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CASE REPORT

Augmentation–Mastopexy Using an Autologous Parenchymal Sling

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Abstract

Background Mastopexy–augmentation is an important treatment to address breast deflation. Combining these two procedures is technique-sensitive, with a reported high revision rate and propensity for complications. We describe an approach to achieve aesthetic breast correction in an effective, reproducible, and safe manner while minimizing untoward sequela.

Methods A vertical mastopexy, using a superior dermoglandular pedicle, is coupled with a subpectoral breast implant with the support of a longitudinal autologous sling of breast fascia, termed autologous sling augmentation–mastopexy.

Results Twenty consecutive patients, aged 25-49 years, were treated by this technique, with a follow-up period of at least 1 year. Aesthetic improvement of breast shape, projection, and nipple position were achieved in all patients. No major complications, including infection, necrosis, or implant exposure, occurred. Minor wound-healing deficits at the inferior aspect of the vertical resection occurred in three patients. One patient required implant exchange early postoperatively because of saline leakage. No revisions were necessary to adjust breast symmetry or nipple position.

Conclusion We describe a mastopexy–augmentation technique, based on patient selection, mastopexy resection pattern, and implant size and position, to improve breast aesthetics safely and reproducibly while minimizing complications and the need for near-term revision.

Keywords Mastopexy–augmentation · Breast · Autologous parenchymal sling

The deflated ptotic breast frequently benefits from combined mastopexy and augmentation procedures. The mastopexy repositions the breast mound and nipple superiorly, while the augmentation increases breast volume and further fills the skin envelope. These procedures have been performed in concert for nearly 50 years [1, 2], but recently several reports have suggested that mastopexy and augmentation performed in unison carry an increased complication rate [3]. Several reports advocate caution when performing these procedures simultaneously [4–7]. The purpose of this article is to report our approach to achieve consistent, reproducible results using a vertical mastopexy technique in combination with augmentation using implants no greater than 350 cc.

Surgical Technique

The autologous sling augmentation–mastopexy technique is ideal for women with mild to moderate ptosis and adequate breast skin quality. Nonsmoking patients aged

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30–50 years with post-lactational deflation are well-suited for this technique. Massive weight loss patients are not good candidates because of a tendency toward greater deflation and ptosis, poor skin quality, and frequently large skin resection required. Implant selection takes into account body habitus and breast width, similar to when a breast augmentation is performed in isolation. The prosthesis can be silicone or saline with a volume no greater than 350 cc. If the patient desires an augmentation greater than 350 cc, we recommend a staged procedure.

The breasts are marked preoperatively with the patient in a standing position (Fig. 1). The sternal notch and midline are marked vertically down to the xiphoid. The inframammary folds are drawn. The breast meridian is scribed descending from the clavicular midpoint (typically 6–8 cm from the sternal notch) down onto the anterior and posterior breast surfaces and terminating on the abdominal skin. The planned nipple position is determined by transposing the inframammary fold position onto the breast and the superior border of the mosque pattern is placed at this point, rather than 2 cm cephalad, to account for further raising of the nipple position upon implant placement. The nipple position is lower than the traditional Wise pattern reduction or mastopexy markings. The patient is then instructed to resist motion while the surgeon deflects the breast first medially and then laterally and marks a vertical tangent from the breast meridian onto the deflected breast, tapering to a point 2 cm superior to the existing inframammary fold. A horizontal line is then drawn 2 cm below the nipple–areola complex (NAC), within the confines of the medial and lateral borders. This horizontal divide serves as the boundary of dermoglandular preservation above and skin and parenchymal excision below. These markings are performed bilaterally and were visually assessed for symmetry, taking into account existing breast asymmetries.

