folia medica

Folia Medica 65(2):301-304
DOI: 10.3897/folmed.65.e68256

Case Report

Giant Cell Tumor of the Patellar Tendon Sheath in Childhood: Case Report

Konstantinos Skarentzos[1], Dimitra Panteli[1], Reichan Molla Moustafa[2], Stylianos Tottas[2], Ioannis E. Kougioumtzis[2], Georgios I. Drosos[2]

[1] *Department of Medicine, Democritus University of Thrace, Alexandroupolis, Greece*

[2] *Department of Orthopaedic and Trauma Surgery, Democritus University of Thrace, University General Hospital of Alexandroupolis, Alexandroupolis, Greece*

Corresponding author: Konstantinos Skarentzos, Department of Medicine, Democritus University of Thrace, Alexandroupolis, Greece; Email: k.skarentzos@gmail.com

Received: 4 May 2021 ♦ **Accepted:** 7 Oct 2022 ♦ **Published:** 30 Apr 2023

Citation: Skarentzos K, Panteli D, Moustafa RM, Tottas S, Kougioumtzis IE, Drosos GI. Giant cell tumor of the patellar tendon sheath in childhood: case report. Folia Med (Plovdiv) 2023;65(2):301-304. doi: 10.3897/folmed.65.e68256.

Abstract

The aim of this study was to report a rare case of a giant cell tumor of the patellar tendon sheath. This indicates the diagnostic procedures and treatment options for giant cell tumors of the patellar tendon. This study reported a case of a 13-year-old male patient with a giant cell tumor of the tendon sheath. In our case, open arthrotomy was performed with complete surgical excision of the lesion. Histopathological examination revealed a giant cell tumor. At the last follow-up, 2 years after surgery, no complications were reported. The giant cell tumor of the patellar tendon sheath is an uncommon benign tumor. It mimics common knee symptoms. A differential diagnosis is definitely a challenge. Available operation approaches have demonstrated similar results, which lead to symptom relief and a low recurrence rate.

Keywords

arthroscopy, child, open arthrotomy

INTRODUCTION

The WHO classified two types of giant cell lesions originating from the tendon and synovium. Giant cell tumors of the patellar tendon sheath (GCT-TS) can be classified as localized (L-) or diffuse (D-) type. L-GCT-TS initially occurs in the tendon sheaths of the hand and foot and is characterized by a nodular mass. In comparison, D-GCT-TS occurs in large joints with increased growth and recurrence rates. It is common for the knee joint to invade the outer part of the joint capsule. The prevalence of GCTs is 1/50,000 per population. Females tend to be affected 1.6 times more than males. Tissues around the knee were affected in only 2 of 71 patients in the study by Monaghan et al.[1]

The exact etiology of GCTTS remains unknown. Clinical characteristics are proportional to the location; however, differential diagnosis remains challenging. The predominant symptom is painless soft tissue masses, accompanied by discomfort, swelling, and restriction of the range of motion.[2]

The aim of this study was to report a rare case of GCT-TS of the patellar tendon. This indicates the diagnostic procedures and treatment options for GCT-TS of the patellar tendon.

CASE REPORT

A 13-year-old boy presented to our hospital complaining of chronic, continuous, worsening pain in the anterior surface of the right knee for 2 years. There was no history of trauma during the study period. On clinical evaluation, no knee

instability was observed, and all the meniscal evaluation tests were negative. A hard-textured, immobile, palpable mass was found on the inner side of the patellar tendon. Full flexion was limited by 10 degrees compared to the left knee. Radiographic examination revealed no abnormalities. Magnetic resonance imaging (MRI) revealed an extra-articular formation 40×20 mm on the inner half of the patellar tendon, which had a high-intensity signal in T2 sequences ***(Fig. 1)****. The formation was initially considered a hemorrhagic collection. Open arthrotomy was performed with complete surgical excision of the lesion* ***(Fig. 2)****. The histopathological examination revealed a giant cell tumor. The tumor was slightly brownish in color, capsulated, 50×33×25 mm in size, and rubbery in consistency. Postoperative assessment revealed no complications or symptom reappearance. The last follow-up was 2 years after surgery.*

DISCUSSION

The patellar tendon is considered a rare location for manifestation of GCTTS. This condition is mostly localized in the hands (93%) and rarely around the knee (2.82%). The mean age at presentation is 46.3 years.[1] It seems that the juvenile incidence of GCT-TS around the knee is low. This makes our case even more uncommon. However, the exact etiology remains unclear. However, there are some theories that include several factors that might contribute to this rare condition, including inflammation, neoplasia, trauma, toxic substances, allergies, and genetic factors.[3]

The most predominant symptom is a painless soft-tissue mass, accompanied by pain, swelling, and ROM limitation.[2] The clinical manifestations in our patient were quite similar. Soft tissue masses may be detected by pal-

