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Medial Patellar Dislocation with Traumatic Avulsion of Quadriceps Tendon in a Young Athlete: A Case Report

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Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Background: We presented an uncommon orthopedic case of medial patellar dislocation with traumatic avulsion of quadriceps tendon in a young healthy athlete. We were interested in this case because of its rarity.
Case Presentation: A 32-year-old athletic male patient, not known to have any medical illness, with a history of falling down on stair 3 steps and sustained a direct trauma to his left knee. He has noticed that the patella was shifted to the medial side with severe pain. He sought medical advice in a polyclinic and they performed orthogonal x-ray on his left knee and then discharged home on NSAID and non-articulating, non-hinged knee brace. He came to our hospital a few days after his initial trauma with sever left knee pain. *On Examination,* he was vitally stable, walking only by crutches and having an antalgic gait. On inspection, there was a moderate left knee effusion with

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no ecchymosis or wounds. He had a gap felt above the patella, lateral patellar side tenderness and restricted range of motion as a result of the pain. He had a positive patellar apprehension test on medial translation and weak knee extension associated with pain. Initial X-rays showed moderate arthritic changes in medial joint space, so patient was advised to take NSAID and to wear hinged-knee brace with no weight bearing for 2 weeks until effusion subsides with an appointment with sport clinic after MRI. Later on, he seen in clinic still complaining of lateral side knee pain and restricted range of motion, MRI was done to the left knee which showed: mild knee effusion, arthritic changes, insertional quadriceps and lateral retinaculum tear. He was admitted and underwent primary repair of quadriceps tendon and lateral retinaculum through anterior mid-line knee approach. Then, a hinged locked knee brace was applied in full extension. Post operatively, he was advised to start mobilizing, no weight bearing by 2 crutches for 3 weeks. Then weight bearing was tolerated for 3 more weeks, and discharged on oral analgesic and to follow up in OPD after 2 weeks. Two weeks later, patient was presented to OPD for suture removal and referred to physiotherapy. Serial follow-up in OPD and physiotherapy showed significant improvement. **Conclusion:** This case illustrates the importance of a thorough detailed history, physical examination, and imaging studies emphasizing on the important role of MRI during early diagnosis and management. Close follow-up and physiotherapy post operatively are highly needed for full regain of normal activity.

Keywords: Patellar dislocation; quadriceps tendon avulsion; trauma; medial patellar dislocation.

1. BACKGROUND

Patella provides an insertion to the four muscles of quadriceps femoris to form patellar ligament [1]. Patellar dislocation is a common injury which leads to knee instability [2]. Evidence has shown that 5.8 per 100,000 of general society sufferd from patellar instability [3]. The main predisposing factors in such an injury includes, people aged <20 years, especially athletes, both genders, particularly females, obesity, history of recurrent dislocation, increasing lateral quadriceps vector, twisting injury, and axial load on a flexed knee [3-6]. People who are aged 10-17 years old have peaked patellar dislocation incidence of 29 per 100,000 [3]. A patient will have 17% of recurrence rate injury if he/she had primary patellar dislocation, and 49% for a patient who had sustained repeated patellofemoral joint subluxation [5].

Medial patellar dislocation considered as less commonly occurring than the lateral patellar dislocation [2]. It is usually associated with large effusion, disrupted Posterior cruciate ligament, and posteriolateral corner injuries of the patella [4].

Usually, it occurs due to extensive lateral retinacular release [7]. In 1988, New Orleans reported Thirty knees with medial patellar subluxation which were involved as a complication of lateral retinaculum release [8]. Soft tissue injuries could be detected by Magnetic Resonance Imaging [9], It provides us with information about whether the patellar dislocation is in acute or chronic stage [10].

We present unusual circumstances in which the medial patella and the quadriceps femoris muscles got involved due to lateral retinaculum injury.

2. CASE PRESENTATION

A 32-year-old male patient, not known to have any medical illness, professional body builder has a history of falling down on stair 3 steps and sustaining a direct trauma to his left knee and had noticed that the patella was shifted to medial side with severe pain and so he pushed the patella back to its place by himself for the first time. He sought medical advice in polyclinic, they performed x ray orthogonal on the left knee and discharged him on NSAID, and he was not given any instructions about articulation, or hinged knee brace and weight bearing status.

