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Breast Reconstruction Using Contour Fenestrated AlloDerm: Does Improvement in Design Translate to Improved Outcomes?

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Background: Acellular dermal matrices are used in implant-based breast reconstruction. The introduction of contour fenestrated AlloDerm (LifeCell, Branchburg, N.J.) offers sterile processing, a crescent shape, and prefabricated fenestrations. However, any evidence comparing reconstructive outcomes between this newer generation acellular dermal matrices and earlier versions is lacking.

Methods: Patients undergoing implant-based breast reconstruction from 2010 to 2014 were identified. Reconstructive outcomes were stratified by 4 types of implant coverage: aseptic AlloDerm, sterile "ready-to-use" AlloDerm, contour fenestrated AlloDerm, or total submuscular coverage. Outcomes were compared with significance set at $P < 0.05$.

Results: A total of 620 patients (1019 reconstructions) underwent immediate, implant-based breast reconstruction; patients with contour fenestrated AlloDerm were more likely to have nipple-sparing mastectomy ($P = 0.0001$, 0.0004, and 0.0001) and immediate permanent implant reconstructions ($P = 0.0001$). Those with contour fenestrated AlloDerm coverage had lower infection rates requiring oral ($P = 0.0016$) and intravenous antibiotics ($P = 0.0012$) compared with aseptic AlloDerm coverage. Compared with sterile "ready-to-use" AlloDerm coverage, those with contour fenestrated AlloDerm had similar infection outcomes but significantly more minor mastectomy flap necrosis ($P = 0.0023$). Compared with total submuscular coverage, those with contour fenestrated AlloDerm coverage had similar infection outcomes but significantly more explantations ($P = 0.0001$), major ($P = 0.0130$) and minor mastectomy flap necrosis ($P = 0.0001$). Significant independent risk factors for increased infection were also identified.

Conclusions: Contour fenestrated AlloDerm reduces infections compared with aseptic AlloDerm, but infection rates are similar to those of sterile, ready-to-use AlloDerm and total submuscular coverage. *(Plast Reconstr Surg Glob Open 2015;3:e505; doi: 10.1097/GOX.0000000000000482; Published online 4 September 2015.)*

Implant-based breast reconstruction remains the most common reconstruction method.[1] Acellular dermal matrices (ADMs) are used to overcome deficient muscular coverage, to improve contracture, and to enhance cosmetic results in a cost-effective manner.[2–4] However, the complication profile of multiple ADMs continues to be investigated and defined in the literature.[2,5–8] Although AlloDerm (LifeCell, Branchburg, N.J.) has been shown to offer improved outcomes in some studies,[2,7] our

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institution identified increased complication risks from aseptic AlloDerm relative to total submuscular implant coverage.[9]

AlloDerm transitioned from aseptic to sterile "ready-to-use" ADM with component human cadaveric dermis being hydrated and terminally sterilized before distribution.[8] Studies comparing aseptic and sterile "ready-to-use" AlloDerm have demonstrated mixed outcomes with one study finding decreased infection and need for explantation and others demonstrating either no difference in outcomes or increased cellulitis and seroma formation with sterile "ready-to-use" AlloDerm.[8,10–12]

In response to plastic surgeon feedback, contour fenestrated AlloDerm was developed specifically for use in breast reconstruction. Contour fenestrated AlloDerm uses the same processing methods as sterile "ready-to-use" AlloDerm, but the AlloDerm is crescent shaped with prefabricated fenestrations and various size dimensions.[13] The "contour medium" size of 19.3×9.6 cm was used by the authors.[13] The authors did not alter or create more fenestrations in the product once it was opened.

The authors have previously instituted strict indications for the use of ADM in breast reconstruction after an internal review revealed increasing complications with its use.[9] Our institutional use of ADM has transitioned from aseptic to sterile "ready-to-use" and now contour fenestrated AlloDerm. As there have been no studies examining results with contour fenestrated AlloDerm to date, the authors aim to compare outcomes between aseptic, sterile "ready-to-use," and contour fenestrated AlloDerm in breast reconstruction.

METHODS

All patients undergoing implant-based breast reconstruction at NYU Langone Medical Center from 2010 to 2014 were identified in this retrospective review of the authors' practices. Patients undergoing reconstruction with tissue expander (TE) or permanent implant reconstruction were included for analysis. Patients undergoing delayed breast reconstruction or in whom SeriScaffold (Allergan, Irvine, Calif.) was used were excluded from analysis.

