

Evaluation of Subfascial Breast Augmentation in Thin Patients

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ABSTRACT

Female breasts represent since dawn of time a symbol of femininity. That's why female breasts size and shape are so important to the female. Being one of the most required plastic surgery procedures, breast augmentation became so popular. With practice and discovering of many implant types, incisions, planes of insertion, subfascial breast augmentation carries some of the advantages of both subglandular and subpectoral planes. Since it is described by Graf et al, it became a plane of interest among surgeons. Our study included 40 cases of subfascial breast augmentation using the inframammary approach, and using rounded high profile cohesive gel implants. Follow up up to 2 years was ruled with serial photos. A questionnaire about female satisfaction starting from post-operative till 2 years after was followed with high satisfaction indices. Complications were 2 cases of rippling and 2 cases of capsular contracture.

Conclusion: Subfascial breast augmentation is a promising procedure that should be considered as a plane of insertion of breast implants especially in thin females with strong pectoralis and less than 2 centimeters pinch. It requires more study to have an accurate data about its complications and how to avoid them.

Keywords: Breast augmentation, subfascial plane, pectoral fascia

INTRODUCTION

The female breast has always been a symbol of femininity, protection, feeding, attraction. It has been manipulated and modified throughout the years with aesthetic and reconstructive surgery. Cultural changes in addition to the development of modern implants, and new surgical techniques have made the majority of population would accept the idea of breast augmentation during the past decades.⁽¹⁹⁾

Breast augmentation has become one of the most popular surgical cosmetic procedures. This is partially because of the increasing demand for better shape and partially due to the development of modern types of implants, with safe measures followed in the surgical techniques.^(5,13)

The dynamics between a breast prosthesis and the soft tissue envelope are important in establishing a desirable outcome surgeons have utilized numerous anatomical locations to optimize the interface.⁽¹⁸⁾

Nowadays, the most commonly employed pocket planes are subglandular introduced by Cronin and Gerow, partial retropectoral, and totally submuscular⁽¹²⁾. The possible benefits of subglandular placement are little or no animation deformity and more easy to insert the implant. The potential problems with subglandular placement are statistically probably a greater

incidence of capsular contracture, greater visibility of the implant in thin patients, greater incidence of visible rippling, and greater interference with mammography, which is a significant consideration given the high incidence of breast cancer.^(14,7)

The benefits of subpectoral positioning include improved upper-pole soft tissue, camouflage in thin patients, less visible rippling, less visibility of the implant, probably a lower rate of capsular contracture, and improved visibility of the breast parenchyma on mammogram. Disadvantages to subpectoral placement are the potential for increased animation deformity, possibly greater postoperative pain, and, in certain patients and control of the upper breast contour.⁽¹¹⁾

Animation deformities following subpectoral implant placement may be significant in certain patients, especially if they exercise frequently or lift weights. The only way certain to avoid or correct animation deformity is to place the implant in front of the muscle.⁽¹¹⁾

Dual-plane breast augmentation, introduced by Tebbetts, was developed to minimize the risk of implant contour deformity using the subpectoral plane associated with the subglandular plane.⁽¹⁷⁾

According to the author, the dual-plane technique improves the implant-soft tissue

relationship by adjusting the positions of the pectoralis muscle and glandular tissue relative to the implant. However, the technique did not offer the ideal implant/soft tissue dynamic. Furthermore, bottoming-out of the implant and marked postoperative pain from muscle splitting are the tradeoffs of the procedures.^(3,15)

The Pectoral Fascia and the subfascial plane:

The pectoral fascia, in addition of being an additional thickness of tissue between the skin and the implant, it is claimed to provide additional support to the implant, by preserving Cooper's ligaments that attach breast parenchyma to the chest wall. Authors describe an enhanced aesthetic appearance between the upper pole of the implant and the chest wall, a reduced incidence of capsular contraction, and less animation of the implant^(9,13,6).

