

Implant to Fat: A Breast Augmentation Technique Validated by BREAST-Q

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Background: Implant-based breast augmentation is the number one cosmetic procedure performed in the United States. However, it is associated with relatively high revision rates, reaching up to 24% at 4 years. This case series presents our experience in implant explantation with simultaneous breast augmentation using fat.

Methods: This case series was conducted by the authors in Cairo, Egypt, during the period from January 2018 to June 2019. Following a detailed data collection, careful physical examination was done. Implant-to fat conversion was done for all cases. None of the cases needed >1 session of fat injection following the implant removal. Size of the implants removed ranged from 200–350 cm³ (average of 310). Volume of fat injected ranged from 300 to 550 ml (average of 430). Patients' satisfaction was evaluated using the BREAST-Q questionnaire.

Results: Twenty patients were included, with a mean age of presentation of 33.1 years (range, 26–42 years; SD, 5.3). Mean body mass index was 26.9 kg/m² (range, 24–30; SD, 1.9). Implant complications were as follows: capsular contracture (10 cases), implant migration (3 cases), breast asymmetry (3 cases), poor aesthetic outcome (3 cases), and palpable implant (1 case). Overall patient's satisfaction was evaluated by the BREAST-Q 1-year following surgery. The overall satisfaction score was 3.8, where a score of 4 indicates very satisfied and a score of 1 indicates very dissatisfied.

Conclusions: Implant-to-fat conversion is a good option for complicated breast implant cases, with good long-term results and excellent patient's satisfaction as verified by the BREAST-Q. (*Plast Reconstr Surg Glob Open* 2020;8:e2859; doi: 10.1097/GOX.0000000000002859; Published online 22 May 2020.)

INTRODUCTION

Implant-based breast augmentation is the number one cosmetic procedure performed worldwide and in the United States.^{1,2} However, it is associated with high postoperative revision rates: 24% at 4 years and 36% at 10 years.³

Despite its early satisfactory results, multiple long-term complications have been reported in the literature (10%–20% of cases) including, but not limited to, capsular contracture, malposition, implant rupture, infection, and decreased sensitivity of mammographic breast visualization.⁴

Several revision procedures have been offered to cope with those complications. These include changing the

implant style, using dermal matrices, pocket reassignment, or a permanent explantation with fat injection.⁴

The replacement of breast implants with new ones, in cases of capsular contracture, necessitates excision of the capsule in most cases. This leaves a delicate atrophic breast tissue, with minimal breast tissue coverage available for the implants.^{5,6}

Autologous fat grafting can yield natural long-term results with preservation of breast sensation. Limitations of breast fat grafting include donor site limitation and the need for repeated sessions to achieve the required volume.⁷

In this case series, we present our experience in explantation with simultaneous breast augmentation using autologous fat grafting.

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PATIENTS AND METHODS

The study was conducted by the principal author and his surgical team in Cairo, Egypt, during the period from January 2018 to June 2019. This study followed the Declaration of Helsinki. It followed the Medical Research Involving Human Subjects Act. Counseling was given to the patients regarding the different options available (new implants in a different pocket or fat injection), with the advantages and disadvantages of each option. The purpose of this study was explained in the Arabic language to all patients who agreed to participate in this study and chose to convert to fat breast augmentation.

Patients presenting with any complication due to breast implants such as capsular contracture of different degrees, breast asymmetry, a poor aesthetic outcome in the form of wrinkling, palpable implant, and implant migration were included in this study.

All the patients already had complicated implants and did not want to keep them. However, they wanted to keep the good volume, and hence, fat augmentation was the recommended alternative. All our patients consented to the procedure. Verbal and written consent was obtained from all the patients. An approval by the local ethical committee was obtained.

Exclusion criteria included American Society of Anesthesia score 3 or 4 (high risk for anesthesia); patients with breast cancer, uncontrolled diabetes mellitus, and collagen vascular diseases; smokers; patients on anticoagulants; and patients with bleeding tendencies.

Preoperative Patient Assessment

Patient evaluation included detailed history collection, physical examination, and photography (pre- and postoperative). Patient history included age, onset of the complication, laterality, presence or absence of masses, presence or absence of nipple discharge, or presence or absence of axillary lymphadenopathy. Adequate physical examination was done to exclude any signs of breast cancer such as a solid breast mass, nipple discharge, or suspicious axillary lymphadenopathy.

Operative Technique

Preoperative marking of the donor sites (abdomen, flanks, trochanteric regions) for liposuction was done first with the patient standing. The procedure was done under general anesthesia. Power-assisted liposuction was done using Lipomatic (Euromi, des Plennes, Rue des nouvelles technologies, Andrimont, Belgium). Fat was collected in sterile containers and left to decant. The assistant surgeon prepares the fat for injection, while the chief operator removes the implant and washes the pocket. The implant was removed via an inframammary incision.

