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TRAUMATIC PATELLA ALTA FOLLOWING A SLIP AND FALL WHILE PLAYING CRICKET: A RARE CASE REPORT

General Surgery

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ABSTRACT

Patella alta, defined as an abnormally high positioning of the patella relative to the femoral trochlea, is most often encountered as a congenital anomaly or in association with chronic extensor mechanism disorders. Acute traumatic patella alta due to patellar tendon rupture is a rare presentation, particularly following low-energy sports injuries. We report the case of a 25-year-old male who developed acute patella alta after a slip and fall while playing cricket. Diagnosis was established using plain radiography and magnetic resonance imaging (MRI), which revealed patellar tendon disruption. Early recognition and surgical repair are essential to restore extensor mechanism function and prevent long-term morbidity.

KEYWORDS

Patella alta, patellar tendon rupture, traumatic knee injury, sports trauma, MRI.

INTRODUCTION

The patella plays a vital role in the biomechanics of the knee joint, acting as a fulcrum to increase the leverage of the quadriceps tendon during extension. Proper positioning of the patella within the trochlear groove is essential for normal knee kinematics. Abnormal positioning, either superior (patella alta) or inferior (patella baja), alters the extensor mechanism's efficiency and predisposes to dysfunction, pain, and instability.

Patella alta is diagnosed radiographically when the patella is positioned higher than normal relative to the femoral condyles. Several indices are used for assessment:

- Insall–Salvati ratio (>1.2 suggests alta) [1].
- Caton–Deschamps index (>1.3 indicates alta).
- Blackburne–Peel ratio (>1.0 suggests alta).

The condition is commonly congenital, associated with generalized ligamentous laxity, trochlear dysplasia, or chronic tendon pathologies. Traumatic patella alta, however, is unusual and most often results from patellar tendon rupture.

Patellar tendon rupture itself is rare, representing less than 0.5% of knee injuries [2]. Risk factors include systemic diseases (diabetes, lupus, chronic kidney disease), local corticosteroid injections, and chronic overuse. It typically occurs in young, active individuals due to eccentric loading of the quadriceps against resistance, such as during jumping or abrupt deceleration [3].

Here, we report a rare case of acute traumatic patella alta following a low-energy cricket-related injury, managed at the Emergency Department of Sri Lakshmi Narayana Institute of Medical Sciences (SLIMS), Puducherry. The case is presented with clinical, radiographic, and MRI findings, alongside a review of relevant literature to emphasize diagnostic and management considerations.

Case Presentation

A 25-year-old male, recreational cricket player, with no significant past medical or surgical history, presented to the Emergency Department of SLIMS, Puducherry with acute right knee pain, swelling, and inability to extend his knee following a fall.

The patient reported that while running between wickets, his foot slipped on the ground, causing a sudden jerk. He immediately felt a "pop" sensation in the front of his knee, followed by sharp pain and inability to continue playing. He denied any direct blow to the knee.

Examination

On arrival, the patient was hemodynamically stable.

- Inspection revealed diffuse swelling of the right knee, with the patella appearing abnormally elevated compared to the opposite side.
- A supra-patellar bulge was noted, and infrapatellar fullness was reduced.
- Palpation demonstrated tenderness localized over the patellar tendon region with a distinct gap below the inferior pole of the patella.
- Active straight leg raise test was not possible.
- Passive range of motion was limited due to pain, but no gross instability was elicited.
- Distal neurovascular examination was normal.

Imaging

- Plain radiographs (AP and lateral views of both knees) revealed superior migration of the right patella compared with the contralateral knee. The Insall–Salvati ratio measured >1.3 on the affected side (Figure 2).
- MRI of the right knee confirmed complete disruption of the patellar tendon at its proximal attachment, with proximal displacement of the patella (Figure 1). Edema and hemorrhagic changes surrounded the injury site. The cruciate and collateral ligaments were intact, and no meniscal or osteochondral pathology was observed.

Hospital Course

The patient was diagnosed with traumatic patella alta secondary to complete patellar tendon rupture. He was admitted under the orthopaedics department and scheduled for early surgical repair. A knee immobilizer was applied for comfort, and analgesics were given. Informed consent was obtained for operative management.

Literature Review

Although patellar tendon ruptures are well documented, reports of acute traumatic patella alta are scarce.

- Siwek and Rao (1981) described 37 cases of patellar tendon ruptures, most of which presented with patella alta on radiographs [4].
- Matava (1996) emphasized that tendon ruptures typically occur in patients <40 years during high-stress athletic activity [5].
- Clayton and Court-Brown (2008) noted that tendon ruptures accounted for <0.5% of musculoskeletal injuries in a large epidemiological study [6].
- Cases of traumatic patella alta following seemingly minor mechanisms, such as slips or sudden stops, are particularly rare, with only isolated reports in the literature [7].