The pectoral fascia is attached to the sternum and clavicle and covers the pectoralis major muscle; it is continued laterally with the fascia of the back and inferiorly with the fascia of the abdominal wall. Numerous thin fibrous bundles from the upper pectoral fascia are attached to the deep layer of the superficial fascia of the breast. At the level of the fourth intercostal space, a dense horizontal septum connects the pectoral fascia and nipple; this septum extends medially and laterally to merge into the medial and lateral ligaments of the breast. Along the inframammary crease, a dense connective tissue connects the skin of the inframammary crease and the pectoral fascia.⁽¹³⁾

Graf et al., Sampaio Goes and Landecker, and Barbato et al., reported that the subfascial plane for breast augmentation had many advantages over the conventional planes, such as rapid recovery, satisfactory breast shape, and lower fibrous capsular contracture. The use of the retrofascial plane seems to yield the benefits of both planes without the drawbacks.^(4,9,2)

Advantages of subfascial breast augmentation over the subglandular plane include the creation of a stronger support system for the implant's superior pole to keep it from altering its shape and position over time. Implant displacement in the superior direction is avoided because the upper pole is placed between the muscle and the fascia. Another advantage of the subfascial breast augmentation technique is less visibility of the edges of the implant on the skin. Subfascial breast augmentation possesses numerous advantages

because it combines the potential benefits of the subglandular approach (more accurate control of both breast shape and inframammary fold position, more rapid postoperative recovery, and lack of distortion with pectoralis muscle contraction) with the improvements that may be achieved by using the subpectoral approach, having more tissue available to cover the implant's upper pole.⁽¹³⁾

Capsular contracture is the most common long term complication of breast augmentation. In subfascial breast augmentation, there had been reports of 0% to 2% of capsular contracture^(12,20,19). However, Graf et al. mentioned a 2.3% of capsular contracture grade II in 263 patients that underwent subfascial breast augmentation⁽⁴⁾. There are several theories that can explain the presence of a capsular contracture, and the most described are: the microbiology theory and the contamination of the pocket due to a foreign body. It is said that if the implant is indirect contact or near the ducts of the gland, many bacteria like coagulase-negative staphylococci, diphtheroids, lactobacilli, Bacillus species, β -hemolytic streptococci, anaerobic microorganisms. The contamination of the pocket with a foreign body can be provoked due to: an excessive manipulation of the implant or the pocket, the use of surgical towels, powder from surgical gloves, and/or the use of mammary implant size testers.^(1,10)

PATIENTS AND METHODS

Number of patients included in our study was 40 patients

Age of patients was between 19 and 39 years old with average of 29 years old

Range of volume inserted 250- 350 cc silicon filled, rounded, textured and high profile cohesive gel implants.

The approach used was the inframammary one.

All patients had general anesthesia

All patients had no drains inserted

Inclusion criteria:

- All patients seeking breast augmentation with a BMI less than 30 and who had a well formed pectoralis major muscle
- Thin patients with Skin pinch <2cm
- No aspirin needed to be given for 2 weeks pre-operative or 4 weeks post-operative

Exclusion criteria:

- Patients who are on immunosuppressant drugs
- Patients who are heavy smokers
- Patients with unreal expectations
- Patients with obvious unequal breast sizes
- Patients with uncontrolled diabetes.
- Patients with blood disorders or coagulation problems
- Patients who had done previous breast surgery or biopsy

Pre-operative preparation:

First of all, proper history taking is of upmost importance, including history of previous breast diseases and symptoms as discharge or infections, medical diseases, drug intake, allergies, gynecological history, menstrual history and obstetric history if present, Lactation history and lastly family history with same condition and female cancers among the family as breast, ovarian and uterine. Then, they are subjected to clinical examination, taking measure of base then discussing patient's expectation about the procedure. Lastly, we gave the patient information about the procedure and the follow up plan.

Patients who will do the operation are instructed to do routine laboratory investigations including CBC, Fasting blood sugar, Liver and kidney function, Prothrombin time and concentration, Bleeding time.

Patients are instructed to do pre-operative mammography and ultrasound to exclude any associated breast masses or diseases.

At the day of operation, the patient is coming to the hospital fasting for 6 hours.

After drawing the breast mound borders, the inframammary fold and the incision line, using general anesthesia, one gram of third generation cephalosporin was given intravenous at the start of the surgery.

