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CASE REPORT

Traumatic Simultaneous and Bilateral Rupture of the Quadriceps Tendon in a Bodybuilder Patient

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Abstract

Simultaneous and bilateral rupture of the quadriceps tendon is a rare condition. We present the case of a 38-year male bodybuilder patient with a traumatic simultaneous and bilateral rupture of the quadriceps tendon.

Introduction

Simultaneous bilateral rupture of the quadriceps tendon is an uncommon injury in healthy people and only a few cases have been reported in athletes, requiring rapid diagnosis and surgical treatment. Less than ten cases have been reported during a sporting event [1-4] or due to direct trauma like in the case of a 16-year-old patient with a tendon rupture after receiving a kick from a horse [4] or a case of a 39-year-old male patient how suffered this injury while playing basketball [5]. Spontaneous rupture is more frequent in patients with chronic kidney disease or other systemic diseases that weaken tendons, such as gout, hyperparathyroidism, rheumatoid arthritis, diabetes, obesity and abuse of anabolic steroids or fluoroquinolones [5,6].

The most common cause of bilateral rupture is a sudden violent contraction of the quadriceps muscles with the knees semi-flexed and the feet fixed.

Clinically it presents with joint effusion, acute knee swelling, palpable or visible suprapatellar gaps, and an inability to extend both knees and lift the straight legs. Other findings include a mobile free-floating patella and hemarthrosis [6].

Description of the case

A 38-year-old man bodybuilder with no significant past medical history presented to the emergency room with acute bilateral knee pain and swelling after doing a squat at the gym. He stated that the pain began weeks after the event, always during gym time. He was unable to walk after the incident. He complained of swelling and of not being able to extend his legs. Physical examination showed the patient to be a well-developed athletically fit man. He was unable to actively extend his legs and had bilateral suprapatellar gaps. Radiographs of the knees showed an effusion, with disruption of the quadriceps unit on both knees. His haematological and metabolic profiles were all within normal limits. There was history of use of anabolic steroids in the past years, but he was not currently using them, there was not history of previous local steroid injections, or tendinitis. A clinical diagnosis of bilateral quadriceps tendon rupture was made, and the patient was admitted for surgical repair the next day. With the use of longitudinal incisions, both quadriceps tendons were repaired with 4 metallic 3.5 mm anchors sutures in each knee through patellar drill holes (Figure 1). The extensor retinaculum was reapproximated both medially and laterally. Both legs were then immobilized in braces for six weeks. He received physiotherapy on an outpatient basis to regain strength and range of motion. Six months after the operation, the patient had completely recovered, with bilateral knee extension to zero degrees and flexion to 90 degrees bilaterally. He had no difficulties with the activities of daily living. A year after treatment he was running and trekking but was not back to weightlifting.

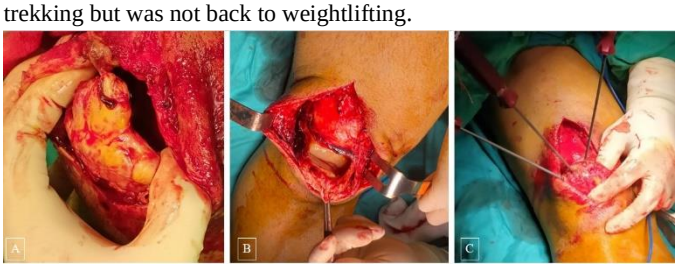

Figure 1: 38-years-old man bodybuilder. A: Intraoperative finding of a left quadricipital tendon injury where it shows an aspect of a sub-acute/chronic rupture; B: Shows an intraoperative photograph of the right knee with a complete acute quadricipital tendon rupture; C: Shows a photograph after anchor placement in the right knee, 2 proximally, and 2 by the sides of the patella.

Discussion

Simultaneous bilateral quadricipital tendon rupture is extremely rare. It occurs in 80% of cases in men [7]. Major trauma is an uncommon cause of bilateral quadriceps tendon rupture. In a small minority of the cases, no risk factor can be identified, and in these cases, repetitive microtrauma may play a role in the pathogenesis [8]. Some recent studies report the simultaneous injury of the patellar tendon and contralateral quadricipital tendon [9], others of both patellar tendon ruptures [10] however there is little evidence of both quadricipital tendons tears, the most recent article published is about an elite weightlifter athlete who suffered a spontaneous injury during the competition [11] similar to our case.

Knee flexion (which is done by doing a squat) increases the force on the quadriceps tendon. When the flexion angle is greater than 50°, the force on this tendon is greater than on the patellar tendon, rendering the quadriceps tendon more vulnerable to rupture [12]. The tendon can rupture at 3 sites: the osteotendinous junction, the musculotendinous junction, and within the tendon itself [13]. Of these 3 locations, the most common site is the musculotendinous junction.

Magnetic resonance imaging is the gold standard for diagnosis, but ultrasound is also reliable and cheap [14]. Urgent surgical treatment is indicated, because when 72 hours or more pass before surgery, retraction of the quadriceps apparatus may make it difficult to obtain apposition of the torn ends and to increase the tension along the suture lines [12].

Shah reviewed the medical literature and found only 66 reported cases of simultaneous and bilateral rupture of the quadriceps tendon,

and most of them were spontaneous [13]. He also reported that 57% of patients regain full range of movement and strength.

We believe that the importance of presenting this case lies in the fact that it is a very rare injury, and we want to highlight the importance of rapid diagnosis and immediate surgical treatment in order to achieve a total recovery of the function of the tendon.

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