

Autologous Grafts for the Correction of Breast Contour Deformities after Breast Reconstruction

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Abstract: Background: Breast oncologic treatments often lead to disfiguring breast contour deformities and tissues damage. The necessity to obtain an oncological radicality should be associated to an acceptable cosmetic outcome. Fat grafting is an effective technique, however in selected cases is not indicated, therefore other techniques should be investigated.

Methods: Five patients that underwent reconstruction after mastectomy have been evaluated. Breast deformities were filled with autologous grafts derived from peri-prosthetic capsule, dermoadipose tissue or both. They underwent ultrasonographic exam before and after surgery (medium 9 months) to evaluate the stability and vitality of the grafts, furthermore the thickness and vascularization of breast regions to be corrected. The aesthetic outcome was evaluated by patients and a panel of surgeons.

Results: Subcutaneous tissue thickness increase resulted at Ultrasonography in all cases except one, while vascular spots were maintained in one case. Regarding the cosmetic results all cases were judged as good-excellent by the surgeon. Patients were all satisfied with the improvements obtained.

Conclusions: The technique allows to obtain a great aesthetic improvement and a good satisfaction degree of patients, without the addition of recovery days or treatment sessions. It could be considered a valid alternative when other techniques are not applicable.

Keywords: Breast reconstruction, Autologous graft, Ultrasonography, Peri-prosthetic capsule.

1. INTRODUCTION

In the field of breast surgery, the oncological treatment outcomes often result in a feeling of discomfort and psychological distress for the women resulting in difficulties to overcome the disease. A deeper aesthetic sensibility has been developed in recent times. Several surgical techniques have been experienced in order to combine the oncological radicality with the necessity to obtain an acceptable cosmetic outcome.

Nowadays fat grafting is definitely the most widely performed technique for the treatment of soft tissue defects because it is simple, minimal invasive and at low risk; otherwise it still raises doubts on the indications in some conditions. Patients with family history of breast cancer and genetic background [1], or with an aggressive histology or diagnosis of Intraepithelial neoplasia of the primary tumor [2]; or thin patients where fat tissue is not available should not undergo the lipofilling procedure.

In the current debate about the capability of cells derived from adipose tissue to promote breast cancer

onset or recurrence through the stimulus on the dormant cells on tumor bed [3], other techniques can be used to obtain satisfactory results in breast reconstruction.

The use of capsular flaps to correct and improve different types of breast deformities has been introduced in the past [4-10], in the other hand the use of autologous grafts has not been widely investigated.

In our series, five cases that underwent mastectomy and immediate reconstruction with poor cosmetic outcome, were selected to be treated with the positioning of autologous grafts in the breast tissue. Preoperative and postoperative subcutaneous thickness variation and the presence of vascular supply were evaluated through ultrasonographic exams to investigate the stability and vitality of the grafts in the breast tissue over time.

2. METHODS

Five patients presenting breast contour deformities resulted from oncologic surgery were selected to be treated with autologous grafts in the second stage of breast reconstruction during implant replacement. All patients underwent second intervention after completing

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oncological treatments including radiotherapy and chemotherapy. Standardized photographs of the breasts were taken before and after surgery in five positions: frontal, profile and oblique bilaterally. All patients underwent an ultrasonographic exam prior to surgery to evaluate the thickness and the vascularization of the breast regions to be corrected. A preoperative planning was performed marking the breast regions that necessitate to be corrected. Ultrasonographic scans were performed on the marked regions and compared before and after surgery.

In three patients capsular grafts were harvested from the same breast and positioned during partial removal of the peri-prosthetic capsule; in one case a dermo-adipose graft was obtained during contralateral breast reduction; both grafts were used in the last case. The regions treated were those of evident deformity such as depressions or retractile scars, causes of functional impairment and patient dissatisfaction. Grafts were inserted through an incision on a preexisting scar in a subcutaneous plane above the pectoralis major muscle and then sutured in that plane with Vycril 3/0, in order to avoid rotations (Figures 1 and 2).

All patients underwent an accurate clinical and radiological follow-up. Ultrasound was performed at least three months after surgery (medium 9 months), to assure integration and stability of the grafts. The aesthetic and functional outcomes were evaluated considering patient and surgeon assessment. A postoperative psychological evaluation of patients was carried out in order to assess the satisfaction related to the softness and naturalness of tissues. Patients were asked to use a four point scale from insufficient to excellent evaluating their perception of the final aesthetic result and the feelings correlated.

A panel consisting of two female plastic surgeons assessed the cosmetic outcome, observing the photographs taken before and after 6 months from surgery. Different parameters were considered: shape, contour, symmetry, and volume of the breasts.

