

Comparative Study between No Vertical Scar Reduction Mammoplasty and Subcutaneous Mastectomy with Free Nipple and Areola Grafting in Management of Post Bariatric Marked Breast Ptosis

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ABSTRACT

Background: Marked breast ptosis in males is considered one of the most challenging problems for plastic surgeons and so many techniques have been used in the last few years trying to give the patients the best esthetic outcomes, our research will help us to determine the proper management for such patients.

Objectives: To compare between no vertical scar reduction mammoplasty and subcutaneous mastectomy with free NAC grafting in management of post bariatric marked breast ptosis cases regarding patient satisfaction, objective esthetic outcome.

Methods: This is a prospective, comparative, randomized and descriptive study of 30 male patients suffering from post-bariatric marked breast ptosis. The patients were divided into two groups; Group A subjected to no vertical scar reduction mammoplasty technique (15 patients). Group B subjected to subcutaneous mastectomy with free NAC grafting technique (15 patients). Both groups were compared for objective esthetic outcome, patient satisfaction and rate complications.

Results: Both techniques resulted in a good satisfaction rate through getting rid from excess skin and breast tissue. Cases that were managed by no vertical scar technique had little NAC complications but were more liable to contour irregularities and asymmetries, on the other hand better esthetic outcomes but more NAC complications occurred with cases managed by subcutaneous mastectomy with free NAC grafting technique.

Conclusion: No vertical scar reduction mammoplasty technique has better results regarding preservation of NAC sensation and color, while subcutaneous mastectomy with free NAC grafting technique provides a better breast contour and little irregularities but carries more risk of NAC complications.

Key Words: *Ptosis – Reduction – NAC – Grafting.*

Conflicts of Interest: There are no conflicts of interest.

Ethical Committee: The Faculty of Medicine Beni-Suef University Research Ethics Committee Approved the Study.

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INTRODUCTION

The main target of bariatric surgery is to minimize excess weight and many of its accompanying comorbidities [1]. One of the main drawbacks of such procedure is marked skin and soft tissue ptosis and redundancy that often leads to referral to plastic surgeons [2]. In males the thoracic region, especially the breast area, is one of the main body regions that may cause psychosocial problems because of the feminized appearance that alters the masculine ideal of virility [3].

After marked loss of weight, male breast can be a difficult region to manage because of the varying degrees of nipple abnormal location, skin redundancy, huge parenchyma/fat, and loss of the infra-mammary fold [4].

The nipple areola complex is the main “aesthetic unit” in the male anterior chest; and so, it is difficult to accept a visible scar in this area and it will a problem if significant skin resection is needed [5,6,7].

Multiple techniques were applied to solve such multifactorial problem. Most of them arouse from the ideas of breast reduction techniques in females. The main steps in such techniques are getting rid from excess breast tissue and excess redundant skin with relocation of the NAC to its normal position [8,9]. In this research, we chose two different techniques for management of post bariatric marked breast ptosis cases and comparing their results regarding patient satisfaction, objective esthetic outcomes and complications rate.

PATIENTS AND METHODS

A- Patients:

This is a randomized-controlled interventional study including 30 patients complaining of post-bariatric marked breast ptosis. The study was done between June 2022 and March 2023 in Plastic and reconstructive surgery department, Beni-Suef University.

According to computerized program, patients were divided randomly into 2 equal groups: Group A = 15 patients and they were managed by no vertical scar reduction mammoplasty technique while Group B = 15 patients and they were managed by subcutaneous mastectomy with free nipple and areola grafting.

Inclusion criteria:

- Patients between 18 and 55 years old.
- Post-bariatric surgery with marked breast ptosis, after passage of 18 months from the time of bariatric surgery or 6 months from weight stability.

Exclusion criteria:

- Patients with medical comorbidities like uncontrolled DM, severe cardiac, hepatic or renal problems.
- Patients who refused participation in this research.
- Patients who still during the period of post bariatric weight loss.

Patient counseling and consent:

The Faculty of Medicine Beni-Suef University research ethics committee approved the study. Patients were informed and consented about the procedure steps, the possibility for partial or complete loss of NAC, wound dehiscence or infection and about any suspected complications.

