Simultaneous rupture of the quadriceps tendon with contralateral patellar tendon: A rare combination

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Abstract

Although spontaneous rupture of the Knee extensor mechanism is frequently described in patients with uremia undergoing maintenance hemodialysis, simultaneous ruptures of bilateral knee extensor tendons is a rarely reported condition. In this report, we present a case of simultaneous quadriceps and patellar tendon rupture in a 53-year-old man with chronic renal failure, who was treated surgically by osteotendinous repair on both sides, with supplemental cerclage wire fixation for the patellar tendon rupture with satisfactory results.

Keywords: Quadriceps tendon, patella tendon, simultaneous rupture

Introduction

Ruptures of quadriceps or patellar tendons are common and serious Knee extensor mechanism injuries, however simultaneous rupture of either the infrapatellar tendon or contralateral quadriceps tendon is rare. This condition is usually described in subjects with systemic diseases such as gout, rheumatoid arthritis, chronic renal failure systemic, lupus erythematosus (SLE), rheumatoid arthritis, hyperparathyroidism, hereditary disorders of the connective tissue (like Ehlers-Danlos syndrome) or who are receiving long-term corticoid and fluorquinolones treatment [1, 2]. In this report, we describe a case of Concurrent Rupture of the Patellar Tendon with Contralateral quadriceps tendon in a chronic hemodialysis patient.

Materiel and method

A 53 years-old patient with chronic renal failure secondary to membranous glomerulonephritis for the last 15 years, who had been receiving maintenance hemodialysis (three times per week since that time) was referred to our hospital with complaints of pain and swelling in both his knees after a fall. The patient reports having dropped its height with reception on both knees flexed, following a sensation of instability of the right knee without notion of trauma or stumbling. Clinical examination revealed bilateral severe effusion around the both knees with two large gaps, one below the right patella and one above the left patella (Fig 1). Loss of the active extensor mechanisms of both knees was also noted. Bilateral knee x-rays (Fig 2), obtained at 30° of flexion showed patella alta on the left side and patella baja on the right side, according to the Insall-Salvati method [3].

Result

The diagnosis of a Simultaneous rupture of the quadriceps tendon with contralateral patellar tendon was retained. In our case, we did not find that it is necessary to do other complementary examinations such as ultrasound or MRI given their cost and therapeutic delay they cause. The patient underwent surgical repair of both tendons through a midline knee approach. In the right side, the patellar tendon was avulsed from its proximal insertions (like Ehlers-Danlos syndrome) or who are receiving long-term corticoid and fluorquinolones treatment [1, 2]. In this report, we describe a case of Concurrent Rupture of the Patellar Tendon with Contralateral quadriceps tendon in a chronic hemodialysis patient.
adjust the height of the patella under fluoroscopic control with obtaining a Caton-Deschamps Index around 1. On the left, surgical exploration showed a rupture of quadriceps tendon just above the insertion to the patella (Fig 3b). It was repaired by the same steps but without cable augmentation (Fig 4b, 5). Postoperatively, both knees were immobilized in removable splints for 6 weeks. Isometric quadriceps and straight-leg-raising exercises was undertaken since second day in a range of mobility of 0°-40° by arthromotor. At the 4 week postoperatively, the patient started doing partial weight-bearing with crutches and at the third month, he underwent an active rehabilitation, and the range of movement was 0-85 degrees and 0-110 degrees on the right and left respectively. At the forth month, the strapping wire was removed. Full flexion had been achieved in both knees at twenty-two weeks (Fig 6).

Discussion

The knee extensor mechanism injuries include patellar fractures and tendon lesions of the extensor apparatus. They
are rare injuries, with an incidence of 1.37/100,000 per year for quadriceps tendon ruptures (QTR) and an incidence of 0.68/100,000 per year for patellar tendon ruptures (PTR) [4]. Simultaneous rupture of quadriceps tendon with contralateral patellar tendon is extremely rare and usually occur spontaneously in patients with chronic diseases which lead to the degeneration of collagen fibrils and the loss of tendon vascularization [5]. Specifically In case of chronic hemodialysis patient, Elevated levels of parathyroid hormone (PTH) in serum stimulate excessive activity of osteoclasts in the tendon–bone junction, resulting in more bone resorption than bone formation, and this condition decreases mechanical strength at these junctions [6]. Therefore, a relatively minor trauma can cause spontaneous tendon rupture at the tendon–bone junctions. In this current case of a patient with uraemia, there was evidence during surgery that the quadriceps and patellar tendon were inflamed, and weak. Clinically, in patient with Concurrent Rupture of the Patellar Tendon with Contralateral quadriceps tendon, the functional impairment of knees and defective active extension with a palpable gape on physical examination direct the diagnosis. However, cases reported in the literature have shown that up to 50% of bilateral quadriceps tendon rupture may be misdiagnosed [7]. In this condition, careful digital palpation completed by Ultrasound as well as MRI are useful tools in confirming the clinical diagnosis. Surgical repair is the standard treatment of complete rupture of the knee extensor tendon. A number of operative techniques are available for quadriceps tendon rupture. The most common method of treatment is transpatellar repair, in which the nonabsorbable sutures are passed through holes drilled in the upper pole of the patella such as in our case. In addition, the use of Dacron vascular grafts, polydioxanone cord, carbon fibre, synthetic prosthetic ligaments, and suture anchors were also reported [8]. Augmentation with cerclage wiring was used in some reports [9]. For our case, the decision was a transpatellar tendon repair without augmentation because the rupture was acute, and we prefer use repair with semitendinous tendon augmentation only for patients who have undergone previous operations. In the literature, various methods have been described to treat patellar tendon ruptures, but there is no clearcut superiority between them. End-to-end sutures alone or combined with cerclage wires, PDS cords, Ethibond sutures, cables, and soft tissues fixed to the patella are options for repair [10]. In our patient, after suturing the tendon to the patella through holes, we augmented the repair site with cerclage wiring. Postoperative immobilization is advocated by most of the authors for three to six weeks [9, 10]. Early rehabilitation, progresses slowly into strengthening, gait and balancing activities and individual patients will progress at different rates depending on pre-injury function, the extent of the injury and the commitment to the rehabilitation program. In this case, we encouraged the patient to start weight bearing as tolerated during immobilisation. Passive rehabilitation was begun since second day and active rehabilitation after removal of the cast. At the sixth month postoperatively, the patient was free of any limitation in recreational activities and he was pleased with the clinical result.

**Conclusion**

Simultaneous rupture of the quadriceps tendon with contralateral patellar tendon is extremely rare and require early surgical treatment with subsequent functional exercise, in order to maximize functional outcomes for the patient.