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Open Ankle Dislocation without Associated Malleolar Fracture

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ABSTRACT

Open ankle dislocation without an associated fracture is an extremely rare injury. We present the case of a 24-year-old male athlete who had sprained his left ankle during volleyball playing. He sustained an open posteromedial dislocation of his left ankle, without an associated malleolar fracture. The treatment consisted of wound irrigation, debridement, reduction, and suture of the skin, followed by immobilization with a short leg cast. The ankle was immobilized in a neutral position for 8 weeks, and weight bearing was restricted for the first 6 weeks. At the 3-month follow-up visit, the patient reported that both ankle and feet had regained full, pain-free range of motion. At the 6-month follow-up visit, he returned to sports activities. At 9 months of follow-up, the patient participated in volleyball games at the same level as before his injury. At 2 years after the initial injury, he did not have any clinical complaints, and his ankle had no clinical or subjective signs of instability.

Dislocation of the ankle without an associated fracture is an extremely rare injury. The first reported case was in 1913 by Peraire (1). A review of the published data (2–19) indicated that pure dislocation of the ankle is caused predominately by road accidents (40%), in particular, motorcycle accidents (33%). The second most common cause is sports trauma (35%), particularly sports in which jumping is a fundamental component, such as volleyball (13%) and basketball (8%). We report a case of open dislocation of the ankle without an associated malleolar fracture.

Case Report

A healthy 24-year-old male injured his left ankle while playing volleyball. The injury occurred with the following mechanism: after a jump at the net, the player landed on another player's foot, with his foot in full plantar flexion. He was admitted to our emergency department with a deformity of his left ankle. The clinical examination showed that his left foot was deviated posteromedially. The tip of the lateral malleolus protruded from the skin (Fig. 1*A* through *C*). Another laceration of the skin was present nearby. The dorsalis pedis pulse was not palpable, and the capillary refill time was longer than 2 seconds. Sensation was intact, but the patient was unable to move his foot and toes because of pain. Thus, about 1 hour after the initial injury and after the administration of antibiotic prophylaxis, reduction was performed with the patient under local skin anesthesia because the tension of the skin hampered the reduction of the protruding bone (Fig. 1*D*). Thus, a forceps was used to manipulate the skin during the procedure. Reduction was achieved by longitudinal traction, with the knee flexed, applying an anteriorly directed force on the left foot while the ankle was stabilized. When reduction had been achieved (Fig. 2), the peripheral pulses were palpable, and the capillary refill time had returned to normal. Finally, wound cleansing and debridement were done, and the skin was sutured. The treatment occurred in the emergency room, because the operating room was not available. The postreduction radiographs showed that the reduction of the ankle was anatomic. The patient was treated with a short leg cast in neutral position for 8 weeks, with no weight bearing for the first 6 weeks. One week after the injury, an additional investigation with magnetic resonance imaging (MRI) was performed (Fig. 3) to explore the soft tissue injuries. However, even if this examination had shown rupture of the anterior talofibular and calcaneofibular ligaments, the conservative treatment plan would not have changed.

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Fig. 1. Open posteromedial dislocation of the ankle status (*A*–*C*) before and (*D*) after reduction.

At 6 weeks after the initial injury, stress radiographs of the ankle (Fig. 4) were performed to evaluate the stability of the lateral ankle ligaments. Under fluoroscopic control, the injured foot was stabilized by the examiner's hand and the patient's heel was inverted and plantar flexed with the other hand. The talar tilt was measured using the contralateral ankle for comparison; however, no differences were found, indicating no stability problems with the injured foot. After removing the plaster, the patient underwent physical therapy for ankle proprioceptive training, and he progressively returned to his normal activities. At the 3-month follow-up visit, he reported that both ankle and foot had already regained full, pain-free range of motion (Fig. 5). At 6 months of follow-up, he had returned to his sport activities, and after 9 months, he had participated in volleyball games at the same level as before the injury. At 2 years after the initial injury, he did not have any clinical complaints, and his ankle had no clinical or subjective signs of instability.

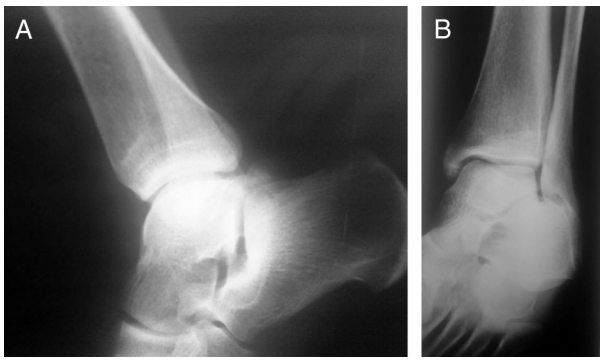

Fig. 2. Postreduction radiographs of (*A*) face and (*B*) profile showing good alignment of the tibiotalar joint without malleolar fractures.

Discussion

Ankle dislocation without an associated fracture is a rare injury. This entity can present as a closed injury, although more than 50% of ankle dislocations are open (10,13,20–23). The rarity of this entity is the reason for the isolated case reports and a few small case series (2–19). According to our knowledge, the largest series was reported by Toohey and Worsing (24). The classification of a tibiotalar dislocation has been reported by Fahey and Murphy (25) according to the direction of the dislocation. Fahey and Murphy (25) described 5 types: anterior, posterior, medial, lateral, and combined. In our case, the patient had a posteromedial dislocation of his left ankle. More than 50% of these dislocations will be posteromedial (6).

The ankle joint consists of the distal tibia, fibula, and talus. The joint is stabilized by the bony structures, the medial and lateral malleoli, and 4 main ligaments: the anterior talofibular ligament, calcaneofibular ligament, posterior talofibular ligament, and talotibial ligament (26). No other stabilizing structure is present in the anterior or posterior aspect of the ankle joint, except for the joint capsule. The factors predisposing to ankle dislocation are as follows: medial malleolus dysplasia, lack of coverage of the talus, ligamentous laxity, previous sprains, and weakness of the peroneal muscle (22,27–33). Our patient had had no previous injury or severe sprain to the left ankle and no complaint regarding the left foot or ankle before injury.

Usually, the mechanism of injury consists of high energy trauma, which produces a combination of plantar flexion and forced inversion or eversion of the foot (34). When the dislocation is open, the bone