

# Bilateral Quadriceps Tendon Rupture: Sequelae Of Patellar Maltracking?

P Sharda, S Chandak, S Maheshwaran

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## Abstract

Quadriceps ruptures are more common in older age groups or young active athletes. Bilateral quadriceps ruptures have been reported in patients with predisposing factors such as steroid abuse, chronic renal failure, Diabetes etc. We report about a middle aged patient who had chronic patellar maltracking, and presented with ruptured quadriceps after trivial trauma. He did not have any other predisposing factors, and the maltracking has perhaps led to lateral facet arthritis of patella and degeneration of quadriceps tendon. Immediate repair using bone anchors gives predictably good results and results in good function.

## INTRODUCTION

Quadriceps tendon rupture has been well reported in older patients (more than 65 years), and younger athletes between 15-30 years of age (5, 7). Bilateral tears are quite uncommon, and usually related to a predisposing factor such as anabolic steroids (3), renal dysfunction(2), hyperparathyroidism(4), gout(8), obesity, leukaemia, rheumatoid arthritis, Diabetes mellitus(1), systemic lupus erythematosus, tumours, etc.

McMaster et al (5) have demonstrated that the quadriceps tendon is usually a very strong structure, requiring upto 30kg/mm<sup>2</sup> longitudinal force to rupture. It follows, that most of the cases are associated with degenerative changes in the tendon.

Although various different techniques have been described for repair, consensus exists about the need for urgent surgical repair of such injuries (6, 7).

## HISTORY

We report a case of a 45 year old male musician, with longstanding history of bilateral anterior knee pain. He was noted to have mild patellar maltracking on both sides and was on waiting list for bilateral lateral release as pain persisted despite physiotherapy. However, he slipped from a stair and twisted his left knee, presenting with pain and swelling. Examination revealed swelling and ecchymoses around the knee, with palpable gap in the suprapatellar region and inability to straight leg raise. X - Ray revealed loss of continuity of soft tissue shadow in the suprapatellar

region. A clinical diagnosis of quadriceps rupture of the left knee was made, which was surgically repaired.

Subsequently, a lateral release was performed on the other symptomatic knee.

He was temporarily relieved of his symptoms following the operations, but had a similar injury after 2 years, and presented with ruptured quadriceps tendon in the other knee! This was confirmed by x-rays showing a flake of bone in the suprapatellar region (fig 1) and the MRI scan (fig 2) and early surgical repair undertaken within 48 hours.

**Figure 1**



**Figure 2**



Discussion: previously, cases of simultaneous bilateral quadriceps rupture have been reported with increased frequency in steroid abusers, athletes and older population in general. However, this patient was being seen for long standing anterior knee pain, attributed to maltracking patella and grade III lateral facet arthritis, (that was confirmed during the repair). He did not have any of the above mentioned predisposing factors. A possible hypothesis is that the maltracking had caused gradual attrition of the quadriceps tendon over many years, thus predisposing it to tear.

Up to 97% of quadriceps tendon ruptures have been described as degenerative. Deficient nutrition and decreased blood flow, resulting in local hypoxia and impaired metabolic activity are the key factors in tendon degeneration (6). It is notable that this patient was not found to have any other intra articular injury on both the occasions, which suggests the force of the fall may not have been the only factor contributing to the tear. Also, the mechanism of the injury was identical in both the knees- he missed a step, jarred his knee, and felt a snap.

An X-ray with fresh quadriceps rupture typically shows a small flake of bone in the suprapatellar pouch. It may or may

not show patella alta depending on the state of retinaculum. Clinically, there is obvious haemarthrosis, inability to do straight leg raise. There may be paradoxical defect palpable over the patellar tendon, giving the impression of patellar tendon rupture, but this is actually due to crumpling of the tendon.

Different techniques have been described for repair, including drill holes in patella and PDS for repair, a triangular flap of muscle stitched back on itself, augmenting repair with fascia etc (7, 9). However, some of them are quite complex, and involve techniques that can be daunting for the non specialist knee surgeons who would expect to do such cases only occasionally. With the advent of bone anchors, we now have a very reliable tool that makes the repair easy and reproducible by different surgeons. The repair is also very strong, and depending on the size of the tear, more than one anchor can be used to provide adequate fixation (fig 3, 4).

**Figure 3**



**Figure 4**



Peroperatively, this man was found to have torn the insertions of Vastus medialis, Rectus femoris and Vastus lateralis on either side. We used suture anchors for both the knees. The osteochondral fracture was secured through the sutures, to promote bony healing thus providing a stronger fixation. Both the repairs were protected by immobilization for 6 weeks. Vigorous physiotherapy was started, and patient was able to recover nearly full strength and ROM within 3 months after the operation.

Conclusion: a history of chronic anterior knee pain, combined with clinical findings of effusion, inability to straight leg raise and palpable suprapatellar gap should immediately alert one to the possibility of a quadriceps tear. Many a times X-ray shows a small flake of bone avulsed from superior pole of patella.

This is a hitherto unknown complication of anterior knee pain. Early investigation of anterior knee pain, including MRI scan maybe a good way to spot early maltracking of patella and aggressive surgical management is indicated early if physiotherapy doesn't seem to yield good results. Following rupture, Bone anchors provide a quick and very secure fixation, thus avoiding the need for sometimes cumbersome drill holes. It is preferable to appose the

osteochondral fragment to the main bone to promote bony healing and reduce the chances of re rupture. It is still prudent to immobilise for 4-6 weeks postoperatively to protect the repair. The early recovery of our patient (full ROM and back to work in 3 months) may be partly attributable to the use of bone anchors.

### **CORRESPONDENCE TO**

Praveen Sharda Level 7, University Hospital of North Tees  
Hardwick, Stockton on Tees Cleveland, United Kingdom.  
TS19 8PE Telephone: 00447981293426(M)  
00441642624635(W) 00441429236104(H) Email:  
shipra22@gmail.com

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**Author Information**

**Praveen Sharda, M.S. (Orthopaedics), MRCSEd**

Orthopaedic Surgeon, University Hospital of North Tees

**Shikha Chandak**

Foundation doctor, University Hospital of North Tees

**S. S. Maheshwaran, Mch (Orth), FRCS**

Consultant Orthopaedic surgeon, University Hospital of North Tees