

Avulsed Bipartite Patella with Chronic Partial Quadriceps Tendon Rupture: A Case Report

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Abstract

Introduction: The presence of quadriceps tendon rupture in a patient with bipartite patella is extremely rare. To our knowledge, only four documented cases in literature were found, two of which had both the patella and the tendon repaired. In this case report, we present a case of avulsed bipartite patella with chronic medial quadriceps tendon rupture in a patient with no underlying disease or trauma.

Case report: A 70-year-old male presented with inability to do an active straight leg raise, with no significant medical history or previous injury. Upon X-ray, he was diagnosed as bipartite patella with avulsed lateral fragment. Intra-operatively, we found a chronic medial partial quadriceps tendon tear with scar tissue formation and a lateral avulsed patellar fragment. The avulsed fragment was decorticated and reduced using two cancellous partially threaded screws and the quadriceps tendon was repaired and reattached using 5/0 ethibond suture with Kessler's technique.

Conclusion: This technique of repair produced good outcome with gain of extensor function within 10 weeks.

Keywords: *Avulsed Bipartite Patella; Quadriceps Tendon*

Introduction

The presence of quadriceps tendon chronic tear on top of avulsed bipartite patella is extremely rare injury especially in absence of history of trauma or fall. We report a patient who had successful surgical repair of a separated type III bipartite patella with a chronic partial quadriceps tendon rupture.

Case Report

A 70 year old gentleman presented to the Accident and Emergency department with painless inability to extend his left knee. He had no significant medical history nor any recalled fall or trauma. He denies any previous left knee problems. Initial clinical assessment revealed inability to do a Straight Leg Raise test and a palpable defect proximal to the superior pole of the patella at the quadriceps tendon insertion laterally. No swelling or tenderness were reported.



Figure 1: Pre-operative, showing the deformity of the left knee.

AP and lateral radiographs were done showing bipartite patella with avulsed lateral fragment and no signs of effusion.



Figure 2: AP and lateral radiograph at admission.

Surgical Technique

Operative management was discussed with the patient and informed consent was obtained. Surgery was done under general anaesthesia in a supine position with the use of a tourniquet. A midline incision approach was used. No haemarthrosis was found. An old medial quadriceps tear with scar tissue and a 2x2 cm lateral avulsed patellar fragment with de-vascularized edges were seen. However, the lateral third of quadriceps tendon was still attached to the avulsed bony fragment.

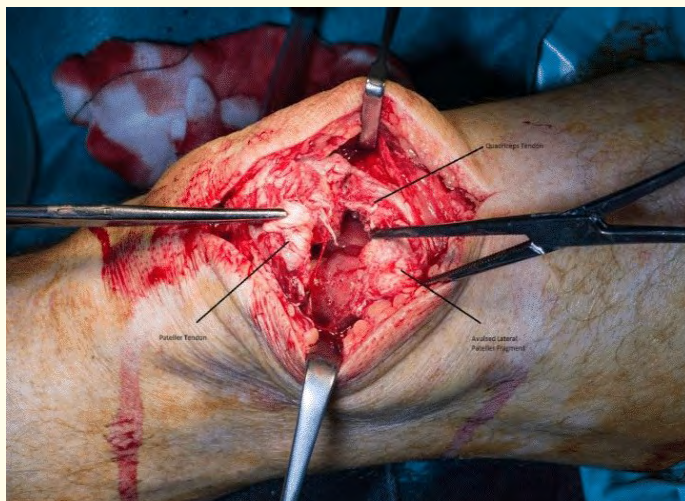


Figure 3: Showing patellar tendon, quadriceps tendon and the lateral patellar fragment.



Figure 4: Showing chronic medial patellar tendon tear.

The avulsed fragment and patellar surface were decorticated using high speed burr and the fragment was held temporary in place with 1.6mm K wire. A 1.1 wire was passed under image intensifier through the patella followed by a cannulated drill.



Figure 5: K wire fixation of the avulsed lateral patellar fragment.

Two 44 mm parallel partially threaded cancellous screws were used.

Good compression and hold were achieved. The medial third of the quadriceps tendon was prepared and the scar tissue excised. 2.5 mm drill was used to create three holes in the patella and the tendon was repaired using 5/0 ethibond suture with Kessler’s technique. 90 degree flexion was achieved on table. The medial and lateral retinaculæ were repaired with 2.0 Vicryl sutures. The wound was closed in layers and clips used to the skin were applied. The knee was then placed in a cricket pad splint.



Figure 6: 2 X 44mm partially threaded cannulated screws holding the avulsed lateral patellar fragment.



Figure 7: Ethibond repair of the patellar tendon tear and the retinacular repair.



Figure 8: 90 degrees of flexion on table – post repair.



Figure 9: (a) Intraoperative AP image.



Figure 9: (b) Intra operative lateral image.

Post-operatively, above knee back slab applied for two weeks then a change to cylinder cast for further four weeks. During this period, the patient was allowed to mobilize partial weight bearing and was given Rivaroxaban as a DVT prophylaxis. At six weeks, Donjoy brace was applied allowing 0-30 degrees of flexion, with subsequent increase in flexion of 30 degrees every two weeks. X-rays were checked at two, four and six weeks and deemed satisfactory. Eventually, patient achieved full free active movement with physiotherapy.



Figure 10: AP radiograph at 10 weeks.



Figure 11: Lateral radiograph at 10 weeks showing 90 degrees of flexion.

Discussion

Bipartite patella is synchondrosis or congenital fragmentation of the patella where the secondary ossification center fails to fuse with the primary center.

It is present in about 2% of population with a 9:1 male to female ratio [1]. It occurs in 25% of patients bilaterally, 39% in the right knee and 36% in the left knee [2]. However, 98% of the cases are asymptomatic and are diagnosed incidentally by plain radiographs [3].

Bipartite patella was first described by George and Gurber [4,5]. A classification system was then developed by Saupe in 1943; it describes three types of bipartite patellae based on the position of the accessory fragment. Type I (5%) is located at the inferior pole of patella; Type II (20%) is located on the lateral margin, and Type III (75%) at the supero-lateral margin [6].

The occurrence of bipartite patella simultaneously with quadriceps avulsion is an uncommon injury [7]. Clinically, patients usually present with a triad of pain, suprapatellar gap and failure of extensor mechanism [8]. The quadriceps tendon injury is most frequently caused by falls or degenerative changes associated with ageing and calcific tendinopathy [9]. Conditions such as diabetes, chronic renal failure and gout were considered as predisposing factors [10]. However, our patient did not complain of pain and showed chronic partial tear of unknown cause.

Conclusion

In literature, the treatment depends on the degree of quadriceps tendon avulsion. Acute incomplete avulsion is managed non-operatively by immobilization and physiotherapy and complete avulsion requires prompt surgical management [11]. In contrary, our patient had chronic incomplete avulsion and our choice of operative management yield a good outcome.

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