As discussed in our institution's prior publication,[1] strict institutional indications for the use of AlloDerm (LifeCell) were initiated in November 2010. Sterile "ready-to-use" AlloDerm has been in use since November 2011, whereas contour fenestrated AlloDerm was used from October 2014. Reconstructions were thus subdivided into 4 groups: submuscular, aseptic AlloDerm, sterile "ready-to-use" AlloDerm, and contour fenestrated AlloDerm implant coverage.

As in our previous study,[8] all reconstructions were performed with either textured, shaped TEs or round, smooth implants. Implants were placed in a total submuscular position with elevation of the pectoralis and serratus anterior muscles when possible. AlloDerm was sewn in as an inferolateral sling when total submuscular placement was not possible secondary to inadequate pectoralis or serratus musculature, either due to congenital insufficiency or iatrogenic injury. This decision was made at the discretion of the plastic surgeon. In general, 2 drains were placed per breast in all patients. One drain was placed superiorly and one was placed inferiorly along the inframammary fold; all drains were placed above the level of the implant pocket in the subcutaneous plane. Drains were maintained until output was less than 30 mL in 24 hours. Patients remained on prophylactic antibiotics until all drains were removed as per the authors' preferences.

Data regarding patient demographics, neoadjuvant therapy, type of reconstruction, nipple-sparing mastectomy (NSM) or skin-sparing mastectomy, type of implant coverage, intraoperative TE fill volume, and reconstructive complications, including infectious complications, seroma, hematoma, interventional radiology drainage, explantation, and mastectomy flap necrosis (MFN), were collected. Infections were stratified by minor infection requiring only oral (PO) antibiotics and major infection requiring hospital readmission and intravenous antibiotics. MFN was stratified by minor MFN requiring only local wound care and major MFN requiring debridement either in the office or in the operating room.

Measures of central tendency and descriptive statistics were used to describe absolute and mean outcomes. Chi-square analysis and Student's *t* tests were used to compare categorical variables and to analyze means, respectively. Univariate logistic analysis was performed to assess independent risk factors for infection. *P* values less than 0.05 were deemed significant.

RESULTS

From November 2010 to October 2014, a total of 620 eligible patients (1019 reconstructions) underwent immediate, implant-based breast reconstruc-

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Table 1. Overall Patient Demographics

Total reconstructions	1019 (620 patients)
Patient demographics	
Age (y)	50.0
BMI	25.0
Current smoker	49 (4.8%)
Diabetes	33 (3.2%)
Previous radiation	59 (5.8%)
Adjuvant radiation	72 (7.1%)
Nipple-sparing mastectomy	389 (38.2%)
Type of reconstruction	
Tissue expander	881 (86.5%)
Permanent implant	137 (13.4%)
Implant + latissimus	1 (0.1%)
Implant coverage	
Total submuscular	645 (63.3%)
Aseptic AlloDerm	91 (8.9%)
Ready-to-use AlloDerm	164 (16.1%)
Contour fenestrated AlloDerm	119 (11.7%)

BMI, body mass index.

tion. Overall patient demographics are presented in Table 1. About 86.5% of these reconstructions were with TEs while 13.4% were with permanent implants. The majority (63.3%) of reconstructions were performed with total submuscular implant coverage. Of the reconstructions requiring AlloDerm, 8.9%, 16.1%, and 11.7% were performed with aseptic, sterile "ready-to-use," and contour fenestrated AlloDerm, respectively. Patient demographics and complications stratified by the type of implant coverage are presented in Table 2.

Patient characteristics and outcomes were compared between contour fenestrated and aseptic AlloDerm (Table 3). Patients who underwent contour fenestrated AlloDerm reconstruction were more likely to have lower body mass index ($P = 0.0009$), have less previous radiation ($P=0.0439$) and adjuvant radiation ($P=0.0001$), have an NSM ($P=0.0001$), and have permanent implant reconstructions ($P=0.0001$). Contour fenestrated AlloDerm was associated with lower rates of infection requiring oral ($P = 0.0016$) and intravenous antibiotics ($P = 0.0012$), interventional radiology drainage ($P = 0.0439$), and minor MFN ($P = 0.0001$) compared with those with aseptic AlloDerm coverage.