3. RESULTS

Overall five patients were selected from July 2011 to June 2012. Mean age was 51,8 (range 32-70 y.o.). The results obtained at the ultrasound exam compared with the scans obtained before surgery displayed a consistent increase of thickness of the subcutaneous tissue in all cases except for one. In the case of transplant of both grafts, a 8,7 percent of augmentation was

a:



b:



Figure 1a: Patient presenting a breast contour deformity after oncological treatments **b:** Capsular graft positioning through the preexisting breast scar.

a:



b:

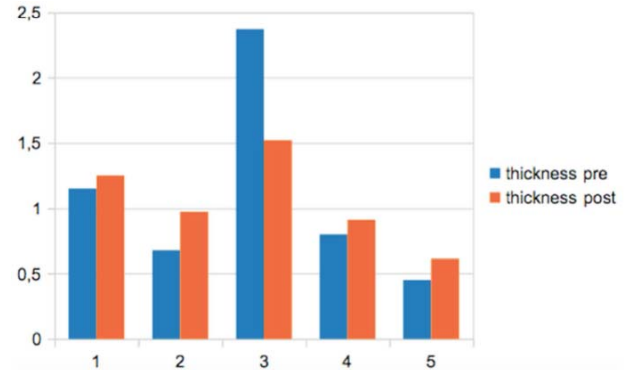


Figure 2a: Patient presenting an upper pole deformity on her breast. **b:** Placement of a capsular graft on the superior quadrants of the breast.

observed; while in the case of dermo-adipose grafting a 43 percent. Among the three cases of capsular graft transplantation we observed an increase of tissue thickness of 30 percent in one case, an 14 percent in second case, while in a further case we observed a decrease thickness of 25 percent (Table 1). Three vascular spots were maintained in the case of both

grafts transplant, while with capsular and dermo-adipose transplants no vascular spots were found postoperatively.

Table 1: Preoperative and Postoperative Thickness Values at Ultrasonography



No lesions such as fat necrosis, oil cysts or calcifications were found at postoperative Ultrasound in the five cases investigated.

Concerning the cosmetic results, all patients were pleased with the final result that was judged to be in a range of good/very good. The cosmetic assessment of the panel was good in three cases and excellent in two (Figure 3).

4. DISCUSSION

The technique described has been performed in our Institute for many years with excellent aesthetic results. In 2011 we began to collect our cases to justify the comforting results through the detection of tissues modification. Five of them underwent an ultrasonographic evaluation as we usually do for patients undergoing lipofilling treatment and the cosmetic outcome was evaluated. The periprosthetic capsule is the result of an inflammatory fibroblastic reaction around a foreign body. The preparation of pedicled capsular flaps in order to correct the periprosthetic wrinkling, to save prosthesis exposition and to replace the inframammary fold is already known [7-12]. In breast augmentation capsular flaps are used to fill depressions in the breast profile or to increase the nipple areola complex projection by opening the submuscular pocket and rotating the flap [6].

In our case, vascular pedicle was not preserved; graft healing was permitted by imbibition and new vascularization as cutaneous grafts and the compression of the graft was due to the cutaneous tension. In Literature one case is reported that was treated with grafts for contour deformities after breast reconstruc-