Patient came to our hospital a few days after his initial trauma with sever left knee pain, seen at orthopedic trauma clinic. In past medical and surgical history: He has a history of taking growth hormone and protein supplementation without a medical advice for the past 12 years. There's a positive history of a right side medial meniscus and ACL tear due to knee twisting injury 10 years back and underwent only arthroscopic menisceal debridement without ACL reconstruction done in private hospital. Last X- ray for the right knee was done 2 months earlier showed severe valgus in right knee and moderate arthritic changes in medial joint space. It was advised to do Varus producing osteotomy but patient refused to do the surgery.

2.1 On Examination

General: He is vitally stable, walking without brace only by crutches, having antalgic gait.

Local: by inspection, there's moderate left knee effusion with no ecchymosis or wounds. On palpation, the patient has a gap felt above the patella and lateral patellar side tenderness. Range of motion was restricted due to the pain. Valgus, Varus stress test, anterior, and posterior withdrawer tests were negative. He has a positive patellar apprehension test on medial translation. He has weak knee extension associated with pain with normal distal neurovascular examination.

AP, Lateral and Skyline knee X-rays showed moderate arthritic changes in medial joint space, so patient was advised to take NSAID and to wear hinged knee brace with non-weight bearing for 2 weeks until effusion subside with an appointment with sport clinic after MRI.

2.2 Later on, Patient was Seen in the Sport Clinic

Patient still complaining from lateral side knee pain and restricted range of motion but the swelling subside. MRI was done to the left knee which showed: Mild knee effusion, arthritic changes, insertional quadriceps and lateral retinaculum tear.

He was admitted to hospital and underwent primary repair of quadriceps tendon and lateral retinaculum through anterior mid line knee approach.

Fig. 1. Lateral view of left knee shows widening of patellofemoral space with no significant patella baja

Fig. 2. Bilateral knee standing view shows in left side inferior and medical displacement of patella as compares to right side

Fig. 3. MRI sagittal cut shows complete quadriceps tendon rapture with gap, proximal retraction. Patellar ligament kinked

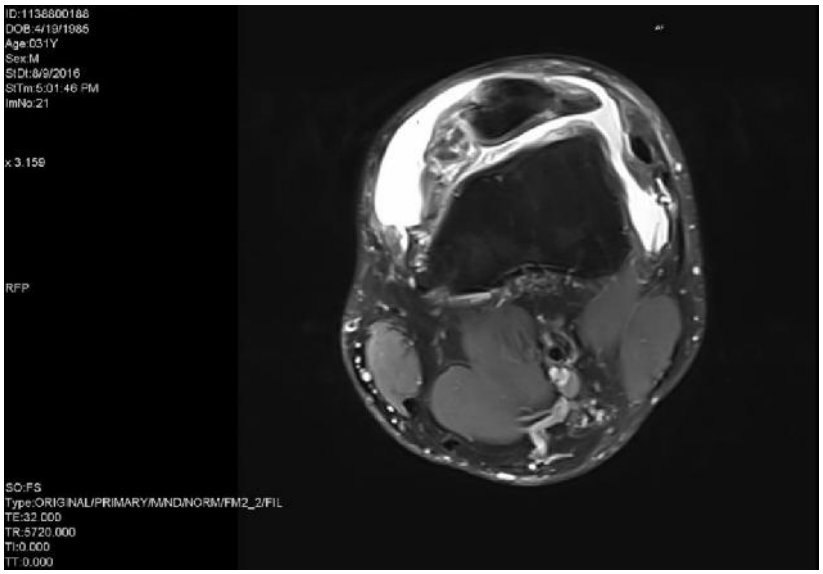

Fig. 4. MRI axial cut shows complete tear of lateral reticulum, intact medial reticulum, vastus medialis fiber still attach to medial border of patella

Longitudinal drill holes in patella by non-absorbable sutures in tendon in a running locking fashion with ends free to be passed through osseous drill holes, lateral retinaculum is repaired with heavy non-absorbable sutures. Then, hinged locked knee brace was applied in full extension.