Patient characteristics and outcomes were compared between contour fenestrated and sterile "ready-to-use" AlloDerm (Table 4). Patients who underwent contour fenestrated AlloDerm reconstruction were more likely to be younger ($P = 0.0305$), have less previous radiation ($P = 0.0022$) and adjuvant radiation ($P = 0.0002$), have an NSM ($P = 0.0004$), and have permanent implant reconstructions ($P = 0.0001$). However, contour fenestrated AlloDerm was associated with greater minor MFN ($P = 0.0023$) compared with sterile "ready-to-use" AlloDerm.

Finally, patient characteristics and outcomes were compared between contour fenestrated AlloDerm and total submuscular coverage (Table 5). Patients who underwent contour fenestrated AlloDerm reconstruction were more likely to be younger ($P = 0.0001$), have less previous radiation ($P = 0.0035$) and adjuvant radiation ($P = 0.0063$), have an NSM ($P = 0.0001$), and have permanent implant reconstructions ($P = 0.0001$). Contour fenestrated AlloDerm was associated with more explantations ($P = 0.0001$) as well as major ($P = 0.0130$) and minor MFN ($P = 0.0001$).

Table 2. Demographics and Complications by Implant Coverage

	Submuscular	Aseptic AlloDerm	Ready-to-Use AlloDerm	Contour Fenestrated AlloDerm
Total	645	91	164	119
Patient demographics				
Age (y)	51.0	49.1	49.4	46.4
BMI	25.1	26.5	24.2	24.4
Current smoker	30 (4.7%)	5 (5.5%)	7 (4.3%)	7 (5.9%)
Diabetes	20 (3.1%)	4 (4.4%)	7 (4.3%)	2 (1.7%)
Previous radiation	43 (6.7%)	3 (3.3%)	12 (7.3%)	0 (0.0%)
Adjuvant radiation	38 (5.9%)	13 (14.3%)	17 (10.4%)	0 (0.0%)
Nipple-sparing mastectomy	198 (30.7%)	25 (27.5%)	85 (51.8%)	81 (68.0%)
Type of reconstruction				
Tissue expander	623 (96.6%)	76 (83.5%)	127 (77.4%)	55 (46.2%)
Permanent implant	21 (3.3%)	15 (16.5%)	37 (22.6%)	64 (53.8%)
Implant + latissimus	1 (0.1%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Complications				
Infection requiring PO antibiotics	16 (2.5%)	7 (7.7%)	5 (3.0%)	0 (0.0%)
Infection requiring IV antibiotics	8 (1.2%)	10 (11.0%)	7 (4.3%)	2 (1.7%)
IR drainage	1 (0.1%)	3 (3.3%)	1 (0.6%)	0 (0%)
Explantation	8 (1.2%)	7 (7.7%)	5 (3.0%)	6 (5.0%)
Seroma	7 (1.1%)	4 (4.4%)	2 (1.2%)	3 (2.5%)
Hematoma	8 (1.2%)	1 (1.1%)	0 (0.0%)	0 (0%)
Minor MFN	19 (2.9%)	2 (2.2%)	8 (4.9%)	13 (10.9%)
Major MFN	19 (2.9%)	10 (11.0%)	6 (3.7%)	8 (6.7%)

BMI, body mass index; IR, interventional radiology; IV, intravenous; MFN, mastectomy flap necrosis; PO, per os.

Table 3. Comparison of Breasts with Aseptic AlloDerm and Contour Fenestrated AlloDerm Implant Coverage

	Aseptic AlloDerm	Contour Fenestrated AlloDerm	*P*
Total	91	119	—
Patient demographics			
Age (y)	49.1	46.36	0.1030
BMI	26.53	24.42	**0.0009**
Current smoker	5 (5.5%)	7 (5.9%)	0.8548
Diabetes	4 (4.4%)	2 (1.7%)	0.1481
Previous radiation	3 (3.3%)	0 (0.0%)	**0.0439**
Adjuvant radiation	13 (14.3%)	0 (0.0%)	**0.0001**
Nipple-sparing mastectomy	25 (27.5%)	81 (68.0%)	**0.0001**
Type of reconstruction			
Tissue expander	76 (83.5%)	55 (46.2%)	**0.0001**
Permanent implant	15 (16.5%)	64 (53.8%)	**0.0001**
Implant + latissimus	0 (0.0%)	0 (0.0%)	1.000
Complications			
Infection requiring PO antibiotics	7 (7.7%)	0 (0.0%)	**0.0016**
Infection requiring IV antibiotics	10 (11.0%)	2 (1.7%)	**0.0012**
IR drainage	3 (3.3%)	0 (0%)	**0.0439**
Explantation	7 (7.7%)	6 (5.0%)	0.2768
Seroma	4 (4.4%)	3 (2.5%)	0.3176
Hematoma	1 (1.1%)	0 (0%)	0.2500
Minor MFN	2 (2.2%)	13 (10.9%)	**0.0001**
Major MFN	10 (11.0%)	8 (6.7%)	0.1359

