

Surgical Repair of Multiple Fractures and a Lisfranc Injury: A Case Study

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ABSTRACT

CASE HISTORY: The patient in this study was a 21-year-old college student. She sustained the injury when jumping from height at a trampoline park onto an airbag with the foot in full plantarflexion and phalanges in full extension. **PHYSICAL EXAM:** Immediately following the injury, the patient described severe pain and inability to ambulate with proper gait. However, the patient was able to walk if she put all her weight through her heel. Within six hours, edema and bruising were evident throughout both the dorsum and plantar aspects of the foot and toes as well as around the ankle. The patient was point tender along the tarsometatarsal joint line on both plantar and dorsal surfaces. **DIFFERENTIAL DIAGNOSES:** Metatarsal fracture: The patient described tenderness along metatarsal bones and was unable to plantarflex foot. Navicular fracture: The patient described pain through the arch of the foot, pain with walking, and edema and bruising. Syndesmosis, Ankle Sprain- The patient described pain while walking but was able to bear weight through the heel. **TESTS & RESULTS:** The patient underwent further evaluation at an orthopedic clinic the next morning where a full set of weightbearing x-rays were ordered. These images showed gapping between the medial and intermediate cuneiforms. The patient was then referred to the hospital for an MRI. The MRI showed stress fractures of the cuboid as well as the first, fourth, and fifth metatarsals. Other findings included extensive deep soft tissue edema consistent with a lateral ankle sprain and full thickness tear of the Lisfranc ligament. The patient underwent an open reduced internal fixation (ORIF) with two screws. The proximal screw extended through the medial cuneiform into the intermediate cuneiform. The distal screw extended through the medial cuneiform into the second metatarsal. While at a follow up appointment four months post-op, the x-ray showed a sheared distal screw. Two weeks after discovery of the broken hardware, another surgery was completed to remove it. **FINAL DIAGNOSIS:** 1. Stress fracture of the cuboid. 2. Stress fractures of the first, fourth, and fifth metatarsals 3. Extensive deep soft tissue edema, greatest laterally with evidence of lateral ankle sprain 4. Fiber thickening and increased signal within the Lisfranc's ligament suggesting a full-thickness tear. **DISCUSSION:** A Lisfranc injury is an uncommon injury in which one or more of the proximal metatarsal heads are displaced from the talus. The main mechanisms of injury are an axial force through the foot or twisting on plantar-flexed foot. In this case, not only did the patient sustain a Lisfranc injury, but she also sustained several acute stress fractures accompanied by expected soft tissue damage. Additionally, the fixation hardware failed which led to an additional surgery and extended healing time. **OUTCOME OF THE CASE:** After the first surgery, the patient was given a scooter for 12 weeks in order to avoid weightbearing. She then began partial weight bearing. At 16 weeks, it was discovered that the hardware failed. The cause of this failure is unknown, but it is thought partial weight bearing while on crutches could have contributed to the hardware malfunction. After the hardware was removed during the second surgery, the patient was weightbearing immediately while in a boot. Full weight bearing in tennis shoes was allowed at 24 weeks. **RETURN TO ACTIVITY AND FURTHER FOLLOW-UP:** At six months post-op, the patient was fully released. Patient is now fully functioning and back to normal a year later.