

## **Analysis of Complications associated with Incisional Wound Vacuum Assisted Closure (VAC) in Deep Inferior Epigastric Perforator (DIEP) Reconstruction: A Single Institution Retrospective study**

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**Background:** Deep inferior epigastric perforator (DIEP) flap reconstruction is a preferred technique for breast reconstruction following mastectomy due to its muscle-sparing approach and high patient satisfaction. However, postoperative donor site complications, particularly wound dehiscence, remain a challenge. Wound vacuum assisted closure (VAC) systems, which provide negative pressure wound therapy, have shown promise in reducing these complications by enhancing perfusion and reducing edema. The purpose of this study was to evaluate the association between perioperative wound VAC placement and postoperative complications in the setting of DIEP flap breast reconstruction.

**Methods:** A retrospective cohort study was conducted at the University of Colorado Anschutz Medical Campus, comparing postoperative outcomes in patients who received closed incision negative pressure therapy (VAC) during DIEP flap reconstruction to those who did not (No VAC). The study included patients from 2021 to 2023, with a primary outcome of 90-day abdominal complications. Demographic and clinical characteristics, as well as 90-day abdominal complications, were compared between the cohorts. Statistical analyses included t-tests, Wilcoxon rank-sum, Chi-squared, and multivariable logistic regression, with a p-value of  $\leq 0.05$  considered significant.

**Results:** A total of 302 patients were identified, of which 114 (38%) had a wound VAC placed on the abdominal donor site. Patients in the VAC group were older (mean age  $53 \pm 10$  vs.  $50 \pm 10$  years,  $p=0.03$ ) and had longer operative times ( $534 \pm 108$  vs.  $495 \pm 110$  minutes,  $p=0.003$ ). There were no significant differences in BMI, ASA class, or most comorbidities. No statistical significance was found in complications, including donor site hematoma ( $p=0.7$ ), seroma ( $p=0.5$ ), infection ( $p=0.7$ ), wound dehiscence ( $p=0.7$ ), bulge ( $p=0.1$ ), hernia ( $p=0.2$ ), emergency department visits ( $p=0.2$ ), and readmissions ( $p=0.2$ ). Multivariable regression indicated a nonsignificant trend toward reduced abdominal complications with VAC use (adjusted OR 0.549, 95% CI 0.277-1.088,  $p=0.08$ ).

**Conclusion:** Our findings have shown a trend towards reduction in the incidence of postoperative abdominal complications with the utilization of perioperative incisional VAC systems in DIEP flap breast reconstruction. However, our results were not statistically significant, thus further investigation is warranted with larger sample sizes in multi-institutional settings to better understand if there is potential benefit of incisional VAC therapy in improving surgical outcomes for this patient population.