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Secondary lipofilling after breast reconstruction with implants

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Abstract. BACKGROUND: Several Authors have reported on the use of lipoinjection as a low-risk and low-morbidity procedure that gives good results for the correction of soft-tissue defects.

AIM: The purpose of this study was to review our caseload of fat grafting after breast reconstruction with prosthesis.

PATIENTS AND METHODS: Between January 2008 and December 2011, 20 patients were treated for breast asymmetries with secondary autologous fat injection after nipple-sparing, skin-sparing and skin-reducing mastectomies breast reconstruction in our Departments. Exclusion criteria was postoperative radiotherapy. In order to assess aesthetic satisfaction, patients and an indipendent plastic surgeon filled an evaluation form (VAS = 1-10) preoperatively one and six months after surgery.

RESULTS: In postoperative days no major complications occurred. Donor sites looks completely healthy and no scars were evident. The average values of aesthetic satisfaction in patients (VAS) were 5.2 (range 3-7) preoperatively, 7.9 (range 5-9) one month post-operatively and 7.2 six months postoperatively (range 5-9). Values reported by the surgeon team were an average of 4.9 (range 4-6) preoperatively, 7.6 after one month (range 6-9) and 7.1 after six months (range 5-9).

CONCLUSIONS: Acquired contour deformities of the reconstructed breast are relatively common and independent from the technique used. Therefore, they present a frequent therapeutic challenge to reconstructive surgeons. Lipomodelling offers an "easy to perform" and predictable cosmetic solution to these patients. An objective examination of aesthetic results, in addition to our clinical analysis shows a significant improvement of cosmetic outcomes; moreover, all patients were satisfied for their final appearance.

Key Words:

Lipofilling, Breast reconstruction, Fat grafting, Skin sparing mastectomy, Nipple sparing mastectomy, Skin reducing mastectomy.

Introduction

Patient expectations for a natural-appearing reconstructed breast are high. Recently plastic surgeons are increasing the number of secondary procedures to improve contour deformities and asymmetry.

Several Authors[1,2] have reported on the use of lipoinjection as a low-risk and low-morbidity procedure that gives good results for the correction of soft-tissue defects.

The first report of fat transplantation was in 1893 when Neuber[3] transferred fat from the arm to correct a facial deformity.

The first Author who described fat transplantation to the breast was Czerny in 1895[4]. He used a large lipoma to reconstruct a defect resulting from excision of a benign lesion. Then, Lexer[5] transferred fat to the face and later to the breast and Bruning[6] was the first to use a syringe to inject fat in 1911. Following the introduction of liposuction by Fischer[7] and the report by Illouz[8] of more than 3000 cases of liposuction, the concept of using the suctioned fat to correct defects elsewhere began to emerge.

In the 1980s, concerns over the development of fat necrosis and consequent calcification, which could compromise the early detection of breast cancer, led to widespread scepticism about the application of the technique to breast deformities[9,10].

In 2009, a task force of the American Society of Plastic Surgeons made recommendations for the safe and efficacious use of fat grafting to the breast[11].

Published data on long-term outcomes of fat grafting to the breast are few. However, the recent re-emerging popularity of breast fat transplantation is based on recent reports and work by a number of surgeons[12] including Coleman[13],

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who have introduced the term "lipomodelling", and used the technique alone, or in combination with other reconstructive procedures.

The purpose of this study was to review our case load of fat grafting after breast reconstruction with prosthesis.

Patients and Methods

Between January 2008 and December 2011, 20 patients were treated with secondary autologous fat injection after breast implant, in the Plastic Surgery Units of the "Policlinico Umberto I" Hospital of Rome, and Monserrato Hospital of Cagliari, Italy.

The patients age ranged between 29 and 75 (average 65).

All patients developed asymmetries after breast reconstruction, resulting in dissatisfaction from an aesthetic point of view. Imperfections were usually localized at the upper and lower outer quadrant. All procedures were performed under general anesthesia or laryngeal mask.

Surgeons, with the patient's approval, identified potential donor sites for fat graft harvest, including the lower abdomen, flanks, hips, and thighs, preoperatively.

About 100 to 300 cc of anesthesia was infiltrated into the site for fat graft harvest 10-15 minutes before liposuction. Breast's incisions were placed in previous incisions or in natural folds to limit visibility.

