Paper - Annual Meeting

Paper Session: Foot and Ankle

Acute ORIF of Tibial Pilon Fractures: Is Staging Necessary?

Reuben C Lufrano MD*; Lazaro Mesa MD; Paul Jordan Hannon MD; Brandon Reece Hull MD; Joshua Mizels BA; David Timothy Watson MD; Anjan Rajni Shah MD; Benjamin Maxson DO; Anthony F Infante DO; David Donohue MD; Katheryne Downes PhD; Roy W Sanders MD; Hassan Riaz Mir MD*
Florida Orthopedic Institute, Tampa, FL, United States

Purpose: Tibial pilon fractures are challenging due to fracture complexity and associated soft-tissue injuries. Multiple investigators have reported high rates of complications with acute open reduction and internal fixation (aORIF). A staged approach with initial external fixation followed by delayed ORIF (sORIF) has become the standard of care for pilon fractures for most surgeons. Limitations of sORIF include increased cost, need for additional procedures, and increased difficulty of the definitive ORIF. Some surgeons perform aORIF of selected pilon fractures based upon clinical experience and recent literature. The purpose of this study is to compare the outcomes of aORIF to sORIF of tibial pilon fractures.

Methods: A retrospective review of all operatively treated patients with AO/OTA 43-C fractures from 2010 to 2019 at our Level-I trauma center was performed. Adult patients with >6 months of follow-up were included. Patients were stratified into aORIF and sORIF groups. Patient demographics, comorbidities, ASA (American Society of Anesthesiologists) class, mechanism of injury, associated injuries, open fracture grade, and ISS were collected. Outcomes included operative time, reduction quality, wound dehiscence, superficial and deep infection, nonunion, amputation, flap coverage, arthrodesis, and posttraumatic osteoarthritis (PTOA). In addition to comparative statistics (Fisher exact, t tests, Wilcoxon rank sum), logistic regression models were used to estimate odds of complications.

Results: 98 patients met all inclusion criteria, with median follow-up of 12 months (range, 6-36). 40 patients underwent aORIF and 58 underwent sORIF. There were significantly more diabetic patients in the aORIF group, but otherwise no differences in group characteristics. ORIF time was significantly less in the aORIF group (121 vs 146 min, $P = 0.02$), with no difference in reduction quality. Univariate analysis showed no significant difference in dehiscence, superficial or deep infection, nonunion, amputation, flap coverage, or arthrodesis between groups. Additionally, aORIF was associated with a significantly lower rate of unplanned reoperation ($P <0.001$) and severe PTOA ($P = 0.02$). Univariate analysis also revealed that aORIF had lower incidence of composite "any complication" than sORIF ($P <0.001$). Multivariable logistic regression showed a 90% reduction in odds of "any complication" with aORIF: odds ratio 0.11 (95% confidence interval: 0.04-0.28); $P <0.001$.

Conclusion: We found a lower risk of complications with aORIF compared to sORIF for type C tibial pilon fractures. While not all fractures may be appropriate for aORIF, our results support other recent studies that have demonstrated the safety of aORIF when patients are properly selected by experienced fracture surgeons.