

## AUTOLOGOUS FAT TRANSPLANTATION IN AESTHETIC BREAST RECONTOURING

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### ABSTRACT

Reconstructive techniques using flaps, implants have led to vast improvements in the result of reconstructive surgery. To further improve the cosmetic outcome we have applied the technique of autologous fat transfer, which has proven to be a very successful treatment for reconstructive breast surgery.

**Objective:** The authors report their experience with large volume free fat transfers for breast reconstruction.

**Methods and Techniques:** From June 2004 to October 2011, 36 sessions of autologous fat transfers were undertaken in 18 patients with 10 receiving fat grafts in both breast. To improve the cosmetic outcome and to repair the contour deformities, 36 fat transfers were done at the superior and medial perimeter, 9 at the area of the wrinkling around the implant.

**Technique:** Tumescence technique was used to harvest the lipo-aspirate for immediate transplantation after decantation. The cannula used to aspirate and to transfer the fat was 3-4 mm through two small incisions which was performed in the chest outside of the area of fat transfer. The fat donor area was the abdomen, the mean value of the fat transfer was 259cc (range 95-530cc)

**Results:** Eighteen patients underwent 36 fat transfer procedures that mean follow-up procedures were 15 months ranging from 4 months to 54 months. The average age was 55 years (range 47-70 years) 10 patients (55%) underwent bilateral fat transfer, 4 patients underwent a second fat transfer procedure, one for asymmetry correction, and the other for previous under corrected contour deformity. The average interval between repeat fat transfers was 22 months (range 6-38 months).

The indications for fat transfer were superior and medial perimeter defect in all the patients (100%), Implant Wrinkling in 9 patients, to increase the soft tissue thickness in 8 patients. There were no reports of the postoperative cellulites or fat necrosis, one patient had persistent asymmetry, 2 patients improved the post radiation pigmentations.

**Conclusions:** Autologous fat transfer is a safe, simple, reproducible method for correcting tissue deformities following post mastectomy reconstruction. All patients were satisfied with the soft natural appearing.

**KEYWORDS:** Fat Transfer- Breast Reconstruction Was Presented at the South Eastern Plastic and Reconstructive Surgery Meeting

### INTRODUCTION

The application of autogenous fat grafts for primary and secondary breast reconstructions has experienced recent growth in popularity, with the associated controversies regarding technique, indications, and complications inherent to its nascent, evolutionary status and individual, empirically reproducible results [1-5]. Historical precedence was established by Czerny in 1895, who first described the transfer of fatty tissue derived from a lipoma for breast reconstruction [6].

The variability of individual technique naturally yields a subsequent variability in clinical outcome. Active discussions regarding the volume of transfer per operation have shown disparate stances on the optimal volume to be injected, with mean volumes of transfer ranging 101 – 145 ml [7,8,9]. Further disagreements remain regarding the necessity of pre-graft tumescent, centrifugation of grafted tissue, and the components of the grafted content to be injected. In spite of all of this, several reports have documented significant patient satisfaction following both primary breast augmentation and secondary, post-reconstructive breast augmentation by autologous free fat transfer [10, 11]

Micro calcifications following autologous fat transfer to the breast have been documented, with a resultant clinical risk of radiological equivocalty in evaluation of breast malignancy, a risk made more pertinent for those with a personal or family history of breast cancer, which represents a significant portion of autologous fat transfer patients [12,13]. Yu and Bhowmich have demonstrated a potentially heightened rate of tumorigenesis when mesenchymal-derived stem cells have been co-cultured with mammary cancer cells[14,15].

However, a clinical review by Fraser indicated no increased rate of new cancer formation or recurrence [16]. Bearing in mind the potential risk of cancer recurrence and compromised radiographic screening, the reconstructive surgeon must also be cognizant of other complications such as fat necrosis, persistent contour deformity, and tissue resorption rates have also been reported [17,18].

The purpose of this study is to demonstrate the surgical technique and evaluate the results achieved by large volume autologous free fat transfer in post-reconstructive breast surgery patients, including a review of the clinical outcomes and complication rates.