The procedure is performed under general anesthesia or local/IV sedation. Antibiotics are administered and mechanical DVT prophylaxis implemented prior to incision. A circumareolar incision is made (average diameter = 40 mm), and the mosque and remainder of the vertical pattern are incised. The pedicle is deepithelialized, leaving at least 2 cm of dermoglandular tissue inferior to the lower border of the areola (Fig. 2). Next, the inferior triangular skin, subcutaneous tissue, and a small wedge of breast tissue are excised, taking care to leave a thickness of breast tissue on the chest

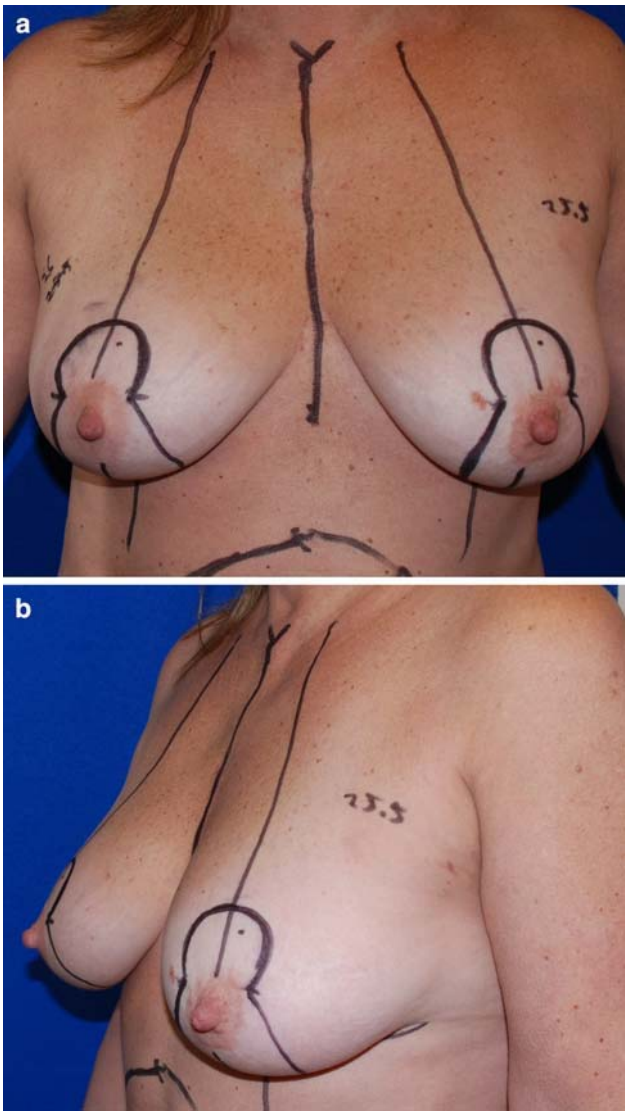

Fig. 1 The breast meridian, sternal midline, and mastectomy pattern are drawn with the patient standing

Fig. 2 The superior dermoglandular pedicle of the mastopexy is deepithelialized

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wall and without lateral or medial undermining (Fig. 3). Inferiorly, 2–3 cm of undermining is implemented, taking the apex of the excised triangle from the skin close to the dermis as this will be inferior to the new breast position and raise the inframammary fold. This triangle of inferior pole skin and breast tissue is typically minimal (20–40 g in this series).

Fig. 3 An inferior triangle of skin and breast parenchyma is excised

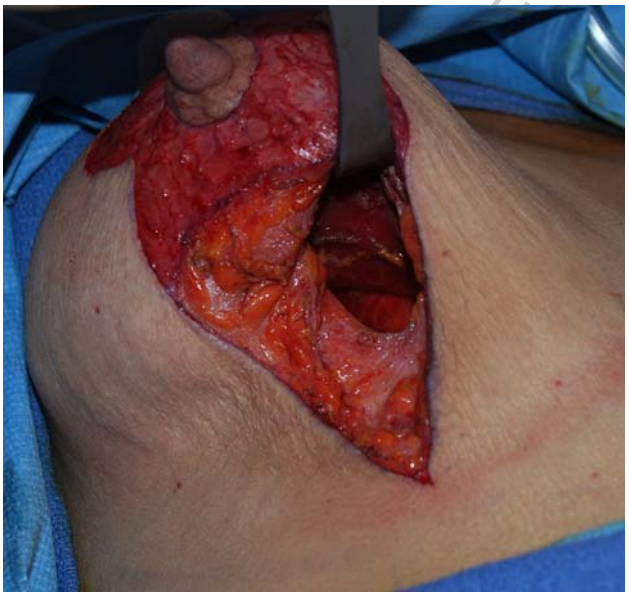

Fig. 4 A sling of breast fascia is identified and incised and a subpectoral implant pocket is created

