

Acute traumatic dislocation of the proximal tibiofibular joint: case report and review of the literature

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ABSTRACT

Proximal tibiofibular dislocation is hardly frequent; it is associated with sport injuries such as those seen in traumatism in rotation with foot's inversion and plantar flexion, knee's flexion and leg's external rotation, all simultaneously. It causes pain on the lateral aspect of the knee and leg, with total but painful knee ROM. Diagnosis is clinical and radiological. It is an entity that can go unseen at the ER (60%) with functional and biomechanical consequences if it is not timely diagnosed. The aim of this article is to describe our diagnostic and therapeutic experience in a rare injury in knee traumatism. We present a 23-years-old patient who suffered a fall while skating and reported proximal protuberance on the lateral aspect of his left leg, oedema, pain and limitation in knee extension.

Key words: Dislocation; proximal tibiofibular joint; diagnosis.

Level of evidence: IV

LUXACIÓN TRAUMÁTICA AGUDA DE LA ARTICULACIÓN TIBIOPERONEA PROXIMAL REPORTE DE UN CASO Y REVISIÓN BIBLIOGRÁFICA

RESUMEN

La luxación tibioperonea proximal es poco común, se relaciona con lesiones deportivas, como consecuencia de un trauma en rotación con el pie en inversión y flexión plantar, la rodilla en flexión y la pierna en rotación externa simultáneamente. Provoca dolor en la región lateral de la rodilla y la pierna, con arcos de movilidad completos de la rodilla, pero dolorosos. El diagnóstico es clínico y radiológico. Es una entidad que pasa inadvertida en el Servicio de Urgencias (60%), con consecuencias funcionales y biomecánicas si no se diagnostica oportunamente. El objetivo es describir la experiencia diagnóstica y el tratamiento ortopédico de una entidad inusual en trauma de rodilla.

Se presenta a un paciente de 23 años que sufrió una caída patinando y refiere protuberancia proximal en la cara lateral de la pierna izquierda, edema, dolor y limitación para extender la rodilla.

Palabras clave: Luxación; articulación tibioperonea proximal; diagnóstico.

Nivel de Evidencia: IV

Conflict of interests: The authors have reported none.

Introduction

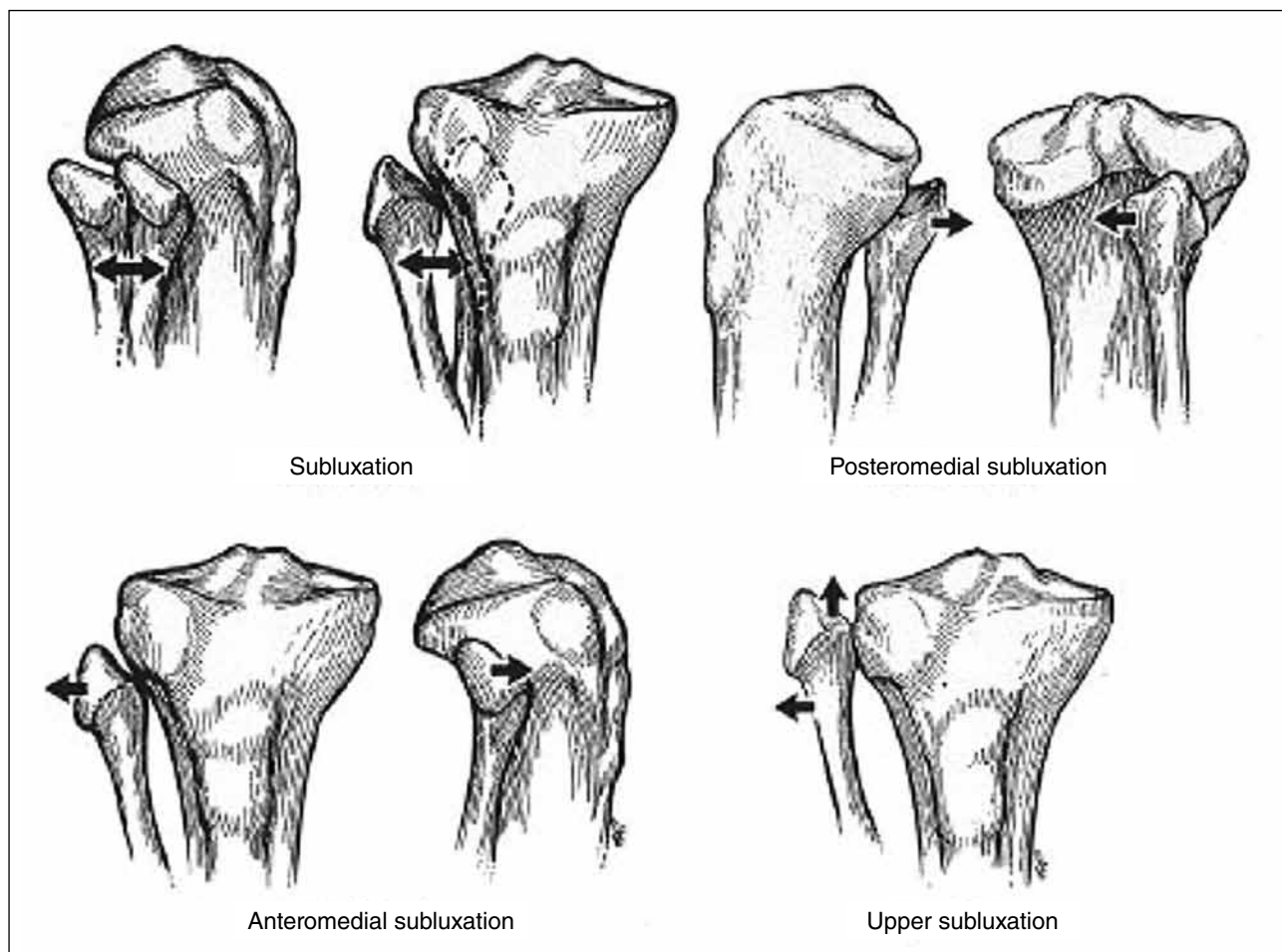
Proximal tibiofibular joint dislocation is a rare injury; it represents 1% of the traumatic injuries of the knee and, in general, it is associated with an indirect traumatism during sports or car crashes.¹ Lyle described this injury in 1925 for the first time and, in 1974, Ogden et al.^{1,2} published 108 cases and described four types of sub-luxation (Figure I): type I, it is caused by ligament laxity and, in most cases, there is no history of traumatism;³ type II, it is an anterolateral dislocation that occurs in up to 85% of all the cases,^{4,5} especially due to fall on flexed knee with ankle inversion and foot plantar flexion;^{3,4} type III, it is the joint posteromedial dislocation and it is associated with fibular nerve injury; it results from direct traumatism^{2,6} and type IV, it is the upper dislocation, it is scarcely frequent, and it is associated with high-energy ankle injuries.^{4,6}

