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A Unique Procedure for Treatment of Osteochondral Lesions of the Tarsal Navicular: Three Cases in Athletes

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ABSTRACT

Surgery in the athlete can present unique challenges, particularly when articular damage and osteoarthritic changes are noted. To allow athletes to return to their desired activity level, an alternative to the traditional approach of fusion must be developed. We prospectively reviewed 3 cases of osteochondral lesions and degenerative changes of the tarsal navicular joint involving a unique surgical approach consisting of microfracture of the lesions with concomitant arthrodiastasis. All 3 patients were treated with a miniexternal fixator to provide distraction for 4 weeks. The patients were aged 15, 17, and 21 years, with follow-up ranging from 2 to 4 years, at which point each patient was competing at their desired activity level and pain free. Each patient was initially treated at different stages of a navicular injury with patient 3 having undergone 2 courses of casted non-weightbearing. This new treatment gives more options to a potentially athletic career-ending injury.

Osteochondral lesions involve damage to the articular cartilage and the underlying subchondral bone. The lesions are most commonly found in the knee, with the talar dome the most common location in the foot and ankle (1). Osteochondral lesions of the tarsal navicular can lead to significant morbidity, including degenerative changes of the talar navicular joint. Traditionally, few surgical options are available beyond microfracture or curettage, although access can be difficult, or talar navicular joint fusion.

The pathogenesis of osteochondritis dissecans of the tarsal navicular can include previously undiagnosed navicular stress fractures, direct traumatic injury in the tarsal navicular joint and sequelae from midfoot and ankle sprains (2–4). Beil et al (2) recently described a case report of surgical curettage of an osteochondritis dissecans of the concave portion of the navicular at the tarsal navicular joint without significant degenerative joint disease of the joint. The treatment in their case report was excellent in the absence of significant degenerative changes.

Type III navicular stress fractures, such as those described by Saxena et al (5) can be predisposed to osteochondritis dissecans and degenerative changes, because these fractures are through 2 cortices and might frequently involve the talar navicular joint (5). A high index of suspicion for navicular stress fractures must exist on the part of the sports medicine specialist. We present medium-term follow-up for 3 athletic patients for a procedure involving microfracture technique of the osteochondral lesion with an external fixator to distract the talar navicular joint for up to a 4-week period postoperatively. All patients were highly athletic, making talar navicular fusion invalid as an initial treatment. However, because their lesions were centrally located, and arthrosis was already occurring, additional surgical improvisation was needed. Arthrodiastasis has been described for other joints but not for the talar navicular joint.

Case Reports

Case 1

A 17-year-old female complained of an insidious onset of right midfoot pain for several months. She was active in basketball and track. She had a history of ankle sprains. She had tenderness on the "N-spot" of the navicular, with some midfoot pain with range of motion. Some edema was present in the region, but with no crepitus, and she had a stable midfoot. She had tried ice and an ankle brace for treatment. Her radiographs showed some degenerative changes at the level of the talar navicular joint, with lucencies at the proximal aspect of the navicular (Fig. 1). A computed tomography scan taken with 0.6-mm slices showed findings consistent with osteochondritis of the proximal navicular, with loose bodies within the talar navicular joint

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Fig. 1. (*A*) Lateral preoperative radiograph of patient 1. (*B*) Anteroposterior preoperative radiograph of patient 1.

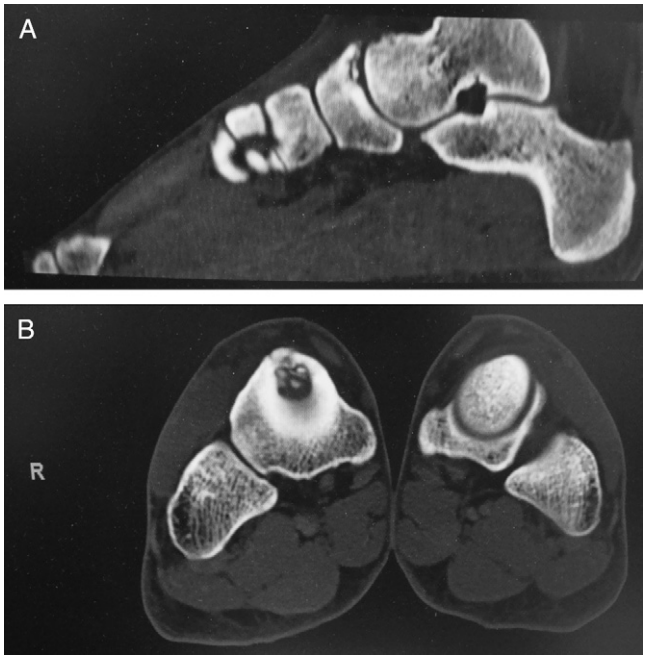

Fig. 2. (*A*) Preoperative lateral computed tomography scan of patient 1. (*B*) Frontal computed tomography scan of patient 1.