After excising the inferior triangle of skin, fat, and breast tissue, an access portal to the chest wall is established. A 2–3-cm incision is created on the fourth or fifth rib (identical bilaterally). A subpectoral pocket is raised extending medially 1 cm from the sternum, superiorly 1–2 cm from the clavicle, and with judicious lateral dissection (Fig. 4). From within the submuscular pocket, the inferomedial aspect of the pectoralis muscle (6–9 o'clock) is divided from deep to superficial until breast parenchyma is visualized. This creates a biplanar transition zone where the implant rests mostly underneath pectoralis but is directly under glandular tissue inferomedially.

The implant is inserted into the pocket and manipulated into a symmetric position that is verified with the patient seated upright. The breast tissue overlying the subpectoral pocket is then closed as the deepest layer with 3-0 absorbable sutures and the knots being superficial to the implant (Fig. 5). With the implant now secure in its pocket

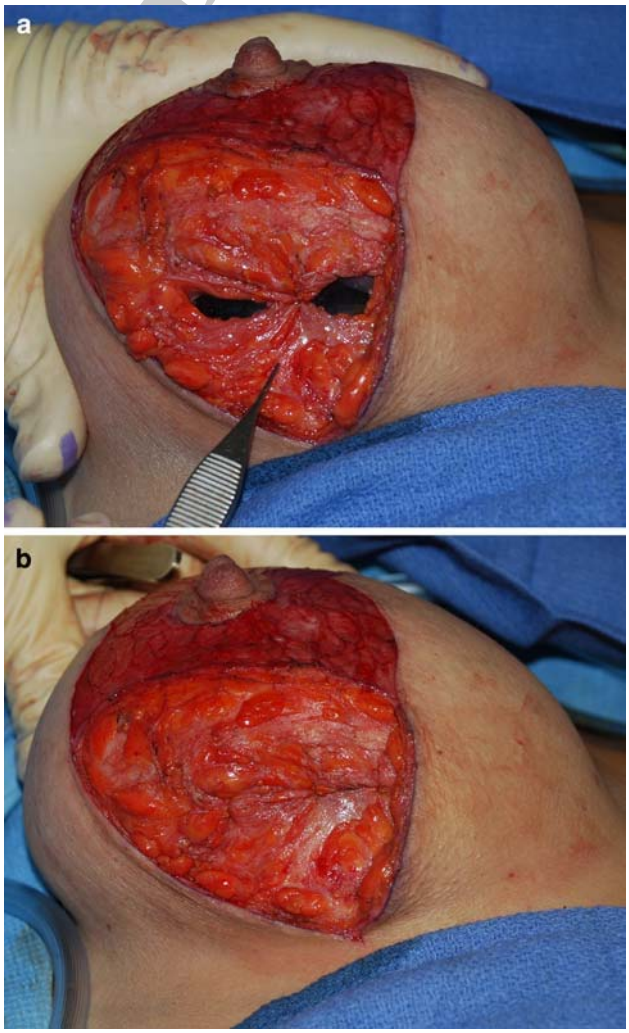

Fig. 5 The autologous fascial sling is closed over the inferior pole of the implant, providing stable coverage

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and symmetric with the contralateral side, the open mastopexy flaps are manipulated superomedially into an ideal aesthetic position and tailor-tacked. Attention is paid only on the upper two thirds of the breast mound and nipple at this point, and the lateral and medial breast skin is either tailor-tacked or marked into place. Once judged as aesthetic and symmetric, the pillars are closed with a 2-0 monofilament absorbable suture (Fig. 6).

