

Radiological findings in mammary autologous fat injections: A multi-technique evaluation

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AIM: To describe the radiological appearance of normal and pathological findings resulting from mammary autologous fat injections (lipofilling).

MATERIALS AND METHODS: Informed consent and institutional review board approval were obtained. From January 2008 to December 2010, all patients that had undergone breast lipofilling at our institution (Catholic University) were consecutively enrolled. The site and amount of autologous fat injections were known. Mammography, ultrasonography, and magnetic resonance imaging (MRI) were prospectively obtained preoperatively, and 6 and 12 months after the procedure. Normal and pathological findings were described.

RESULTS: Twenty-four patients (mean age 50.8 ± 10.5 years; range 26–70 years) were included. Fourteen patients underwent lipofilling after mastectomy, eight after wide local excision, one as a treatment for a congenital asymmetry, and one as a treatment for Poland syndrome. No severe complications were observed after treatment. Normal findings due to lipofilling (“oil cysts”) were identified in 23 cases using ultrasound and in 16 using MRI. Liponecrosis, the most frequently observed complication, was detected in four cases using ultrasound and in eight by MRI. In one case mammography showed calcific fat necrosis. Mean amount of fat injected was 114.8 ± 55 ml. The average amount of fat grafted in patients who developed liponecrosis was 158.4 ± 42.7 versus 104.6 ± 52.3 ml ($p = 0.0043$, *t*-test). In one case breast cancer recurrence was diagnosed.

CONCLUSION: Normal findings due to lipofilling are better identified by ultrasound, and pathological findings are best identified using MRI. Liponecrosis most frequently occurs when large amounts of fat are injected. In the authors’ experience lipofilling does not interfere with breast cancer early diagnosis.

Fat Grafting and Breast Reconstruction with Implant: Another Option for Irradiated Breast Cancer Patients

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Background: In postmastectomy radiated patients, autologous tissue reconstruction is preferred over implant reconstruction, because the latter is associated with a higher rate of postoperative complications. Autologous tissue reconstruction, however, is not always feasible and is sometimes refused by the patient. A challenge also arises in breast-conserving surgery patients seeking breast augmentation with an implant. In this article, the authors present a further reconstructive option for irradiated breast cancer patients consisting of fat grafting followed by implant placement.

Methods: The authors retrospectively reviewed 16 cases of irradiated breasts treated with fat grafting and subsequent alloplastic reconstruction/breast augmentation. The evaluation methods were clinical and photography-based assessments. The BREAST-Q was used to quantify patient satisfaction.

Results: Sixteen patients, with a pretreatment Late Effects on Normal Tissues—Subjective, Objective, Management, Analytic (LENT-SOMA) score of 1 or 2, underwent two to three fat grafts to achieve a LENT-SOMA score of 0. The placement of the breast implant had been performed in a separate stage at least 3 months after the last grafting session. The average follow-up was 15 months. Reconstructive outcomes were graded from excellent to good in 93.7 percent of patients. Patient satisfaction was marked as high to very high. There were no short-term complications. A Baker grade 1 capsule contracture was found in all patients.

Conclusions: The authors' experience shows that breast fat grafting followed by implant placement may represent a feasible reconstructive option in highly selected patients with irradiated breasts. Fat grafting seems to reduce radiation-induced complications in implants. Larger studies with a longer follow-up are needed. (*Plast. Reconstr. Surg.* 129: 317, 2012.)

CLINICAL QUESTION/LEVEL OF EVIDENCE: Therapeutic, V.

