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Bilateral Quadriceps Tendon Rupture in a End-Stage Renal Disease Patient: Case Report

Kronik böbrek yetmezliği olan hastada bilateral quadriceps tendon rüptürü: Vaka sunumu

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Abstract
Simultaneous bilateral quadriceps tendon rupture is a very rare injury. Occurrence after minor trauma is predominantly associated with certain medical problems including chronic diseases and long-term use of certain drugs.We report the case of a 56-year-old patient with end stage renal disease who sustained a simultaneous bilateral quadriceps tendon rupture following minor trauma and succesful surgical treatment.
Keywords: Renal failure, quadriceps, tendon rupture, bilateral.

Özet
Bilateral eşzamanlı quadriceps tendon rüptürü nadir görülen bir yaralanmadır. Minor travma sonrası görülmesi genellikle kronik hastalıklar veya uzun dönem kullanılan bazı ilaçlar nedeniyledir. Bu yazıda 56 yaşında böbrek yetmezliği olan hastanın minor travma sonrası görülen bilateral eşzamanlı quadriceps tendon rüptürü sorunu ve bunun cerrahi başarılı tedavisi anlatılmıştır.
Anahtar kelimeler: Böbrek yetmezliği, quadriceps, tendon rüptürü, bilateral.

Introduction

Quadriceps tendon has a great impact on knee function and independent walking ability. Rupture of quadriceps tendon are uncommon in healthy people. Bilateral tears are even less frequent, and when occurring in a spontaneous fashion or with minor traumas are usually associated with systemic disorders like hyperparathyroidism [1,2], systemic lupus [3], gout [4], rheumatoid arthritis [5], and end-stage renal disease (ESRD) [6-8] that lead to tendon weakening and rupture.

Case

A 56-year-old male presented to the emergency room with unability to stand and walk after a fall from the stairs. The patient heard loud cracks as he touched the ground. Immediately after the trauma, he was not able to bear weight and collapsed due to giving way of both knees. He was hemodialysed for 12 years because of end stage renal disease. On physical examination, there was oedematous swelling and hematoma in the suprapatellar region as well as intraarticular effusion of both knees and bilateral palpable suprapatellar gaps. The patient could not actively extend the knees and quadriceps contractions did not result in movement of the patellae. Laboratory tests showed a creatinine level of 11.04 mg/dl and BUN (blood urea nitrogen) 126.5 mg/dl. Lateral radiographs showed inferior displacement of both patellas

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as illustrated in Figure 1. In magnetic resonance imagings, complete disruption of the quadriceps tendons at the patella insertion sites in both knees was revealed (Figure 2). The patient was operated the day after the injury. Ruptured tendons were exposed through a median approach. A full thickness rupture was observed at the insertion site of the superior patellar aspect on the both knees (Figure 3). The stumps were trimmed and stitched through transosseous sutures using an anchor (Figure 4). Postoperative radiography showed regular positioning of the patellae as illustrated in Figure 5. Long-leg cast immobilization was maintained for two weeks.Then using a range-of-motion brace, knee flexion was postoperatively limited to 60 degrees for two weeks following another period of two weeks with flexion limitation of 90 degrees. The patient was not allowed to perform weight bearing for the time of knee flexion limitation. After 6 weeks, the patient was able to do full weight bearing. At 6 months after surgery, the patient was pain free and range of motion of both knees improved to 0-120 degrees and active extension was possible.

Figure 1. Lateral radiographs of right (A) and left (B) knees showing patella baja and calcification of quadriceps tendons

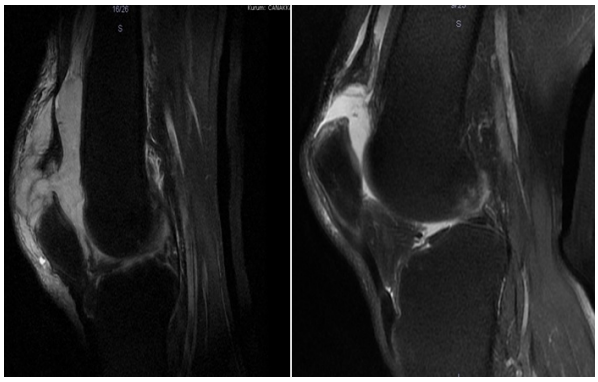

Figure 2. Preoperative sagittal T2-weighted magnetic resonance images of the right (A) and left (B) knees showing complete disruption at the distal quadriceps tendo-osseous junctions (arrow).

