

Spontaneous Bilateral Patellar Tendon Ruptures in a Patient with Chronic Renal Failure: A Case Report

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Citation

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Abstract

While unilateral patella tendon ruptures are frequently a complication among athletic patients below forty, cases of bilateral spontaneous patella tendon ruptures are rare and still not fully understood. We present a case of bilateral patellar tendon rupture in a 53-year old patient with a history of chronic renal failure. Primary repair utilizing the Krackow interlocking stitch technique provided excellent results in both knees. This case highlights the rare occurrence of spontaneous bilateral patellar tendon ruptures in patients with chronic renal failure.

INTRODUCTION

While disruption of the patellar tendon is not an uncommon occurrence following significant trauma, bilateral spontaneous ruptures are rare¹. The true incidence is unknown with a little over 50 cases being reported in the literature. Patella tendon ruptures are the third most common cause of disruption of the extensor mechanism of the knee after patella fractures and quadriceps tendon ruptures². We report a case of a patient with chronic renal failure who presented to the accident and emergency department with an inability to walk and was subsequently found to have ruptured both patella tendons.

CASE REPORT

A 53 year old Afro-Caribbean male presented to the accident and emergency department with complaints of mild swelling of both knees and an inability to stand or walk. The patient gave a history of feeling a “pop” in his leading leg which buckled under him while descending a flight of stairs. He tried to prevent himself from falling by supporting his weight on the opposite leg, when again he felt a similar “pop” in the knee which also collapsed under him. The patient noted immediate swelling and difficulty standing. At the time of admission the patient was unable to stand unsupported or walk without assistance.

The patient gave a history of chronic renal failure secondary to uncontrolled hypertension and was on hemodialysis twice weekly for the last 4 years.

Clinical examination revealed a boggy symmetrical swelling

in the peri-patella area with minimal local tenderness but a distinct defect was felt in the infra patellar region, Fig. 1.

Figure 1

Fig 1. Infrapatellar defect seen on lateral view



The patient was unable to perform a straight leg raise or straighten his knee from a flexed position. Radiographs showed bilateral patella alta and disruption of the soft tissue envelope around the patella tendon. Fig. 2.

Figure 2

Fig. 2 Lateral radiograph shows high riding patella (patella alta)



The patient was taken to the operating theatre and his knees explored through an anterior midline incision, both patella tendons were found to be completely ruptured from their insertion at the inferior poles of the patella. There were no fractures present but the tendons showed evidence of chronic inflammation, and reactive fibrosis. The tendon ends were freshen to healthy tissue and repaired with No. 2 Vicryl sutures utilizing the Krackow technique. This was supplemented with a defunctioning 18 –gauge cerclage steel wire passed from the proximal tibia through the patella. Postoperatively both knees were immobilized in long leg cylinder casts and the patient was allowed to weight bear. Following removal of the casts at six (6) weeks the patient underwent intensive physiotherapy and at 3 months was walking unaided with 120° of knee flexion bilaterally. Breakage of one of the steel wires caused pain locally and had to be removed electively at 6 months. One year following surgery the patient had no complaints of knee pain, was back to work full time and had resumed low impact recreational sporting activities.

DISCUSSION

The etiology of patellar tendon ruptures is still not fully

understood and even less is known about spontaneous bilateral patellar tendon ruptures. Unilateral patellar tendon ruptures are known to occur more frequently in patients under age 40 who may overload the extensor mechanism during athletic activity. It is estimated that a force of 17.5 times body weight is required to cause rupture in a normal tendon³. Spontaneous bilateral patellar tendon ruptures are a rare occurrence with just over 50 cases being recorded in the literature. Our patient with a history of chronic renal failure sustained bilateral patella tendon ruptures while simply descending a flight of stairs. We suspect that this may be linked to chronic renal failure as many systemic diseases including rheumatoid arthritis, Ehlers-Danlos syndrome , hyperparathyroidism , diabetes mellitus and chronic renal failure have been associated with bilateral patella tendon rupture⁴

Reports describing this phenomenon in patients with chronic renal failure date back to the 1950s⁵. For some patients with a history of renal failure on hemodialysis several complications linked to the dialysis process have been known to affect the tendon contributing to a reduction of the tendon's elasticity and predisposing it to rupture following minimal stress ,this situation may have been present in our patient^{6,7}.

There are three reports of bilateral patella tendon ruptures in patients with chronic renal failure but only in one did this occur with minimal trauma. This patient reported by Luft et al⁸ in addition to having end stage renal failure was also diabetic, which may have further contributed to failure of the patella tendon. This case report is unique in that our patient had only chronic renal failure contributing to his atraumatic bilateral patella tendon ruptures.

