

Traumatic proximal tibiofibular joint dislocation treated by open reduction and temporary fixation: a case report

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Abstract Isolated dislocations of the proximal tibiofibular joint are a rare condition. Missed diagnosis can lead to chronic knee pain and disability. Early recognition should be followed by immediate closed reduction or open reduction and joint transfixation. We present a young athlete with this injury which was treated successfully by open reduction.

Keywords Proximal tibiofibular dislocation · Peroneal head dislocation

Introduction

The isolated proximal tibiofibular dislocation is a rare condition causing knee tenderness. Furthermore treatment options are far from equivocal and range from closed reduction to open joint capsule reconstruction. We therefore present a representative case of an isolated proximal tibiofibular joint dislocation which was treated successfully by open reduction and temporary joint transfixation.

Case

A 23-year-old male basketball player reported lateral knee pain while landing on his left foot after a jump-

shot. He presented with local pain and swelling over the left peroneal head, but no pain, swelling or instability of the ankle or the tibiofibular syndesmosis. The peroneal nerve function was intact. The radiographs of the knee showed an anterolateral tibiofibular joint dislocation Ogden Type II [5] with widening of the interosseous membrane (Fig. 1). CT scans supported the findings and excluded bony lesions (Fig. 2). Closed reduction manoeuvres were without success. Thus a decision for open reduction was made. A lateral slightly curved incision was performed and the peroneal nerve identified, released and retracted proximally (Fig. 3). As manual reduction still was impossible, parts of the extensor digitorum longus muscle insertion on the peroneal head were loosened. The interosseous membrane was still intact. Under maximal relaxation in general anaesthesia a reposition of the peroneal head was achieved which was then transfixed by a single tricortical screw (Fig. 4). An above knee plaster was put on for 6 weeks and weight bearing was not allowed for this period. After 6 weeks the temporary transfixating screw was removed and functional rehabilitation started. During the 1-year follow-up the patient presented with full knee range of motion and no tenderness or pain.

Discussion

The isolated proximal tibiofibular joint dislocation is a rare condition and the suggested treatment regimens are not univocal. Ogden [5] classified four types of traumatic tibiofibular joint dislocations: I, the subluxation; II, the anterolateral; III, the posteromedial; and IV, the superior dislocation. The subluxation (Type I)

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Fig. 1 Plain radiographs show an anterolateral dislocation of the proximal tibiofibular joint with widening of the interosseous membrane. Enhanced fibular contours were added in the lateral view by image processing

is a condition found predominantly in adolescents with lax joints. It is mostly self-limiting with maturation. Anterolateral (Type II) dislocations are the most common injuries and occur both after direct and indirect trauma. The posteromedial dislocation (Type III) is found after direct peroneal head trauma. Type III dislocations are often linked to peroneal nerve injury. Superior (Type IV) dislocations are always associated with fibular fractures [1].

The tibiofibular joint is stabilised by a capsule which is supported by the anterior and posterior proximal tibiofibular ligaments. The fibular collateral ligament as well as the biceps femoris muscle insertion involves the tibiofibular joint into knee and hip joint function. Functionally the tibiofibular joint belongs to the ankle joint. By the interosseous membrane the tibiofibular joint is stabilised additionally. Muscle insertions in the

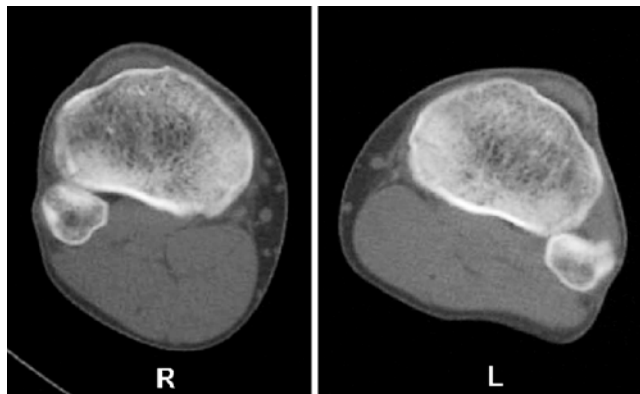


Fig. 2 Bilateral CT scans reveal the extent of the anterolateral dislocation and exclude bony lesions

