Surgical Delay of the Thoracodorsal Artery Perforator Flap for Autologous Breast Reconstruction

Mark A. Maier, BS [1]; Ryan D. Hoffman, BS [1]; Joshua Levine, MD [2]; Hugo St. Hilaire, MD, DDS [3]; Robert J. Allen, MD [2,3]

[1] School of Medicine, Louisiana State University Health Sciences Center, New Orleans, LA

[2] Center for Breast Reconstruction, New York, NY

[3] Division of Plastic and Reconstructive Surgery, Louisiana State University Health Sciences Center, New Orleans, LA

mmaie1@lsuhsc.edu; rhoff3@lsuhsc.edu; hsthil@lsuhsc.edu; boballen@diepflap.com

Introduction

- While the abdomen is the most popular donor site for autologous breast reconstruction, some women are poor candidates for DIEP/SIEA reconstruction.[1]
  - i.e. body habitus, prior abdominal surgery, poor perforator anatomy
- Traditionally, the non-delayed TDAP flap is limited by:
  - Volume necessary for larger breasts[2,3]
  - Distal tip necrosis (~3%)[2]
- We demonstrate our novel method for total autologous breast reconstruction using muscle-sparing delayed TDAP flaps extended to the midline of the back.

Objective: Demonstrate hemodynamics of the delay phenomenon in thoracodorsal artery perforator flaps for total autologous breast reconstruction.

Methods

- Patients enrolled at an academic practice underwent TDAP flap dissection followed by inset in 2-7 days.
- We used a doppler to localize perforators, and an ultrasound to measure vessel diameter (cm) and peak systolic blood flow (cm/s) pre- and post-delay (Fig 2).[4]
- Clinical outcomes, surgical complications, and operative data were collected.

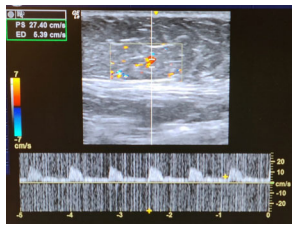

Figure 1. Patient ultrasound of TDAP flap perforator vessels demonstrating the method for measuring vessel diameter (cm) and peak systolic flow (cm/s).

Results

Patients	Flaps	Age (yr)	BMI (kg/m²)	Skin Paddle (cm)	Skin Paddle (cm²)	Delay (days)	Complications/ Revisions	Follow-up (days)
		*n=5	*n=5	n=3	n=3	n=7	n=7	n=7
5	7	59.8	31	33.3 x 11.0	370	6	Donor site seroma (1) None (6)	70

Table 1. Delayed TDAP results: patient and flap total, average age, BMI, skin paddle, delay time, complications/revisions, and follow-up. *Two patients received bilateral reconstruction, age and BMIs were averaged from each reconstruction.

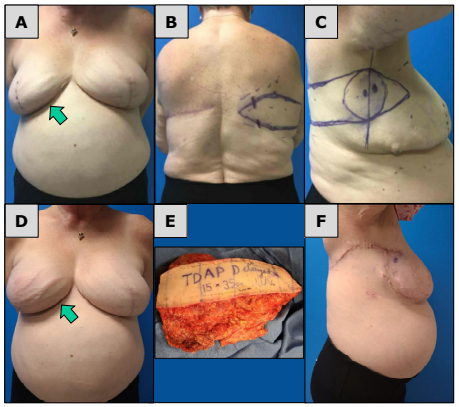

Figure 2. A) Pre-operative right TDAP breast reconstruction, 5.5-month post-operative left TDAP breast reconstruction images. B,C) Posterior, lateral pre-operative markings of right TDAP flap. D) 2-week post-operative right TDAP, 6-month left side post-operative result. E) Intra-operative 5-day post-delay right TDAP flap. F) 6-month right TDAP post-operative scar.

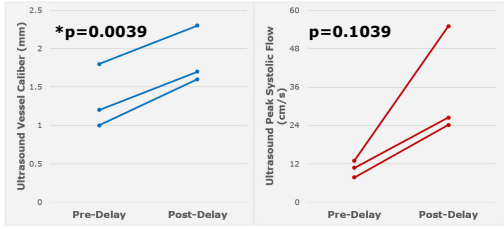

Figure 3. Vessel caliber and peak systolic flow, pre-/post-delay. Vessel caliber (mm) significantly increased pre-delay (1.2, 1, 1.8) to post-delay (1.7, 1.6, 2.3) [paired t test: *p=0.0039]. Peak systolic flow was not significantly different pre-delay (10.75, 7.73, 13.00) to post-delay (26.45, 24.13, 55.00) [paired t-test: p=0.1039].

Post-delay outcomes: (Fig 2,3; Table 1)

- ICG angiography demonstrated rapid flap perfusion during reconstruction (n=4).
- No recorded fat necrosis or flap loss (n=7).

Summary

- While more data is needed, there is great potential with the delay phenomenon and TDAP flap for autologous breast reconstruction without necrosis or implants.
- The delayed TDAP flap is a viable alternative to the DIEP/SIEA flap for some patients due to its bra-line scar, shorter operative time, and no vessel anastomosis.

Future Directions

- Recruit more patients to further demonstrate TDAP reliability when coupled with a delay procedure, and ultimately reduce time between flap dissection and transfer.

References

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