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CASE REPORT

Giant Cell Tumours of the Tendon Sheath: Clinical Insights and Surgical Perspectives From Three Cases

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Abstract

Giant cell tumours of the tendon sheath (GCTTS) are benign soft tissue tumours that can exhibit locally aggressive behaviour, particularly in the hand and foot. Despite their slow growth, they may cause pain and functional limitations due to compression of adjacent structures. The aim of this study was to describe the clinical presentation, diagnostic process and surgical management of three cases of GCTTS and to assess postoperative outcomes with a focus on recurrence prevention. Three female patients aged 33, 47 and 62 years presented with progressively enlarging painful swellings in the hand or foot. Each patient underwent a full diagnostic work-up including radiography, ultrasound and magnetic resonance imaging (MRI). Complete surgical excision of the lesions was performed under regional anaesthesia. Histological analysis confirmed the diagnosis of GCTTS in all cases. Patients were followed clinically and radiologically for up to 12 months postoperatively. All patients recovered fully, with resolution of pain, restoration of joint mobility and no motor or sensory deficits. MRI follow-up at 6 and 12 months showed no evidence of tumour recurrence. Histology revealed classic features of GCTTS, including multinucleated giant cells, foamy histiocytes and hemosiderin deposits. No postoperative complications such as infection or hematoma were observed. Functional autonomy was maintained in all cases. GCTTS, while benign, requires meticulous surgical excision to prevent recurrence. Early diagnosis and complete resection result in excellent clinical and functional outcomes. Postoperative surveillance, particularly through MRI, is essential to detect any potential recurrence. Future strategies may include the use of adjuvant therapies in selected high-risk cases to further minimise recurrence risk.

Key words: Giant cell tumour of tendon sheath; Hand; Foot; Neoplasms; Surgical procedures, operative; Margin of excision; Treatment outcome; Postoperative care.

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Introduction

Giant cell tumours of the tendon sheath (GCTTS) are the second most common benign soft tissue tumours of the hand, following synovial cysts. They can also affect other locations, notably the foot. These tumours are characterised by a proliferation of mononuclear cells with multinucleated giant cells, foamy histiocytes and hemosiderin deposits.[1] GCTTS account for approximately 2–5 %

of soft tissue tumours of the hand and are more frequently observed in women between the third and fifth decades of life.[2] Clinically, GCTTS typically present as firm, well-defined, slow-growing masses, adherent to deep planes and sometimes painful.[2] Pain is often due to compression of adjacent structures, including nerves and blood vessels. Symptoms may include paraesthesia and restricted digital movements.

Diagnosis is based on imaging, particularly magnetic resonance imaging (MRI), which is the gold standard for characterising the nature and extent of the tumour. MRI typically shows a well-defined lesion, hypointense on T1 and heterogeneous on T2, with enhancement after gadolinium injection.[3] However, definitive diagnosis relies exclusively on histological analysis.

Management involves complete surgical excision to reduce recurrence, which remains frequent, with rates ranging from 10 % to 45 %.[2] Incomplete excision, due to microscopic extensions often undetectable on imaging, is the primary cause of recurrence. In certain cases, adjuvant radiotherapy may be considered to mitigate this risk.[4]

Case history

This study is based on the analysis of three cases of female patients presenting with slow-growing, painful swellings located in the hands and feet. The objective was to characterise these lesions through clinical, radiological and histopathological approaches and to evaluate the effectiveness of surgical excision as the primary treatment.

Case 1

Patient was 33-year-old female. Symptoms were painful swelling of the right index finger evolving over two years. X-ray revealed cortical erosion; MRI suggested a giant cell tumour (Figure 1). Complete surgical excision with histological confirmation was performed (Figure 2).

