



Case report

Simultaneous bilateral rupture of the patellar ligament in chronic renal patient. A case report^{☆,☆☆}

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ABSTRACT

The authors report a case of simultaneous bilateral rupture of the patellar ligament resulting of low-energy trauma in a patient with chronic renal failure.

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Ruptura bilateral simultânea do ligamento patelar em paciente renal crônico. Relato de caso

RESUMO

Os autores apresentam um caso de uma ruptura bilateral simultânea do ligamento patelar decorrente de trauma de baixa energia em paciente portador de insuficiência renal crônica.

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Introduction

The knee extensor mechanism is composed of the quadriceps musculature, quadriceps tendon, patella and patellar ligament. Experimental studies have demonstrated that normal tendons do not rupture when longitudinal stress is applied. In this case, a rupture will occur at the muscle-tendon junction, the muscle belly or the tendon insertion in the bone. Rupturing of the patellar ligament usually occurs in a pathological area.¹

Patellar ligament injuries are less common than those of the quadriceps and they generally occur in patients under the age of 40 years.^{2,3} They are often associated with trauma. However, there are reports relating to local injection of steroids and a large number of systemic diseases such as systemic lupus erythematosus, diabetes mellitus, rheumatoid arthritis, osteomalacia and chronic kidney failure.⁴⁻¹⁰

It is not difficult to make a clinical diagnosis of acute injuries. Patients generally complain of intense pain and impossibility of walking. Localized swelling is observed, along with a deficiency that is painful on palpation, generally located on the lower edge of the patella, and there is evidence of a high patella. These patients are unable to raise an extended leg, but if they manage to do so, it will be an indication of partial rupture.¹¹ The rarity of bilateral injury and the symmetry of the findings from clinical examination may add difficulty to the diagnosis.¹²

The aim of this study was to report on a case of simultaneous bilateral rupture of the patellar ligament in a patient with chronic kidney failure who was treated by the Knee Group of the Orthopedics and Traumatology Service of Hospital Maria Amélia Lins (FHEMIG).

Case report

The patient was a 63-year-old man (medical file 140015), born in Bonfim (RR) and living in Contagem (MG). He presented chronic kidney failure secondary to polycystic kidneys, and was undergoing dialysis treatment three times a week.

He had a history of sudden pain in both knees when going downhill across uneven ground, accompanied by a crackling feeling and incapacity to walk.

He sought medical care at an orthopedic emergency service and a diagnosis of bilateral rupture of the patellar ligament was made. He was referred to our service for elective orthopedic surgical treatment.

On clinical examination, he presented difficulty in extending his lower limbs, accompanied by a palpable gap at the level of the lower pole of the patella (Fig. 1) and joint effusion. Radiographs produced at the emergency service demonstrated that the patella was high (Fig. 2), without any associated fracture.

Five days after the injury, the patient underwent surgical treatment, which was done in a simultaneous manner. The technique used was similar to what was described by Zekcer et al.¹³

The patient was placed on the surgical table in dorsal decubitus. After applying asepsis and antisepsis care, a longitudinal incision was made in the anterior region of the knee,

