

Failed Neuropathic Ankle Fracture Converted to IM Nail

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Purpose

Despite advances in ankle fracture fixation, neuropathic fractures remain a very complex multifactorial surgery. More diabetic patients are living extended and active lives. Diabetics are known to have higher rates of hardware failure, infection and healing complications. Unfortunately increase in diabetic epidemiology is also directly correlated with increased complications. In attempts at limb salvage surgeons must be aware of options to treat failed and infected ankle fractures to prevent amputation in the diabetic patients. When complications occur, the surgeon must address them in a swift and effective manner with the main goal of producing a plantigrade and functional extremity with as little pain as possible.

Literature Review

Hindfoot arthrodesis with an intramedullary (IM) nail has been effective in physiologic preservation of the extremity. In cases with significant bone loss due to failed ankle hardware or osteomyelitis, intramedullary arthrodesis becomes an essential salvage tool. Patients have been shown to respond favorably to this procedure with significant increase in subjective scores postoperatively along with up to 100 percent fusion rates(1-5). Schill's single non-union in a cohort of 15 patients who underwent intramedullary hindfoot arthrodesis secondary to infected ankle implants further speaks to the stability and predictability of the procedure(2). In 16 patients with failed total ankle replacements, Kotnis et al showed more favorable outcomes with patients who underwent hindfoot fusions versus revisions total ankle replacements(3). At this point, the literature supports this method of therapy in providing a stable extremity capable of facilitating pain-free ambulation. IM nailing following eradication of more distal infection is a standard to correct and salvage an infected ankle or Pilon fracture, especially in the neuropathic patient where a pseudo-arthrosis or hardware retained will have minimal residual pain consequences.

Case Study

A 52-year-old neuropathic diabetic with poor glycemic control sustained and Left trimalleolar ankle fracture/dislocation. The initial fracture was reduced and the patient underwent an essential ORIF of the ankle using standard AO technique. The patient's initial Blood Glucose was 290 in the E.D. and HgA1c following was 11.3. Upon follow-up the patient walked continually and did not use any DME assist against medical advice. The patient subsequently went onto dehiscence and due to poor follow up he became infected and did not seek treatment until he had seeded his distal fibula and possibly his talus. He subsequently had a removal of the infected and failed hardware, the lateral fibula and portions of his talus was removed and biopsied. The patient had 8 weeks of antibiotics via PICC line for MSSA and also had an PMMA antibiotic spacer placed with both Gent and Vanco mixed. Following the treatment of the infection, the patient had a removal and excision of all fibrosis and an IM nail placed with minimal joint resection of the subtalar joint. Both tibia and fibula autograft and Iliac crest allograft were used as adjuncts. The patient subsequently only showed for one post op visit to have stitches removed and then followed up 13 months later. At the 14 month point the patient had a fibrous union of both the ankle and subtalar joints. He had minimal pain and a corrected deformity. The foot was plantar-grade and minimal swelling despite the pseudo-fibrous (nonunion) of the STJ and ankle. Clinically, his gait is antalgic with no tenderness at the ankle and sinus tarsi. Ankle / STJ range of motion is limited. Radiological findings showed talar sand STJ nonunions. These findings were confirmed on CT images. Despite the patient's noncompliance after surgery, he still had a fair outcome and salvage of the limb at this time.

Analysis/ Discussion

In the case of total ankle implant failure, it is important to establish long-term functional and quality of life goals. These goals can aid the surgeon in deciding on continuing to fight to salvage the leg or turning to amputation procedures. In the case presented, the amount of noncompliance coupled with the DM neuropathy and poor glycemic control directly resulted in osteomyelitis. After proper treatment of the infection with both IV and antibiotic spacer, long-term goals lead to the choice of an IM nail procedure. This patient had a limb salvaged despite profound non-compliance and functions well with a pseudo-arthrosis of his Tibia-Talar-Calcaneal Fusions.

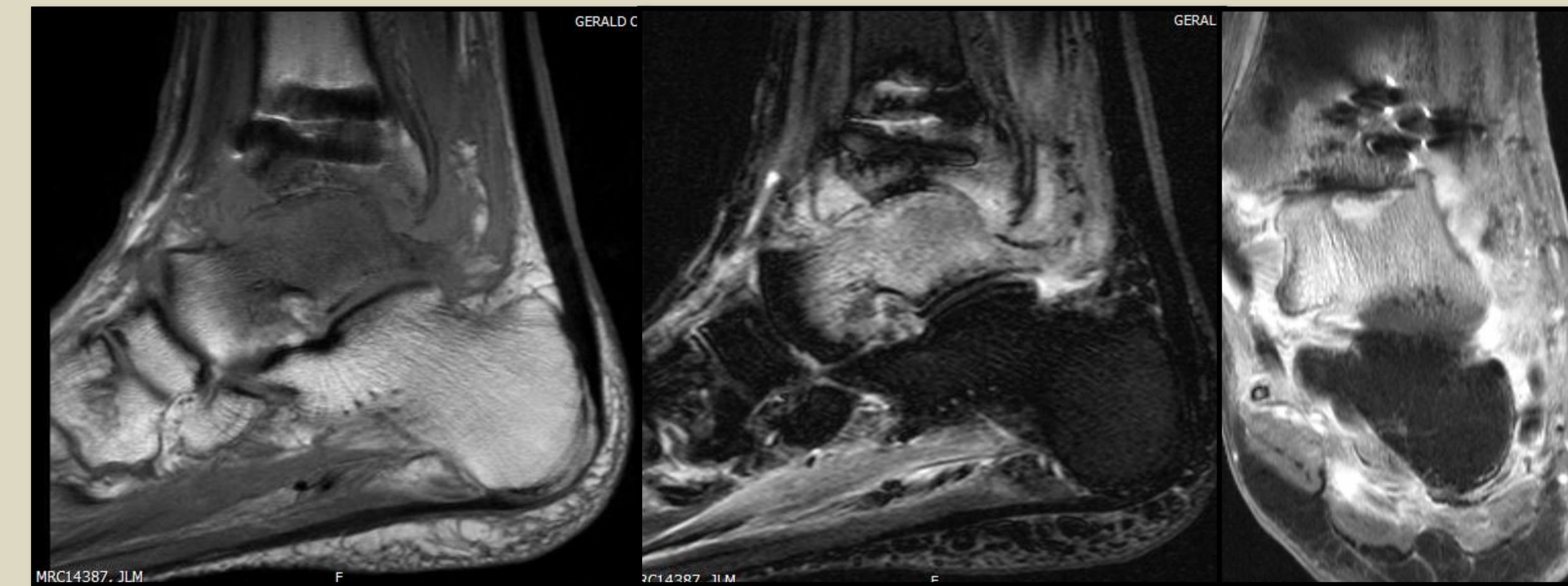
Results

The patient is now 27 months post-op and is ambulating with no pain. He had severe complications of his ankle fracture directly related to the severe injury, his non-compliance and his DM with neuropathy. He has had an uncomplicated IM NAIL postoperative course mostly because he FAILED to follow up. The patient has shown that despite unlikely odds, he still has a functional foot and leg. This patient has a functioning pseudo arthrosis after fracture complications.

27 months post - op



Pre - op w/PMMA Spacer



References

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