

## Lateral Wings Suspension Technique for Improving the Results of Inferior-Pedicle Breast Reduction in Patients Attending Main University Hospital of Alexandria, Egypt

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### ABSTRACT

**Background:** The inferior pedicle wise pattern breast reduction is one of the most popular techniques used. However, a major criticism of inferior pedicle technique is bottoming out of the breast and lack of upper pole fullness. This is caused by gravitational pressure of the breast parenchyma/pedicle on the inferior pole with subsequent scaphoid appearance in the upper pole and lengthening of the vertical scar. In this study, a modification of the inferior pedicle technique will be done by creation of two lateral dermal flaps alongside with the inferior pedicle, and using these flaps to suspend the pedicle to the chest wall and prevent its descent to evaluate its effect on prevention of bottoming out of the breast.

**Patients and Methods:** This is a prospective randomized study that included 20 healthy female patients suffering from breast hypertrophy and they are candidate for reduction mammoplasty by the proposed technique. Design of skin marking for inferior pedicle breast reduction technique was carried out with the standard wise pattern with the creation of two wings (medial and lateral) at the middle of the inferior pedicle; composed of de-epithelialized dermal flaps. Buttressing these two wings to the pectoral fascia at the suitable distances would create a sort of an internal bra effect; which supports the inferior pedicle. During the follow up, the length of the vertical scar (as an indicator of bottoming out) was measured immediately postoperative and every 3 months in the follow-up period.

**Results:** This study includes 20 female patients of an age ranged between 22-51 years old and a breast size (suprasternal notch to nipple distance) ranging from 31 to 44cm. The follow-up for 1-year post-operative shows change in the areola to fold distance by a ratio  $<1.3$  in 85% of patients with patient satisfaction reaching 60%.

**Conclusion:** From this study we concluded that the inferior pedicle suspension to pectoral fascia improve the result shape of the breast and decrease the bottoming out of the breast.

**Key Words:** Inferior – Pedicle – Breast reduction – Lateral wings suspension.

### INTRODUCTION

The size, shape, and symmetry of breasts considerably affect the physical and psychological

health of women. Large breasts not only cause shoulder-lower back pain, bra strap grooves and intertrigo under the breasts, but also decrease self-confidence and thus result in psychological problems [1].

Breast reduction surgery is both an aesthetic as well as reconstructive procedure that has proven to be highly effective in relieving both physical and psychosocial discomfort attributable to gigantomastia, as well as improving breast shape and figure with more aesthetic proportions [2].

The wise pattern breast reduction with inferior pedicle is one of the most popular techniques used, and particularly helpful in long pendulous breasts where the nipple transposition distance is large [3-14]. However, a major complication of inferior pedicle technique is bottoming out of the breast and lack of upper pole fullness, which is caused by gravitational force on the breast parenchyma/pedicle of the inferior pole with subsequent scaphoid appearance in the upper pole and lengthening of the vertical scar [7].

A lot of modifications of the inferior pedicle technique were described to overcome this major disadvantage. These modifications include the use of dermal/fascial or breast flaps to suspend the pedicle and prevent it from downward descent [3-14].

In this study, a modification of the inferior pedicle technique will be done by creation of two lateral dermal flaps alongside with the inferior pedicle, and using these flaps to suspend the pedicle to the chest wall and prevent its descent and evaluate its effect on prevention of bottoming out of the breast.

*Aim of the work:*

The purpose of this study is to assess the lateral dermal flaps technique of inferior pedicle shaping and suspension for improving the results of inferior pedicle breast reduction.

**PATIENTS AND METHODS**

This is a prospective randomized study that included 20 healthy female patients suffering from breast hypertrophy and they are candidate for reduction mammoplasty by the proposed technique. The patients were managed in Plastic and Reconstructive Surgery Unit in Alexandria University Hospitals.

*Research design:*

Design of skin marking for inferior pedicle breast reduction technique was carried out with the patient standing along the standard wise pattern [6] (with the suprasternal notch-to-areola distance, and the angle of the key-hole vertical limbs, varying according to the specific morphology of the breast in each case).

During designing and dissection of the nipple-areola pedicle, the following was done: Creation of two wings (medial and lateral) at the middle to

inferior portions of the pedicle; composed of de-epithelialized dermal flaps from the medial and lateral breast segments that are normally excised during the inferior pedicle technique Fig. (1).

