A CTA Guided Algorithm for Double-pedicle Abdominal Based Breast Reconstruction: Perforator Selection and Anastomosis

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PURPOSE: Using a hemi-abdominal flap for unilateral breast reconstruction in patients may not be ideal due to paucity of abdominal tissue, presence of a lower abdominal midline scar, or a larger and/or ptotic contralateral native breast. Several algorithms exist to make these flaps successful but all ultimately require an anastomoses sequence. We present our experience with use of imaging to predict flap dominance and anastomosis sequence to make them consistently successful.

METHODS: 75 consecutive bi-pedicled abdominal composite free flaps for unilateral breast reconstruction were performed. Patient demographics, type/weights of flaps, number of anastomoses, location of perforators, length/type of pedicles, and flap related complications were recorded. Guided by CTA imaging, the bi-pedicled flaps were anastomosed to split internal mammary artery/vein (IMA/V) or an intra-flap anastomosis was performed and anastomosed to the IMA/V. Preoperative CTA was obtained to depict the pattern of perforators, flap dominance, and feasibility for intra-flap anastomosis.

RESULTS: 75 patients underwent composite DIEP and/or SIEA flaps (150 total flaps). There were 62 DIEP-DIEP flaps, 11 DIEP-SIEA flaps, and 2 SIEA-SIEA flaps. Average flap weight was 1,054 +/- 420 grams (average age 57 yrs and average BMI was 27 +/- 3.9). Sixty-one patients had delayed reconstruction and 14 were immediate. 31 patients had intra-flap anastomosis over the abdomen and carried as single composite flap to cranial IMA/V; 44 patients had independent bi-pedicle flaps anastomosed to cranial and caudal split IMA/V. Flaps were not split in midline, but carried as a composite hemi-abdominal flap with anastomosis to the IMA/V. There were no flap losses.

CONCLUSION: Guided by preoperative CTA imaging, we recommend the consistent use of these bi-pedicle hemi-abdominal flaps for unilateral reconstruction, primarily those with delayed reconstruction and radiation deficits. Preoperative CTA imaging is crucial in directing perforator dissection to maximize perfusion zones and guide in performing intra-flap anastomosis over the abdomen. All patients with intra-flap anastomosis had preoperative CTA criteria for success. Technical considerations such as flap inset and folding, use of simplified algorithm, perforator selection and need for intra-flap anastomosis will be presented to make these flaps consistently successful.

Impact and Cost-Analysis of Routine Mastectomy Scar Surveillance in Two-Stage Implant-Based Reconstruction

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PURPOSE: Routine histologic surveillance of the mastectomy scar during the expander to permanent implant exchange remains a controversial practice. Many surgeons feel histologic evaluation affords added oncologic safety and an opportunity to detect occult local recurrence. While the practice of examining the mastectomy scar in delayed reconstruction is better studied, no data exists on the role of routine mastectomy scar surveillance during the implant-exchange procedure. To better inform decision making during this process, we report our experiences with timing, cost, and histology of the mastectomy scar during expander to implant exchange.

METHODS: We performed a retrospective review of all the senior author’s (DLC) patients who underwent bilateral, two-stage, implant-based reconstruction. This included both immediate and delayed reconstruction. The senior author routinely sends the mastectomy scar during the expander exchange for local recurrence surveillance. Patients were stratified based on mastectomy indication (neoplasm and risk reduction). Time frames between mastectomy and final reconstruction, mastectomy and implant exchange, and
expander implantation and permanent prosthetic implantation were analyzed. Scar pathology at implant exchange was determined. The comprehensive cost per detection was then calculated. We used our institutional charge of $602 per scar in this analysis.

RESULTS: 502 breasts scars were studied. No scar was found to have evidence of carcinoma; all were benign. The analysis of every breast results in a cumulative charge of $302,204, the analysis of all cancerous breasts in a charge of $143,276, and all normal breasts in a charge of $101,738. Our data reflects a combination of immediate reconstruction and delayed reconstruction with the average timeframe of 274.4 days between extirpation and final implant placement in cancerous breasts and 237.2 days between extirpation and final implant placement in normal breasts. 481 breasts underwent immediate reconstruction, with an average of 256.2 days between extirpation and permanent implant placement. Two of our patients had known stage IV disease at the time of reconstruction. Two patients developed metastatic disease following extirpation without evidence of local recurrence. 1 patient developed local, in breast recurrence two years following implant-exchange.

CONCLUSIONS: The overall finding supports our belief that local, occult, in-scar recurrence is a rare phenomenon. Our data also suggests that the mechanism of routine scar sampling is inadequate to detect both local and/or distant recurrence and comes with a significant cost. The majority of our study population consists of breasts in which immediate reconstruction was performed. In this scenario, the time between extirpation and second stage reconstruction is less than one year. Local recurrence within this timeframe appears unlikely and may be the result of controllable factors (positive margins or refusal of radiation) and oncologic virulence. Recommendations to continue or abandon this practice should be based on a combination of physician comfort, patient-focused decision making, and an understanding of the costs involved.

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