Fig. 6 The medial and lateral pillars are approximated and the nipple position inset

The NAC position is then finalized, occasionally requiring additional excision of small skin crescents from the mosque to permit the nipple to lie circular and/or to achieve symmetry with the contralateral side. Once appropriately positioned, the NAC is secured with dermal 3-0 braided absorbable sutures. Finally, the inferior aspect of the incision is addressed where the inframammary fold is raised. This is closed in a linear fashion or a "J" is incorporated into the incision if significant puckering is present. The skin is then closed with a 4-0 running buried monofilament suture and steristrips are placed perpendicular to the incisions. Two-inch paper tape is used as an abutment at the new inframammary fold position.

Results

The mastopexy–augmentation technique described was performed in 20 consecutive patients, aged 25–49 years (average age = 38 years) with mild to moderate ptosis, relative breast symmetry, and no prior history of breast surgery. Approximately 20–40 g of dermoglandular tissue was excised from the inferior quadrant of each breast as

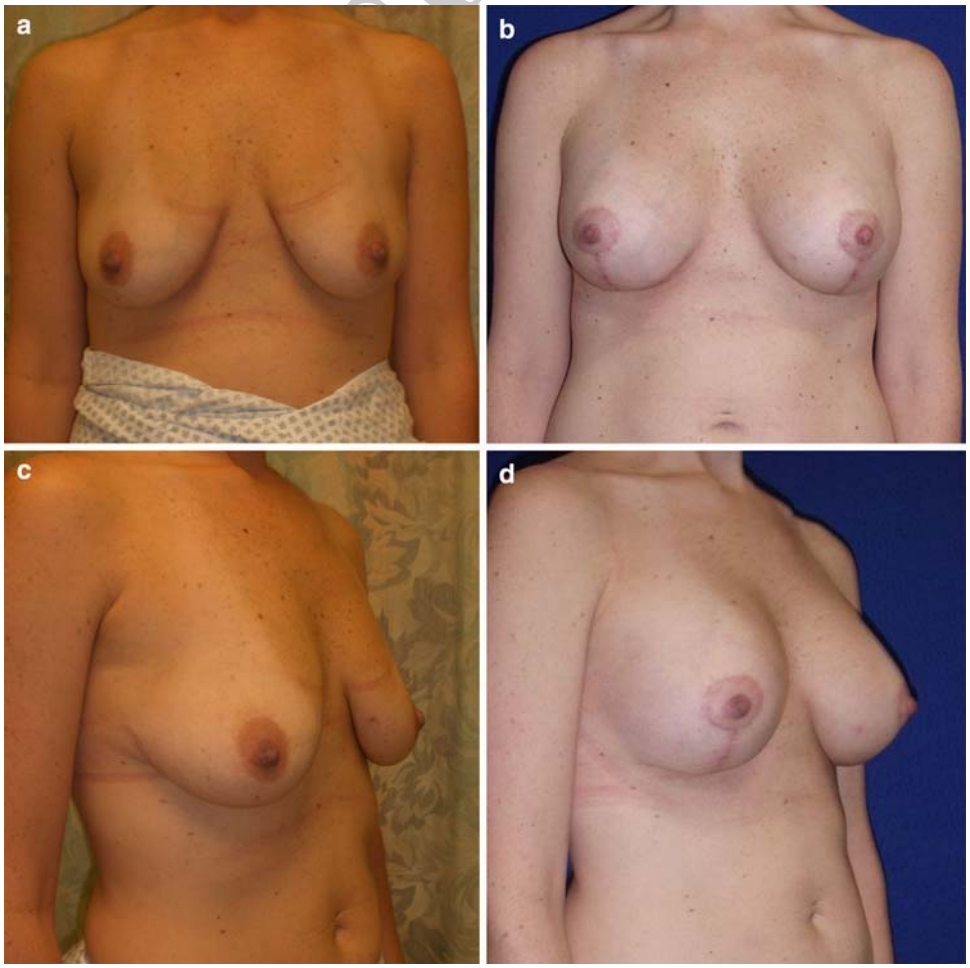

Fig. 7 **a**, **c** Preoperative views of a 32-year-old patient with moderate breast ptosis. **b**, **d** Postoperative views 3 months after mastopexy and augmentation with a 275-cc implant

