

Textured Versus Smooth Tissue Expanders – A Comparison of Complications in 3,526 Breast Reconstructions

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Background

With increased understanding of BIA-ALCL, a shift away from textured breast devices has occurred. Few small studies have compared complication rates of textured and smooth tissue expanders (TE). The aim of this study was to compare complication profiles in patients undergoing two stage post-mastectomy breast reconstruction with either textured or smooth tissue expanders.

Methods

We performed a retrospective review of female patients who underwent immediate breast reconstruction with textured or smooth TEs from 2018-2020 at our institution. Demographics, comorbidities, and neoadjuvant/adjuvant therapies were evaluated. Outcomes of interest included seroma, infection/cellulitis, malposition/rotation, exposure, and expander loss. Subgroup analysis was performed to analyze prepectoral/subpectoral cohorts. We used multivariate logistic regression to evaluate the odds of certain complications occurring in textured versus smooth expanders.

Results

We analyzed 3,526 TEs (1,456 textured; 2,070 smooth). Increased utilization of ADM, SPY angiography, and prepectoral expander placement were noted in the smooth TE cohort (p<0.001). Overall, a greater proportion of smooth TEs experienced infection/cellulitis, malposition/rotation, MSFN, and exposure than textured TEs (all p<0.01). No significant differences were noted comparing expander loss. In multivariate analysis, textured expanders had lower odds of experiencing infection/cellulitis and malposition/rotation; however, there was no significant relationship between odds of TE loss and expander surface.

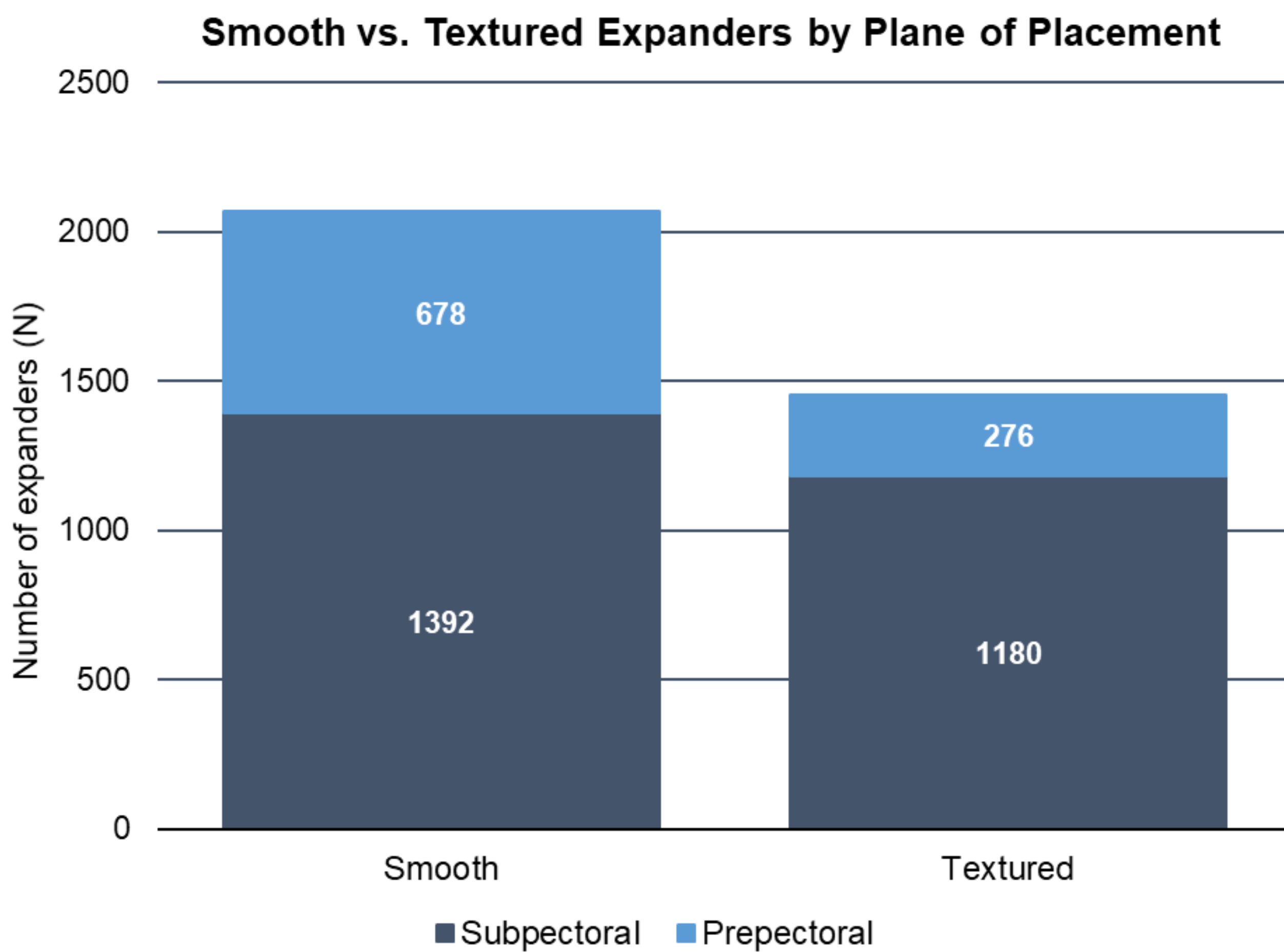


Table 1. Complication rates according to tissue expander surface type within the overall, prepectoral, and subpectoral cohorts.

