Egypt, J. Plast. Reconstr. Surg., Vol. 43, No. 1, January: 159-163, 2019

A Modified Superior Pedicle Technique for One-Stage Prosthetic Augmentation-Mastopexy in Post-Bariatric Surgery Patients

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ABSTRACT

Background: Augmentation mastopexy in post-bariatric surgery patients is a combined challenge that may not be successfully addressed with traditional procedures. One stage augmentation mastopexy techniques poses a relatively high rate of complications and revisions. Pathological changes in post-bariatric surgery breasts make them more complicated. This necessitates modification of our techniques to overcome these problems and achieve long lasting esthetic results.

Patients and Methods: Thirty five post-bariatric patients who underwent augmentation mastopexy using a modified superior pedicle technique and subpectoral implant placement were included in a retrospective study. The data collected involved: Pre-operative patients' age, body mass index (BMI), amount of weight reduction, grade of ptosis, standard pre- and post-operative photographs, patients' satisfaction, complications and rate of revisions.

Results: This technique was successfully applied with good to excellent results, rated by 94% of the patients after an average follow up period of 14.3 months, 10% complication rate and 7.1% reoperation rate.

Conclusion: The described technique provides long lasting aesthetic results for correction of post-bariatric breast deformity.

INTRODUCTION

One-stage breast augmentation-mastopexy is a difficult controversial procedure because it involves volume augmentation with concomitant reduction of the skin brassier.

The deformity is more complicated in post-bariatric surgery patients where the breasts are often ptotic, laterally displaced with flat upper pole due to unstable envelop with significant skin laxity and unstable mound with loss of volume and shape **[1]**.

Reports on the impact of parenchymal rearrangement, nipple-areola elevation with simultaneous volume augmentation by an implant on the overall complication varied between higher incidences of disastrous complication rate, absence of additional risk, to even less complication rate than single procedures **[2,3,4]**.

The literature on that subject is sparse and heterogeneous with no clear distinction as regards the indication whether aesthetic, reconstructive or after massive weight loss **[5]**.

In this study, we provide a single author personal experience with one-stage augmentation-mastopexy in post-bariatric patients. A modified superior pedicle technique with subpectoral placement of medium sized and medium height breast implant was used. Patient selection criteria and potential complications were discussed.

PATIENTS AND METHODS

This is a retrospective study done on 35 post-bariatric surgery patients (70 breasts) operated upon by the author in the period between 2014 and 2017. Their age ranged between 25-48 years (average 36.3 years). All had stable BMI for at least 6-12 months and grade II & III ptosis **[6]**. The follow-up period was 14.3 months on average, ranging between 6 and 30 months. Smokers, obese, and unrealistic patients as well as patients presenting for secondary correction after previous breast surgery were excluded.

*We used the superior pedicle technique described by Lejour **[7]**, with some modifications:*

- Intraoperatively, the skin was carefully de-epithelialized to avoid removal of the thin dermis.
- The superior pedicle was extended inferiorly to involve all the glandular and subcutaneous tissue down to the inframammary crease (Fig. 1B). Then, the pedicle and the rest of the subglandular pocket were widely undermined to allow free contouring of the breast tissue and tension free closure.

Moderate-size (250-350 cc), moderate height, round, textured, silicone gel-filled implants were used. The pocket for implant placement was subpectoral (Fig. 1C).

- After insertion of the implant and fixation of the nipple-areola to the new site, the lower end of the extended de-epithelialized pedicle was sutured to the fascia at the level of the new inframammary fold for extra-coverage of the lower part of the implant (Fig. 1D).

No drains were used. Skin was tailored and closed longitudinally (Fig. 1E).

Results were documented by standard pre- and post-operative medical photographs. The patients' files were revised for early postoperative complications and long-term tissue & implant-related complication rates, re-operation rate, and patient satisfaction according to the scale presented by Albert and Daniel **[1]**.