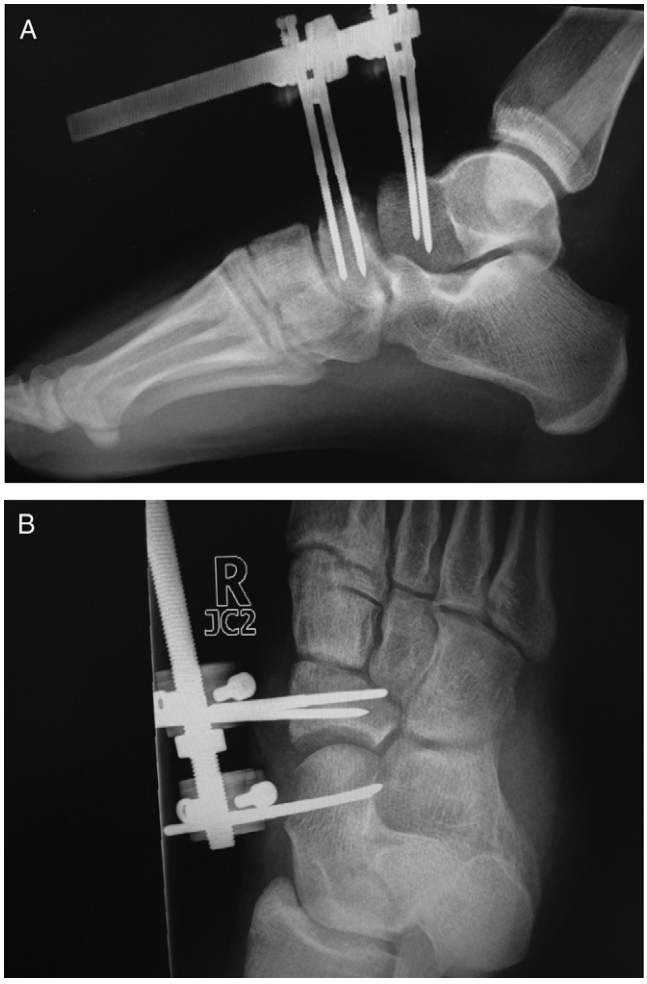

Fig. 3. (*A* and *B*) Postoperative view with external fixator in place for patient 1.

(Fig. 2*A*–*C*). Because of the patient's age, debridement and microfracture were recommended. In addition, because of the degenerative changes already noted, a concomitant arthrodiastasis procedure was also recommended.

The patient underwent surgery under general anesthesia. A dorsal exposure was created medial to the neurovascular buddle. A EBI/Biomet™ Mini-External fixator was placed spanning the talar navicular joint. The joint was then distracted several millimeters to create exposure. The navicular defect was curetted and then microfractured. An autogenous bone graft was placed in a small area of bony void. The talar head articular cartilage had a focal subchondral defect, which was microfractured. The external fixator was left in place, but the distraction was reduced to 2 mm. The wound was closed in layers. The talar navicular joint was distracted an additional 2 mm until 2 weeks postoperatively (Fig. 3*A* and *B*). The fixator was removed at 4 weeks postoperatively. The patient was kept non-weightbearing until 6 weeks after surgery. She used a splint for the first 4 weeks, and after the fixator was removed (in the office), she was placed in a boot that she wore until 10 weeks postoperatively. Formal physical therapy was initiated at 10 weeks. She returned to running at 14 weeks and basketball shortly thereafter. The dorsal incision had some hypertrophy and early keloid formation. This resolved with topical steroid and silicone gel sheeting. She competed in college track and field, including the long jump, cross country, and basketball. Radiographs taken 3 years after surgery after symptoms of posterior tibial tendinopathy (which resolved with physical therapy and orthoses)