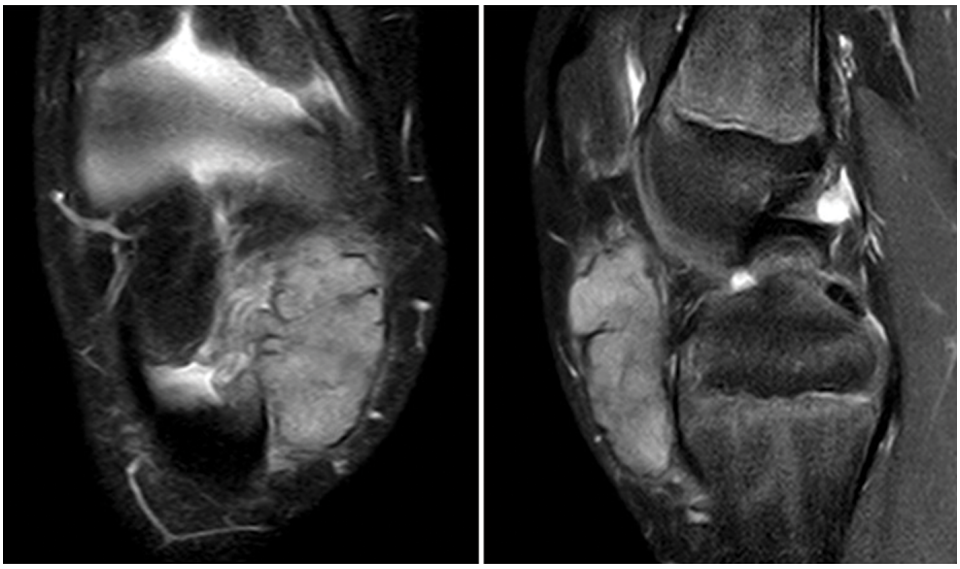

Figure 1. T-2 weighted MR1, coronal and sagittal planes, depicting the giant cell tumor of the patellar tendon sheath.

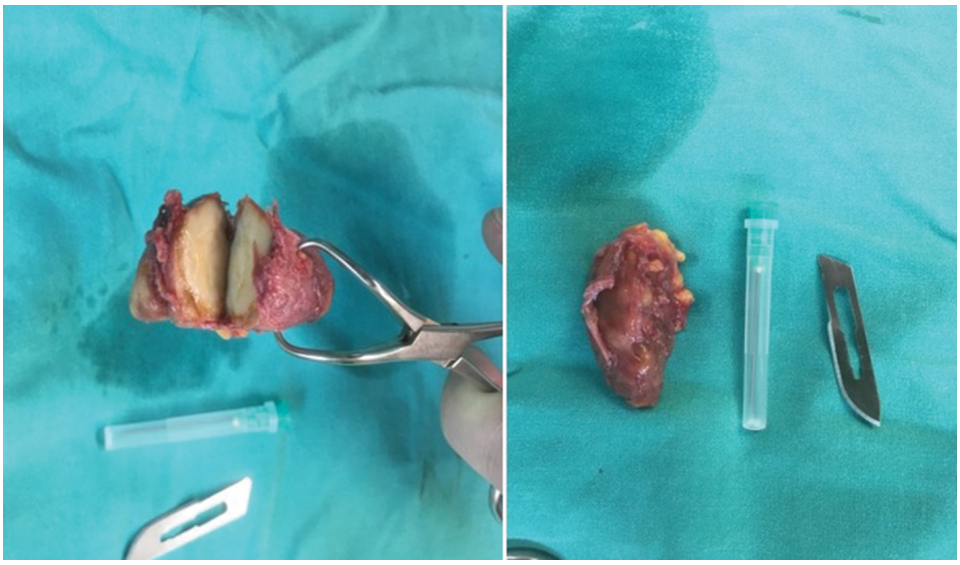

Figure 2. The excised lesion of the giant cell tumor.

pation or imaging techniques. The differential diagnosis includes intra-articular and extra-articular lesions, including PVNS, synovial cyst, and synovial sarcoma.[4] The most important imaging examination is magnetic resonance imaging (MRI). GCT-TS is characterized by a weak or intermediate signal on the T1 and T2 sequences. Synovial cysts show high T2 signals, but other pathologies, including xanthoma and Morton neuroma, usually show intermediate T2 signals. In these cases, the diagnosis is guided by the location, symptomatology, and clinical findings. Ultrasound can be indicative of a hypervascularized mass of variable aspect but with a suggestive location, which optimally guides synovial biopsy.[5]

Surgical treatment involves an assorted approach. Abdullah et al. treated a patient with arthrotomy.[3] In contrast, Chechik et al. treated patients with arthroscopy with similar results.[4] In all cases, the examination was unremarkable at the last follow-up. No recurrence was observed.

Histopathological examination confirmed the diagnosis after tumor excision. Typically, the tumor is soft, slightly brownish, or reddish-tan. Common findings include yellow and white areas due to xanthomatous changes and fibrous tissue. Microscopical elements are addressed into distinction of forms including the presence of foam cells, multinucleated giant cells, stromal cells with or without hemosiderin deposits and collagen.[6] GCT is associated with mutations in H3F3A (G34W or G34L).[7]

Open arthrotomy and arthroscopic recession are considered acceptable treatment options. According to the cases, both interventions showed similar results. Moreover, they showed no complications, pain relief, or ROM recovery. Minimally invasive approaches, such as arthroscopy, allow for the effective examination of all compartments of the knee with compelling excision of the lesion. The recurrence rate is independent of mitotic activity and incomplete resection. [2] As a result, radiotherapy may play a decisive role in these cases.[6] GCT-TS, as a benign lesion, showed no recurrence in our case. Ushijima et al. reported local postoperative recurrence rates of 10%-20% within 24 months, particularly in non-removable satellite nodules.[8] Thus, postoperative follow-up can be considered as devoid of lesions.

