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Background

Unilateral breast reconstruction is challenging in patients with radiation defects, large post-mastectomy soft tissue deficits, and obese patients. 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. The lower abdomen (hemi-abdominal flaps) can be used to create one breast, in a stacked manner or bipediced non-split composite fashion.

Methods

51 consecutive bipediced abdominal composite free flaps for unilateral breast reconstruction were performed. Patient demographics, type/weights of flaps, number of anastomoses, length/type of pedicles, and flap related complications were recorded. Using a simplified unique algorithm (**Figure 1**) that we created, the bipediced flaps were anastomosed to split internal mammary artery/vein(IMA/V) or an intraflap anastomosis was performed and anastomosed to the IMA/V.

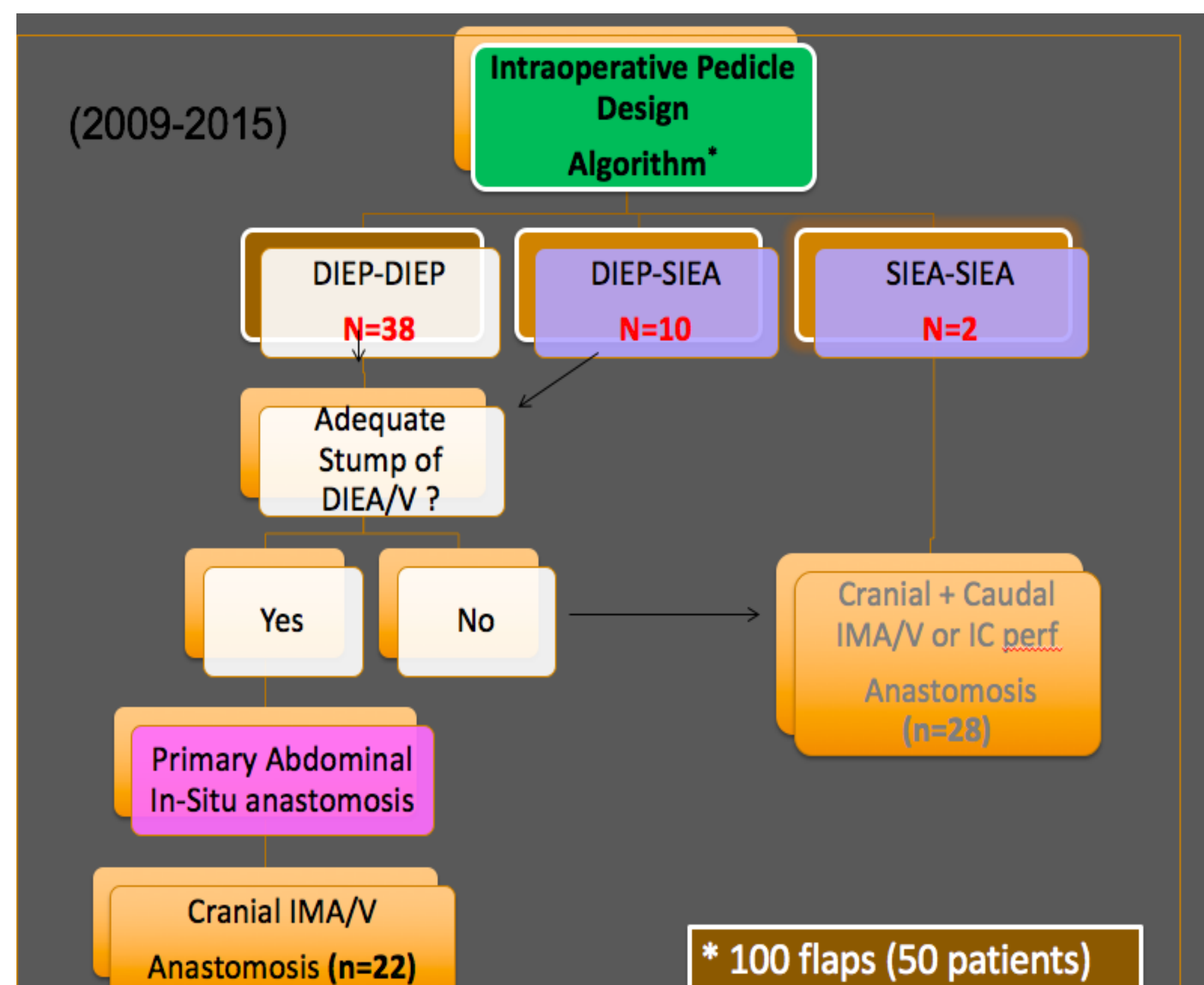