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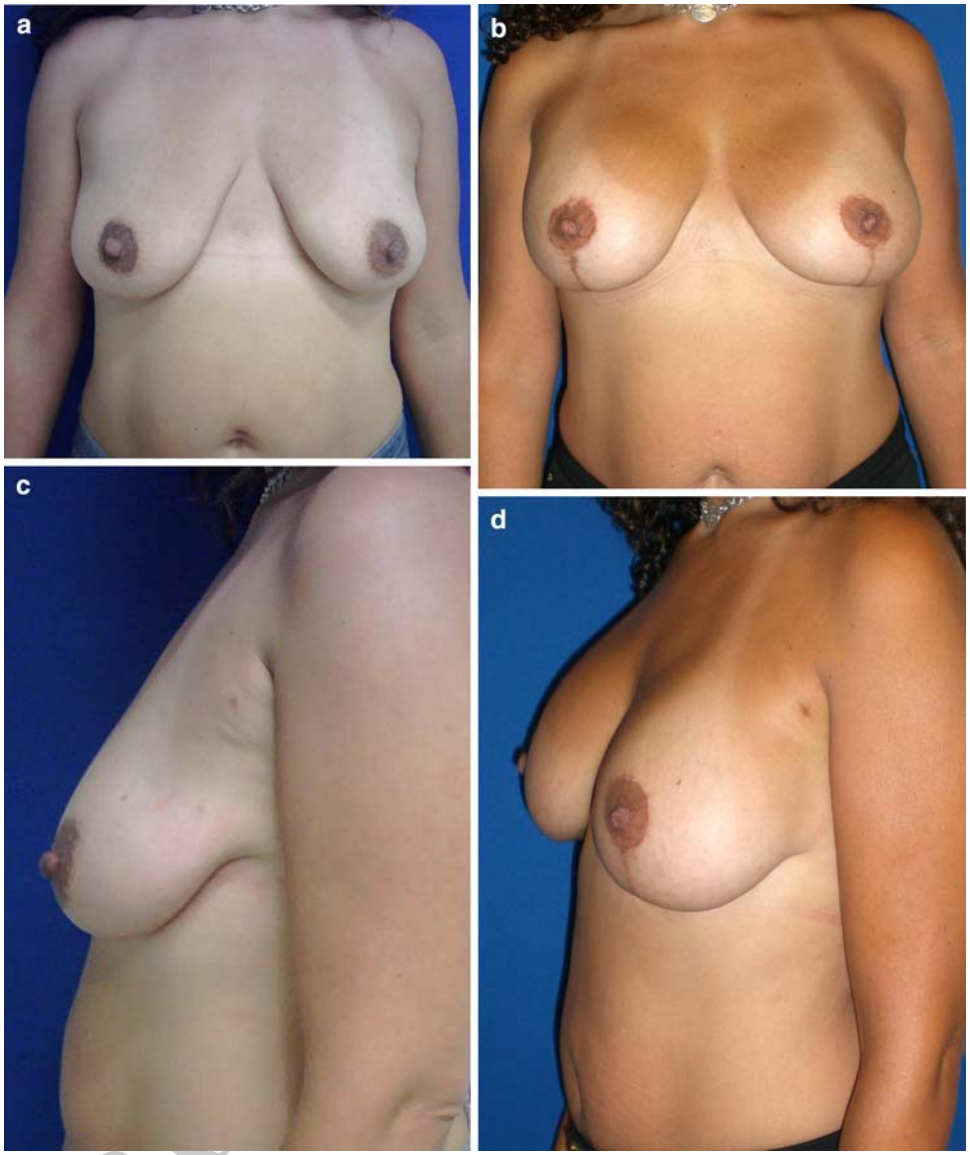

Fig. 8 **a**, **c** Preoperative views of a 42-year-old patient with moderate breast ptosis. **b**, **d** Postoperative views 12 months after mastopexy and augmentation with a 250-cc implant

part of the mastopexy. Symmetry, breast projection, and nipple projection were judged as good by both patients and practitioners at both 6-month and 1-year follow-up (Figs. 7, 8, 9 and 10). There were no cases of hematoma, nipple–areola necrosis, or implant loss. Minor complications consisting of partial dehiscence at the inferior aspect of the mastopexy excision occurred in three patients, each healing by secondary intention following conservative measures. One patient required implant exchange because of saline leakage secondary to port malfunction in the early postoperative period.

