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Abstract #1943

A Retrospective Study: Outcome of Rigid Fixation (Plating) for Tibiotalocalcaneal Arthrodesis

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Introduction/Purpose: Tibiotalocalcaneal arthrodesis (TTCA) is a salvage procedure for end-stage pathology of the tibiotalar and subtalar joints including primary arthritis, severe deformity, failed total ankle arthroplasty, failed ankle arthrodesis with subsequent subtalar arthritis, talus avascular necrosis and Charcot arthropathy. Although many different fixation techniques of TTCA have been proposed, there is still no consensus gold standard fixation strategy. The various options include plate and screw constructs, intramedullary nails and external fixator systems. The purpose of this study is to report our experience with rigid fixation using a commercially available 4.5mm locking plate for TTCA.

Methods: We retrospectively reviewed the clinical charts and radiographs of 17 patients who underwent TTCA during the time period of 2012-2014. We used a lateral surgical approach with fibular osteotomy and a 4.5mm Smith and Nephew™ PERI-LOC ankle fusion plate. Two senior foot and ankle surgeons at our institution performed all surgeries. The main outcomes were postoperative fusion rate and complication rate.

Results: Of the 17 patients, 9 were male and 8 were female with a mean age of 53. 29% of patients had diabetes mellitus and 69% were either current or former smokers. The average BMI was 32.9. The average follow up was 17.7 months. The nonunion rate in our patient series was 76%. Nonunion was defined as no radiographic evidence of fusion at 6 months post-surgery. This failure rate is very high in comparison to historical data of nonunion rates in TTCA, which are often reported to be 7-26%. Only four out of 17 patients had a successful arthrodesis using this locked plate construct. Complications included nonunion, hardware failure (with screws and/or plate fracture), deep infection (35% of patients), and pseudoarthrosis.
Conclusion: Too rigid of fixation with thick stainless steel plates and locking screw constructs can lead to failure in tibiotalocalcaneal arthrodesis. Increased nonunion rates due to overly rigid fixation has been demonstrated in many other contexts but never in the foot and ankle literature.