The inframammary incision line is infiltrated with the mixture composed of 200cc normal saline mixed with 1cc epinephrine 1%. 5-cm incision is made above by 1 cm to the inframammary fold on a vertical line crossing the areola (breast meridian) where 2 cm lies medial to it and 3 cm lateral. The dissection is carried out through the subcutaneous tissue reaching to the pectoral fascia. The pectoral fascia is incised and with good visualization offered by the optic fiber illumination, the subfascial pocket is undermined by the electroscalpel connected to a fine Colorado

needle. The undermining is carried out releasing the fascia from the pectoralis muscle. Undermining is stopped medially 2cm from the midsternal line. Meticulous hemostasis is carried out. Packing of the pocket is done to help for more hemostasis. The other side is done mirror image and pocket is packed too. The implant is washed in 100cc of normal saline mixed with 3 ampules gentamycin. Gloves are changed before handling the implant. The implant is inserted in the subfascial plane in the first pocket after removal of its pack then closure of the deep layer. Then, the other implant is inserted within the second pocket. After insertion of both sides, the operating table is flexed 45 degree to allow the visualization of the breasts in the semi-sitting position. Immediate revision is made if any asymmetry or tethering was noticed. The wound is then closed in layers.

Postoperative care: Immediately after breast augmentation, a surgical bra is worn for six weeks. Patients are instructed not to sleep on the prone position. They are discharged the same day. Oral Antibiotics, Analgesics and anti-inflammatory were prescribed. First visit is on the third day for first dressing. Stitches were removed in the third week postoperative.

Follow up plan:

Throughout the follow-up period, the patient is instructed to come for consultation at any time if any worrying sign aroused as pain or capsular contracture.

- First visit is on the third post-operative day to check for infection and any seroma or hematoma formation, dressing is done.
- Second visit is one week post-operative. Same is done and emphasizing on anti-inflammatory intake.
- After second week, the patient is instructed to stop taking the antibiotic. She can start to do her non heavy work.
- At the third week, the stitches are removed, still the patient is asked to continue wearing the bra.
- One month post-operative to check that oedema is subsiding
- Six weeks post-operative, patient is told she can take off the surgical bra, yet to take care not to expose her breasts for any kind of trauma. She is prescribed to use silicon gel cream on the wound.

- Second month post-operative to check for oedema subsidence and checking for return of sensation if it was altered.
- Third month. Patient can start to do her heavy work if present. She can start doing her workout and exercises.
- Sixth month: The final state has nearly been reached
- Ninth month: routine follow up and check for any sign of late complication
- 1 year post-operative to check for any discomfort or beginning of delayed complications
- 18 months post-operative: as 1 year check up
- And 2 years post-operative the patient is given a questionnaire about her experience with breast augmentation, her satisfaction about the procedure and the follow up.

RESULT

57 patients were done within a year starting February 2012 to August 2013 with 2 years follow up (till August 2015). However 17 had dropped out follow up plan, 9 couldn't be reached by notification email and phone calls, 7 due to travelling abroad and 1 died in a car accident. The remaining 40 patients were included in the study.

Patients' BMI were between 19.5 and 29.5 where 16 were less than 25 while the remaining 24 were between 25 and 30.

Among the 40 patients, 29 were post-lactational breast atrophy, 8 of them had breast atrophy with first degree ptosis that was corrected by implant insertion, and 11 had virginal breast atrophy.

Operative time ranged between one and half to two and half hours.

Implants used

They were all Silicone, textured, high profile, cohesive gel, ranging from 250 ml to 350 ml. Most common used implant was 275 ml.

Complications

Early complications:

within the first 2 months as infection, Seroma and Hematoma were NOT seen in any of our patient.

Late complications were seen as follow:

- 2 post lactational breast atrophy cases showed rippling (5%)
- 2 cases showed capsular contraction (5%), one was virginal breast atrophy after 11 months

and the other was post-lactational after 17 months.