Figure 1. Intraoperative Pedicle Design Algorithm

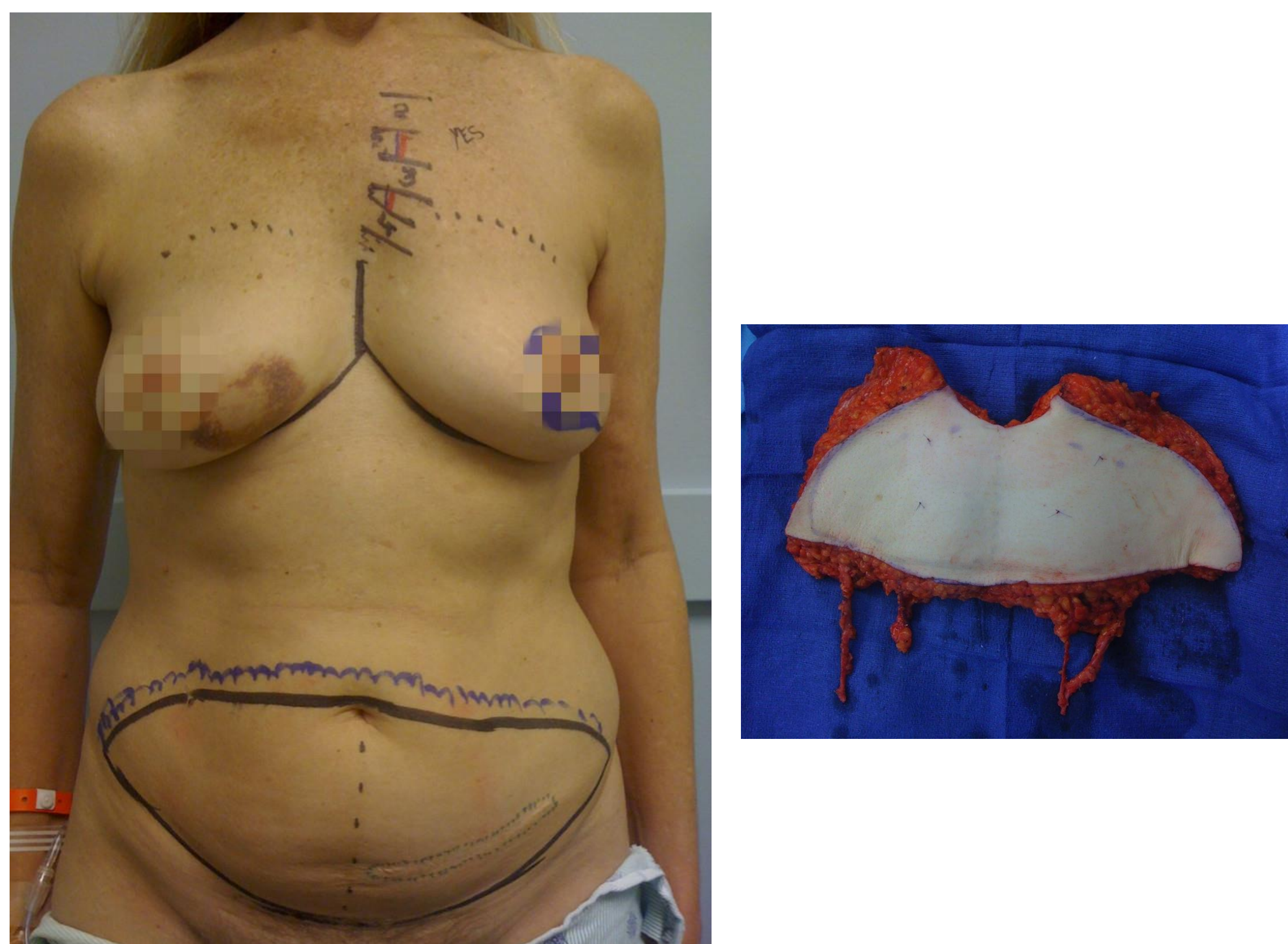


Figure 2. Abdominal flap pre-operative markings and subsequent SIEA-SIEA bipediced composite free flap

Results

51 patients underwent composite DIEP and/or superficial inferior epigastric artery(SIEA) flaps (102 total flaps). Average flap weight was 1,074 +/- 466 grams (average age 57 yrs and average Body Mass Index(BMI) 26.6 +/- 3.9). 25 patients (49%) had flaps >1,000 grams (average 1,430 grams, range 1052-2400 gms), and 36 (71%) patients had flaps >750 grams. 39 patients had delayed reconstruction and 12 were immediate. 23 patients had intra-flap anastomosis over the abdomen and carried as single composite flap to cranial IMA/V; 28 patients had independent bi-pedicle flaps anastomosed to cranial and caudal split IMA/V. There were 39 DIEP-DIEP flaps, 10 DIEP-SIEA flaps, and 2 SIEA-SIEA flaps. Flaps were not split in midline, but carried as a composite hemiabdominal flap with anastomosis to the IMA/V. There were no flap losses. Donor site morbidity was equivalent to bilateral breast reconstruction with DIEP flaps.

Conclusion

Composite bi-pedicle hemi-abdominal flaps for unilateral breast reconstruction are feasible with low complication rates but are technically challenging, chiefly in flaps >1,000 grams. To maximize aesthetic outcomes, use of highly complex double pedicle abdominal flaps is crucial in some patients, primarily those with delayed reconstruction and large contralateral breast, radiation deficits, and large post-mastectomy defects. Technical considerations such as flap inset and handling, use of simplified algorithm, and selection of anastomosis and pedicles will be presented to make these flaps successful. This series represents an ongoing largest experience of composite bi-pedicle DIEP and/or SIEA combination for unilateral breast reconstruction.

