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One stage mastopexy augmentation in the ptotic patient. The superiorly based dermal flap for autologous reinforcement of the inferior pole

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KEYWORDS

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Summary *Background:* The use of one stage mastopexy augmentation in the ptotic patient remains controversial. Expansion of breast volume and reduction of the skin envelope contradict each other and increase the risks of potential complications. By carefully selecting and consenting patients appropriately I describe the use of the superiorly based dermal flap for autologous reinforcement of the inferior pole to increase safety and reliability in one stage mastopexy augmentation.

Objectives: To determine whether the superiorly based dermal flap could provide a safe and reliable method of one stage mastopexy augmentation.

Methods: 40 one staged mastopexy augmentation procedures were performed on 21 patients. Patients were excluded if they smoked, BMI >30, had significant co-morbidities, had unrealistic expectations, required a nipple lift of >8 cm, wanted >400cc volume in primary cases or >25% increase in volume in secondary mastopexy augmentation. Both round and anatomical implants were used in either the sub glandular or dual plane pocket depending on patient's aesthetic wishes.

Results: The average implant size was 290cc and average nipple lift was 5 cm. After an average follow up of 27months there have been no implant based complications, no reoperations and no infections/haematomas/seromas.

Conclusions: Careful selection and consent of patients make the use of the superiorly based dermal flap for autologous reinforcement of the inferior pole a safe reliable technique in one stage mastopexy augmentation.

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Introduction

Gonzalez-Ulloa¹ initially described one staged mastopexy augmentation through an incision pattern for ptosis as described by Aufricht.²

Gonzalez-Ulloa¹ described some important principles stating that the introduction of an implant should be placed in a nonaggressive manner, the substance should be protected, the pocket in which the implant be placed be large enough and the wounds closed without tension. This was achieved by choosing an implant in proportion to the patient's chest. Regnault³ subsequently described retaining the dermis during one stage mastopexy implant and subsequently the different degrees of ptosis.⁴

Dermal flaps have been described in various mastopexy/breast reduction techniques using a variety of different pedicles.^{5–7} Inferiorly based dermal flaps,^{8,9} superiorly based fascial flaps^{12,13} non autologous tissue and dermal grafts^{10,11} have been advocated to cover the lower pole in reconstruction. There is increasingly a focus on providing lower pole coverage for breast augmentation to prevent bottoming out and the possibility of augment extrusion with the use of silicone implants now common place with a number of longer follow studies available.^{14,15}

The problems of placing implants in the ptotic patient were highlighted by Goulain¹⁶ concluding that the simple placing of implants was not the correct solution to the problem of the ptotic breast and that a reconstructive mastopexy should be performed first and then the surgeon should determine whether the insertion of implants should follow or not. Goulain¹⁷ subsequently described the use of utilising dermal flaps in mastopexy procedures.

The choice of whether to perform a mastopexy or augmentation first in a two staged mastopexy augmentation remains controversial. Although either may produce satisfactory results neither mastopexy nor augmentation alone are likely to produce an aesthetic result in the primary stage for a patient with grade 3 ptosis.

The safety of single-stage augmentation-mastopexy in the ptotic patient remains controversial^{18–30} with concerns that the actions of expansion of breast volume and reduction of the skin envelope contradict each other leading to increased risks of nipple loss, devascularisation of breast tissue, nipple malposition, and implant extrusion. Several studies though have demonstrated acceptable complication and reoperation rates with the concomitant advantages of avoiding a second operation, lower costs and potentially greater patient satisfaction.^{18–31} As stated in a recent meta-analysis of one stage mastopexy implant it has been difficult to make evidence-based decisions weighing the potential added risks of complications and poor aesthetic outcomes against the benefits of a single-stage procedure.²⁹

For the patient with grade 3 ptosis the risks are highest and it is in this group in whom a breast augmentation only or mastopexy alone would likely give a suboptimal outcome.

As one staged mastopexy augmentation has become more common place the technique has been safely applied in the revisionary case as termed secondary mastopexy augmentation.³¹

We describe a reliable one stage mastopexy augmentation technique for the patient with grade 3 ptosis and

discuss our selection criteria for one stage mastopexy augmentation in order to maximise safety and reduce complications.

Patient selection

All patients with grade 3 ptosis who consulted for breast augmentation, mastopexy and mastopexy/augmentation were considered as candidates for a one staged mastopexy augmentation using the superiorly based dermal flap for autologous tissue coverage of the lower pole. Patients were not offered the one stage procedure if they smoked, their body mass index (BMI) was >30, had significant comorbidities or their expectations were deemed unrealistic.

