



Bifocal disruption of the knee extensor apparatus (“floating patella”) in a 72-year-old patient

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We present the unusual case of a simultaneous ipsilateral rupture of the quadriceps tendon and the patellar ligament in a 72-year-old male patient. No predisposing factors were diagnosed. After surgical treatment, the patient healed with full function and full range of motion.

Keywords : quadriceps tendon rupture ; patellar ligament rupture.

INTRODUCTION

Traumatic lesions to the knee extensor mechanism are common. The most frequent lesion is patellar fracture, followed closely by quadriceps tendon rupture. Damage to the patellar tendon tends to be rather rare (4).

In addition, quadriceps tendon rupture tends to occur in a population aged 40 or older (10), whereas patellar tendon rupture affects a younger population (12).

The association of an ipsilateral quadriceps tendon and patellar tendon rupture is exceptional ; to the best of our knowledge, only one case has been reported in a 13 year-old patient (6).

CASE REPORT

A 72-year-old male patient sought consultation at the emergency department for pain and swelling of his left knee after a fall.

History revealed that, as he was walking down a slope, his left knee suddenly gave out, provoking a fall without any direct blow to the knee.

Physical examination showed a knee effusion and a painful supra-patellar depression. The patient was unable to perform active knee extension. There were no cutaneous lesions.

Plain radiographs (Fig. 1) performed in the emergency department showed no evidence of fracture. However, an abundant effusion was present, as well as a supra-patellar depression. The patella was not tilted or lowered.

As the clinical suspicion of a quadriceps tendon rupture was very high, no further imaging studies were performed.

The patient was in generally good health condition and took no daily medical treatment. Past medical history was negative for any kind of knee surgery.

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Fig. 1. — Pre-operative knee radiographs (AP and lateral views).

A complementary workup also allowed us to exclude renal failure, diabetes, hyperparathyroidism and hyperuricaemia.

On the tenth day posttrauma, a quadriceps tendon suture was performed using a midline approach.

The operative findings confirmed a complete disruption of the quadriceps tendon, associated with a complete patellar ligament rupture, which was discovered incidentally.

After debridement of the tendon edge and its bony insertion, the quadriceps tendon was attached to the proximal pole of the patella using two Twinfix™ anchors (Smith and Nephew, Andover, Mass, USA) and an additional suture with non-resorbable thread.

Patellar ligament repair was performed with the same type of fixation, using two anchors and an added suture after trimming of the tendon edges. Slight knee flexion was applied (Fig. 2, 3 & 4). The haemarthrosis was evacuated and articular lavage was performed.

Immediate postoperative immobilisation was provided by a removable extension splint, in order to be able to evaluate the wound evolution.

As there were no wound complications, the patient was put in a full leg cast for six weeks. Walking rehabilitation was begun on postoperative day two with full weight bearing allowed.

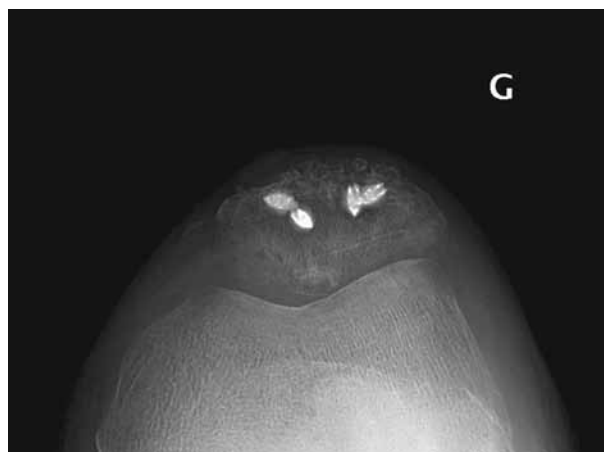


Fig. 2. — Post-operative skyline view of the patella in 30° flexion.

At the end of the six-week immobilization period, the patient was allowed to bend his knee up to 60° of passive and active flexion, moving up to 90° after three weeks for another three weeks. Unrestricted flexion was authorized thereafter.

The overall evolution was favourable. Recovery of mobility was excellent, with knee joint range of 130°/0°/0° at three months postoperatively. Furthermore, active extension against resistance was good. The patient requires no walking aids and is entirely satisfied with the result.

DISCUSSION

The stresses applied to the extensor mechanism and patella are very high. They are the resultant of the traction forces of the quadriceps and of the patellar tendon (1). At the level of the patellar tendon, these forces rise further as knee flexion increases, generating values up to 614 kg/cm² at 5° of flexion and 1039 kg/cm² à 90° (8).

The mechanism responsible for both quadriceps and patellar tendon rupture is often that of a sudden quadriceps contraction on a slightly flexed knee (3, 4). Direct blows to a knee flexed at 90° are also described as potential explanations for patellar tendon rupture (4).



Fig. 3. — Post-operative AP radiograph of the knee



Fig. 4. — Post-operative lateral radiograph of the knee

Most of the time, these ruptures affect a pathological tendon in patients under 40 years of age for the patellar tendon, or above 40 years of age for the quadriceps tendon (10,12). These tendons can be weakened by microtrauma in athletes or by systemic disease such as diabetes, renal failure, hyperparathyroidism, gout or obesity. Chronic corticosteroid intake or prior knee surgery may also be involved (10,11).

Bilateral patellar or quadriceps tendon ruptures have been described in literature (2,3,4,5,7,9), most often in patients presenting with systemic disease or receiving specific medical treatments. However, our literature review has yielded only one case of simultaneous quadriceps and patellar tendon rupture (6), in a 13-year-old child who presented with a detachment of the anterior tibial tuberosity, and in whom a quadriceps tendon rupture had been overlooked at the time of the initial diagnosis. Secondary suture of the quadriceps tendon was then performed, ultimately providing a satisfactory functional result.

Bone anchors attached to the inferior and/or superior pole of the patella are used more and more often in the repair of those types of lesions. Protection by tension band wiring (metallic, tendinous or synthetic) is provided in patellar tendon rupture. This technique appears to be as efficient as the technique using transpatellar suture tunnels (2).

To the best of our knowledge, the case reported here is the only one featuring a combined lesion of the quadriceps tendon and patellar ligament. The traumatic mechanism involved is typically compatible with a quadriceps tendon rupture in a patient over 40 years of age. However, as there were no cutaneous lesions, we are unable to explain the patellar tendon rupture by a direct blow. Furthermore, the patient presented no conditions predisposing to tendon weakness. The case was managed according to the techniques usually described for the treatment of isolated ruptures, with the addition of strict postoperative immobilisation for a period of 6 weeks. Other authors favour

early mobilization. No residual stiffness has resulted from this prolonged immobilisation.

In conclusion, in spite of the exceptional occurrence of the simultaneous ipsilateral rupture of the quadriceps tendon and patellar ligament, we consider that the integrity of these two anatomic structures should be checked when one or the other is ruptured. Delay in diagnosis, which is associated with a poorer treatment outcome, can thus be avoided.

Treatment principles are the same as those that apply to isolated ruptures. The use of bone anchors is a valid treatment option, providing results similar to isolated sutures.

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