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Refine the Aesthetic Outcome of Implant Based Breast Augmentation Using External Pre Expansion

DALIA M.M. EL SAKKA, M.D.

The Department of Plastic and Reconstructive Surgery, Faculty of Medicine, Menoufia University, Egypt

ABSTRACT

Background: Attractive breasts are symmetrically situated on the anterolateral chest wall and have soft texture. The breast profile is a gentle downward vertical flow from the clavicle to the nipple-areola and a mildly convex from the nipple-areaola to the infra-mammary crease. The goal of the breast surgeon in aesthetic breast surgeries is always to create the appearance of pleasant symmetrical breasts.

Aim of the Study: Refine the aesthetic outcome in the implant based breast augmentation using external pre expansion.

Patients and Methods: The technique of external pre expansion of the breast was used in 12 patients who subsequently underwent implant breast augmentation. The follow-up period up to 24 months.

Results and Conclusion: Breast expansion before final implant augmentation surgery enable the use of a larger implant size, provides adequate natural ptosis and better positioning of the implant on the chest wall, leading to a more natural and symmetrical appearance of the augmented breast.

INTRODUCTION

Many women seek breast enlargement in order to correct hypoplastic breasts. Those who have undergone significant post-partum involution also opt for augmentation, for further improvement. These women have experienced the fullness and want the volume back. Some women opt for surgery for correcting asymmetry. Breast augmentation can have significant positive influence on the body image **[1]**.

An increase in the popularity of silicone gel-filled breast implants is expected since their recent approval by the American Food and Drug Administration **[2]**. Cohesive gel implants provide a more natural breast shape and greater plasticity with a reduced risk of postoperative rippling and deflation **[3]**. However, because the size of a gel-filled implant cannot be modified postoperatively, choosing the right size for a particular patient remains a practical challenge **[4]**.

Selection of the implant size based on the diameter of the breast (base width), anterior pull skin stretch measurement, nipple-to-inframammary fold distance (measured under maximal stretch), amount of mammary parenchyma, and desire of the patient **[5]**.

Smaller implants may fail to fulfill patients' goals regarding cleavage, slightly round upper poles, and good projection without the lateral breast fullness that is often objectionable to patients. Larger implants give better cleavage and better upper pole fullness, but they can stretch the breast tissues and the chest wall, resulting in drooping breasts, an overstretched inframammary fold with pressure on the lower ribs, and an uncomfortable feeling, sometimes with lack of nipple sensitivity and stretching and thinning out of the skin **[6]**.

Drawbacks of sub glandular augmentation in severe post-partum involution may include: An increased incidence of implant rippling and palpability, and potentially an increased risk of infection and capsular contraction, and increased difficulty with interpreting mammograms as less of the gland is visualized **[7]**.

Disadvantages to sub pectoral placement are the potential for increased animation deformity, possibly somewhat greater postoperative pain, and, in certain patients, less direct control of the upper breast contour **[8]**.

In 1999, an external breast tissue expander was introduced as a nonsurgical alternative to breast augmentation when used consistently for 10 hours a day for a minimum of 10 weeks **[9]**.

Since 1999, several reports have confirmed that the distractive force exerted on the breasts by the device can stimulate tissue growth and thereby effectively enlarge the breasts **[10]**. However, in the clinical experience, not all patients achieved the promised one-cup enlargement, and satisfaction

with the results varied among doctors and patients **[11]**.

In this study, we try to solve the problems of tight skin in sever hypoplasia and lack of enough soft tissue cover of the implant in postpartum involution by using external pre expansion before final insertion of the breast implant.

PATIENTS AND METHODS

This study enrolled 12 female (7 cases with hypoplasia and 5 cases with post-partum breast involution with a median age of 26 years (range, 19-52 years). The technique of breast parenchymal external expansion using breast external expander (Fig. 1) was used in all patients whom subsequently underwent sub glandular breast augmentation using silicone implant (size range from 225-350CC-moderate to high profile).

During the physical examination: Asymmetries in the patient's base diameter of the breasts, location of the inframammary fold, skin quality, size, shape and position of the breast parenchyma and nipple areolar complex was evaluated and pointed out to the patient.

An agreement was reached as to the ultimate result the patient desires and whether this was compatible with her intrinsic anatomy. All patients underwent preoperative mammography.

During the first stage: The patient was fitted for a negative pressure using the external expander and was instructed to wear the device for 3 weeks prior to the surgical procedure, for a minimum of 12 hours each day continuously or intermittent (Fig. 2).