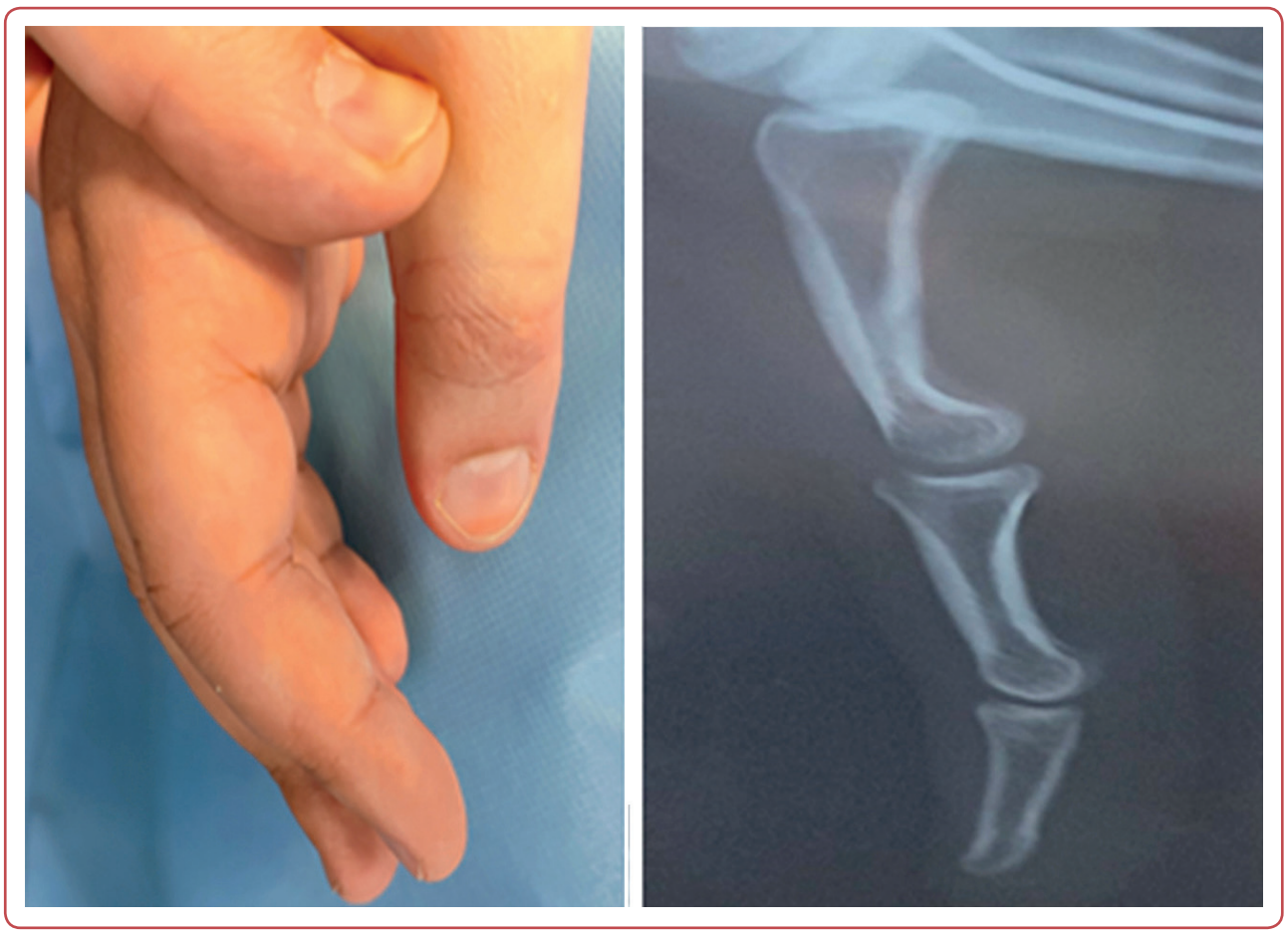

Figure 1: Preoperative clinical and radiological aspect

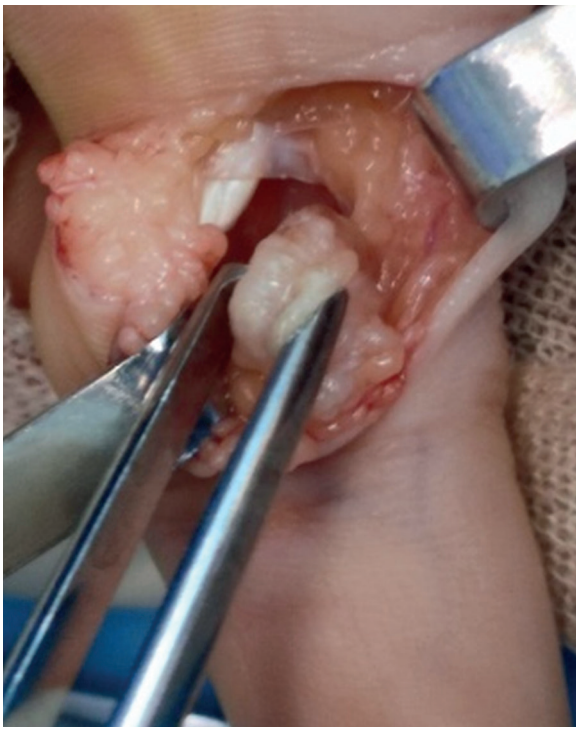

Figure 2: *Intraoperative exploration of the tumour*

Case 2

Patient was 62-year-old female, presented with palmar swelling (3 cm) evolving over three years. MRI revealed a well-circumscribed mass, heterogeneous on T2-weighted sequences. Complete surgical excision with histological confirmation was performed (Figure 3).

