Arthroscopic Assisted Reduction and Percutaneous Fixation of a Talar Body Fracture

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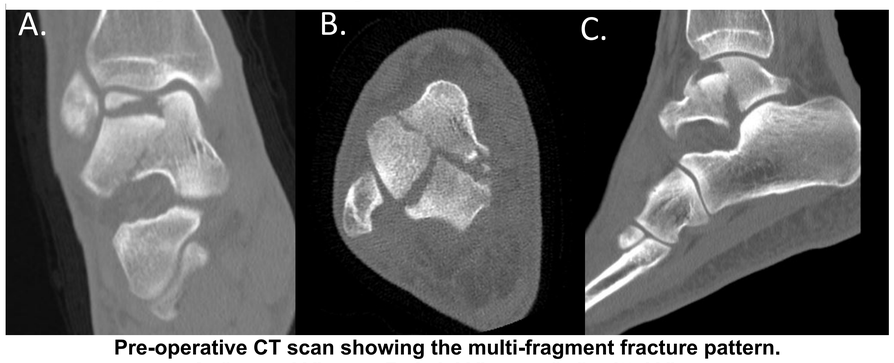
PURPOSE

The purpose of this case study is to present the use of arthroscopic assisted fracture reduction with percutaneous fixation of a talar body fracture with multiple fragments.

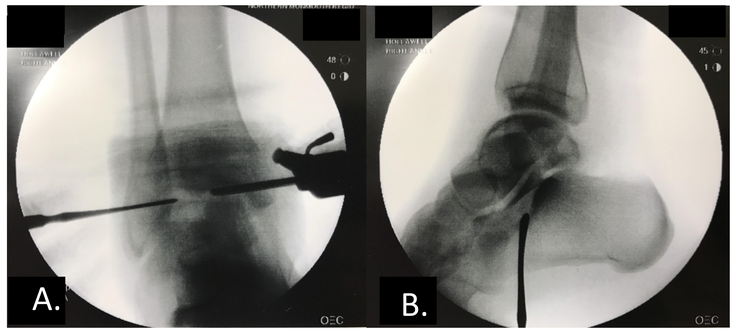
Pre-operative radiographs
A. AP View
B. Lateral View

REVIEW OF LITERATURE

Talar body fractures are less common than talar neck or process fractures (1). Talar body fractures are associated with the highest incidence of DJD compared to neck or process fractures (1). The tenuous blood supply of the talus and high incidence of AVN after talar fractures is well documented. An arthroscopic approach minimizes soft tissue trauma and allows precise fracture fixation under direct visualization of the joint. An arthroscopic approach can provide better visualization of the articular surface and help prevent complications associated with an open approach (2). ARIF is best suited for two-fragment fractures without severe soft-tissue damage. More complex fractures with soft tissue involvement are typically more difficult to manage and at an increased risk of saline leakage or compartment syndrome (3). Based on existing literature, the effectiveness of ARIF compared with ORIF for management of fractures of the distal tibia, malleolous, displaced talar neck and talar body fractures has yet to be determined (3).



Pre-operative CT scan showing the multi-fragment fracture pattern.
A. Coronal View B. Axial View C. Sagittal View



Intra-operative Fluoroscopy images showing:
A. Debridement and depression of the fracture fragment
B. Elevation of the fracture fragment at the STJ through a percutaneous incision

CASE PRESENTATION

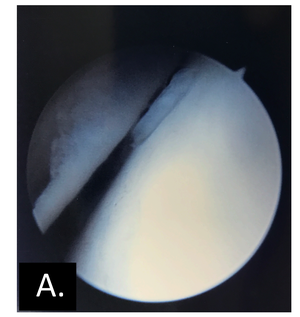
32 year old male presented to an urgent care after a fall from 8 feet while rock climbing unrestrained. Radiographs revealed talar fracture. CT showed a three fragment fracture through the talar body with fractures in the sagittal and coronal planes. Surgery was delayed secondary to swelling. The patient was managed arthroscopically through 2 anterior ankle portals, a percutaneous lateral incision at the lateral talar process, and a percutaneous Achilles incision. The fracture fragment was debrided arthroscopically. Reduction was performed using a freer elevator to depress the fragment through the anterolateral portal and key elevator was used to lift the fragment at the STJ through the percutaneous incision. Anatomic reduction was confirmed using intraoperative fluoroscopy. Temporary K-wire fixation was followed by 2x5.0mm headless compression screws from posterior-to-anterior. 2x4.0mm headless compression screws were placed from lateral-to-medial and medial-to-lateral. Titanium screws were used in order to allow subsequent MRI of the talus if AVN developed. Early ROM was begun at 3 weeks postoperatively to improve the prospects of long term stiffness/arthritis. The patient was kept NWB for 3 months.

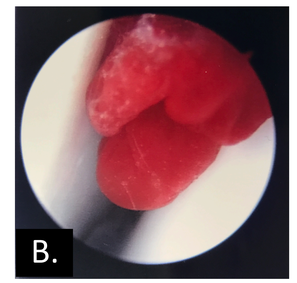
RESULTS

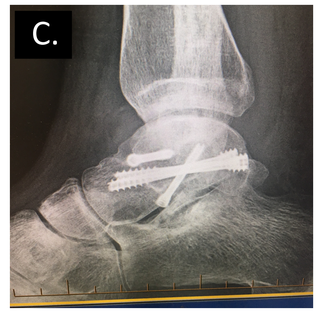
All fractures healed uneventfully with no signs of AVN confirmed via post operative CT imaging. The patient returned to full activity including running without pain/discomfort.

DISCUSSION

Many of the reasons for performing arthroscopic reduction and percutaneous fixation of talar fractures focuses on avoiding the complications of traditional ORIF. Complications of talar injuries include AVN of the body and head, malunion and nonunion, bony ankylosis, skin necrosis, infection, impaired joint mobility, neurovascular compromise, and tendon trapping (1). Late development of complications posttraumatic degenerative joint disease of the ankle, subtalar, and midtarsal joints has been reported (1). Fractures of the body of the talus were associated with the highest incidence of degenerative joint disease of both the subtalar and ankle joints which will be mitigated by ARIF and percutaneous anatomic fixation (1). Arthroscopic reduction with internal fixation for talar fractures avoids medial/lateral malleolar osteotomies (4). Percutaneous fixation also helps avoid early complications such as wound dehiscence or skin necrosis. This technique also provides better visualization of the articular surface which may enhance accuracy in reduction and debridement of loose fragments (3). The use of arthroscopy for talar fractures is case-specific and surgeon dependent.







Intra-operative images from the arthroscopy showing:
A. Fracture fragment
B. Hematoma formation
Post-operative radiographs 1-year after the injury:
C. Lateral view
D. Mortise View

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