

Case Report

Fabella fracture with radiological imaging: A case report

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ABSTRACT

The fabella is a kind of sesamoid bone which is located in the lateral head of the gastrocnemius muscle. A slice of studies demonstrated that fabella is involved in the knee joint stabilization. Fabella fracture may cause knee pain or functional impairment as the previous reports pointed. It is extremely rare, which leads to its high rate of missed diagnosis in clinical and radiography to some extent. We report a case of a 38-year-old female who was struck by an electromobile. The fabella fracture was confirmed on X-ray plain films. After that, the degree of injury was evaluated with the magnetic resonance imaging (MRI).

Introduction

The fabella is a sesamoid bone of the knee, accounting for 10–30% of the population [1]. It is usually located in the lateral head of the gastrocnemius muscle [2,3] (Fig. 1), and may play an role in stabilizing the knee joint.

Fabella fracture is so rare that few cases have been reported [4,5]. It could be induced by direct trauma to the knee, chronic stress or total knee arthroplasty (TKA) [3]. As described for the first time by Sagel in 1932 [6], there are no more than 20 cases of fabella fracture reported during the past 70 years, which may in part attribute to its high rate of missed diagnosis.

We report a case of a 38-year-old woman who was struck by an electric vehicle traveling approximately 30 miles per hour and got fabella fracture confirmed by X-ray and magnetic resonance imaging (MRI).

Case report

A 38-year-old female patient presented to the emergency department as a pedestrian who had been struck by an electromobile traveling about 30 miles per hour. The patient was conscious and suffered from left knee pain around the posterolateral.

Anteroposterior and lateral plain films of the left knee were taken for initial evaluation immediately (Fig. 2). It revealed a transverse radiolucent line across the fabella, which was regarded as a complete fracture. The radiolucent line was aggravated by keen joint passive extension (Fig. 3).

To further evaluate the internal structures of the knee, 3.0 Tesla MRI scanner was performed with sagittal T1-weighted fast spin-echo and axial T2-weighted fat suppressed sequences, and then it confirmed the tibial plateau contusions and transverse fracture of the fabella (Figs. 4, 5).

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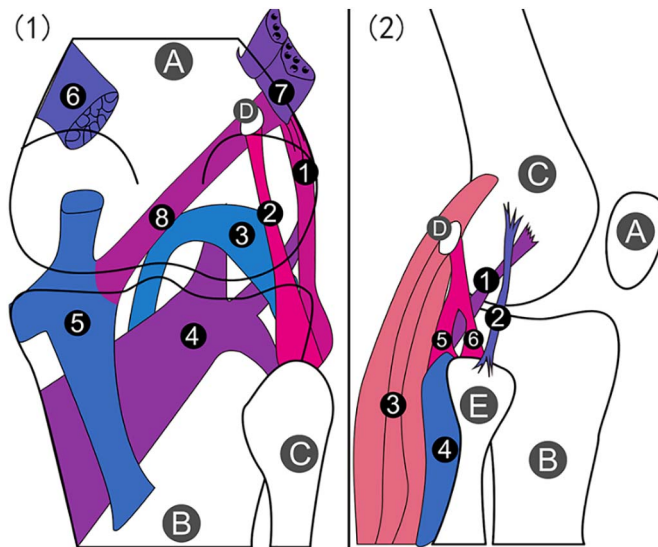


Fig. 1. Structures of knee joint. (1) Posterior aspect of knee joint. A: femur, B: tibia, C: fibula, D: fabella. 1: Fibular collateral ligament, 2: fabellofibular ligament, 3: arcuate ligament, 4: popliteus tendon, 5: semimembranosus tendon, 6: gastrocnemius muscle (medial head), 7: gastrocnemius muscle (lateral head), 8: oblique popliteal ligament. (2) Lateral aspect of knee joint. A: patella, B: tibia, C: femur, D: fabella, E: fibula. 1: Popliteus tendon, 2: fibular collateral ligament, 3: gastrocnemius muscle (lateral head), 4: popliteus muscle, 5: oblique popliteal ligament, 6: fabellofibular ligament.

