An Unusual Case Report of a Stage IV Osteochondral Defect Imitating a Medial Malleolar Avulsion Fracture

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INTRODUCTION

Osteochondritis dissecans, otherwise referred to as an osteochondral defect (OCD), is most commonly reported in literature as occurring in the knee, followed by the elbow, with the next most prevalent location appearing to be in the talus of the ankle joint [1, 2]. The first known case in literature involving an OCD of the ankle joint was reported by Alexander Munro in 1856, citing loose bone fragments as a result of trauma[3]. It wasn't until 1959 that Berndt and Harty studied these lesions more carefully establishing both a mechanism of injury and a classification system widely used today [1].

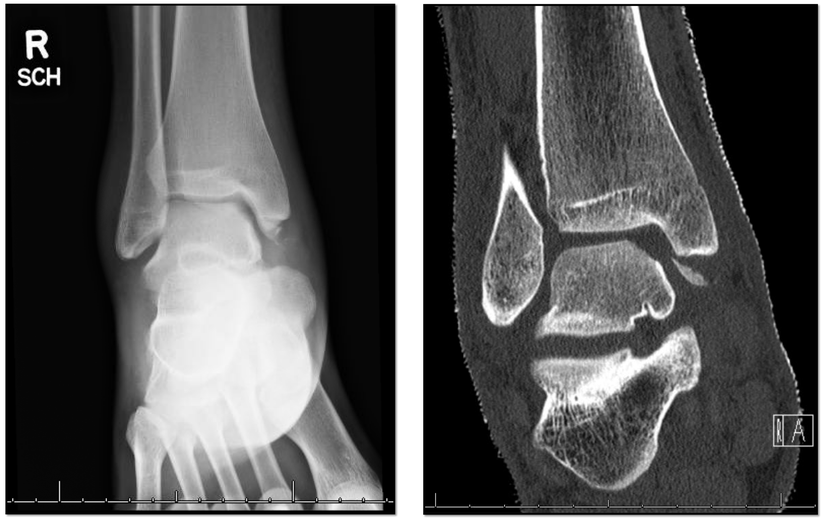
Osteochondritis dissecans can often be a very debilitating disease. Symptoms of these patients typically include pain, swelling, stiffness, locking of the ankle joint, and gait abnormalities such as limping or need for assistance with ambulation. The most common etiologic factors include both trauma and ischemia, but have also been cited to include genetics, metabolic abnormalities, and even infection [4, 10].

Several surgical interventions have been proposed to treat osteochondritis dissecans of the talus such as removal of the bony fragment, arthroscopic debridement, drilling of the subchondral bone, microfracture, osteochondral grafting, and fixation of the fragment with traditional hardware vs Bioabsorbable pins [9].

Before surgical intervention can be accomplished, a thorough investigation of the ankle joint must be performed. Serial radiographs are often adequate for appropriate visualization and diagnosis of a talar OCD. However, some talar OCDs can present subtly and the help of an MRI or CT can aid in precise location and size of the lesion [6, 7].

In this report, we present an unusual case of a 17-year-old male who was diagnosed using standard radiographs with an avulsion fracture of the medial malleolus. However, persistent pain led to a more advanced imaging modality of a CT where the patient was appropriately diagnosed with a talar OCD that was surgically treated with ORIF using bioabsorbable fixation.

Figure 1-2: Preoperative Xray and CT



CASE REPORT

A 17-year-old male presented to clinic with the chief complaint of right ankle pain. One week prior, the patient was skateboarding when he fell injuring his ankle. The patient immediately presented to the ED where radiographs were taken. At the time, radiographs were read as an avulsion fracture to the distal tip of the medial malleolus. The patient was placed into a posterior splint and given crutches with instructions to be non-weightbearing to the right lower extremity.

The patient described the initial injury as an inversion and plantarflexion injury. Using the visual analog pain scale (VAS) the patient rated his pain as a 6/10. Repeat radiographs were taken showing no cortical irregularity at the distal aspect of the medial malleolus. However, radiographs showed a loose fragment of bone in the medial gutter of the ankle joint and a faint disturbance in the cortical bone to the medial aspect of the talus. Due to clinical suspicion of a talar OCD, the patient underwent a CT scan. Results showed a large flipped and displaced OCD of the medial aspect of the talus presenting just inferior to the medial malleolus. The patient and his mother agreed to surgical intervention and the patient was boarded for surgery.

In a supine position, an incision was performed over the medial malleolus and an inverted chevron osteotomy was made. The bone was reflected inferiorly to allow for visualization of the medial gutter and the medial aspect of the talus. The avulsed OCD of the talus was identified and retrieved from the the medial gutter and retrograde drilling with the use K-wire was performed to the talar dome. The osteochondral fragment was then reintroduced into the defect and temporarily fixated with a K-wire. Permanent fixation was then performed utilizing four chondral darts. The medial malleolus was reduced and fixated using two partially threaded cannulated screws. Finally, the incision was irrigated with antibiotic solution and closure was completed. The patient was placed in a well padded below-the-knee cast and instructed to remain non-weightbearing.