- No patient complained from implant position
- No patient complained from pectoralis muscle movement

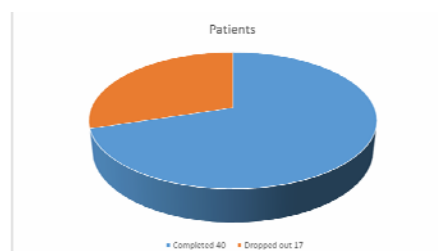


Fig (1). Chart showing number of patients (40 = 70.1%) who completed the follow up plan in two years and the patients who didn't complete it (17 = 29.9%)

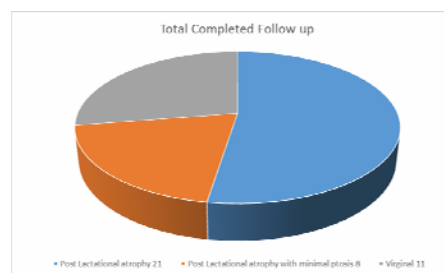


Fig. (2) Showing distribution of types of patients met where 21 of them were post lactational atrophy, while 8 were associated with mild ptosis, and virginal breast atrophy in 11 cases

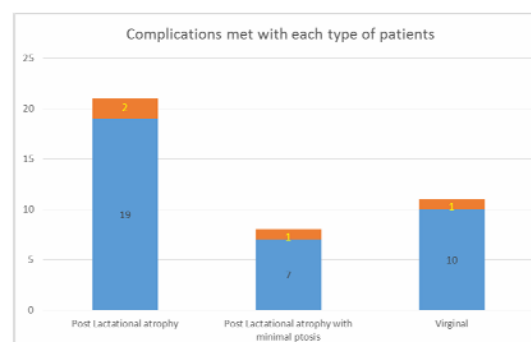


Fig (3): Complications met were 2 cases in post lactational atrophy (1 was rippling, the other was capsular contraction) (9.5%), 1 case met in post lactation atrophy with minimal ptosis (rippling) (12.5%) while in the virginal cases, only 1 case showed capsular contraction (9%)

After the two years, a questionnaire was given to the patient to ask about her satisfaction and any feedback.

They were asked about:

- Social appearance
- The size of your breasts
- The shape of your breasts
- The symmetry of your breasts
- Dress appearance
- Overall satisfaction from the whole procedure designated by a number scale as follow:

1. Very satisfied
2. Somewhat satisfied
3. Neither satisfied nor dissatisfied
4. Somewhat dissatisfied
5. Very dissatisfied

34 of them were satisfied, 4 were not happy having complications and 2 were not happy as they were asking for more projection.

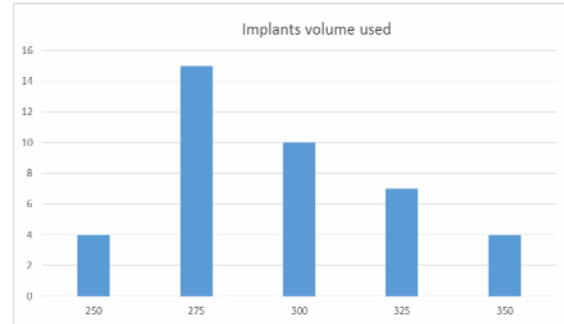


Fig. (4): Showing the implant volumes used

Table showing patients and their satisfaction scoring

#	Age	BMI	Implant size	Atrophy cause	Social	Size	Shape	Symmetry	Dress appearance	Complication	Overall satisfaction
1	20	24.8	275	Virginal	1	1	1	1	1		1
2	36	28.7	325	Ptosis	1	2	2	1	2		2
3	39	21.0	250	Ptosis	2	1	2	1	1		2
4	22	21.9	275	Virginal	1	2	1	1	2		2
5	23	27.4	300	Virginal	2	1	1	1	1		1
6	37	21.2	250	Post lact	3	2	5	2	5		5
7	38	28.3	350	Post lact	2	1	2	2	2		2
8	25	24.2	275	Virginal	2	1	2	2	1		1
9	21	27.3	300	Virginal	1	1	2	1	1		1
10	33	21.1	250	Post lact	3	2	4	2	3	Rippling	4
11	35	28.7	325	Ptosis	2	3	2	1	1		2
12	38	27.5	300	Post lact	1	2	1	1	3		1
13	31	23.4	275	Post lact	1	3	2	1	2		2
14	30	27.5	325	Post lact	2	2	1	2	3		2
15	21	23.6	275	Virginal	1	2	2	1	1		1
16	33	28	350	Post lact	2	1	2	1	1		1
17	25	27.3	325	Virginal	1	2	1	1	1		1
18	31	26.3	275	Post lact	3	2	4	4	4	Capsular cont	5
19	37	25.5	275	Post lact	1	2	4	2	1		2
20	39	26.9	300	Post lact	2	2	3	1	1		2
21	27	23.2	275	Post lact	2	1	1	2	1		1
22	33	27.5	350	Ptosis	1	2	1	1	1		1
23	36	22.5	275	Post lact	3	2	1	1	2		2
24	28	23.6	275	Post lact	2	1	3	2	1		2
25	23	28.5	300	Virginal	4	3	3	2	3	Capsular cont	5
26	35	21.7	275	Ptosis	3	2	2	1	1		2
27	38	29.3	325	Post lact	1	2	2	1	1		1
28	21	23.9	275	Virginal	1	2	1	2	1		2
29	19	26.7	300	Virginal	3	2	1	1	2		2
30	37	21.3	250	Ptosis	4	3	5	3	4	Rippling	5
31	36	27.4	300	Ptosis	2	1	3	1	2		2
32	37	26.9	325	Post lact	1	1	2	1	1		1
33	32	22.3	275	Post lact	3	4	5	2	3		4
34	30	28.6	350	Post lact	3	2	1	1	2		2
35	28	24	275	Post lact	2	1	3	2	1		2
36	34	27.9	300	Ptosis	2	3	1	1	1		2
37	22	26.1	275	Virginal	1	2	1	1	1		1
38	32	28.9	325	Post lact	2	1	3	1	1		2
39	38	27.8	300	Post lact	2	3	1	1	1		2
40	31	27.1	300	Post lact	1	2	1	1	1		1

