

## Conventional vs Three Positions Marking Technique in Inverted-T Superior Pedicle Reduction Mammoplasty

<sup>1</sup>Waleed AlBadry, MSc, MRCS; <sup>1</sup>Raafat Gohar, MD; <sup>1</sup>Ashraf El-Sebaie, MD;  
<sup>2</sup>Mohamed Salah, MD; <sup>1</sup>Mohamed Ashraf El Meleigy, MD  
 Department of Plastic Surgery <sup>1</sup>Cairo University; Fayoum University

### ABSTRACT

Women have a variety of body shapes and sizes, thus no simple definition for macromastia exists (Shewmake, 1994). Multiple marking techniques have been suggested in the past. The majority aim to achieve some degree of precision in determining the angle between the two vertical limbs. This ultimately affects the amount of tissue resected and the postoperative shape. The free hand technique, being the most widely used, requires experience and practice to achieve the desired results. Multiple devices have been created to facilitate marking, including templates, keyhole patterns, goniometers, and others (Mendez and Fernandez, 1991; Lazarus, 1998; Palumbo et al., 1998; Paloma et al., 1998; Kavka, 1999). The study included forty female patients with breast hypertrophy. All underwent superior pedicle technique using inverted-T scar Reduction Mammoplasty, comparing the conventional breast marking technique and that marked pre-operatively in three positions: Sitting, Oblique and Supine (SOS). Patients were followed up for up to two years. The results showed that the three positions marking technique had better aesthetic outcome: Achieving both symmetrical markings and outcome and adapts easily with pre-existing breast asymmetry. However, the conventional breast marking technique still has its indications.

### INTRODUCTION

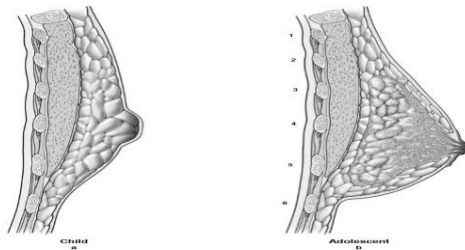
Macromastia can cause considerable emotional and physical stress. The problem of macromastia has been the subject of the efforts of many plastic surgeons since late nineteenth century. In United States alone nearly 40,000 women undergo breast reduction each year <sup>[1]</sup>. Pre-operative planning is an integral step for the successful outcome in many plastic surgical procedures. Because the breast is a paired organ, achieving symmetry is challenging. There is also the added effect of recumbency, which alters the shape and position of the breast. The classic breast shape, as we know it, exists in the erect posture <sup>[2][3][4][5][6]</sup>.

### Review of Literature:

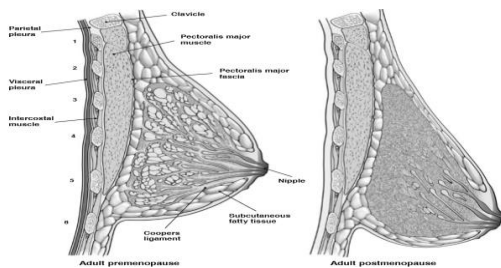
<b>Ridge stage</b> (<5-mm embryo)
Milk hill stage (7 to 8 weeks, 5- to 10-mm embryo)
Thickening of the mammary anlage in the region of the thorax
Regression of the remainder of the milk streak
<b>Mammary disc stage</b> (10-mm embryo)
Invagination into the chest wall mesenchyme
<b>Lobule stage</b> (11- to 25-mm embryo)
Tridimensional growth
<b>Cone stage</b> (10 to 14 weeks, 25- to 30-mm embryo)
Flattening of the ridge
<b>Budding stage</b> (12 to 16 weeks, 30- to 70-mm embryo)
Mesenchymal cells differentiate into smooth muscle of nipple and areola
Epithelial buds develop
<b>Indentation stage</b> (70 mm to 10 cm)
<b>Branching stage</b> (16 weeks, 10-cm fetus)
Epithelial buds branch into 15 to 25 strips of epithelium
Differentiation of hair follicle, sebaceous gland, and sweat gland elements
Apocrine glands develop to form Montgomery glands around the nipple
<b>Canalization stage</b> (20 to 32 weeks of gestation)
First stage dependent on hormonal influences
Placental sex hormones induce canalization of the branched epithelial tissues
<b>End-vesicle stage</b> (newborn)
Development of lobuloalveolar structures containing colostrum

Breast development takes place in several stage (Figs. 1-2).

