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Paulo Roberto de Almeida Silvares¹, João Paulo Fernandes Guerreiro², Sérgio Swain Müller¹, Ricardo Violante Pereira³, Rodrigo Vannini³

ABSTRACT

Isolated traumatic dislocation of the proximal tibiofibular joint is rare. This injury may go unrecognized or be misdiagnosed at the initial presentation. Lack of clinical suspicion can cause diagnostic problems. The diagnosis requires an accurate history of the mechanism and symptoms of the injury, and adequate clinical and radiographic evaluation of both knees. Unrecognized cases are a source of chronic abnormalities. The treatment consists of closed reduction and immobilization or, in non-reducible or unstable cases, open reduction with temporary internal fixation. A rare case of isolated proximal tibiofibular dislocation in a basketball player is reported to illustrate this injury.

Keywords – Knee dislocation; Fibula; Basketball; Masculine

INTRODUCTION

Lesions on the lateral face of the knee are less frequent than medial lesions. The lateral ligaments, tendon insertions and proximal fibula protect, but may cause difficulties in examining and diagnosing lesions in this region(1-3). Acute dislocation of the proximal tibiofibular joint is a rare diagnosis and may go unnoticed in walk-in and emergency services(4,5). Neglected or untreated cases may lead to degenerative abnormalities of the joint, with chronic pain and even dysfunction of the fibular nerve(6,7).

ANATOMY

The proximal tibiofibular joint is a synovial joint between the lateral tibial condyle and the head of the fibula(8,9). At least 10% of the population has communication between this joint and the tibiofemoral joint, thus explaining some cases of slight joint effusion in the knee(6,10).

The tibiofibular joint is naturally stable because of joint-bone congruence with the muscle-ligament envelope and its posterolateral location(7). The orientation of the joint surface may vary and lead to greater risk of dislocation(1). The variants have been defined as horizontal (up to 20° of inclination in relation to the ground plane) or oblique (inclination greater than 20°), and the latter is found in 70% of the patients with this lesion(1) (Figure 1).

Anterior and posterior capsule thickenings form the tibiofibular ligaments, among which the anterior tibiofibular ligament is the most resistant(6,9,11). Additional stabilization for the joint is provided by the lateral collateral ligament and the tendon of the femoral biceps (when the knee is extended), and the popliteal tendon and popliteal fibular ligament(3,9,12). With the knee flexed, the fibular head migrates anteriorly, while the lateral collateral ligament and the tendon of the femoral biceps relax, thereby losing stability(1,13-15).

In addition to the proximal joint, the tibia and fibula have the distal syndesmosis between them, which may
become injured in the same traumatic event\(^9\). The primary function of the proximal joint is to dissipate torsion forces that are applied to the ankle, dissipate lateral tibial support forces and transmit the axial load\(^9,14\).

**CLINICAL CONDITION**

Histories of isolated acute tibiofibular dislocation are associated with severe twisting with inversion and plantar flexion of the foot, simultaneously with knee flexion and external rotation of the leg\(^11,16\). Dislocation may also occur due to direct trauma in high-energy mechanisms\(^1,11,16\).

Patients may have spontaneous pain, which is worsened by inversion, eversion or dorsiflexion of the foot, in the inferior lateral region of the knee\(^1,11,16,18-20\). Paresthesia in the region of the fibular nerve is common, but paralysis with dorsiflexion deficit has been little described\(^2,11,21\). A bone prominence is seen in the region of the fibular head, and slight joint effusion may be present\(^6,12\). The range of motion of the joint is preserved, but the movement causes pain\(^11,12\). Absence or slight presence of ecchymosis and edema are explained by the poor vascularization of the area\(^11,16,19\).

Examination of the ankle joint is essential in order to detect lesions of the interosseous membrane and syndesmosis ligaments\(^7,22\).

**RADIOLOGICAL CONDITION**

Anteroposterior radiographs of the knee usually show the proximal fibula and tibia overlain\(^23\). Comparison between front and lateral radiographs on the two knees helps to confirm the diagnosis and the location of the fibular head\(^19\). Computed tomography is indicated for better assessment of the joint and when there are diagnostic doubts\(^12,24,25\).

**CLASSIFICATION**

Four types, according to the dislocation, were described by Ogden in 1974\(^1\) (Figure 2).

Type I – Characterized by excessive joint mobility, with multidirectional subluxation; frequently found in young patients with joint hypermobility.

Type II – Characterized by anteroposterior dislocation; this is the commonest type, occurring in up to 85% of the cases\(^1,12,20,26\).