The Processing of Fat and Injection

Harvested fat was left to decant for 20 minutes. The supernatant fat was collected in 20 ml syringes with Leurlock. Tulip (Tulip Medical Products, San Diego, Calif.) cannula (2 mm) was used for fat transfer, with the fat being injected into 6 planes: subdermal, subcutaneous, precapsular (subglandular), postcapsular, intermuscular, and submuscular planes.

The Capsule

Scoring was not done, to avoid the potentiality of fat migration through the scoring sites. No gross pathology was noted in any of the capsules operated on (eg, calcifications), and hence, no capsulectomy was done. Additionally, neither fat injection inside the pocket nor capsulorrhaphy to obliterate the capsule was done. The target volume of fat injected was 1.5 times of the implant volume. The end point for injection was when the space between the anterior and posterior capsules was compressed and obliterated by the injected fat in pre- and postcapsular planes. (See [Video \[online\]](#), which displays implant removal, followed by fat injection in subdermal, subcutaneous, precapsular, and postcapsular planes. Layered closure of the submammary incision then followed.)

Postoperative Follow-up and Assessment of Patient's Satisfaction

The patients were followed up for 1 week, 1 month, and then every 3 months up to 12 months. At 12 months postoperatively, patients were asked to complete a non-anonymous questionnaire (BREAST-Q) in English (translated by the authors into Arabic language) to assess the patients' satisfaction with the surgical outcome.⁸ Some patients were able to respond to the questionnaire in English language.

Statistical Analysis

All statistical tests were done using a significance level of 95%. A value of $P < 0.05$ was considered statistically significant. SPSS software (Statistical Package for the Social Sciences, version 20.0; SSPs Inc, Chicago, Ill.) was used for the statistical analyses. Data were presented as (mean \pm SD) for continuous variables and as a frequency for categorical variables.

RESULTS

Between January 2018 and June 2019, 20 cases with complicated breast implants presented to us. The complications were as follows: different grades of capsular contractions (10 cases), breast asymmetry (3 cases), poor aesthetic outcome (3 cases), palpable implant (3 cases), and implant migration (1 case).

Baseline Characteristics and Operative Procedures

Twenty patients were included with mean age of presentation of 33.1 years (range, 26–42 years; SD, 5.3). Mean body mass index was 26.9 kg/m² (range, 24–30; SD, 1.9). Implant complications were as follows: capsular contracture (10 cases), implant migration (3 cases), breast asymmetry (3 cases), poor aesthetic outcome (3 cases), and palpable implant (1 case) ([Table 1](#)).

None of the cases needed >1 session of fat injection. Sizes of the implants removed ranged from 210 to 345 ml (mean, 278; SD, 40). Volume of fat injected ranged from 420 to 530 ml, per side (mean, 320; SD, 60). (See [figure, Supplemental Digital Content 1](#), which displays a female patient, 28 years old, with a body mass index of 26, Baker's

Table 1. Baseline Characteristics

Characteristic	Number
No. cases	20
Age, y	
Mean (SD)	33.1 (5.3)
Minimum	26
Maximum	42
BMI, kg/m ²	
Mean (SD)	26.9 (1.9)
Minimum	24
Maximum	30
Implants complications	
Capsular contracture	10
Breast asymmetry	3
Poor aesthetic outcome	3
Implant migration	3
Palpable implant	1

BMI, body mass index.

grade III capsular contraction, implant explanted volume 290 ml, fat injected 435 ml to each breast, preoperative, <http://links.lww.com/PRSGO/B385>.) (See figure, **Supplemental Digital Content 2**, which displays postoperative results of patients at 1 year after implant to fat exchange, <http://links.lww.com/PRSGO/B386>.) Volume of fat injected was estimated to be 1.5 times the volume of breast implant removed to compensate for fat absorption (Table 2).

Postoperative Complications and Patients' Satisfaction

Patients followed up for 1 year, showing only minor complications in the form of 1 case of early seroma (after 1 month, which was treated by syringe aspiration) and another case of infection (in the form of superficial cellulites) that was treated conservatively with intravenous antibiotics, analgesics, and anti-inflammatory drugs.

Overall patient satisfaction was measured by the BREAST-Q score filled out by the patient 1 year following surgery. The results showed that the overall satisfaction score was 3.8, where a score of 4 indicates very satisfied and a score of 1 indicates very dissatisfied. (See figure, **Supplemental Digital Content 3**, which displays patients' responses to BREAST-Q at 1-year follow-up, with overall satisfaction of 3.8, <http://links.lww.com/PRSGO/B387>.)

DISCUSSION

After the introduction of breast augmentation with autologous fat, various surgical procedures have been advanced to optimize the process of fat harvesting, purification, and injection. Nowadays, breast augmentation by autologous fat transfer is considered a significant advancement in mastoplasty operations.

