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Bilateral spontaneous patella tendon rupture: A case report

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Abstract
Spontaneous rupture of both patellar tendons is an extremely rare occurrence. This case involves a 49-year-old man who sustained a bilateral atraumatic complete patellar tendon rupture at the lower pole of the patella. The objective of this study is to systematically review this case.
Methodology: The patient's medical records were reviewed and analysed. Initial X-rays of both knees revealed bilateral patella alta, while MRI scans confirmed a complete avulsion of the patellar tendons. Surgical repair was performed using a four-strand Krackow stitch technique in the patellar tendon, along with transosseous repair through three bone tunnels in the patella.
Results: The patient was able to walk with a knee range-of-motion (ROM) brace on both knees within two weeks' post-surgery. By 16 weeks, he achieved a pain-free 90° range of motion in both knees and was able to resume daily activities.
Conclusion: Spontaneous bilateral patellar tendon rupture is an exceedingly rare condition, typically documented as case reports in the literature. Early diagnosis, timely surgical intervention, and structured post-operative rehabilitation contribute to favorable functional outcomes in such cases.

Keywords: Patella tendon, spontaneous rupture, Krackow sutures, metabolic disorder

Introduction
Atraumatic acute rupture of the bilateral patellar tendons is an exceptionally rare condition, with only around 60 cases documented in the English literature to date) [1, 2]. This condition predominantly affects individuals over the age of 40, with a reported male-to-female ratio of approximately 6:1 [3]. The rarity of this injury is further compounded by its strong association with systemic diseases, including chronic renal failure, diabetes mellitus, rheumatoid arthritis, chronic tendinopathy, amyloidosis, and prolonged systemic or local corticosteroid use [4-6]. Additionally, adverse effects of medications particularly fluoroquinolones have been implicated in increasing the risk of spontaneous tendon rupture [5]. In cases lacking identifiable predisposing factors, degenerative changes linked to aging or calcific tendinopathy may contribute to tendon weakening, a mechanism similar to that observed in quadriceps tendon ruptures [6].
The most frequently reported mechanism involves a sudden, reflexive eccentric contraction of the quadriceps muscle while the foot remains anchored to the ground and the knee is flexed, producing excessive tensile stress on the patellar tendons that leads to rupture [1, 3]. Despite a characteristic presentation such as inability to actively extend the knee—diagnosis is often delayed or missed, especially in emergency settings. Up to 38% of patellar tendon ruptures are initially misdiagnosed, underscoring the importance of thorough clinical examination and focused history-taking [7].
Prompt surgical intervention, ideally within 48-72 hours following injury, is strongly recommended, as early repair correlates with superior outcomes including restored range of motion and return to activity [2 ,3, 6]. Delayed repair increases the risk of fibrosis, tendon-end retraction, and compromised healing, all of which can impair long-term functional recovery [2, 3]. Early surgery typically involves tendon reinsertion with Krackow sutures and transosseous patellar bone tunnels [1, 3].

Case
A 49-year-old male presented to casualty with complaint of sudden onset bilateral knee pain while his morning walk following which he was unable to walk and bear weight on bilateral lower limb. Patient has no known co-morbidities.

Patient was not on any long term medication, no history of steroid intake. On examining the patient, a palpable gap on bilateral knees distal to the lower pole of patella and patient was unable to do Bilateral Straight leg raising. Ankle movements were within normal limits and no distal neurovascular deficit was noted. Blood work up of the patient was within normal limits. Radiological investigation: X-ray was done for the patient both knees Antero-posterior view and lateral view (Fig. 1) and MRI of both knees (Fig.2).