B- Pre-operative assessment:

- Proper history taking: Such as age, body mass index (BMI), date of the bariatric surgery, any associated comorbidities.
- Physical examination: Proper assessment of breast size and degree of ptosis according to ASPS scale with exclusion of any suspicious breast mass.
- Investigations:
 - Laboratory investigations in the form of CBC, Coagulation profile, renal and liver function tests and HA1C.
 - Radiological investigation: Breast ultrasound to exclude any breast masses.

- Technique:

A- Photography:

Standard photographs of the breast and chest wall of all cases including the frontal and oblique views were taken preoperatively and 6 months postoperatively.

B- Marking:

- Regarding Group A: In standing position the chest wall midline, infra-mammary fold and the breast meridian lines were marked. Then drawing the position of the new NAC at the lower border of Pectoralis major muscle which is nearly 16-18cm from the mid-clavicular point. The lower incision line is one finger breadth superior to the natural infra-mammary fold to minimize postoperative scar exposure, while the upper incision line was marked with the help of pinching test to assess the amount of excess skin and hypertrophied gland (mostly it is just above the upper limit of the NAC). The diameter of the new NAC was 2, 5cm. Then an inferiorly based flap carrying the neurovascular supply to the NAC was marked, the width of such flap is 8-10cm. The de-epithelialization area that corresponds to inferiorly based flap was also marked.

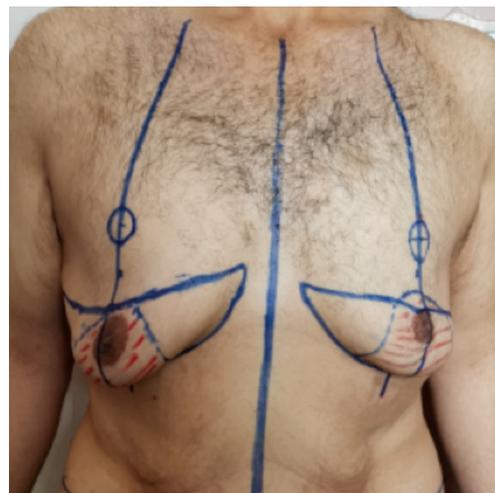


Fig. (1): Showing the marking of a case of post-bariatric surgery marked breast ptosis managed by no vertical scar breast reduction technique.

- Regarding Group (B): The same like in Group A, but there was no need for marking of any flap or any area of de- epithelialization as we harvested the NAC as a free graft, so we only adjust the ideal position of the new NAC which varies according to the built of each case. Such new position is commonly 6cm from the upper excision line along the lower border of the pectoralis major muscle.

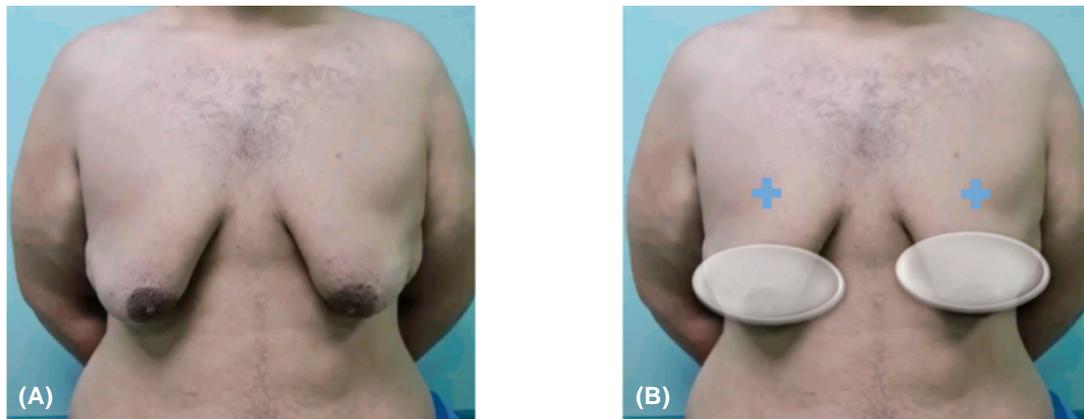


Fig. (2): Showing the marking of a case of bilateral marked breast ptosis managed by subcutaneous mastectomy with free NAC grafting (the + mark denotes the position of the new NAC).