Buttressing these two wings to the pectoral fascia at the suitable distances that would create a sort of an internal bra effect; which supports the inferior pedicle, relieves tension on skin flaps, and improve the shape of the breast Fig. (2).

In creation and suspension of these two suspensory dermal flaps, it might be needed to extend their lower borders; by variable distances of dermal incision along the inferior border of the inferior pedicle, for better mobilization and suspension of the pedicle, tension free skin closure and eventually better shape of the breast Fig. (3).

Standard breast photography (front, right and left views) was carried out (pre-operative and post-operative for a minimum period of six months) to assess the results of surgery as regards wound healing, scar quality, and breast shape.

Follow-up, the length of the vertical scar (as an indicator of bottoming out) was measured immediately post-operative and every 3 months in the follow-up period Fig. (4).

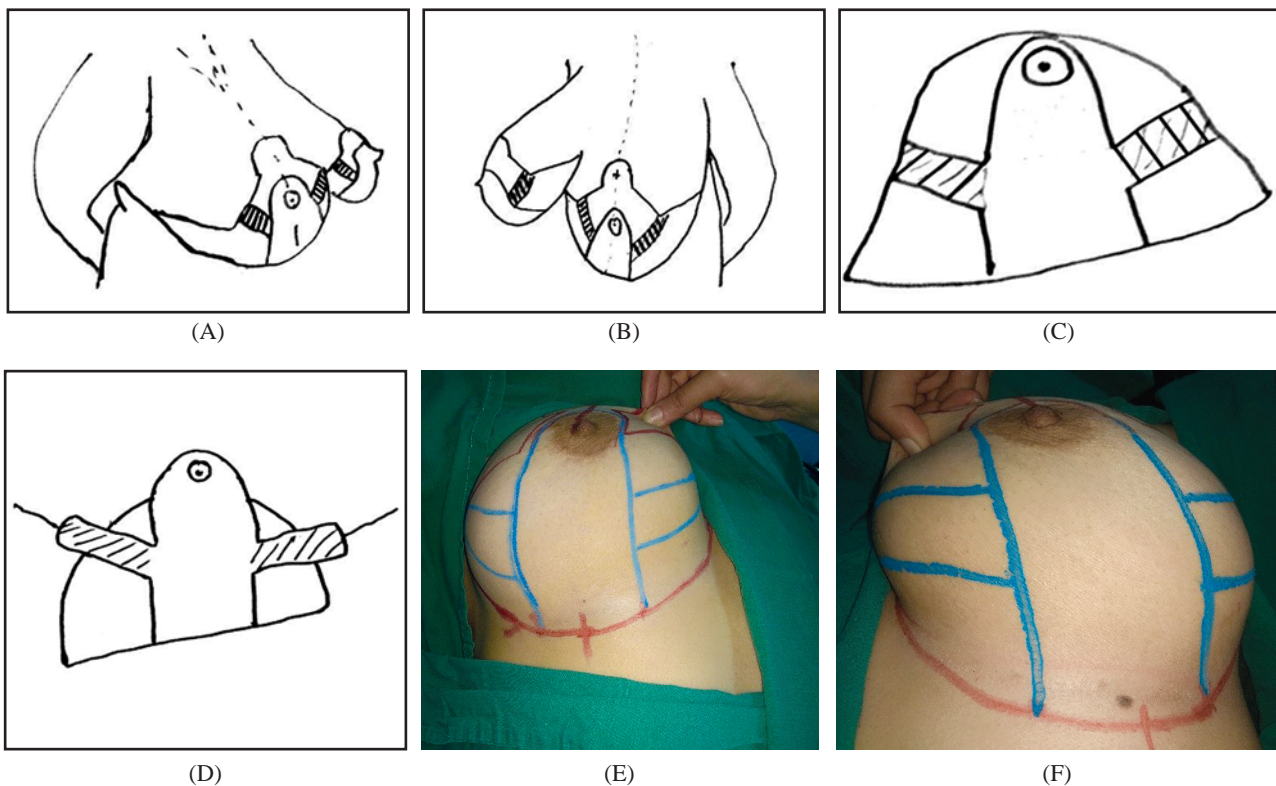


Fig. (1): (A, B) Pre-operative schematic drawings of inverted T scar inferior pedicle technique combined with dermal suspension flaps. (C) Measurement and planning of dermal flaps on pedicle. (D) Elevation of inferior pedicle and dermal suspension flaps. (E, F) Marking the dermal wings on pt.