Procedure

Midline incision over the knee exposing the patella tendon and quadriceps. Patella tendon was found to be torn from the lower end of patella. Bilateral patella tendon repair was done using 4 strand Krackow stitch placement in patella tendon and transosseous repair using 3 bone tunnels in patella. (Fig.3)

Post-operative follow up

The patient was made to walk with support of walker with knee brace for 2 weeks post-surgery. Physiotherapy was started immediate post op in the form of Quadriceps strengthening and assisted knee range of motion of up to 60 degrees for first 2 weeks and gradually increased to 90 degrees by 6 weeks. After 6 months' patient was able to walk without support without knee brace, patient was able to climb up the stairs and go down the stairs without any aid. Bilateral knee flexion was achieved up to 100 degrees with SLR up to 80 degrees

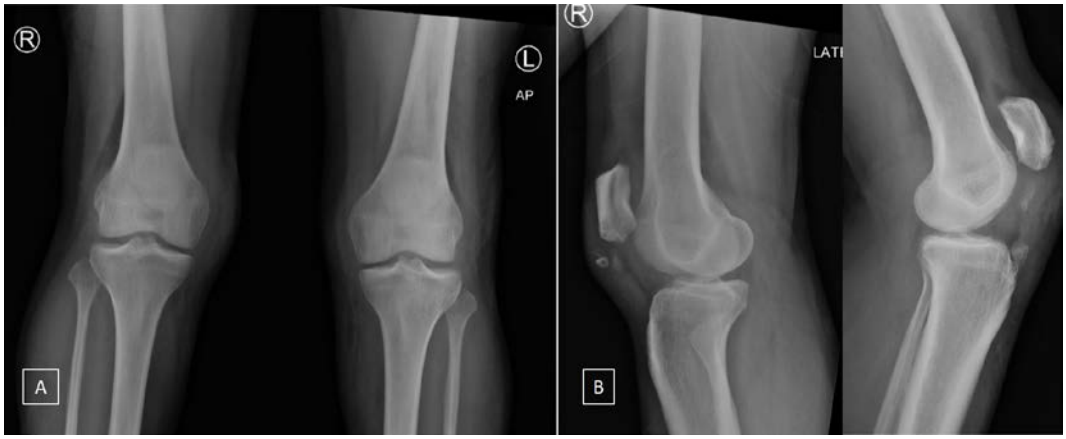

Fig 1: (A) Bilateral knee AP view suggestive of no bony injury (B) Bilateral knee lateral view suggestive of patella alta

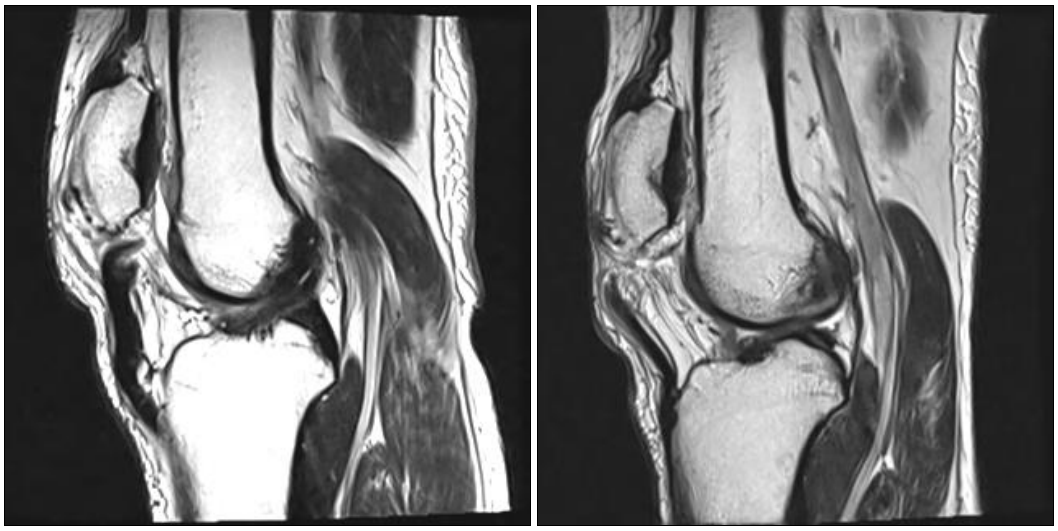

Fig 2: (A) MRI Left knee sagittal section showing discontinuity in patella tendon (B) MRI Right knee sagittal section showing discontinuity in patella tendon