Type III – Posteromedial; this occurs in 10% of the cases and is more associated with direct trauma to the fibular head\(^12,17\). It is generally more unstable after the initial closed reduction, which makes it difficult to implement conservative treatment\(^1,16\).

Type IV – This is an upwards dislocation of the fibular head, in association with fracturing of the fibular neck or high-energy trauma to the ankle, with severe injury to the tibiofibular syndesmosis\(^11,16,26\).
TREATMENT

The acute dislocation should firstly be reduced non-surgically, under local anesthesia or intravenous sedation\(^{(12,16,27,28)}\).

This maneuver requires direct pressure in the fibular head, in the opposite direction to the dislocation, with knee flexion of around 90° to relax the lateral collateral ligament and the tendon of the femoral biceps\(^{(1,7,11,16,19,17,29)}\). By keeping the foot rotated externally, everted and dorsiflexed, the fibular muscles and long extensors of the hallux and toes are theoretically relaxed, thereby facilitating the reduction\(^{(1,2,4,6)}\).

After the reduction, and once a stable condition has been assured, most authors indicate that there should be three weeks of knee immobilization, with slight flexion, and with the ankle at 90° of dorsiflexion. After removal of the immobilization, movement without loading is started, for a further three weeks\(^{(6,10-12,30)}\).

Cases that are non-reducible or remain unstable after the reduction require open reduction and provisional internal fixation as soon as possible\(^{(7,11,20-22,31)}\). Kirschner wires or screws can be used, and these should be removed six to twelve weeks later, or else bioabsorbable pins can be used\(^{(4,11,19,21,32-34)}\).

CASE REPORT

The patient was a 20-year-old male who was a student and a member of a university basketball team. He came to the emergency services complaining that after twisting his ankle in association with lateral rotation of the leg in relation to the right knee, he felt intense pain that remained constant, on the lateral face of the right knee.

On physical examination, he presented a protruding fibular head, with slight edema (Figure 3), without joint effusion or ecchymosis. The proximal fibula was painful on palpation. Range of motion was preserved, despite exacerbation of the pain during the examination. There was slight pain on palpation of the tibiofibular syndesmosis region of the ankle, without local edema. There were no clinical signs of fibular nerve lesion.

On radiographic examination of the knees in front and lateral views (Figure 4), anterolateral dislocation of the right proximal fibula was noted, in comparison with the left-side joint.

An unsuccessful attempt at reduction of the dislocation was made in the emergency room after administering local anesthesia with 1% lidocaine, while keeping the knee flexed and applying pressure on the head of the fibular in the posterior direction (Figure 5). Following this, the patient was referred to the surgical center, where, after application of subarachnoid spinal anesthesia, the same maneuver was performed. Anatomical reduction was achieved, as confirmed by new radiographs (Figure 6).

Because of the stability achieved after the reduction, and after assessing the ankle joint, treatment with right knee and ankle immobilization was administered for three weeks, followed by another three weeks with joint movement while protecting them from loading. After these six weeks, loading was resumed and the patient successfully underwent muscle strengthening exercises.

DISCUSSION

Since the first description of proximal tibiofibular dislocation by Nelaton\(^{(35)}\), in 1874, and the classic study by Ogden\(^{(1)}\), 100 years later, it has been known that this injury exists but is rare, and that the isolated form is even rarer.

From the end of the nineteenth century to the present day, cases have been reported separately from around the world\(^{(3,4,6,12,36-38)}\). The largest review so far produced was in 1974, and this found only 108 cases in the literature\(^{(1)}\).

Because of the rarity of this lesion, alertness is required in order to make this diagnosis\(^{(6,12)}\). Radiographs alone on the knee in question generally do not suggest
ACUTE ISOLATED ANTEROLATERAL DISLOCATION OF THE PROXIMAL TIBIOFIBULAR JOINT

Figure 4 – A) Anteroposterior radiograph: right and left knees before the reduction. B) Lateral radiograph: right and left knees before the reduction

Figure 5 – Reduction maneuver that was performed

Figure 6 – Anteroposterior and lateral radiographs after the reduction

the lesion\(^{(12, 19, 23-25)}\). For these reasons, the few reports in the literature may not correspond to the reality, and proximal tibiofibular dislocations may be going unnoticed at emergency services around the world\(^{(1, 6)}\).

Knowledge of the possibility of the lesion, a well-taken clinical history, adequate physical examination and radiographs comparing the two knees, in suspected cases, are the way to reach the diagnosis at the right time, thus facilitating treatment and improving the prognosis\(^{(1, 5, 6, 12, 19, 29)}\).

REFERENCES