This underlines the importance of clinical suspicion: even low-energy mechanisms can lead to tendon failure when eccentric forces act on a flexed knee.

DISCUSSION

Pathophysiology

The patellar tendon connects the inferior pole of the patella to the tibial tuberosity and functions as part of the knee extensor mechanism. Sudden eccentric contraction of the quadriceps against resistance produces extreme tensile forces across the tendon. In this case, the slip during cricket produced such a contraction, causing tendon rupture and

subsequent proximal migration of the patella.

Clinical Diagnosis
Key Features Include:
- Inability to extend the knee or perform a straight leg raise.
- Palpable gap below the patella.
- Swelling and high-riding patella on inspection.

Radiological Diagnosis
Radiographs confirm patella alta by comparing patellar height indices. MRI is indispensable in confirming tendon rupture, identifying the site (proximal, mid-substance, distal), and ruling out associated ligamentous or meniscal injuries.

Management
Surgical repair is the gold standard for complete tendon rupture. Techniques include end-to-end suturing with non-absorbable sutures, transosseous tunnel fixation, or suture anchors. Augmentation with hamstring autograft or cerclage wire may be used in chronic or poor-quality tissue cases [8].

Rehabilitation involves initial immobilization followed by gradual range-of-motion exercises, quadriceps strengthening, and progressive weight-bearing. Early physiotherapy is critical for preventing stiffness.

Prognosis And Complications
Most patients regain near-normal function with timely repair. However, delayed or missed diagnosis can result in:
- Chronic patella alta with extensor lag.
- Quadriceps weakness.
- Knee instability.
- Early patellofemoral arthritis.

Relevance Of This Case
This Case Is Notable Because:
- The mechanism of injury was low-energy (slip and fall), unlike the high-energy trauma usually implicated.
- The condition was promptly identified in the Emergency Department, underscoring the importance of clinical vigilance.
- Radiology (X-ray + MRI) was essential in confirming the diagnosis and guiding surgical planning.

CONCLUSION
Traumatic patella alta is an uncommon but important presentation of knee trauma. Clinicians should suspect this diagnosis in any young athlete presenting with loss of active knee extension, even when the trauma appears minor. Early imaging and diagnosis are crucial to avoid delays in treatment. Surgical repair of the patellar tendon offers excellent outcomes when performed promptly.

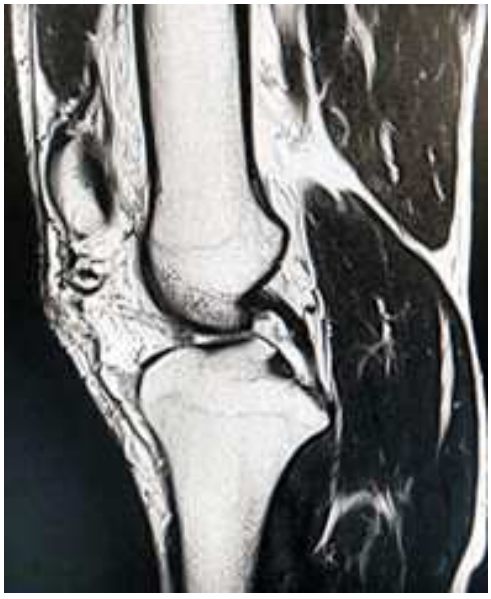

Figure 1: MRI sagittal section of the right knee showing superior displacement of the patella with complete disruption of the patellar tendon.

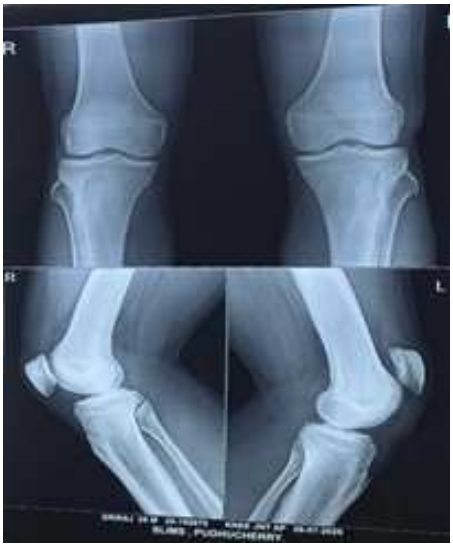

Figure 2: Plain radiographs (AP and lateral views) comparing both knees. The right patella is positioned abnormally high compared to the left, consistent with patella alta.

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