Autoaugmentation Mastopexy with an Inferior-Based Pedicle

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Abstract  Mammaplasty for breast enhancement and correction of ptosis augmentation is described. Between 2002 and 2007, autoaugmentation mammaplasty was performed for 27 patients (age, 48 ± 7.3 years) using an inferior-based flap of deepithelialized dermoglandular tissue inserted beneath the breast parenchyma of a superior-based nipple-areolar complex pedicle. The results confirmed that autoaugmentation mammaplasty corrects ptosis while increasing the projection and apparent volume of the breast. The degree of inframammary fold (IMF) descent 6 months after surgery generally paralleled that of the nipple. The mean level of the IMF was below the mean level of the nipple. Postoperatively, the optimum distance had been largely achieved. The advantage of the technique is that it optimizes the shape and volume of the breast without the use of an implant.

Keywords  Autoaugmentation mammaplasty · Breast ptosis · Mastopexy

Autoaugmentation mammaplasty is an alternative for patients with small breasts who desire improvement in their breast shape without the use of an implant [1–12]. This procedure corrects ptosis while increasing the projection and apparent volume of the breast when mastopexy is used. The goal of autoaugmentation mammaplasty is to give the breast volume. Using the inferior pedicle described by Ribeiro et al. [3, 4] in 1971 or the vertical pedicle described by McKissoc [9], volumetric transfer of the back of the central pedicle augments the breast projection. At follow-up evaluation, autoaugmentation mammaplasty is assessed, with special attention paid to the long-term results in terms of breast shape.

Fig. 1  Preoperative view showing the preoperative markings for a patient undergoing autoaugmentation mammaplasty
Indications

Autoaugmentation mammoplasty is suitable for patients with small or ptotic breasts who desire repositioning of their breasts but do not wish to undergo a breast implant.

Patients and Methods

Between 2002 and 2007, autoaugmentation mammoplasty was performed for 27 patients (age, 48 ± 7.3 years). All

Table 1 Pre- and postoperative evaluation of the NAC positioning (n = 27)

| Distance | Preoperative (cm) | After 6 months (cm) | After 12 months (cm) |
|----------|------------------|---------------------|----------------------|
| N-SN     | 25.2 ± 0.9       | 20.2 ± 0.7          | 21.3 ± 0.6           |
| N-IMF    | 9.3 ± 0.8        | 7.1 ± 0.7           | 7.3 ± 0.3            |
| IMD      | 3.4 ± 0.1        | 2.8 ± 0.9           | 3.2 ± 0.7            |

N-SN distance between the nipple and the sternal notch, N-IMF distance between the nipple and the inframammary fold, IMD intermammary distance

Fig. 2 a Frontal intraoperative view of a patient undergoing autoaugmentation mammoplasty using an inferior-based flap of deepithelialized skin and subcutaneous breast tissue modulated to its pedicle inserted beneath a superior pedicle to correct ptosis and to increase the projection and apparent volume of the breast. b Lateral intraoperative view of a patient undergoing autoaugmentation mammoplasty with a superior pedicle mastopexy technique using a deepithelialized inferior-based flap. c Frontal intraoperative view a patient undergoing autoaugmentation mammoplasty with a superior pedicle mastopexy technique using a deepithelialized inferior-based flap of subcutaneous and breast tissue as a foundation with the superior nipple-areola complex (NAC) seated on top. d Oblique intraoperative view of a patient undergoing autoaugmentation mammoplasty with a superior pedicle mastopexy technique using a deepithelialized inferior-based flap. The skin has been draped over the flap.
the patients underwent a thorough, individualized preoperative evaluation to establish a correct diagnosis, exclude malignancies, and determine the level of the new nipple position.

For all the patients, the distance between the nipple and the sternal notch, the distance between the nipple and the inframammary fold, and the intermammary distance were measured preoperatively then 6 and 12 months after surgery (Fig. 1, Table 1).

### Surgical Techniques

With the patient under general anesthesia, autoaugmentation mammoplasty was routinely performed. Markings were performed preoperatively with the patient in a standing position (Fig. 1). Establishment of the new nipple position was the most important step. The best way to estimate nipple position is by measuring the proposed new nipple from the fixed point of the suprasternal notch. The final nipple position was established with the patient sitting up at 90° on the operating table.

The breast tissue was reconfigured to produce the best possible shape by narrowing the base dimension and position of the breast, which usually entailed central transposition of tissue. This was achieved with a superior pedicle mastopexy technique using a deepithelialized inferior-based flap of subcutaneous and breast tissue as a foundation with the superior nipple-areola complex (NAC) seated on top (Fig. 2a–d).

The inferior pedicle was drawn with a width of 5 to 6 cm, a length 2 cm below the NAC, and a thickness not less than 2 cm. After deepithelialization of the periareolar and pedicle area, the marked flap was incised. After the parenchyma had been undermined toward the upper pole, the inferior deepithelialized pedicle was raised and both the subcutaneous tissues and the breast parenchyma of the central lower breast were folded beneath the nipple and areola to maximize upper breast volume (Fig. 2a–d). The pedicle was fixed to the pectoralis major fascia without any restriction behind the NAC (Fig. 2c).

After the flap was tacked to the chest wall with 3 × 0 polydioxanone sutures, closure of the medial and lateral pillars over the flap optimized upper pole fullness. Closure of the periareolar incision was performed via a round block technique using a purse-string suture as described by Hammond et al. [2].