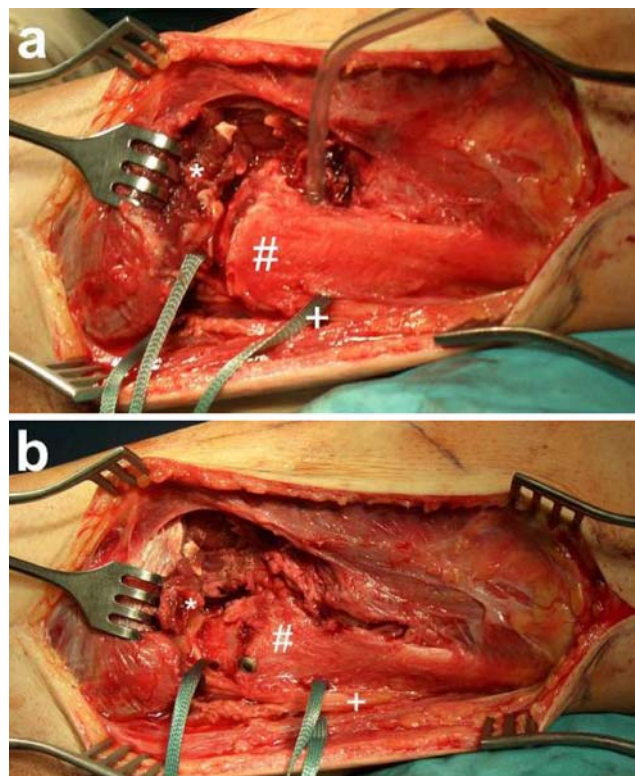


Fig. 3 a, b Before open reduction could be performed the peroneal nerve (*plus*) was identified and marked. Then the extensor digitorum longus insertion (*asterisk*) was mobilised from the peroneal head to allow full anterior access (*hash*)

peroneal head, especially the extensor digitorum longus muscle and the anterior tibial muscle, cause dynamic movement of the proximal fibulotibial joint [6]. For the postulated mechanism of the anterolateral proximal tibiofibular joint dislocation (Type II) the knee has to be bent to relax the fibular collateral lig-



Fig. 4 After open reduction a transfixating screw was placed to keep the peroneal head in position

ament. Then forced rotatory motion can disrupt the tibiofibular ligaments, and anterolateral dislocation may occur [3].

Clinically the patient with anterolateral proximal tibiofibular joint dislocation presents a prominent peroneal head with local swelling and tenderness. Ankle joint tenderness and peroneal nerve function have to be evaluated. On physical examination there is often surprisingly free movement of the knee joint and no effusion. Plain AP and lateral radiographs of the lower leg show a lateralised peroneal head and can exclude a syndesmotic disruption and bony lesions. Because of the rare condition most investigators choose to perform a bilateral CT scan of the proximal tibiofibular joints, which will support the findings [4].

To avoid cartilage damage, early reduction should be performed. This is primarily done by closed reduction, which can be performed by mobilisation under analgosedation or general anaesthesia. Manual reduction is performed in flexion of the knee (relaxation of the fibular collateral ligament), dorsal extension of the foot (relaxation of the interosseous membrane) and anteroposterior manual pressure on the peroneal head [1, 6]. After successful reduction an immobilisation in an above knee plaster for 2–3 weeks followed by functional rehabilitation is recommended [8]. Other authors suggest immobilisation for 6 weeks [1].

If closed reduction is not successful open reduction should be performed as soon as possible. Using a lateral approach the peroneal head should be exposed. Care should be taken not to injure the peroneal nerve. It is recommended to locate and mobilise the peroneal nerve as the first step. Then reduction in knee flexion and dorsal ankle extension by manual pressure should be tried. If this is not successful release of the extensor digitorum longus insertion on the peroneal head should be performed. This should lead to easy reduction. In the presented case, both the strong anterior muscle tension and interposition of disrupted capsular ligaments resisted reduction manoeuvres, but after muscular release reduction was successful. Reduction should be followed by capsular reconstruction with sutures and temporary transfixation by a screw or K-wires [2, 9].

Delayed diagnosis of tibiofibular joint dislocations may result in chronic dislocations. These patients present chronic local pain and, very often, peroneal

nerve dysfunction. Closed reduction is mostly impossible, so open reduction has to be performed. Possible techniques are (1) resection of the peroneal head [1], (2) arthrodesis of the proximal tibiofibular joint, which should include a fibular osteotomy to avoid ankle joint stress [7], and (3) reconstruction of the proximal tibiofibular joint with techniques using the biceps femoris tendon or the iliotibial band [4, 9]. After open reduction stabilisation by joint transfixation should be performed.

Because of the rare condition of the proximal tibiofibular joint dislocation, early diagnosis can be missed easily if no awareness of this injury is present. The symptoms can be confused with lateral meniscal injury or partial lateral collateral ligament disruption. Plain X-rays are helpful to diagnose the dislocation, but if no comparative X-ray of the contralateral side is available the untrained eye might miss the diagnosis. Since dislocation of the proximal tibiofibular joint is a potential cause of chronic knee pain and disability it should be considered in the differential diagnosis of lateral knee pain. Early diagnosis and correct management will lead to complete recovery of the patient.

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