**Method:** A collection of reconstructive breast surgery patients who received autologous free fat transfer at Georgia Health Sciences University dating from June 2004 to October 2011 was compiled. A total of eighteen patients underwent the procedure, with a total of thirty six autologous free fat transfer sessions. The mean age of the study participants was 55 years old, ranging 47 – 70 years. Clinical outcome was recorded for each individual case through patient questionnaires, with a mean final post-operative follow-up of 15 months, ranging 6 – 54 months. Complications such as a required second fat transfer, persistent anatomic asymmetry, post-operative cellulites, and fat necrosis were recorded.

**Technique:** Pre-operative contour deformities and abdominal donor sites were marked with the patient orthostatic. Tumescent formula composed of 1000 milliliters of normal saline with 0.5% lidocaine with 1 milligram epinephrine was applied to the abdominal donor site with an average volume of 1000 cc. A 3 – 4 mm blunt cannula attached to a negatively pressurized suction cannula was used for lipo-aspiration and same cannula was used for transfer. (Figure No. 1) Following reception of the fatty tissue, the content was permitted to stratify via gravity, with transfer immediately following decantation. A minimal incision was made 0.5 – 1 cm outside of the intended domain of fat transfer, serving as the autologous fat injection port. The fat was transfer into the pectoral major muscle and at subcutaneous level. (Figure No. 2)

## RESULTS

A total of 18 patients were involved in the study, with a total of 36 autologous fat transfer sessions. A mean volume of 259 ml was transferred, with a range of 95 – 530 ml. For these patients, 55% of them underwent bilateral autologous free fat transfers to the breasts. Average interval for final post-operative follow-up was 16 months, with a range of 6 – 54 months. Four out of the eighteen patients required a second fat transfer, with the mean interval between transfers of 22 months. Visual inspection of post-operative outcome demonstrated a 6% rate of persistent asymmetry. The procedure resulted in improved post-radiation pigmentation in two of the patients. None of the patients experienced clinical

local recurrence of breast malignancy. No post-operative cellulites or fat necrosis was recorded. Post-operative questionnaires completed at follow-up clinic indicated a 94% patient satisfaction rate, notably for the soft texture and natural, appearance of the post-operative result. (Figures No. 3, 4, 5)

## DISCUSSIONS

With the increasing prevalence of breast cancer, and subsequent growth of a post-mastectomy patient population, the variety of options available for post-mastectomy breast reconstruction is critical to the ability of the reconstructive surgeon to produce a satisfactory functional and aesthetic outcome. Methods of reconstruction such as tissue expansion with secondary implant placement, pedicle flap transfer, and free flap transfer have advanced accordingly with surgical empiricism; however, the need remains for post-reconstructive augmentation or correction of residual asymmetries or contour deformities. The clinical experience with these nine patients demonstrated that autologous fat transfer possesses the ability to produce satisfactory results from the patient's perspective. Although operator dependent, the minimal complication rate lends credence to its relative safety versus other, more invasive alternatives. The mean volume of transfer of 259 ml resulted in no evidence of fat necrosis, demonstrating that higher single session volumes remain efficacious for contour deformity correction, even at extended follow-up periods of more than four years.

## CONCLUSIONS

Autologous free fat transfer is a simple, safe, and reproducible method for correcting post-reconstruction tissue contour deformities. Patient satisfaction remains remarkably high due to the soft texture and natural appearance of the post-operative result.

**Disclosures:** The authors declared no potential conflicts of interest with respect to the authorship and publication of this article.