BMI, body mass index; IR, interventional radiology; IV, intravenous; MFN, mastectomy flap necrosis; PO, per os; Bold values, significance of $P < 0.05$.

Table 4. Comparison of Breasts with Ready-to-Use AlloDerm and Contour Fenestrated AlloDerm Implant Coverage

	Ready-to-Use AlloDerm	Contour Fenestrated AlloDerm	*P*
Total	164	119	—
Patient demographics			
Age (y)	49.36	46.36	**0.0305**
BMI	24.17	24.42	0.6290
Current smoker	7 (4.3%)	7 (5.9%)	0.3948
Diabetes	7 (4.3%)	2 (1.7%)	0.1590
Previous radiation	12 (7.3%)	0 (0.0%)	**0.0022**
Adjuvant radiation	17 (10.4%)	0 (0.0%)	**0.0002**
Nipple-sparing mastectomy	85 (51.8%)	81 (68.0%)	**0.0004**
Type of reconstruction			
Tissue expander	127 (77.4%)	55 (46.2%)	**0.0001**
Permanent implant	37 (22.6%)	64 (53.8%)	**0.0001**
Implant + latissimus	0 (0.0%)	0 (0.0%)	1.000
Complications			
Infection requiring PO antibiotics	5 (3.0%)	0 (0.0%)	0.0551
Infection requiring IV antibiotics	7 (4.3%)	2 (1.7%)	0.1590
IR drainage	1 (0.6%)	0 (0%)	0.3967
Explantation	5 (3.0%)	6 (5.0%)	0.1916
Seroma	2 (1.2%)	3 (2.5%)	0.1857
Hematoma	0 (0.0%)	0 (0%)	0.9991
Minor MFN	8 (4.9%)	13 (10.9%)	**0.0023**
Major MFN	6 (3.7%)	8 (6.7%)	0.0807

BMI, body mass index; IR, interventional radiology; IV, intravenous; MFN, mastectomy flap necrosis; PO, per os; Bold values, significance of $P < 0.05$.

Independent risk factors for infection were identified using univariate analysis (Table 6). Age over 50 [odds ratio (OR) = not significant (NS); $P = 0.0385$], diabetes mellitus (OR = 3.4279; $P = 0.0075$), aseptic ADM (OR = 5.4958; $P = 0.0001$), mastectomy skin flap necrosis (OR = 4.1422; $P = 0.0001$), adjuvant radiation therapy (OR = 2.5186; $P = 0.0161$), initial TE fill ≥40% (OR = NS; $P = 0.0372$), and the presence of seroma (OR = 15.8413; $P = 0.0001$) were significant independent risk factors for increased infectious complications. Bilateral reconstruction was a significant independent predictor of decreased infectious complications (OR = 0.4822; $P = 0.0006$). Of note, the type of implant used, whether a TE or a permanent implant, was not a significant independent predictor of infectious complications ($P = 0.5463$ and $P = 0.5591$, respectively).