Fig. (2): Buttressing the two wings to the pectoral fascia at the suitable distances with 2/0 Vicryl that would create a sort of an internal bra effect.



Fig. (3): Dermal incision along the inferior border of the inferior pedicle for better mobilization.



Fig. (4): Measurement of the vertical scar length in follow-up.

**RESULTS**

The present study was conducted on twenty female patients with Breast Hypertrophy admitted to Plastic Surgery Unit at Alexandria Main University Hospital.

**I- Demographic data:**

**- Age:**

The study included 20 females. Their ages ranged from 22 years old to 51 years old. The mean age was 34.25 years. (Table 1, Fig. 5).

Table (1): Distribution of the studied cases according to age (years) (n=20).

Age (years)	No.	%
<30	8	40.0
30-40	9	45.0
>40	3	15.0
Min.-Max.	22.0-51.0	
Mean ± SD.	34.25±7.66	
Median	35.0	

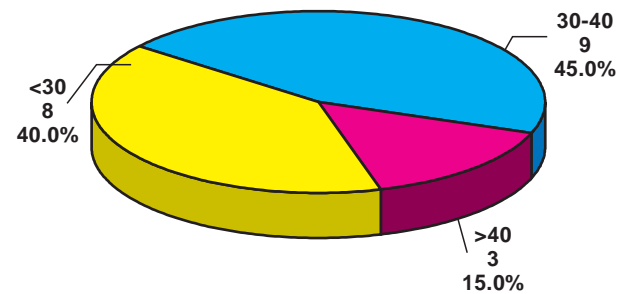


Fig. (5): Distribution of the studied cases according to age (years) (n=20).

**- Body Mass Index (BMI):**

The mean BMI of the studied patients was 31.10±1.59; ranging from 29 to 33 and the median BMI was 31.5 (Table 2, Fig. 6).

Table (2): Distribution of the studied cases according to BMI (n=20).

BMI%	No.	%
Overweight (25-<30)	5	25.0
Obese (30-<35)	15	75.0
Min.-max.	29.0-33.0	
Mean ± SD.	31.10±1.59	
Median	31.50	

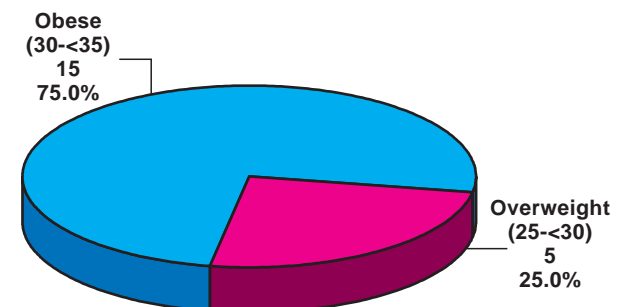


Fig. (6): Distribution of the studied cases according to BMI (n=20).

**- Suprasternal notch to nipple distance in cms:**

The breast size in our study was ranging from 31 to 44cms with a mean of (36.70±3.54) cms in the right side and from 31 to 43cms with a mean (36.40±3.19) cms in the left side (Table 3, Fig. 7).

Table (3): Descriptive analysis of the studied cases according to notch to NAC distance (CM) (n=20).

Notch to NAC distance (CM)	Right	Left
Min.-max.	31.0-44.0	31.0-43.0
Mean ± SD.	36.70±3.54	36.40±3.19
Median	36.50	36.50

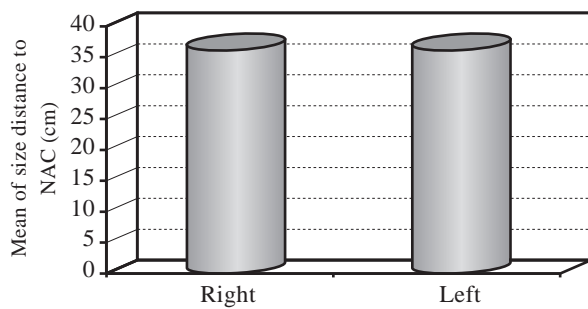


Fig. (7): Descriptive analysis of the studied cases according to notch to NAC distance (CM) (n=20).

**II- Operative data:**

**Weight of removed tissue:**

The weight of removed tissues during surgery in our study was ranging from 600 to 2250 grams with a mean of 992.0±342.03 grams and median was 957.50 grams in the right side and from 695 to 2100 grams with a mean of 994.5±321.4 grams and median was 945 grams in the left side (Table 4, Fig. 8).

