

20 Degree Post Traumatic Ankle Valgus and Distal Lateral Tibial Osteonecrosis Treated with Staged Deformity Correction and Total Ankle Arthroplasty: A 5-year Follow Up

Statement of Purpose

The purpose of this review is to present a case of post-traumatic ankle valgus and distal lateral tibial osteonecrosis successfully treated with staged deltoid repair, opening wedge tibial osteotomy, fibular lengthening, syndesmotic fusion and total ankle arthroplasty.

Introduction

The list of relative and absolute contraindications for total ankle arthroplasty is extensive. Oftentimes the surgeon plays the role of convincing the patient to not undergo replacement. Steck and Anderson offered a well-thought list of indications, relative contraindications, and absolute contraindications:

Their indications included age >55, low physical demand, good bone stock, intact neurovascular status, immunocompetent, ankle allowed to be reduced to neutral, competent deltoid ligament, arthritic generation secondary to: Inflammatory arthritis, OA, trauma, or successfully treated sepsis.

Relative contraindications include AVN of talus, age <55, poor bone stock, immunosuppression, smoking, ankle deformity, history of sepsis with questionable resolution, severe trauma with bone loss, DM, obesity, workmans compensation, osteoporosis.

Absolute contraindications include high physical demand, poor distal vascular supply, significant neuropathy, incompetent deltoid, nonreducible deformity, suspicion of infection, severe soft tissue compromise, NM disease, noncompliance, AVN of entire talar body.

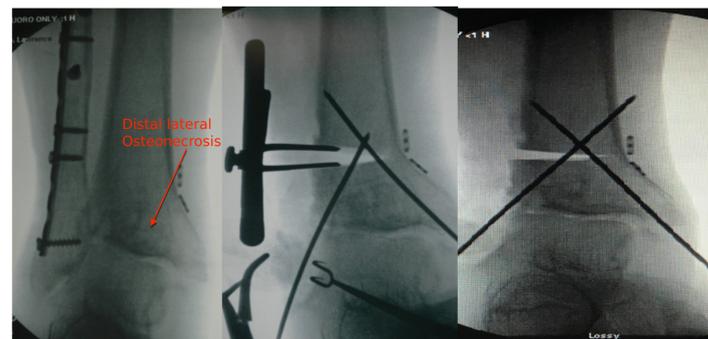


Figure 1: AP X-rays demonstrating pre-op valgus deformity and intra-op opening wedge tibial osteotomy.

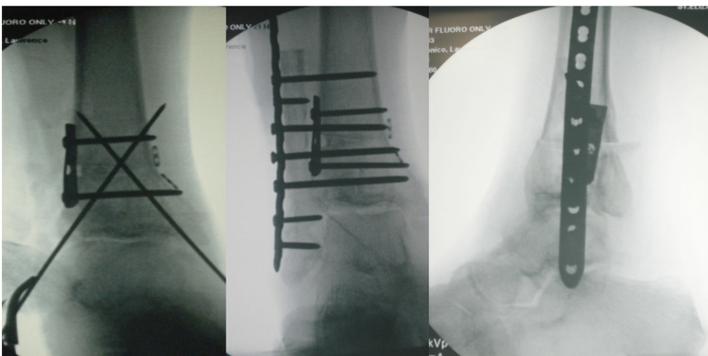


Figure 2: X-rays demonstrating fixation of the opening wedge osteotomy, fibular lengthening osteotomy, internal rotation of the distal fibula and syndesmotic fusion



Figure 3: AP X-ray demonstrating union of the syndesmosis and opening wedge osteotomy, also confirmed by CT scan. Pre-op X-ray before total ankle replacement & Post-op total ankle replacement

Case Report

A 56 year old male presented with the complaint of right sided post traumatic ankle pain. He experienced supination-external rotation ankle fracture which was reduced and fixated initially at an outside institution. At follow up the patient was informed that the reduction was not satisfactory, he underwent two subsequent surgeries to reduce his dislocated ankle. When he presented to our institution he was ambulating in a cane with an apropulsive gait. His radiographs revealed a 20 degree ankle valgus with an apex in the distal tibial metaphysis. The radiograph also displayed a lucency in the distal lateral tibia which was confirmed by CT scan as osteonecrosis. The senior surgeon as well as the patient were interested in a total ankle arthroplasty. The patient's physical demands as well as age and co-morbidities were amenable to replacement. The only major concerns with this particular patient were the valgus deformity and osteonecrosis. A staged approach was decided upon.

Initial surgery consisted of ankle joint arthrotomy and deltoid imbrication. The second surgery consisted of a tibial opening wedge osteotomy with autogenous cortical fibular bone graft superior to the area of osteonecrosis to correct the 20 degree ankle valgus. Fibular lengthening osteotomy, internal rotation of the fibula and fusion of the distal syndesmosis were also performed (Figures 1,2). Xray and CT scan confirmed bony consolidation at the distal tibiofibular syndesmosis as well as union of the allograft opening wedge (Figure 3). The final surgery was total ankle joint replacement with bone grafting of the area of osteonecrosis (Figure 4).

Results

After 5 years of follow up the patient has progressed out of his AFO to full weightbearing. He reports no pain, improved function and is ambulating independently with no assistive devices

Discussion

Distal tibial osteonecrosis is not a common occurrence. Since Assal et al's case series and Rajagopalan et al's case report we know of 11 cases in the literature. Osteonecrosis of the distal tibia is thought to occur due to trauma and resultant intra osseous compartment syndrome, especially in areas of relatively poor blood supply. Assal et al described radiographic findings of osteonecrosis to be loss of bone density adjacent to the talo-crural joint, spotty sclerosis, lacuna formation with progressive collapse, joint space narrowing, and malalignment. This clinical entity has been a result of ankle fracture in all reports including ours. Treatment has traditionally been drilling, grafting, realignment, and fusion(2,3).

We successfully treated a case of distal lateral tibial osteonecrosis, and a 20 degree ankle valgus with staged deformity correction and ankle replacement. Radiographs demonstrate a well seated and positioned implant. We believe that with proper alignment that total ankle arthroplasty is a safe treatment option in the face of bone infarction.

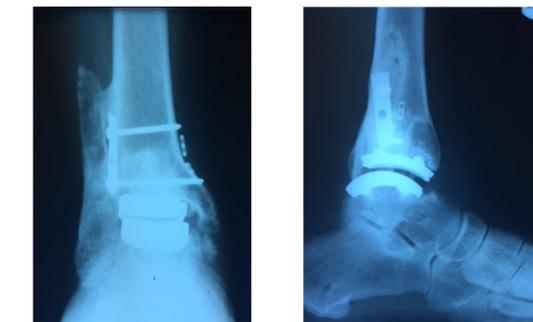


Figure 4: AP and LAT x-rays demonstrating rectus alignment of the ankle joint at 5 years status post total ankle replacement



Figure 5: Clinical photographs 5 years status post total ankle replacement

References

1. Steck JK, Anderson JB. Total Ankle Arthroplasty: Indications and Avoiding Complications. Clin Podiatr Med Surg 26 (2009) 303-324
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3. Assal M, Sangeorzan BJ, Hansen ST. Post-traumatic osteonecrosis of the lateral tibial plafond. Foot and Ankle Surgery 13 (2007) 24-29