Case 3

Patient was 47-year-old female, presented with dorsal swelling of the right forefoot (3 cm) evolving over an unspecified period. Ultrasound revealed a well-defined nodular lesion (Figure 4). Complete surgical excision with histological confirmation was performed.

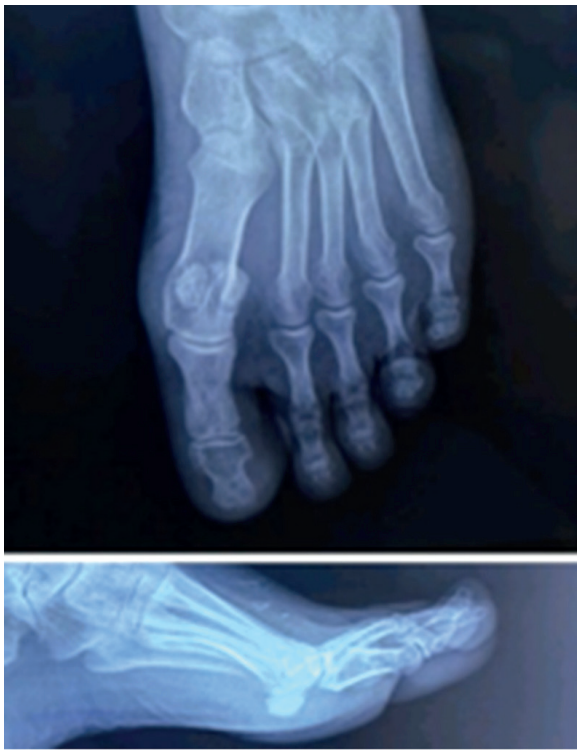

Figure 4: *Preoperative clinical and radiological aspect*

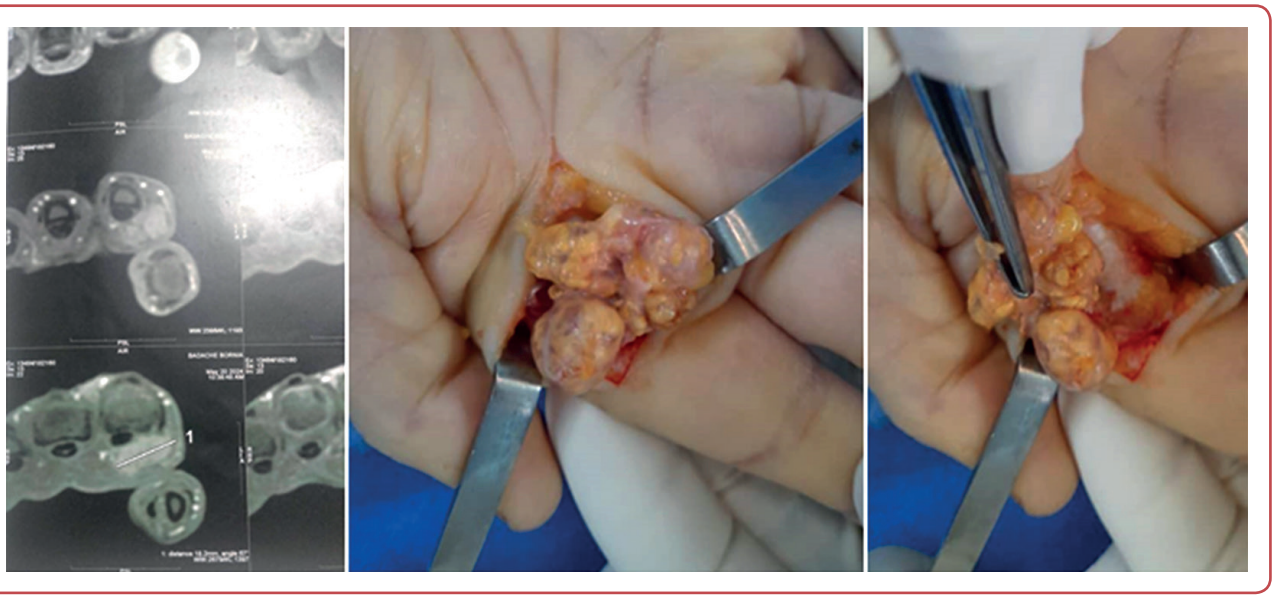

Figure 3: *Preoperative clinical and radiological aspect and intraoperative exploration of the tumour*

All patients underwent a comprehensive imaging assessment, including:

- Standard radiographs: Used to detect potential cortical bone erosions associated with the lesion.
- Ultrasound: Assessed the tumour 's internal structure and its relationship with adjacent anatomical structures.
- MRI: Performed in all cases to determine tumour extension, vascularisation and specific tissue characteristics of GCTTS.

