

to identify the styloid bone and any focal degenerative disorders at its articulation with the base of the third metacarpal such as sclerosis or small osteophytes that tend to occur in symptomatic cases and which explain an increased uptake of the tracer in a bone scan^{1,4,5}.

In spite of the fact that CGS is a well-known disease, there are hardly any studies that discuss its most characteristic MRI signs^{2,6}. MRI permits detection of bone edema in the styloid bone and in adjacent articular surfaces in symptomatic cases, which may arise as a result of the development of focal osteoarthritis or chronic distraction of the ECRB tendon. Associated alterations such as ganglia, adventitial bursitis, peritendonitis and subcutaneous cell tissue edema can also be observed in the soft tissues covering the area where the snapping tends to occur. The alterations found in our case are very similar to those presented by Zanetti et al in a study on MRI diagnosis of chronic wrist pain⁶ and in another one on acute trauma to the styloid bone². The efficacy of MRI as a diagnostic tool has been amply demonstrated in other accessory bones such as os acromiale, the bipartite patella, and the accessory scaphoid bone, which may become symptomatic as a result of a partial disruption of their synchondroses due to chronic overuse, which results in abnormal motion, friction and development of bone edema at the ossification site, which clinically correlates with pain⁷.

Differential diagnosis of SCB must also include other conditions that may cause a prominence or tumefaction in the dorsum of the hand, such as ganglia, extensor tenosynovitis, calcific tendonitis, solid tumors and an accessory extensor digitorum brevis muscle.

Surgical treatment of SCB is reserved for cases of disabling pain that is refractory to conservative treatment. It consists in a wedge-shaped resection of the protuberance and the adjacent arthritic cartilage⁵. Around 6% of operated cases of SCB may present with recurrence of pain or of the protuberance resulting from incomplete excision, ganglion formation or CMC instability caused by dorsal ligament disruption⁵. Nevertheless, other studies report pain recurrence in up to 50% of cases operated through simple excision⁸. An alternative to wedge-shaped

resection is arthrodesis, although it entails a high risk of pseudoarthrosis⁷.

In conclusion, a styloid bone may give rise to the formation of a painful mass over the dorsum of the hand. Imaging studies, specifically MRI, are extremely useful to confirm the diagnosis and demonstrate the existence of local inflammatory phenomena in symptomatic cases.

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Bilateral quadriceps tendon rupture in a healthy patient: case report and literature review

Rotura bilateral del tendón cuadricipital en paciente sano. A propósito de un caso y revisión de la literatura médica

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Introduction

Spontaneous bilateral tears of the quadriceps tendon, although infrequent, have been reported in elderly patients

following minor trauma or as a consequence of renal dialysis and hyperparathyroidism¹. In young patients it appears as a complication further to burns, orthopedic surgery or anabolic steroid abuse². In this study, however, we present the case of a healthy patient with a complete spontaneous simultaneous bilateral tear of the quadriceps tendon. After a careful review of the literature, we have not found reports of any similar cases.

Case report

Our patient is a 58-year-old male (88 kg, 170 cm; BMI 30.44) who presented with a suprapatellar clicking noise as he was walking on an irregular surface. Physical examination revealed a bilateral suprapatellar depression and a functional extension lag in both knees; knee flexion was well preserved.



Figure 1 Nuclear magnetic resonance of the right knee with a gap in the quadriceps tendon.

Radiographs showed bilateral *patella baja*, with no evidence of fracture. Nuclear magnetic resonance imaging (NMRI) indicated a complete bilateral tear of the quadriceps tendon with involvement of the medial patellofemoral retinaculum (fig. 1).

The biochemical and metabolic analytical parameters used in the literature to identify the potential causes of this condition (uric acid, alkaline phosphatase, calcium, sodium, potassium, urea and creatinine) detected no alteration whatsoever. The result of immunologic analyses (anti-neutrophil cytoplasmic antibodies [C-ANCA], perinuclear anti-neutrophil cytoplasmic antibodies [P-ANCA], rheumatoid factor, anti-nuclear antibodies, citric citrullinated peptide, human leukocyte antigens (HLA)-B27, anti-ro and anti-la antibodies) and parathyroid hormone (PTH) values were also within normal ranges. Slight triglyceride-related dyslipidemia was found (247 mg/dl), with total LDL and HDL cholesterol levels at normal levels.

Results

The patient was operated at 72 h from injury. The quadriceps tendon attachment to the patella was debrided and the tendon margins were refreshed. Microscopically, no tissue involvement was found. Subsequently, a transosseous terylene and polydioxanone (PDS) suture was applied. Following a 4-week immobilization of the knee in extension, a rehabilitation program was instituted with progressive mobilization and exercising of the extensor mechanism. At 8 months from surgery, the patient presents with a joint balance of 130/0 degrees, with restoration of extensor function sufficient for performance of activities of daily living (fig. 2).



Figure 2 Post operative appearance of the extensor mechanism 8 months post-op.

Discussion

Diagnosis of a quadriceps tendon tear is an essentially clinical endeavor.

The presence of a *patella baja* on radiographs, although helpful, is not pathognomonic. NMRI and ultrasound are useful for describing and locating the tear as well as for surgical planning². In spite of all this, diagnostic delays have been reported, which have ranged from a few days to several months².

Since Steiner and Palmer³ described the first case in 1949, several cases of spontaneous bilateral tear of the quadriceps tendon have been reported^{4,5}. Around 70% of the cases we have reviewed present with predisposing factors, such as prolonged use of systemic steroids, chronic renal failure with renal transplant and secondary hyperparathyroidism¹, diabetes mellitus, osteogenesis imperfecta, auto-immune systemic disease² (rheumatoid arthritis, systemic lupus erythematosus and vasculitis), gout, pseudogout, amyloidosis, alkaptonuria⁵, obesity⁴, anabolic steroid abuse and fluoroquinolones. The most important predisposing factor to spontaneous tears is chronic renal insufficiency with long-standing hemodialysis and secondary hyperparathyroidism^{1,2}. Shiotani et al¹ report that hyperparathyroidism tends to be accompanied by dystrophic calcifications and subperiosteal resorption that make the bone brittle at the tendon insertion site. Obesity has been described as a predisposing factor to tendon lesions. Kelly et al⁴ provide an example of such a case. However their patient weighed 159.1 kg and is not comparable with the case described herein (slight triglyceride increase with HDL and LDL cholesterol within normal ranges).

Partial tendon tears tend to evolve favorably if the patient is kept with his/her knee immobilized in extension for a period of no less than 6 weeks.

Surgical treatment is reserved for complete tears. However, the type of surgical technique to be used remains a moot point. The majority of authors emphasize the importance of restoring correct tendon thickness following proper debridement and refreshment of the tendon margins².

End-to-end suturing tends to produce good results when the tendon extends distally to the rupture. However, as the lesion is often close to the bone-tendon junction use of transosseous sutures is recommended to facilitate tendon reattachment.

In the presence of chronic tears, tendon retraction often does not allow direct suturing. In these cases, the best option is to release any quadriceps tendon adhesions or extensions, such as those reported by Codivila. These types of lesions are often associated with less satisfactory results.

Assisted joint motion after 4-6 weeks' immobilization seems to promote reorganization and remodeling of collagen fibers. However, Rougraff et al² found no significant differences between early and deferred mobilization in a study of 53 ruptures. The final goal should be complete range of motion recovery in 12-16 weeks.

To conclude, spontaneous tears of the quadriceps tendon, although infrequent, should prompt a careful etiopathogenic study. Nevertheless, it is also possible for this condition to present in healthy individuals.

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