The proximal tibiofibular joint is surrounded by a fibrous capsule³ and the margins defined by the fibular bone head and the lateral tibial condyle are lined by hyaline

cartilage.^{2,6} Its stability is mainly given by the anterosuperior and the posterosuperior ligaments, and the interosseous membrane, the lateral collateral ligament and the popliteus tendon represent additional support for stability.^{5,7} The anterior displacement of the fibular head is stabilized by the femoral biceps tendon, which is inserted in the fibular head.⁸ From the symptomatic point of view, the patient can consult with pain on the lateral aspect of the knee, pain at palpation by pressure on the fibular head, which can be prominent, and with oedema, incapability for knee extension and difficulty with weight bearing on the affected limb.³

Radiographic findings can be subtle and symptoms can be more or less severe—sometimes, diagnosis can be difficult. In 60% of the cases, it is delayed.

Treatment depends on the pattern of instability. Acute dislocation can be managed with closed reduction with 90°-knee flexion.⁹ Later it is necessary to evaluate the status and stability of the lateral collateral ligament.^{2,10} If closed reduction fails, open reduction is the next therapeutic option.



▲ **Figure 1.** Classification of proximal tibiofibular dislocation as described by Ogden et al.

Stabilization can be carried out by screws or Kirschner pins combined with capsule-ligament repair.^{11,12} If dislocation is recurrent, there are several therapeutic options—arthrodesis,² resection of the fibular head¹³ and Weinert and Giachino reconstruction,^{12,13} with significant long-term morbidity,² such as ankle joint pain and instability. The resection of the fibular head can cause knee instability and ankle chronic pain. Spontaneous reduction is hardly frequent.