Resume table of our result:

Number of patients	Overall 57	Actually in the study 40	Missed 17
Age	Between 19 and 39	Below 30 years: 14 (35%)	30 years or above: 26 (65%)
BMI	All were less then 30	Below 25: 16 (40%)	Above 25: 24 (60%)
Implants	Silicone textured high profile	Less then or equal to 300 cc: 29	More then 300 cc: 11
Breast atrophy	Post-lactational atrophy 21 (52.5%)	Post- lactational atrophy with mild ptosis 8 (20%)	Virginal 11 (27.5%)
Early complications	No Seroma	No hematoma	No infection
Later complications	Rippling 2 cases (5%)	Capsular contraction 2 cases (5%)	Unsatisfied regarding projection: 2 (5%)
Unsatisfied (15%)	2 Rippling cases	2 case of Capsular contraction	2 cases regarding projection

All statistics included are related ONLY to the 40 cases who had passed through the whole follow up plan.

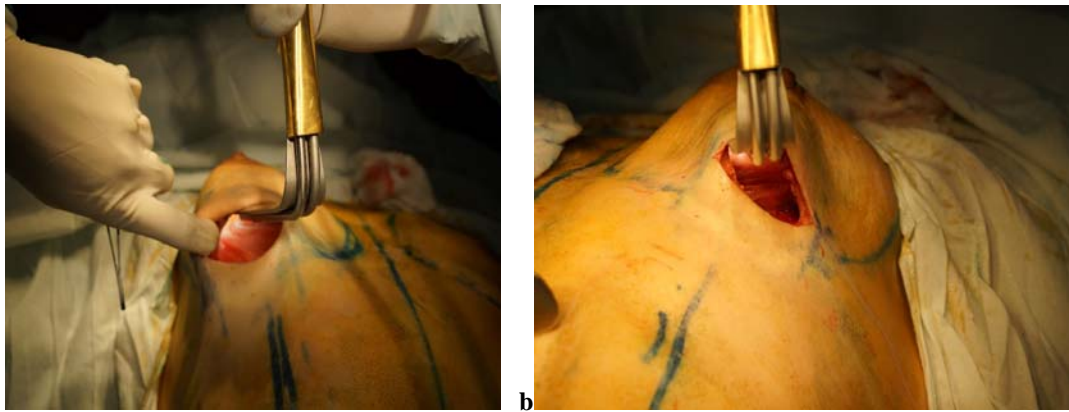


Fig (5a,b): Showing the incision and the plane of dissection in both breasts. a: The right breast showing the pectoralis muscles stripped from its fascial covering, b: The left breast showing the subfasial plane (the pectoralis muscle is seen in the floor of the pocket)

