

THE DIFFICULTY OF THE DIAGNOSIS OF AN ISOLATED PROXIMAL TIBIOFIBULAR JOINT DISLOCATION: A CASE REPORT AND REVIEW OF LITERATURE

Zied Bellaaj*, Makram Zrig*, Issam Aloui*, Mustapha Koubaa*, Abderrazek Abid*

* University Hospital Fattouma Bourguiba, Orthopaedic, Monastir, Tunisia

Abstract

Introduction: An isolated dislocation of the proximal tibiofibular joint is uncommon injury. The diagnosis can be easily missed. In this case report, we expose how avoid missing out on the diagnosis and we expose a special maneuver which facilitating the open reduction.

Case Report: We report the case of a 31-year-old man presented at emergency after right knee during football game. Initially physical examination objectives a moderate swelling and a local pain on the lateral side of the right knee. The anteroposterior and lateral radiographs was considered normal. The diagnosis of lateral meniscal injury was admitted. After one week, reexamination objective a tender bony prominence over the anterolateral aspect of the knee. Radiological investigations confirms the diagnosis of a proximal tibiofibular dislocation. An open reduction was performed. At final follow-up, the patient don't presents any complaints, with complete range of motion of the knee and the ankle.

Conclusion: The proximal tibiofibular joint dislocation is rare entity. The early diagnosis can be missed easily if no awareness of this injury is present. The clinical presentation can mimes a lateral meniscal or lateral ligaments injuries. CT cofirms diagnosis if X-ray are insufficient. Often, early diagnosis allows a closed reduction without surgery.

Introduction

Isolated dislocation of the proximal tibiofibular joint is a rare condition first described by Nelaton in 1874 (1). The dislocation can be individualized with anteroposterior (AP) X-rays of the knee. However, the lack of sufficient and clear signs is resulting in diagnosis difficulties and further investigations are required especially bilateral AP X-rays and CT scan of the knee (2,3). Noticeably, the initial diagnosis in emergencies can be misleading in case of a lack of awareness of this specific injury (4).

We report the case of a young man with an isolated dislocation of the proximal tibiofibular joint that was initially misdiagnosed leading to failure of the closed reduction. We describe a special maneuver used to obtain open reduction of the dislocation without necessity of muscle release.

Case Report

A 31-year-old man presented at the Emergency Department after a trauma of the right knee that occurred during a football game. The mechanism of the

injury was not clearly explained by the patient. He only reported that his knee was fully flexed, and his ankle was inverted during a violent, twisting motion. The patient was complaining of pain in the right knee with impossibility to bear weight on his right lower limb. Physical examination revealed pain on palpation and swelling localized at the lateral side of the joint. The knee was stable but its range of motion was limited and painful. AP and lateral radiographs of the knee were considered as normal and the diagnosis of lateral meniscal tear was initially retained. Immobilization with an above-knee plaster was preconized associated to pharmacologic treatment. One week later, the patient was always painful. A bony prominence over the anterolateral aspect of the knee was found (figure 1).

The comparative AP and true lateral radiographs of the knee showed an anterior translation of the fibular head (figure 2). CT scan with comparative axial and 3D images of the knee, confirmed a right anterolateral proximal tibiofibular joint dislocation (figure 3). Thus the patient was operated under general anesthesia. Closed

reduction was initially tried, by applying a pressure on the fibular head with 90° knee flexion combined with an external rotation and eversion of the ankle. This attempt was unsuccessful leading to an open reduction by direct lateral approach. The reduction was difficult, facilitated by tire remover maneuver using a spatula. A pop was felt and heard concomitant with the reduction. An additional stabilization by Kirchner (K) wire was realized. Fluoroscopy confirmed the reduction and the right position of the K-wire (figure 4). Cast immobilization was preconized for three weeks. It was then removed and rehabilitation sessions started targeting to regain knee full range of motion with complete weight bearing. The K-wire was removed two months after surgery. At 29 months follow-up, the patient had complete knee and ankle range of motion and went back to his anterior sport activities without residual complaints.



FIGURE 1. Photograph of both knees showing accentuation of the bony prominence of the right fibular head.



