

Editorial

Reduction Mammoplasty: Desire or Necessity

Reduction Mammoplasty is a procedure in which a volumetric reduction of the breast is done. In the process it also improves the shape of the breast and repositions the nipple areola complex.

This is the plastic surgery procedure used to remove excess fat, breast tissue and skin. If a person has large breasts, she might choose to have breast reduction surgery to alleviate discomfort or to achieve a breast size proportionate to the body. Breast reduction surgery might also help improve self-image and self-confidence, as well as the ability to participate in physical activities^{1,2,3}.

Macromastia, or mammary hypertrophy, is a disease process that can result in physical and psychological symptoms. Patients with mammary hypertrophy can present with a variety of symptoms³. Typical complaints include neck and back pain, shoulder grooving from bra-straps

indenting the skin, headaches, difficulty in finding well fitted clothes and limited ability to exercise. Psychosocial issues surrounding excessively large breasts also exist, creating a focal point for embarrassment for women, especially teenagers and elderly women. Often, women with mammary hypertrophy experience inter triginous skin maceration and rashes, as well as infections – all the result of heavy, pendulous breasts^{3,4,5}. Macromastia symptoms rarely improve without surgical intervention, which typically results in significant improvement in the patient's quality of life. Though the symptomatic improvement of patients suffering from mammary hypertrophy is the primary goal of reduction mammoplasty, there is another goal that is nearly as equally important – creating a more aesthetic breast^{6,7}.

The indications for breast reduction surgery are three-fold - physical, aesthetic, and psychological - the restoration of the bust, of the woman's self-image, and of her mental health⁵.

Historic perspective

One of the earliest descriptions of breast reduction is from the writings of Paulus Aegenita, who described a detailed account of what is thought to be the first surgical correction of gynecomastia in the 7th century AD (635-90)^{1,6}.

One of the first cases of reduction mammoplasty in a female patient was submitted by Dieffenbach in 1848,⁷ who reduced

the lower two-thirds of the breast via an inframammary fold incision. Various techniques for skin and parenchymal resections were used, but none employed transposition of the nipple-areola until Morestin in 1909. Resections of up to 1400 g were being reported in this time frame, mostly using an inframammary approach, such as that described by Morestin and Guinard. It was only in the late nineteenth century that the concept of a "natural breast" gradually evolved^{7,8}.

Axhausen⁹ pioneered his three step technique:

- Reduce the glandular portion of the breast
- Nipple transposition
- Fashioning of a skin brassiere

Ideal requirements

Requirements of an ideal breast reduction have been put forth by Biesenberger and have stood the test of time^{9,10},

1. The breast should be lifted to a youthful and natural form in proportion to other parts of the body.
2. The two breasts should be symmetrical
3. The nipple and areola should be translocated to an appropriate location.
4. The blood supply to nipple and areola should not be jeopardized.
5. The function of the breast should be preserved.
6. The scars should not be visible through normal clothing or be above the areola.
7. The operation must be applicable to all forms of deformity.
8. The procedure should be a one stage operation.

Anatomy

The Internal Mammary artery, Intercostal arteries and the Lateral Thoracic artery supply the breast. The internal mammary artery is responsible for about 60% of the blood supply to the breast, the medial or superomedial pedicle being based on the anterior perforating branches of this vessel especially the 2nd and 3rd intercostals, which anastomose with the branches of the lateral thoracic artery. The lateral thoracic artery supplies about 30% of the blood supply to the breast, the branches course inferomedially

and anastomose with the branches of the internal mammary and intercostal arteries. The 4th and 5th are the least important of the arteries supplying the breast, they are responsible for the viability of the inferior pedicle.

Sensory nerve supply to the nipple areola complex comes from the 4th lateral intercostals branch, which enters laterally through the 4th interspace and runs medially under the deep fascia for a few cms. It then courses upwards through the breast tissue to supply the nipple-areola. Some sensation is also provided by the 3rd and 5th lateral intercostal branches in the lateral breast^{11,12}.

Pedicles

While planning breast reduction, it is important to understand that the skin resection pattern and the placement of the pedicle are two entirely different things. Most of the skin resection patterns can be combined with most pedicles^{13,14,15,16}.

However the inferior pedicle has been most associated with an inverted T skin resection and a superior pedicle or superomedial pedicle with a vertical skin resection.

1. Horizontal bipedicle

This is the Strombeck pattern with the blood supply coming from both sides, the dermal pedicle is sufficient to maintain nipple areola viability but caused nipple retraction and inclusion of glandular element in the pedicle made inset difficult.