Patients were sized with implants in a suitable bra. Patients chose implants based initially on volume requirements. Once the volume was determined the base width of the implant was chosen to fit the chest width. Patients were offered both round and anatomical implants if implants existed in the volume that approximated to the breast width. The pros and cons of each type of implant and the pros and cons of pocket placement were discussed. Patients wishing to have a volume of implant >400cc (in primary one stage mastopexy augmentation) or wished to increase more than 25% of volume (in secondary mastopexy augmentation) were excluded. All patients were shown results applicable to them for each option and perceived complications of one staged mastopexy/implant were discussed. A nipple lift of 8 cm was considered the limit for this technique and all patients in whom expectations were deemed unrealistic were excluded. It would be estimated that around 40% of patients with grade 3 ptosis were excluded as a result of this rigid selection and consent process. Costs applicable to each procedure were included and all patients undergoing one staged mastopexy augmentation were consented for the possibility of re-operation.

Method

On the day of surgery the new nipple height, new areola and original IMF were marked with the patient standing and awake and patients photographed. Breast width, SN-N, Areola diameter, distance of nipple from the midline and distance from nipple to infra mammary fold (IMF) on stretch were recorded. All patients underwent general anaesthesia with lower extremity sequential compression devices and given perioperative antibiotics. During surgery the new areola was marked and the measurements of the vertical limbs were performed under maximum skin stretch (10–12 cm). The length of the limbs varied depending on the volume of the implant and the quality/excess of the skin and rather than triangulating outwards the limbs were triangulated inwards. The outside of the Areola marked A and B are shown in [Figure 1](#) and the areola was considered as the centre of a long ellipse down to point E at the planned inframammary fold.

The de-epithelisation process was completed using a blade, de-epithelising everything within the wise pattern markings ([Figure 1](#)). The dermis was released around the

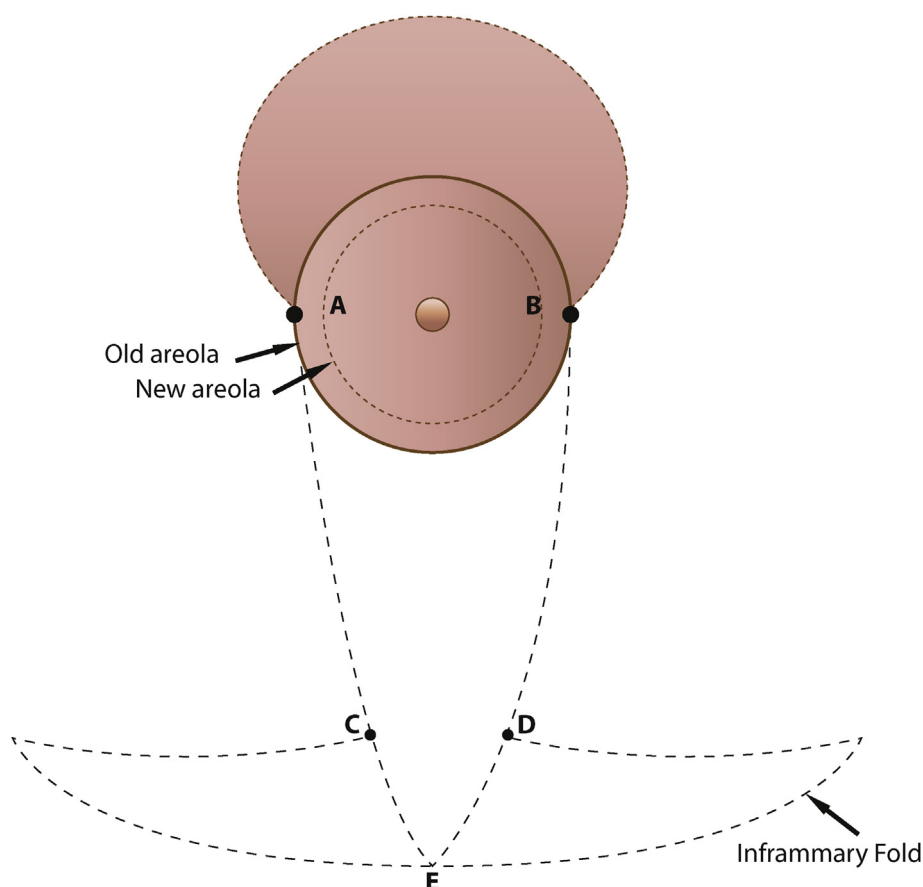


Figure 1 Schematic drawing of the markings of the superiorly based dermal flap.