Irradiation, as adjuvant therapy, decreases locoregional disease recurrence in breast cancer patients and improves their overall survival.¹⁻³ After breast-conserving surgery, whole-breast irradiation is being recommended.² Postmastectomy radiation therapy is reserved for patients with T3/T4 tumors, incomplete resection, and/or four or more positive axillary nodes, because they carry

a risk of locoregional recurrence greater than 25 to 30 percent.⁴⁻⁶

Recently, retrospective studies on postmastectomy locoregional recurrence, prospective clinical trials, and the latest meta-analysis of Early Breast Cancer Trialists' Collaborative Group have documented benefits of postmastectomy radiation therapy for patients with one to three positive axillary nodes.⁷⁻¹⁰ Some guidelines on breast cancer, including the 2010 National Comprehensive Cancer Network references on the matter, state that this therapy should also be considered for patients with one to three positive nodes.^{4,11} The

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Breast Fat Grafting with Platelet-Rich Plasma: A Comparative Clinical Study and Current State of the Art

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Background: The role of platelet-rich plasma in enhancing fat graft take is attracting the scientific community. There is, however, a lack of clinical studies on the matter. The aim of this article is to report the authors' experience in breast fat grafting with and without platelet-rich plasma and to investigate the state of the art on adipose tissue platelet-rich plasma enrichment.

Methods: The authors retrospectively reviewed 42 women who underwent breast fat grafting between September of 2007 and September of 2009. Seventeen of these patients (40 percent) were grafted with fat (according to Coleman) enriched with platelet-rich plasma at 10 percent (group A), and 25 patients (60 percent) received only fat grafts according to Coleman (group B). All patients underwent preoperative breast ultrasound and mammography and were regularly followed up with breast ultrasound 3 months later and then at 6-month intervals. The reconstructive and aesthetic outcomes were evaluated using the following parameters: (1) clinical outcomes according to the surgeons and the patient, (2) the rate of liponecrosis at breast ultrasound, and (3) the need of further fat grafting to achieve the planned result.

Results: The clinical outcomes, the rate of liponecrosis at breast ultrasound, and the need for further fat grafting reveal that fat grafting plus platelet-rich plasma at 10 percent is not superior to Coleman fat grafting alone.

Conclusions: In the authors' retrospective analysis, no effect of platelet-rich plasma was seen in enhancing fat graft take when compared with the Coleman fat graft. Further research and prospective clinical studies are needed to understand the role of platelet-rich plasma, if any, in fat grafting. (*Plast. Reconstr. Surg.* 127: 2176, 2011.)

Qualitative and quantitative differences of adipose-derived stromal cells from superficial and deep subcutaneous lipoaspirates: a matter of fat

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Abstract

Background aims. Subcutaneous fat represents a valuable reservoir of adipose-derived stem cells (ASCs) in the stromal vascular fraction (SVF), widely exploited in regenerative medicine applications, being easily harvested through lipoaspiration. The lack of standardized procedures for autologous fat grafting guided research efforts aimed at identifying possible differences related to the harvesting site, which may affect cell isolation yield, cell growth properties and clinical outcomes. Subcutaneous fat features a complex architecture: the superficial fascia separates superficial adipose tissue (SAT) from deep layer tissue (DAT). We aimed to unravel the differences between SAT and DAT, considering morphological structure, SVF composition, and ASC properties. **Methods.** SAT and DAT were collected from female donors and comparatively analyzed to evaluate cellular yield and viability, morphology, immunophenotype and molecular profile. ASCs were isolated in primary culture and used for *in vitro* differentiation assays. SAT and DAT from cadaver donors were also analyzed through histology and immunohistochemistry to assess morphology and cell localization within the hypoderm. **Results.** Liposuctioned SAT contained a higher stromal tissue compound, along with a higher proportion of CD105-positive cells, compared with DAT from the same harvesting site. Also, cells isolated from SAT displayed increased multipotency and stemness features. All differences were mainly evidenced in specimens harvested from the abdominal region. According to our results, SAT features overall increased stem properties. **Conclusions.** Given that subcutaneous adipose tissue is currently exploited as the gold standard source for high-yield isolation of adult stem cells, these results may provide precious hints toward the definition of standardized protocols for microharvesting.

Key Words: *subcutaneous adipose tissue, adipose-derived stem cells, regenerative medicine, stemness*