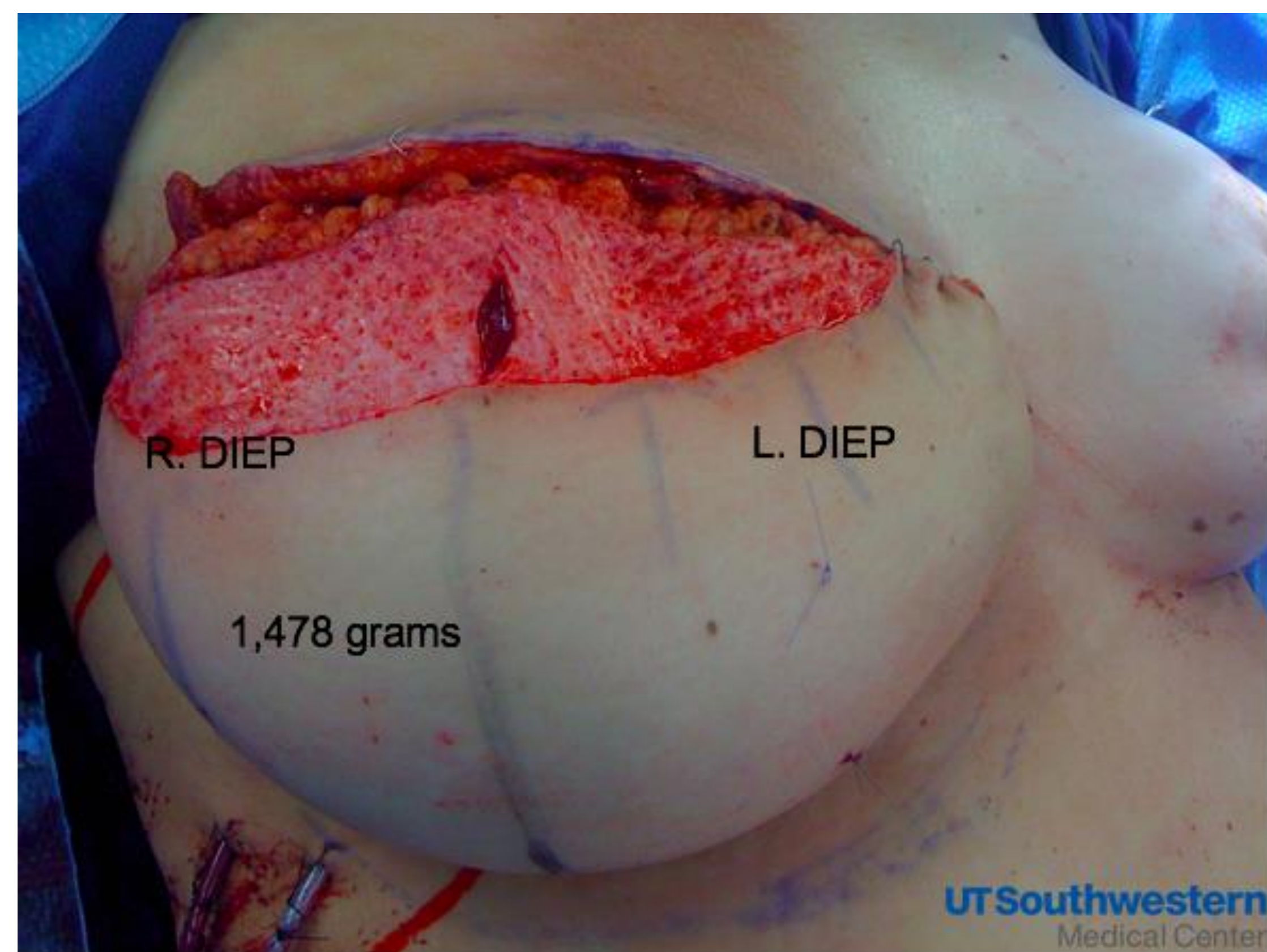


Figure 3. DIEP-DIEP bipediced composite flap. R. DIEP anastomosed to L. DIEP over abdomen, then R. DIEP anastomosed to R. Cranial IMA/V



Figure 4. DIEP-SIEA bipediced composite flap reconstruction 4 year result



Figure 5. DIEP-DIEP bipediced composite flap reconstruction 5 year result

References

- Hamdi M, Khuthaila DK, Van Landuyt K, Roche N, Monstrey S. Double-pedicle abdominal perforator free flaps for unilateral breast reconstruction: New horizons in microsurgical tissue transfer to the breast. *J Plast Reconstr Aesthet Surg.* 2007;60:904–912; discussion 913–914.
- Rabey, Nicholas G. M.R.C.S., Erel, Ertan F.R.C.S., and Malata, Charles M. F.R.C.S. Double-Pedicle Abdominal Free Flap Using an Entirely New Microvascular Combination of DIEP and SIEA Vascular Pedicles for Unilateral Breast Reconstruction: A Novel Addition to the Hamdi Classification. *Plastic and Reconstructive Surgery.* 2012;130(5):767e–769e. doi:10.1097.
- Xu, Hua M.D., Dong, Jiasheng M.D., Wang, Tao M.D. Bipedicle Deep Inferior Epigastric Perforator Flap for Unilateral Breast Reconstruction: Seven Years' Experience. *Plastic and Reconstructive Surgery.* 2009; 124(6): 1797-1807. doi 10.1097.