The device created a negative suction pressure on the breast mound by a hand-held pump.

For the last 3 days immediately preceding the surgical procedure she was encouraged to wear the device continuously.

At the time of surgery, the patient had successfully undergone skin and parenchymal breast expansion. An estimated 300% increase in breast volume was achieved (Fig. 3-C).

There was an increase in the nipple–inframammary fold distance.

The second stage: After completion of external expansion.

Under general anesthesia, through an infra mammary incision, sub glandular creation of a pocket was done, and then we used sizing implants in order to get an idea of the projection, ease of placement and the aesthetic result. Based on the sizer, the decision regarding the appropriate implant is made.

After removing the sizer, the pocket was checked for haemostasis. The gloves are then changed. The definitive implant was then taken and, under strict aseptic precautions, it was introduced into the pocket. Once the implant was in good position, the index finger was used to make sure that there are no areas of hold up and that the implant surface was free, without any folds or wrinkles.

The closure was then carried out using 5/0 Prolene for dermal subdermal closure and for skin closure. A firm dressing was done. Antibiotics were continued for 5 days.

Postoperative breast massage had been advocated to reduce incidence of capsular contracture.

The patient was advised to have the sutures removed after six days and the edges are then supported with steristrips for another five days. The patient was also advised to wear a bra at all times to give support.

Each patient’s bust size was assessed both pre-expansion, post external expansion, and postoperatively by measuring the chest circumference snugly with a tape at the level of the nipple-areola complex.

RESULTS

All patients were satisfied with the results. They felt that their breasts were fuller, firmer, and filled up or even outgrew their bras Figs. (3,4).

No postoperative complications such as hematoma formation or infection were observed.

There were no capsular contractures and no complaints regarding displacement of the implants with contraction of the pectoralis major muscle. The implant edges were not noticeable, even in the larger implants (350g). All patients returned to normal activities in 7 days.

Chest circumference at the height of the nipple increased by a median of 4.4cm (1-11cm) after the 2nd stage. There is also a respectable increase in the Nipple-Inframamary fold distance (N-IMF) after external expansion and after implant insertion.

The results of the measurements are presented in Tables (1,2). Most often, 250-and 300-ml implants were used. The increase in chest circumference with the smallest implant (225ml) was 4.4cm. The median augmentation with each additional volume of 25ml varied from 0.3 to 0.6cm. A 350ml implant yielded a median increase of 6.9cm.

Table (1): Measurements of pre-expansion, after expansion and postoperative.

	Pre-operative	After external expansion	Post-operative
Bust circumference	82±0.8 cm	84±0.3 cm	86±0.7 cm
N-IMF*	4.3±0.8 cm	5.1±0.7 cm	6.3±0.3 cm

* N-IMF: Nipple-Inframamary fold distance.

Table (2): Correlation of the increase in chest circumference with the implant volume.

Implant volume (ml)	No. of patients	Median increase cm
225	1	4.4
250	3	5 (4.7–5.3)
275	2	5.3,5.6
300	3	6.1 (5.7–6.3)
325	2	6.3,6.5
350	1	6.9

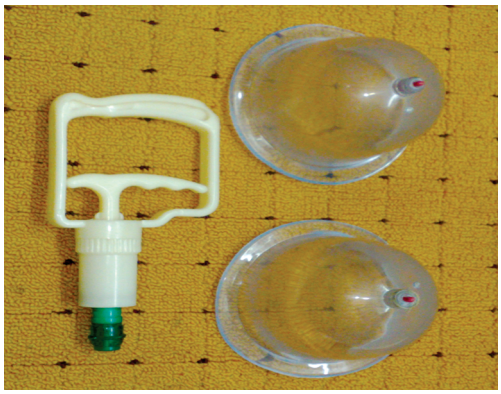

Fig. (1): Breast external expander device.

2 cups: Applied to the breast and hand held pump: Used to create negative suction pressure.

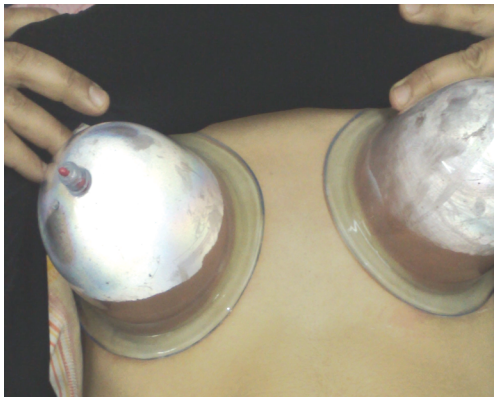

Fig. (2): External expander applied to the breast.

