Original Article

Septum-Based Superomedial Pedicle Breast Reduction: Reliable Results with Minimal Complications

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Abstract

Introduction: Different pedicle patterns have been used including superior, superomedial and medial pedicle techniques. A thin horizontal septum had been identified by Wuringer et al. which arises from the pectoral fascia at 5th rib. This septum divides the breast into cranial and caudal parts. It carries intercostal perforators and the main nerve supply to the NAC. **Method:** 20 patients are included in this study with septum-based superomedial breast reduction with mean distance for nipple transfer is 11.5 cm & 11.48 cm for right and left breast and mean excised breast tissue 930 gm & 894 gm for right and left breast respectively. **Result:** Complications occurred in 5 patients; hematoma in 2 patients, wound breakdown in 2 patients and partial nipple and areola necrosis in 1 patient. **Conclusion:** Combination of the horizontal breast septum with the superomedial pedicle in breast reduction surgeries allows for resection of the desired breast tissue while maintaining a good vascular supply to the nipple-areola complex with a minimal rate of complication.

Keywords: Reduction mammoplasty, Breast reduction, Superomedial pedicle technique, horizontal septum, Gigantomastia.

INTRODUCTION

The extent to which extremely large breasts can negatively impact a woman's life is often underappreciated. For those who live with unwanted macromastia and its associated symptoms, the relief from pain and tension that breast reduction can produce is immediately noticeable after surgery. Recovery from surgery leads to additional benefits, and the majority of women enjoy an improved quality of life. [1, 2].

The concept of dermo-glandular pedicle was 1st described by strombeck by transferring the nipple areola complex via a pedicle of dermis and subcutaneous tissue.[3] Then different pedicle patterns have been used including superior, superomedial and medial pedicle techniques [4, 5]. A thin horizontal septum had been identified by wuringer et al. which arises from the pectoral fascia at 5th rib. This septum divides the breast into cranial and caudal parts. It carries intercostal perforators and the main nerve supply to the NAC [6]. Depending on this septum, Hamdi et al. identified the septum-based technique for breast reduction either with medial or lateral pedicle [7].

In this study we added the septum-based technique with the superomedial pedicle to maintain a good aesthetic result while minimizing the complications.

Materials and Methods

Pre-operative markings

While the patient is standing. The sternal notch, the sternal midline, the midclavicular point, and the breast meridian are marked (Fig.1). A mark is positioned 18-24 cm away from the SN over the axis of breast meridian and corresponding to the IMF to denote the new provisional nipple position. The final nipple location will be located intra operatively, taking into account the initial markings, projection, symmetry, and the distance to the IMF. The areola's diameter is marked and decreased to form a nipple-areola complex of 42–45 mm.

The IMF is marked from medial to lateral and not exceeding mid axillary line. The vertical limbs of the keyhole are determined to be equivalent by dragging the breast medially along the axis of medial rotation of the nipple and draw the lateral vertical limb extending downward from the new Nipple position. The same is done to draw the medial vertical limb. The length of the vertical limbs is 9-11 cm (Fig1). The medial and lateral ends of vertical limbs are

extended horizontally to meet the IMF. The pedicle is then drawn: the base extends from 2nd to 5th rib and run obliquely in inferolateral direction toward the nipple. The expected position of the septum is then drawn along the 5th rib from medial to lateral passing through the NAC.

Figure (1) shows marking of septum based- superomedial pedicle technique**. (A&B)** oblique and lateral views of left breast showing (arrows) the lateral extension of the septum. **(C)** Frontal view exposing the patient from sternal notch to the umbilicus. **(D&E)** oblique and lateral views of the right breast.

