Use of Total Talar Prosthesis for Treatment of Post-Traumatic Avascular Necrosis of the Talus: A Case Report

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Purpose

A 52-year-old female presented with a chief complaint of pain and tenderness to the right ankle. The patient admitted to previous talus body fractures secondary to motor vehicle accident which was treated acutely with open reduction with internal fixation (ORIF). Following ORIF, she developed AVN of the talus. A STJ fusion was attempted, which resulted in a non-union and she was referred to our institute for surgical consultation. Initial evaluation demonstrated a severely atrophic joint with pain and stiffness of the right hindfoot and ankle. Ankle and STJ range of motion (ROM) was significantly limited with crepitus and pain. Imaging studies demonstrated STJ non-union and AVN of the talus. After discussion of surgical options she decided to pursue TTP implantation. A custom, 3D-printed, cobalt chrome TTP was developed utilizing radiographs and CT scan of the contralateral extremity.

Case Report

Figure 2 A-C: Intraoperative images demonstrating removal of the diseased talus, implantation of the talar prosthesis and prosthetic closure.

Procedure

A longitudinal incision was made over the anterior ankle to access the ankle through the interval of the tibialis anterior and extensor hallucis longus tendons. Retained hardware was then removed followed by the talar extraction. Extensive hypertrophic periarticular bone was then meticulously resected. Appropriately sized talar prosthesis was implanted, and the final TTP was implanted. Fluoroscopic evaluation demonstrated excellent ROM of the ankle and STJ with anatomic alignment of the TTP. Lateral closure was then performed.

Results

The patient’s postoperative course was uneventful and she remained non-weight-bearing in a cast for 6 weeks. Full return to activity occurred at 10 weeks post-operatively. At 12-month follow-up the patient was doing exceptionally well with sustained improvement in ankle and STJ ROM. Ultimately, the patient was satisfied with her outcome and is able to perform activities of daily living in normal shoe gear without pain or limitation.

Discussion

Post-traumatic talar AVN is a challenging condition encountered by foot and ankle surgeons. Surgical management of talar AVN traditionally consists of arthrodesis procedures aimed to relieve pain within the symptomatic joint. Unfortunately these procedures result in loss of function and carry a risk of nonunion, which is particularly concerning in our case.

Procedure selection is paramount in this patient population. In patients suffering from STJ arthrosis, concurrent STJ arthrodesis with TTP may be performed.14 This option was avoided based on clinical examination, radiographic findings, and response to diagnostic injection. Given the patient’s severe ankle arthritis, total ankle arthroplasty (TAA) with concomitant STJ TTP treatment was entertained. Studies evaluating this technique demonstrate promising results with improvements in subjective and objective outcome scores, which in some cases were more significant than with TAA alone. 15, 16 Despite these results and the viability of this procedure in our case, the patient declined combined replacement. Ultimately, based on clinical and radiographic findings it was the author’s opinion that TTP would provide the most suitable treatment option.

Post-traumatic talar AVN is a condition which can cause significant morbidity and reduced quality of life. Treatment of this condition is challenging and should be focused towards resolution of pain and function. This case presents a successful surgical treatment alternative to arthrodesis for patients suffering from post-traumatic talar AVN. Our one-year follow-up demonstrates encouraging results, though further research is needed.

References