Surveillance or Signal? Increased Diagnostic Burden Without Increased Oncologic Risk Following Postmastectomy Breast Reconstruction

Nicole C. Ontiveros, MD, MS*[1], Katherine A. Kozlowski, BS[2], Marlynn P. Lopez, MS[2], Aneeq S. Chaudhry, BS[2], Daniel Rabin, BS[2], Robert D. Galiano, MD[2]

[1]Northwestern Quality Improvement, Research, and Education in Surgery (NQUIRES), Department of Surgery, Feinberg School of Medicine, Northwestern University [2]Feinberg School of Medicine, Northwestern University

INTRODUCTION

- Nearly half of patients who have a mastectomy elect to undergo breast reconstruction[1,2]
- Reconstruction confers well-established benefits in quality of life and psychological wellbeing[3]
- Prior studies have largely supported the oncologic safety of reconstruction[4,5]
- Reconstructed breasts present unique challenges; altered tissue architecture, implant or flap-related imaging changes, and increased postoperative surveillance may influence downstream diagnostic and procedural rates
- Reconstructive considerations may influence mastectomy technique and residual breast tissue, potentially affecting recurrence risk
- The impact of reconstruction on oncologic outcomes remains controversial

- Characterize oncologic outcomes following mastectomy with and without breast reconstruction utilizing a real-time, global database

METHODS

A retrospective cohort analysis was conducted utilizing the TriNetX database. Patients with Stage I-III breast cancer undergoing mastectomy (simple, skin-sparing, nipple-sparing, or radical) were compared to those undergoing mastectomy with breast reconstruction (implant-based or autologous). Propensity score matching was performed based on age, AJCC cancer stage, and comorbidities (diabetes, hypertension, and obesity). Mastectomy served as the index event. The primary outcome was breast cancer recurrence; due to limitations in direct recurrence coding within administrative databases, abnormal diagnostic mammography, breast biopsy, chest wall/breast excision, and nodal metastasis occurring >6 months following mastectomy served as proxies. Secondary outcomes included all-cause mortality >6 months after mastectomy.

RESULTS

A total of 7,840 patients were included in the final matched analysis. The mean age at mastectomy was 50.7 +/- 11.1 years, and the largest proportion of patients had Stage I disease. Mean follow-up was 1,788.8 days in the mastectomy-only cohort and 2,267.9 days in the reconstruction cohort.

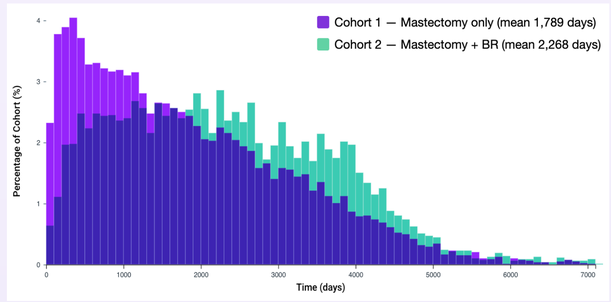


Figure 1: Reconstruction Cohort Had Longer Mean Follow Up Time

Reconstruction was associated with an increased risk of abnormal or inconclusive diagnostic mammography (RR 1.31, 95% CI 1.17-1.47, p < 0.0001), breast biopsy (RR 2.78, 95% CI 1.76-4.39, p < 0.0001), and chest wall/breast excision (RR 1.6, 95% CI 1.27-2.02, p < 0.0001) occurring >6 months after mastectomy. There was a modest but statistically significant increase in metastatic risk for mastectomy alone (HR 1.34, 95% CI 1.03-1.75, p = 0.032). Mastectomy alone was also associated with increased all-cause mortality >6 months after surgery (HR 2.01, 95% CI 1.65-2.44, p < 0.0001).

Figure 2: Reconstruction Increases Diagnostic Burden but Not Oncologic Risk

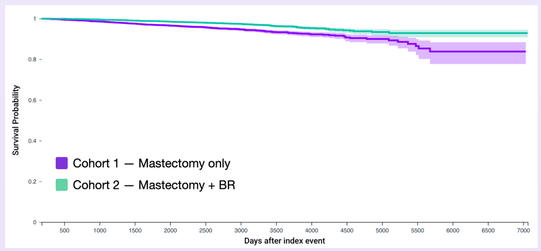
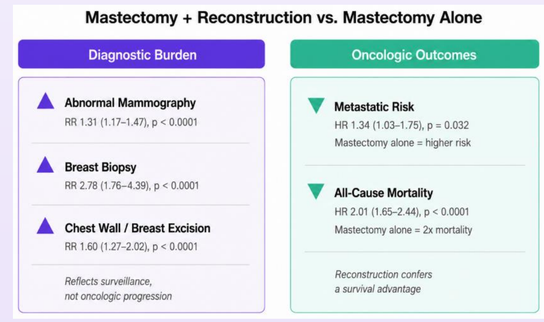


Figure 3: Mastectomy Alone Associated with Higher All-Cause Mortality

Breast reconstruction increased downstream diagnostic interventions but was NOT associated with increased oncologic progression

CONCLUSIONS

Breast reconstruction following mastectomy is associated with increased downstream diagnostic and procedural burden; however, mastectomy alone was associated with significantly higher metastatic risk and all-cause mortality. **These findings suggest that increased post-reconstruction diagnostic intervention reflects heightened surveillance and altered postoperative anatomy rather than true oncologic progression.** Notably, reconstruction appears to confer a survival advantage, which may relate to differences in patient selection, access to care, or health-seeking behavior. These results have important implications for patient counseling and post-reconstruction surveillance strategies. Further studies are needed to explore the influence of surgical technique and patient factors on oncologic outcomes following breast reconstruction.



REFERENCES

1. Wong SM, Chun YS, Sagara Y, Golshan M, Erdmann-Sager J. National Patterns of Breast Reconstruction and Nipple-Sparing Mastectomy for Breast Cancer, 2005–2015. *Ann Surg Oncol*. 2019;26(10):3194-3203. doi:10.1245/s10434-019-07554-x

2. Sun M, Fu A, Du X, Dong H, Hou S, Liu C. National Trends in Immediate and Early Delayed Postmastectomy Breast Reconstruction: An Updated Population-Based Study of 84,088 Reconstructed Patients. *Aesthetic Plast Surg*. 2025;49(23):6586-6599. doi:10.1007/s00266-025-05115-0

3. Santosa KB, Qi J, Kim HM, Hamill JB, Wilkins EG, Pusic AL. Long-term Patient-Reported Outcomes in Postmastectomy Breast Reconstruction. *JAMA Surg*. 2018;153(10):891. doi:10.1001/jamasurg.2018.1677

4. Siotos C, Naska A, Bello RJ, et al. Survival and Disease Recurrence Rates among Breast Cancer Patients following Mastectomy with or without Breast Reconstruction. *Plast Reconstr Surg*. 2019;144(2):169e-177e. doi:10.1097/PRS.0000000000005798

5. Shen Z, Sun J, Yu Y, et al. Oncological safety and complication risks of mastectomy with or without breast reconstruction: A Bayesian analysis. *J Plast Reconstr Aesthet Surg*. 2021;74(2):290-299. doi:10.1016/j.bjps.2020.08.121

Funding: Dr. Ontiveros is supported by an NIH R38 SMART grant.

Contact: nicole.ontiveros@nm.org