A 3-mm Coleman aspiration cannula was then used to harvest adipose tissue with manually generated negative pressure. Harvested fat was transferred to 10-cc syringes and centrifuged at 3000 rpm for 3 minutes. Then, supernatant oil was removed and fluid at the dependent portion of the syringe decanted. The fat grafts were then transferred into 1 ml and 2.5 ml syringes for transfer into soft tissue deformities by means of Coleman's cannulas.

The fat were injected through multiple passes and different tissue planes to improve graft take, overcorrecting defects from 20 to 25%.

Aesthetic analysis was performed using preoperative and postoperative digital photographs.

Follow-up visit was performed after 1-3-6-12 months.

In order to assess aesthetic satisfaction patients filled an evaluation form (VAS = 1-10) preoperatively, one and six months after surgery. In addition patients were evaluated from a cosmetic point of view mainly by measuring the symmetry. A plastic surgeon, not part of the operating team, evaluated the outcome using the same evaluation scale (VAS = 1-10).

Results

The mean operative time was 1 hour and 30 minutes, ranging between 50 minutes and 2 hours and 20 minutes.

The most common donor site was the abdomen (15 patients, 75%): fat was taken from the buttocks (3 patients, 15%) and lumbar region (2 patients, 10%) if the abdominal donor site was insufficient.

All patients were discharged from the Hospital in two days, with instruction to wear a compressive garment belt for 5 weeks.

Postoperatively no major complications occurred, one patient developed a fat necrosis. Donor sites looked completely healthy and no scars were evident.

The average values of aesthetic satisfaction in patients (VAS) were 5.2 (range 3-7) preoperatively, 7.9 (range 5-9) one month post-operatively and 7.2 six months postoperatively (range 5-9). Values reported by the surgeon team were an

Table I. Patient (P) and surgeon (S) aesthetic evaluation (VAS: 1 no satisfaction, 10: total satisfaction).

Patient	VAS (P) 1 month	VAS (P) 6 month	VAS (S) 1 month	VAS (S) 6 month
1	8	7	8	7
2	8	8	8	8
3	9	9	9	8
4	7	5	7	6
5	8	7	6	7
6	8	7	8	6
7	8	8	8	8
8	7	8	8	7
9	8	6	7	5
10	8	8	7	7
11	9	8	8	8
12	7	6	7	6
13	8	6	6	7
14	7	7	7	7
15	7	7	9	8
16	9	8	7	7
17	8	6	7	6
18	7	7	8	8
19	8	7	8	7
20	9	9	9	9
Mean	***7.9***	***7.2***	***7.6***	***7.1***

Table II. Comparison between pre and 1 month post-operative VAS values in Patients.

Groups	Mean	*p*-value	*t*-value
Pre-operative	5.2	< 0.0001	9.12
1 m-Postoperative	7.9		

Table III. Comparison between pre and 1 month post-operative VAS values in Surgeon.

Groups	Mean	*p*-value	*t*-value
Pre-operative	4.9	< 0.0001	10.6
1 m-Postoperative	7.6		

average of 4.9 (range 4-6) preoperatively, 7.6 after one month (range 6-9) and 7.1 after six months (range 5-9) (Table I). Statistical analysis was performed with *t*-Student test and was found to be significant ($p < 0.0001$) both in patients and in Surgeon evaluation (Tables II and III).

Discussion

Acquired contour deformities of the reconstructed breast are relatively common and independent from the technique used, thereby presenting a frequent therapeutic challenge to reconstructive surgeons. Primary breast reconstruction usually meets the goal of establishing a natural appearing breast shape. However, in the immediate or late postoperative period, secondary contour defects of the reconstructed breast can develop[14].

Lipomodelling offers an "easy to perform" and predictable cosmetic solution to these patients.

The survival of fat cell grafts depends on the techniques used to harvest and inject them into the recipient site.

Missana et al[15] demonstrated that autologous fat transfer provides interesting results for recurrent grade 3 or 4 capsular contracture. In these indications, capsulotomy associated with a reduction in implant size and lipoinjection is a good alternative to conversions using an autologous flap. This technique is limited by the quantity of fat that can be removed, which explains the unsatisfactory results that can be observed.

Some Authors[16] present a relatively high rate of postoperative fat transfer calcifications and fat necrosis; this may be related in part to the large amount of fat transferred in one session or to the large amount of fat injected in the single injection.

Another important aspect is the maintenance of sterility inside and outside the syringe: Colwell and Borud[17], in their work, placed a sterile piece of transparent film (Tegaderm; 3M, St. Paul, MN, USA) over the open end of the syringe after the plunger has been removed. This device prevents potential dust or debris from the centrifuge lid from contaminating the fat.

