

Statement of Purpose

We present a case study of a single stage technique which may be used as an attempt for major deformity limb salvage in the setting of chronic osteomyelitis of the talus.

Literature Review

Osteomyelitis is a severe infection of bone that can arise from a variety of mechanisms. Largely because of the avascular nature of sequestra, osteomyelitis is difficult to treat and can be associated with a high morbidity and possible mortality for the patient. Treatment is aimed at resolution of infection while maximizing function of patient [2]

Salvage of diffuse ankle osteomyelitis, especially in compromised hosts, is a challenging problem. Although transtibial-level amputation is a treatment option, studies show one-year mortality rate ranging from 23-33% following a transtibial-level amputation [1]. Options for salvage surgery are several, and most involve multiple surgeries and long-term treatment [3 and 4].

Successful surgical management requires meticulous excisional debridement of all non-viable bone and adequate management of dead space. The goal is to replace dead bone and soft tissue with viable vascularized tissue. Osseous defect reconstruction has involved a variety of techniques, including healing by secondary intention, closed irrigation and suction systems, temporary antibiotic-laden polymethylmethacrylate (PMMA) beads, autologous bone graft, and vascularized free fibula or iliac crest bone grafts.

Case Study

A 68-year-old male with a past medical history of asthma, CAD, COPD, HLD, HTN who presented with osteomyelitis of the talus was successfully treated with a left revisional ankle arthrodesis with total talectomy and application of femoral head allograft via IM nail in February 2022.

The patient initially presented to the ED in December 2019 after tripping and rolling his left ankle. Imaging revealed a closed, displaced tri-malleolar fracture where he was splinted and admitted per ED. Patient then underwent Left ankle ORIF (Open reduction internal fixation) with syndesmotomic repair. In March 2020, the patient was admitted to the hospital for left foot infection with dehiscence of surgical wound. He then underwent an incision and drainage with bone biopsies and wound vac application. The surgical bone culture was negative, He was then discharged on PO Bactrim for 3 months. The infection resolved, however the pain still ensued along with surgical dehiscence. Outpatient X-rays revealed a non-union of the fibula. In May 2020, patient returned to the OR for left ankle incision and drainage with hardware removal, revision of fibula nonunion, dermal graft substitute application, and wound vac application. In July 2020, patient underwent left foot incision and drainage with hardware removal, ankle arthrodesis, subtalar joint arthrodesis, tendo-achilles lengthening, and application of dermal graft substitute. The patient was then followed at TJH (The Jewish Hospital) outpatient Resident clinic where a bone stimulator and total contact cast were used. In this follow up period, patient had subsequent dehiscence of wound with painful prominent hardware. There were full thickness ulcerations which expressed purulence at both the medial and lateral aspect of ankle. Routine monitoring of inflammatory markers showed stable elevation during this period. Patients ankle was fixed in rigid valgus. Radiographs (Fig B) confirmed ankle valgus of 16 degrees with decreased joint space of the ankle.

In November of 2021, he underwent left foot incision and drainage, skin plasty, and bone biopsy of the talus. The talus was noted to be soft intra-operatively. This biopsy revealed acute osteomyelitis of the talus. Patient was then referred to infectious disease who placed him on PO doxycycline.

In February 2022, patient was successfully treated with a left revisional ankle arthrodesis with total talectomy. A femoral head allograft was used along with a 200mm intramedullary nail. Patient returned to full weight bearing in a CAM boot at 3 months post op. He returned to AFO (ankle foot orthosis) and normal shoe gear at 5 months. Today patient is ambulating without assistance in an AFO and has a wound-free, pain-free plantigrade foot with healthy osseous fusion upon x-ray (Fig D).



Fig A. Clinical pre-op picture of left ankle taken on November 2021



Fig B. Pre-op XR left ankle from November 2021



Fig C. Clinical post-op picture of left ankle from March 2022



Fig D. Post-op XR left ankle from March 2023

Analysis and Discussion

Severe limb deformity can create a major disability for a person which can ultimately lead to a non-ambulatory lifestyle. Limb deformities created by fractures not only put the patient at risk for a non-functional lifestyle, but the patient is also at risk for gross contamination and osteomyelitis of the osseous structures. At times, these deformities require amputation for better functionality, however, are associated with elevated mortality rate. However, an attempt for limb salvage should always be pursued. Most literature refers to a staged procedure using a temporary antibiotic nail, which may be exchanged for a permanent nail after infection resolves. Downfalls to this technique include the necessity of multiple surgical procedures and a prolonged non-weight bearing period.

We consider a TTC arthrodesis using a femoral head allograft a salvage procedure that is technically difficult to perform and carries a high risk for complications in patients who are immunocompromised. In this case, the patient developed ankle valgus as a result of complications from multiple salvage attempts from open reduction internal fixation of the ankle. Patient had also developed contaminant talar osteomyelitis that was inadequately treated with antibiotics. We successfully treated the talar osteomyelitis and ankle valgus with a single stage procedure consisting of total talectomy to address osteomyelitis, femoral head allograft to reduce dead space of the ankle, and intramedullary nail to provide the patient a stable plantigrade foot.

References

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