2. Vertical bipedicle

Mckissock's Vertical Bipedicle is very popular for a long time as it provided good blood supply and also easy to inset.

3. Inferior pedicle

Inferior pedicle proved to be sufficient to sustain the nipple areola complex and also had other advantages – good circulation, good sensation and possibility of breast-feeding. As a result, it replaced the vertical bipedicle.

4. Superior pedicle

Superior pedicle has good circulation but is not very easy to inset and has to be thinned for better inset. Being a dermal pedicle breast feeding is no longer possible.

5. Central pedicle

The Central pedicle is a modification of the Inferior pedicle with the removal of the dermal bridge. The blood supply is the same - perforating branches of the intercostal arteries. However one must be very careful about shear injuries to the pedicle at its base on the pectoral muscles. It preserves sensation and breast feeding potential.

6. Lateral pedicle

This pedicle is half the pedicle of Strombeck's method and it is easier to inset, also has good viability and is based on the lateral thoracic artery perforators; this pedicle is not as commonly used as the rest.

7. Medial pedicle

Similar to the lateral pedicle, it has become popular following the realization that it has good sensation and good blood supply and can be inset relatively easily.

Skin Resection Patterns

There are different methods of skin resection^{15,16},

1. Inverted T resection (wise pattern)

This is best suited for very large breasts and patients who have massive weight loss with skin excess. It is usually associated with the inferior pedicle but can be combined with other pedicles too. It is very important to realize that it depends on the skin brassiere to shape the breast.

2. Vertical resection

The vertical resection pattern uses the pillars of remaining breast parenchyma to shape the skin as well as hold the breast up. It can be used for a wide variety of cases except the extremely large breasts where it needs some modifications.

3. Circumareolar resection

This method is useful for small resection but still requires a permanent suture. Use of mesh by Sampaio Goes is a modification but its use is not yet widespread as the mesh is not available everywhere.

4. Lateral skin resection

The design avoids the ugly medial scar so often seen in inverted T resections but in larger resections the breasts are displaced medially and are unaesthetic.

5. Pattern with no vertical scar

In this the pedicle is based inferiorly and is broad based. The breast tends to be flat and lacks upper pole fullness. The scar also has a tendency to keep pulling the breast tissue downwards.

6. Liposuction only

The procedure is best suited for the fat ptotic breast; it relies on skin elasticity and retraction. It is more likely to preserve nipple sensation and breast feeding potential. However it is not suited for treatment of gigantomastia in teenagers.

Complications

The possible complications are^{17,18},

Early

1. Haematoma: More common with tumescent type infiltration, careful haemostasis is essential to avoid haematoma.

2. Seroma: Common and tend to get absorbed spontaneously over a period of time.
3. Flap Necrosis: More common with inverted T technique, especially in smokers. May require debridement and secondary suturing.
4. Nipple Areola Necrosis: Not very common unless the pedicle is long and patient is a smoker. Very difficult to assess whether intervention is required, it is probably better to let the necrotic area get demarcated and heal than excise and suture.
5. Infection: Not common unless there is vascular compromise, usually due to tight closure.

Late

1. Asymmetry is a common problem and is usually preoperative asymmetry, which becomes more noticeable later. However attempts should be made to make the breasts symmetrical by proper planning.
2. Lack of proper shape: The vertical skin resection gives a better shape compared to the inverted T resection and also lasts longer.
3. Dog ears: A problem with the inverted T technique, it is difficult to chase dog ears. In the vertical resections the treatment of the dog ear is easier.
4. Under resection: Not very common with the inverted T resections but more likely with vertical resections. May need correction by Liposuction or direct resection.
5. Over resection: Not a common problem. Need counselling rather than surgery. However the occasional case may need augmentation. Ruth Graf procedure where the tissue to be excised is used as a flap to augment the breast primarily is a good option.
6. Unsightly scars: Usually scars settle down over time but in some may bad scar formers the scar can be a problem and have to be dealt with in the usual manner.

Conclusion

Breast reduction is a procedure, which has evolved tremendously over the years due to the continuous and ongoing quest on the part of Plastic Surgeons to achieve the objective of reducing the breast size, improving breast shape and relocating the nipple areola complex, while minimizing scars and also preserving lactation and innervation to the nipple-areola complex.

Many of the procedures in use currently do achieve all these objectives, but the quest for ideal operation continues.

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