FIGURE 2. The comparative anteroposterior (AP) bilateral knee X-ray, showing some lateral translation of the right fibular head.

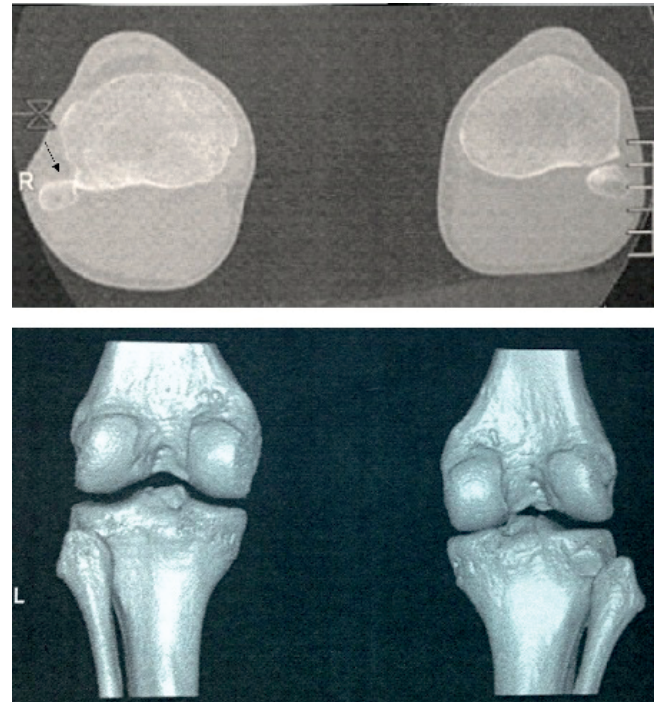


FIGURE 3. Comparative axial CT scan images, clearly identified a right anterolateral proximal tibiofibular joint dislocation.

Discussion

The proximal tibiofibular joint is a synovial joint between the head of the fibula and the lateral tibial plateau. The primary stabilization is ensured by the oval form of the articular surfaces, the articular capsule and the anterior and posterior proximal tibiofibular ligaments. This primary stability is reinforced anteriorly by the biceps femoris tendon, posteriorly by the popliteus tendon, superiorly by the fibular collateral ligament and inferiorly by the interosseous membrane (5). Functionally, this joint belongs to the knee and to the ankle due to the interosseous membrane (6).

Dislocation of this joint is a rare condition. The original paper of Ogden (6) defines four types of this injury: subluxation (type I), anterolateral dislocation (type II), posteromedial dislocation (type III) and superior dislocation (type IV). Type II is the most frequent.

The mechanism of this injury most often involves both knee and ankle after a violent twisting motion (7-8). For the ankle, it was postulated that a sudden plantar flexion and inversion of the foot cause tension in the peroneal muscles applying a forward displacement force on the proximal fibula. For the knee, the mechanism associates a simultaneous knee flexion and external rotation of the

leg disrupting the tibiofibular ligaments. This injury is commonly sports related, especially during landing after jumping and after high-velocity accident (9).

In majority of the publications, the clinical findings are pain located at the lateral side of the knee happening during sport activities with a normal range of motion and without joint effusion (10). In some cases, physical examination objectives a prominence over the fibular head accentuated by knee flexion as noted in the current case. The diagnosis can often be hindered due to the lack of sufficient and clear signs. Thus, it can be easily diverted to whether lateral meniscal lesion or partial lateral collateral ligament disruption. The injury has then to be suspected in front of pain located at the lateral side of the knee happening after a suggesting traumatism. AP radiographs of the knee are the first investigation to undertake, however some difficulties could be encountered to identify the dislocation (11). In case of inconclusive diagnosis, comparative X-rays of the knees should be performed and can suggest some abnormalities at the tibiofibular joint. Alternatively CT or MRI becomes necessary to establish the diagnosis (2,3). After establishing the diagnosis, an early reduction decrease the risk of complications. Then a closed reduction must be performed under sedation or general anesthesia. As reported in the major publications, the maneuver of reduction are similar and based on ligamentotaxis (5,6,12). Usually, it is performed with a knee flexed at 90° (relaxation of the fibular collateral ligament and biceps tendon) associated to a dorsal extension, external rotation and eversion of the foot (relaxation of the anterolateral muscles and the interosseous membrane). It can be facilitated by applying a direct pressure over the fibular head in an opposite direction of that of the dislocation. Subsequently, after reduction, immobilization of at least 2-3 weeks in an above-knee-plaster followed by functional rehabilitation are always recommended (13). Closed reduction can fail due to interposition of soft tissues or an anterior muscle tension or delayed diagnosis as reported in the current case. Open reduction by a direct lateral approach is then indicated. It must be performed after identifying the peroneal nerve, with a knee flexed associated to a external rotation and eversion of the ankle and direct pressure over the fibular head. If the reduction was not obtained, a supplementary muscle release of the extensor digitorum longus insertion on the peroneal head could be necessary (9). In our case, reduction was obtained