Limited complication data associated with fat injection can be found in literature, with a study of 37 patients reporting an 8.5 percent prevalence of infection/fat necrosis[18,19].

Disappointing results were also reported in mammary ptosis[20]. Lipomodelling can be used for augmentation following mastopexy; however, it is unlikely to be suitable as a sole intervention in the management of a breast ptosis.

Fat grafting has received a significant amount of attention because of its success in facial soft tissue augmentation and the treatment of postoperative liposuction contour defects[2].

Our findings proves that a similar technique, when applied to the breast, following primary breast reconstruction, is highly effective. Is also a versatile procedure that is appropriate in many conditions[15] (Figures 1, 2, and 3).

An objective examination of aesthetic results, in addition to our clinical analysis, shows a significant improvement of cosmetic outcomes; moreover all patients were satisfied for their final appearance.

Conclusions

These results, obtained with a procedure easy to perform[21,22], with minimal post operative morbidity and few complication, are encouraging and further support the use of autologous fat grafting in improving aesthetic outcomes in breast reconstruction[23,24].

Although definitive guidelines are required for a safer application[11], fat grafting remains a suitable technique for the management of common issues for patients who underwent breast reconstruction: the breast's asymmetry and the consequent dissatisfaction due to the aesthetic outcomes.

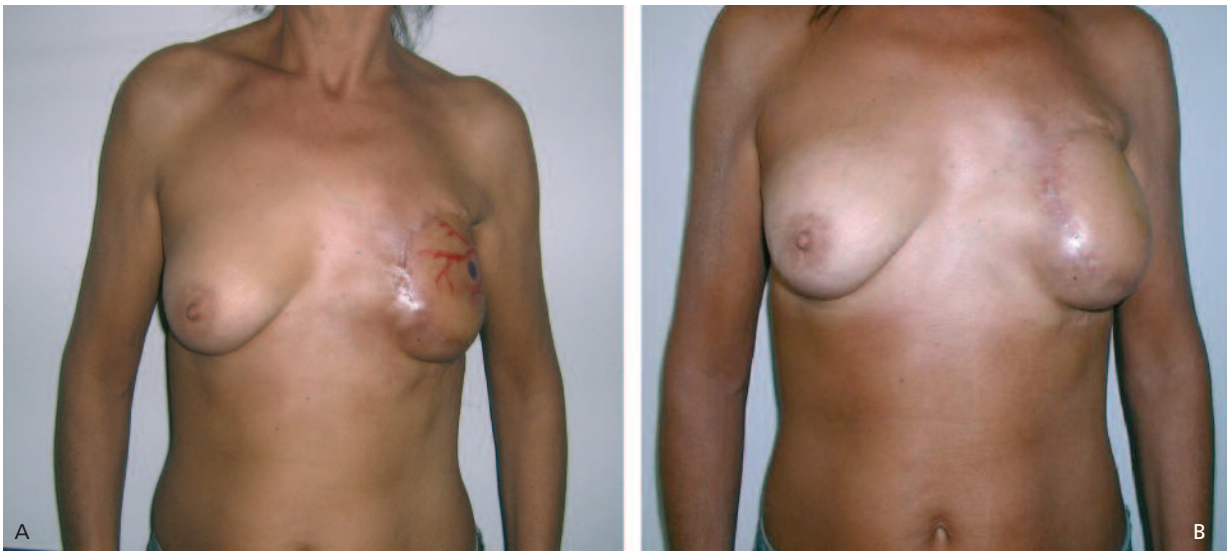


Figure 1. *Patient 1*. Lipofilling in a patient with previous breast reconstruction with latissimus dorsi flap, and skin irregularities in the medial border. *A*, Preoperative view with Doppler identification of the pedicle. *B*, Postoperative view. Notice the improvement in the texture and colour.

