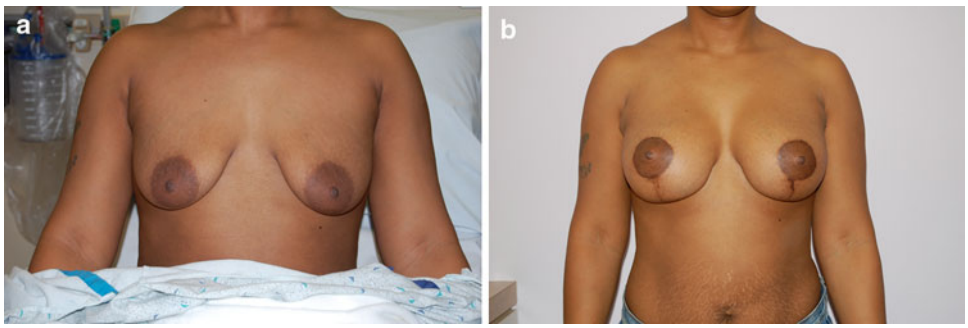

Fig. 10 Before and after simultaneous augmentation mastopexy. *Before* this 28-year-old, 5-ft 1-in., 141-pound woman had a bilateral augmentation mastopexy with 375-ml saline implants placed subpectorally. *After* view 10 months later

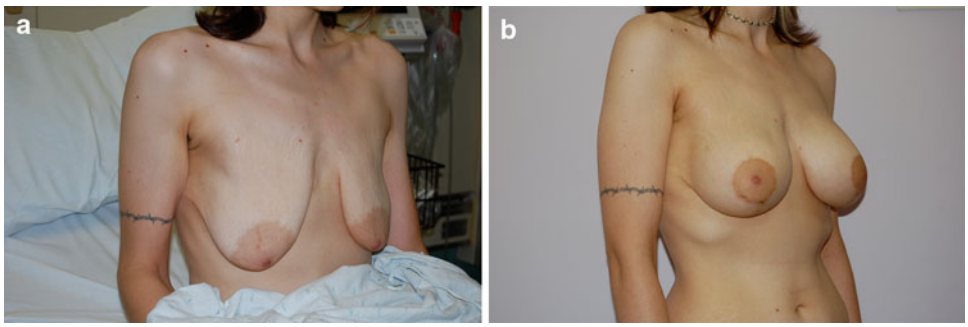

Fig. 11 Before and after simultaneous augmentation mastopexy. *Before* this 30-year-old, 5-ft 8-in., 130-pound nulliparous woman had experienced severe weight loss. She underwent a bilateral augmentation mastopexy with 425-ml saline implants placed subpectorally. *After* view 11 months later

Disclosure The author declares that he has no conflicts of interest to disclose.

References

1. Cardenas-Camarena L, Ramirez-Macias R (2006) Augmentation/mastopexy: how to select and perform the proper technique. Aesthet Plast Surg 30:21–33
2. Iwuagwu OC, Drew PJ (2005) Deskinning versus deepithelialization for inferior pedicle reduction mammoplasty: a prospective comparative analysis. Aesthet Plast Surg 29:202–204
3. Karacaoglu E (2009) Single-stage augmentation mastopexy: a novel technique using autologous dermal graft. Ann Plast Surg 63:600–604
4. Kirwan L (2007) Breast autoaugmentation. Can J Plast Surg 15:73–76
5. Kroll SS (1988) A comparison of deepithelialization and deskinning in inferior pedicle breast reduction. Plast Reconstr Surg 81:913–916
6. Marchac D (1990) Reduction mammoplasty with a short horizontal scar. In: Goldwyn R (ed) Reduction mammaplasty. Little, Brown, Boston, pp 317–336
7. Parsa AA, Jackowe DJ (2010) A new algorithim for breast mastopexy/augmentation. Plast Reconstr Surg 125:75e–77e
8. Pinsky MA (2005) Radial plication in concentric mastopexy. Aesthet Plast Surg 29:391–399
9. Regnault P (1966) The hypoplastic and ptotic breast: a combined generation with prosthetic augmentation. Plast Reconstr Surg 37:31–37
10. Regnault P (1976) Breast ptosis: definition and treatment. Clin Plast Surg 3:93
11. Rohrich RJ, Gosman AA, Brown SA, Reisch J (2006) Mastopexy preferences: a survey of board-certified plastic surgeons. Plast Reconstr Surg 118:1631–1638
12. Spear SL (2003) Augmentation/mastopexy: "Surgeon, beware". Plast Reconstr Surg 112:905–906
13. Spear SL, Dayan JH, Clemens MW (2009) Augmentation mastopexy. Clin Plastic Surg 36:105–115
14. Spear SL, Giese SY (2000) Simultaneous breast augmentation and mastopexy. Aesthet Surg J 20:155–164
15. Stevens WG, Stoker DA, Freeman ME, Quardt SM, Hirsch EM, Cohen R (2006) Is one-stage breast augmentation with mastopexy safe and effective? A review of 186 primary cases. Aesthet Surg J 26:674–681
16. Stevens WG, Freeman ME, Stoker DA, Quardt SM, Cohen R, Hirsch EM (2007) One-stage mastopexy with breast augmentation: a review of 321 patients. Plast Reconstr Surg 120:1674–1679
17. Tebbetts JB (2001) Dual-plane breast augmentation: optimizing implant-soft-tissue relationships in a wide range of breast types. Plast Reconstr Surg 107:1255–1277
18. Whidden PG (1978) The tailor-tack mastopexy. Plast Reconstr Surg 62:347–354
19. Wise RJ, Ganon JP, Hill JR (1963) Further experience with reduction mammoplasty. Plast Reconstr Surg 32:12