Table 2. Operative Details

Detail	Number
Volume of implants removed, ml	
Mean (SD)	278 (40)
Minimum	210
Maximum	345
Fat injected, ml	
Mean (SD)	320 (60)
Minimum	420
Maximum	530

Modern approaches to breast augmentation by fat transfer involve Brava expansion with fat grafting, composite breast augmentation, and simultaneous implant exchange with fat.^{9–12}

After Illouz and Sterodimas first introduced liposuction as a means of reducing unwanted fat, fat grafting to the breast was briefly described in the literature. However, this had mostly been placed on “standby” for >20 years. Concerns about the effect of fat injection on monitoring breast cancer had delayed the popularity of that procedure. With advances in radiology, safety and efficiency of fat injection were proved to lift the ban of fat injection to the breast in 2009.¹³

Breast reaugmentation postexplantation is one of the challenging issues in plastic surgery. Breast implant removal due to capsular contracture, pain, asymmetry, safety concerns, rupture, or extrusion usually leaves atrophied breast tissues.¹⁴ Many patients who suffered from prosthesis complications would prefer a natural substitute to restore breast volume. Implant-to-fat conversion provides a good solution for those patients.¹⁵

The main concerns in the implant-to-fat conversion procedure can be summarized in the safety of the technique, the efficacy in restoring the breast volume and shape following explantation, and the technique to achieve such results.

Yoshimura et al¹⁶ used transplantation of adipose tissue (cell-assisted lipo transfer) in 15 patients. The authors obtained the stromal vascular fraction containing the adipose tissue progenitor cells from liposuction aspirates. Then it was used to enrich progenitor cells in the graft to increase fat survival. The overall, clinical results were satisfactory, and no significant abnormalities were seen on magnetic resonance imaging or mammography after 1 year. Atrophy of the fat injected was insignificant and did not change substantially after 2 months.¹⁶

Thekkinkattil et al¹⁷ carried out a retrospective analysis of a database of 10 patients with implant-assisted LD flaps who underwent implant-to-fat conversion. The mean number of sessions was 3, with an average duration of treatment of 14 months. The initial follow-up duration ranged from 15 to 40 months. No significant complications were observed in the series, and overall satisfaction was high with a mean score of 9.3 out of 10. It was concluded that lipo-modeling is a useful, feasible option to replace for the implant volume in patients with complicated implants. Multiple sessions of lipo-modeling were acceptable for those patients.¹⁷

Furthermore, Khouri et al¹⁸ introduced the concept of mega-volume breast fat grafting. Autologous fat grafting for implant-to-fat conversion was performed on 94 patients. There was 1 pneumothorax, requiring a temporary chest tube, with no further complication. Authors found that large-volume autologous fat grafting after implant removal is a safe and efficient alternative for breast augmentation and deformity correction.¹⁸

Abboud et al⁴ described a novel approach for large-volume fat grafting after the explantation, exchanging the implants with fat in a single session for 80 patients. Fat was harvested using lipomatic power-assisted liposuction and

was injected (with simultaneous vibration and tunnelization) into the recipient site using the same machine with suction disabled. Patients were monitored by ultrasonography and mammography. Assessment of patient's satisfaction was evaluated using a questionnaire 6 months postoperatively. Injected fat volumes ranged from 300 to 600 ml per breast. One session of fat injection was enough to replace the volume of the previous implant for all patients. The power-assisted transfer of autologous fat to the breast improved the ability of the recipient site to receive the graft and allowed for simultaneous explantation and fat transplantation.⁴

In this study, we provide our experience in an immediate implant-to-fat conversion in a single session, with high patient satisfaction and few complications. Fat injection immediately after explantation allows for injecting the fat under low pressure due to much space left after implant removal. This low pressure allows for large volume fat grafting with better survival.¹⁹

All patients in this series did not need >1 session for fat injection following implant removal. This has many advantages. Patients walk in with 2 breasts and go out with 2 breasts, avoiding the psychological impact that might occur on many patients following the implant explantation.²⁰ The costs for further surgeries can be avoided when multiple sessions for fat injections are needed. An additional body contouring procedure (liposuction) is done, which enhances the overall look of the patients and keeps them motivated.

In many studies, the fat resorption rates following breast injection ranged from 30% to 40%.^{21–25} In this study, we believe that resorption rate is less due to the relatively high vascular nature of the implant capsule,²⁶ which will eventually improve the graft survival rates.²⁷

The BREAST-Q can analyze the cost-effectiveness and patient education as well. Additionally, it helps surgeons to assess their clinical performance.⁸ The results for this case series revealed high satisfaction rates at 12-month follow-up, enlightening the efficacy of the technique as an alternative to implants, without endangering patient's safety, the overall results, and patient's self-perception.

CONCLUSIONS

Implant-to-fat conversion is a good option for complicated implants cases, with good long-term results and excellent patient's satisfaction verified by the BREAST-Q. Studies with larger number of cases and postoperative imaging for objective assessment of fat retention rates are recommended.

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