de-epithelised area sparing the superior dermal pedicle. The superior vertical dermal pedicle was never released between the 3 O'clock to 9 O'clock positions (Figure 2). The dermis was released down to the level of the breast parenchyma and then the breast augmentation procedure was performed through the IMF incision. Where a dual plane pocket was created the sub glandular plane was elevated to the level of the areola.³² The pectoralis major muscle was entered as low as possible medially, but above the IMF, and divided along the line of the pectoralis muscle without disrupting the serratus fascia. A sizer was used where an implant greater than 250cc was planned. The pocket was then washed out with betadine and the implant inserted. The dermal flap was fixed onto the onto fascia and/or the periosteum of the chest wall and a retractor used to ensure no trauma to the implant during the fixing of the dermal flap onto the chest wall (Figure 2). The dermal flap and thus the IMF was always raised between 2 and 4 cm. Patients with a longer dermal flap and less of a nipple lift, a 4 cm raising of the IMF can be achieved. Three to five individual 3.0 monocryl stitches were placed on clips and then parachuted into position at the same time to make sure that a uniform new inferior mammary fold was created. The T junction, areola and the superior 12 O'clock position of the areola were secured with 2.0 vicryl. Where the superiorly based dermal flap was tight in a vertical vector (Figure 2) it was necessary to release the dermal flap in a horizontal/transverse fashion. The full width of the dermis was not released leaving at least 5 mm of dermis intact at either

end. A transverse release was made in under 30% of cases but in one case two transverse releases were made (Figure 2).

The skin was closed with subcuticular 3.0/4.0 monocryl and the areola incision with interrupted 4.0 vicryl rapide. Liquiband was applied on the skin incisions and no drains were used. Early mobilisation in a bra was encouraged and patients were monitored overnight and discharged home the next day.

Results

Between March 2009–Oct 2014 40 breasts in 21 consecutive patients underwent autologous cover of the inferior pole for one stage mastopexy augmentation using the superiorly based dermal flap. The average age was 40 (Median 41, Range 21–78) and average follow up was 27.4 months (range – 3–70 months – median 22 months). 17 patients had bilateral primary one stage mastopexy implant (Figure 2), 4 of which had a simultaneous abdominoplasty procedure (Figure 3) 2 patients had unilateral primary one stage mastopexy implant for contralateral symmetrisation following breast reconstruction and 2 patients had bilateral secondary mastopexy augmentation (Figure 4). Both primary augmentations had been performed elsewhere and referred for a revisionary procedure. In all cases the Mentor Worldwide LLC range of cohesive silicone gel implants were used. The average implant volume was 290cc (range 150–420, median 300cc). Round implants were used in 13