Table (1): Stages of Embryologic Breast Development <sup>[7]</sup>



**Fig. (1a-b)** Breast development. a In a prepubertal girl, the mammary glands grow and branch slowly. b In adolescence the mammary glands develop rapidly<sup>[8]</sup>



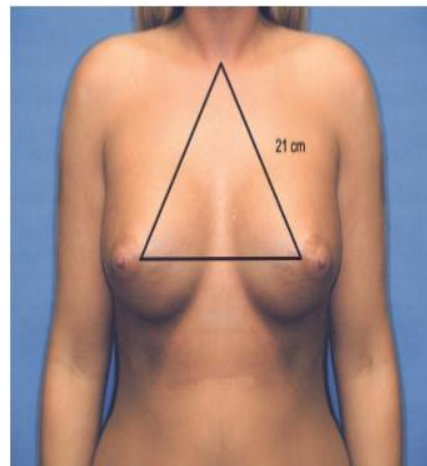
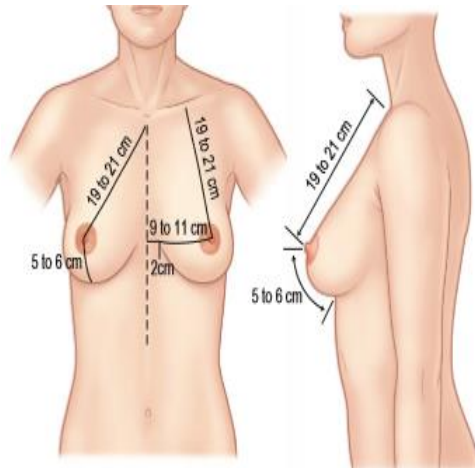
**Fig. (2a-b):** a The adult premenopausal breast. b The adult postmenopausal breast<sup>[8]</sup>

**Blood Supply to the Breast:**

Extensive arterial collateralization exists around the breast. The arterial supply to the breast can be subdivided into major and minor vessels. Major arteries include: the internal mammary artery, the external mammary artery off the lateral thoracic artery and the branches of the intercostal arteries. Minor arteries include: the thoracoacromial, subscapular, upper thoracic, and thoracodorsal arteries<sup>[9]</sup>.

**Breast Aesthetics:**

The breast's position on the chest wall and its symmetry with the opposite breast must be considered. Each junction of the breast with the chest, upper abdomen and axilla is an important reference point for the surgeon when he is considering breast modification or reconstruction. Contour changes of the breast and surrounding tissue should have a pleasant flow rather than a sharp delineation<sup>[10]</sup>.

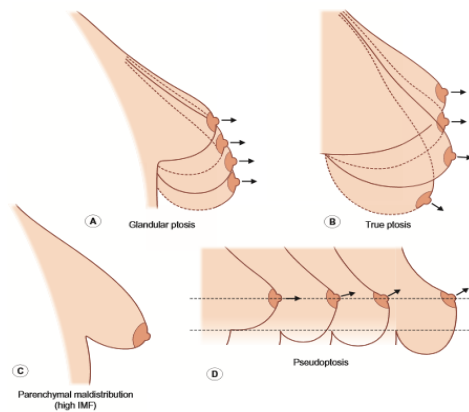


**Fig. (3):** a Statistical standards for the dimensions of the breast b AP image: ideal breast dimensions demonstrating symmetry and projection<sup>[11]</sup>.

### Hypertrophy Classification

Jones (2006) classified hypertrophy according to estimated resection volume into:

- Mild < 200 gm.
- Moderate = 200-500 gm.
- Major = 500-1500 gm.
- Gigantic > 1500 gm per side.



**Fig. (4):** (A–D) Different types of breast ptosis. IMF, inframammary fold<sup>[13]</sup>

## PATIENTS AND METHODS

This study was conducted upon 40 female patients with breast hypertrophy of different sizes. Twenty patients underwent inverted T scar reduction mammoplasty using the superior pedicle with the conventional breast marking technique and the other twenty underwent the same reduction mammoplasty technique using the breast marking technique where the patient is marked in three positions: sitting, oblique, and supine.

### • Inclusion criteria

- Patients asking for Breast Reduction
- Only Female patients
- Young and middle aged group (20-25 years old)
- Nullipara, unipara or multiparitous
- Virgin or married status
- Pre or post-menopausal
- Significant psychological disturbance and self-awareness of the condition
- Neck or Back Pain
- Bra strap marks digging in the shoulders
- Infra-mammary irritation or fungal infection

### • Exclusion criteria

- Smoking
- High BMI >37
- Significant co-morbidities affecting wound healing process (e.g uncontrolled Diabetes)
- Concomitant Breast Pathology

Patients were followed up for a period of 6 months up to 2 years depending on patient availability and circumstances.