Discussion

Improving the shape, contour, and fullness of the deflated, ptotic breast is challenging. Augmentation increases breast volume but does not completely improve the sagging breast mound and inferior nipple position. Mastopexy repositions the breast mound and nipple superiorly and removes excess skin, but does not increase breast size. Both procedures are necessary to achieve a larger, pert breast with a well-positioned nipple in a woman with ptotic breasts.

However, mastopexy and augmentation impart contradictory forces. The mastopexy lifts the breast superiorly, transmitting forces inward and upward, while contracting the skin envelope. Augmentation pushes outward and down while expanding the skin envelope. Though opposing forces, in the ideal setting these are synchronized to create the optimal correction of the deflated breast.

Complications of a combined mastopexy–augmentation are related to the implant, the breast soft tissue, or both. Phenomena that occur with each procedure individually can develop when performed in combination. For instance,

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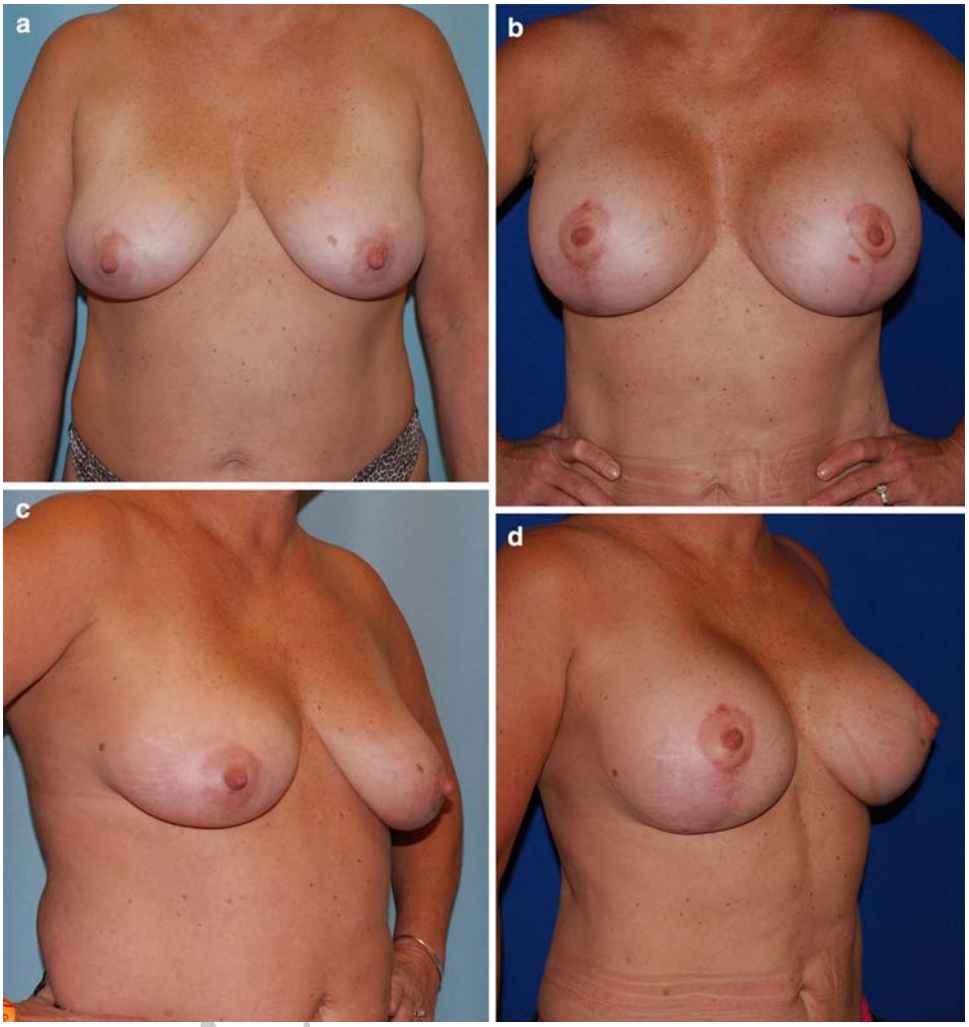