RESULTS

This retrospective study was done on 35 post-bariatric surgery, massive weight-loss female patients (70 breasts) operated upon by a single-stage augmentation-mastopexy using a modified superior pedicle technique and moderate size, moderate height silicone implants. Their average age was 36.3 years (range 25 to 48 years). The average weight loss was 31.1 kilograms (range 20-45 kilograms) with stable body weight for at least 6-12 months.

Breast contour, volume restoration, and symmetry was rated good to excellent by 33 (94%) of our patients 6-30 months postoperatively (Figs. 2,3).

Fig. (1): (A) Superio pedicle de-epithelialized. (B) The de-epithelialized superior pedicle flap is incised and extended inferiorly to capture all the subcutaneous and glandular tissue down to the inframammary crease. (C) The extended superior pedicle flap dissected and lift away to show the pectoralis muscle (in red) and fascia (in green) and the implant (in blue) inserted in sub-muscular pocket. (D) Nipple areola complex fixed in its new level and lower end of the flap tied at new inframammary level. (E) Final closure.

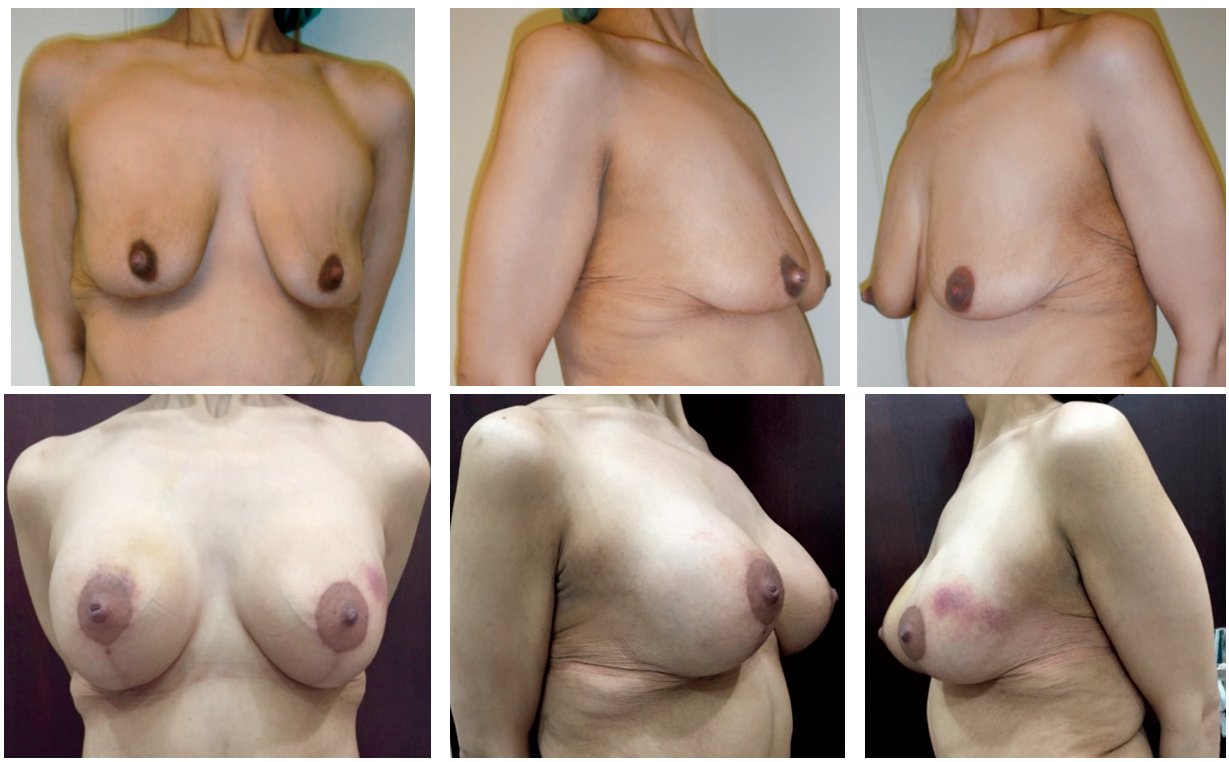

Fig. (2): This is a 36 years old patient before and 6 months after augmentation mastopexy. A 350 cc. breast implant was used.

