

## **The 3-Dimensional Printed Total Talus Replacement: A Novel Treatment Option for Avascular Necrosis of the Talus**

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**Purpose:** Talus avascular necrosis (AVN) is a challenging entity to treat. Management options depend upon disease stage and severity. Total talus replacement (TTR) is a treatment option that maintains joint range of motion. The literature on TTR is limited, with variability in implant design and material. The purpose of this study is to evaluate outcomes following TTR with a custom 3-dimensional (3D) printed metal implant.

**Methods:** Patients who underwent TTR were retrospectively reviewed over a 3-year period. Basic demographic data and comorbidities were collected. Medical records were reviewed to obtain postoperative and preoperative visual analog scale (VAS) scores, Foot and Ankle Outcome Scores (FAOS), ankle range of motion, and postoperative complications. Statistical analysis was conducted to compare clinical and patient-reported outcomes pre- and postoperatively.

**Results:** 28 patients underwent TTR for talar AVN with a mean follow-up of 16.4 months. Ankle range of motion remained unchanged statistically pre- and postoperatively. VAS pain scores improved significantly pre- and postoperatively from 6.6 to 3.9. FAOS scores significantly improved postoperatively with regard to pain, symptoms, quality of life, and activities of daily living. There were 3 complications requiring reoperation in this cohort.

**Conclusion:** 3D-printed total talus replacements represent a unique surgical option for patients with talar collapse secondary to AVN. Patients in this cohort demonstrated significant improvements in pain scores and patient-reported outcomes while maintaining preoperative joint range of motion. TTR allows for symptomatic improvement with the preservation of motion in individuals with talar collapse and end-stage AVN.