Operative steps:

In both groups, general anesthesia was performed. The patients were placed in the semi-setting position with abducted arms. We infiltrated the marked lines, the breast and the site of de-epithelialization (over the inferiorly based flap carrying the neurovascular supply to the NAC in Group A) with a tumescent that had a diluted epinephrine, 1/200,000.

In group A:

The first step is the de-epithelialization of the inferiorly based flap followed by excision of the breast tissue. The limits of the excision extended inferiorly from the lower incision line which was at one finger breadth superior to the natural infra-mammary fold till the upper incision line superiorly which was marked with the help of pinching test with preservation of the de-epithelialized flap carrying the NAC. A superior fascio-cutaneous thoracic flap was dissected to the limit that allowed removal of any remnant of breast tissue and to the level that allowed sliding of this flap to be fixed to the infra-mammary fold.

We then started to excise a disk of skin on the superior thoracic flap at the marked site of new NAC and then delivering of the NAC from this opening.

In group B:

The first step is harvesting the NAC as a free full thickness graft. Then breast tissue resection was done extending from the upper to the lower excision lines, then a superior cutaneous thoracic flap was dissected to the level that allowed wound closure without any tension and removal of any remnant of breast tissue. Finally, at the marking of the new NAC, a circle of 2.5cm diameter from

the skin of the superior cutaneous thoracic was de-epithelialized to allow inseting of NAC graft with proper tie over application.

At the end of the operation (whether group A or B) one suction drain was inserted in each breast and exited just lateral to infra-mammary scar. Three-layer closure of the wound was done composed of deep interrupted stitches with 0 Vicryl sutures, subcutaneous continuous stitches with 3-0 Vicryl sutures, and intradermal suture with 4-0 propylene sutures. A compressive clothing was used over a total period of 2 months.

Follow-up:

The post-operative assessment period was up to 6 months after the operation. Postoperative assessment included pre and postoperative photographic documentation, analysis of early and late post-operative complications and patient's satisfaction score.

RESULTS

Data were analyzed by self-paired *t*-Test using SPSS version 26 and presented as a mean \pm standard error and LSD was used to determine significance. The significance of the results was assessed using Medcalc program in the form of *p*-value that was differentiated into non-significant when *p*-value >0.05 and significant when *p*-value <0.05 .

There was no statistically significant difference in patients' demographics, age, BMI, range of weight loss, preoperative comorbidities and details of the previous bariatric surgery (Table 1).

Regarding the postoperative outcomes, there was no statistically significant difference in the early complication rates between both groups, but

in late complications, we found that there was significant increase in rate of contour irregularities in group A and there was significant increase in rate of prolonged hypoesthesia and NAC hypopigmentation in group B (Table 2).

Regarding Patient's satisfaction score there was no statistically significant difference in rate of patient satisfaction between both groups as in both groups nearly total excision of the excess skin and glandular tissue was achieved (Table 3).

Table (1): Pre-operative demographic data: Showing no significant difference between patient characteristics in both groups.

Demographic data	Group A N=15	Group B N=15	<i>p</i> - value
Age (years)	20-49	22-50	0.933
Body mass index (range)	20.4-36	27.5-38.4	0.251
Weight loss range (kg)	40-65	37-63	0.349
<i>Preoperative comorbidities:</i>			
- Diabetes mellitus	6	9	0.371
- Smoking	6	5	0.435
- Cardiac diseases	3	2	0.768
<i>Previous bariatric surgery:</i>			
- Gastric plication	4	3	
- Sleeve gastrectomy	9	10	
- Gastric bypass	2	2	
Time passed from bariatric surgery (month)	16-30	17-32	0.635

Table (2): Postoperative outcomes in both groups.