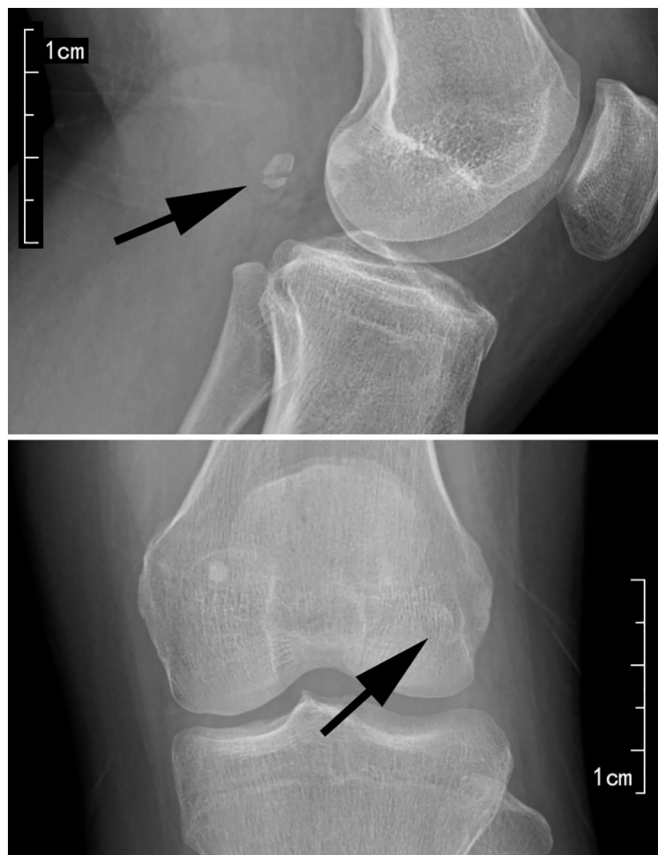


Fig. 2. Lateral and anteroposterior X-ray plain film of the left knee revealed a transverse radiolucent line across the fabella (black arrow).



Fig. 3. Lateral X-ray plain film of the left knee revealed the aggravated radiolucent line (black arrow) by knee joint passive extension.



Fig. 4. A sagittal T1-weighted fast spin-echo showed bone contusions in the tibial regions.

Because there was no definitive surgical indication, conservative treatment was adopted for eliminating pain and edema. At four-month follow-up, the patient recovered well with no knee discomfort (Fig. 6).

Discussion

The fabella is an ossified sesamoid bone embedded in the lateral head of the gastrocnemius muscle, forming a typical synovial joint with the lateral femoral condyle [7]. It lies at the terminal of the tendon of the lateral head of the gastrocnemius muscle, the arcuate ligament, and the oblique popliteal and fabellofibular ligaments [8], consisting of a point of confluent forces [9].

Fabella fracture is rare and often reported as an incidental finding by the radiologist [10], and this fracture is often accompanied with serious injury of the knee. Fabella fracture could be induced by direct trauma to the posterolateral or lateral aspect of the knee [11–13]. Theodorou SJ [3] reported a case of fabella fracture caused by TKA, suggesting the probability of iatrogenic pathway of fabella fracture.

The fabella consists of a number of pathological conditions, including tendinitis of the lateral head of the gastrocnemius muscles, chondromalacia of fabella [14], peroneal nerve impingement [15], fabella dislocation and fracture, et al. Compared with those, traumatic fabella fractures and TKA related fabella fractures are more common [3,15].

Lateral X-ray plain film can make the diagnosis when radiolucent line of fabella fracture is obvious. CT or MRI may further confirm a suspected fabella fracture and guide management or treatment to prevent morbidity which is mainly related to knee pain and functional impairment [5,10], MRI dose better in evaluating bone marrow and soft tissue injury.

Conservative treatment is recommended in the acute phase of fabella fracture [4]. In reported cases, conservative treatment such as medications, rest, immobilization and physical therapy indeed took effect [11,16]. Fabellectomy is recommended when

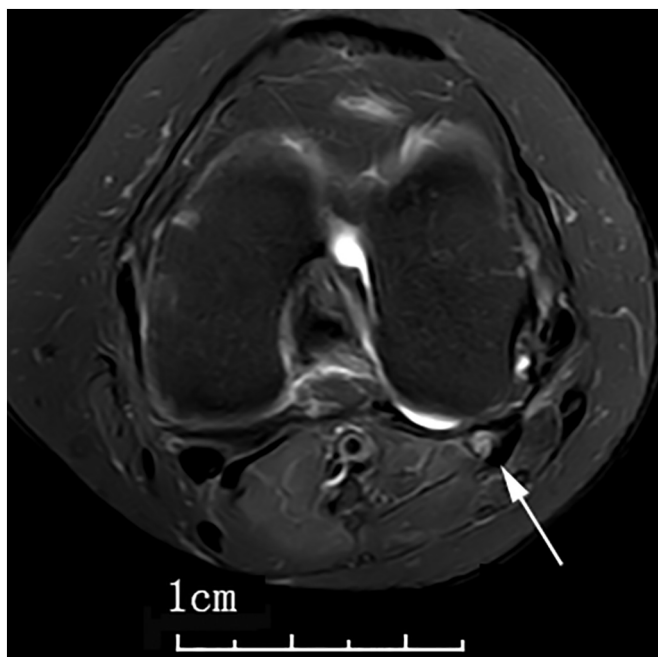


Fig. 5. Axial T2-weighted fat-suppressed sequences revealed a low signal line within the fabella consistent with fracture (white arrow).



Fig. 6. Four months later, the patient recovered well, knee joint flexion and extension movement was good.

conservative therapies fail or there is impingement of the peroneal nerve [2].

Conflict of interests

The authors have no conflicts of interest to declare.

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