



Rare Case of Bilateral Patellar Tendon Rupture in a Patient of Systemic Lupus Erythematosus with Chronic Renal Failure

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Unilateral patellar tendon ruptures are a common complication that can occur frequently among athletic patients below the age of 40; however, bilateral spontaneous patellar tendon ruptures are rare and still not fully understood. We present a case of bilateral patellar tendon rupture in a 37-year-old patient with a history of systemic lupus erythematosus (SLE) who had concomitant chronic renal failure. Primary repair utilizing the Krackow interlocking stitch technique provided excellent outcomes in both knees. This case highlights the rare occurrence of spontaneous bilateral patellar tendon rupture in patients with SLE and chronic renal failure.

Key words: Bilateral patellar tendon rupture, chronic renal failure, systemic lupus erythematosus, Krackow technique

INTRODUCTION

Unilateral patellar tendon disruptions and injuries are not an uncommon occurrence following significant trauma; however, bilateral spontaneous rupture of both tendons is rare.¹ A little over 50 cases of bilateral patellar tendon rupture have been reported; however, its real incidence is still unknown.

We report a case of a patient with systemic lupus erythematosus (SLE) and associated chronic renal failure requiring long-term hemodialysis, who presented to the accident and emergency department with an inability to walk and was subsequently diagnosed with bilateral patellar tendon ruptures.

CASE REPORT

A 37-year-old Taiwanese male patient, with a body mass index of 22.2, presented to the orthopedic service of the emergency room with complaints of mild swelling of both knees and an inability to stand or walk. The patient described feeling a “pop” in his leading leg, which buckled under him while playing badminton. As he tried to prevent himself from falling by supporting his weight on the opposite leg, he again

felt a similar “pop” in the knee, which also collapsed under him. The patient noted immediate swelling and difficulty in standing. On admission, the patient was unable to stand unsupported or walk without assistance. His medical history included chronic renal failure secondary to SLE, and he had been on hemodialysis three times weekly for the last 4 years. Examination revealed a boggy symmetrical swelling in the peripatellar area with minimal local tenderness, but a distinct defect was felt in the infrapatellar region [Figure 1].

The patient was unable to perform the straight leg raise test or to straighten his knee from a flexed position. Radiographs showed bilateral patella alta and disruption of the soft tissue envelope around the patellar tendon. A lateral view of the plain radiographs of the left knee demonstrated a high-riding patella, anterior swelling, and no other osseous injuries [Figure 2]. The sonogram showed complete bilateral rupture of both the patellar ligaments [Figure 3]. The magnetic resonance imaging (MRI) report revealed complete bilateral tearing of the patellar tendons and lower pole avulsion fractures of the patella with a Grade I medial collateral ligament injury [Figure 4]. During surgery, the patient's knees were explored through an anterior midline incision. Both

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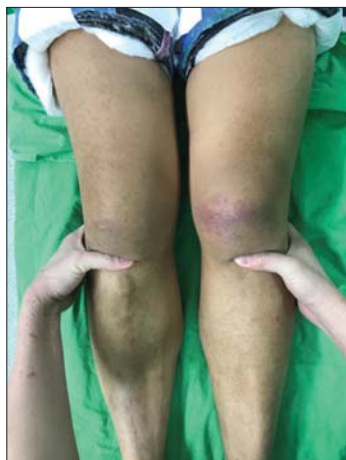


Figure 1: Infrapatellar defect seen on physical examination

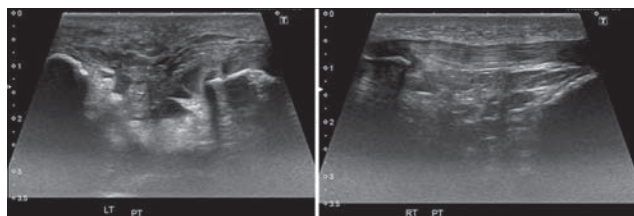


Figure 3: Sonography performed at emergency department

patellar tendons were completely ruptured from their insertion point at the inferior poles of each patella. Fracture fragments were found, and the tendons indicated chronic inflammation and some reactive fibrosis. The tendon ends were then cut back to healthy tissue and repaired utilizing the Krackow technique [Figure 5]. Three tunnels were drilled through the patella using a 1.8-mm drilling bead, and No. 5 Ethicon® sutures passed through the tunnels and tied [Figure 6]. Postoperatively, both knees were immobilized in knee braces and set in full extension. The patient could bear weight on both the knees. Isometric and passive exercises were initiated early in the postoperative period. For rehabilitation, exercises were focused on a gradual increase in the degree of knee flexion while in the brace for 6 weeks. At 3 months, the patient could walk unaided but with slight discomfort, and at 1 year, he could walk unassisted without complaints of knee pain. He demonstrated a bilateral range of motion from 0° to 130° and good muscular strength (Grade 4). Currently, he has resumed low impact recreational activities.