The device applied either: Continuous or intermittent for 10-12h/d for 3 weeks prior to surgery.

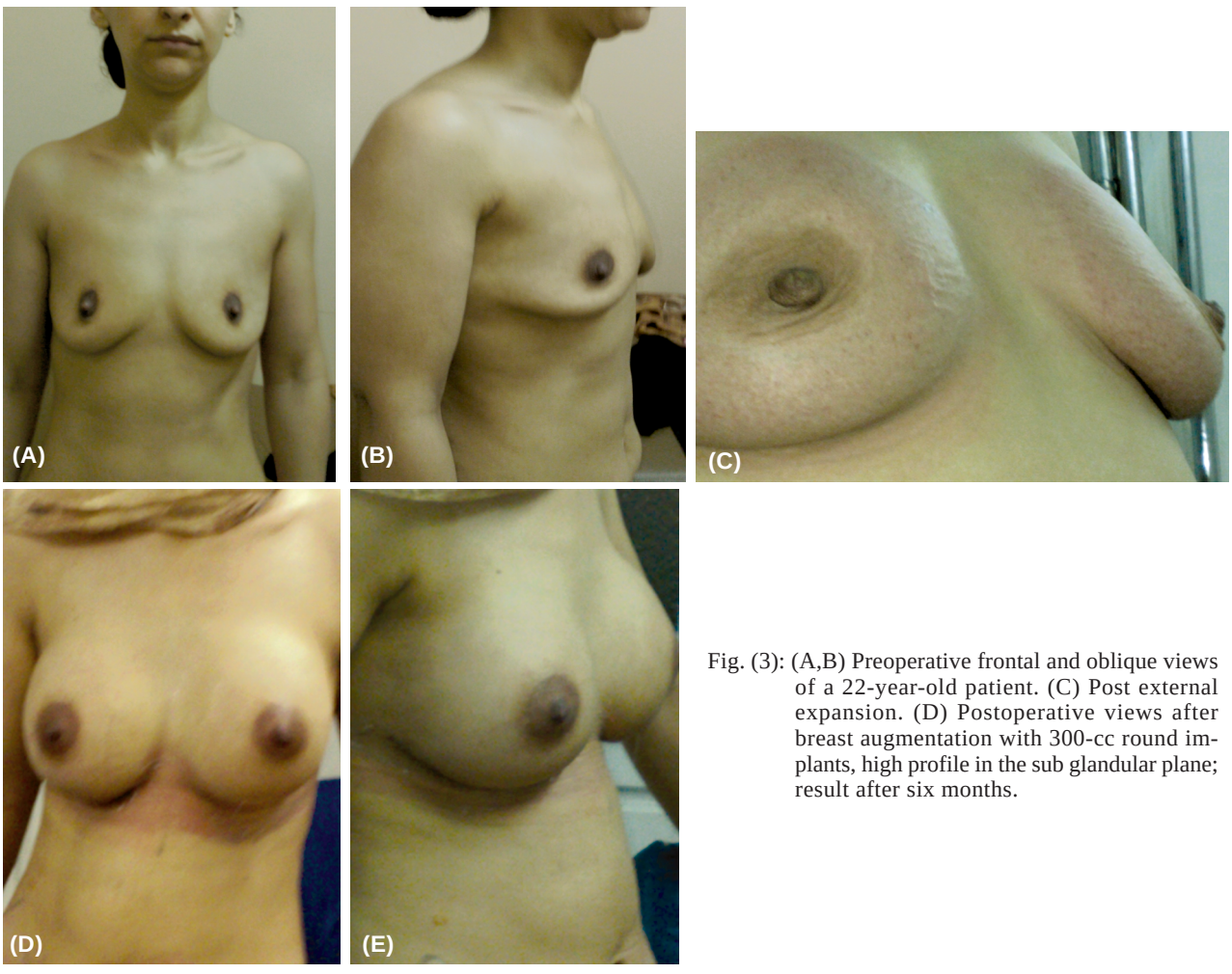

Fig. (3): (A,B) Preoperative frontal and oblique views of a 22-year-old patient. (C) Post external expansion. (D) Postoperative views after breast augmentation with 300-cc round implants, high profile in the sub glandular plane; result after six months.

