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Tenosynovial Giant Cell Tumor in the knee: Case report

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ABSTRACT
Tenosynovial Giant Cell Tumors (GCTT) are benign proliferative neoplasms of undetermined etiology. Unlike bone tumors, their growth is usually slower, originating from the synovial tissue of tendon sheaths, joints, bursae, and fibrous tissues adjacent to tendons, usually in the appendicular skeleton. GCT corresponds to less than 2% of all soft tissue tumors and its most common location is on the hands, corresponding to 80-85% of cases. In large joints, its incidence reaches 10%, and can reach large dimensions. The least commonly affected sites are the knee and ankle. This report presents a rare case of TTCG located in the knee, without bone involvement, whose treatment was tumor resection using the arthroscopic method.

Keywords: Knee, Giant Cell Tumor, Neoplasm, Arthroscopy.

1 INTRODUCTION

Tenosynovial giant cell tumors (GCTT) are benign proliferative lesions of undetermined etiology and slow growth, originating in the synovial tissue of the tendon sheaths, joints, bursae and fibrous tissues adjacent to the tendons[1,2]. GCTT was initially questioned as to its origin, which could be of true neoplastic cause or a disease of reactional origin. More recent evidence suggests a neoplastic etiology.

GCTT is rare, accounting for approximately 1.5% of all soft tissue tumors1. They are more frequently observed in patients aged between 30 and 50 years, with a higher prevalence in females (2:1)[3,4,5]. They can affect any synovial joint, including the hip, ankle, shoulder and elbow, and there are also records of polyarticular form in children8,9.

According to the staging, they are classified as benign fibrohistocystic tumors, according to the World Health Organization Classification System for Bone and Soft Tissue Tumors[6]. They are subdivided according to their location in soft or intra-articular tissues; and as for the growth pattern, in nodular or diffuse2.

During the screening of the pathology due to the presence of the lesion, there may be joint blockage, limited range of motion, as well as strokes or hemarthrosis [8,9,10]. Nuclear magnetic resonance imaging (NMR) is considered the screening test of choice in these cases, as it most significantly demonstrates a soft tissue mass, presenting light signs on T1-weighted images due to the presence of fat and dark signs due to hemosiderin deposit. As in T2-weighted sequences, the light signs are due to the accumulation of fluid and the dark signs are due to the same deposit of hemosiderin [9].

Histologically, GCTT present hyperplasia of synovial cells, multinucleated giant cells, macrophages, fibroblasts, foam cells, and intra- and extracellular deposits with variable amounts of lipids and hemosiderin[7].

The treatment of these tumors is surgical, and can be open or arthroscopic. Conservative therapeutic approaches are not considered effective, because although the disease may remain stable, most patients seek surgical treatment due to clinical complaints and the presence of limitations. In cases of recurrence or dissemination of these lesions, radioactive treatment may be associated, but this approach may cause joint degradation, which may lead to total knee arthroplasty in the future[11].

The objective of this study is to present a case of a patient with TTCG of the knee without bone involvement.

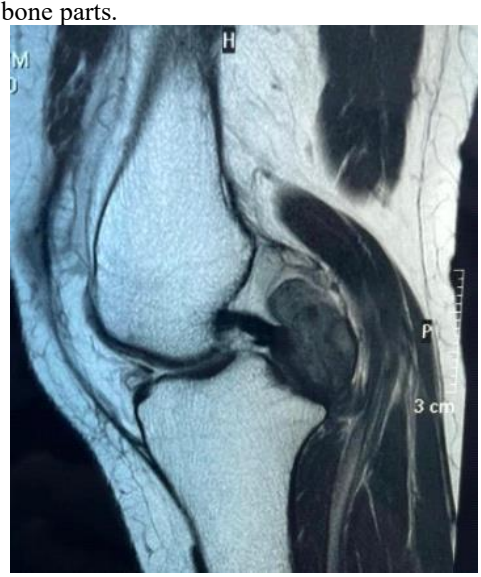
2 CASE REPORT

Patient M.B.C.P., female, 50 years old, active (amateur running), with no previous diseases, with report of moderate, progressive joint pain in the right knee starting about 4 months ago, with no associated traumatic history.

On physical examination, the patient reported pain on posterior palpation and the presence of palpable masses was remarkable. Ligament instability tests were negative and meniscal stress maneuvers were positive for the posteromedial compartment. There was an inability to flex completely and, if forced, it caused pain in the posterior region.

On the radiographs, no bone alterations were observed. MRI was requested due to the presence of a palpable mass (Figure 1).