Case

Twenty-three years old male who suffered fall from own height while skating. At the time of admission, he reports protuberance on the lateral aspect of his left leg at the proximal level, oedema, and pain at palpation and knee extension. The patient is assessed with

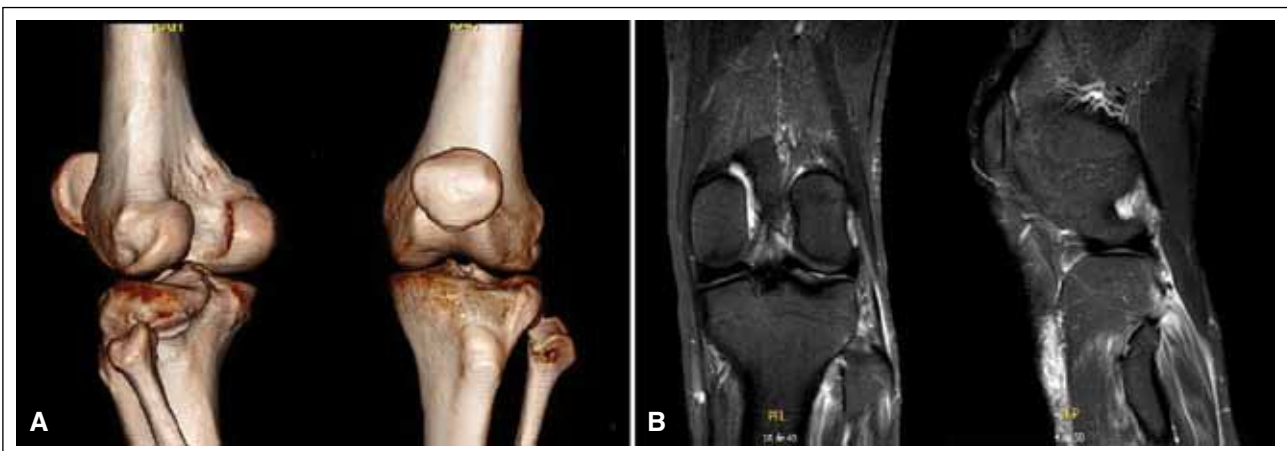
comparative X-rays (Figure 2), which show left fibula proximal dislocation with no associated fractures that can be seen. The patient is immobilized with posterior long leg splinting.

In CT scan with 3D reconstruction (Figure 3A), we rule out fractures but detect the posterolateral dislocation of the fibular bone. We prescribe knee MRI, which show lateral and posterior displacement of the fibular bone due to dislocation, and also changes in the signal intensity in the posterolateral corner due to fluid with laminar distribution without defined collections (Figure 3B).

We considered that the patient was suitable for closed reduction under anesthesia; however, while waiting for the procedure, the patient performs weight-bearing on the affected limb and undergoes spontaneous reduction. Pain improves immediately and knee mobility is complete. X-rays to confirm reduction are considered to be satisfactory (Figure 4).



▲ **Figure 2.** AP and lateral X-rays of right and left knees. We can see proximal dislocation in left fibula.



▲ **Figure 3.** A. Left knee CT scan with 3D reconstruction. B. Left knee MRI.



▲ **Figure 4.** AP and lateral X-rays of left knee after reduction.

Discussion

The traumatic dislocation of the proximal tibiofibular joint in isolation is a rare injury, which should be suspected to avoid diagnosis delay, what can be the case in 60% of the cases. In this case, CT scan with 3D reconstruction clearly shows posterolateral dislocation. The patient was given analgesia and he was immobilized, but while waiting for closed reduction, he performs weight-bearing on the affected limb, what results in the spontaneous reduction of the dislocation with immediate improvement in symptoms and total mobility due to the contraction of the femoral biceps muscle. Spontaneous reduction in such injuries is not frequent and nor has it been described, maybe because it rarely occurs; nevertheless, closed management is the first therapeutic alternative.

In 2014, Nieuwe et al. described the case of a football player who received closed reduction under sedation with immediate recovery of articular continuity and symptoms subside. Symptoms reported in this case were very similar to those in our patient; however, the patient was able to perform knee flexion and extension and he only felt pain beyond 110°-flexion. Along these lines, Calabro et al. published a method for closed reduction without seda-

tion with the patient's knee in 90°-flexion and pressure on the fibular head in posterior direction. Results were satisfactory with recovery of joint continuity and resolution of symptoms. This one may be the technique of choice for closed reduction without sedation.

Differential diagnoses in this injury are menisci injury, femoral biceps tendinitis, and knee posterolateral instability, which should be ruled out by appropriate physical examination and adequate imaging studies.

Therefore, on the basis of our results and those in the two articles that have been published on the issue, we suggest trying a short period of patients' weight-bearing before adopting other therapeutic alternatives, such as closed or open reduction, in case the case resolves by spontaneous reduction.

Conclusions

The acute traumatic dislocation of the proximal tibioeponeal joint is a hardly frequent entity, which can well go unseen at the ERs. If it is timely diagnosed, it can be managed at acute stages and thus avoid surgical procedures and chronic instability.

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