Group	Group A N=15	Group B N=15	<i>p</i> - value
<i>Early complications:</i>			
- Seroma	3 (20%)	2 (13.3%)	0.628
- Wound dehiscence	2 (13.3%)	3 (20%)	0.628
- Hematoma	1 (6.7%)	2 (13.3%)	0.553
<i>Late complications:</i>			
- Breast asymmetry	5 (33.3%)	1 (6.7%)	0.073
- Contour irregularity	4 (26.6%)	0 (0%)	0.034
- Incomplete resection	4 (26.6%)	1 (6.7%)	0.150
- Prolonged hypoesthesia	2 (13.3%)	7 (46.7%)	0.049
<i>NAC Complication:</i>			
- Asymmetry in position	3 (20%)	1 (6.7%)	0.292
- Hypopigmentation	1 (6.7%)	8 (53.3%)	0.006
- Hypoesthesia	5 (33.3%)	10 (66.7%)	0.072
- Partial necrosis	2 (13.3%)	5 (33.3%)	0.202
- Complete Necrosis	0 (0%)	3 (20%)	0.071
- Sunken NAC	3 (20%)	0 (0%)	0.071

Table (3): Patient's satisfaction score.

Satisfaction rate	Group A N=15	Group B N=15
Highly dissatisfied	0	0
dissatisfied	0	0
Average satisfaction	3	2
satisfied	6	5
Highly satisfied	6	8

Clinical Cases



Fig. (3): A case of bilateral marked breast ptosis managed by no vertical scar breast reduction mammoplasty technique. (A,B): Preoperative, (C,D): 7 months postoperative.



Fig. (4): A case of bilateral marked breast ptosis managed by no vertical scar breast reduction mammoplasty technique. (A, B): Preoperative, (C, D): 7 months postoperative.

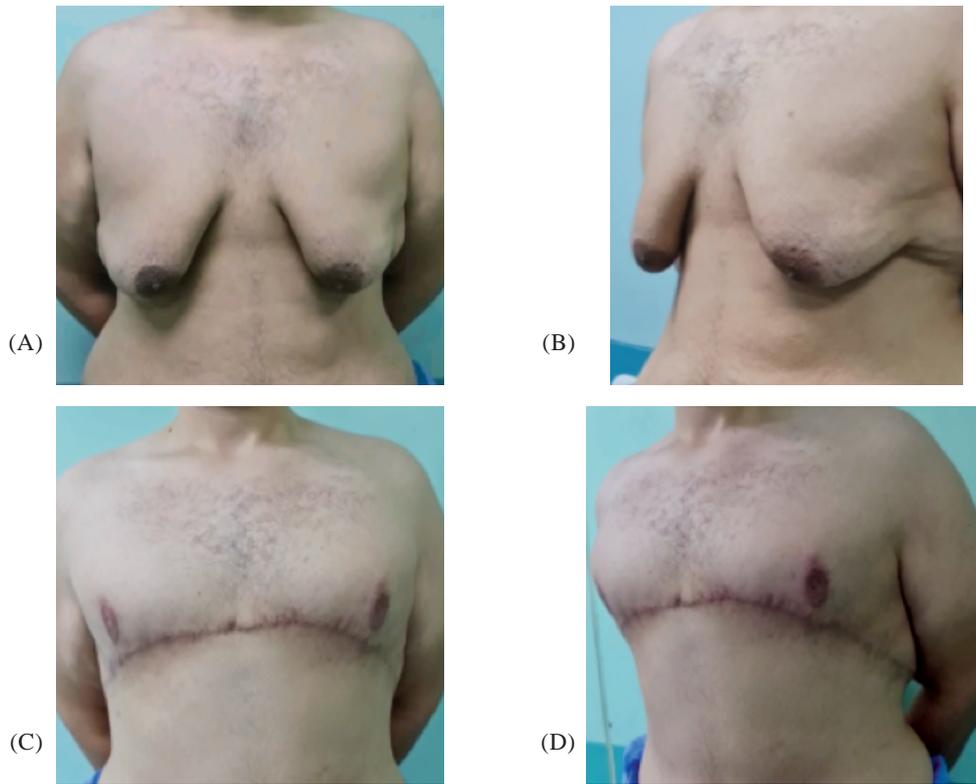


Fig. (5): A case of bilateral marked breast ptosis managed by subcutaneous mastectomy with free NAC grafting. (A, B): Preoperative, (C, D): 6 months postoperative.