DISCUSSION

The use of ADM in breast reconstruction remains a contested subject. Increased complications with ADM have been published and purported by some,

Table 5. Comparison of Breasts with Total Submuscular and Contour Fenestrated AlloDerm Implant Coverage

	Submuscular	Contour Fenestrated AlloDerm	*P*
Total	645	119	—
Patient demographics			
Age (y)	51.02	46.36	**0.0001**
BMI	25.07	24.42	0.2214
Current smoker	30 (4.7%)	7 (5.9%)	0.5422
Diabetes	20 (3.1%)	2 (1.7%)	0.3694
Previous radiation	43 (6.7%)	0 (0.0%)	**0.0035**
Adjuvant radiation	38 (5.9%)	0 (0.0%)	**0.0063**
Nipple-sparing mastectomy	198 (30.7%)	81 (68.0%)	**0.0001**
Type of reconstruction			
Tissue expander	623 (96.6%)	55 (46.2%)	**0.0001**
Permanent implant	21 (3.3%)	64 (53.8%)	**0.0001**
Implant + latissimus	1 (0.1%)	0 (0.0%)	0.7300
Complications			
Infection requiring PO antibiotics	16 (2.5%)	0 (0.0%)	0.0807
Infection requiring IV antibiotics	8 (1.2%)	2 (1.7%)	0.6301
IR drainage	1 (0.1%)	0 (0%)	0.7300
Explantation	8 (1.2%)	6 (5.0%)	**0.0001**
Seroma	7 (1.1%)	3 (2.5%)	0.1372
Hematoma	8 (1.2%)	0 (0%)	0.2293
Minor MFN	19 (2.9%)	13 (10.9%)	**0.0001**
Major MFN	19 (2.9%)	8 (6.7%)	**0.0130**

BMI, body mass index; IR, interventional radiology; IV, intravenous; MFN, mastectomy flap necrosis; per os; Bold values, significance of $P < 0.05$.

whereas others have demonstrated its benefits in reducing capsular contracture, improving cosmetic outcomes, and permitting stable implant coverage when pectoralis major and serratus anterior muscles are insufficient.[2–8]

AlloDerm is the predominant ADM used at our institution and many others.[2–12] In response to increased complications from aseptic AlloDerm use,[9] it has been refined into a sterile product[8] and now includes the current contoured fenestrated form.[13] Contour fenestrated AlloDerm is designed to allow the egress of fluid, to theoretically reduce periprosthetic fluid collection, and to provide greater ease of inset due to shape.[13] To our knowledge, this is the first study to critically evaluate contour fenestrated AlloDerm against aseptic and sterile "ready-to-use" AlloDerm.

Although the majority of the implant-based reconstructions at our institution continue to be performed with total submuscular coverage, the proportion of patients who received contour fenestrated AlloDerm (11.7%) was comparable to the other AlloDerm subgroups. In general, patients who had reconstruction with contour fenestrated AlloDerm were more likely to have NSM and permanent implant reconstruction. This trend is due to the broadening indications for NSM and increased use of permanent implants that coincides with the introduction of contour fenestrated AlloDerm.

Consistent with our results comparing aseptic with sterile "ready-to-use" AlloDerm, contour fenestrated AlloDerm is associated with reduced infection.[8] However, contour fenestrated AlloDerm, sterile "ready-to-use" AlloDerm, and total submuscular coverage have comparable infection and seroma rates. Given the power of our study, we did not identify fewer periprosthetic fluid collections from the prefabricated fenestrations. These results suggest that the sterilization process, rather than mechanical alterations in design, may be the most important aspect in decreasing infection with AlloDerm.

Contour fenestrated AlloDerm was associated with higher rates of minor MFN than sterile "ready-to-use" AlloDerm and higher rates of both major and minor MFN and implant explantation compared with total submuscular coverage. Once again, this may be related to the broader use of NSM, a higher risk procedure, and direct-to-implant reconstruction, which may stress the breast skin envelope.[14–16] Minor MFN was treated with local wound care in all cases with relatively minor impact on final reconstructive result.[15]

Diabetes, seroma formation, MFN, and aseptic AlloDerm were again determined to be independent predictors of infection, confirming our previous findings.[8] However, additional predictors emerged in this review includes age over 50, TE fill greater than 40%, and adjuvant radiation therapy. Bilateral reconstruction, meanwhile, emerged as a protector against infection. Although age and radiation are known predictors of poor wound healing[17–19] and greater TE fill can increase tissue stress,[20] the finding of unilateral reconstruction as a risk factor for infection requires further investigation. Possible explanations include an increased incidence of neoadjuvant radiation, chemotherapy, or permanent

