

Comparing Complication Rates in Prepectoral Tissue Expanders with and without Acellular Dermal Matrix Utilization

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Background

- Prepectoral tissue expander (TE) placement for two-stage postmastectomy reconstruction is a widely accepted technique with the potential for decreased animation deformity and postoperative pain.
- Reconstructive success is, in theory, contingent upon adequate soft tissue coverage, with acellular dermal matrix (ADM) playing an important supportive role as an adjunct.
- While ADM is thought to be necessary for prepectoral expansion, this paradigm has not yet been rigorously challenged.
- We aimed to assess early outcomes and complications between patients undergoing prepectoral TE placement with ADM compared to patients that had prepectoral TEs without ADM placement.

Methodology

- We performed a retrospective cohort study of all patients that underwent prepectoral breast reconstruction with tissue expanders from January 2018 to June 2021.
- The primary outcome was TE loss. Secondary outcomes included 90-day complications such as exposure, infection/cellulitis, full-thickness mastectomy skin flap necrosis (MSFN) requiring revision, and seroma. Variables of interest included patient demographics, comorbidities, and surgical characteristics.

Results

Table 1. Demographic characteristics of the study cohort (n = 741 patients, 1,225 TEs), analyzed on the patient level.

Variable		No ADM (n = 98)	ADM (n = 643)	P-Value
Age, years	Mean (SD)	48.3 (10.6)	46.4 (10.6)	0.100
Race	White	70.4% (69)	69.7% (448)	0.435
	Black or African American	15.3% (15)	11.0% (71)	
	Asian/Indian Subcont.	6.1% (6)	10.1% (65)	
	Other/Unknown	8.2% (8)	9.2% (59)	
Smoking History	Never	82.7% (81)	76.% (489)	0.284
	Current	2.0% (2)	1.9% (12)	
	Former	15.3% (15)	22.1% (142)	
Comorbidities	Diabetes	7.1% (7)	3.4% (22)	0.090
	Cardiovascular Disease	27.6% (27)	14.5% (93)	0.002
	HTN	29.6% (29)	18.4% (118)	0.014
	Autoimmune Disease	21.4% (21)	16.2% (104)	0.195
	CHF	0.0% (0)	0.3% (2)	1
	CKD	0.0% (0)	0.6% (4)	1
	COPD	10.2% (10)	6.8% (44)	0.216
	Connective Tissue Disorder	7.1% (7)	3.6% (23)	0.101
Chemotherapy	Liver Disease	2.0% (2)	2.6% (17)	1
Chemotherapy	Neoadjuvant	30.6% (30)	33.4% (215)	0.645
	Adjuvant	40.8% (40)	41.2% (265)	1
Radiation Therapy	Prior Radiation	1.0% (1)	1.6% (10)	1
	Adjuvant	19.4% (19)	20.8% (134)	0.790

Table 2. Surgical characteristics of the study cohort (n = 741 patients, 1,225 TEs), analyzed on the TE level.

Variable		No ADM (n=165 TEs)	ADM (n=1,060 TEs)	P-Value
Mean TE Size (cc) (SD)		466.1 (124.9)	460.9 (110.1)	0.616
Mean TE Fill (cc) (SD)		240.5 (129.3)	255.4 (117.1)	0.169
Mean TE Fill:Size Ratio (SD)		0.50 (0.2)	0.54 (0.2)	0.018
Mean Breast Weight (g) (SD)		750.3 (440.7)	540.8 (327.9)	<0.001
Nodal Surgery	SLNB	55.8% (92)	57.6% (611)	0.673
	ALND	7.3% (12)	10.2% (108)	0.323
*Mastectomy Type	Nipple Sparing	11.2% (11)	21.2% (136)	0.021
	Skin Sparing	88.8% (87)	78.9% (507)	
*TE Laterality	Bilateral	68.4% (67)	64.9% (417)	0.569
	Unilateral	31.6% (31)	35.2% (226)	

*Analysis conducted on the patient level.

Table 3. Complication analysis performed on the tissue expander level.

Variable	No ADM	ADM	OR (95% CI)	P-Value
Overall Loss	6.6% (11)	3.8% (40)	0.55 (0.27, 1.22)	0.095
Overall Complication	22.3% (37)	20.9% (221)	0.92 (0.61, 1.41)	0.683
Capsular Contracture	0% (0)	0.8% (8)	Inf (0.27, Inf)	0.608
TE Exposure	4.2% (7)	1.8% (19)	0.42 (0.16, 1.19)	0.073
Infection/Cellulitis	12% (20)	7.6% (81)	0.61 (0.35, 1.08)	0.067
Full MSFN with Revision	1.2% (2)	2.6% (28)	2.23 (0.55, 19.46)	0.416
Seroma	9% (15)	8.6% (91)	0.95 (0.53, 1.81)	0.882

Conclusions

- We observed no major differences in prepectoral tissue expander-based reconstruction contingent on ADM usage.
- Ubiquitous ADM usage for prepectoral expansion incurs significant cost, and effects on complications should be further examined in future studies.
- Our results align with those of a previous study which had similar aims, though a different study design.
- Study strengths: large sample size.
- Limitations: retrospective data collection and lack of long term follow up after exchange to permanent implants (especially for evaluation of capsular contracture).

References

- Margulies, I.G. and C.A. Salzberg, *The use of acellular dermal matrix in breast reconstruction: evolution of techniques over 2 decades.* Gland Surg, 2019. **8**(1): p. 3-10.
- Salibian, A.A., et al., *Do We Need Support in Prepectoral Breast Reconstruction? Comparing Outcomes with and without ADM.* Plast Reconstr Surg Glob Open, 2021. **9**(8): p. e3745.
- Singla, A., et al., *Subcutaneously Placed Breast Implants after a Skin-Sparing Mastectomy: Do We Always Need ADM?* Plast Reconstr Surg Glob Open, 2017. **5**(7): p. e1371.