Table (4): Descriptive analysis of the studied cases according to removed tissue (n=20).

Removed tissue (g)	Right	Left
Min.-max.	600.0-2250.0	695.0-2100.0
Mean ± SD.	992.0±342.03	994.5±321.4
Median	957.50	945.0

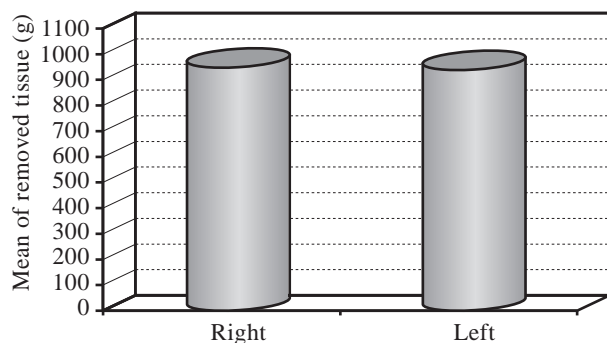


Fig. (8): Descriptive analysis of the studied cases according to removed tissue (n=20).

**III- Post-operative data:**

**1- Vertical line length (areola-fold distance):**

The pre-operative areola fold distance in our study was ranging from 13-19cm with a mean of 15.55±1.61cm and median was 15.50cm in the right side and from 13 to 18cm with a mean of 15.45±1.36cm and median was 15cm in the left side.

The immediate post-operative areola fold distance in our study was ranging from 5-7cm with a mean of 6.03±0.60cm and median was 6cm in the right side and from 5 to 7.5cm with a mean of 6.13±0.70cm and median was 6cm in the left side.

The 3 months post-operative areola fold distance in our study was ranging from 5.20-7.50cm with a mean of 6.35±0.65cm and median was 6.40cm in the right side and from 5.20-7.8cm with a mean of 6.45±0.80cm and median was 6.40cm in the left side.

The 6 months post-operative areola fold distance in our study was ranging from 5.5-8cm with a mean of 6.64±0.69cm and median was 6.65cm in the right side and from 5.50-8.0cm with a mean of 6.77±0.83cm and median was 6.75cm in the left side.

The 1-year post-operative areola fold distance in our study was ranging from 6-9cm with a mean of 7.32±0.81cm and median was 7cm in the right side and from 6-9cm with a mean of 7.53±1.05cm and median was 7.40cm in the left side (Table 5, Fig. 9).

Table (5): Descriptive analysis of the studied cases according to areola-fold distance (n=20).

Areola-fold distance	Right	Left
<b>Pre-operative:</b>		
Min.-max.	13.0-19.0	13.0-18.0
Mean ± SD.	15.55±1.61	15.45±1.36
Median	15.50	15.0
<b>Immediate post-operative:</b>		
Min.-max.	5.0-7.0	5.0-7.50
Mean ± SD.	6.03±0.60	6.13±0.70
Median	6.0	6.0
<b>Post-operative after 3 months:</b>		
Min.-max.	5.20-7.50	5.20-7.80
Mean ± SD.	6.35±0.65	6.45±0.80
Median	6.40	6.40
<b>Post-operative after 6 months:</b>		
Min.-max.	5.50-8.0	5.50-8.0
Mean ± SD.	6.64±0.69	6.77±0.83
Median	6.65	6.75
<b>Post-operative after 9 months:</b>		
Min.-max.	5.60-8.50	5.80-8.50
Mean ± SD.	6.99±0.74	7.14±0.91
Median	7.0	7.05
<b>Post-operative after 1 year:</b>		
Min.-max.	6.0-9.0	6.0-9.0
Mean ± SD.	7.32±0.81	7.53±1.05
Median	7.0	7.40

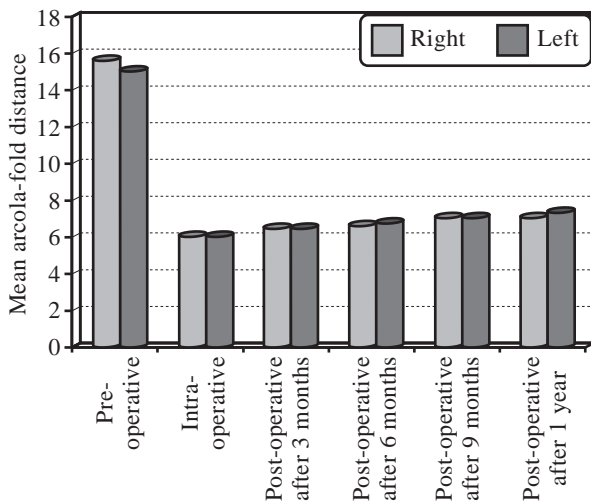


Fig. (9): Descriptive analysis of the studied cases according to mean areola-fold distance (n=20).