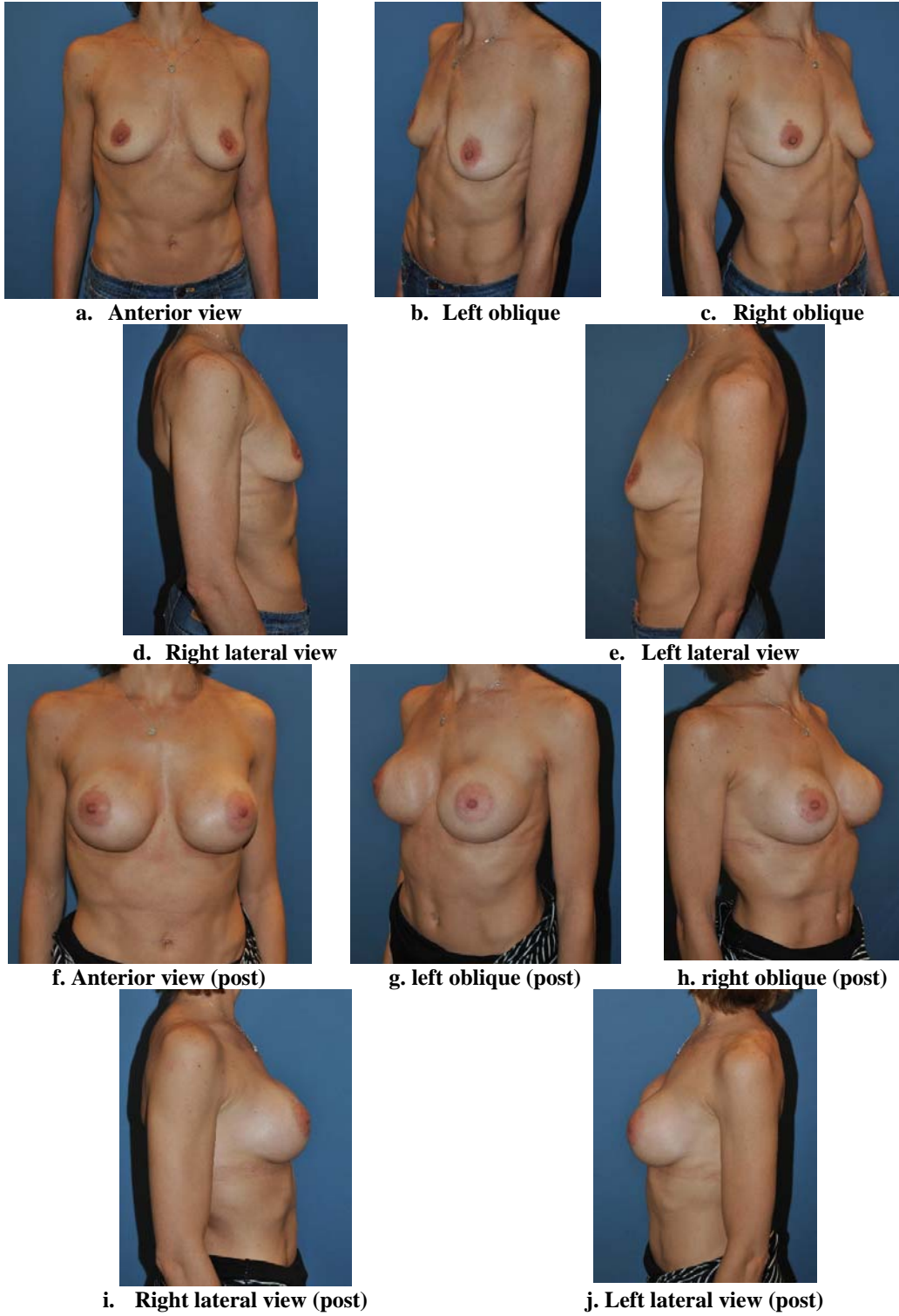


Fig (6). Showing photos of a lady 35 years old with 1 year postoperative photos in different views



a. Anterior view



b. Left oblique



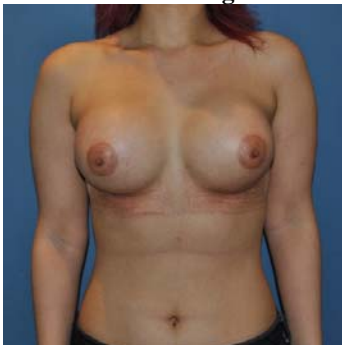
c. Right oblique



d. Right lateral view



e. Left lateral view



f. Anterior view (post)



g. left oblique (post)



h. right oblique (post)



i. Right lateral view (post)



j. Left lateral view (post)

