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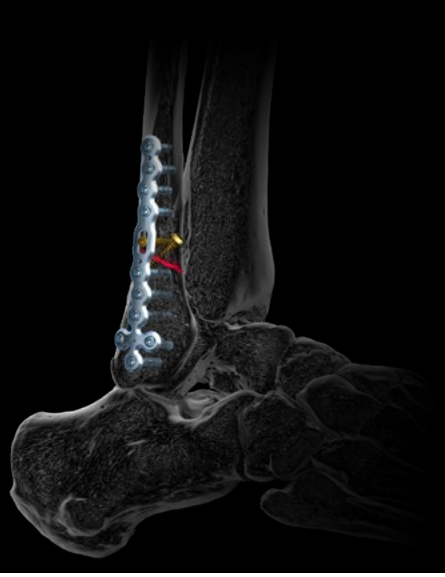
CASE REPORT



Medartis Ankle Fracture Case Study

The Surgeon

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Hospital: St.Lucie Medical Center, Port St. Lucie, Florida

Dr. Sebag is an Ankle and Foot surgeon with experience in complex foot and ankle injuries. He works at Coastal Orthopaedic & Sports Medicine Center in Stuart and Port St. Lucie, FL.

Introduction

Ankle fractures are amongst the most commonly encountered lower extremity injuries having a significant impact on quality of life and years lived with disability (YLD).
Reducing disability and increasing function are pillars of surgical treatment.

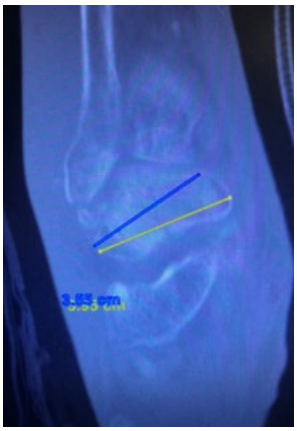
The Case

Patient Profile
The patient was an 88-year-old female who presented to the emergency department with an inversion-type ankle injury after stepping off a curb and landing backwards at her assisted living facility. She reported immediate pain, hearing an audible pop, and an inability to ambulate. Her pre-injury ambulatory status was considered excellent, with unassisted normal bipedal weight-bearing reported without limitation. Her past medical history is consistent with osteoporosis, hypertension, three childbirths, and a total hip replacement to the contralateral side. She was splinted and brought to the ED via EMS, where plain film radiographs revealed a significant ankle injury, including of tibial plafond shearing fracture with displacement and distal fibular fracture with comminution. The ED performed a closed reduction with conscious sedation, posterior stirrup splinting, and non-contrast CT scans. The patient was admitted to our institution for formal workup and fracture management.

Examination
Upon examination, the patient was in severe pain to the ankle with no other injuries. The soft tissue integument, although ecchymotic and fragile, remained closed without skin tenting. Instability was evident with a tendency for the joint to fall into varus because of the nature of this injury. Neuroprotective sensation and vascular checks were within normal limits with palpable pedal pulses and brisk capillary fill time. A jones type compression splint was applied, and icing, elevation, and edema control measures were taken to optimize the patient for reconstructive efforts pending CT scan evaluation.

Imaging and Diagnosis

Post-reduction AP, mortise, and lateral X-rays display a comminuted distal fibular fracture with multi-segment failure, and a Mueller D type medial malleolar injury which extends to a central portion of the plafond. Advanced imaging identified a minimally displaced oblique talar body fracture, a Sneppen classification coronal plane variant .



Case Assessment

This patient had poor bone stock and suffered a complex fragility fracture with concurrent talar trauma. Advanced imaging was paramount in the preoperative planning and fixation placement of a complex osseous fracture which was performed in a stepwise approach. Surgical considerations included external fixation, internal fixation, joint sparing, and joint sacrificing ankle arthrodesis procedures. Given the patient's health and independence, pre-injury activity level, and our mutual desire to maintain motion, we agreed for joint preserving open reduction with internal fixation of both ankle and talar fractures with a goal of early weight-bearing.

