

**Purpose and Literature Review**

Prevention of major limb amputation in the face of septic arthritis and chronic osteomyelitis is a daunting task for any foot and ankle surgeon. Multiple case studies have been reported in the literature using an external Ilizarov frame in order to achieve septic fusion of an ankle joint with satisfactory union rates. Kollig et al in 2003 reported on 15 cases of ankle joint arthrodesis in patients with a combination of bone and soft tissue infections. They showed that hybrid external fixators present a successful alternative to fusion when concomitant infection is present. More recently, Kawoosa et al in 2015 looked at long term outcome at 6 months for 16 patients who had primary or revision ankle arthrodesis using the Ilizarov technique. All ankle reviewed in this study achieved a union rate at an average of 14 weeks with no major complications. Here we present a very complicated case study of a patient with both septic arthritis of the left ankle and chronic osteomyelitis of the distal tibia and talus who underwent multiple procedures and debridement in order to achieve a plantigrade foot and prevent loss of his leg. Our technique mirrors that presented in the literature by using an external frame to achieve gradual fusion. Our case is made more complicated, however, by the need for a total talectomy.

**Case Study**

This is a 70 year old man with a past medical history of essential hypertension who was initially seen as a consult at the local hospital for septic arthritis and chronic osteomyelitis of the left ankle status post complications from a failed ORIF of an ankle fracture/ dislocation done at an outside facility two years prior to admission. Limb salvage was attempted for the patient and included removal of all internal hardware, complete talectomy, resection of infected distal tibia with application of antibiotic impregnated spacer, and application of external multi-planar external fixator. The antibiotic spacer was removed at 8 weeks post-op and a femoral head allograft was inserted in the left ankle. Gradual fusion of the tibiocalcaneal joint was then performed using the external fixator. The external fixator was removed at 10 weeks. The patient subsequently developed recurrence of osteomyelitis and an acute abscess of the ankle, which necessitated further debridement of bone in the operating room with secondary wound closure utilizing negative pressure wound therapy. The patient received 8 weeks total of intravenous antibiotics, which was managed by the Infectious Disease team. The patient then had another external fixation system applied and gradual correction took place over the next ten weeks with successful arthrodesis verified by post-operative CT scan. The patient has since returned to ambulation in a rocker bottom shoe and has had no recurrence of infection at his one year post-operative visit.

