

CASE REPORT

doi: 10.5455/medarch.2021.75.317-320

MED ARCH. 2021 AUG; 75(4): 317-320

RECEIVED: AUG 03, 2021

ACCEPTED: AUG 23, 2021

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A Simultaneous Rupture of the Patellar Tendon and the Contralateral Quadriceps Tendon in a Patient with Chronic Renal Failure Undergoing Long Term Hemodialysis

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ABSTRACT

Background: Quadriceps or patellar tendon rupture incidence is relatively low, especially simultaneous bilateral rupture, which usually reported as a complication of chronic systemic disorders such as renal failure. **Objective:** Herein, we report a case of bilateral knee extensor mechanism ruptured in a patient with chronic renal failure on long standing hemodialysis. **Case presentation:** A 38-year-old white male, a known case of chronic renal failure on long term hemodialysis, presented to our clinic with clinical signs of bilateral simultaneous knee extensor tendons rupture. After proper workup simultaneous quadriceps and contralateral patellar tendons rupture diagnosis was made. The patient was managed with surgical repair of the tendons and within few days after the surgery he started physiotherapy and rehabilitation program, using walking crutches partial weight bearing mobilization was allowed, and a gradual increase of knee flexion within brace was applied. He used the knee braces and the walking crutches for two months, to ensure complete healing of the repaired tendon with a sufficient strength to allow full weight bearing. At four-year follow-up, complete bilateral knee extensor tendons healing and both knees functional outcome was satisfactory. **Conclusion:** A simultaneous rupture of quadriceps and contralateral patellar tendons is a rare event in patients with chronic renal failure undergoing long term hemodialysis. With early surgical intervention and good physiotherapy, the patient usually has good recovery of both knees function.

Keywords: Chronic renal failure, Hemodialysis, Patellar tendon rupture, Quadriceps tendon rupture, case report.

1. BACKGROUND

Fractures of the patella are common causes of disturbance of knee extensor mechanism; quadriceps or patellar tendon rupture incidence is relatively low, especially simultaneous bilateral rupture, which contribute to a small percent of all quadriceps tendons ruptures (1).

In general, there is high association between bilateral knees extensor mechanism rupture and chronic systemic disorders such as: systemic lupus erythematosus (SLE), hyperparathyroidism, chronic renal failure (CRF), and psoriasis. Recently, bilateral quadriceps or patellar tendons rupture have been reported in the literatures in uremic patients who underwent regular hemodialysis (2-5). Bilateral tendon rupture could happen spontaneously or secondary to traumatic event (6, 7).

The most acceptable mechanism in the literature that plays a major role in the pathophysiology of tendon rupture in patients on regular hemodialysis is secondary hyperparathyroidism (8, 9). Early surgical intervention in the management of tendon rupture results in better outcome than delayed intervention (10-12). Herein, we report a rare case of bilateral simultaneous knees extensor mechanism tendon rupture in a patient with renal failure on long standing hemodialysis for five years.

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2. OBJECTIVE

The aim of this article is to present a case of bilateral knee extensor mechanism ruptured in a patient with chronic renal failure on long standing hemodialysis.

3. CASE PRESENTATION

A 38-year-old white male, accountant, known to have diabetes, hyperparathyroidism and chronic renal failure on regular hemodialysis for five years, he was presented to our emergency department with history of minor fall while he was going down stairs, he had severe bilateral knees pain and inability to ambulate.

Clinical examination showed bilateral knees massive effusion, right infra-patellar ecchymosis and left supra-patellar obvious depression. There was palpable soft tissue defect in the right patellar tendon and the left quadriceps tendon, restricted both knees range of motion with extreme patellae mobility and he was unable to straight raising his both legs. Plain radiographs showed right Patella Alta and left Patella Baja, but there was no evidence of patella fracture or any calcified deposits in either quadriceps tendons or patellar tendon (Figure 1). Magnetic Resonance Images (MRI) on sagittal plane T2-weighted of right knee showed complete transection of the patellar tendon from its origin with superior displacement of the patella, associated with infra-patellar large hematoma, thickened edematous quadriceps tendon and disruption of the patellar retinaculum; while left knee showed complete transection of the quadriceps tendon at its insertion with inferior and lateral displacement of patella associated with a supra-patellar large hematoma, thickened wavy patellar tendon and disruption of the patellar retinaculum (Figure 2).