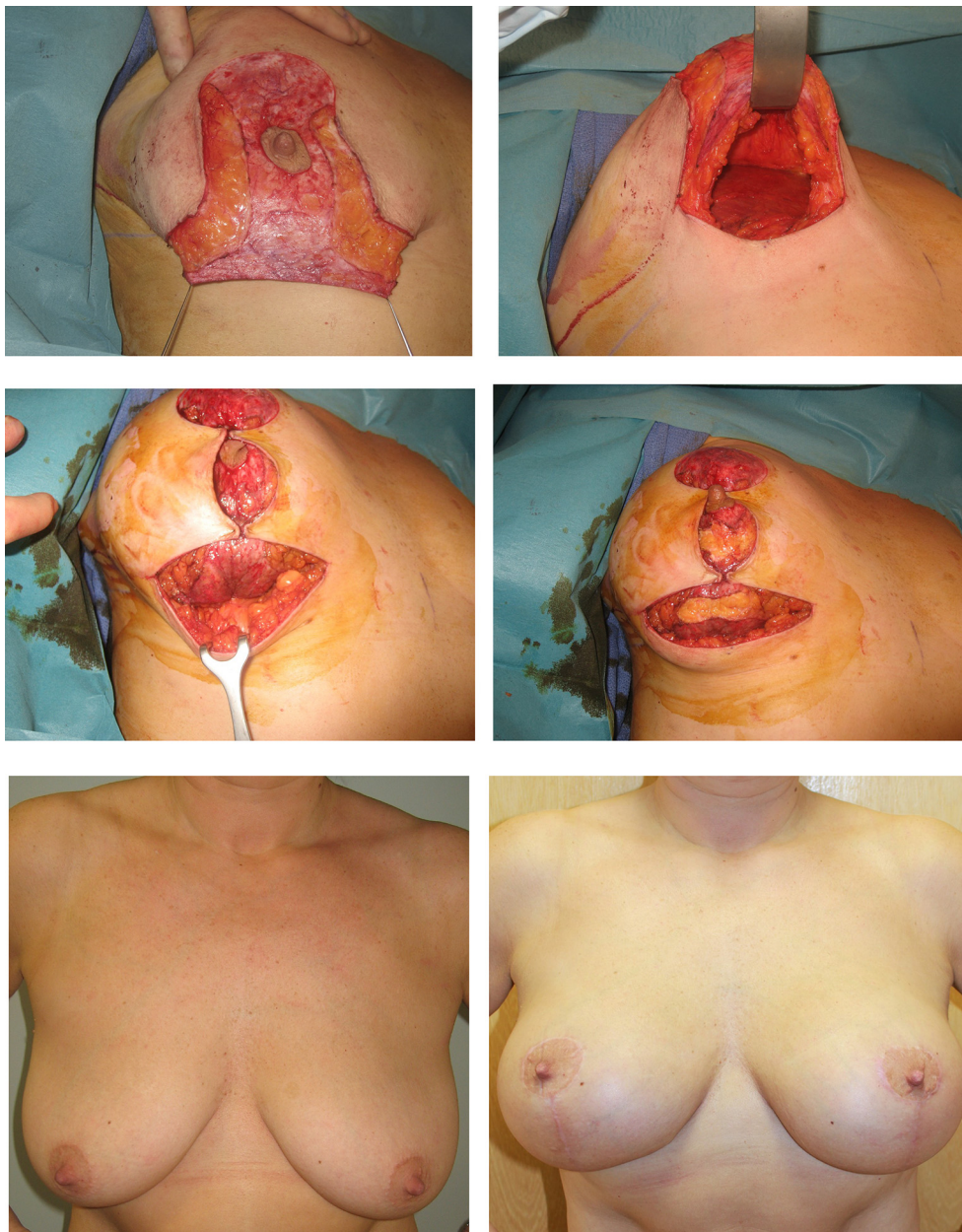


Figure 2 The breast augmentation pocket is created through a large IMF incision (top left). The breast augment is inserted and the superiorly based dermal flap secured to chest wall (top right). Two transverse dermal releases made in flap to decrease tension on NAC on closure (middle). Preop photo (bottom left). Postop photo (bottom right).

patients and anatomical in 8. The subglandular plane was used in 11 patients and the dual plane technique in 10. The SN-N preop distance was an average 28 cm (median 28 cm range 26–33) and the new position of SN – N distance average was 23 (median 23 range 22–25). The amount of additional autologous tissue coverage utilising the superiorly based dermal flap was an average 4 cm (median 4 and range 3–6 cm).

There were no cases of infection or haematoma or seroma. There were no wound healing problems at scar at the T junction. One patient who suffered with psoriasis had delayed healing of the mid portion of the vertical limb. There have been no reoperations. There was one patient 1 year postop who although happy did have asymmetry. This

patient required a lift of 33 cm–25 cm and had a 6 cm dermal flap with a 4 cm lift of the dermal flap on the chest wall. She had been consented previously for asymmetry and had different sized implants on each side to try and correct some of the size asymmetry. She understood the limitations of the procedure and in particular consented for the right side to be smaller postoperatively. (Figure 5).

Discussion

Of prime importance when choosing the option of one stage mastopexy augmentation is patient selection. All patients who smoked, elevated BMI and wishing for enlarged volume

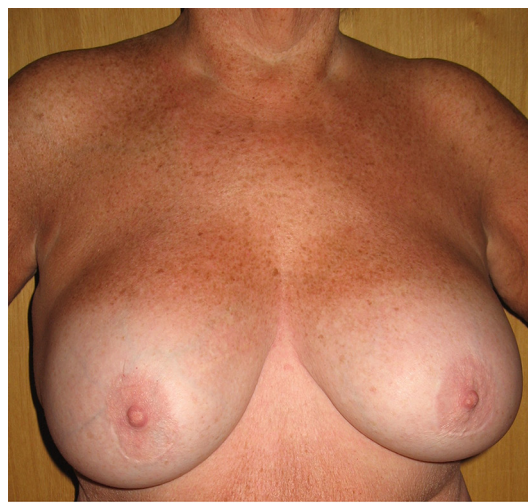


Figure 3 Pre and postop images of a patient with significant weight loss undergoing mastopexy augmentation and abdominoplasty.