Tendon ruptures have been classified by Gilbin and Small⁹ into three groups , Type 1 – at the origin of the tendon at the inferior pole of the patella, Type 2 –a midsubstance tear through the tendon, Type 3 – at the insertion of the patellar tendon into the tibial tubercle. At surgery our patient was found to have a bilateral Type 1 injury which is the most common type with macroscopic degenerative changes in the tendon which may have accounted for the relatively low force required to produce the tendon rupture.

The mechanism of injury in our case suggest eccentric loading of the patella tendon as the patient descended the stairs, forces generated during this phase are known to exceed that of concentric contraction but are well below the force of 17.5 times the body weight that is required to

rupture a healthy patella tendon³. These findings highlight a higher vulnerability for rupture given the tendon degeneration in the context of lower-energy stress.

Difficulty in diagnosing patients with bilateral patella tendon ruptures has been well recognized, Siwek and Rao¹⁰ reported that 28% of patients with this injury were misdiagnosed using clinical examination. Reasons for this include the rarity of occurrence of this condition coupled with a low index of suspicion. In our patient the combination of an inability to actively extend the knee, together with a palpable infrapatellar defect and patella alta seen on the initial radiographs indicated disruption of the patella tendon. Further imaging was unnecessary although ultrasound or magnetic resonance imaging (MRI) could have confirmed the diagnosis and given some indication as to the quality of the patella tendon. Our case suggests that history, physical examination and standard radiographs are adequate for making a diagnosis of patellar tendon rupture

Techniques to repair the ruptured tendon often involve direct suturing of the tendon to the patella, using either simple Vicryl or Fibre-Wire (Arthrex, Inc, Naples FL) suture material. Both a Krackow or Bunnell type repair has also been used with equally good results and the use of a defunctioning cerclage wire to protect the primary repair has not been shown to be beneficial. In our case we used a No. 2 Vicryl suture with a Krakow technique to effect the primary repair which was augmented with a cerclage steel wire¹¹. One wire broke and dissociated from its tibial attachment as the patient regained knee movement, this caused significant pain prompting removal at a second operation. Regardless of the technique used to repair the tendon rupture early primary operative care resulted in excellent function allowing a return to normal activities within a year. Surgical repair is indicated in all cases and in general a good clinical outcome can be anticipated.

CONCLUSION

In summary, a 53 year old male experienced spontaneous

bilateral patellar tendon ruptures while descending a flight of stairs. Bilateral tendon ruptures were accurately diagnosed in the emergency department and early primary repair was performed. While spontaneous bilateral patella tendon ruptures are a rare occurrence, in the presence of chronic renal failure, minor trauma can lead to disruption of the diseased tendon. Early surgical repair results in an excellent clinical outcome and is recommended for all cases.

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References

1. Pandya NK, Zgonis M, Ahn J, Israelite C. Patellar tendon rupture as a manifestation of Lyme disease. *Am J Orthop (Belle Mead NJ)*. Sep 2008;37(9):E167-170
2. Rose PS, Frassica FJ. Atraumatic bilateral patellar tendon rupture, A case report and review of the literature. *J Bone Joint Surg Am*. Sep 2001;83-A(9):1382-1386
3. Zernicke RF, Garhammer J, Jobe FW. Human patellar-tendon rupture. *J Bone Joint Surg Am*. Mar 1977;59(2):179-183
4. Loehr J, Welsh RP. Spontaneous rupture of the quadriceps tendon and patellar ligament during treatment for chronic renal failure. *Can Med Assoc J*. Aug 1 1983;129(3):254-256
5. Sullivan RL. Traumatic bilateral patellar tendon rupture with chronic renal disease. *Wis Med J*. Feb 1986;85(2):12-13
6. Kannus P, Jozsa L. Histopathological changes preceding spontaneous rupture of a tendon. A controlled study of 891 patients. *J Bone Joint Surg Am*. Dec 1991;73(10):1507-1525
7. Jones N, Kjellstrand CM. Spontaneous tendon ruptures in patients on chronic dialysis. *Am J Kidney Dis*. Dec 1996;28(6):861-866
8. Kalantar-Zadeh K, Singh K, Kleiner M, Jarrett MP, Luft FC. Nontraumatic bilateral rupture of patellar tendons in a diabetic dialysis patient with secondary hyperparathyroidism. *Nephrol Dial Transplant*. Sep 1997;12(9):1988-1990
9. Giblin P, Small A, Nichol R. Bilateral rupture of the ligamentum patellae: two case reports and a review of the literature. *Aust N Z J Surg*. Apr 1982;52(2):145-148
10. Siwek CW, Rao JP. Ruptures of the extensor mechanism of the knee joint. *J Bone Joint Surg Am*. Jul 1981;63(6):932-937
11. Krakow KA TS, Jones LC. A new stitch for ligament-tendon fixation. Brief note. *J Bone Joint Surg Am*. (1986);68:764-766

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