2- The ratio between 1-year post-operative areola to fold distance and immediate post-operative:

In our study we divided our patients into 2 groups according to the ratio between 1 year post-operative areolar to fold distance and immediate postoperative (Table 6, Fig. 10):

- 17 (85%) patients with a ration  $\leq$  (1.3).
- 3 (15%) patients with a ratio  $>$  (1.3).

Table (6): Descriptive analysis of the studied cases according to areola-fold distance (n=20) ratio of 1 year post-operative to immediate post-operative.

Ratio	Right	Left
<i>Post-operative 1-year vs. intraoperative:</i>		
$\leq$ (1.3)	18 (90%)	17 (85%)
$>$ (1.3)	2 (10%)	3 (15%)
Min.-max.	1.1-1.40	1.10-1.40
Mean $\pm$ SD.	1.23 $\pm$ 0.09	1.23 $\pm$ 0.10
Median	1.20	1.20

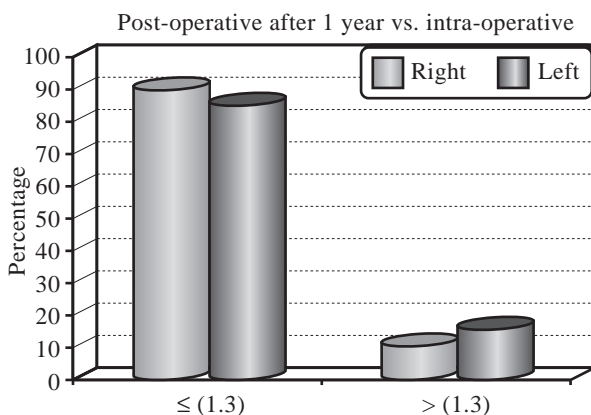


Fig. (10): Descriptive analysis of the studied cases according to areola-fold distance (n=20) ratio of 1 year post-operative to immediate post-operative.

- **Haematoma:** Haematoma occurred in one case (5%) in the left breast (Table 7).
- **Seroma:** Seroma occurred in one case (5%) in the left breast (Table 7).
- **Infection:** There was no reported cases with infection (Table 7).
- **Wound healing problems:** There were wound healing problems in 3 cases in our study at the T-junction (Table 7).
- **Partial nipple loss:** There was partial nipple loss in 3 cases (15%) 1 case with bilateral partial loss and 2 cases with unilateral partial loss (Table 7).
- **Fat necrosis:** There was fat necrosis in 1 case (5%) (Table 7).

Table (7): Recorded complications of the cases (n=20).

	Right		Left	
	No.	%	No.	%
Haematoma	0	0.0	1	5.0
Seroma	0	0.0	1	5.0
Infection	0	0.0	0	0.0
Wound healing problems	1	5.0	3	15.0
Partial nipple loss	1	5.0	3	15.0
Fat necrosis	1	5.0	0	0.0

- **Patient satisfaction:** We found that 60% of patients were satisfied, 25% of patients were somewhat satisfied/somewhat dissatisfied and 15% of patients were dissatisfied (Table 8, Fig. 11).

Table (8): Distribution of the studied cases according to patient satisfaction (n=20).

Patient satisfaction	No.	%
Dissatisfied	3	15.0
Somewhat satisfied/somewhat dissatisfied	5	25.0
Satisfied	12	60.0

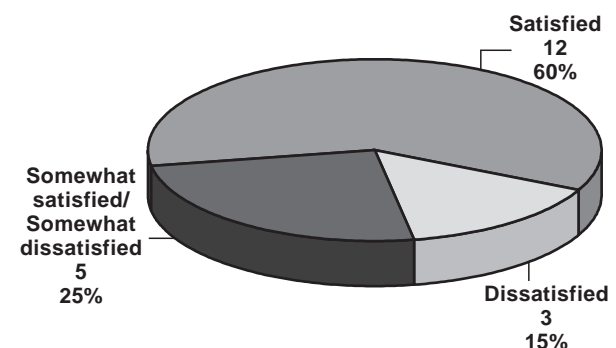


Fig. (11): Distribution of the studied cases according to patient satisfaction (n=20).