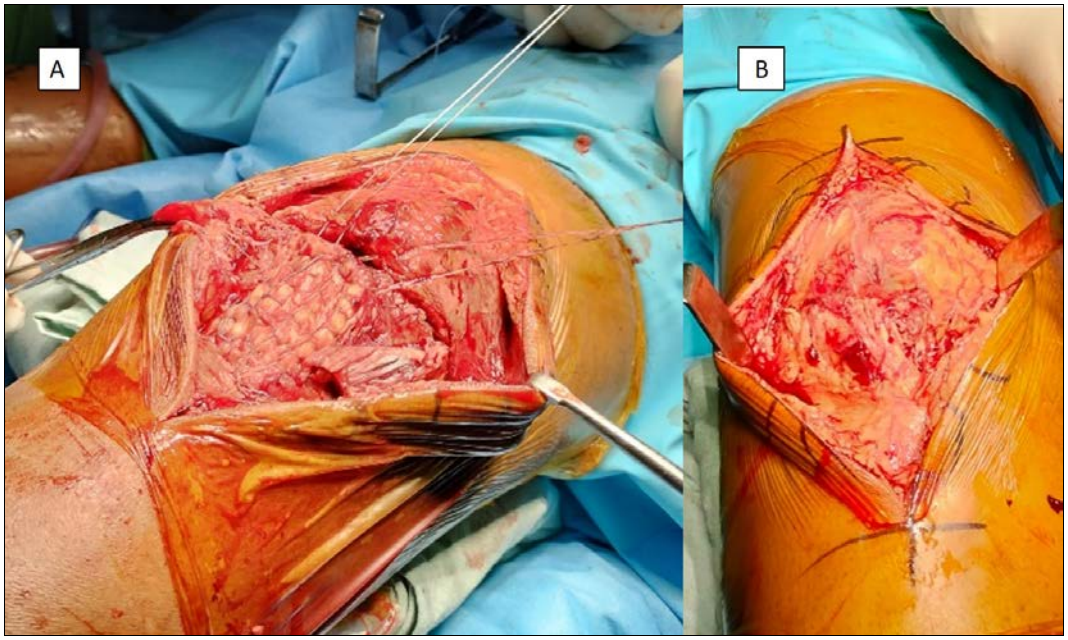

Fig 3: Intra-op image of Right and left knee with Krackow sutures in patella tendon

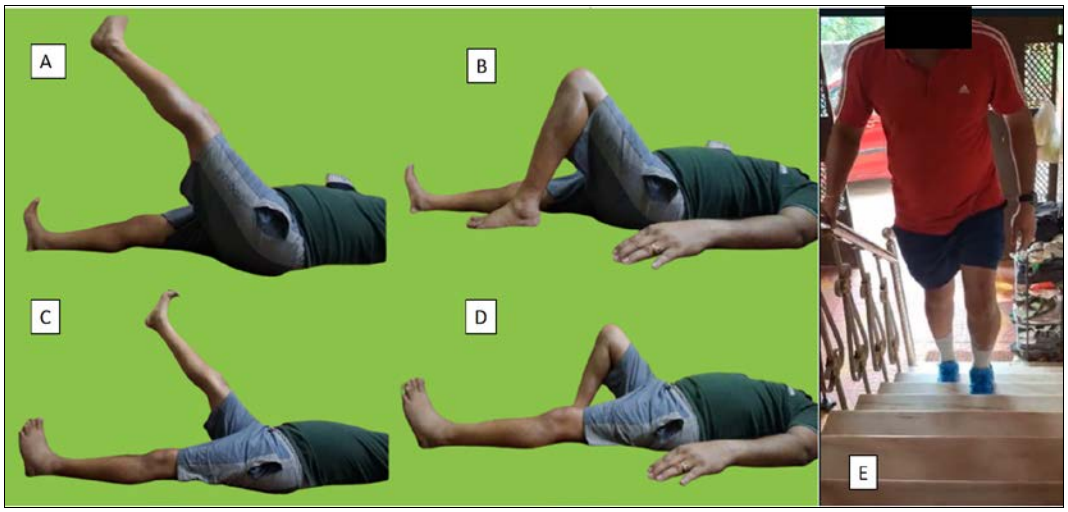

Fig 4: Range of motion of both (A) and (B) left lower limb; (C) and (D) right lower limb; (E) Patient climbing up the stairs without walking aid

