

Supination Adduction Ankle Fractures Develop Early Posttraumatic Arthrosis*Kimberly Jacobsen, MD; Justin Haller, MD; Reza Firoozabadi, MD; Hunter Ross, BS;**Julie Agel, ATC; Michael Githens, MD**Harborview Medical Center, Seattle, WA, United States*

Purpose: Supination adduction (SAD) ankle injuries, as characterized by a tension failure fibula fracture and vertical shear medial malleolar fracture, have not been well studied. These injuries can be associated with medial tibial plafond impaction and talar dome injuries. The incidence of tibial plafond impaction in SAD ankle fractures is unknown, as are rates of posttraumatic arthrosis, secondary operations, and treatment failure. The primary purpose was to identify the rate of tibial plafond articular impaction associated with SAD ankle fractures. Secondary purposes include identifying rates of posttraumatic arthrosis, secondary operations, and treatment failure. Lastly, we aim to identify whether the presence of articular impaction affects the rate of arthrosis.

Methods: A retrospective review of a prospectively collected data base at a Level-I trauma center was performed. Fractures associated with OTA codes 44A-C and 43B from 2005-2015 were screened for SAD ankle injuries. Patient demographics and injury characteristics including coronal and sagittal articular impaction of the medial tibial plafond were analyzed using injury CT scans. Treatment strategies including whether the impaction was addressed, implant choice, and duration of non-weight-bearing were analyzed. Posttraumatic arthrosis was graded using the Kellgren-Lawrence (KL) scoring system at 6 months, 1 year, and final follow-up.

Results: 777 ankle fractures were identified, 81 of which were SAD patterns. Of those patients who underwent CT scan, 84% had medial tibial plafond impaction. The mean sagittal impaction was 6.6 mm and coronal impaction was 6.1 mm. 88% of impaction injuries were multifragmentary. 30% had associated talar dome injuries. For those fractures with talar impaction, the maximum sagittal impaction was significantly larger than those without talar impaction. 45 patients had at least 6 months follow-up and 25 had over 1 year follow-up (average 25.4 months). At 6 months, 84% of patients had developed posttraumatic arthrosis, increasing to 95% at 1 year. Five patients progressed 1 grade of arthritis between 6 months and 1 year and 2 patients progressed 2 grades at 1 year. 20 patients had progressed at least 1 grade from their 6-month to final follow-up. The presence of impaction was not associated with development of arthrosis. 13 patients underwent removal of implants for pain, 2 patients went on to fusion, and 1 went on to a total ankle arthroplasty.

Conclusion: SAD ankle injuries have a high rate of medial articular impaction and development of early posttraumatic arthrosis. The presence of articular impaction did not effect the development of arthrosis. Secondary operations for implant removal were common, while treatment failure in this cohort was rare. Functional outcomes and long-term prognosis after SAD ankle injuries remain unclear and should be the focus of further study.