Evaluating Textbook Outcomes and Resource Utilization in Immediate Free Flap Breast Reconstruction Compared to Immediate Tissue Expander Breast Reconstruction

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INTRODUCTION

- Textbook outcomes (TO) are binary composite measures capturing optimal surgical recovery across all dimensions simultaneously. A single criterion failure disqualifies the patient
- TO frameworks have been validated across surgical oncology (pancreatic, liver, colorectal, esophageal); achievement consistently associates with improved outcomes and reveals inter-institutional variation
- Prior TO work in breast reconstruction has been limited to DIEP flap; no study has systematically compared TO rates across reconstructive modalities
- DIEP and TE reconstruction carry distinct risk profiles, recovery trajectories, and resource demands
- A comparative TO framework is needed to inform patient counseling and health-system planning

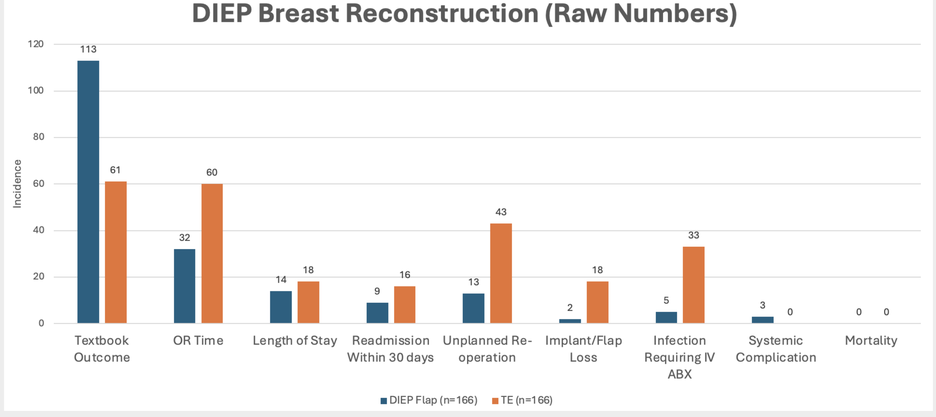
METHODS

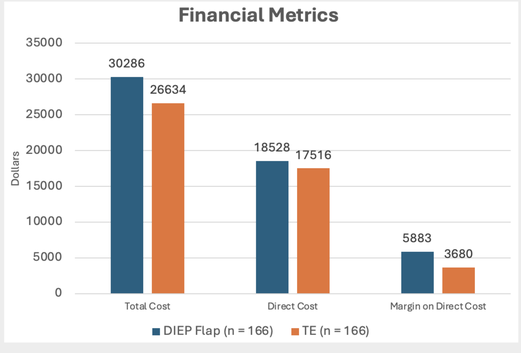
- Retrospective review of immediate breast reconstruction at a single academic center, July 2017–October 2023
- 264 DIEP flap and 310 TE patients identified; 176 and 265 underwent immediate reconstruction, respectively
- Propensity score matching (1:1 nearest-neighbor, caliper 0.2 SD) on laterality, chemotherapy, radiation, age, smoking, T2DM, HTN, CHF, CAD, and vascular disease → 166 matched pairs
- DIEP TO criteria: OR time within ±1 SD of institutional average, LOS ≤4 days, no flap loss, no unplanned readmission/reoperation within 30 days, no IV antibiotic infection, no systemic complication, no mortality
- TE TO criteria: OR time <6 hr bilateral / <4 hr unilateral, LOS ≤1 day, no implant loss, no unplanned readmission/reoperation, no IV antibiotic infection, no systemic complication, no mortality
- Financial data from institutional cost-accounting system (total charges, total/direct/indirect costs, estimated reimbursement, estimated margin, margin on direct cost)
- Paired t-test (continuous) and McNemar's test (categorical)

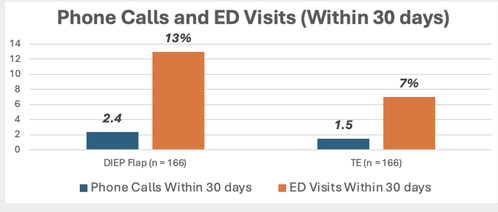
RESULTS

Variable	DIEP Flap (n = 166)	TE (n = 166)	p-value
Age (years)	50.2	50.6	0.73
BMI	29.4	27.8	***0.03***
Current Smoking	5.40%	4.80%	0.81
HTN	24.70%	29.50%	0.29
T2DM	9.00%	12.70%	0.24
CHF	1.20%	3.60%	***0.05***
CAD	1.20%	1.80%	0.65
Vascular Disease	0%	0%	NA
Chemotherapy	44.60%	34.90%	***0.03***
Prior Radiation	6.00%	4.80%	0.61
Bilateral Case	45.80%	50.60%	0.37

CLINICAL OUTCOMES	DIEP FLAP (N = 166)	TE (N = 166)	P-VALUE
Case Duration (min)	*431*	*283*	*p < 0.01*
Length of Stay (days)	*2.9*	*1.1*	*p < 0.01*
Daily MME	*30.3*	*55.7*	*p < 0.01*
Total MME	*123.2*	*64.6*	*p < 0.01*
MSFN	17.50%	13.90%	p = 0.34
Infection (PO or IV ABX)	17.50%	22.90%	p = 0.19
Wound	*48.20%*	*26.50%*	*p < 0.01*
Seroma	*4.20%*	*47.60%*	*p < 0.01*
Hematoma	*7.20%*	*1.20%*	*p < 0.01*
DVT	0.60%	0.60%	p = 0.99
PE	0.60%	0.60%	p = 0.99







DISCUSSION & CONCLUSION

- DIEP achieved significantly higher TO rates; failure modes differed by modality. DIEP failures were efficiency-driven (OR time, LOS), while TE failures were event-driven (implant loss, unplanned reoperation)
- TE's lower apparent complexity belies its vulnerability to discrete adverse events that directly disqualify TO achievement and compromise reconstructive continuity
- Higher early resource utilization after DIEP reflects microsurgical surveillance demands, not worse outcomes. Free flap monitoring requires a lower threshold for clinical assessment given salvage time-sensitivity
- Short-term TE resource burden likely underestimates its longitudinal footprint given higher rates of unplanned secondary procedures and long-term major complications compared to DIEP in prior literature
- Financial margins were similar and negative for both modalities; DIEP's higher costs were driven by indirect costs, not direct patient-care costs
- TO contextualizes complications by weighting events that lead to reoperation, readmission, or prolonged hospitalization, explaining DIEP's superior TO performance despite greater overall wound complication burden
- DIEP flap achieves superior TO rates through primarily modifiable efficiency factors; TE failure is driven by device-related events with downstream consequences; margins are equivalent. Reconstructive decisions should integrate both TO performance and resource utilization

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