without muscle release but facilitated by tire remover maneuver with a spatula, a pop was heard and felt at the same time of the reduction. For more stability, open surgical reduction can be followed by capsular sutures and mostly by fixation using a K-wire or a screw (14). In the current case, K-wire was used because it is more practical and easier to remove.

Conclusion

The proximal tibiofibular dislocation is uncommon. Clinical presentation mimics lateral meniscal or lateral ligaments injuries. AP knee X-ray can be insufficient to confirm the diagnosis and further radiological investigations become necessary. Often, early diagnosis allows closed reduction. While, lack of awareness of this specific injury associated with the lack of clear signs on physical examination can lead to miss or delay the diagnosis, open reduction becomes then necessary.

References

1. Nelaton A. Elements de pathologie chirurgicale. Paris: Balliere; 1874;292.
2. Keogh P, Masterson E, Murphy B, McCoy CT, Gibney RG, Kelly E. The role of radiography and computed tomography in the diagnosis of acute dislocation of the proximal tibiofibular joint. *Br J Radiol.* 1993; 66:108-11.
3. Voglino JA, Denton JR. Acute traumatic proximal tibiofibular dislocation confirmed by computed tomography. *Orthopedics.* 1999;22:255-58.
4. Love JN. Isolated anterolateral proximal fibular head dislocation. *Ann Emerg Med.* 1992;21:757-9.
5. Aladin A, Lam KS, Szypryt EP. The importance of early diagnosis in the management of proximal tibiofibular dislocation: a 9- and 5-year follow-up of a bilateral case. *Knee.* 2002; 9: 233-6.
6. Ogden JA. The anatomy and function of the proximal tibiofibular joint. *Clin Orthop Relat Res.* 1974; 101:186-191.
7. Laing AJ, Lenehan B, Ali A, Prasad CVR. Isolated dislocation of the proximal tibiofibular joint in a long jumper. *Br J Sports Med.* 2003; 37:366-7.
8. Ellis C: A case of isolated proximal tibiofibular joint dislocation while snowboarding. *Emerg Med J.* 2003; 20:563-4.
9. Robinson Y, Reinke M, Heyde CE, Ertel W, Oberholzer A. Traumatic proximal tibiofibular joint dislocation treated by open reduction and temporary fixation: a case report. *Knee Surg Sports Traumatol Arthrosc.* 2007; 15:199-201.
10. Veerappa LA, Gopalakrishna C. Traumatic proximal tibiofibular dislocation with neurovascular injury. *Indian J Orthop.* 2012;46: 585-588.
11. Capps GW, Hayes CW. Easily missed injuries around the knee. *Radiographics.* 1994; 14:1191-1210.
12. Nieuwe Weme R. A., Somford M. P., Schepers T. Proximal tibiofibular dislocation: a case report and review of literature. *Strat Traum Limb Recon.* 2014; 9:185-189.
13. Semonian RH, Denlinger PM, Duggan RJ. Proximal tibiofibular subluxation relationship to lateral knee pain: a review of proximal tibiofibular joint pathologies. *J Orthop Sports Phys Ther.* 1995; 21:248-57.
14. Van den Bekerom MPJ, Weir A, van der Flier RE. Surgical stabilisation of the proximal tibiofibular joint using temporary fixation. *Acta Orthop Belg.* 2004; 70:604-8.