Stacking the Odds: Maximizing Flap Perfusion and Improving Size Match with the Use of Stacked Free Flaps in Unilateral Breast Reconstruction

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BACKGROUND

Inadequate tissue volume has long persisted as one of the limiting factors to free tissue transfer for unilateral breast reconstruction. The impact of size mismatch on aesthetic outcomes, patient satisfaction, and the need for additional symmetrizing procedures is significant. To overcome this, the use of stacked and conjoined free flaps has come into favor as a means of augmenting tissue transfer volume. However, there is a paucity of data comparing abdominally-based stacked/conjoined (SC) free flaps and their non-stacked/conjoined counterparts, particularly with respect to matching native breast size, post-operative recovery and complications, and the need for future symmetrizing procedures in unilateral breast reconstruction.

METHODS

A single institution retrospective review was performed that was inclusive of all stacked/conjoined (SC) and non-SC unilateral abdominally-based autologous breast reconstructions from 2011-2018. The groups were compared on the basis of variables including demographics, operative characteristics, complications, and revision procedures.

RESULTS

A total of 182 patients were included in the study. Of these, 36 underwent reconstruction with SC flaps (7 stacked; 29 conjoined) while 146 had procedures with non-SC flaps. Mean follow up time was 54.7 and 54.6 months, respectively. With respect to flap type, the SC cohort had more DIEP flaps (91.7% vs 65.1%) while the non-SC group had a higher percentage of MS-TRAMs (34.2% vs 6.9%, p=0.000). Non-SC flaps more often made use of combined medial and lateral row perforators (p=0.000). Regarding flap size, there was a significant difference between the groups when comparing mean flap weight to mastectomy weight (SC flaps +110.7g vs non-SC flaps -40.2; p=0.023). Stacked/conjoined flaps also had a lower rate of contralateral breast reduction (p=0.041).

The SC flap cohort had a lower rate of fat necrosis (8.3% vs 25.4%%, p=0.039) and stacking/conjoining flaps was found to be protective against fat necrosis on univariable regression analysis (p=0.038). No other significant differences in flap, breast, or donor-site complications were detected.

CONCLUSION

In this cohort, patients who undergoing unilateral abdominally-based breast reconstruction with SC flaps experienced lower rates of fat necrosis compared to those who received non-SC flaps. SC flaps were also found to be more successful in matching native breast size, with a lower rate of contralateral symmetrizing reductions compared to their non-SC counterparts. Stacking/conjoining flaps appears to be a safe and reliable means of augmenting the volume of free tissue for transfer in abdominally-based autologous breast reconstruction.