Complication	Smooth	Textured	p	Power
Overall (n = 3,526)				
	n = 2,070	n = 1,456		
Hematoma	2.5% (52)	1.7% (25)	0.128	0.374
Seroma	5.0% (104)	4.9% (71)	0.875	0.052
Infection/cellulitis	6.4% (132)	4.3% (62)	0.007	0.783
Malposition/rotation	1.6% (33)	0.5% (8)	0.004	0.906
Mastectomy skin flap necrosis	5.7% (119)	7.8% (114)	0.016	0.689
Mastectomy skin flap necrosis requiring revision	2.7% (55)	3.2% (46)	0.412	0.139
TE exposure	1.6% (34)	0.6% (9)	0.007	0.822
TE removal with immediate replacement	1.7% (35)	0.3% (4)	< 0.001	0.993
TE removal without replacement*	3.0% (63)	2.6% (38)	0.474	0.109
Prepectoral (n = 954)				
	n = 678	n = 276		
Hematoma	2.9% (20)	0.4% (1)	0.013	1.000
Seroma	8.7% (59)	9.8% (27)	0.619	0.199
Infection/cellulitis	8.6% (58)	6.9% (19)	0.434	0.461
Malposition/rotation	2.1% (14)	0.4% (1)	0.081	0.998
Mastectomy skin flap necrosis	3.5% (24)	5.1% (14)	0.277	0.639
Mastectomy skin flap necrosis requiring revision	2.4% (16)	3.6% (10)	0.279	0.543
TE exposure	2.5% (17)	1.4% (4)	0.465	0.652
TE removal with immediate replacement	3.2% (22)	0% (0)	< 0.001	1.000
TE removal without replacement*	3.8% (26)	5.1% (14)	0.378	0.456
Subpectoral (n = 2,572)				
	n = 1,392	n = 1,180		
Hematoma	2.3% (32)	2.0% (24)	0.686	0.103
Seroma	3.2% (45)	3.7% (44)	0.517	0.093
Infection/cellulitis	5.3% (74)	3.6% (43)	0.046	0.126
Malposition/rotation	1.4% (19)	0.6% (7)	0.073	0.678
Mastectomy skin flap necrosis	6.8% (95)	8.5% (100)	0.117	0.654
Mastectomy skin flap necrosis requiring revision	2.8% (39)	3.1% (36)	0.725	0.081
TE exposure	1.2% (17)	0.4% (5)	0.032	0.776
TE removal with immediate replacement	0.9% (13)	0.3% (4)	0.086	0.652
TE removal without replacement*	2.7% (37)	2.0% (24)	0.363	0.273

* Equivalent to TE loss.

Table 2. Multivariable logistic regression analysis of factors contributing to complications.

Complication	Potential contributing factors	Odds ratio (95% CI)	p
Infection/cellulitis	Smooth TE	-	-
	Textured TE	0.69 (0.49, 0.97)	0.032
	Prepectoral placement	-	-
	Subpectoral placement	0.76 (0.52, 1.11)	0.160
	ADM used	1.69 (1.15, 2.47)	0.008
	Prior radiation	2.34 (0.96, 5.69)	0.061
	Adjuvant radiation	1.29 (0.90, 1.83)	0.162
	Mastectomy weight	1.00 (1.00, 1.00)	< 0.001
	History of smoking	1.57 (1.14, 2.17)	0.005
Malposition/rotation	Smooth TE	-	-
	Textured TE	0.32 (0.14, 0.73)	0.007
	Prepectoral placement	-	-
	Subpectoral placement	0.93 (0.41, 2.10)	0.857
	ADM used	1.14 (0.51, 2.56)	0.759
	Prior radiation	0 (0, inf)	0.987
	Adjuvant radiation	0.56 (0.23, 1.37)	0.206
	Mastectomy weight	1.00 (1.00, 1.00)	0.006
	History of smoking	0.92 (0.45, 1.91)	0.826
TE removal without replacement (TE loss)	Smooth TE	-	-
	Textured TE	0.85 (0.54, 1.33)	0.480
	Prepectoral placement	-	-
	Subpectoral placement	0.82 (0.49, 1.36)	0.442
	ADM used	1.79 (1.08, 2.97)	0.023
	Prior radiation	1.47 (0.34, 6.26)	0.606
	Adjuvant radiation	1.38 (0.88, 2.17)	0.166
	Mastectomy weight	1.00 (1.00, 1.00)	< 0.001
	History of smoking	1.47 (0.96, 2.24)	0.076

Model performance (AUC): infection/cellulitis: 0.66, malposition/rotation: 0.71, TE loss: 0.70

Conclusion

In the largest study to date examining textured versus smooth TE outcomes, expander surface did not impact TE loss, though differences favored textured expanders overall. Further research is needed examining BIAALCL risk with temporary textured TE exposure to improve decision-making regarding use of textured expanders.