Case (1)

Cases presentation

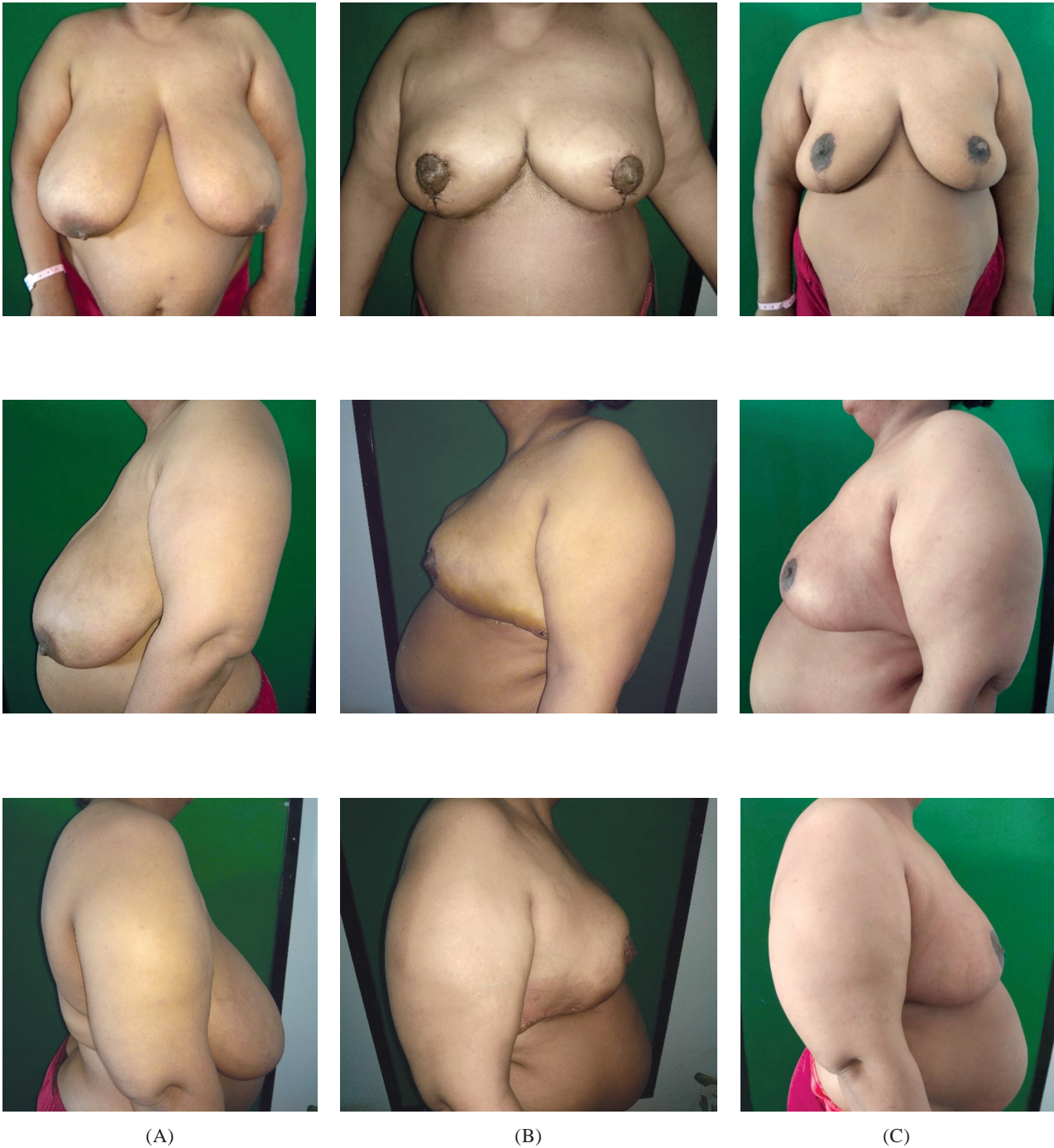


Fig. (12): 37-years old pt. (A) Pre-operative (front, left and right views). (B) Early post-operative (front, left and right views). (C) Late post-operative (front, left and right views).

