## Pilon Fracture Outcomes: a retrospective review

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INTRODUCTION: Pilon fractures pose a significant challenge in orthopedics with regards to soft tissue management and patient outcomes. The purpose of this study is to examine factors that influence risk for adverse outcomes in the treatment of pilon fracture, specifically with regards to timing of definitive fixation.

METHODS: A retrospective chart review was performed with adult patients treated for pilon fracture from May 2016-December 2020, identified by OTA classification 43A-C from a single ACS Level 1 Trauma Center Fracture Registry. Univariate statistics were performed and logistic regression with stepwise selection used to identify variables associated with unplanned return to the OR (uRTOR) and incidence of any postoperative complications, including wound dehiscence, wound drainage, soft tissue breakdown, superficial or deep infection, nonunion, symptomatic hardware, or compartment syndrome.

RESULTS: 340 fractures met inclusion criteria (52.4% male, mean age 49.8±17.4). Mechanism of injury was most commonly a home accident/fall (39.1%), followed by other (31.5%) and motor vehicle accident (22.1%). 250/340 patients had other known fractures (mean fractures 2.2±1.7). 32.4% were classified as polytrauma patients. 21.8% of included pilon fractures were open at the time of initial presentation. Soft tissue condition at the time of surgery was noted to be abnormal in 17.4% of cases, including presence of fracture blisters. 83.8% of patients were hospitalized after definitive surgery, and 9.1% required transfusion. Time to external fixation in those treated with staged surgery was 1.6±4.1 days; time to definitive fixation after external fixation was 25.3±41.6 days (n = 62). Time to definitive fixation when treated without staged fixation was 2.7±5.7 days (n = 278). There were 19/340 patients with some recorded postoperative complications, including wound dehiscence (n = 3), soft tissue breakdown (n = 2), superficial or deep infection (n = 10) and nonunion (10). Significant factors predictive of postoperative complication in the series overall included smoking (63.2% vs. 33.6%), depression (26.3% vs. 9.7%), open fracture (52.6% vs. 19.9%), discharge to locations other than home or rehab (including long term care facilities, incarceration, AMA, or group homes) (26.3% vs. 6.3%). 43/340 patients had an uRTOR within 1 year, including for hardware removal (n = 34), revision for malunion (n = 12), manipulation under anesthesia (n = 4), amputation (n = 2), or other (n = 16). Significant factors predictive of uRTOR included smoking (48.4% vs. 33.3%), CAD (9.3% vs. 2.0%), depression (20.9% vs. 9.1%), open fracture (44.2% vs. 18.5%), discharge to locations other than home or rehab (19.0% vs. 5.8%) and any documentation of postoperative complications (44.2% vs. 0%). Complications and uRTOR were higher in patients treated first with external fixation but not significant (9.7% vs. 4.7%; 17.7% vs. 11.5%).

DISCUSSION AND CONCLUSION: Factors predictive of pilon fracture complications or uRTOR aide in patient expectation management, treatment, and postoperative planning. Early definitive fixation was not predictive of these adverse outcomes.