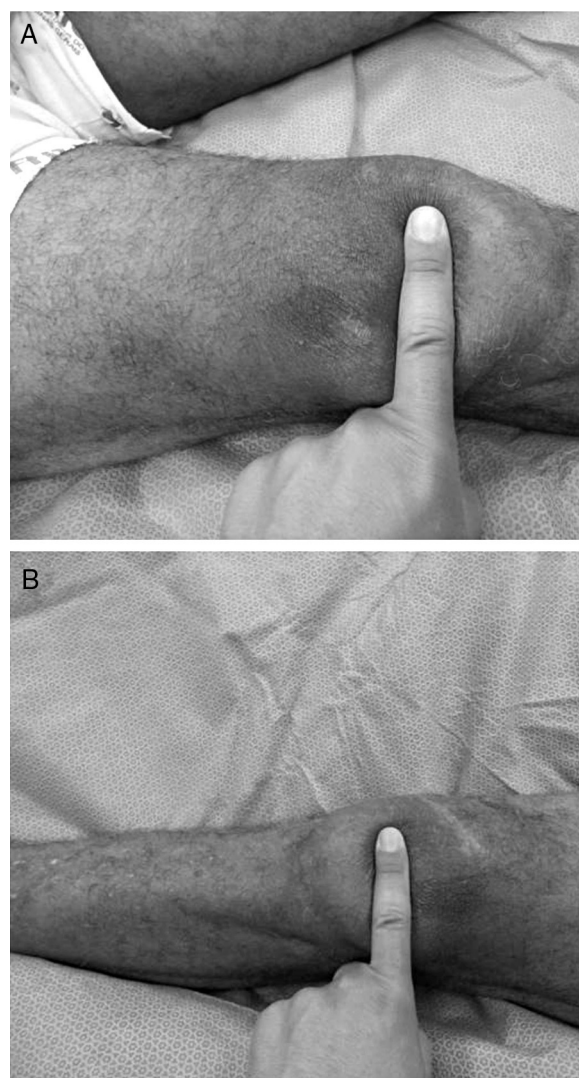


Fig. 1 – Palpable gap at the inferior pole of the patella. (A) Left knee. (B) Right knee.

around 4 cm proximally to the upper pole of the patella and continuing as far as 3 cm below the anterior tibial tuberosity (ATT). The tendon of the semitendinosus was easily identified in the pes anserinus and was removed with the aid of tenotomy (Fig. 3).

After careful dissection, the location of the injury at the level of the lower pole of the patella was identified on both sides. The lower pole was scarified and then Kessler stitches were inserted at three locations in the patellar ligament: lateral, intermediate and medial. Ethibond® number 5 thread was used, and the stitches were left repaired.

With the aid of a 5 mm drill bit, a horizontal tunnel was opened at the junction of the lower third and middle third of the patella. Another hole of the same diameter was made at the level of the ATT, parallel to the first hole (Fig. 3). The tendon of the semitendinosus was passed through these tunnels and it was left repaired medially to the ATT.

Following this, three vertical holes were drilled parallel to each other in the patella. Three Kirchner wires with an opening at one end were used to pass the Ethibond® threads of

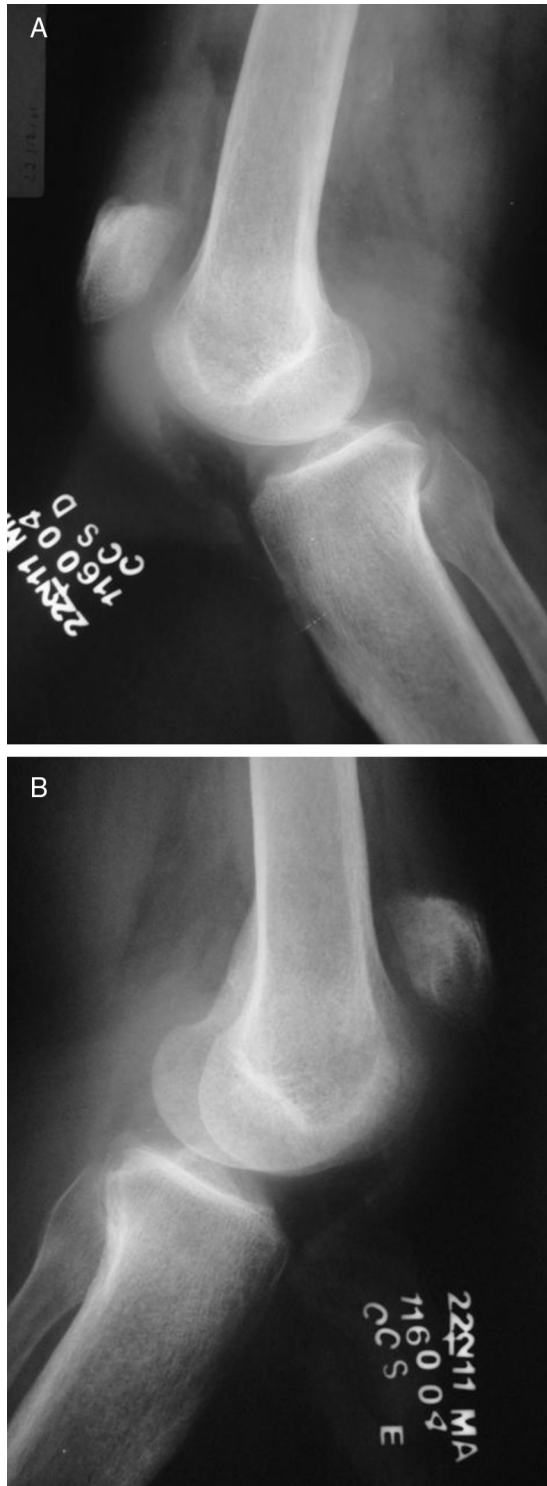


Fig. 2 – Radiographs showing high patella. (A) Left knee. (B) Right knee.

the patellar ligament from distal to proximal (Fig. 4). Simple stitches between the threads were made at the upper pole of the patella.