Post-operative X-ray was done as shown in Fig. 8, the patient was advised to start mobilizing, non-weight bearing by 2 crutches for 3 weeks then weight bearing was tolerated for 3 more weeks. He was discharged on oral analgesic and to follow up in OPD after 2 weeks. Two weeks later, patient presented to OPD for suture removal and referred to physiotherapy.

3. DISCUSSION

Acute traumatic patellar dislocation is a common injury in the active and young adult populations [11] Patellar dislocation occurs as the quadriceps

muscles pull along the patellar tendon to extend the knee. This often recurrent injury rarely occurs from direct force but rather happens more often during dancing or gymnastics. The patient may feel or hear a ripping or popping sensation or sound. The patient complains of intense pain and holds the knee flexed. The patella is visibly more medially than normal. The dislocation maybe reduced before radiographs are taken. The quadriceps or patellar tendon can rupture acutely especially in an older athlete who jumps or falls off a high altitude. The tendon will be tender directly over the rupture, and the patella may be positioned abnormally. A hemarthrosis may be present, and radiographs may show the abnormally positioned patella [12].

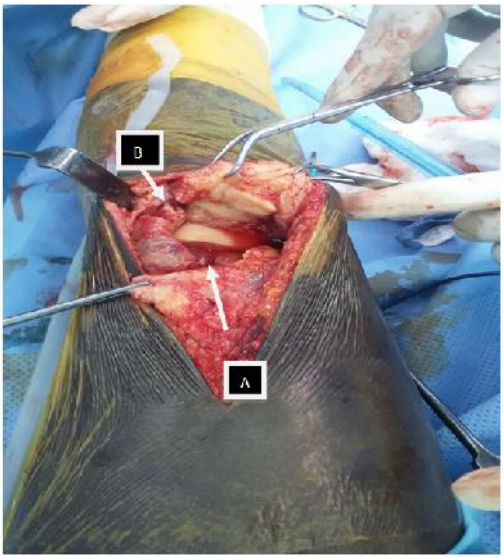

Fig. 5. Intraoperative. A- Quadriceps defect. B- Lateral retinaculum discontinuity

The reported incidence of patellar dislocation is 5.8 per 100,000, but it may be as high as 29 per 100,000 in the adolescent population [13].

Medial dislocation of the patella is a disabling condition; there are several reports in the literature review that describe this condition and its association with failed lateral retinacular release. The diagnosis and treatment of medial subluxation of the patella may be difficult. Direct repair or imbrication of the lateral retinaculum provides initial stability but a noticeable increase in medial excursion usually reappears [14].

Medial patellar instability is a disabling condition that can limit daily functional activities because of apprehension and pain. The instability is influenced by a variety of factors that allow the patella to translate medially and ultimately subluxate or dislocate to the medial side. In patients with normal trochlear and patellar osseous anatomy and lower extremity alignment, the patellar instability results from insufficient passive soft-tissue stabilizers [15,16].

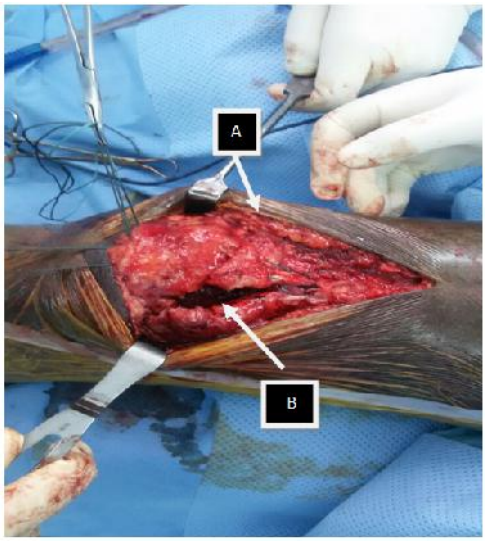

Fig. 6. Intraoperative. A- Quadriceps tendon sutured to patellar stump through patella drill holes. B- The lateral retinaculum defect is clear