Fig (7): Showing photos of a lady 29 years old with 6 weeks Post-operative photos in different views

DISCUSSION

As any surgical procedure, there are some complications that could be met with the procedure. These could be either early as hematoma or later as capsular contraction and rippling. Describing the procedure for the first time, in 2003, Graf RM et al., announced for the discovery of the subfascial plane for breast augmentation. The authors had a study over 263 patients over 3 years, 1998-2001, with an encouraging results. There were six patients (2.3 percent) with class II capsular contracture (Baker); three patients (1.1 percent) had unilateral hematoma and required surgical intervention; and eight patients (3 percent) had unilateral implant malposition and demanded surgical intervention for repositioning. There were no infections. All patients returned to normal activities in 7 days⁽⁴⁾.

In 2004, Stoff-Khalili et al. described the complications in 69 patients having the subfascial approach. Baker grade III capsule contracture occurred in 2.6% and Baker grade IV in 0.0%. Rippling was noted in 1.5% of patients, and there were no patients with hematoma or seroma⁽¹⁶⁾.

While in 2005, Ventura and Marcello had 63 patients who received subfascial placement, two of them (2%) had Baker grade II capsule contracture, and one patient had excess drainage that required surgical exploration. There were no seromas or infections⁽²⁰⁾.

In 2006, Munhoz AM. et al. claimed that they didn't had any case of capsule contractures in 42 patients with the subfascial approach who were followed for 16 months⁽⁸⁾.

Throughout 10 years, Tijerina VNE. et al, in 2010, published about the largest series, 1000 patients, who underwent subfascial breast augmentation. An inframammary incision was used in 95% of the patients and a periareolar incision in 5%. Given the different complications that can occur in a breast augmentation procedure, with the subfascial technique only 0.4% of patients developed capsular contracture grades III and IV, according to Baker's classification. Transoperative hematoma occurred in 0.1% of the patients and there were no open wounds postoperatively⁽¹⁹⁾.

In our study, we used only high textured silicone high profile cohesive gel implant, we used the inframammary approach for the insertion of the implant. We didn't encounter any case with

early complication as infection, seroma or hematoma. There were no complaint regarding malpositioned implants, but capsular contraction rate was 5% (2/40), rippling was seen in only 2 cases (5%).

In their study about patient satisfaction, Hunstad JP and Webb LS., in 2010, had published the high satisfaction rate in the patient feedback on this subfascial breast augmentation series. The patients were especially pleased with their appearance and shape, the softness of the implant, and the lack of implant palpability or visibility. They reported little discomfort with the procedure, and all were pleased at the lack of implant animation with arm movement.⁽⁶⁾

Tijerina et al, in 2010, in their publication had a major satisfactory results, reaching up to 99.6% of patients who underwent subfascial breast augmentation were satisfied with the short- and long-term results⁽¹⁹⁾.

In our study, 6 out of 40 cases (15%) were not satisfied by the procedure, 4 of them due to complications met, 5% capsular contraction, 5% rippling, and another 2 cases (5%) were not satisfied by the projection of the implant. But the rest 85% were pleased by the results, especially the non-visible edges and the stable non mal-positioning of the implant with no animation deformity seen.

About the pinch test, although the author claimed, that the pinch test result less than 2 cm is considered a relative contraindication to subfascial placement and an indication for submuscular placement.⁽⁶⁾, in our study, we followed the pinch test putting in mind the priority of implant insertion in the subfascial plane, especially tin patient who had a kin pinch less then 2 cm.

CONCLUSIONS

Subfascial breast augmentation provides for the naturally pleasing shape of subglandular augmentation while preserving the fascial framework to lessen postoperative breast implant ptosis. This procedure provides significant additional implant coverage to prevent palpability and visibility without the added postoperative pain and disturbing implant animation experienced with submuscular placement. The discomfort associated with this procedure is relatively minimal, and the recovery is relatively

rapid. Overall patient and physician satisfaction was high. For these reasons, we found that technique is really promising, and that subfascial implant placement has become our preferred technique for breast augmentation.

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