Lastly, the ends of the tendon were sutured to the semi-tendinosus muscle using Vycril® and a 7 mm interference screw was placed at the level of the ATT.



Fig. 3 – Construction of horizontal tunnels at the level of the patella and ATT.

The resistance of the assembly was checked during the operation, with a range of motion from 0° to 90°. A lateral radiograph with the knee flexed at 30° was also produced to check the level of the patella (Fig. 5). The lower pole should be located at the level of the Blumensaat line.

Isometric exercises were started early on, along with support on crutches. Flexion was started at the end of the first week, by means of active exercises with the heel supported on the ground. Active extension exercises were started in the fourth or fifth week.

The patient presented satisfactory evolution and, six months after the injury, the range of motion was seen to be 0°–125°, with residual hypotrophy of the quadriceps, although without impairment of his activities of daily living.

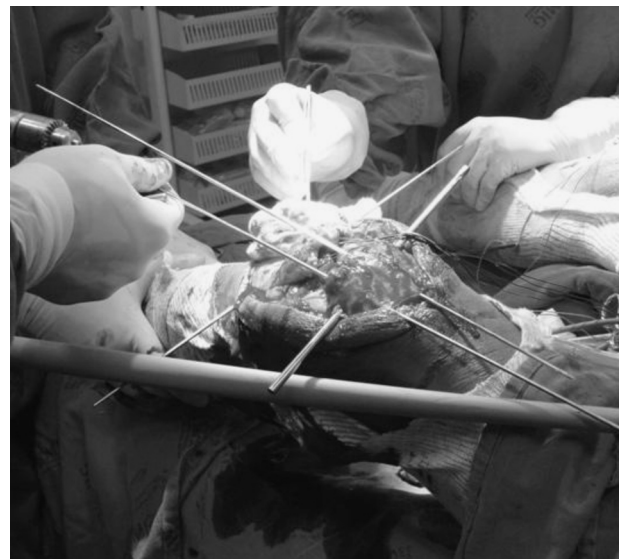


Fig. 4 – Construction of parallel vertical drilled holes in the patella.

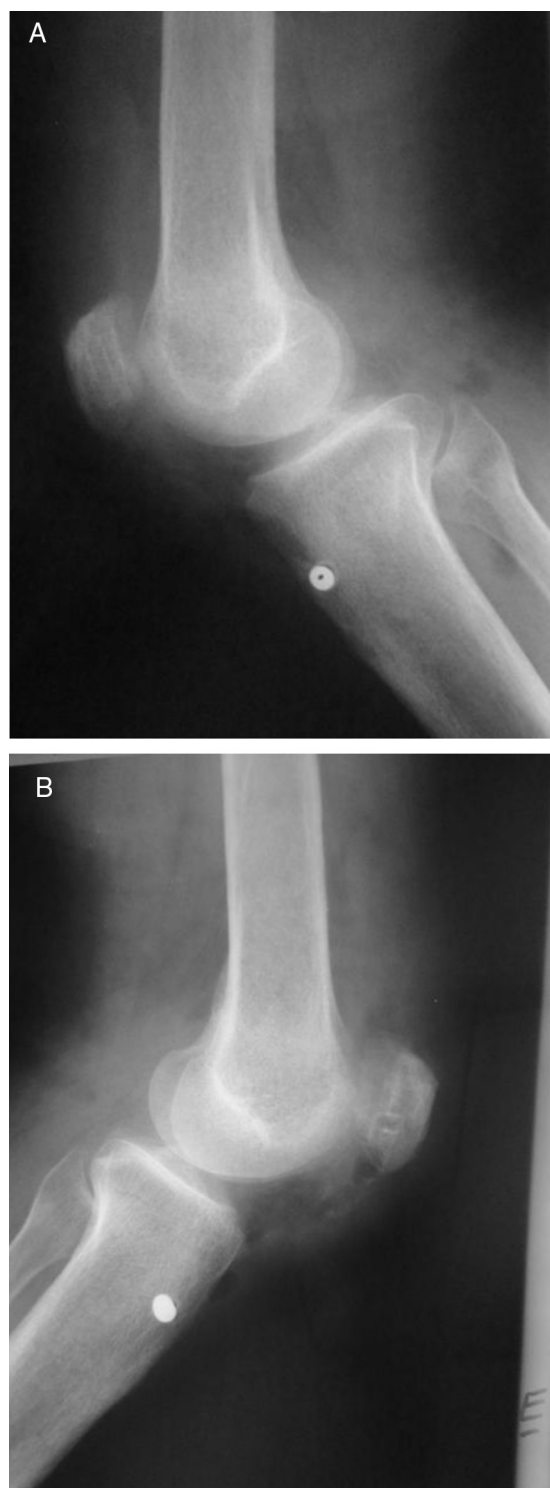


Fig. 5 – Transoperative radiographs showing good patellar positioning. (A) Left knee. (B) Right knee.

