Outcomes of Pilon Fractures

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INTRODUCTION:
Pilon fractures are debilitating injuries with consequences affecting patients long-term and require unplanned surgical interventions. Post-operative complications such as infection, non-union, and post traumatic osteoarthritis require unplanned surgical interventions and further worsen outcomes. The primary aim of this study was to determine survivorship of the native ankle joint through evaluation of subsequent procedures and complications.
METHODS:
A retrospective chart review of pilon fractures was performed within a large healthcare system, including a level one trauma center, from 2010 to 2022. Patients with less than 6 months of follow-up were excluded. The primary outcome, survivorship of the native ankle joint, was determined by collecting ankle fusion, arthroplasty, and amputation data. Demographics, injury characteristics, and comorbidities (diabetes mellitus (DM), vascular disease, smoking status) were collected.
RESULTS:
Our cohort included 386 patients with an average age of 48.5 years, 51.6% were male. 11.4% had DM and 45.1% were smokers. 61.4% had a high energy mechanism and 23.6% were open fractures. Patients had an average of 2.8 operations, including irrigation and debridement, ORIF, bone graft, free flap, hardware removal, and definitive management with arthrodesis, arthroplasty, and amputation. Nonunion, high energy, open fracture, and infection were all associated with unplanned procedures ($p < 0.01$).
31 patients lost their native ankle, with 11 ankle fusions, 6 total ankle arthroplasty, and 14 amputations. Infection was associated with ankle fusion and amputation ($p < 0.01$). Those with infection were 15.6x more likely to undergo fusion. Open fractures were associated with amputation ($p < 0.01$). Diabetes and vascular disease were associated with amputation ($p < 0.05$).
DISCUSSION AND CONCLUSION:
This study demonstrates the burden pilon fractures place on patients, with an average of 2.8 operations per patient. With modern surgical technique, joint survivorship is likely for most patients at 92%. Notably, the presence of diabetes, vascular disease, open fracture, and infection were all significantly associated with loss of the native joint. Injury characteristics, such as high energy and open fractures, significantly affect the need for unplanned procedures following these devastating injuries.