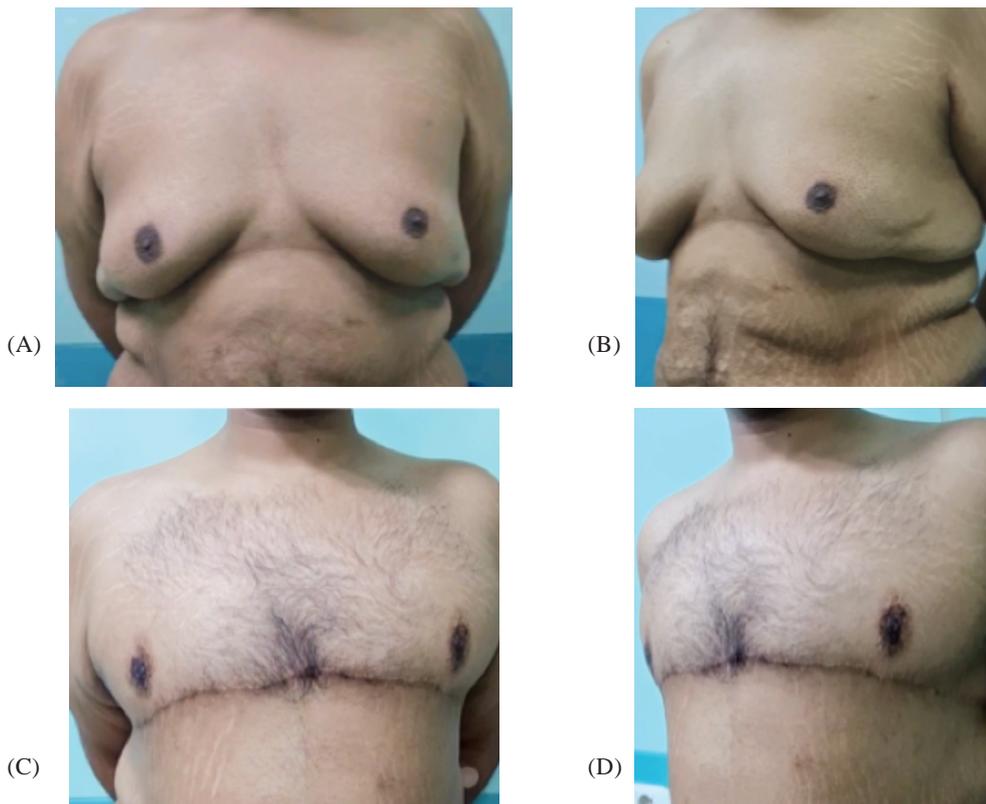


Fig. (6): A case of bilateral marked breast ptosis managed by subcutaneous mastectomy with free NAC grafting. (A, B): Preoperative, (C, D) are 6 months postoperative.