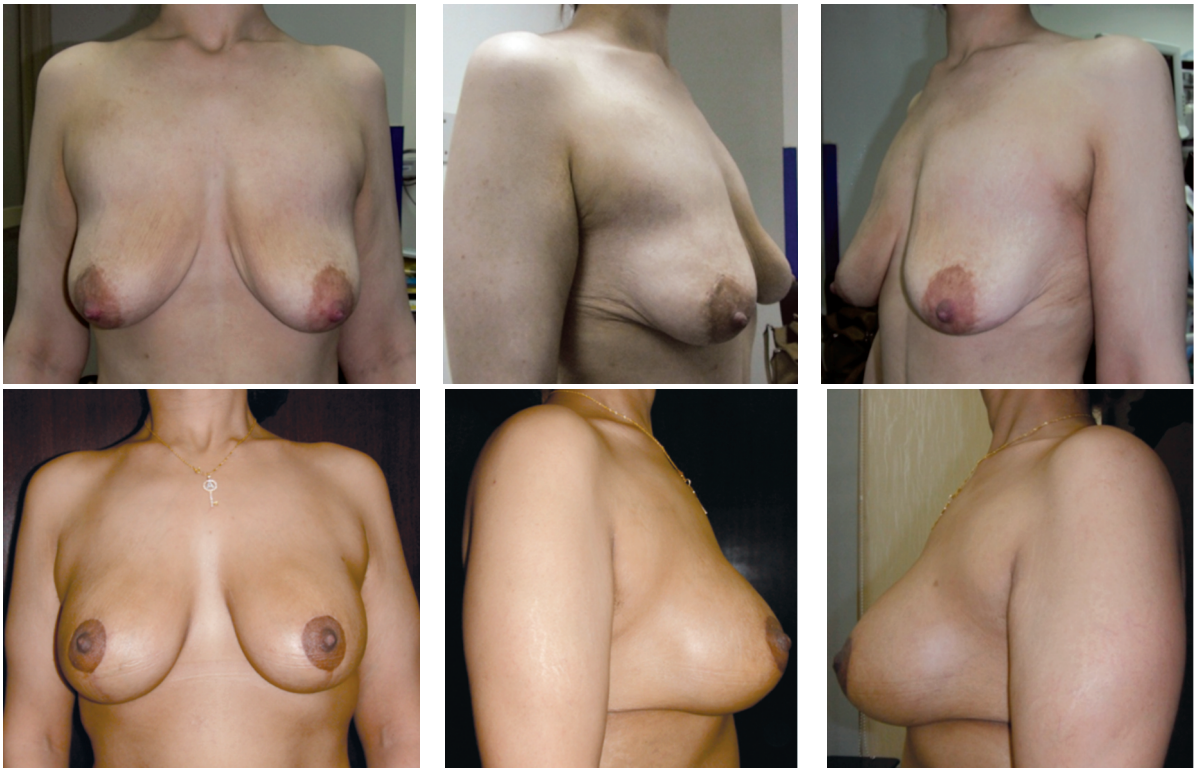

Fig. (3): This is a 40 years old patient before and 18 months after augmentation mastopexy. A 250 cc. breast implant was used.

Postoperative complications were recorded in 5 patients. The tissue-related complications were delayed healing in 3 breasts of 2 patients (resulted later in wide scars) and bilateral recurrent ptosis in 1 patient. There was unilateral implant-related complication (malposition) in 2 patients (Table 1).

Re-operation was done for 5 breasts in 4 patients (7.1%). The indications for re-operation were scar revisions in 3 breasts and correction of implant malposition in 2 breasts (Table 2).

