

Spontaneous Bilateral Patellar Tendon Rupture: A Case Report

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Abstract

Background: Spontaneous bilateral patellar tendon rupture is a rare condition, which is known to occur in patients with systemic illness like SLE, rheumatoid arthritis and renal failure that warrant long term systemic steroid use. It is even more exceptional in patients without such predisposing conditions. So far, only 8 other cases with neither an underlying systemic disease nor significant trauma have been reported.

Methods: We report a case of spontaneous sequential bilateral patellar tendon rupture following separate episodes of trivial trauma in an active 45 year-old male without any systemic disease known to cause patellar tendon weakening.

Results: Treating the tendon ruptures with direct surgical repair using non-absorbable synthetic sutures and reinforcement with stainless steel cerclage wires yielded satisfactory results with the patient achieving full, painless range of movements without any extensor lag in four months. This result was maintained at six years follow-up.

Conclusion: Our case is particularly remarkable for two episodes of very trivial sequential injuries leading to bilateral spontaneous patellar tendon rupture in an active individual.

Keywords: Avulsion; Bilateral; Patellar; Spontaneous; Tendon.

Introduction

Spontaneous Patellar tendon rupture is unusual, and bilateral ruptures are even rarer. The majority of reported cases are associated with systemic diseases or there is often a history of significant trauma. Only a handful of cases have been reported in mainstream literature till date. Majority of these cases are associated with a systemic disease warranting long-term treatment with systemic steroids. We are reporting a rare case of a healthy individual who suffered from bilateral patellar tendon avulsion without any significant trauma.

Materials and Methods

An active 45 year-old male presented to us with acute pain in his left knee during a slow dance, following which he was unable to walk. There was no past history of injury or repetitive high impact activity. He was empirically treated with systemic steroids for 2 years for suspected Crohn's disease, 12 years earlier. He had a childhood history of rheumatic heart disease for which he was on penicillin prophylaxis for 15 years. He also suffered a transient ischaemic attack four years ago, with complete recovery.

Clinical and radiological (X rays and magnetic resonance imaging) evaluation of the left knee revealed complete proximal disruption of the patellar tendon, for which surgery was scheduled (Figure 1).

During transfer from his cot to wheelchair while shifting to the Operation theatre, he felt an acute pain in his contralateral right knee and was unable to bear weight. Identical evaluation of the right knee this time demonstrated complete patellar tendon

separation from the inferior pole of the patella (Figure 2).

Blood investigations to look for an underlying predisposing systemic disease, including complete blood counts, serum electrolytes, renal profile, erythrocyte sedimentation rate (ESR), C- reactive protein (CRP) and Rheumatoid factor were done, all of which were normal. The Rheumatologist eliminated an underlying collagen-vascular or inflammatory condition, and the Cardiologist ruled out any residual effects from his rheumatic heart disease.

The bilateral patellar tendon ruptures were surgically repaired through midline incisions with trans-osseous non-absorbable, braided, size 5 polyester sutures and the repair was reinforced with patello-tibial, stainless steel cerclage wires (figure 3 and figure 4).

Intra-operatively, both tendons looked contused and frayed. Histopathological examination showed normal collagenous tissue with lymphocytic infiltrate and healing granulation tissue, which was confirmative of reparative tendon tissue.

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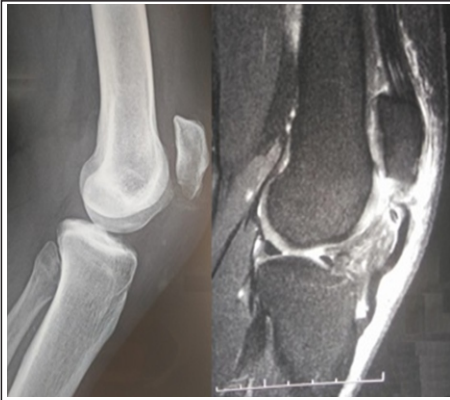


Figure 1: Plain X-Ray and MRI Left Knee showing separation of Patellar tendon from its attachment to the inferior pole of the patella

Post-operatively, patient was mobilized partial weight bearing and initiated on graduated continuous passive motion (CPM). Active range-of-movement exercises of both knees were started once the patient comfortably achieved 90 degrees on CPM.

Results

He was bearing full weight with normal range of knee movements at 6 weeks post-operatively (as seen in Figure 5) and achieved quadriceps strength with no extension lag at 4 months.

He complained of implant-site irritation at 10 months and there was breakage of the right knee cerclage wire. Both knee implants were removed at 1 year, and the

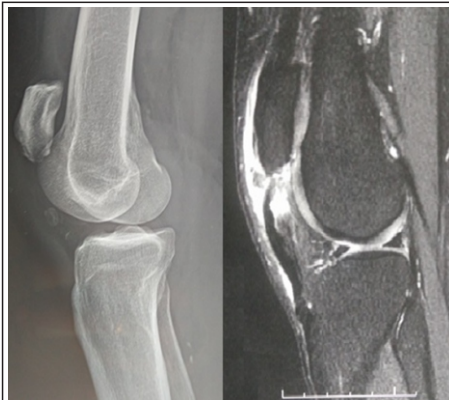


Figure 2: Plain X-Ray and MRI Right Knee showing separation of Patellar tendon from its attachment to the inferior pole of the patella

tendons looked completely healed intra-operatively. At six years follow up, he continues to have full function in both knees and remains asymptomatic.