were excluded. In all but one patient the nipple elevation was 6 cm or less. It has previously been shown that all of these factors are unfavourable in the ptotic patient undergoing a one staged mastopexy augmentation and the results obtained are a reflection of the rigid selection process. The other important aspect in selection is the realistic patient and all patients were sized during the initial consultation and implants selected to fit the breast width. For almost 50% of patients this meant that only low or moderate profile implants could be used. Anatomical implants were offered in either the subglandular or dual plane position. In low and moderate profile implants the take-off in the upper pole is shallow and in these scenarios patients were offered placement in either the subglandular or dual plane position. If the amount of breast tissue in the upper pole was less than 2 cm patients were preferentially offered the dual plane position (eg weight loss patients). Patients were consented that in the subglandular plane that

Figure 4 Pre and postop images of a patient undergoing mastopexy augmentation following a previous breast augmentation performed elsewhere.

implants would have a tendency to become more palpable in the upper pole with time and that the implants were more likely to drop with the breast. Patients opting for a dual plane pocket were consented for the implants having a tendency to remain higher on the chest wall and for the breast to have a tendency to drop over the implant with time. The informed consent process included the limitations of the procedure including recurrent ptosis and bottoming out. It is likely that over time that there will be recurrent ptosis in a proportion of patients and the follow up in this study is short. One would anticipate that recurrent ptosis will occur and for some with poor quality skin and for those following weight loss this is inevitable. In patients with asymmetry prior to surgery patients must be realistic about what can be achieved (Figure 5).

In order to minimise the risks of skin necrosis and implant exposure authors have described limiting skin removal until after augmentation. It is always necessary to remove some skin below the areola to prevent a dog ear below the areola and it is this tissue below the areola that is being de-epithelialised in the method described. If during



Figure 5 Preop of patient with significant ptosis and asymmetry and wide areola diameter (upper left). Marking of new nipple areola complex and limbs not triangulated and dropped as close to areola as possible (upper right). Postop at one week showing amount of swelling superiorly (lower left). Postop view of patient after 2 years (lower right).

the procedure there is any risk to the vascularity of the nipple one needs to consider performing a mastopexy only and converting to a two stage procedure. This was not required in any patient within this series and the technique can safely be applied to carefully selected patients.

There were no cases requiring a return to theatre for infection/haematoma or scar revision and there were no poor scars in this series. The scars appeared to be of better quality than that of mastopexy/reduction patients only and it is likely that the maximum tension in this procedure is internally against the dermal flap. One breast had delayed wound in the central part of the vertical limb. Because the highly vascularised dermis lies underneath the scar line it healed within 4 weeks. By using vascularised tissue rather than grafts or non-autologous tissue to cover the lower pole there are significant advantages in terms of vascularised cover. Furthermore there are two stitch lines required for a graft or non-autologous tissue in the lower pole and being non-vascularised, certainly initially, has increased potential to stretch and unable to give the same internal strength.

By not releasing into the breast parenchyma the blood supply to the breast tissue is preserved. The dermal release

at the level of the new areola incision needs to be released so that the width of the dermal flap equals that of the combined width of the releases at this level once the augment is in place. For round implants the maximal tension on closure will be between A-B (Figure 1) whereas the maximal tension for anatomical implants is between C-D (Figure 1). Dermal release needs to lead to at least a doubling in distance of A-B and C-D so that the incision can be closed without tension. In mastopexy augmentations of larger breasts it may be necessary to resect some tissue. Following de-epithelialisation the dermal flap in these patients is often long and one can remove subcutaneous fat and breast tissue from the lower portion of the flap. This tissue is best removed as a crescent.

When Gonzalez-Ulloa¹ described mastopexy augmentation he described a need for wide access for no aggressive implant introduction. This is achieved by the wide IMF access with this technique. He described that the augment should be protected. This is achieved by this technique and has advantages over non autologous tissue/grafts in providing strong vascularised tissue coverage. Gonzalez-Ulloa¹ also described that the wounds should be closed

under no tension. The superiorly based dermal flap moves the tension of the closure internally and means that the T junction is kept under minimal tension and allows the skin incisions to heal under minimal tension.

The pros and cons of one staged mastopexy augmentation have been discussed at length. The options for the ptotic patient involve a) breast augmentation \pm mastopexy as a second stage b) mastopexy \pm breast augmentation as a second stage and c) a one stage mastopexy augmentation. Where implant volume, distance of nipple lift is appropriate and patients are realistic about their expectations and selected appropriately the superiorly based dermal flap using autologous tissue coverage to cover the lower pole in one stage mastopexy augmentation is a reliable way of creating aesthetic results.

Conflict of interest

I am part of the Johnson and Johnson Global Educational Council and a consultant in their Educational Programme. I also lecture for Baxter as part of their educational programme. I have advised for both Johnson and Johnson, Allergan and for Roche. I have received honoraria for educational events from Johnson and Johnson, Allergan, Baxter and Roche.

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