Surgical excision was performed under regional anaesthesia in a sterile operating room. An incision was tailored to the tumour's location to allow complete resection while preserving adjacent structures. Special care was taken to remove all tumour extensions to minimise the risk of recurrence.

Operative specimens were analysed in pathology to confirm the diagnosis of GCTTS. The key criteria assessed included: cellular proliferation, presence of multinucleated giant cells, foamy histiocytes, hemosiderin deposits.

Clinical and radiological follow-up was conducted at 1, 3, 6 and 12 months postoperatively to evaluate functional recovery and detect potential recurrences. Patients were assessed for persistent pain, functional limitations and the occurrence of local complications.

All three patients underwent complete surgical excision, with close follow-up to assess functional recovery and potential recurrence (Figure 5). Complete resolution of preoperative pain in all cases was found. No postoperative motor or sensory deficits was found. Full and functional joint

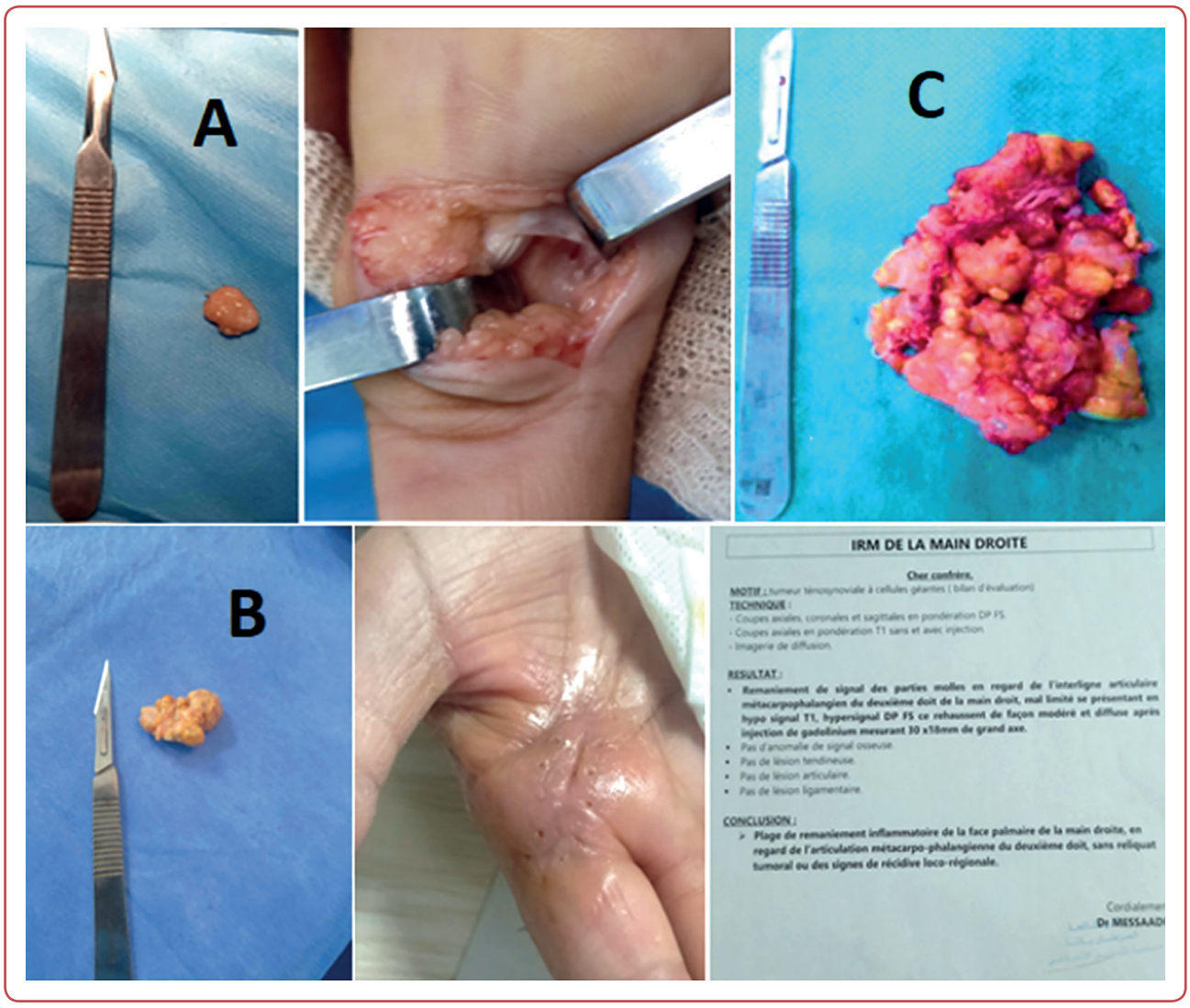

Figure 5: Postoperatively: A. Case 1, B. Case 2, C. Case 3

mobility was restored within 3 months. No limitations in daily activities at 12 months postoperatively was found.

Follow-up MRI at 6 and 12 months showed no signs of tumour recurrence. Histological confirmation of multinucleated giant cells associated with foamy histiocytes and hemosiderin deposits was done. Absence of atypical mitoses or vascular invasion, confirming the benign nature of the lesions.

Postoperative complications were not found: no cases of postoperative infection or hematoma, no postoperative neuropathy. Complete and satisfactory wound healing in all cases was found.

Discussion

GCTTS are benign proliferative tumours but can be locally aggressive, with a recurrence risk ranging from 10 % to 45 % according to the literature.[5] Their differential diagnosis includes foreign body granulomas, fibrous tenosynovitis and lipomas. Histologically, they present multinucleated giant cells associated with histiocytes and foamy macrophages.[6]

Surgical excision remains the gold-standard treatment. However, due to microscopic infiltrations not visible on imaging, the risk of recurrence remains high.[7] Adjuvant radiotherapy has been proposed to reduce this risk in recurrent or incompletely resected cases.[8]

Presented findings confirm that the prognosis of GCTTS is generally favourable when early diagnosis is made and complete surgical excision is performed. The key points to highlight are: excellent tolerance to surgical excision, with rapid functional recovery; absence of tumour recurrence at 12 months, suggesting the effectiveness of meticulous surgery; classic histopathological morphology consistent with data in the literature.