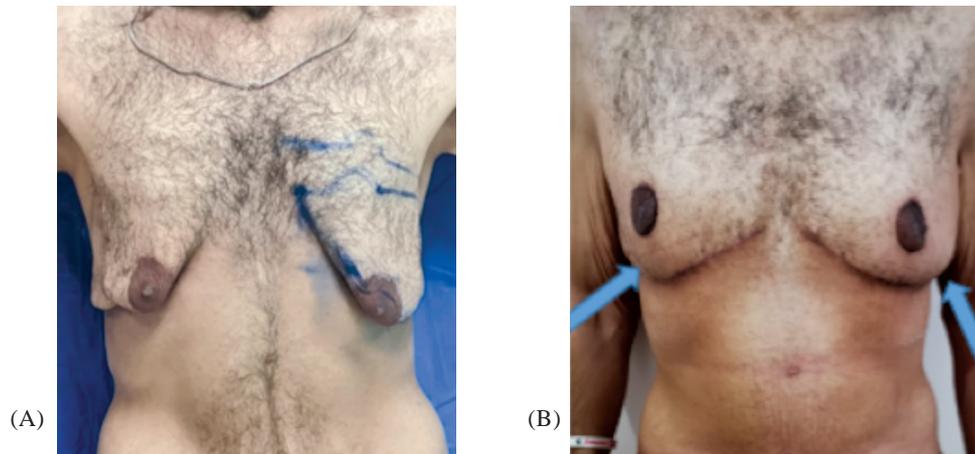


Fig. (7): A case of bilateral marked breast ptosis managed by no vertical scar breast reduction technique after 6 months from surgery and complicated by breast asymmetry and contour irregularity (marked by the blue arrow) (A: Preoperative, B: 6 months postoperative).



Fig. (8): A case of bilateral marked breast ptosis managed by subcutaneous mastectomy with free NAC grafting technique after 6 months from surgery and complicated by bilateral NAC epidermolysis.

DISCUSSION

It is well known that with marked weight loss in males, the breasts may actually decrease in size without actual shrinkage of the breast skin and so the resulting deformities do not fit exactly into the common and well-known gynecomastia classification. So, a more practical classification must be developed for marked weight loss patients, taking in mind some factors like glandular tissue versus fat and skin elasticity, to allow better management plan [9].

The deformities that occur in male's chest after bariatric surgeries vary significantly. Multiple techniques are described for treating gynecomastia but management of cases of marked breast ptosis is considered a difficult job [10].

Webster in 1946 designed a technique that depended on applying an intra-areolar semicircular incision but actually, one of its main drawbacks was its limited ability to eliminate the excess skin found in ptotic breasts [11].

Ibrahim designed another technique that leaves a small circumareolar scar. This technique depended on a superiorly based NAC flap through a circumareolar incision to remove the excess skin and submammary tissue. However, it leaves a small and hidden scar but it does not restore pectoral projection [12].

Over years there have been many other suggestions have been described aimed to resect the ptotic skin such as the concentric circle or circumareolar reduction, but corrugated scar around the NAC appeared to be the main complication for such techniques [13,14].

So, getting rid from the excess skin ptosis appears to be the main target for successful management of marked breast ptosis patients, but in our opinion, it is so difficult to reach such target without an actual larger scar allowing us to tailor and reshape such lax skin to appear more tight and youthful.

In this research, we chose two different techniques that share in the site, number, and visibility of the scars and compared their effect on early and late outcomes and patient satisfaction. We operated 30 patients of post-bariatric marked breast ptosis, 15 patients were subjected to no vertical scar reduction mammoplasty technique and the other 15 patients were subjected to subcutaneous mastectomy with free NAC grafting technique.

We found that no vertical scar reduction mammoplasty technique was a good option that allowed resection of a large part of mammary gland and also resection of the excess skin with preservation of NAC sensation and color, but the main drawback of such technique was the incomplete resection of the mammary gland leaving an inferiorly based flap carrying the neurovascular supply to the NAC. This results in some sort of breast asymmetry if unequal resection was done. Also, postoperative breast irregularities appeared in some cases with fullness of the breast at inferior and central zones (site of the inferiorly based flap) with flattening on superior, medial and lateral breast zones.

On the other hand, patients that were managed by subcutaneous mastectomy with free NAC grafting technique showed a noticeable satisfaction mainly about the overall shape of the chest wall and skin tightening with minor breast asymmetries or contour irregularities, but unfortunately many patients were upset from the NAC hypoesthesia and hypopigmentation.

Both groups nearly had the same rate of other minor complications like seroma, hematoma and wound dehiscence.

Conclusion:

No vertical scar reduction mammoplasty technique has a beneficial effect on management of post bariatric marked breast ptosis cases with preservation of NAC sensation and color but breast asymmetry and contour irregularities are common drawbacks, while subcutaneous mastectomy with free NAC grafting technique provides a better breast contour and little irregularities but carries more risk of NAC complications.

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