



The Use of Reinforced Ovine Mesh in Implant Breast Reconstruction: Equivalent Outcomes to Human Acellular Dermal Matrices and More Cost-Effective

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Background

The use of “mesh” in implant-based reconstruction is widespread, with both acellular dermal matrices (ADMs) and extracellular matrices (ECMs) being used, especially in pre-pectoral device placement. This study compared Ovitex (ovine ECM) versus human cadaveric ADMs to determine safety profiles and cost-effectiveness.

Methods

A single surgeon’s longitudinal experience with two-stage, immediate tissue expander breast reconstruction from 2018-2023 was analyzed. Patients demographics, co-morbidities and 90 day complications with AlloDerm and Cortiva (human ADM) were compared with those receiving Ovitex, Patients with radiation were excluded. Data were analyzed by Chi squared and ANOVA. Costs of each mesh were tabulated.

Product	Company	\$/cm^2
AlloDerm	Allergan	\$30.80
FlexHD	MTF	\$31.70
DermACELL	Novadaq	\$28.80
Cortiva	RTI Surgical	\$25.00
OviTex PRS	TELABIO	\$19
GalaFLEX	Bard	\$16-18*

Figure 1: various common ADM types with publicly available cost information and cost per sq cm (reimbursement may be different based on insurance, and cost may vary based on hospital or provider contract negotiations) *recent sales data (\$3,350 for 10x20cm, \$4,700 for 15x20)

Results

- Patient demographics were comparable.
- 127 patients (234 breasts), 85 received ovine ECM (163 breasts) and 42 received cadaveric ADM (81 breasts).
- No significant difference between the groups for complications requiring RTOR (12.7% Ovine vs 14.8% Human, (p=0.31) or minor complications (9.8% Ovine vs 7.4% Human, p=0.34).
- The cost of Ovitex was 24-38% cheaper than Cortiva and AlloDerm, respectively.
- Cadaveric ADM followed on average 920 days=/-708 days. Ovine ECM followed on average 848 days +/- 293 days.
- No significant difference between incision types (Wise pattern, transverse, IMF, and radial) between the two groups for minor complications (p=0.53) or RTOR (p=0.91),
- Increased complications were noted in the wise pattern group as a whole. (p=0.03).
- 11 breast surgeons, one had a significant difference in RTOR compared to the others (P=0.009 – overrepresented in the ECM group (p<0.001)
- No difference between pre-pec and sub-pec placement of the implant in either group (p=0.313) or complications in pre-pec or sub-pec groups (p=0.084).
- Drain removal times were comparable (p=0.42) - The first surgical drain removed for ovine ECM POD 8.1 +/- 3.8. Second drain removed POD 12.5 +/- 2.5 days.
- Cadaveric ADM - first drain was removed POD 9.6 +/- 5.3 second drain was removed on POD 14.9 +/- 5.3 days.
- No difference between reconstructive success or failure between the two groups (p=0.066), as measured by the likelihood the patient achieved a permanent implant.

Conclusions

In this longitudinal, single surgeon study of two different types of meshes in two stage expander implant breast reconstruction, we found ovine multilaminated reinforced extracellular matrix (Ovitex) was comparable in outcomes with human acellular dermal matrices (AlloDerm and Cortiva). Ovine mesh was considerably cheaper. Multiple factors determine which mesh should be chosen for implant breast reconstruction. This study supports the use of Ovitex as a cost-effective substitute for human acellular dermal matrices in implant breast reconstruction.

"Minor" Complications Treated Outpatient

Parameters	Ovine ECM n (%)	Human Cadaveric ADM n (%)
Seroma	10 (6.1)	3 (3.7)
Cellulitis	1 (0.6)	0
Mastectomy Flap Necrosis	5 (3.1)	3 (3.7)
Total	16 (9.8)	6 (7.4)
Total Breasts	163	81

Table 3. Minor Complications treated outpatient. Seroma group represents any fluid collection aspirated in the office. Cellulitis group was treated successfully with PO antibiotics. Drain site cellulitis was not included. Small areas of wound breakdown without implant exposure were treated with local wound care.

"Major" Complications Requiring RTOR

Parameters	Ovine ECM n (%)	Human Cadaveric ADM n (%)	Implant Loss Ovine n (%)	Implant Loss Cadaveric n (%)	Implant Replacement Initial RTOR Ovine n (%)	Implant Replacement Initial RTOR Cadaveric n (%)
Hematoma	9 (5.5)	1 (1.2)	0	0	9 (5.5)	1 (1.2)
Seroma	3 (1.8)	4 (4.9)	1 (0.6)	1 (1.2)	2 (1.2)	3 (3.7)
Infection	3 (1.8)	1 (1.2)	3 (1.8)	1 (1.2)	0	0
Mastectomy Flap Necrosis	4 (2.5)	6 (7.4)	4 (2.5)	5 (6.2)	0	1 (1.2)
Total	19 (12.7)	12 (14.8)	8 (4.9)	7 (8.6)	11 (6.7)	5 (6.2)
Total Breasts	163	81				

Table 2: Reported surgical site complications in patient population that received Ovine ECM vs Human Cadaveric ADMs that required RTOR and recorded replacement or explant of implant. No differences were statistically significant. Implant replacement is a RTOR with washout and replacement of TE or implant at that time of washout secondary to hematoma or seroma.