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Case Reports and Series

Maisonneuve Equivalent Injury With Proximal Tibiofibular Joint Dislocation: Case Report and Literature Review

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ABSTRACT

We report the case of a 31-year-old male who presented with traumatic dislocation of both proximal and distal tibiofibular joints without fibular fracture. The patient underwent closed reduction of the proximal tibiofibular joint and surgical stabilization of the distal tibiofibular joint. An 18-month postoperative evaluation confirmed a very good clinical outcome after anatomic reduction. This type of trauma is very rare and, to our knowledge, has only been described 3 times previously. Furthermore, our surgical management was different from that used for the previous cases and proved to be satisfactory.

Maisonneuve injury is caused by a pronation-external rotation mechanism of the ankle that leads to a medial ligament injury of the ankle, a lesion of the distal tibiofibular syndesmotic complex (anterior inferior tibiofibular ligament, posterior inferior tibiofibular ligament and interosseous ligament), and a high fibular fracture. We present the original case of a patient with a Maisonneuve-type injury involving proximal tibiofibular dislocation, instead of the more typical fibular fracture.

Case Report

A healthy 31-year-old male was admitted to the emergency department in August 2014 for left leg trauma consequent to jumping from a height of approximately 2 m into shallow water. The patient reported severe pain in his left knee and ankle immediately on landing and was unable to bear weight on the left leg.

On examination, we noted a prominent of the fibular head on the anterolateral aspect of the left knee, with hematoma and swelling over the left lateral malleolus. The neurologic examination findings were normal. Radiographic imaging revealed anterolateral dislocation of the proximal tibiofibular joint (PTFJ; Fig. 1) and a widening of the mortise in the anteroposterior view of the ankle. The latter finding was confirmed on a computed tomography scan (Fig. 2). An increased medial clear space was also noted. We diagnosed an atypical Maisonneuve variant fracture with associated distal tibiofibular joint (DTFJ) injury, concomitant with a PTFJ dislocation without a high typical fibular fracture, and with a medial ligamentous injury of the ankle.

Surgical stabilization was performed in the operating room with the patient under regional anesthesia and in the supine position. A thigh tourniquet was used for hemostasis. First, the PTFJ was reduced by firm anteroposterior pressure on the head of the fibula, with the knee flexed to neutralize the pull of the biceps femoris. After reduction, no instability of the PTFJ was noted; however, the dislocation could not be reduced further. A varus stress test was performed under fluoroscopic guidance and revealed no laxity. Next, the DTFJ was explored through a lateral approach, and complete syndesmotic disruption was found, with the anteroinferior tibiofibular ligament interposed between the fibula and the incisura of the tibia, preventing anatomic reduction (Fig. 3). The fibula was reduced into the incisura of the tibia, which allowed us to fully reduce the fracture. The reduction was maintained with a 2-hole plate and two 3.5-mm quadricortical syndesmotic screws placed 2 and 4 cm above the ankle joint with the ankle dorsiflexed. Primary repair of the anterior tibiofibular ligament was performed with direct suture. Fluoroscopy was used to verify the anatomic reduction on the mortise views and perfect stability with dorsiflexion and external rotation. A postoperative computed tomography scan confirmed both proximal and distal reduction (Fig. 4).

Passive mobilization of the knee and ankle was begun immediately postoperatively and after a short stay in the hospital. He was maintained non-weightbearing for 8 weeks, after which the syndesmotic screws were removed, and progressive weightbearing was initiated.

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Fig. 1. Posterior view of the knee showing the anterolateral tibiofibular dislocation.

We reevaluated the patient 18 months after the original injury. At that time, he reported that he had returned to all of his preinjury sports activities by 6 months postoperatively, was experiencing no pain, and was capable of a full range of motion at the knee and ankle (which was symmetrical with the contralateral, uninjured limb). Furthermore, at the final follow-up visit, the patient's American Orthopaedic Foot and Ankle Society hindfoot-ankle scale score was 100 of 100 (1,2).