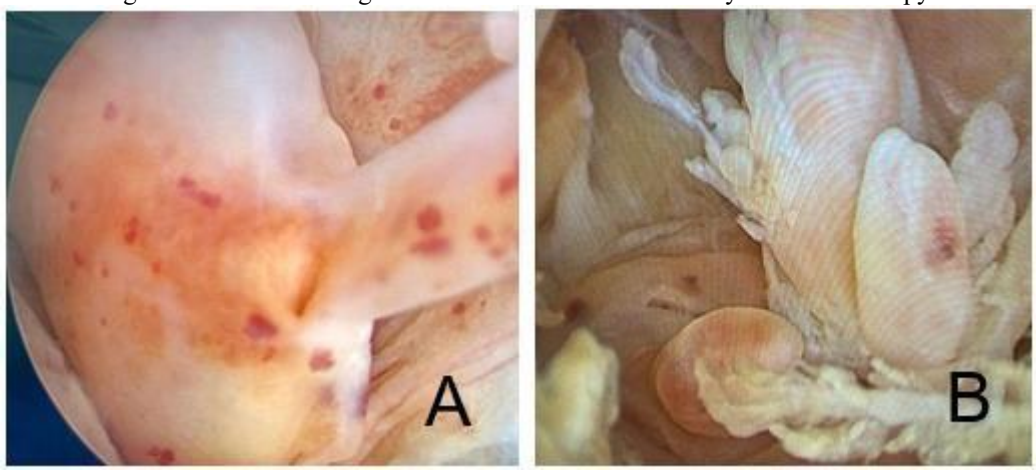
Figure 1. Sagittal T1-weighted MRI showed a tumor in the posterior region of the knee near the insertion of the posterior cruciate ligament without adhesion of bone parts.



Source: Authors

Due to the location and less aggression to the soft tissues, it was decided to perform primary resection in an arthroscopic video approach for better visualization of the lesion and collection of material (Figures 2A and 2B).

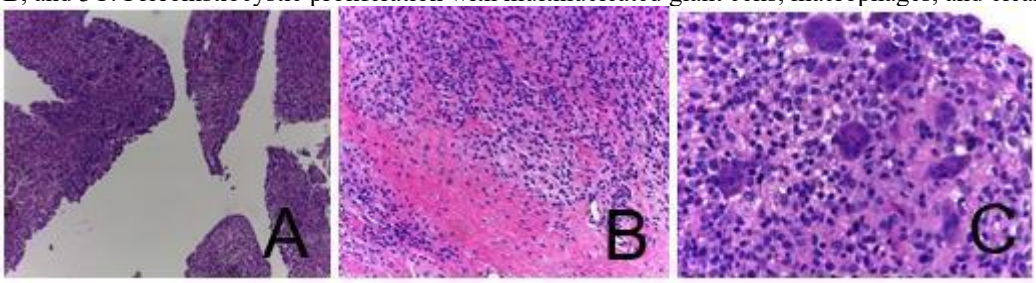
Figure 2 A and 2 B. Images of the tumor lesion observed by videoarthroscopy.



Source: Authors

Histopathological analysis revealed papillomatous fragments, with enlarged fibrous fragments and stromal collagenization forming large nodular structures. As well as the extensive presence of fibrohistiocystic proliferation with multinucleated giant cells, macrophages, and clear cytoplasm, confirming the suspicion of GCTT (Figures 3 A, 3 B, and 3C).

Figure 3A, 3B, and 3C: Fibrohistiocystic proliferation with multinucleated giant cells, macrophages, and clear cytoplasm.



Source: Authors

After the first intervention, the patient presented fewer complaints and greater ranges of motion of the knee.

In view of the results of the histopathological evaluation, we opted for a second surgical approach to involve the margins of the lesion using a posterior portal in arthroscopic surgery with adequate excision of tumor parts with free margins, reducing the chances of tumor recurrence.

After the second surgical procedure, the patient maintained improvement in the clinical and functional condition and range of motion with full knee amplitude.

The patient agreed to surgical consent to the use of her data for scientific/educational purposes.

3 DISCUSSION

Synovial giant cell tumor is a benign, usually monoarticular neoplasm that most commonly affects young adults in the third and fourth decades of life[3]. Its incidence rate is approximately 1 in every 8 million people per year1. The clinical manifestations resulting from this type of tumor are pain, effusion, and limitation of the range of motion. Localized diagnosis is difficult to perform because the symptoms can simulate a meniscal injury.[1; 3]

Among the etiologies are the benign neoplastic process and reactional lesions after repeated trauma and hemarthrosis. Synovial tumors in the presentation of villonodular synovitis are found in the diffuse form involving the synovial lining entirely; and in the localized form commonly present at the meniscocapsular junction.[7]

As for complementary exams, radiographs show signs of swelling and expansion of the suprapatellar synovial pouch when it is diffuse. In cases where it presents locally, the radiographic alterations are nonspecific. On the other hand, MRI is very effective for diagnosing this type of lesion because it reveals the presence of a heterogeneous mass with low signal intensity on T1- and T2-weighted images.[3]

The recommended treatment for TTCG is arthroscopic resection, however, open synovectomy is also a treatment option with the advantage of performing a marginal excision with better visualization of the borders. Regarding tumor recurrence, both techniques have similar rates, but arthroscopy presents a faster postoperative rehabilitation.[5]

In the present case report, after the diagnosis was suspected by MRI and confirmed by histopathological examination, arthroscopy was chosen to remove it. When the lesion is diffuse, extra-articular, many surgeons prefer to perform open removal; On the other hand, when the lesion is focal nodular, the arthroscopic option is considered more feasible[5; 9].

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