DISCUSSION

Bilateral atraumatic rupture of the patella is complex, in that it involves the knee's extensor mechanism, generating major functional disability and gait disturbances. This extensor mechanism includes quadriceps tendon, patella, patellar



Figure 2: Lateral projection knee radiographs after bilateral patellar tendon rupture, showing cephalic patellar migration (“patella alta”). Lateral radiograph of the knee, demonstrating patella alta (Insall–Salvati ratio 0.58/0.57; left/right) (a: left and b: right)

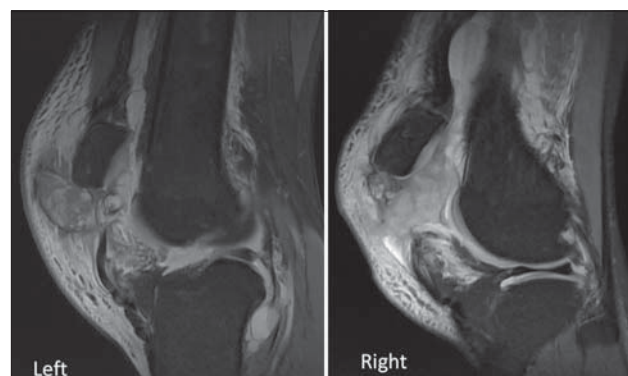


Figure 4: Magnetic resonance imaging was arranged after admission

ligament, and tibial tuberosity. In healthy ligaments, rupture requires a force of 17.5 times the body weight, and even a 75% tear in thickness is unlikely to cause complete rupture.²

Patellar fractures and quadriceps tendon ruptures are among the common causes of disruption to the knee's extensor mechanism. Unilateral patellar tendon ruptures usually occur in athletes and individuals younger than 40 years of age. However, this type of injury may occur under low-energy stress, resulting from local corticosteroid injections, systemic inflammatory or rheumatologic diseases, chronic renal failure, metabolic disorders, and fluoroquinolone use. We believe that the injury in our patient may be linked to his chronic renal failure, as many systemic diseases including SLE, rheumatoid arthritis, diabetes, and chronic renal failure have been associated with bilateral patellar tendon rupture.³

For patients with a history of renal failure, several complications linked to dialysis have been known to affect the tendons, reducing their elasticity and predisposing the patients

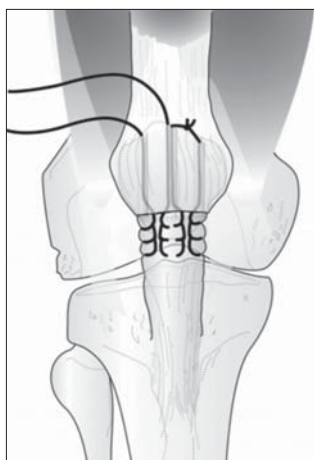


Figure 5: No. 5 Ethibond® sutures were used for the repair and were woven through the medial and lateral of the patellar tendon by means of a Krackow technique. The sutures were passed through drill holes in the patella and the sutures were tied

to rupture following minimal stress.^{4,5} This may have been the case with our patient. Atraumatic patellar tendon ruptures in patients with SLE, though extremely rare, have been described in the literature.⁶ In these cases, the tendon is predisposed to rupture due to chronic degenerative and reparative changes and chronic inflammation.⁷ Our case report is unique since our patient had chronic renal failure and SLE, both of which may have contributed to his atraumatic bilateral patellar tendon ruptures.

Tendon ruptures have been classified by Giblin *et al.* into three groups: Type 1 – at the origin of the tendon at the inferior pole of the patella, Type 2 – a mid-substance tear through the tendon, and Type 3 – at the insertion of the tendon into the tibial tubercle.⁸ At the time of surgery, our patient was found to have a bilateral Type 1 injury, which is the most common type. This may have accounted for the relatively low force, resulting in tendon rupture. In our case, injury was possibly due to the eccentric loading of the tendons as the patient was jumping during his game; however, the force generated during this phase, though exceeding that of concentric contraction, is well below the force required to cause complete rupture.² These findings highlight a higher vulnerability for rupture given the tendon degeneration in the context of low-energy stress.

Delayed diagnosis of patellar tendon ruptures has been reported several times. This may be due to the rarity of occurrence of this condition coupled with a low suspicion index. The resulting delayed treatment leads to proximal retraction of the patella, scarring, complicated repairs, quadriceps atrophy, prolonged recovery time, and diminished long-term function.⁶ Our patient presented with an inability to actively extend the

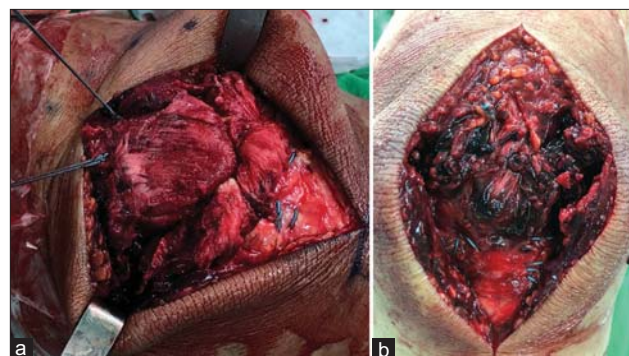


Figure 6: Bilateral patellar tendon rupture at time of surgery: Tear of the patellar tendon repaired with No. 5 Ethicon® sutures utilizing the Krackow technique (a: left and b: right)

knee, together with a palpable infrapatellar defect and patella alta indicated on the initial radiographs by superiorly displaced patellar tendons. Sonography examination further confirmed his condition. Although further imaging was unnecessary, MRI confirmed the diagnosis and provided indications of the quality of the patellar tendon. Our case suggests that history, physical examination, and standard radiographs are adequate for diagnosing patellar tendon ruptures.

In our case, we used a No. 5 Ethicon® suture with a Krackow technique for primary repair, which was augmented with a pull-out-tying-up technique.⁹ Regardless of the repair technique, early primary operative care resulted in excellent function, allowing a return to normal activities within a year. Surgical repair is indicated in all cases with a good clinical outcome in general.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understand that his name and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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