Is there an ideal donor site of fat for secondary breast reconstruction?

Introduction

Previous work has documented the validity of 3D imaging to assess surgical outcomes of autologous fat grafting (FG). However, no study exists to delineate the ideal donor site of fat for secondary breast reconstruction. Millard argued in Principilization of Plastic Surgery that tissue losses should be replaced in kind; thus, theoretically, plastic surgeons should harvest adipose tissue from neighboring donor sites to optimize aesthetic results. The following study compares fat graft survival from two distinctive anatomical sites utilizing three-dimensional imaging.

Methods

All patients receiving fat grafting to the reconstructed breast from 2009-2012 were enrolled in the study. The patients were divided into two groups: fat harvested from the abdomen and from the thighs. FG surgery was performed using a modified Coleman technique to achieve symmetry. 3D scans were obtained on all patients. 3D imaging was performed using the Canfield VECTRA system, and volumes were analyzed using Geomagic software.

Results

In the observed time period, a total of 73 patients (109 breasts) received autologous fat transfer and associated 3D images. 46 patients (66 breasts) averaged 101.17cc of fat injected from the abdomen, and 27 patients (43 breasts) averaged 101.98cc of fat injected from the thighs. The abdominal subset had 81.98% volume retention at 16 days, 63.15% at 49 days, and 44.63% at 140 days. The thigh subset had 85.80% at 16 days, 62.71% at 49 days, and 46.43% at 140 days. P>0.05 at all points.

Patients were also stratified by radiation exposure. Of those patients that were non-radiated, in the abdominal subset (49 patients), there was 78.92% volume retention at 16 days, 64.53% at 49 days, and 45.10% at 140 days; and in the thigh subset (31 patients), there was 90.02% at 16 days, 59.45% at 49 days, and 43.27% at 140 days. In the radiated abdominal subset (17 patients), there was 97.32% at 16 days, 56.93% at 49 days, and 43.08% at 140 days; and in the thigh subset (12 patients), there was 71.75% at 16 days, 67.06% at 49 days, 53.80% at 140 days. P>0.05 at all late time points.

Patients were then stratified by volume injected. Of those patients that received small volume injections (<100cc), in the abdominal subset (39 patients), there was 79.19% volume retention at 16 days, 57.29% at 49 days, and 33.50% at 140 days; and in the thigh subset (24 patients), there was 93.97% at 16 days, 78.08% at 49 days, and 42.52% at 140 days. In the large volume (>100cc) abdominal subset (27 patients), there was 91.75% at 16 days, 68.09% at 49 days, and 57.62% at 140 days; and in the thigh subset (19 patients), there was 72.73% at 16 days, 51.19% at 49 days, and 49.63% at 140 days. P>0.05 at all late time points.

Conclusions

Our data suggests that the fat graft donor site does not affect percent volume retention. Furthermore, radiation or volume inject does not affect donor site viability. Longer-term studies are needed to assess the stability of the breast after autologous fat transfer.