CONCLUSIONS

GCT-TS is an uncommon benign tumor. It mimics common knee symptoms. A differential diagnosis is definitely a challenge. It is crucial to indicate patient history, meticulous clinical examination, and cutting-edge imaging techniques; however, the definitive diagnosis is confirmed by histopathological examination. Available operation approaches have demonstrated similar results, which lead to symptom relief and a low recurrence rate.

Source of funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors. Written consent was obtained from all the patients.

Declaration of Competing Interest

All authors have declared no conflict of interest.

REFERENCES

1. Monaghan H, Salter DM, Al-Nafussi A. Giant cell tumour of tendon sheath (localised nodular tenosynovitis): clinicopathological features of 71 cases. J Clin Pathol 2001; 54(5):404–7.
2. Kim DE, Kim JM, Lee BS, et al. Distinct extra-articular invasion patterns of diffuse pigmented villonodular synovitis/tenosynovial giant cell tumor in the knee joints. Knee Surg Sports Traumatol Arthrosc 2018; 26(11):3508–14.
3. Abdullah A, Abdullah S, Haflah NH, et al. Giant cell tumor of the tendon sheath in the knee of an 11-year-old girl. J Chin Med Assoc 2010; 73(1):47–51.
4. Chechik O, Amar E, Khashan M, et al. Giant cell tumors in the patellar tendon area. J Knee Surg 2010; 23(2):115–9.
5. Gouin F, Noailles T. Localized and diffuse forms of tenosynovial giant cell tumor (formerly giant cell tumor of the tendon sheath and pigmented villonodular synovitis). Orthop Traumatol Surg Res 2017; 103(1S):S91–S97.
6. Kotwal PP, Gupta V, Malhotra R. Giant-cell tumour of the tendon sheath. Is radiotherapy indicated to prevent recurrence after surgery? J Bone Joint Surg Br 2000; 82(4):571–3.
7. Rehkamper J, Steinestel K, Jeiler B, et al. Diagnostic tools in the differential diagnosis of giant cell-rich lesions of bone at biopsy. Oncotarget 2018; 9(53):30106–14.
8. Ushijima M, Hashimoto H, Tsuneyoshi M, et al. Giant cell tumor of the tendon sheath (nodular tenosynovitis). A study of 207 cases to compare the large joint group with the common digit group. Cancer 1986; 57(4):875–84.

Гигантоклеточная опухоль влагалища сухожилия надколенника в детском возрасте: клинический случай

Константинос Скаренцос[1], Димитра Пантели[1], Райхан Молла Мустафа[2], Стилианос Тотас[2], йоанис Е. Кугиомцис[2], Георгиос И. Дросос[2]

[1] *Медицинский факультет, Университет Фракии имени Демокрита, Александруполис, Греция.*

[2] *Отделение ортопедии и травматологии, Университет Фракии имени Демокрита, Университетская многопрофильная больница Александруполиса, Александруполис, Греция*

Адрес для корреспонденции: Константинос Скаренцос, Медицинский факультет, Университет Фракии имени Демокрита, Александруполис, Греция.; E-mail: k.skarentzos@gmail.com

Дата получения: 4 мая 2021 ♦ **Дата приемки:** 7 октября 2022 ♦ **Дата публикации:** 30 апреля 2023

Образец цитирования: Skarentzos K, Panteli D, Moustafa RM, Tottas S, Kougioumtzis IE, Drosos GI. Giant cell tumor of the patellar tendon sheath in childhood: case report. Folia Med (Plovdiv) 2023;65(2):301-304. doi: 10.3897/folmed.65.e68256.

Резюме

Целью данного исследования было сообщение о редком случае гигантоклеточной опухоли влагалища сухожилия надколенника. Это указывает на диагностические процедуры и возможности лечения гигантоклеточных опухолей сухожилия надколенника. В данном исследовании описан случай 13-летнего пациента с гигантоклеточной опухолью влагалища сухожилия. В нашем случае была выполнена открытая артротомия с полным хирургическим иссечением образования. При гистологическом исследовании обнаружена гигантоклеточная опухоль. При последнем контрольном осмотре через 2 года после операции осложнений не зарегистрировано. Гигантоклеточная опухоль влагалища сухожилия надколенника – редкая доброкачественная опухоль. Она имитирует наиболее часто встречающиеся симптомы коленного сустава. Дифференциальный диагноз, безусловно, представляет собой сложную задачу. Доступные оперативные подходы продемонстрировали аналогичные результаты, которые привели к облегчению симптомов и низкой частоте рецидивов.

Ключевые слова

артроскопия, ребёнок, открытая артротомия