**Images**

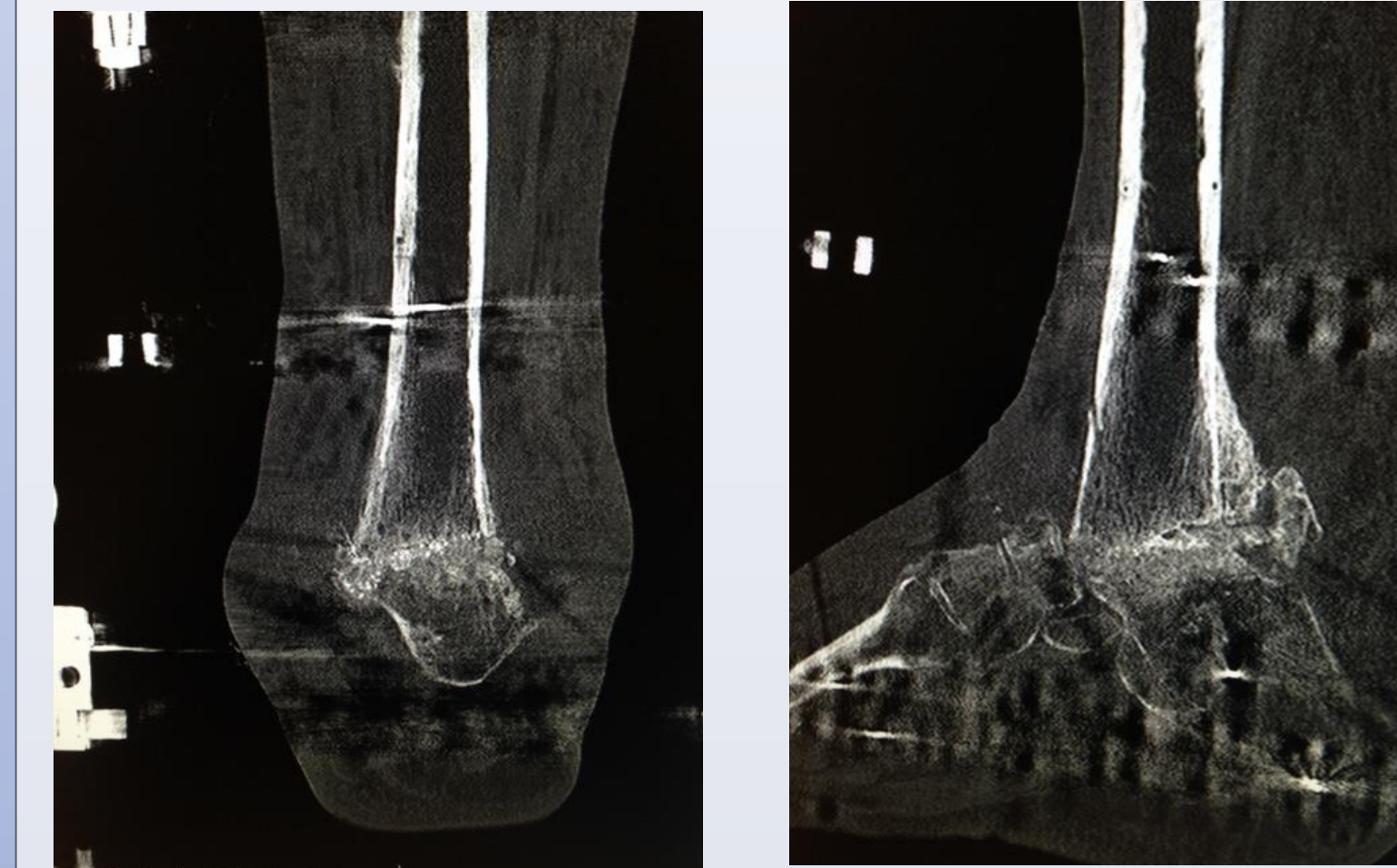


Radiographs of the left ankle taken when the patient was first evaluated in the hospital in April 2016.



Post-operative radiograph s/p talectomy with insertion of antibiotic apacer and external frame in April 2016

**Images (cont.)**



Post-operative CT san of ankle joint taken in May 2017 to confirm tibiocalcaneal fusion before removal of the external frame.



Radiographs of ankle joint taken at patient's later post-op visit in Dedember 2017

**Conclusion and Discussion**

A successful tibiocalcaneal fusion and limb salvage were achieved using gradual compression with external fixation in a septic ankle joint with chronic osteomyelitis that required multiple surgical debridements and multiple rounds of intravenous antibiotics. This case demonstrates that fusion across an infected ankle joint is possible by using an external frame even after extensive debridement of the distal tibia combined with a complete talectomy. This ultimately afforded the patient a plantigrade foot, resolution of chronic joint infection and osteomyelitis, and prevented a major limb amputation.

**References**

- 1) Kollig, E. et al . Fusion of septic ankle: experience with 15 cases using hybrid external fixation. J Trauma 55(4): 685-691, 2003.
- 2) Kawoos, A. et al. Ankle arthrodesis using the Ilizarov technique in difficult situations- a prospective study with mid-to-long term follow up. Orthop Traumatol Rehabil 17(2): 147-145, 2015.
- 3) Suda, A. et al. Arthrodesis for septic arthritis of the ankle: risk factors and complications. Arch Orthop Trauma Surg 136 910): 1343-1348, 2016.
- 4) Khanfour, A. Versatility of Ilizarov technique in difficult cases of ankle arthrodesis and review of literature. J Foot and Ankle Surg 19: 42-47, 2013.
- 5) Paley, D. et al. Treatment of malunion and nonunion at the site of an ankle fusion with the Ilizarov apparatus: surgical technique. JBJS 88(1): 119-134, 2006

**Acknowledgements**

The authors have no relevant financial interests to disclose. Special thanks to Palo Alto Medical Foundation and Dominican Hospital in Santa Cruz, California and to Dignity Health