Discussion

Simultaneous bilateral quadriceps tendon rupture is an extremely rare injury, predominantly documented as individual case reports in the medical literature. The first clearly reported case dates back to 1949, when C.A. Steiner and L. H. Palmer described this unusual presentation in a patient [8]. This condition most often affects middle-aged and older individuals, especially those with underlying chronic conditions that compromise tendon integrity. Chronic illnesses such as chronic renal failure, hyperparathyroidism associated with dialysis, systemic lupus erythematosus, rheumatoid arthritis, diabetes mellitus and gout, as well as prolonged corticosteroid use and obesity, have all been identified as risk factors due to their degenerative effect on the quadriceps tendon's intra-tendinous structure [9]. In athletes and bodybuilders, anabolic steroid use, fluoroquinolone therapy, and local steroid injections have been described as biochemical modifiers of tendon structure, further increasing the predisposition to bilateral ruptures [10]. Even in the absence of obvious predisposing conditions, spontaneous bilateral ruptures have occurred and are attributed to latent degenerative changes (for instance fatty infiltration, calcific tendinopathy, or micro trauma accumulation) which lower the threshold for failure.

An exhaustive assessment of our patient comprising detailed history-taking, laboratory evaluations, and thorough review of prior medical records did not reveal any of the established risk factors or underlying conditions reported in the literature to explain a spontaneous tendon rupture. Clinically, patients present acutely with severe pain, often hearing an audible "pop" or "crack", and immediately lose the ability to actively extend both knees and perform a straight leg raise. Physical examination commonly reveals a distinct suprapatellar defect in quadriceps tendon rupture, accompanied by a low-lying patella (patella baja). Conversely, patellar tendon rupture is characterized by a high-riding patella (patella alta). In both scenarios, disruption of the extensor mechanism leads to marked weakness, preventing the patient from performing active knee extension [7]. Nevertheless, despite the presence of these hallmark clinical signs, diagnosis is frequently delayed

or missed, especially in emergency settings. Bilateral involvement can mask the typical asymmetry in patellar height observed in unilateral cases and may lead clinicians to erroneously attribute the patient's symptoms to alternative causes of knee dysfunction, such as neurological or spinal pathology. In our case, the patient underwent a comprehensive evaluation in the emergency setting. The clinical presentation of a sudden 'pop' sound in the knee during ambulation, followed by an immediate inability to walk, was highly suggestive of an acute extensor mechanism disruption rather than a neurological or proximal cause. A high index of suspicion for tendon rupture prompted further imaging, and MRI was performed to confirm the diagnosis, consistent with current recommendations emphasizing MRI as the gold standard for assessing soft-tissue integrity and defining the extent of tendon injury. Timely surgical repair within three days of injury contributed significantly to the successful outcome, aligning with reports in the literature that advocate for early intervention to prevent tendon retraction and promote better functional recovery.

Structured and progressive postoperative physiotherapy was equally crucial in restoring strength and mobility, allowing the patient to regain independent ambulation without support within six months. Similar observations have been reported by Quintero Quesada *et al*. and Albayrak *et al*., who highlighted the importance of prompt diagnosis and early repair in optimizing postoperative function and minimizing extensor lag [11, 12]. Early recognition is critical, because prompt surgical repair (ideally within days) is associated with better functional outcomes; delays may result in tendon retraction, increased fibrosis, poorer tendon-bone healing and less favourable return of extension strength [13].

Conclusion

Bilateral spontaneous patellar tendon rupture is extremely rare; however, it must be considered in emergency cases, even if the patient has only experienced minor trauma to both knees, particularly when there is an associated deficiency in active extension. This is especially important in men over the age of 40. A missed diagnosis or delayed repair can lead to significant quadriceps retraction, making treatment more challenging. The general recommendation is to perform surgical intervention within 48 to 72 hours after injury to achieve optimal functional outcomes.

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