Table (1): Complications.

Total Complications: 7 breasts (10%)	
Tissue related complications: 5 breasts (7.1%)	Implant related complications: 2 breasts (2.9%)
Delayed healing 3 (4.3%)	Implant malposition 2 (2.9%)
Recurrent ptosis 2 (2.8%)	

Table (2): Re-operation.

Indication of re-operation	Number
Scar revision	3 (4.3%)
Correction of implant malposition	2 (2.8%)
Total re-operation number	5 (7.1%)

DISCUSSION

Obesity is a major problem worldwide. Many medical problems are associated with obesity including cardiovascular disease, hypertension, type II diabetes, stroke, osteoarthritis, dyslipidemia, sleep apnea and some cancers. Concomitantly, there is an increased demand for bariatric surgery that provides the only method for achieving long-term weight control in obese patients **[8]**. However, weight loss and improvement of obesity-related health problems is associated with soft tissue and skin laxity that can affect the body image and quality of life **[9]**.

Colwell et al., described the changes that occur in the female breast in massive weight loss patients after bariatric surgery **[10]**. These include significant volume loss, ligamentous support attenuation, thin dermis and inelastic skin. The breasts usually exhibit grade III ptosis with lowering of the inframammary fold, upper pole deficiency and blunting of the lateral curvature. Breast changes is considered a part of upper body contour changes associated with massive weight loss in bariatric surgery patients that also include circumferential laxity, back rolls and deformity of the arms **[11]**.

Several techniques were described to address massive weight-loss breast deformity depending on the remaining volume of the breast. Mastopexy

with dermal suspension can be considered if the remaining breast tissue is sufficient **[12]**. Augmentation-mastopexy is done if there is volume deficiency using either an implant or autologous lateral thoracic flap supplied by the lateral intercostal arteries perforators **[13,14]**. Implant-based breast augmentation requires less operative time, short recovery period with no donor site morbidity but caries the possibility for capsular contracture, migration, rippling and other implant related complications. On the other hand, breast augmentation by autologous tissues allows simultaneous correction of the breast and upper body contour changes **[11]**.

In this study, we used only prosthetic volume augmentation of the breast for several reasons. First, all cases had deflated breasts with volume deficiency. Second, autologous augmentation was not suitable for thin patients with little circumferential volume excess. Third, our patient population was highly concerned with correction of the breast contour rather than the whole upper body laxity.

One-stage augmentation-mastopexy is a difficult controversial operation that seems attractive because it avoids the 100% re-operation rate in the two-stage procedure. However, combination of the augmentation procedure introduces the implant-related concerns such as infection and capsular contracture, whereas mastopexy increases the risk of tissue-related complications such as nipple/flap necrosis and poor scaring. Spear pointed out that the combined procedure carries higher incidence of disastrous complication rate of flap necrosis and nipple loss **[2]**. Other authors observed that simultaneous timing of these procedures does not add any additional risk **[3]**. Stevens et al., in their retrospective study found that tissue-related and implant-related complication rates were even less than the complication rates of single procedures without addressing the technical concerns or the aesthetic outcome **[4]**. Khavanin et al., explained the controversial safety of single stage augmentation-mastopexy by combination of two procedures with odd effect on each other namely expansion of the breast volume and reduction of the skin envelop **[5]**. Spear et al., attributed the relatively high complication rate of the combined procedure to alteration of the blood supply from undermining of the skin, rearrangement of the parenchyma, elevation of the nipple and dissection for placement of the implant & the presence of breast implant itself **[13]**.

In this study, the overall complication rate was 10%. Of these, 7.1% were tissue-related and 2.9% were implant related. We had no case of nipple, parenchyma or flap necrosis because of conservative skin resection to minimize the effect of increased breast volume after insertion of the implant on the blood supply of the nipple and the central part of the breast parenchyma. Also viability of the pedicle was checked before and after implant placement and any query tissue was trimmed before final wound closure without tension.

