

Intraosseous Screw and Post versus Traditional Screw Fixation for Talonavicular Arthrodesis

Seth O'Donnell, MD, Brad Blankenhorn, MD

Category: Midfoot/Forefoot

Keywords: Talonavicular arthrodesis; fusion; intraosseous fixation; IO Fix; screw and post; union rate

Introduction/Purpose: Talonavicular (TN) arthrodesis historically has high rates of non-union and complications including prominent hardware. Traditional constructs include screw fixation and can be limited by the geometry of the midfoot. Screw and post devices utilize a post implanted into the navicular and either fixed or variable angle compression screws inserted through the post into the talus. This creates a fixed angle intraosseous construct. Reported advantages include increased axial compression strength, low profile, and greater multi-plane stability during healing than traditional methods. Few comparison studies exist in the literature. We present our experience with TN arthrodesis using a screw and post device compared to traditional fixation at an average 13.7 month follow up.

Methods: A retrospective chart review identified consecutive midfoot fusion procedures at our institution performed by fellowship trained orthopaedic Foot and Ankle surgeons. Arthrodesis of the TN joint was the primary inclusion criteria. Prior infection and prior surgical procedures to the midfoot were excluded. Our cohorts were divided into traditional screw fixation and arthrodesis performed with the IO Fix (Extremity Medical, Parsippany, NJ) screw and post device. Primary endpoints were union rate, time to clinical and radiographic healing, and complications requiring return to operating room. Post-op rehab protocols were at the discretion of the surgeon and involved short leg cast or CAM boot immobilization with no weight bearing until clinical indicators of healing were present. Statistical analysis was performed with STATSPACK.

Results: Twenty-one consecutive patients were reviewed. One was excluded for prior procedures. Seven patients had IOFix and 13 patients had screw constructs. One patient was lost to all follow up. No statistical difference in demographics such as age, gender, BMI, or smoking existed (Figure 1). Primary fusion rate was 89% (17/19 patients). Average follow up was 13.7 months. Time to clinical healing was 9.9 weeks with screw fixation and 8.2 weeks with IOFix ($p=0.11$). Time to radiographic healing was 18.8 weeks with screw fixation and 13.5 weeks with IOFix ($p=0.01$). Three of 10 patients in the screw construct group had complications. One non-union was present in each group; both underwent revision fusion with IOFix and ultimately fused radiographically at average 16.2 weeks following revision.

Conclusion: Prior laboratory study has suggested screw and post constructs for talo-navicular arthrodesis have improved mechanical properties compared with traditional techniques. In our clinical comparison with screw fixation, we demonstrate a trend towards faster clinical healing and statistically significant faster radiographic healing with the IO Fix screw and post construct. Both non-unions in our cohort ultimately fused with use of the IO Fix device during the revision procedure. Additional study examining the cost of a commercial device may guide the surgeon in both primary and revision T-N fusion procedures.