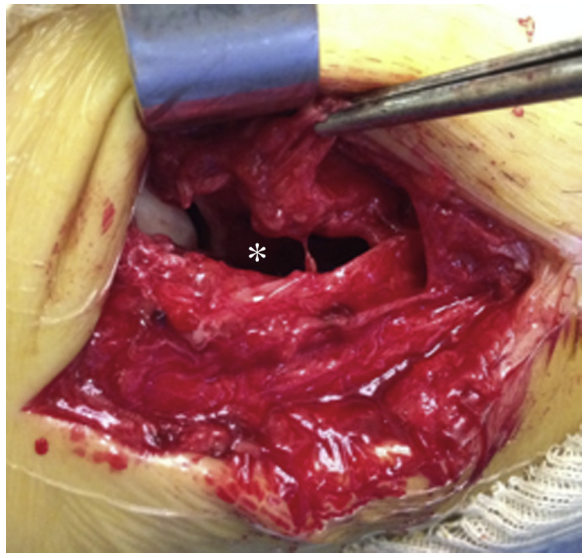

Fig. 3. Operative view of the distal syndesmotic lesion. Note the widening of the tibiofibular space *(asterisk)* and the tear of the anterior tibiofibular ligament in the dissecting forceps.

Discussion

Proximal tibiofibular dislocation is a rare injury typically caused by high-energy trauma and often associated with other traumatic lesions (neurovascular, osseous, or ligamentous) (3). It usually occurs with the knee in flexion, with the lateral collateral ligament relaxed. Ogden (4) described 4 types of proximal tibiofibular dislocations: anterolateral dislocation, the most frequently occurring; posteromedial dislocation; superior dislocation; and atraumatic subluxation. Gabrion et al (3) also described an inferior type of dislocation. Closed reduction of anterolateral dislocations has been recommended (5–7), with the maneuver involving the direct application of pressure over the fibular head with the knee flexed. These lesions are generally

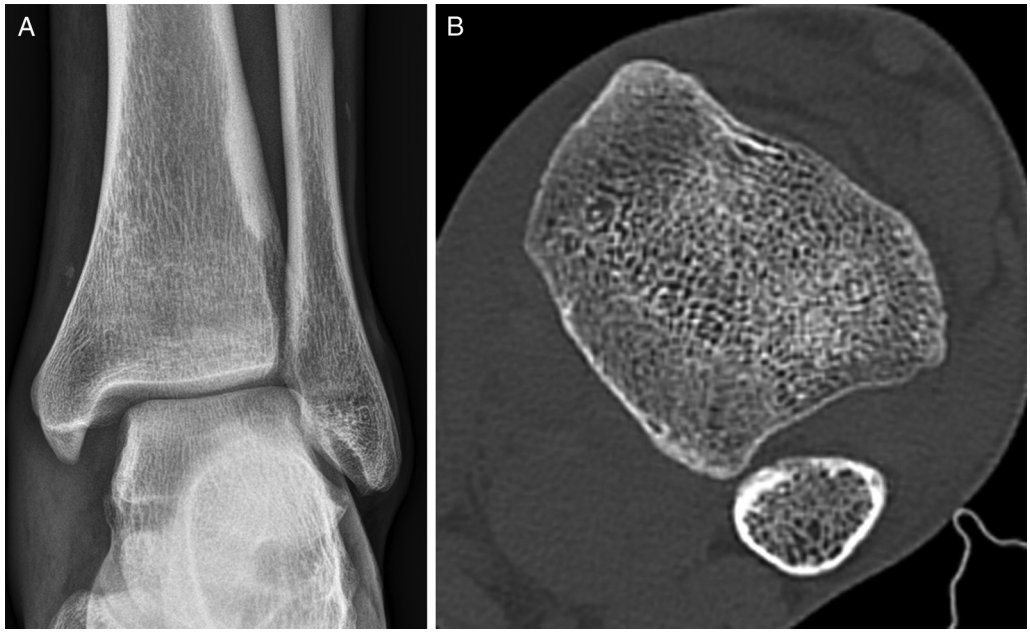

Fig. 2. (*A*) Anteroposterior view and (*B*) view of horizontal computed tomography scan of the distal syndesmotic lesion.