

Time-Dependent Complications of Acellular Dermal Matrix in Implant-Based Breast Reconstruction

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Background

- From 2006–2018, breast augmentation was the most popular cosmetic surgical operation in the United States, and has been within the top 5 since
- In 2024, there were more than 162,000 breast reconstruction procedures performed, and approximately 51 percent of these utilized acellular dermal matrices (ADMs)
- Despite their widespread use, the literature evaluating ADM outcomes remains highly variable and often contradictory
- Aim:** to map complication trajectories over time in ADM-assisted breast reconstruction and compare them with implant-based reconstructions performed without ADM

Methods

- Design:** Retrospective cohort study
- Databases:** TriNetX US Collaborative Network (70 healthcare organizations)
- Inclusion:** Adult patients undergoing implant-based breast reconstruction
 - ADM cohort defined by CPT 15777 (biologic implant for soft tissue reinforcement)
- Outcomes:**
 - Seroma, Hematoma, Infection, Fat Necrosis, Capsular Contracture, Implant Displacement
- Analysis:**
 - Relative risk comparing ADM vs non-ADM
 - Longitudinal evaluation of complication trajectories over time

Methods

Table 1: Outcome Criteria

SEROMA (ICD-10)	
N64.89	Other specified disorders of breast
T88.8XXA	Other specified complications of surgical and medical care, not elsewhere classified, initial encounter
L76.82	Other postprocedural complications of skin and subcutaneous tissue
L76.34	Postprocedural seroma of skin and subcutaneous tissue following other procedure
HEMATOMA (ICD-10)	
N64.89	Other specified disorders of breast
D78.01	Intraoperative hemorrhage and hematoma of the spleen complicating a procedure on the spleen
INFECTION (ICD-10)	
T85.79XA	Infection and inflammatory reaction due to other internal prosthetic devices, implants and grafts, initial encounter
FAT NECROSIS (ICD-10)	
N64.1	Fat necrosis of breast
CAPSULAR CONTRACTURE (ICD-10)	
T85.44	Capsular contracture of breast implant
IMPLANT DISPLACEMENT (ICD-10)	
T85.49XA	Other mechanical complication of breast prosthesis and implant, initial encounter
T85.42	Displacement of breast prosthesis and implant

Results

Table 2: Relative Risks Comparing ADM to Non-ADM

	1 Week	2 Weeks	1 Month	3 Months	6 Months	1 Year	2 Years	3 Years	5 Years
Seroma	1.156	1.404	1.571	1.602	1.547	1.518	1.430	1.404	1.345
Hematoma	1.061	1.206	1.374	1.465	1.383	1.436	1.375	1.334	1.277
Infection	0.8	1.395	1.953	1.799	1.850	1.864	1.743	1.777	1.763
Fat Necrosis	1.263	1.595	1.966	1.789	1.548	1.402	1.333	1.318	1.203
Capsular Contracture	0.513	0.535	0.571	0.726	1.105	1.121	1.237	1.223	1.171
Implant Displacement	0.303	0.349	0.539	0.937	1.121	1.325	1.290	1.282	1.211

Table 2. Relative risks for post-operative complications comparing ADM to non-ADM implant-based breast procedures

Results

- Significant elevation in seroma, hematoma, infection, and fat necrosis risk in ADM reconstructions beginning within the first postoperative month and persisting through long-term follow-up
- Temporal reversal** of ADM's traditionally protective effect against capsular contracture and implant displacement

Conclusions

- The temporally resolved findings argue for **selective** rather than routine ADM use and nuanced patient counseling regarding potential late-onset issues
- Future registries stratified by **ADM type** and **reconstructive plane** could be used to identify subgroups most likely to benefit durably from ADM reinforcement

Limitations

- The use of CPT codes and administrative claims data introduces the possibility of coding inaccuracies
- The dataset did not allow stratification by ADM type (e.g., AlloDerm vs. BellaDerm vs. porcine-derived matrices)
- Surgical variables, such as reconstructive plane (subpectoral vs. prepectoral), use of mesh adjuncts, operative technique, and surgeon experience were not captured

References

- American Society of Plastic Surgeons. 2024 ASPS Procedural Statistics Release. <https://www.plasticsurgery.org/documents/news/statistics/2024/plastic-surgery-statistics-report-2024.pdf>