The re-operation was done for 5 breasts in 4 cases (7.1%). The indications for re-operation were scar revision in 3 breasts of 2 patients (4.3%) and correction of implant malposition in 2 breasts of 2 patients (2.8%).

Attention was directed to patient-selection and implant size in an attempt at minimizing complications of one-stage augmentation-mastopexy. Colwell et al., recommended 2-staged procedure for grade III ptosis to minimize the risk of impaired nipple perfusion with the long pedicle and weak support by the inelastic, overstretched skin **[10]**. Cannon and Lindsey, found favorable results in patients needing nipple elevation for less than 4 cm **[15]**. Calobrace et al., considered severe nipple ptosis greater than 6 cm as a relative contraindication to one-stage technique **[16]**. Albert and Daniel, suggested a staged procedure for patients with significant deformity to minimize the risk of recurrence, ensure nipple viability and allow for secondary procedure for correction of minor asymmetry and deformity in shape **[1]**. Khavanin et al., stated that the ideal candidate for one stage augmentation-mastopexy generally has soft, flaccid breast with good skin elasticity, grade I-II Regnault ptosis, without the need for extreme parenchymal or skin resection **[5,6]**.

In our study 21 patients (60%) had grade II and 14 patients (40%) had grade III ptosis. We also used small to moderate-size, moderate height implants (250-350 cc) to fill the deflated breasts.

Autologous tissues may support a small or medium-sized implant but large implant may require additional support by autologous tissue or Alloderm **[10]**. Albert and Daniel, used 200-350 ml implants and recommended the use of a smaller implant for one stage augmentation-mastopexy to minimize scar widening and the incidence of recurrent ptosis **[1]**. Swanson, described one-stage augmentation-mastopexy using medial pedicle and vertical scar technique. Placement of the implant was submuscular and the mean implant volume was 372ml. The complication rate was 32.9% **[17]**. Khavanin et al., recommended one-stage augmen-

tation-mastopexy to patients who desire moderate augmentation <360ml, with low preoperative risk factors such as obesity and smoking **[5]**. They thought that the rate of recurrent ptosis is not only related to the implant size but also to the incision and site of implant placement as well. The pooled incidence of recurrent ptosis varied with the mastopexy approaches being 3.21% with the inverted-T technique and 5.04% with the periareolar approach.

In our study, recurrent ptosis represented 2.8% of the cases with no need for re-operation. The use of medium-sized implants and its sub-pectoral insetting were the factors responsible for decreasing the incidence of recurrent ptosis.

Also, the use of moderate height rather than high profile implants was found to provide better base to height relation and expansion of the wrinkled medial side and blunted lateral side of the 3 dimensionally deflated post-bariatric breasts.

The extended lower part of the superior pedicle was used to offer extra-soft tissue coverage for the lower part of the implant that has no coverage by the pectoralis muscle. This extra-coverage is especially needed for those post bariatric patients with thin subcutaneous tissue to decrease the incidence of implant rippling. Its fixation at the new inframammary crease level just below the implant may help supporting the implant as well.

The literature on the subject of augmentation-mastopexy is sparse and heterogeneous. More distinction should be made as regards the indication whether aesthetic, reconstructive or after massive weight loss. There was also variation in the techniques used and the follow-up period that is expected to affect the outcome of surgery **[5]**.

Summary and conclusion:

In our current study, we presented a modification of the superior pedicle technique with subpectoral prosthetic augmentation for one-stage augmentation-mastopexy in 35 post-bariatric massive weight loss patients. Volume augmentation was achieved by moderate size, moderate height, round, silicone gel-filled, textured mammary implant. Repositioning of the inframammary fold was done by suturing of the extended lower end of the pedicle at the new level and approximation of the pillars. The total complication rate was 10% and the re-operation rate was 7.1% during the follow-up period. To our knowledge, this modification was not described before for correction of post-bariatric breast deformity.

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