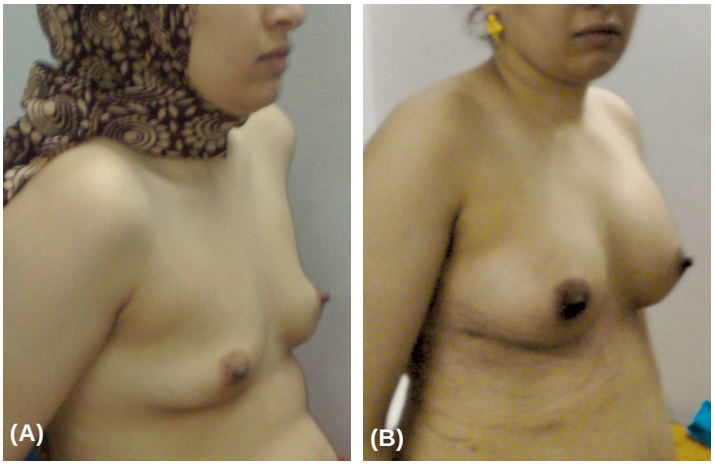

Fig. (4): (A) Preoperative oblique views of a 25-year-old patient. (B) Postoperative views after external expansion and breast augmentation with 275-cc high profile round textured implants; result after six months.

DISCUSSION

Many women seek breast augmentation because they are not satisfied with their body image and to increase their self-esteem. The aesthetically pleasing breast will be of a size and fullness proportional to the body, have minimal ptosis, be conical to teardrop in shape, and have the nipple at the anterior most position **[12]**.

We can notice that, there are 3 main difficulties facing the plastic Surgeons during implant breast augmentation: Sever developmental hypoplasia with tight insufficient skin for implant insertion, small breast volume although adequate breast size as in cases of post-partum involution and hypoplasia associated with asymmetry.

Generally speaking, Implant size must not exceed 50% of the volume of the breast, to avoid a noticeable implant. The presence a relatively thick layer of parenchyma and fat over the implant will provide an acceptable result. So the choice of implant size is a problem in very small breast as smaller implants fail to fulfill patients' goals and larger implants stretch the breast tissues and sometimes affect nipple sensitivity **[13]**.

Most plastic surgeons solve these problems of inadequate skin in hypoplasia and inadequate breast volume in post-partum involution by sub pectoral insertion of the implant but muscle flexion distortion of the breast still a drawback. Elliott **[14]** reported increased postoperative pain for the first 2 to 3 days, high-riding implant deformity as common complaints with sub pectoral placement.

The mechanisms by which sustained gentle mechanical tension induces tissue growth have recently been reviewed. Non-surgical breast enlargement with the Brava external soft-tissue expander has proven that it is effective. It is a good alternative for women looking for one-cup enlargement of their breasts and who do not wish to undergo the risks of surgery and implants **[15]**. There are several factors, however, that make it difficult for the patient and the doctor to achieve the desired results **[16]**.

First, as an external tissue expander, the Brava device is compliance-dependent and only works well for women who are willing to put up with the rigorous wear schedule. Ten hours per day is the minimum amount of time required, and patients who are able to wear it longer show statistically significantly better growth. Since they have to do that for several months, it is understandable that some women lose interest or do not manage to wear the device for enough hours **[17]**.

Second, if the body mass index is less than 18, it is unlikely that women with AA breasts will grow to fit a B-cup, despite prolonged Brava wear. It is difficult to generate substantial amounts of tissue when the initial mass is so limited and when the overall metabolic balance is not permissive **[18]**.

In this study, patients with severe hypoplasia still had a benefit from the external expander treatment, since there was more breast tissue to cover the implants, making the augmented breasts looks more natural. Longer inferior pole provided increased flexibility in positioning and shaping the implant. In comparison to other cases implants remain too high on the chest wall and have inadequate natural ptosis **[19]**.

After each time of expansion: There was initial volume loss due to loss of the edema but with continuous use there was volume maintenance and creation of a generous pocket. This confirmed what Baker et al. found, that the remaining volume is real tissue growth and long-lasting **[20]**.

There were no complications from the use of external expander except for just redness which were managed by stopping the expansion process until it was disappeared and then starting external expansion again. Women with sensitive skin should only gradually increase their wear time to allow their skin to adapt to the pressure.

In this study, external pre expansion created a sufficient amount of skin to accommodate larger implant size especially in virgins with an extensive hypoplasia (Bust circumference was 82±0.8cm pre-expansion and 84±0.3cm post expansion, enlonge the lower pole (N-IMF was 4.3±0.8cm pre pre-expansion and 5.1±0.7cm post expansion), so better positioning of the implant on the chest wall and avoid its migration upward. It also improves the shape of the augmented breast by increasing the natural ptosis and the more definition of the sub mammary fold.