### Conventional Pre-operative Breast Marking Technique:

There are seven key steps to focus on in the markings (**Fig. 05**):

1. breast meridian,
2. new nipple height,
3. vertical limbs,
4. keyhole pattern,
5. ghost patterns,
6. pedicle design,
7. recheck all markings, especially the pedicle for symmetry. With the patient standing hands on hips and surgeon seated, the midline is drawn from the sternal notch to the umbilicus<sup>[14]</sup>.

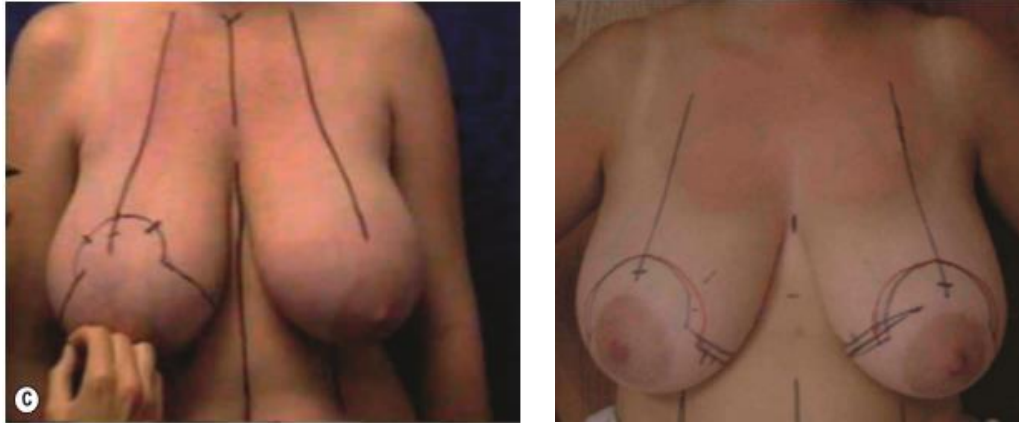


Fig (5): Conventional Pre-operative Breast Marking Technique<sup>[14]</sup>

**The Sitting, Oblique, Supine (SOS) Marking Technique:**

The patient is marked preoperatively in three positions.

1. **Sitting:** This position is adopted to mark the midline, midclavicular point (usually 7.5 cm from the sternal notch) and the breast meridian

(Fig. 6). The superior limit of the vertical limbs is then marked with reference to the inframammary fold. This marks the possible future position of the NAC.

2. **Supine:** The supine position is used to mark the inframammary fold incision and the medial limb of the vertical markings (Fig. 6).



Fig. (6): The Sitting, Oblique, Supine (SOS) Marking Technique

3. **Oblique (Left and Right):** The oblique position is mainly to mark the lateral limb of the vertical markings (Fig. 06)<sup>[15]</sup>

## RESULTS



Pre-operative (SOS technique)

6 months post-operative (SOS technique)  
*Post-Operative Assessment**Table (2): Aesthetic Shape*

	<i>Good</i>		<i>Satisfactory</i>		<i>Poor</i>	
	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>
<i>Conventional</i>	15	75	5	25	0	0
<i>SOS</i>	17	85	3	15	0	0

*Table (3): Symmetry*

	<i>Symmetrical</i>		<i>Asymmetrical</i>	
	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>
<i>Conventional</i>	18	90	2	10
<i>SOS</i>	19	95	1	5

• *Long-term Results**Table (4): Shape*

	<i>Satisfactory</i>		<i>Unsatisfactory</i>	
	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>
<i>Conventional</i>	18	90	2	10
<i>SOS</i>	19	95	1	5

*Table (5): Patient Satisfaction*

	<i>Satisfactory</i>		<i>Unsatisfactory</i>	
	<i>No.</i>	<i>%</i>	<i>No.</i>	<i>%</i>
<i>Conventional</i>	16	80	4	20
<i>SOS</i>	17	85	3	15

## DISCUSSION

The goals of breast reduction are to reduce the volume while achieving an aesthetically pleasing shape and maintaining breast functions and N/A sensations<sup>[16]</sup>.

The free hand technique, being the most widely used, requires experience and practice in order to achieve the desired results. Multiple devices have been created to facilitate markings, including templates, keyhole patterns, goniometers, etc. The standard pattern with a fixed angle of 110° between the two segments was further modified by McKissock<sup>[17]</sup> to allow for adjustment of the angle to the widely variable breast shapes. The wire keyhole pattern marking is influenced by the surgeon's experience<sup>[18]</sup>.

