

Use of Incisional Negative Pressure Wound Therapy Does Not Protect Against Postoperative Wound Complications Following Fixation of Bicondylar Tibial Plateau Fractures

*Yousi Angeli Oquendo, MSc; Taylor Renee Johnson, MD; Ryan Seltzer, BS; Julius A. Bishop, MD; Michael J. Gardner, MD
Stanford University, Stanford, CA, United States*

Purpose: To evaluate whether the preemptive use of an incisional negative pressure wound therapy (NPWT) device, also known as an incisional wound vacuum-assisted closure (VAC), is protective against postoperative wound complications following surgical fixation of bicondylar tibial plateau fractures.

Methods: We retrospectively reviewed all patients who underwent open reduction and internal fixation for an acute bicondylar tibial plateau fracture (AO/OTA 41-C) from 2010 to 2020 at a large academic Level I trauma center. All patients underwent primary closure after fixation and received either a traditional sterile dressing (TD) or incisional NPWT device. Patient demographics including sex, age, medical comorbidities, tobacco, illicit drug use, and alcohol abuse were collected. Injury characteristics including mechanism of injury, whether the patient's fracture was open or closed, and polytrauma status were also noted. Postoperative complications including superficial surgical site infection (sSSI), deep SSI (dSSI), wound dehiscence (WD), osteomyelitis, nonunion, and reoperation rates were recorded. Comparisons of baseline characteristics and complications were done using χ^2 tests. Characteristics that significantly differed between groups were placed into a multivariate logistic regression, and associations between variables were identified.

Results: 194 patients were included in the study. 42 patients had an incisional NPWT device placed and 152 were given a TD chosen per surgeon preference. There were 10 sSSIs, 17 dSSIs, 6 WDs, 10 cases of osteomyelitis, and 6 nonunions in this cohort. 19 patients returned to the operating room (OR) for infection-related complications. The NPWT group had significantly more tobacco users ($P = 0.03$) and drug users ($P < 0.01$). The percentage of polytraumas was larger in the NPWT group (33% vs 23%), but this difference was not found to be statistically significant ($P = 0.37$). A greater percentage of NPWT patients returned to the OR for infection-related complications (16.7% vs 9.3%, $P = 0.46$), but this was not significant. The NPWT group also had a greater percentage of all complications and a significantly greater percentage of dSSIs (19.5% vs 5.92%, $P = 0.02$). However, a multivariate logistic regression controlling for baseline patient characteristics did not reveal a significant association between use of NPWT and dSSIs ($P = 0.13$). Use of incisional NPWT was not significantly associated with any other complication, and use of TD was also not found to be significantly associated with any complications.

Conclusion: The application of an Incisional NPWT device is often considered for prevention of infectious-related complications and wound dehiscence following surgical fixation of bicondylar tibial plateau fractures. In this study, NPWT was not protective against postoperative wound complications compared to TDs.