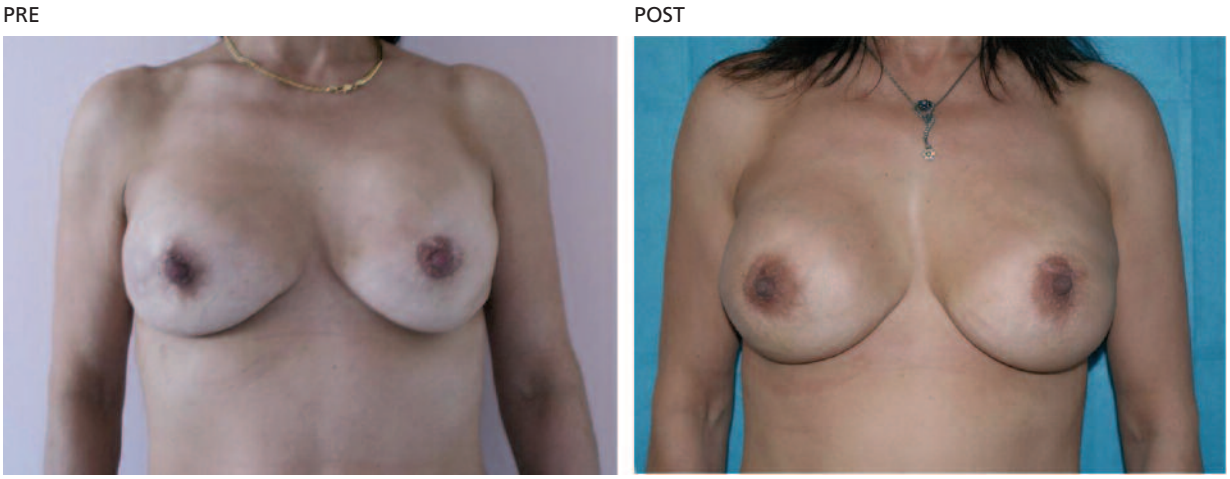
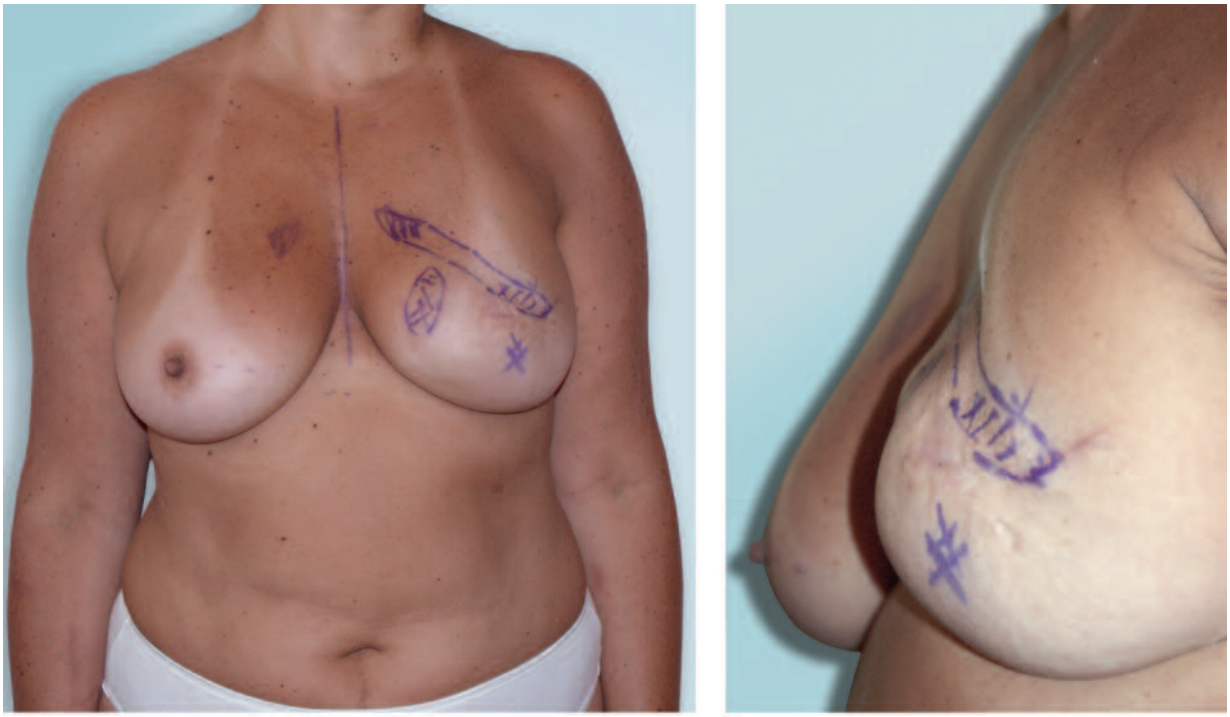


Figure 2. *Patient 2*. Lipofilling in a patient previously treated with nipple sparing mastectomy for multiple infected cysts and mammary reconstruction with implants.

PRE



POST

Figure 3. *Patient 3*. Lipofilling in a patient treated with skin sparing mastectomy and reconstruction with implant.

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