

Evaluation of SSI Risk Prediction Model for Breast Reconstruction Outcomes



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Background/Introduction

Surgical site infections (SSI) in breast cancer patients can result in implant loss, delay in receipt of adjuvant therapy, patient dissatisfaction, psychosocial dysfunction, depression, and sexual dysfunction. The BRA Score is a validated model developed using the National Surgical Quality Improvement Program (NSQIP) and the Tracking Operations and Outcomes for Plastic Surgeons Program (TOPS) that determines risk of postoperative complications, including SSI, for patients undergoing mastectomy with immediate tissue expander or autologous reconstruction using 27 demographic variables and comorbidities.

Purpose/Objectives

We aimed to determine the accuracy of the BRA Score for predicting SSI in our patient population, with a goal of identifying a subgroup of high-risk patients who might benefit from a tailored approach to infection prophylaxis in order to reduce risk.

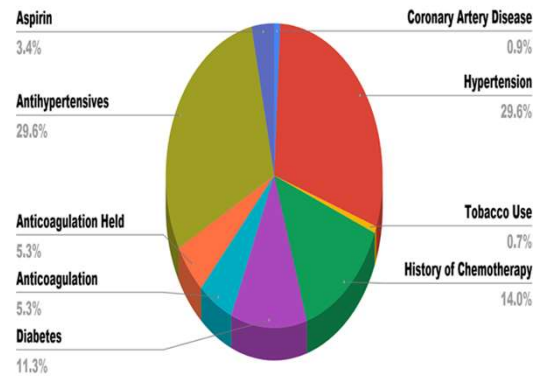
Breast Reconstruction Risk Assessment (BRA) Score - Extended Length						
Outcome	Reconstructive Modality					
	Tissue Expander		Pedicle Abdominal (TRAM) Flap	Latissimus Flap	Microvascular Reconstruction	Single-Stage Implant
	30 Day	1 Year ^d	30 Day	30 Day	30 Day	1 Year ^d
Overall Surgical Complications ^a	19.1%	>19.1%	38.3%	26.5%	29.9%	27.2%
Surgical Site Infection ^b	11.5%	11.6%	17.6%	8.7%	18.1%	
Seroma ^c	5.2%	>5.2%	8.7%	15.2%	7.6%	
Dehiscence ^c	5.9%	>5.9%	8.4%	8.0%	9.7%	
Flap Loss (Partial or Total) ^d	N/A		19.6%	6.0%	19.1%	
Explantation	6.2%	8.8%	N/A	N/A	N/A	
Reoperation ^e	6.2%	N/A	9.9%	4.6%	10.9%	
Overall 30 Day Medical Complications ^f	5.9%		19.1%	7.9%	33.5%	www.brascore.org

Figure 1: Example of BRA Score results.

Methods

Using the BRA Score, we retrospectively calculated the risk of SSI for each of the 643 consecutive patients who underwent a mastectomy with immediate reconstruction between 1/2017 and 6/2018 at our institution. We assessed the model's accuracy in predicting SSI, defined as an abnormal swab and culture, at 30 and 365 days after surgery.

BRA Score Variables

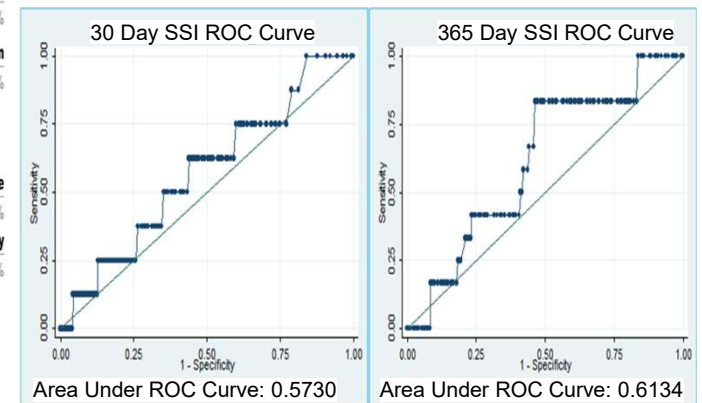


Results

643 patients with an average age of 53.0 ± 12.0 y and BMI of 30.3 ± 7.3 were reviewed. There were 8 occurrences (1.2%) of SSI within 30 days and 12 occurrences (5.9%) within 365 days of operation. ROC curves yielded 0.57 and 0.61 area under the curve for the 30 and 365 day analyses, respectively, reflecting a poor correlation between BRA score and SSI. No patient with a calculated BRA Score of less than 2.3% developed an SSI, accounting for over 15% of our patient population.

Conclusions and Implications/Lessons Learned

In our patient population, the BRA Score underperformed in predicting patients at higher risk for SSI. This is likely secondary to patient selection limiting the number of high-risk patients, use of measures to reduce SSI, as well as the differences between our SSI definition and the NSQIP definition used by the BRA Score. However, a very low BRA Score correlated with not developing SSI in a sizable fraction of our patients. The model may be useful in identifying very low-risk patients in whom preventive measures can be eliminated without leading to adverse outcomes. It is important to validate risk prediction models in the population of interest prior to adoption.



References
Breast Reconstruction Risk Assessment (BRA) Score (brascore.org)

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