Discussion

Rupture of the patellar ligament is the third commonest cause of injury to the extensor mechanism, preceded by fracturing of the patella and injury to the quadriceps tendon.¹² It results from sudden eccentric contraction of the quadriceps with the

foot supported and the knee flexed, which causes rupture of the ligament or tearing at its insertion point.¹¹ Zernicke et al.¹⁴ reported that the force required to break the patellar ligament was around 17.5 times the body weight. Bilateral injury of the patellar ligament is rare. Most patients present histories of systemic diseases or previous knee surgery.¹² Inflammatory alterations can be seen at the rupture site in patients with systemic lupus erythematosus¹⁵; amyloid deposits are found in dialysis patients,^{16,17} and elastosis is found in patients with chronic acidosis.¹⁸ Rupture of the patellar ligament in patients over the age of 40 years should be considered to be an indication of a systemic disease and should serve to warn of the possibility of rupturing of the middle third of the ligament substance.¹¹

According to Taylor et al.,¹⁹ the physiopathology of bilateral rupture of the patellar ligament is divided into three categories. The first group consists of patients with systemic or autoimmune diseases. These conditions generate inflammatory reactions that change the ligament structure. Histologically, chronic inflammation and amyloid deposits are observed. The second group involves patients who make use of oral or injectable corticosteroids. It is believed that corticosteroids affect collagen synthesis and the blood supply to the ligament, and weaken it. The third group is formed by patients who present inflammatory and degenerative lesions attributable to repeated microtraumas.

The clinical diagnosis of bilateral injury to the patellar ligament may go unnoticed at the initial examination. Siwek and Rao³ reported that 10 (28%) of their 36 patients with patellar ligament injuries were not diagnosed during the acute phase. Our patient reported sudden bilateral pain in the knee, with joint effusion and a deficit of the extensor mechanism. On inspection, it was observed that the patella was high. Comparison was made difficult because of the absence of a normal contralateral side. On palpation, an infrapatellar defect was noted. Usually, complete incapacity to extend the knee is observed, but some patients may present varying degrees of extension if the medial and lateral retinacula are intact.¹⁹

Although injuries to the extensor mechanism are diagnosed by means of history-taking and clinical examination, some imaging examinations may be useful for confirming the injury and for differentiating between complete and incomplete injuries.¹ From radiographic evaluation, our patient's patella was observed to be high. In our service, we use the index of Caton et al.,²⁰ calculated from the lateral view with the knee flexed at 20°–30°. This index consists of the ratio of the distance from the lowest point of the joint surface of the patella to the anterosuperior edge of the tibia divided by the length of the joint surface of the patella. A ratio greater than 1.2 indicates a high patella. Ultrasonography can also be performed, although this is examiner-dependent.¹⁹ Magnetic resonance imaging may be useful in doubtful cases, in order to assess the degree of ligament degeneration, and in cases of suspected associated knee injuries. Arthrography and computed tomography do not offer great benefits in diagnostic terms.¹¹

Treatment should be instituted as soon as possible.^{11,12,14–19} Delays in performing the surgical procedure may lead to a need for extensive release of scar tissue, traction for the patella or use of auto or allografts.

Furthermore, delays increase the duration of the rehabilitation and degree of atrophy of the quadriceps.¹² Rougraff et al.²¹ affirmed that the worst prognostic factor for treating injuries of the extensor mechanism was late surgical repair. According to these authors, a delay of some weeks would compromise the quality of the repair, with worse functional results.

In the present case, we reinforced the suture of the patellar ligament using the semitendinosus tendon. According to Seijas et al.,²² in cases with poor viability of the patellar ligament, such as those resulting from chronic injury or corticosteroid use, it may be necessary to use grafts. The semitendinosus is generally used because it is easily accessible and easy to manage, as well as producing low morbidity in the donor zone.

Conclusion

We reported on a case of an event that is rare in the literature. We believe that early diagnosis and treatment are essential for a good functional result. Use of autografts increases the safety of this repair, given that this is an injury of degenerative nature.

Conflicts of interest

The authors declare that there were no conflicts of interest.

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