Iatrogenic Ankle Joint Dislocation Following Subtalar Joint Closed Reduction in the ED

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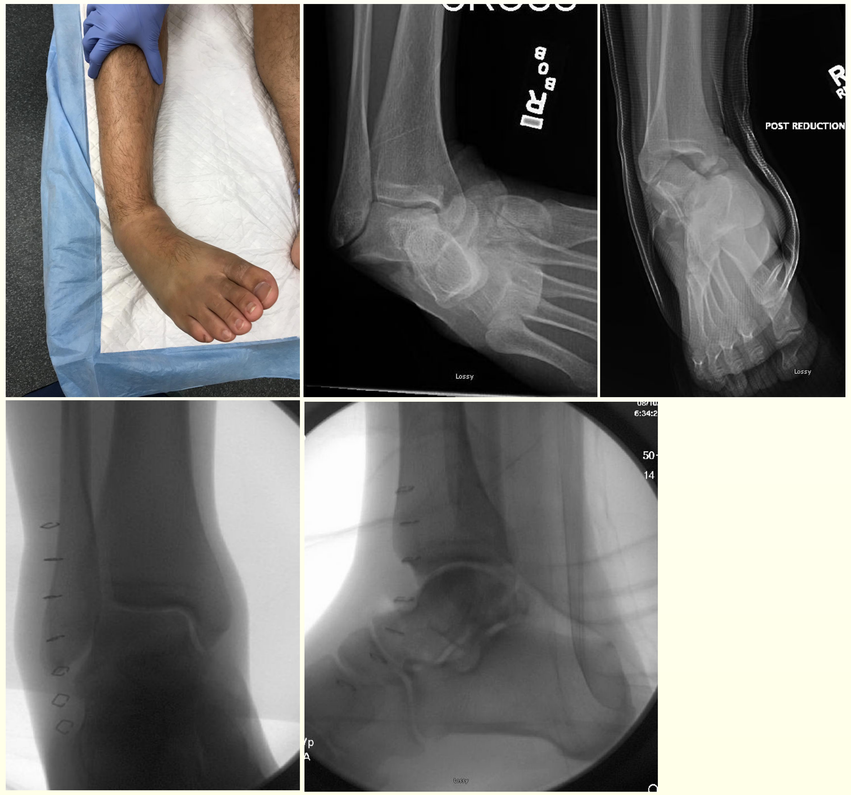
BACKGROUND

Subtalar joint (STJ) dislocations are rare, typically high energy, injuries representing approximately 1-2% of large joint dislocations. Axial, high-energy forces acting through the STJ due to motor vehicle accidents or falls from height account for 50-80% of these injuries.[1] STJ dislocations can displace medially (80%), laterally (17%), posteriorly (2.5%), and anteriorly (1%).[3] Given the infrequency of these injuries, the precarious blood supply to parts of the talus and numerous ligamentous attachments and articular surfaces, proper techniques along with the anatomical nuances of the STJ should be understood when attempting to reduce such dislocations.

We discuss the case of a forty-year-old male who presented to the Emergency Department (ED) after sustaining an ankle injury at a trampoline park. X-rays were obtained and revealed a medial STJ dislocation. An attempt was made by the ED physician to reduce the dislocation. Post-reduction x-rays showed a malreduced STJ dislocation and an iatrogenic ankle joint dislocation, sustained during the attempted STJ reduction. The decision was made at this time to take the patient to the OR for closed reduction under anesthesia versus open reduction of the STJ and ankle joint.

PRE/POST REDUCTION



SURGICAL TECHNIQUE

After general anesthesia was administered, an attempt at closed reduction of the STJ dislocation was attempted, unsuccessfully. The decision was then made to openly reduce the injury. An anterolateral incision was made over the ankle joint, at an interval between the anterior border of the fibula and superficial peroneal nerve. After further dissection, the anterior ankle joint along with the lateral ankle ligamentous complex was found to be ruptured. The talus was rotated 90 degrees in a clockwise fashion. Osseous fragments of the talus were identified in the posterolateral aspect of the ankle joint that were likely preventing previous attempts at closed reduction. These fragments were manipulated out of the way. The talus was then rotated in a counterclockwise fashion and reduced into the tibiotalar joint. The talar head was then placed into an anatomic position in relation to the navicular. The foot was everted and both the talonavicular joint and subtalar joint reduced, evidenced clinically and via intraoperative fluoroscopy.

Post-operatively, the patient was non-weight bearing in a posterior mold. A CT was obtained and revealed an intraarticular, comminuted fracture through the posteromedial talar body. Approximately 2 weeks post-op, the patient was taken back to the OR for open reduction with internal fixation of the fractured talus. Through a posteromedial incision, the talus was exposed and 4 headless compression screws were placed across the 2 main fracture lines, 2 screws from medial to lateral and 2 from posterior to anterior. After 2 weeks non-weight bearing in a posterior mold, the patient was placed into a short leg cast and kept non-weight bearing for an additional 8 weeks. At 10 weeks post-op, he was taken out of the short leg cast, placed into a CAM boot, and permitted to bear partial weight. At 12 weeks post-op, he was allowed to begin full weight bearing in a CAM boot. At post-op week 13, he began formal physical therapy for 6 weeks. He was allowed to return to work at 5 months post-op with restrictions of light duty. At 8 months he was allowed to return to work with no restrictions. At his final visit 14 months post-op x-rays taken in office showed complete union of fracture sites and the patient was back to work full time as a manual laborer with minimal pain.