The standard patterns and devices are rigid methods that may achieve symmetrical markings, not necessarily symmetrical outcomes. They do not account easily to pre-existing breast asymmetry. Devices may also be not readily available in all hospitals. This factor could be a disadvantage to the surgeon who practices in more than one hospital.

The sitting, oblique, supine marking technique is a versatile technique dependent on the natural breast fall. The breast is viewed as a dynamic organ, requiring the individual analysis of each breast. The natural fall of the breast spontaneously generates the desired angle between the vertical limbs, accounting for any existing asymmetries. Marking the patient in the supine position has the added advantage of clearly identifying the inframammary fold. Marking in the sitting position only, as referred to in other techniques, may present difficulty in marking the inframammary fold in large, ptotic breasts<sup>[15]</sup>.

## CONCLUSION

This study showed that the three positions marking technique had better aesthetic outcome especially in the hands of unexperienced surgeons and trainees starting to perform Reduction Mammoplasty. SOS marking technique achieves both symmetrical markings and outcome and adapts easily with pre-existing breast asymmetry. However, the conventional marking technique still has its indications.

## REFERENCES

1. Goldwyn RM, Courtiss EH: Reduction mammoplasty by the inferior pedicle (pyramidal) technique. In: Goldwyn RM (ed), Reduction Mammoplasty. Boston, Little, Brown & Co. 1990, pp 255–266
2. Mendez-Fernandez MA: An easy-to-make, easy-to-use device for preoperative marking for reduction mammoplasty and mastopexy. *Ann Plast Surg* 1991;26(6): 602–603
3. Lazarus D: A new template-goniometer for marking the wise keyhole pattern of reduction mammoplasty. *Plast Reconstr Surg*; 101(1):171–173, 1998.
4. Palumbo SK, Shifren J, Rhee C: Modifications of the Lejour vertical mammoplasty: analysis of results in 100 consecutive patients. *Ann Plast Surg*; 40(4): 354–359, 1998.
5. Paloma V, Samper A, Sanz J: A simple device for marking the areola in Lejour's mammoplasty. *Plast Reconstr Surg*; 103(7):2134–2135, 1998.
6. Kavka S: A simple device for marking the areola in vertical mammoplasty. *Plast Reconstr Surg*; 103(7):2087, 1999
7. Sabel M; Surgical Foundations: Essentials of Breast Surgery – 1<sup>st</sup> Ed. Mosby Elsevier, 2009
8. Jatoi I, Kaufmann M and Petit JY; Atlas of Breast Surgery © Springer-Verlag Berlin Heidelberg 2006
9. Pinsolle V, Grinfeder C, Mathoulin-Pelisser S, et al . Complications analysis of 266 immediate breast reconstructions. *J Plast Reconstr Aesthet Surg*; 59:1017 – 24, 2006
10. Bostwick J III: Anatomy and Physiology. In: Plastic and Reconstructive Breast Surgery, 2nd ed. St. Louis, Missouri, Quality Medical Publishing, pp. 77-123, 2000
11. Neligan PC and Grotting JC; Breast in Plastic Surgery. Third Edition. Elsevier Saunders, 2013
12. Jones G: Breast Reduction. In: Plastic Surgery McCarthy, 2nd ed. Saunders Company, Philadelphia, pp. 539-584, 2006
13. Brink RR. Management of true ptosis of the breast. *Plast Reconstr Surg.*; 91:657–662, 1993
14. Hall-Findlay EJ and Evans GRD; Aesthetic and Reconstructive Surgery of the Breast, Saunders Elsevier, 2010

15. Fahmy FS, Hemington-Gorse SJ. The sitting, oblique, and supine marking technique for reduction mammoplasty and mastopexy. *Plast Reconstr Surg*;117(7): 2145–51, 2006
  16. Nahai F: Clinical Decision-Making in Breast Surgery. In: *The Art of Aesthetic Surgery*, Quality Medical Publishing; pp. 18181825, 2005
  17. McKissock PK: Reduction mammoplasty by the vertical bipedicle flap technique. *Clin Plast Surg*; 3(2): 309–320, 1976
  18. Gasperoni C, Salgarello M: Preoperative breast marking in reduction mammoplasty. *Ann Plast Surg*; 19(4): 306–311, 1987
  19. Shewmake KB: Reduction mammoplasty and mastopexy. *Selected Readings in Plastic Surgery*, 7:30: 1-27, 1994. Mendez-Fernandez MA: An easy-to-make, easy-to-use device for preoperative marking for reduction mammoplasty and mastopexy. *Ann Plast Surg*; 26(6): 602–603, 1991
-