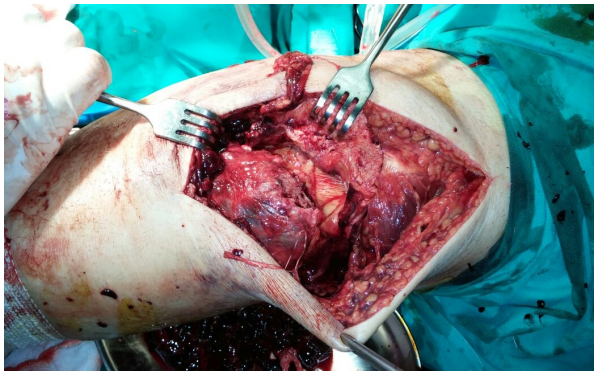

Figure 3. Intraoperative photography showing ruptured quadriceps tendon at the tendo-osseus junction.

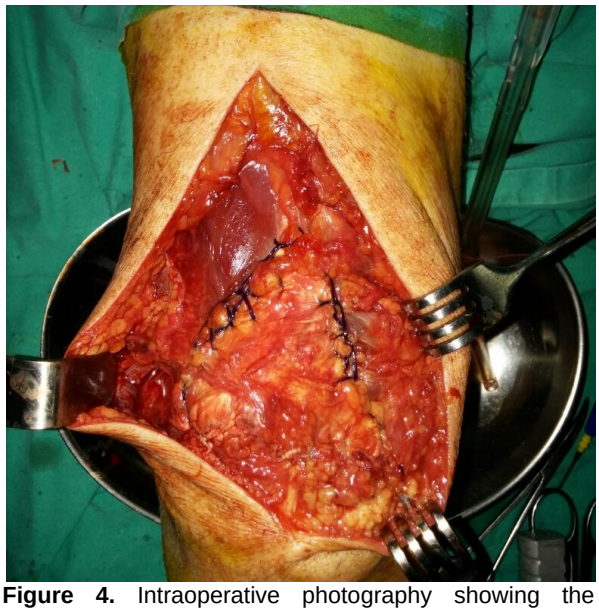

Figure 4. Intraoperative photography showing the tendon repair.

Figure 5. Postoperative lateral radiographs of right (A) and left (B) knees showing the regular positioning of the patellae.

Discussion

The quadriceps femoris muscle is the largest muscle in humans and major extensor tendon of the knee joint. The muscle inserts to the tibial tuberosity through the patella and patellar ligament. The quadriceps tendon is attached to the superior aspect of the patella. It can resist considerable loads. Quadriceps tendon rupture can occur by direct or indirect mechanisms. Most traumas involve eccentric contraction while weight bearing in a partially flexed position of the knee [9].

A detailed history, trauma mechanism, and evaluation of the risk factors can lead to the diagnosis. Painful swelling, palpable suprapatellar gap, and the inability to actively extend the knee are the major symptoms but these are not so specific and only found in about 60% of patients [10]. Plain radiographs reveal only indirect signs of the lesion including intraarticular swelling, shadow in the tendon line, patellar spurs at the tendons insertion, and low riding and forward tilting of the patella. In case of systemic diseases or degeneration, suprapatellar calcifications due to bony transformation can be observed [11]. Ultrasound and magnetic resonance imagings can directly show the rupture.

When considering the pathogenesis of tendon ruptures, mechanical aspects as well as coexisting systemic and local factors should be taken into account, and the blood supply to the tendon seems to be pivotal in this regard [8]. Although the exact mechanism of injury remains unknown, most investigators agree that in chronic kidney disease secondary hyperparathyroidism plays a major role in the pathogenesis of tendon rupture [12-14]. It was suggested that tendon rupture might be secondary to sub-tendon bone resorption, which weakens the tendon insertion [15,16]. Some authors have pointed out that the association of long term haemodialysis and the occurrence of spontaneous tendon ruptures and this may involve progressive deposition of b2-amyloid [17].

We report a case of bilateral quadriceps tendon rupture after minor trauma in a chronic renal failure patient who had been on dialysis for a long-term period. Tendon repairs were performed successfully using non-absorbable sutures and anchors. This case cautions that quadriceps tendon rupture may occur with minor traumas in patients on dialysis for chronic renal failure.

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