The patient underwent bilateral quadriceps and patellar tendon open surgical repair. Right knee infra-patellar longitudinal skin incision was made, the inferior pole of the patella and patellar tendon were exposed. Intra-operatively, there was total rupture of the patellar tendon at its origin with distal tendon retraction, thorough washing and debridement of unhealthy patellar tendon stump, bony refreshment of inferior pole of the patella and retracted patellar tendon was sutured to the distal pole of patella with two non-absorbable heavy an-

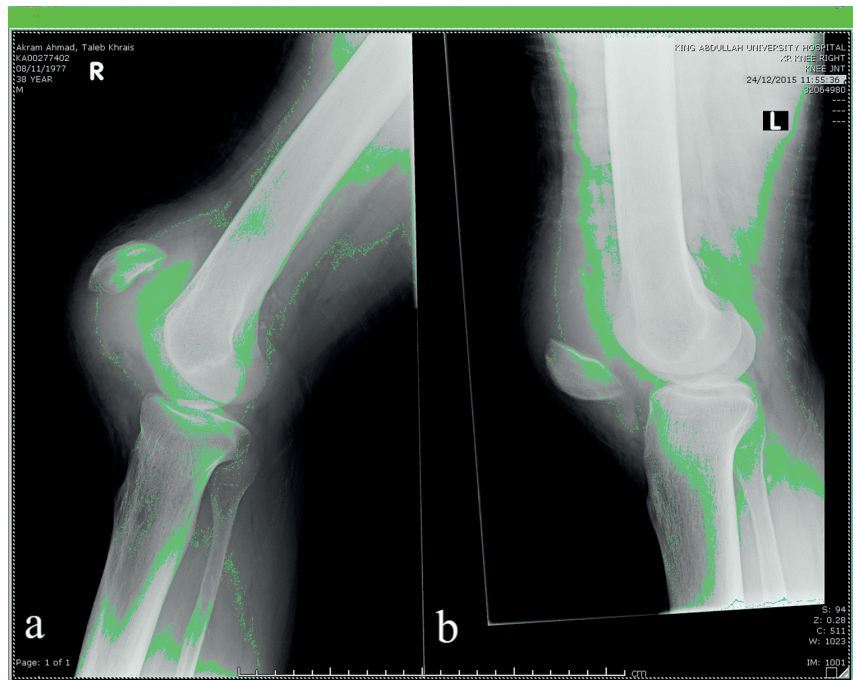


Figure 1 a) Right Knee XR, AP view, showed rupture of the patellar tendon; b) Left Knee XR, AP view, indicated rupture of the quadriceps tendon.

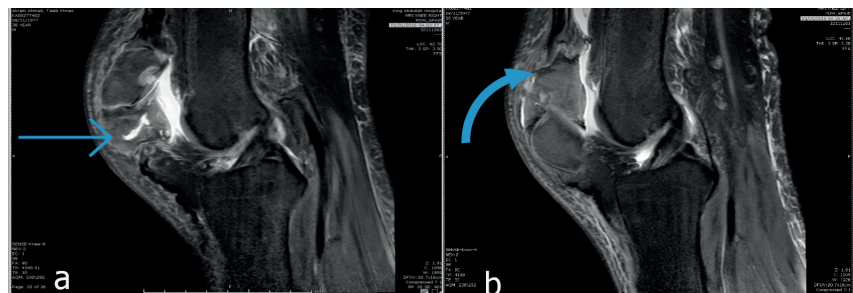


Figure 2 , a) Right Knee MRI, T2WI sagittal view, showed rupture of the patellar tendon as indicated by the arrow b) Left Knee MRI, T2WI sagittal view, indicated rupture of the quadriceps tendon as indicated by the arrow



Figure 3 Postoperative Photograph, taken four years following surgery. Photograph of both knees taken four years following surgery shows satisfactory range of motion of both knees.