Surgical Technique

After induction of general anesthesia, patient in supine position, the markings can be reinforced with a needle dipped in methylene blue, disposable sterile permanent marker, marking by silk sutures or scalpel so that the sterilization will not wash them away. A tourniquet by a Ryle tube is applied to the base of the breast to bulge the breast tissue and decrease the operative bleeding during the de-epithelialization. De-epithelialization of the pedicle except NAC. The borders of the pedicle will be transected to the level of pectoralis fascia at a perpendicular angle to the chest wall with preservation of the horizontal septum of the breast at the level of the 5th rib **fig. (2)**

Figure (2) (A) shows basal view of the horizontal septum. Arrows point to the migrating perforators towards the NAC. **(B)** showing the pedicle and the horizontal septum as medial and lateral extensions.

The septum is identified as thin fascial layer corresponding to the 5th rib and is kept preserved during harvesting. ‘‘pyramidal flap’’ is formed with the pectoralis muscle fascia as a base, and the nipple as apex. Surgical excision of the skin, fat and gland with a C-shaped pattern around the pyramidal flap with resection within the keyhole at the level of the NAC’s new location.

The pedicle will be then fixed to the pectoral fascia medially, laterally, and superiorly. Good hemostasis and washing using saline-garamycin solution. Then Fixation of no. 16 suction drain in each breast to exit at mid axillary line at the level of inframammary line.
The NAC will be then transposed and lifted for inset in its new position. Then wound closure will be done in 3 layers fascial suspension using absorbable 2-0 sutures, dermal closure using 2-0 absorbable sutures and skin closure using 3-0 non absorbable sutures for vertical and horizontal limbs and 4-0 absorbable sutures for NAC. fig (3). Finally, dressing by cotton plaster at the suture lines and as a compression dressing with elastic cotton bandage and well fitted pressure garments or sport bra. NAC should be out of pressure by the dressing.

Figure (3) shows the final result of the breast reduction. **(A)** frontal view. **(B)** lateral view of the right breast. **(C)** lateral view of the left breast.

Results

Our study includes 20 cases as show in **table (1),** all of which underwent breast reduction using septum-based superomedial pedicle with mean age 41 years with severe ptosis as the distance off pedicle transfer was about 11.5 cm and the excised breast tissue reaches 980 gm per side. The post operative complications as in **table (2)** include hematoma in 2 cases only with wound dehiscence at T-junction in 2 cases that healed conservatively. Only 1 case show partial nipple and areola necrosis.

Table (1) Patient demographics, breast measurements, and resection weights

Variables		**Study cases (N = 20)**
Age (years)	Mean ± SD	41.6 ± 13.98
	Median (Range)	39 (20-65)
Suprasternal notch-to-nipple distance (cm)		
Right	Mean ± SD	**32.98 ± 1.66**
Left	Mean ± SD	**32.45 ± 2.15**
Distance of pedicle transfer (cm)		

Right	Mean ± SD	**11.30 ± 1.48**
Left	Mean ± SD	**11.48 ± 1.23**
Weight of resection per breast (g)		
Right	Mean ± SD	**930.02 ± 3.19**
Left	Mean ± SD	**896.49 ± 5.86**

Table (2) Complications in the cases of the study.

Variables	**Study cases (N = 20)**	
	Number	**Percent**
Hematoma	2	10
Seroma	0	0
Infection	0	0
Wound breakdown	2	10
Nipple areola necrosis	1	5
Partial nipple areola necrosis	1	5
Complete nipple areola necrosis	0	0