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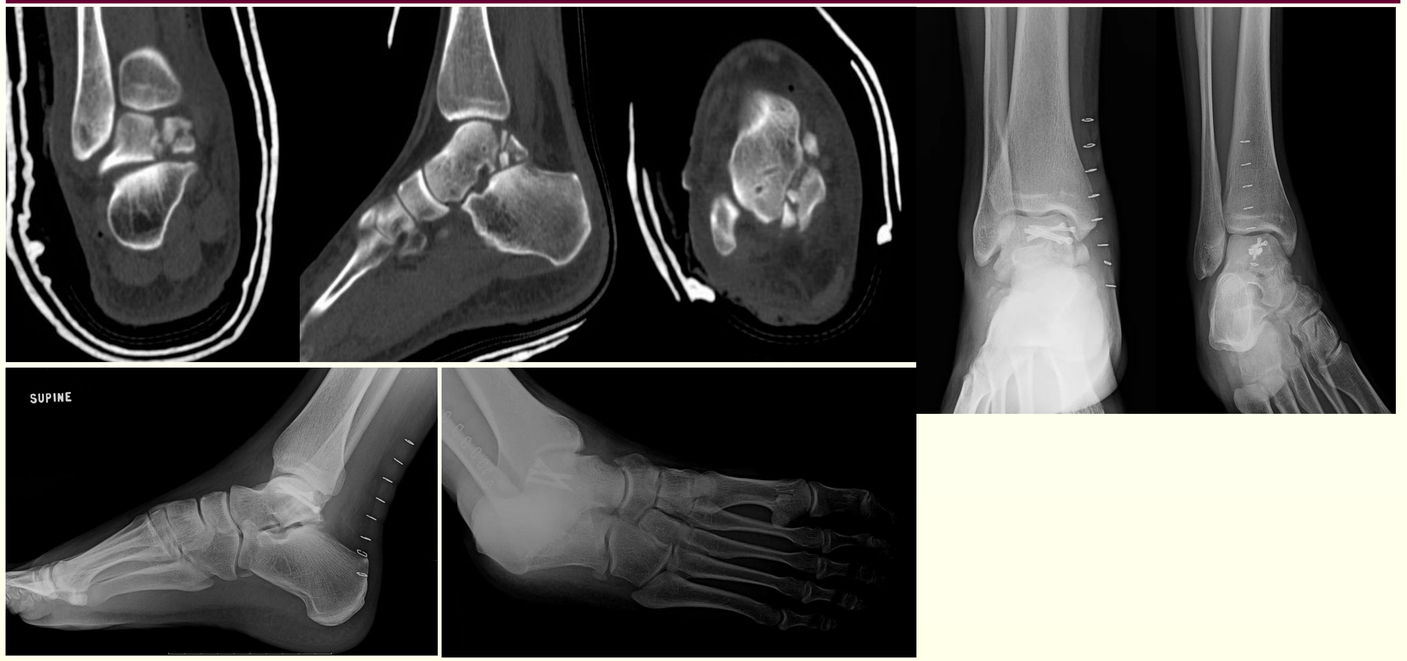

DISCUSSION

STJ dislocations are rare injuries accounting for approximately 1-2% of all dislocations.[1] A review of the literature did not reveal any cases of an iatrogenic ankle joint dislocation following attempted reduction of a STJ dislocation. However, it is well established that STJ dislocations typically result in the disruption of several ligamentous attachments and lead to an inherently unstable foot and ankle. Additionally, approximately 10% of medial STJ dislocations, as seen in our case review, are irreducible via closed reduction.[3] This can be a result of the tibialis posterior tendon or flexor digitorum longus tendon wrapping around the talar head and effectively incarcerating it in the superior extensor retinaculum.[1,2] These factors place a patient at risk for further injury during reduction, as the physician attempting the reduction will place greater force at the STJ and surrounding structures, in our case the ankle joint. In instances of exceedingly difficult STJ reductions it is advised to take the patient to the OR for formal reduction under anesthesia in an effort to not only reduce the risk of damaging surrounding structures but also decrease the chances of avascular necrosis (AVN) and post-traumatic osteoarthritis (PTOA). Rates of AVN after displaced talar body fractures are approximately 50%.[4] Similarly, rates of PTOA are between 50-100%, with increasing likelihood of PTOA over time.[5] Studies have shown that time to reduction is the most important factor for restoring vascular supply and reducing the incidence of AVN. However, time to fixation is not an indicator for likelihood of AVN.[5] This case study highlights the importance of understanding both the esoteric anatomy of the STJ and proper techniques/procedures for successfully treating STJ fracture dislocations.

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