The patient continued to present to clinic on a regular basis for postoperative evaluations and serial radiographs. Immediately, on his first postoperative appointment (1 week) the patients VAS pain score decreased to 4/10. Radiographs were reviewed showing consolidation and a stable appearance of the OCD fragment. By his second postoperative appointment (3 weeks) the patient's VAS pain score decreased to 2/10, radiographs continued to show increased consolidation, and the patient was transition into a CAM boot. By the patients third postoperative appointment (6 weeks) the patient was pain free and by his fifth postoperative appointment (10 weeks) the patient had returned to full activity. Final radiographs showed incorporation of the osteochondral fragment and a stable appearance of the talus [9].

REFERENCES

1.Berndt AL, Harty M. Transchondral fracture-osteochondritis dissecans of the talus. J Bone Joint Surg 41A:988–1020, 1959.

2.Santrock RD, Buchanan MM, Lee TH, Berlet GC. Osteochondral lesions of the talus. Foot Ankle Clin 8:73–90, 2003.

3.Munro A. Part of the cartilage of the joint of the knee separated and ossified by the same. In: Medical essays and observations, vol 4. Edinburgh: Philosophical Society, 1856:305–306.

4.Kadakia, Anish P, et al. Osteochondritis Dissecans of the Talus Involving the Subtalar Joint: A Case Report. The Journal of Foot and Ankle Surgery, Volume 46, Issue 6, 488 – 492

5.Canale ST, Belding RH. Osteochondral lesions of the talus. J Bone Joint Surg Am 62:97–102, 1980.

6.Higashiyama I, Kumai T, Takakura Y, Tamail S. Follow-up study of MRI for osteochondral lesion of the talus. Foot Ankle Int 21:127–133, 2000.

7.Verhagen RA, Maas M, Dijkgraaf MG, Tol JL, Krips R, Van Dijk CN. Prospective study on diagnostic strategies in osteochondral lesions of the talus. Is MRI superior to helical CT? J Bone Joint Surg Br 87:41– 46, 2005.

8.Higuera J, Laguna R, Peral M, Aranda E, Soleto J. Osteochondritis dissecans of the talus during childhood and adolescence. J Pediatr Orthop 18:328 –332, 1998.

9.Navid DO, Myerson MS. Approach alternatives for treatment of osteochondral lesions of the talus. Foot Ankle Clin 7:635–649, 2002.

10.Finger A, Sheskier SC. Osteochondral lesions of the talar dome. Bull Hosp Jt Dis. 2003;61(3-4):155-9.

11.Anderson IF, Crichton KJ, Grattansmith T, et al: Osteochondral fractures of the dome of the talus. J Bone Joint Surg 71A:1143-1152, 1989.

Financial Disclosures: None

CONCLUSION

Osteochondritis dissecans refers to a fracture that occurs in a joint through the articular cartilage and underlying subchondral bone [1]. Many surgical treatment options have been described in the literature including arthroscopic debridement, drilling of subchondral bone, microfracture, and open reduction internal fixation [9]. Choice of surgical intervention will depend on many factors such as the age of the patient, the size of the lesion, and the status of the remaining articular surface [10].

Before surgical intervention can be approached, a thorough work up including medical imaging must be completed. All patients should receive standard radiographic evaluation with plain films. In the literature, it appears that only 41% of talar dome lesions are detected on x-ray as compared to arthroscope [7]. Therefore, if clinical suspicion for a talar dome lesion is still suspected, especially after failure of conservative treatment, more advanced imaging may be required to properly treat and diagnosis the patient.

CT has been found to provide improved delineation of bone and is beneficial in determining the exact position of the osteochondral fragment. CT may be limited, however, in its ability to visualize subtle grade I lesions. MRI is sensitive for detecting subtle bone changes such as edema or hemorrhage from an osteochondral fracture [10]. Anderson, et al., looked at a comparison between bone scan, MRI, and CT. They determined that MRI is more sensitive than CT in demonstrating more subtle lesions such as those classified as grade I, but for more pronounced lesions, the two studies are equivalent [11].

In conclusion, apart from the case described in this report, to the best of our knowledge, no other case report has been identified where the fragment from the talar dome presents in the medial gutter imitating an avulsion fracture of the medial malleolus. Through good clinical suspicion and proper advanced imaging we were able to correctly diagnosis and treat our patient appropriately to provide him the best prognosis with the greatest ability to return to normal activity in the least amount of time.

Figure 3: Osteochondral lesion

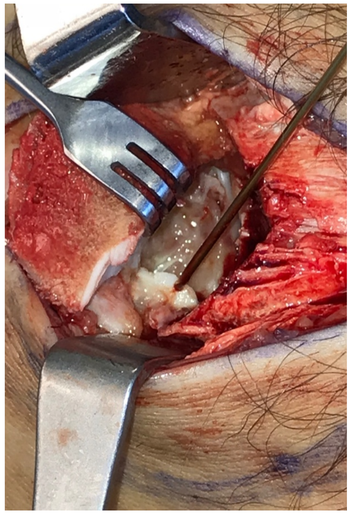


Figure 4: Postoperative Imaging