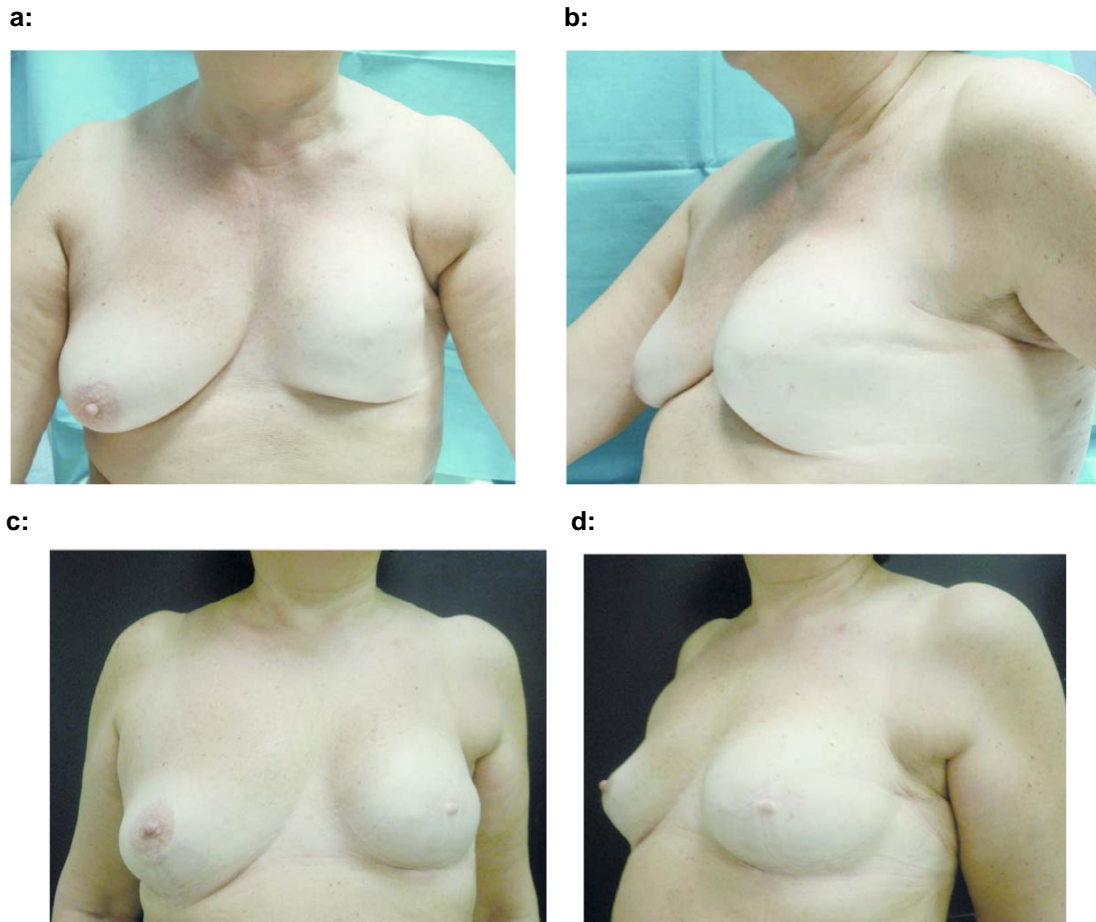


Figure 3a: A 63 y.o. woman in which breast deformities after oncologic treatments are evident. **b:** lateral view. **c:** Postoperative view after 3 months from the procedure of implant replacement and capsular graft positioning in the external quadrant of her left breast. The result has been judged to be good from both surgeons and the patient.

tion with polyurethane implant [13]. In the majority of cases we used the capsule for its property of persistence and minimum resorption over time, reported to be more than seventeen years so that has been even used to increase lips volume [14-16]. Furthermore dermo-adipose grafts could be used. They could be collected from contralateral breast but also from abdominal tissue during a simultaneous abdominoplasty.

The ultrasonographic exam allowed us to detect variation of subcutaneous tissue thickness and the eventual resorption, the formation of new blood vessels and the integration to the surrounding tissues. We evaluated that the new tissue was completely integrated and an increased tissue thickness was identified in all cases, except one probably associated to a recent strong loss of weight. In our case capsule was used as a graft; we suppose that the absence of vascular spots at ultrasonography could be linked to the type of integrated tissue comparable to the scar one [17], but it is not excluded that vascularization could be found at histological analysis. At the ultrastructural analysis of

the capsule, thin vascular layers are described near the surface of textured implant in cases of formation of a strong contracted capsule, probably because vessels represent the reaction sustaining capsule formation [18]. The placement of the grafts do not necessary need the incision of muscular pocket in which prosthesis is located, because they have to be placed above the pectoralis major muscle; thus avoiding any possible risk of prosthesis and muscle contamination or damage.

The capsular and dermo-adipose grafts could represent a viable alternative to fat transplant when it is difficult for the unavailability of fat tissue; furthermore in cases of necessity to avoid several operating sessions, since the intervention takes place during major operating session of implant replacement. It also allows tissues that normally would be removed to be useful to fill depressions and tissue loss. Moreover when fat grafting is not indicated for the risk of recurrence such as the unfavorable histology of the primary tumor, capsular grafts harvested from the same breast could represent a valid alternative.

5. CONCLUSIONS

The placement of autologous grafts seems to be an effective technique. Grafts can be easily reshaped to correct different defects and seem to be resistant to resorption. This technique allows to obtain a great aesthetic improvement and a good level of satisfaction for patients. Furthermore, the technique is performed in association with an larger entity intervention such as a breast reduction adjustment or a capsulectomy under general anesthesia, therefore avoiding a long recovery period or any further intervention. On the contrary fat grafting often requires more operating sessions due to the variable percentage of adipose tissue grafted resorption. These factors motivate us to continue with this technique. We believe, however, that further studies are necessary to clarify the histological evolution of the grafted tissue and therefore its integration into the surrounding tissues.

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