Fig. 9 **a**, **c** Preoperative views of a 46-year-old patient with moderate breast ptosis. **b**, **d** Postoperative views 6 months after mastopexy and augmentation with a 325-cc implant

implant complications (e.g., capsular contracture, implant size change, implant malposition) and ill effects related to the mastopexy (e.g., recurrent ptosis, poor scars, and nipple malposition) can be compounded when performing mastopexy and augmentation together. The nipples may be improperly repositioned (e.g., too high or too low) or a differential nipple location can be inadvertently imparted between sides. Proper planning must take into account soft tissue markings, the effect of the mastopexy, and the effect of the implant to avoid the problem of nipple malposition.

Mastopexy closure should impart controlled tension to effectively tighten the skin envelope, but with the combined outward forces of the implant, the tension should not be so great as to diminish vascularity and portend wound-healing problems or scar widening. The devastating complication of nipple loss due to vascular compromise appears to be more prevalent when a mastopexy is performed on a previously augmented breast, particularly when the implant is in the subglandular position [8].

We describe a method of mastopexy–augmentation that is easy to reproduce and safe. More than half of the cases included in this series were performed by a trainee under the supervision of the senior author. Complications have included partial dehiscence at the inferior aspect of the mastopexy excision in three areas and one port malfunction requiring implant exchange, with the remainder of the cases showing no implant- or soft tissue-related complications to date.

The keys to success in using the sling mastopexy include: (1) conservative vertical mastopexy markings, (2) a low threshold for intraoperative modification of markings, (3) excising an inferior wedge of skin and breast parenchyma (leaving a superior dermoglandular pedicle to the NAC), (4) maintaining parenchymal tissue overlying the pectoralis fascia, (5) utilizing implants less than or equal to 350 cc, (6) placing the implant in a subpectoral pocket, and (7) reapproximating the ligamentous parenchymal attachments for complete implant coverage (so-called "parenchymal sling").