**Funding:** The authors received no financial support with this research, authorship, and publication of this article.

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## APPENDICES



**Figure 1: Lipo-Aspirate Ready for Transfer after Sedimentation, 3-4mm Cannula and Tumescent Infiltrate was used**



Figure 2: Circle Shows the Area of Incision 0.5-1 cm Outside of Area of Fat Transfer

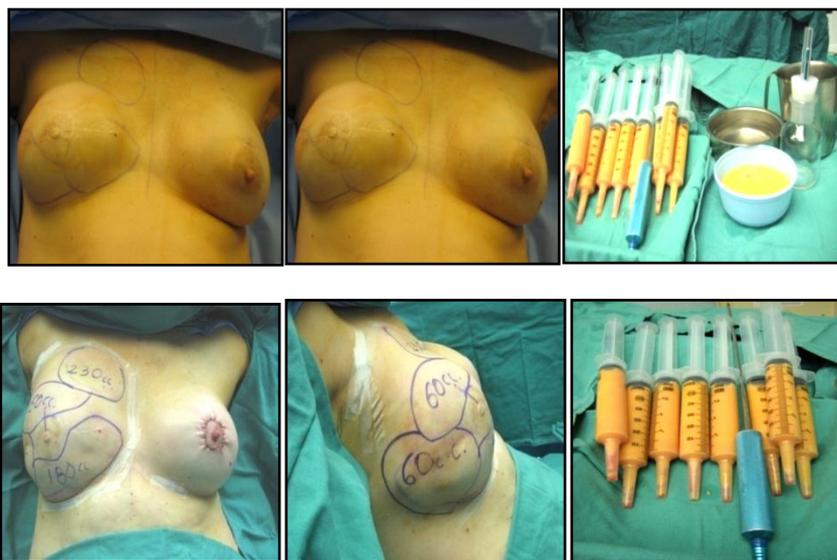
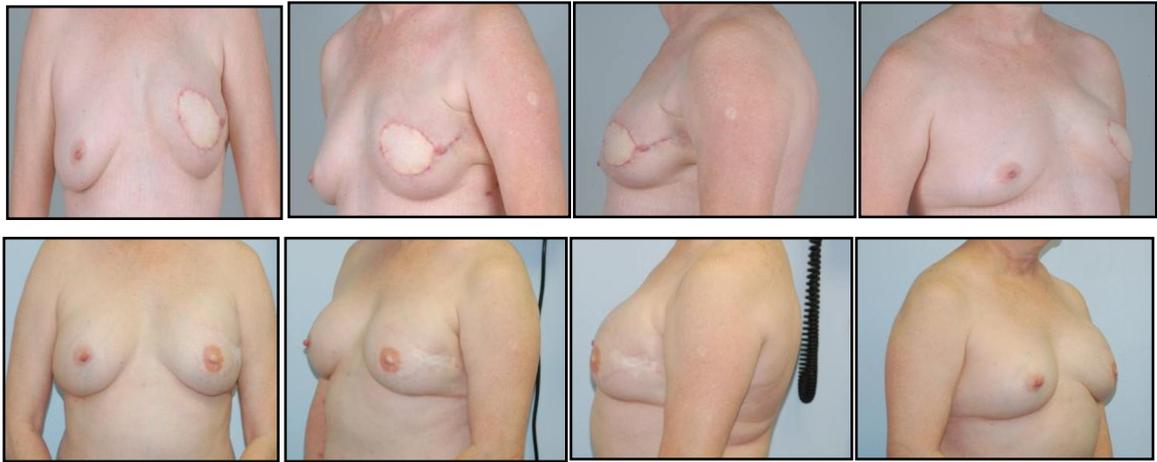


Figure 3: Top: 53 Year Old Patient with Preoperative Markings on Areas to be Corrected Lower: Immediately Post Fat Graft



Figure 4: Top: 51 Year Old Patient Post Reconstruction with Implants. Lower: 12 Months After two Fat Transplants. (First: Right Breast 270 cc. Left Breast 230 cc. Second: Right 230 cc. Left 80 cc.) Upper and Lower Lateral Preoperative Markings



**Figure 5: Top: 50 Year old Patient S/P TRAM Flap Reconstruction with Left Upper Pole Contour Deformity. Lower: After 54 Months of Follow-Up the Left Chest Deformity was Corrected with two fat Transfers 95, 310 cc.**