Table 6. Independent Risk Factors for Infectious Complications

Variable	No. Breasts	No. Breasts with Infectious Complications (%)	Unadjusted OR (95% CI)	*P*
n		56		
Age (y)				
<50	544	23 (4.2%)		
≥50	519	33 (6.4%)	0.6501 (0.3764–1.1230)	**0.0385**
DM				
Yes	33	5 (15.2%)		
No	1030	51 (5.0%)	**3.4279 (1.2707–9.2470)**	**0.0075**
Hypertension				
Yes	105	9 (8.6%)		
No	958	47 (4.9%)	1.8172 (0.8639–3.8220)	0.0814
Hypercholesterolemia				
Yes	90	4 (4.4%)		
No	973	52 (5.3%)	0.8238 (0.2910–2.3324)	0.7171
Smoker				
Yes	49	1 (2.0%)		
No	1014	55 (5.4%)	0.3933 (0.0492–2.6811)	0.2982
Obese (BMI >30 kg/m^2)				
Yes	166	13 (7.8%)		
No	897	43 (4.8%)	1.6875 (0.8864–3.2124)	0.0677
Bilateral reconstruction				
Yes	599	22 (3.7%)		
No	464	34 (7.3%)	**0.4822 (0.2780–0.8363)**	**0.0006**
Prior irradiation				
Yes	59	6 (10.2%)		
No	960	50 (5.2%)	1.9525 (0.8045–4.7390)	0.1391
Adjuvant radiation				
Yes	72	9 (12.5%)		
No	947	47 (5.0%)	**2.5186 (1.1869–5.3443)**	**0.0161**
Neoadjuvant chemotherapy				
Yes	123	6 (4.9%)		
No	940	50 (5.3%)	0.9128 (0.3830–2.1755)	0.8345
Aseptic AlloDerm				
Yes	91	17 (18.7%)		
No	972	39 (4.0%)	**5.4958 (2.9658–10.1843)**	**0.0001**
Ready-to-use AlloDerm				
Yes	164	12 (7.3%)		
No	899	44 (4.9%)	1.5341 (0.7919–2.9718)	0.1516
Contour fenestrated AlloDerm				
Yes	119	2 (1.7%)		
No	944	54 (5.7%)	0.2817 (0.0678–1.1708)	0.0586
Nipple-sparing mastectomy				
Yes	411	18 (4.4%)		
No	652	38 (5.8%)	0.7401 (0.4165–1.3151)	0.2180
Mastectomy skin flap necrosis				
Yes	89	14 (15.7%)		
No	974	42 (4.3%)	**4.1422 (2.1646–7.9267)**	**0.0001**
Initial TE fill ≥40%				
Yes	353	24 (6.8%)		
No	710	32 (4.5%)	1.5456 (0.8958–2.6666)	**0.0372**
Seroma				
Yes	16	7 (43.8)		
No	1047	49 (4.7%)	**15.8413 (5.6637–44.3077)**	**0.0001**
TE				
Yes	881	50 (5.7%)		
No	138	6 (4.3%)	1.3053 (0.5493–3.1021)	0.5463
Permanent implant				
Yes	137	6 (4.4%)		
No	882	50 (5.7%)	0.7726 (0.3250–1.8362)	0.5591

BMI, body mass index; CI, confidence interval; DM, diabetes mellitus; Bold values, significance of $P < 0.05$.

implant reconstruction in patients with unilateral reconstruction. Of note, contour fenestrated AlloDerm trended toward an independent predictor of decreased risk of infection (OR = NS; $P = 0.0586$) but failed to reach statistical significance. Although those undergoing reconstruction with contour fenestrated AlloDerm were significantly less likely to have previous radiation and adjuvant radiation, we do not expect that this alone accounts for this trend toward decreased risk of infection.

Limitations of this study include its retrospective nature, the inclusion of multiple surgeons in whom slight variations in technique may be present, the manner in which data were collected by chart review, and the significant trend of increased NSM and direct-to-implant reconstruction in the fenestrated AlloDerm group. Analyses of long-term outcomes using a prospectively maintained institutional database are forthcoming. Further, future directions of study will involve independent examinations of reconstructive outcomes and risk factors in NSM as well as immediate, permanent implant reconstruction.

CONCLUSIONS

We find that contour fenestrated AlloDerm, sterile "ready-to-use" AlloDerm, and total submuscular coverage have comparable infection profiles. Diabetes, seroma formation, MFN, and aseptic AlloDerm were again found to be independent predictors for infection, whereas age over 50, TE fill ≥40%, and unilateral reconstruction emerged as new predictors of infection.

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