Case (2)



Fig. (13): 35-years old pt. (A) Pre-operative (front, left and right views) (B) Early post-operative (front, left and right views) (C) Late post-operative (front, left and right views).

## Case (3)



Fig. (14): 45 years old pt. (A) Pre-operative (front, left and right views) (B) Late post-operative (front, left and right views).

### DISCUSSION

Breast reduction surgery is a safe and reliable procedure with a high level of patient satisfaction [15]. In all the techniques defined for this surgery, the aim is to eliminate the physical and psychological problems of the patients and protect the new breast shape for a long period of time.

Inferior pedicle technique, which was defined in the mid70s, is still one of the most popular breast reduction techniques used today [16]. Good vascularity of the pedicle and protection of sensation of the nipple areola complex and lactiferous ducts

make this technique safe even for the cases with a need of huge reduction amounts [17].

Besides these well-known advantages, there are disadvantages of the inferior pedicle technique, too. One of the common disadvantages is the risk of developing bottoming out and inability to protect breast shape in the long term due to the loss of the fullness of the upper pole [18]. Although successful results are achieved frequently in the early period, a few months post-operatively, due to skin envelope laxity and lateral and inferior migration of the pedicle, pseudoptosis (bottoming out) and upper pole flattening start to appear.



In order to prevent the deformities seen with the inferior pedicle technique, many suspension techniques have been defined in the literature. Suspension of the pedicle with internal sutures, suspension with dermal flaps, fascia and muscle flaps, dermal strip and fascia lata, and suspension by providing internal bra effect with allogenic or alloplastic materials are examples of these techniques [19-21,29-34]. Especially, suspension methods performed with dermal flaps and strips are very popular [19].

Aydin et al., [20] have defined a suspension technique that provides an internal bra effect by fixing the triangular dermal flaps created on the pedicle edges to the pectoral fascia.

Widgerow [9] has described a suspension technique performed with superiorly based dermal fascial flaps prepared from the medial border of the inferior pedicle.

Echo et al., [19] combined inferior pedicle technique with horizontal dermal suspension and horizontal plication by using medial and lateral triangular dermal suspension flaps. After preparation of lateral and medial horizontal dermal flaps of 1-cm thickness with an intact subdermal plexus, they have fixed these flaps to pectoral fascia at the level of 2<sup>nd</sup> and 3<sup>rd</sup> costa 3cm lateral to the sternal midline. They also made elliptical plication between 3cm below the areola and 3cm above the inframammary fold and reported successful results with this technique, which was used for 66 patients.

Goes obtained good long-term esthetic results with a technique that creates internal bra effect by using polyglactine and polyester mesh [22]. Although this has been reported as safe for patients, the risk of infection and fibrosis and difficulty in imaging of a possible breast cancer remains as disadvantages of the technique. Due to these disadvantages, Brown et al., [17] used alloderm for the purpose of internal bra support in their study with 27 patients and declared successful results.

Kankaya et al., [14] who studied the effect of dermal suspension to periosteum on inferior pedicle breast reduction divided their patients at post-operative year 1 into 3 groups according to the ratio of length of the vertical scar post-operatively to pre-operatively as <1.25, 1.25-1.30, and >1.30. The cases with a ratio of >1.30 and vertical scar length >9cm at post-operative year 1 were accepted as bottoming-out deformity. As a result, Widgerow [9] has declared a 92% success rate with this technique.

By applying the former scale on our study, we found that three patients (15%) had a ratio more than 1.3 with 85% success rate. Inadequate number of patients and lack of long-term follow-up of the patients (more than 1 year) are the disadvantages of our study.

But besides these disadvantages, we believe that fixation of the flaps to the pectoral fascia is an important advantage that can decrease the risk of recurrence in the long term.

Since alloplastic and allogenic materials are not used, this technique becomes cost effective and also disadvantages like risk of infection, palpation and prevention of the imaging of possible breast cancer disappears.

This technique is easy to perform, easy to teach and learn, and also does not increase the operation time nor the amount of hemorrhage and risk of possible complications.

For all these reasons, we believe that this technique can be an effective alternative method for breast suspension.

#### *Conclusion:*

From this study we concluded that the inferior pedicle suspension to pectoral fascia improve the result shape of the breast and decrease the bottoming out of the breast.

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