Rate of Subtalar Joint Arthrodesis after Retrograde Tibiotalocalcaneal Arthrodesis with Intramedullary Nail Fixation: Evaluation of the RAIN Database

Presenting Author: Shyler L. DeMill, DO (Westerville, Ohio)
Additional Authors: Christopher F. Hyer, DPM, MS; Michael Dujela, DPM; Gregory C. Berlet, MD

Summary:
Hindfoot arthritis or significant deformity involving the ankle and subtalar joint is a disabling condition with few salvage options. Anecdotally, many surgeons note a decreased subtalar (STJ) fusion rate compared to ankle when a retrograde nail construct is used. The purpose of this study was to report the STJ fusion rate of tibiotalocalcaneal (TTC) arthrodesis with retrograde nail.

Introduction:
Hindfoot arthritis or significant deformity involving the ankle and subtalar joint is a disabling condition with few salvage options. Anecdotally, many surgeons note a decreased subtalar (STJ) fusion rate compared to ankle when a retrograde nail construct is used. The purpose of this study was to report the STJ fusion rate of tibiotalocalcaneal (TTC) arthrodesis with retrograde nail.

Methods:
An IRB approved comprehensive chart and radiographic review was performed from the RAIN database. Specifically, TTC fusions performed in patients with osteoarthritis, post-traumatic arthritis or deformity correction with retrograde nail were included. Exclusion criteria included neuropathy, Charcot, and failed total ankle replacement. Primary outcome measure was successful subtalar joint union with secondary measure of mean time to radiographic fusion.

Results:
A total of 70 retrograde TTC fusions met inclusion criteria. The average age was 56.1 (21-83, 15.1). There were 33 female patients and 37 male patients. 68.6% had both solid radiographic fusion of the ankle and subtalar joint. There were 12 cases (31.4%) of ankle arthrodesis, but incomplete union of the subtalar joint. There were seven cases (10%) of solid subtalar joint fusion but radiographic ankle nonunion. There were 3 cases (4.2%) of stable radiographic nonunion of both joints. The mean time to subtalar fusion was 115.3 days [22-734,105.9] There were no revisions in this study group.

Conclusion:
A 31% subtalar joint non-union rate in TTC fusion was noted when radiographs were critically evaluated. Despite this relatively high rate of subtalar joint nonunion, no patients required revision or long-term brace management. It is important to give proper attention to the subtalar joint when performing TTC fusions with retrograde intramedullary nail fixation including thorough joint preparation and grafting as required. In addition, selecting fixation constructs that provide compression and rotational stability across the STJ may improve fusion rates.