In breast asymmetry, there is a conflict when using breast implant of different sizes in these patients as the smaller breast has a smaller skin brassiere, but will need to accommodate the larger prosthetic device. There is also apparent asymmetry in nipple areolar position **[21]**. Recipient site pre-expansion may have early clinical adoption in cases of severe asymmetry, tuberous breasts, and other deformities that are difficult to treat with current reconstructive techniques, but studies are needed to clearly delineate its safety and its role.

Conclusion: External breast pre-expansion technique before definitive breast augmentation is simple, easy, safe, associated with good results in refinement the final aesthetic outcome of the augmented breast as natural ptosis of the augmented breast and better definition of the submammary fold.

REFERENCES

1- Cronin T.D. and Gerow F.J.: Augmentation mammoplasty: A new natural feel Prosthesis In Transactions of the Third International Congress of Plastic and Reconstructive Surgery. Amsterdam: Excerpta Medica, 1964.

2- Silicone Gel-Filled Breast Implants Approved. FDA Consum, 41: 8-9, 2007.

3- Brown M.H., Shenker R. and Silver S.A.: Cohesive silicone gel breast implants in aesthetic and reconstructive breast surgery. Plast. Reconstr. Surg., 116: 768-769, 2005.

4- James J.H.: What size prosthesis for augmentation mammoplasty? Ann. Plast. Surg., 19: 294-296, 1987.

5- Tebbetts J.B. and Adams W.: Five critical decisions in breast augmentation using five measurements in 5 minutes: The high five decision support process. Plast. Reconstr. Surg., 118 (Suppl): 35S-45S, 2006.

6- Boutros S., Kattash 1.M., Wienfeld A., Yuksel E., Baer S. and Shenaq S.: The interdermal anatomy of the inframammary fold. Plast. Reconstr. Surg., 102 (4): 1030-1033, 1998.

7- Hammond D., Hidalgo D., Slavin S., et al.: Revising the unsatisfactory breast augmentation. Plast. Reconstr. Surg., 104: 277-283, 1999.

8- Pelle-Ceravolo M., Del Vescovo A. and Bertozzi E.: A technique to decrease breast shape deformity during muscle contraction in sub muscular augmentation mammoplasty. Aesthetic. Plast. Surg., 28: 288-294, 2004.

9- Khouri R.K., Schlenz I., Murphy B. and Baker T.J.: Nonsurgical breast enlargement using an external soft-tissue expansion system. Plast. Reconstr. Surg., 105: 2500, 2000.

10- Greco R.J.: Nonsurgical breast enhancement: Fact or fiction? Plast. Reconstruct. Surg., 110: 337, 2002.

11- Khouri R.K., Rohrich R.J. and Baker T.J.: Multicenter evaluation of an external tissue expander system (Brava) for breast enlargement. Plast. Surg. Forum, 71: 168, 2002.

12- Seghers M.J., Longacre J.J. and De Stefano G.A.: The golden proportion of beauty. Plast. Reconstr. Surg., 34: 382, 1964.

13- Kanhai R.C. and Hage J.J.: Bra cup size depends on band size. Plast. Reconstr. Surg., 104 (1): 300, 1999.

14- Elliott L.F.: Breast augmentation with round, smooth saline, or gel implants: The pros and cons. Clin. Plast. Surg., 28: 523-529, 2001.

15- DeFilippo R.E. and Atala A.: Stretch and growth: The molecular and physiologic influences of tissue expansion. Plast. Reconstr. Surg., 109: 2450, 2002.

16- Khouri R.K.: Initial experience with the Brava nonsurgical system of breast enhancement (Reply). Plast. Reconstr. Surg., 110: 1595, 2002.

17- Claxton A.J., Cramer J. and Pierce C.: A systematic review of the association between dose regimens and medication compliance. Clin. Ther., 23: 1296, 2001.

18- Osterberg L. and Blaschke T.: Adherence to medication. N. Engl. J. Med., 353: 487, 2005.

19- Adams W.P. Jr.: The process of breast augmentation: Four equential steps for optimizing outcomes for patients. Plast. Reconstr. Surg., 122: 1892-1900, 2008.

20- Baker T.J., Schlenz I. and Khouri R.K.: A new device for nonsurgical breast enlargement: Fifteen months follow-up. Plast. Surg. Forum, 23: 113, 2000.

21- Stark N. and Olivari N.: Breast asymmetry: An objective analysis of post-operative results. Eur. J. Plast. Surg., 14: 173, 1991.