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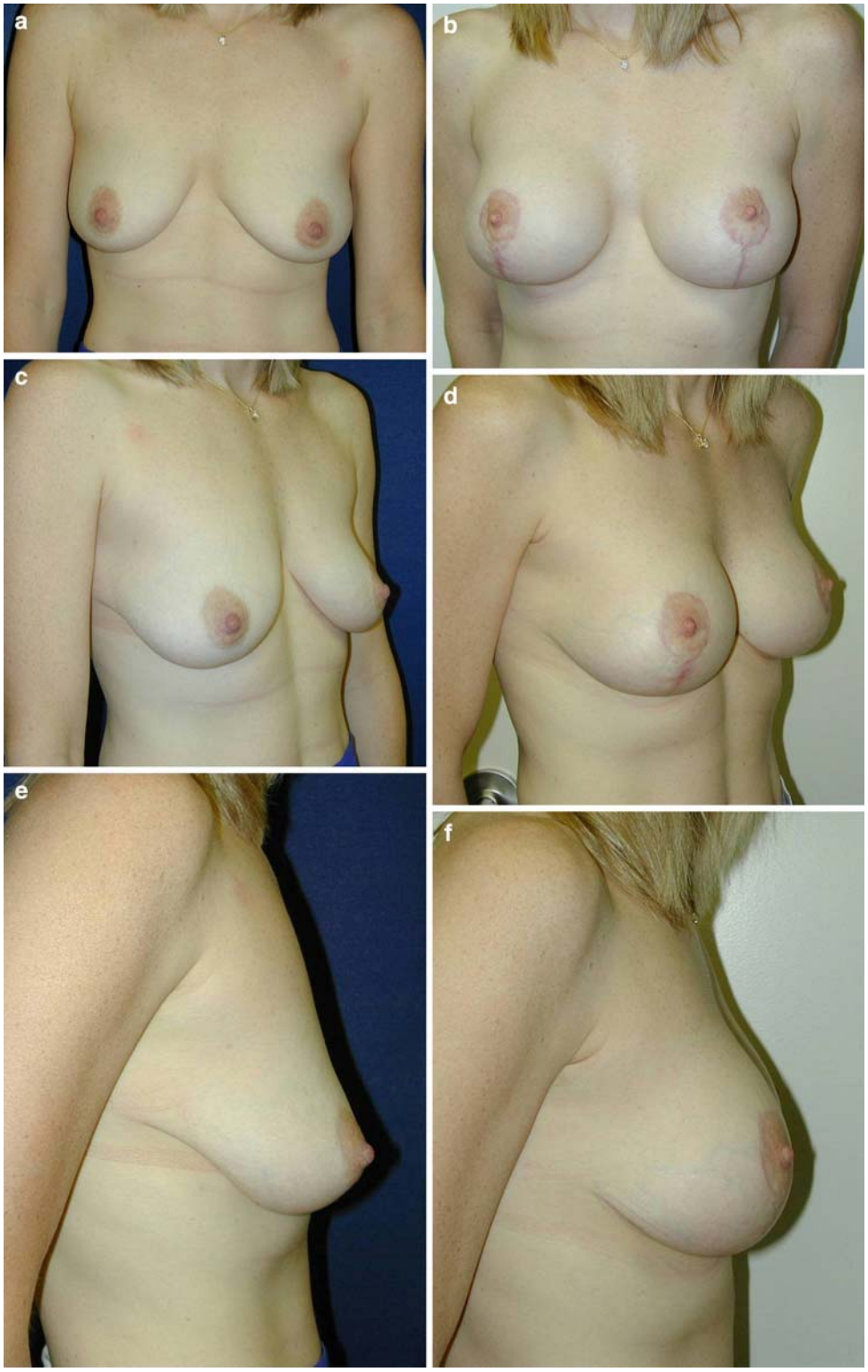

Fig. 10 **a**, **c**, **e** Preoperative views of a 34-year-old patient with moderate breast ptosis and mild asymmetry. **b**, **d**, **f** Postoperative views 14 months after mastopexy and augmentation with a 250-cc implant

The importance of resection of breast parenchyma during an augmentation procedure is counterintuitive but provides a twofold advantage. The first is that resection, followed by closure of medial and lateral "pillars," which consist of full-thickness columns of parenchyma (including intervening suspensory ligaments of Cooper), dermis, and skin, creates a lift with more support compared to a skin-only technique. The second advantage is increased mobility of the NAC, mitigating the tendency for recurrent ptosis and scar widening.

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The wedge excision of the inferior pole parenchyma is partial and spares 1 cm of parenchymal-ligamentous tissue to provide added autologous implant coverage in the region inferior to the free border of the pectoralis major muscle. This coverage serves as structural support, a possible barrier to infection, and added tissue thickness to decrease implant palpability.

In primary mastopexy–augmentation, so long as a conservative, systematic approach is taken, a reproducible, aesthetically pleasing result can be achieved. The keys to our approach are that it is conservative and modifiable. The moderately sized implant is protected by layers of pectoralis muscle, Cooper's ligaments, and breast parenchyma. Equivalent implant pockets, equal dermoglandular excisions, and fastidious attention to final nipple position ensure excellent breast symmetry.

Conclusion

The autologous parenchymal sling augmentation–mastopexy is an effective approach to aesthetically improve the ptotic, involutional breast. Patient selection, implant size, and operative technique are critical to a successful outcome. We present our approach to achieve consistent, reproducible, aesthetic results, while minimizing revisions and complications.

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