

# Fat Graft Survival In the Radiated Breast Compared to Non-Radiated Breast: Volume Measurement Using 3D Imaging

Kevin Small, M.D.; Mihye Choi, M.D.; Chaya Levovitz, B.A.; Christina Lee, B.A.; Nolan Karp, M.D.

## Abstract Text:

**Introduction:** Radiation therapy for breast cancer alters underlying tissue perfusion, which can result in skin discoloration and tissue fibrosis of the reconstructed breast. Management of these deformities remains a challenge, but fat grafting (FG) has emerged to correct symmetry in the radiated breast. Advancements have been made in techniques of fat graft harvest and delivery, but our ability to judge the incorporation of FG to radiated tissue remains limited. The following study applies 3D imaging to assess the stability of breast shape following autologous FG to the radiated reconstructed breast.

**Methods:** All patients receiving FG to the reconstructed breast from 2009-2010 were enrolled in the study. The average time interval between radiation and FG was greater than six months. FG surgery was performed using a modified Coleman technique. Preoperative and post-operative 3D scans were obtained on all patients. 3D imaging was performed using the Canfield VECTRA system with Geomagic software analysis. As previously described, breasts were isolated as closed objects and total breast volume was calculated on every scan.

**Results:** In the observed period, 59 non-radiated patients (88 breasts) and 26 radiated patients (28 breasts) received FG and associated images. Average fat injected to the breast was 91cc to the non-radiated breast and 110cc to the radiated breast. For the non-radiated breast, one month post-operatively, the breast had 70 % volume retention and 1cc/day resorption rate, and two months post-operatively, the breast had 59% volume retention and 0.9cc/day resorption rate. For the radiated breast, one month post-operatively, the breast had 69% volume retention and 1.4cc/day resorption rate, and two months post-operatively, the breast had 58% volume retention and 0.8cc/day resorption rate.

**Conclusions:** FG is a useful method for breast contouring in the reconstructed radiated patient. Our data suggests that radiation therapy does not affect percent volume retention and resorption rate.

## Disclosure/Financial Support

None of the authors has a financial interest in any of the products, devices, or drugs mentioned in this manuscript.