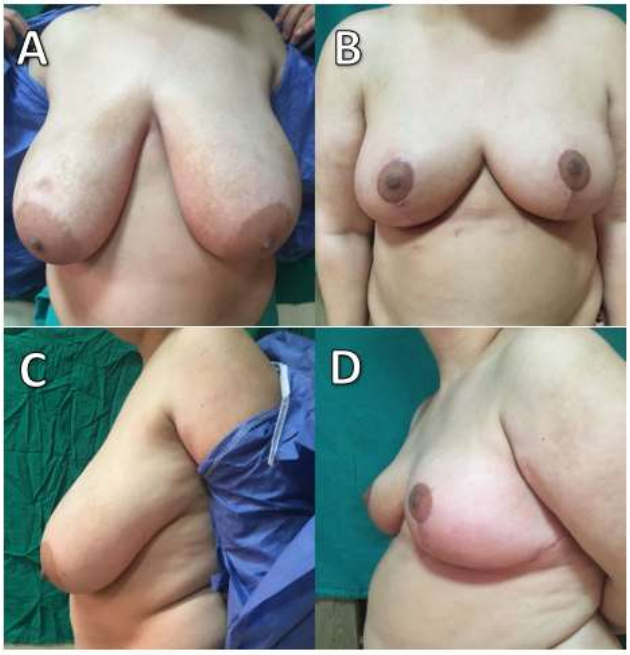

Figure (4) 44 years old female with massive breast hypertrophy. **(A&C)** before septum based superomedial pedicle breast reduction technique. **(B&D)** 6 months postoperative.

Discussion

Maintaining adequate sufficient blood supply to the NAC during breast reduction is a major issue that may force the surgeon to choose a wide pedicle that result in insufficient reduction. Blood supply to the breast comes from the internal mammary artery, the lateral thoracic artery, thoraco-acromial artery, anterior and posterior branches of the intercostal arteries and superficial thoracic artery. designing any breast should include at least one or more of these arteries.[8-10]

One of the most dominant blood supplies to NAC is perforating branches of the internal mammary artery. So, superomedial pedicle that carries these perforators is considered to have the most reliable vasculature [11]. Hamdi et al. utilizes the breast horizontal septum to add more reliability and efficacy to breast pedicles while harvesting. This

septum adds the intercostal perforators through the 2nd to 4th intercostal spaces to the blood supply of the NAC by running through subcutaneous tissue toward NAC after piercing the pectoral fascia[7].

To maintain adequate supply to the superomedial pedicle in our study the pedicle includes the entire medial pillar and inferomedial aspect of the new areola so that the pedicle is superomedial without disruption the internal mammary artery perforators[12]. The pedicle is then harvested in a pyramidal fashion by thinning while going deep to maintain the perforators thar run superficially. identifying the septum as a thin fascial layer over the 5th rib allows to maintain the perforators of the anterior intercostal arteries towards the NAC. So, the result pedicle has blood supply from perforating branches from the internal mammary artery and anterior intercostal arteries.

The overall incidence of ischemic complications in our study is lower than that described by other studies utilizing superomedial pedicle technique for breast reduction. Incidence of partial necrosis of NAC is 10.5% as reported by Lugo et al.[13]. landau described 6.5% incidence of partial necrosis of NAC [12]. In our study partial nipple and areola necrosis developed in 1 case (5%) only which healed with 2ry intension with no incidence of complete NAC necrosis. Wound dehiscence at T-junction was observed by landau in 18% of cases[12], while only 2 cases (10%) in our study show wound dehiscence that treated conservatively.

To be noted that the distance of nipple-areola transfer in our study was about 11.5 cm and the mean resection was 930 gm compared to 11.4 cm and 914 resected tissue in Uslu et al. study done over 185 patients with lower incidence of nipple and areola necrosis 2.7% [14]. Previous studies have been utilized the horizontal septum with inferior pedicled breast reduction but show 24.4 % incidence of nipple-areola necrosis[15]. This means that the best results to minimize the complications comes by combining the horizontal septum with the superomedial pedicle that have the main blood supply to the nipple-areola complex.

Other complications including seroma and infection didn't occur with our cases while hematoma occur in 2 cases (10%), and this isn't directly related to the technique.

The breast with Partial nipple and areola necrosis is the same breast with the largest excised breast tissue and this complication usually occur in cases with gigantomastia. The larger the tissue resected from the breast, the higher the complication rates would be [16]. Here comes the importance of the good perfusion via the combination of the septum and superomedial pedicle specifically.

Conclusion

Combination of the horizontal breast septum with the superomedial pedicle in breast reduction surgeries allows for resection of the desired breast tissue while maintaining a good vascular supply to the nipple-areola complex with a minimal rate of complication.

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