Discussion

Approximately 50 cases of bilateral patellar tendon rupture have been reported in English literature, which makes it a rare condition [1]. Most bilateral ruptures are associated with a systemic pathology [2], especially collagen disorders, such as rheumatoid arthritis, systemic lupus erythematosus (SLE) and polyarteritis nodosa. Other conditions like diabetes mellitus, chronic renal failure, hyperparathyroidism, tuberculosis and villonodular synovitis

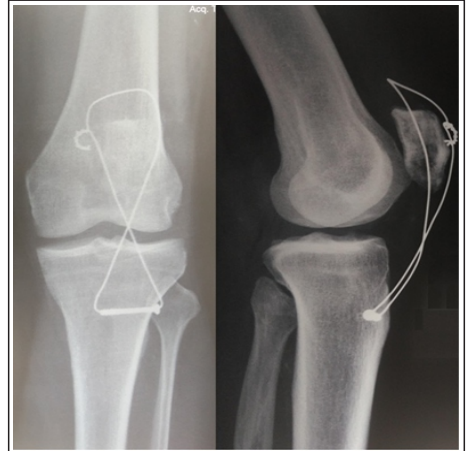


Figure 3: Post-operative Antero-posterior and Lateral plain X-Rays Left Knee

also have a suspected, but unproven association with tendon weakening [3]. Since corticosteroids are believed to inhibit collagen synthesis, the role of systemic or local glucocorticoids in tendon weakening has been studied to test this hypothesis [4]. Systemic steroids produce tendon weakening especially in Achilles and biceps tendons and the likelihood of patellar tendon ruptures following systemic steroid use for conditions unrelated to the musculoskeletal system is negligible, as confirmed by Cooney et al [5]. Evidence suggests that tendon weakening is directly related to the dose and duration of steroid intake, the chances of which drastically reduce as soon as systemic

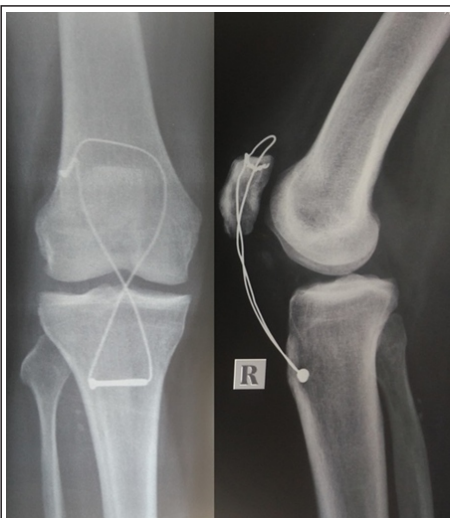


Figure 4: Post-operative Antero-posterior and Lateral plain X-Rays Right Knee



Figure 5: 4 months post-operative clinical pictures showing restoration of full range of motion both knees

steroids are discontinued [6, 7, 8]. Most reported bilateral patellar tendon avulsions are associated with inherent collagen disorder conditions like SLE, chronic renal failure and rheumatoid arthritis, which warrant long-term systemic steroids [9]. In these situations, whether tendon weakening is due to long-term systemic steroids or the disease itself is a subject of controversy. Our patient received oral steroids a decade ago for a presumptive diagnosis of Crohn's disease and based on available evidence, this cannot be considered as a causative or predisposing factor. In most cases, spontaneous rupture in the absence of systemic disease occurred during excessive extensor mechanism loading as in jumping and landing off balance. Biomechanical studies suggest that the force required to disrupt a patellar tendon is 17.5 times the body weight [10]. The unique feature of our case is that two sequential low velocity injuries within the span of nine days led to patellar tendon rupture on each occasion. The likely mechanism could be

a sudden contraction of the quadriceps muscle with the knees in flexion.

History, clinical examination and conventional X-rays usually clinch the diagnosis. Ultrasound scan may be used as a confirmatory test. MRI helps refine the diagnosis by providing precise information about the location of the tear, condition of the tendon and surrounding soft tissues.

Repair should be early and secure enough to allow early active rehabilitation in order to minimize quadriceps atrophy. Passive range of movement exercise and isometric quadriceps exercises are recommended initially, followed by progressively increasing active range of movement exercises. Continuous Passive Motion in the immediate post-operative period may help prevent arthrofibrosis and post-operative stiffness. Metallic wire reinforcements or titanium osseous anchors may be a worthwhile addition to reinforce direct suture, and facilitate early rehabilitation. If the tendon is unhealthy, a quadriceps reinforcement flap is recommended to improve its resistance

to re-rupture [3].

The common goal of treatment is to achieve a surgical repair strong enough to allow early rehabilitation to help achieve complete return to function.

Clinical Relevance

Spontaneous Patellar Tendon rupture following trivial trauma usually occurs in individuals with underlying systemic conditions predisposing them to tendon weakening, and pre-operative investigations to confirm or eliminate such conditions is recommended.

Our case illustrates that sequential bilateral spontaneous patellar tendon rupture following two episodes of very trivial injuries in an active individual without such underlying systemic conditions can occur rarely.

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