chor sutures using a Krackow's suture technique. Left knee supra-patellar longitudinal skin incision was done. Exposure of the quadriceps tendon along with the proximal patella was done. Intra-operatively, there was total rupture of quadriceps tendon at its attachment to the superior pole of the patella, thorough washing and debridement of unhealthy quadriceps tendon stump, bony refreshment of superior pole of the patella and retracted quadriceps tendon was sutured to the proximal pole of

patella with two non-absorbable heavy anchor sutures using a Krackow's suture technique. Both repaired tendons were stable intra-operatively during stressing with passive knee flexion. Post-operatively, patient was placed in bilateral hinged knee brace of 0–30°, then he started physiotherapy within few days after surgery, partial weight bearing mobilization was allowed using walking crutches, gradual increase of knee flexion within brace was applied. The patient used the knee braces and the walking crutches for two months until complete tendons healing with sufficient strength in his repaired tendons. At four-year follow-up, radiographs confirmed solid healing of all repaired tendons. Patient had a satisfactory clinical outcome. His functional range of motion of both knees was near normal, 0°-100° (Figure 3).

4. DISCUSSION

Knee Extensor mechanism is composed of both quadriceps and patellar tendons which provides strong support of the knee, that help maintaining the knee at extension. The stability of these tendons which came from their unique biochemical and structural characteristics protects the knee from external forces. So, Transection of these tendons is a rare injury and commonly affecting middle age and elderly men. Moreover, bilateral Simultaneous rupture of quadriceps tendons is rare, contributing to less than 5% of all ruptures of the quadriceps tendon and it's more difficult to manage than a unilateral tendon rupture (13).

The first published case of bilateral rupture of quadriceps tendon in chronic renal failure patient was published in 1949 (6). However, previously published literature had rarely described the occurrence of spontaneous patellar and contralateral quadriceps tendons rupture in association with chronic renal failure (14-18). Spontaneous Simultaneous quadriceps and contralateral patellar tendons rupture in patients with chronic kidney disease is an uncommon injury combination with only four previous case reports in the published literature (19-22).

Many literatures suggested the important role of the hormonal imbalance especially the secondary hyperparathyroidism plays an important role in the development of quadriceps tendon rupture in hemodialysis patients (23). Secondary hyperparathyroidism and Vitamin D deficiency may result in sub-periosteal resorption of bone, which can disturb the integrity of quadriceps osteo-tendinous junction (24, 25). Uremic patients on long term haemodialysis are usually experience calcium-phosphorus metabolism disturbance which will result usually in secondary hyperparathyroidism. Ligament and tendon tissue degeneration usually resulted from excessive amount of parathyroid hormone will lead to decreased expression of active vitamin D receptors in the parathyroid gland and a low level of active vitamin D. In addition, metabolic acidosis in those patients can result in collagen synthesis disorder (26).

Patients who are on long-standing hemodialysis should pay more attention to their daily living activities, reducing strenuous exercise and should use the appropriate safety equipment. Once rupture of quadriceps

or patellar tendons happens, early surgical repair is the best option to recover the function of the knee extensor mechanism. Literatures suggested that early surgical intervention has the best clinical outcome because there is less fibrosis and retraction during this period (27-29). Suture anchors are the corner stone in the management of the quadriceps or patellar tendons rupture (30-32).

We report a rare case of simultaneous rupture of the patellar tendon and contralateral quadriceps tendon in a patient with chronic renal failure that was successfully managed with early surgery. The knee range of motion was returned to near normal (0°-100°) two months after the surgery. The functional outcome of both knees in this patient was satisfactory.

5. CONCLUSION

A simultaneous rupture of the quadriceps and contralateral patellar tendons is a rare event in patient with chronic renal failure on long term hemodialysis. With early surgical intervention and good physiotherapy, the patient usually has good recovery of both knees function.

- **Patient Consent Form:** The authors certify that they have obtained all appropriate patient consent forms.
- **Authors contribution:** All authors contributed significantly and in agreement with the content of the article. All authors presented substantial contributions to the article and participated of correction and final approval of the version to be submitted.
- **Conflict of interest:** There are no conflicts of interest.
- **Financial support and sponsorship:** Nil.

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