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“Stacked Four Flap Autologous Breast Reconstruction from a Single Abdominal Donor Site”

Background: Autologous breast reconstruction using the Deep Inferior Epigastric Perforator (DIEP) flap is the current gold standard. However, four-flap stacked reconstruction with DIEP flaps with either the Superficial Inferior Epigastric Artery (SIEA) or the Deep Circumflex Iliac Artery (DCIA) can potentially improve reconstructive outcomes for patients with limited donor tissue or complex reconstructive needs.

Materials & Methods: A retrospective analysis was performed of three cases of breast reconstruction following mastectomy where bilateral stacked flaps were harvested from a single abdominal donor site. Primary outcome analyzed were age, body mass index (BMI), history of tobacco and alcohol use, past medical and surgical history, breast cancer characteristics (e.g., ER, PR, HER2 status, BRCA mutation status), history of radiation and/or chemotherapy, and details of mastectomy and reconstruction type. Flap measurements (caliber, flow, flow direction) were recorded for all free flaps. Surgical timing (immediate vs. delayed reconstruction), lymph node involvement, indication for delay, operative time, hospital length of stay (LOS), complications (dehiscence, seroma, hematoma, and metastasis), and return to OR (RTOR) were reviewed.

Results: Three patients, aged 31 to 60, with BMIs ranging from 22.9 to 24.3, received total free tissue transfer volumes greater than their mastectomy weights. Operative times ranged from 7 to 9 hours, with hospital length of stay (LOS) ranging from 3 to 6 days, for an average of 4.33 days. Although some patients experienced complications—including venous congestion in one of the sixteen flaps (6.25%), superficial flap infection (33%), abdominal dehiscence (33%), and infected seroma (33%)—no flaps were lost. There was one take-back procedure with successful salvage of the flap. Two of the three cases were performed with a 24-hour free tissue delay, which resulted in improved perfusion metrics and flow velocities after surgical delay.

Conclusion: The use of stacked DIEP, SIEA, and DCIA flaps from a single abdominal donor site is a viable alternative for breast reconstruction in patients with limited infraumbilical adiposity by enhancing flap perfusion, increasing volume, improving inset and shape, and decreasing donor site morbidity. This technique can be combined with delay phenomena to improve perforator size and tissue perfusion.