

Supination Adduction Ankle Fractures Are Associated with Complications and Poor Outcomes

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Purpose: Ankle fractures resulting from a supination adduction (SA) mechanism are uncommon and have been infrequently described in prior literature. Damage to the medial tibia plafond may be associated with these injuries and could portend poor function. The purpose of this study was to compare complications and outcomes for SA injuries versus torsional ankle fractures.

Methods: 1545 consecutive adult patients treated for an ankle (OTA 44) or simple tibial plafond (OTA 43B) injury at a single Level-I trauma center over 16 years were reviewed. Complications included superficial infection, deep wound infection, deficient wound healing, nonunion, malunion, and posttraumatic arthrosis (PTA: radiographic presence of osteophytes, joint space narrowing, or subchondral sclerosis/cysts at minimum 1-year follow-up). Patient-reported outcomes, as measured by the Foot Function Index (FFI) and Short Musculoskeletal Function Assessment (SMFA), were obtained after minimum 12 months. The most recent 200 consecutive patients treated for torsional ankle injuries (OTA 44, not SA) served as controls for comparison to SA patients.

Results: 50 patients with SA injuries were identified (3.2%). They were younger (41 vs 48 years, $P = 0.016$), with no other differences in other demographic or social characteristics. 62% of those with SA injury were involved in a motorized collision (vs 18.5%, $P < 0.001$). Higher rates of other hindfoot injury (28% vs 4.5%), other orthopaedic injury (68% vs 25%), and other nonorthopaedic injury (46% vs 9.5%) were seen in the SA group (all $P < 0.001$). 50% of those with an SA injury experienced at least 1 complication, versus 24% in the control group ($P < 0.001$). Those with SA injury had more PTA (78% vs 40%, $P = 0.006$), but no differences were noted in infection, malunion, or nonunion. SA patients more often underwent unplanned secondary procedures (20% vs 4.0%, $P < 0.001$), including ankle arthrodesis (6.0% vs 0, $P = 0.008$) and removal of painful implants (12% vs 1.0%, $P = 0.001$). FFI disability (56.5 vs 39.7, $P = 0.046$) and total scores (48.4 vs 34.2, $P = 0.059$) were higher (worse) after SA injuries, as were SMFA dysfunction scores (39.0 vs 28.2, $P = 0.052$).

Conclusion: SA injuries represented 3.2% of all ankle injuries, occurring in younger patients and via higher energy mechanisms more often associated with polytrauma. Functional outcomes are worse after SA injuries. Almost 80% of patients developed PTA, and SA patients more often had secondary procedures for pain relief, warranting counseling to patients about long-term sequelae of their injury.