Assessing the Association Between Seroma and Surgical Site Infection in Immediate Breast Reconstruction

Brittany L. Vieira, BS; Charles D Qin, BA; Sumanas W Jordan, MD, PhD; Karol A Gutowski, MD; John YS Kim, MD

PURPOSE: Several preoperative and intraoperative risk factors have been implicated in infectious complications of immediate breast reconstruction, however the link between common postoperative sequelae and surgical site infection (SSI) remains largely anecdotal. Published rates of seroma and SSI often trend in parallel, and authors have hypothesized that seroma formation may independently promote infectious complications.[1,2] The current study aims to assess and quantify the postulated association between seroma and the risk of SSI in immediate breast reconstruction.

METHODS: A retrospective review of the Tracking Outcomes and Operations in Plastic Surgery data registry was conducted to identify all cases of immediate breast reconstruction (IBR) between 2009-2012. Cohort characteristics and 30-day outcomes were compared between cases with and without seroma using Pearson's chi-squared for categorical variables and student t-tests for quantitative variables. Multivariate logistic regression analysis was performed to control for confounding variables while assessing the association between seroma formation and the risk of SSI.

RESULTS: Of the 6,729 cases of IBR identified in the study period, 4489 were classified as prosthetic and 2240 as autologous, with 717 pedicled TRAM flaps, 611 latissimus flaps, and 912 free flaps. Acellular dermal matrix (ADM) was used in 17.2% of cases. The seroma rate was 2.9 percent and the SSI rate was 1.9 percent. Bivariate analysis showed that seroma was associated with a 3.6 percent increase in absolute risk of surgical site infection ($p<0.0001$). Multivariate analysis confirmed that the presence of seroma independently increased the likelihood of SSI in both prosthetic and autologous IBR (odds ratio 7.195,$p=0.015$; odds ratio, 4.496, $p=0.013$, respectively). Of note, ADM usage was not associated with SSI when confounding variables were accounted for.

CONCLUSION: This study is the first to quantify the independent and statistically significant association between seroma and surgical site infection in immediate breast reconstruction. Seroma is associated with a seven- and four-fold increased likelihood of SSI in prosthetic and autologous reconstruction, respectively. Irrespective of whether postoperative seroma represents an independent nidus of infection or an indicator of aberrant wound healing, our results indicate that a seroma in the setting of recent mastectomy has a greater propensity for infection, and thus we advocate for more attentive surveillance and thoughtful management of seroma following immediate breast reconstruction.

REFERENCES:

1. Chun YS, Verma K, Rosen H, et al. Implant-based breast reconstruction using acellular dermal matrix and the risk of post-operative complications. Plast Reconstr Surg 2010;125:429-36

2. Ganske I, Verma K, Rosen H, et al. Minimizing complications with the use of acellular dermal matrix for immediate implant-based breast reconstruction. Ann Plast Surg. 2013 Nov;71(5):464-70