Mini-Review Article

Central pedicle reduction mammoplasty: a reliable technique

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Abstract: Reduction mammoplasty is one of the most frequently performed procedures in plastic surgery for macromastia or gigantomastia. Recently it is also evolved for oncoplastic breast cancer surgery due to equivalent in terms of outcome for breast conserving surgery with radiotherapy versus mastectomy. Various techniques and modification has been made to achieve long lasting and aesthetically good result with minimal morbidity. Central (posterior) reduction mammoplasty is known for its versatile pedicle due to its good blood supply and innervation for maintaining of nipple sensation with unremarkably long term complication and proven in preservation of breastfeeding function. It is one of the good and reliable options to correct breast hypertrophy and ptosis. Various modifications were introduced by different authors to improve the technique and reduce scar formation which will give more satisfaction to patients.

Keywords: Reduction mammoplasty; central pedicle; breastfeeding; nipple sensation; breast hypertrophy; gigantomastia

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Introduction

Reduction mammoplasty is one of the most frequently performed procedures in plastic surgery. The goals of reduction mammoplasty are to reduce the volume of a breast, to create an aesthetic shape that is stable over time, to maintain blood supply and innervation to the areolar complex, and to make fine limited scars. The different types of methods and modification were all concerning in achieving aesthetically acceptable scar and utmost long term shape and satisfaction with minimal complications.

There are different types of techniques have been used to achieve the above aims with the basis and the knowledge of the blood supply and innervation to the breasts (1-3); to avoid distortion and ischaemia of the nipple areolar complex (NAC) and alteration of nipple sensation apart from the good aesthetic outcome and maintaining ability for breastfeeding function (4,5). Among all the techniques using different pedicle such as superior, inferior, medial, lateral central/posterior, or combinations of pedicles were suitable for different types of patient according to degree of hypertrophy, ptosis and particular surgeon's preference or expertise (6-10).

Central pedicle technique

Central pedicle or posterior pedicle reduction mammoplasty was first described by Balch in 1981 (11) and later popularized by Hester, 1985 (12). It was described by Hester (12) that the central pedicle is designed to incorporate vascular contributions from the lateral thoracic artery, intercostal perforators, internal mammary perforators, and thoracoacromial artery by means of the pectoralis major muscle. The basis of this procedure was found by Würinger, 1998 (2) in his study on the blood and nerve supply on female cadaver breasts. Würinger *et al.*, 1998, have shown a thin horizontal fibrous septum, a guiding structure for the main supplying nerve of the nipple, originating from the pectoral fascia along the level of the fifth rib, heading toward the nipple which lies in between a cranial and a caudal vascular network, responsible for the supply of the nipple areola complex. The cranial vascular sheet is supplied by the thoracoacromial artery and a branch of the lateral thoracic artery, whereas the caudal sheet is supplied by perforating branches from anastomoses of intercostal arteries.

With the basis of the anatomical importance of blood

and nerve supply to the NAC and breast parenchymal, central pedicle with/without combination was used by various authors in breast reduction with good cosmetic result and low complication rate.

Technique and modification

The original technique from Hester *et al*. (12): preoperative markings were made with the patient in the standing position. Wide undermining of thick (1.5 cm) skin and subcutaneous tissue flaps was carried out around the areolar. This plane of undermining is deep to the subdermal vascular plexus of the skin, thereby preserving skin flap viability. The central breast mound is reduced by tangential excision. Laterally, the dissection leaves 1 cm of adipose tissue on the chest wall to preserve the nerve supply from the fourth intercostal nerve. The breasts were shaped "free hand" with the patient in a sitting position. The excess skin and dog ears were trimmed and NAC was repositioned by sitting up the patient and new NAC are marked and sutured. Layered closure trimmed the inverted T skin design by using buried dermal and intracuticular sutures to complete the operation.

In 2001, Grant and colleagues, modified the technique by not elevating the medial and lateral skin flaps from the inframammary crease. Instead, begin the flap elevation approximately 3 cm below the predicted final flap length. The technique differs from operations that use the standard Wise pattern, in that more skin is left in the medial and lateral flaps than is needed for closure. The advantage of this technique is that shaping is still "free hand" and therefore allows the surgeon to individualize the result, fitting it to the particular patient's body habitus. Because there is flexibility in the skin envelope, excellent projection is possible. Time is saved, because flap elevation is abbreviated (5).

