Breast Reduction: The Inferior Pedicle as an Axial Pattern Flap

The ideal breast reduction technique would allow for reliable and consistent transposition of the nipple areolar complex (NAC) with preservation of nipple viability, sensibility, and lactation potential. The ideal technique would also be applicable to all breast sizes. The blood supply to the breast is redundant, and its arterial anatomy has been well described. The arterial blood supply is from internal mammary, suprascapular, lateral thoracic, and intercostal perforators. Three pairs of intercostal perforators exist from the fourth, fifth, and sixth intercostal spaces, respectively (Figure 1). The redundancy is evident in that multiple breast reduction techniques exist that rely on completely different components of this vascular anatomy to sustain the NAC. The application of some of these techniques to the massively enlarged breast is questionable because of the unreliable viability of the NAC, and nipple grafting techniques are often recommended.

The inferior pedicle technique for breast reduction is well established as a reliable procedure. This technique has undergone several modifications. Whereas the dermal plexus was originally thought to supply blood to the NAC, it is now widely accepted that the intercostal perforators are directly responsible for NAC perfusion.

Most descriptions of the technique suggest a “blind” creation of this pedicle without specific identification of these perforators. The technique described here creates an inferior pedicle as an axial pattern flap based on the fourth, fifth, and sixth intercostal perforators. In this way an identifiable vascular supply is established that preserves the glandular tissue beneath the NAC and possibly the fourth intercostal nerves as they ascend the NAC.

Patient Selection

The technique we describe has wide applicability and has been used with patients from 13 to 74 years of age. The longest notch to nipple distance has been 46 cm, and the longest inferior pedicle length (nipple to fold) has been 23 cm. The reduction in weight has ranged from 120 to 2,246 gm. In addition, 17% of patients have been smokers.

Operative Technique

A keyhole pattern is marked on the patient according to surgeon preference (Figure 2, A). The inferior pedicle width is arbitrarily set at 8 cm. The NAC is marked with the appropriately sized nipple ring, and the inferior pedicle is deepithelialized to the inframammary fold (Figure 2, B). Although the dermis probably contributes little to nipple viability, its presence gives the inferior pedicle some structural integrity to prevent twisting or shearing of the intercostal perforators during manipulation.

Skin flaps are developed in a plane between the breast parenchyma and the subcutaneous fat (Figure 2, C), creating a skin brassiere. This plane of dissection is similar.
to that used for a mastectomy but the skin flaps are 1.5 to 2 cm thick. The vascular extensions of the lateral thoracic and internal mammary vessels are kept in the skin flaps, maintaining their perfusion. By performing the dissection in this watershed plane, blood loss is kept to a minimum. This technique for developing the skin flaps has been described previously by Hester et al.\(^\text{13}\)

At this point (Figure 2, D), the upper pole of the breast is elevated off the pectoral fascia in a craniocaudal direction until the intercostal perforators are identified in the fourth intercostal space. Dissection is then carried along these vessels within a cleavage plane of the breast toward the NAC (Figure 2, E). This maneuver essentially unfolds the breast into an axial flap on the basis of the intercostal perforators. Now a resection of the medial, superior, and lateral components of the breast can be performed in an “en bloc” fashion with the nutrient vessels under direct visualization (Figure 2, F). The resulting inferior pedicle (Figure 2, G) can be positioned and the skin can be redraped appropriately to close the inverted T incision (Figure 2, H). The NAC is then positioned and inset (Figure 2, I).

**Results**

When this inferior pedicle technique is used the ultimate shape of the breast depends on the design of the skin brassiere. Creating the pedicle in this way can minimize operative time and blood loss, and vascular anatomy can be defined. The central breast parenchyma is left in continuity with the NAC, which may preserve the lactation potential of the breast. Because the pedicle is based on the fourth intercostal space, the associated intercostal nerve may be preserved. This technique does not obviate the need for meticulous dissection; however, with definition of the pedicle one can resect the maximum amount of tissue more confidently and still preserve NAC viability. This capability is especially important for patients with minimally enlarged breasts, because insurance considerations have dictated weight limits for reimbursement.

A retrospective review of 186 consecutive bilateral reduction mammoplasties was conducted over a 46-month period. The average reduction was 627 gm per breast with an average blood loss of 90 ml and an average operative time of 2 hours and 23 minutes. Forty-six percent of patients described no change in their nipple sensation, 30% described increased sensation, and 24% believed
that their sensation had diminished. Complete nipple loss occurred in one breast (0.25%) when the nipple was delivered through the skin and consequently avulsed from the pedicle before being inset. Areolar epidermolysis occurred in four breasts (1.1%) and fat necrosis occurred in five breasts (1.4%). There was partial skin flap loss in two breasts (6%), and minor wound separation occurred in seven breasts (1.9%). At this time we are unable to determine the lactation ability of these patients. These results indicate that this technique is a reliable reduction mammoplasty procedure with wide application and a minimal complication rate.

References

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