Fig. 7. Intraoperative repair of detached lateral retinaculum

The initial evaluation of a first-time traumatic patellar dislocation should include an appropriate patient history, family history of patellar

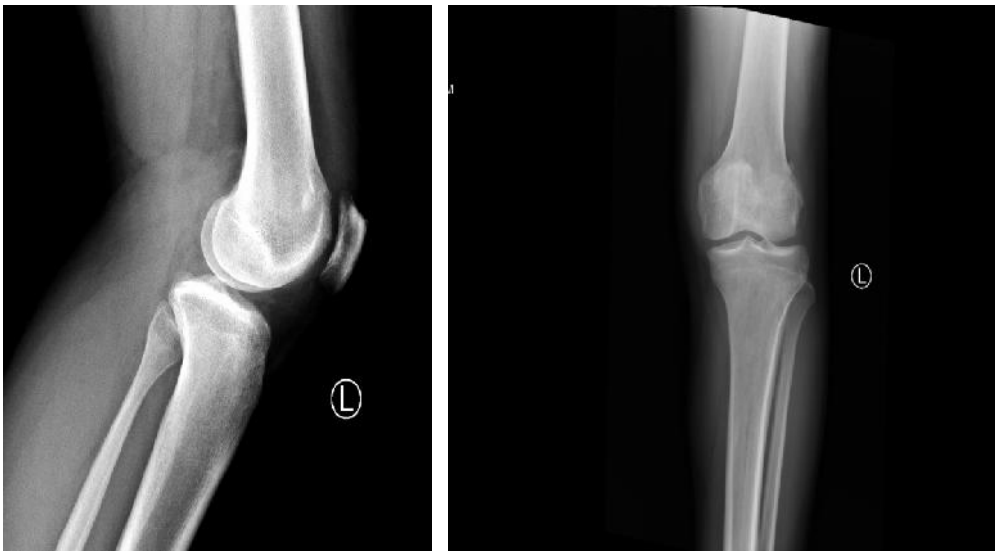

Fig. 8. Post-operative X ray of left knee

dislocation and hyperlaxity, physical examination, and diagnostic studies. Sports (61%) and dances (9%) injuries are two common mechanisms of patellar dislocation [17].

Our case highlights the importance of a thorough detailed history, physical examination, and imaging studies and emphasizes on the important the role of MRI for early diagnosis and management as well as the needed follow-ups for such rare cases.

Some surgeons have advocated surgical rather than nonsurgical intervention to treat patellar dislocation, out of concern for possible recurrence. A Cochrane review by Smith et al found that although there was some evidence that appeared to favor surgical management of primary patellar dislocation, the quality of the currently available evidence was too poor to allow any firm conclusions to be made [18]. A knee immobilizer, crutches, or both are needed for aftercare as well as physical therapy.

In summary, there are a limited number of reported cases of medial patellar dislocation with traumatic avulsion of quadriceps tendon. This type of patellar dislocation might not be as rare as previously thought. It can be a subtle problem, most often difficult to diagnose. A high index of suspicion is needed for appropriate and early diagnosis and management.

3.1 Follow up

Patient post-operative follow-up in 2 weeks was checked in orthopedic department as shown in Fig. 8, his surgical wound was clean, sutures were removed and advised to keep immobilizer in his knee and avoid weight bearing. A month later, the patient was evaluated. He improved without complainants or scars. After 3 months, he was evaluated and referred to physiotherapy to start mobilization with gradual weight bearing over the affected knee. After 6 months, patient had full weight bearing over the affected knee and satisfied. After one year, he return back to full activity.

4. CONCLUSION

The present study was designed to determine the difference between the lateral and medial patellar dislocation. It is important to emphasize that patellar dislocation is an extremely rare condition especially the medial dislocation as in our case. It is a developmental disorder. Its incidence is influenced by sex, age, race, medications and sporting activity. The study has shown that medial patella dislocation needs high index of suspicion for appropriate management.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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