In 2009, Datta *et al*. modified the technique by fixing the double pedicle cranially to the chest wall: three heavy nonabsorbable stitches are passed through the deep aspect of the gland, approximately 3 cm below the areola, and fixed to the pectoralis fascia at the level of the second or third rib. The central pedicle was plicated and fixed to the chest wall functions as an endoprosthesis and provides filling to the upper pole (13).

The technique was used by different authors such as Balch (1981), Moufarrege (1985), Levet (1990), Würinger (1998), White (1996), Grant (2001), Byung (2008) and Yang *et al*. (2012), and Bayramiçli M. (2012) which had shown satisfactory result in their series (2,11,14-19).

Complications

Central pedicle technique which acquires the maximally vascular supply mainly from the pectoralis major muscle is a very good pedicle to avoid all the inadequate remaining tissue perfusion. Due to this reason it obtained a good result with low complications. There are few recognized postoperative complications noted when utilize this technique mainly due to the degree of hypertrophy such as slight wound dehiscence, haematoma or seroma. There was no NAC necrosis reported. However, some degree of reduce nipple sensation which was temporary (*Table 1*).

In Byung series, the technique of periareolar skin incision and the noticed complications are areolar widening in 24 breasts (29%), persistent periareolar wrinkles in eight breasts (10%) and poor sensation to the NAC in 12 breasts (15%), in which more than 500 g of breast tissue was removed per breast in his series of 41 patients (20).

Datta *et al*. documented no NAC necrosis in his 91-patient series. However, there were fat necrosis, some degree of nipple sensory loss nipple sensation (three patients complained of some degree of nipple sensory loss when amount of parenchymal removal >1,200 gm in 4 patients). Apart from this wound dehiscence, haematoma and seroma complication in few patients within removal of parenchymal from 800-1,400 gm patients which was low in complication rate (15).

Yang series showed no hematoma and NAC necrosis. Minimal wound dehiscence occurred in one case and healed by dressing change. Satisfactory breast shape was achieved with good NAC sensibility in his 2-year followup (16).

Long term complication was unremarkable as the technique does not affect breastfeeding (20). As we know the projection and the contour of the breast is important in long term aesthetic outcomes, this technique gives the forward projection needed for good contour and good aesthetic result (3,11-14,16-19,21).

Conclusions

Central pedicle reduction mammaplasty technique is one of the good and reliable options to correct breast hypertrophy and ptosis. It may not suitable for massive reduction or severe ptosis breasts. However, the choice of technique should be individualized to patient and preference by the surgeon. None of the techniques is superior to others. Various modifications were introduced by different authors to improve the technique and reduce scar formation which

Table 1 The summary of the different authors study using central pedicle mammaplasty

	Year	Period of study	No. of patients	Mean resection weight	Mean nipple transposition	Follow up period	Complication	*NAC necrosis	*NAC sensation
Byung *et al*. (5)	2008	1998-2004	41	389 g per breast	-	28 months	-	No	N/A
Yang *et al*. (16)	2012	2009-2011	21	327.8±148.6 g	-	3-12 months	Wound dehiscence	No	Good
Bayramicli *et al*. (17)	2012	2005-2010	67	910.7 g (range, 440-1,935 g)	9.6 cm (range, 6-17 cm)	26.4 months	Seroma Haematoma Puckered suture line Deepithelization of edge of nipple Transient venous congestion	No	Good
Datta *et al*. (13)	2009	2001-2007	91	815 g (range, 210-1,720 g)	-	24 (6-42) months	Superficial peeling of the areola, lipolysis, puckering in the submammary fold	No	Good

*NAC, nipple areolar complex.

will give more satisfaction to patients. With the current trend of using the principle of the technique in breast oncoplastic surgery for breast cancer treatment, this will gain better outcome for breast conserving surgery with good oncology resection without affecting the aesthetic outcome of the breast with radiotherapy.

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