Surgery

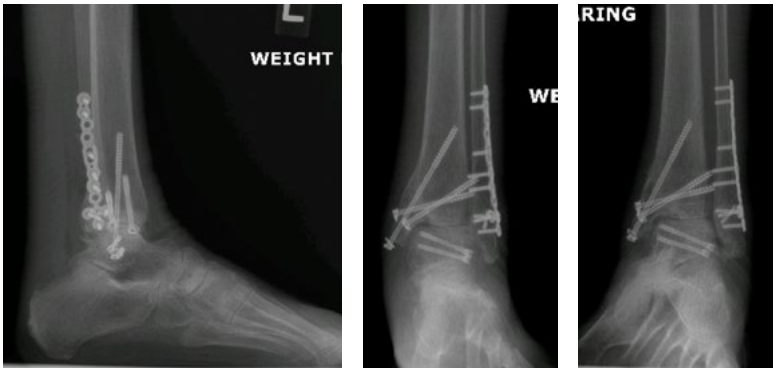
Following regional block administration and supine positioning, the Medartis 2.8/3.5 Ankle Trauma set and CCS screws were verified sterile. First, the Talar body ORIF was performed, next the fibula was repaired, and the distal tibial injury was fixated last. This was to ensure talar body fracture could be optimally fixated without potential disturbance of the recently fixated malleoli. Two K-wires for CCS screws were placed percutaneously from inferior-distal-lateral to superior-proximal-medial within the talar body. Once verified with fluoroscopy to be well-positioned, cannulated screws of appropriate length were placed following drilling and sequentially tightened to close gaps within the talar body fracture. A minimal lateral malleolar incision approach was employed for fibular repair. Reduction was obtained with forceps', and percutaneous plating and CCS screw placement was performed to bridge comminution and maintain length within the lateral malleolous. Due to autoclave issues, initially planned for large bore cannulated screws were unavailable. A competitor titanium 5.0-7.0 cannulated screw set was pulled off the shelf for use in the medial malleolus.

The medial malleolus was fixated with three off axis 5.0 mm cannulated screws with washers and sequentially tightened in AO fashion. Layered closure was performed and a padded below knee splint applied.

Three Weeks Postoperative
At three weeks postoperative, the splint and sutures were removed. A controlled ankle motion boot was dispensed, and the patient was instructed to begin passive and active ROM outside of the boot. Non-weight bearing was maintained until seven weeks post-injury.

Seven Weeks Postoperative
X-rays taken at seven weeks postoperatively showed good alignment and adequate bone healing to begin protected partial weight-bearing in the boot. Continued ROM was encouraged and formal physical therapy was initiated the following week.

Eleven Weeks Postoperative
The eleven-week postoperative x-rays showed sufficient healing allowing for a transition to full weight-bearing to the patient's tolerance. The patient was then weaned from the boot and transitioned to full weight-bearing with a lace-up ankle brace in a supportive shoe. All normal activities of daily living were fully resumed, and the ankle brace was discontinued at 16 weeks post-injury



Six Months Postoperative
Evidence of trabeculation and healing at the injury sites is noted. No evidence of hardware complication, avascular necrosis to the talus, or advanced posttraumatic arthritic change.

Surgeon's Notes

Complications due to traumatic injury, particularly periarticular, segmented, or fragility fractures in a weight-bearing limb, require important treatment considerations to return the injured to early weight-wearing.

The Medartis 2.8/3.5 Ankle Trauma system in conjunction with CCS screws allows a versatile combination of internal fixation in scenarios where precise screw placement is required, and multi-joint preservation is vital. With all plates holes providing axial variability, locking potential, and low profile Grade 4 titanium, the system allows confident implantation of hardware and empowers the surgeon due to freedom from fixed screw orientations. This is paramount when bone quality is of concern and when early weight-bearing is planned for. The system allows for accurate and precise hardware placement , immediate stability, and reduction of the fracture fragments while allowing biologic preservation to allow healing due to soft tissue sparing, anatomic hardware design.

This patient consented to this publication and continues to do well at 9 months post-injury

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