### Table 2 Pre- and postoperative evaluation of nipple (N) and inframammary fold (IMF) positioning (n = 27)

| Level       | Preoperative (cm) | After 6 months (cm) | After 12 months (cm) |
|-------------|-------------------|---------------------|----------------------|
| N to Y      | 4.2 ± 3.2         | 1.2 ± 2.1           | 1.4 ± 1.8            |
| IMF to Y    | 5.8 ± 2.2         | 4.3 ± 1.8           | 4.8 ± 1.7            |

*a Level of nipple (N) and level of the inframammary fold (IMF) to Y. Pre- and postoperative lateral views in a series of autoaugmentation mammoplasties.*

### Table 3 Pre- and postoperative evaluation of nipple projection (n = 27)

| Distance    | Preoperative (cm) | After 6 months (cm) | After 12 months (cm) |
|-------------|-------------------|---------------------|----------------------|
| Npr to Ch   | 4.6 ± 1.2         | 5.6 ± 1.1           | 4.9 ± 1.2            |

*a Projection of the nipple (Npr) to a perpendicular line of the chest (Ch) wall in patients standing erect in a series of autoaugmentation mammoplasties before and after surgery.*

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The level of the nipple (N) and the level of the inframammary fold (IMF) to Y are measured in the lateral view in a series of autoaugmentation mammoplasties pre- and postoperatively. Y is the midpoint (B) between the tip of the acromion and the lateral epicondyle minus 1 cm. X is the level of the IMF measured to Y.
Results

The median follow-up period was 18 ± 2.1 months. Immediate healing was achieved without complications, adverse reactions, or side effects. All patients healed uneventfully without any postoperative problems. No swelling or seromatous fluid collection necessitated a second procedure or a prolonged drainage. No partial or total necrosis of the nipple or hypertrophic scarring was detected.

The surgical outcome was evaluated according to analyses performed before and after surgery based on pre- and postoperative measurements (Fig. 3). The aesthetic results were considered good to excellent in all cases, and the contour results were stable in the long-term follow-up evaluation (Figs. 4 and 5).

The degree of inframammary fold (IMF) descent 6 months postoperatively generally paralleled that of the nipple (Tables 1 and 2). The mean level of the inframammary fold was below the mean level of the nipple. Postoperatively, the optimum distance had been largely achieved. There was a descent of the inframammary fold and that of the nipple projection as a result of whole breast ptosis (Table 3).

Discussion

Autoaugmentation mammoplasty dates back to Ribeiro’s [3, 4] report in 1971. This procedure removes breast tissue from the area with more tissue and places it in an area with

Fig. 4  a Preoperative frontal view of a patient undergoing autoaugmentation mammoplasty using an inferior-based deepithelialized flap in combination with a vertical mastopexy technique for breast enhancement. b Postoperative frontal view 12 months after surgery. c Preoperative right oblique view. d Postoperative right oblique view. Note the projection of the nipple-areola complex (NAC). e Preoperative lateral view. f Later view 12 months after surgery.
a deficit. This tissue works as a natural prosthesis and provides good vascularization for the lower portion of the breast. The inferior pedicle allows shifting of the pedicle under the central parenchyma of the breast behind the NAC to the area that usually is loose and empty. The technique also has a conization effect from vertical reduction using the method described by Lassus [10], Lejour [11] and Marchac [13]. The inferior pedicle preserves the bottoming out because the flap is attached to the pectoralis major fascia, thereby reducing the weight of the remaining breast. This allows elevation of the inframammary fold and reduction of the base, as confirmed by our results. However, fixation of the flap to the pectoralis major is critical [14–20]. It is imperative that a predictable and strong fixation to the pectoralis major fascia be obtained because the muscle fibers alone are prone to rupture.

To achieve aesthetically pleasant pole fullness, a long volumetric pedicle usually is needed when autoaugmentation mammoplasty is performed. Therefore, the volume of the inferior pedicle depends on the distance between the areola and the inframammary fold. Its upper limit is located 1 cm below the inferior edge of the areola. The distance between the lateral and medial borders of the breast pillars and the base of the pedicle extending to the inframammary crease defines the width of the flap, which is approximately 6 to 8 cm, with a thickness of 4 cm.

Compared with a superior pedicle flap or a McKissock [9] flap, which is folded on itself, the inferior pedicle has the disadvantage that in cases of a short pedicle, it can not be folded on itself. Therefore, the milk ducts will not recanalize because the deepithelialized dermoglandular surface is in contact with the sub areola area. Compared with the lateral pedicle advocated in some reduction mammoplasty procedures for autoaugmentation, which offers limited recruitment of tissue [12], the inferior pedicle is designed to give a better breast shape, with upper
fullness and more volume, which is imperative in auto-
augmentation. Ribeiro’s [3, 4] technique, involving rotation
of an inferior pedicle flap in the upper pole, provides
autoaugmentation mammoplasty improvement of upper
breast fullness, as our results confirmed.

To stabilize the shape and the size of the areola, which is
mandatory, we use a round block suture as described by
Hammond et al. [2]. In combination with the pedicle, this
provides a conical shape of the breasts with good projec-
tion and gives good long-term results.

We believe that the autoaugmentation mammoplasty
procedure is suitable for patients with small ptotic breasts
who desire repositioning of their breasts with autogenous
tissue, thereby avoiding insertion of another implant. The
described technique can be used with standard inverted
T-incisions, vertical incisions with short incision compo-
nents, and pure vertical incisions. Depending on the patient’s
wishes and the volume of the breast, a bipedicle flap also can
be used for re-autoaugmentation in certain cases.

Conclusion

Autoaugmentation mammoplasty is an alternative for
patients with small breasts who desire improvement of
their breast shape without the use of an implant. It corrects
ptosis while increasing the projection and apparent volume
of the breast. The advantage of the technique is that it both
minimizes the skin scar and optimizes the shape of the
breast due to suture fixation of the pillars of the breast
parenchyma.

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