Surgical excision remains the reference treatment for GCTTS.[9] However, several precautions should be taken: precise identification of tumour margins to limit recurrence risk; multidisciplinary management, including radiologists and pathologists, to ensure an optimal diagnosis; long-term surveillance is recommended due to the residual risk of recurrence.

Future perspectives

Advancements in surgical techniques and adjuvant treatments (targeted radiotherapy) could further reduce recurrence risk. Larger-scale studies, including extended patient follow-up, are needed to optimise therapeutic strategies and refine criteria for adjuvant treatment. A better understanding of recurrence mechanisms could also lead to the development of more effective preventive approaches.

Conclusion

GCTTS are benign yet locally aggressive lesions that require rigorous management to minimise the risk of recurrence. Complete surgical excision remains the treatment of choice, ensuring optimal functional recovery and a reduced recurrence rate. However, due to the possibility of microscopic infiltrations, prolonged postoperative surveillance is essential to detect early recurrences. MRI remains the preferred tool for monitoring patients after surgery.

Advancements in surgical techniques and the exploration of adjuvant treatments, such as targeted radiotherapy, could further refine therapeutic protocols. Large-scale prospective studies are needed to identify predictive risk factors for recurrence and optimise management strategies.

Finally, increased awareness among clinicians and surgeons regarding this pathology is crucial for early diagnosis and appropriate treatment. Continued research should focus on exploring new diagnostic and therapeutic approaches to provide optimal patient care and further reduce recurrence rates.

Ethics

Our institution does not require ethics approval for reporting individual cases or case series. A written informed consent for anonymised patients' information to be published in this article was obtained from the patients.

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Conflict of interest

The authors declare that there is no conflict of interest.

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Data access

The data that support the findings of this study are available from the corresponding author upon reasonable individual request.

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References

1. Murphey MD, Rhee JH, Lewis RB, Fanburg-Smith JC, Flemming DJ, Walker EA. Pigmented villonodular synovitis: Radiologic-pathologic correlation. Radiographics. 2008;28(5):1493-518. doi: 10.1148/rg.285085134.
2. Suresh SS, Zaki H. Giant cell tumor of tendon sheath: case series and review of literature. J Hand Microsurg. 2010 Dec;2(2):67-71. doi: 10.1007/s12593-010-0020-9.
3. Mastboom MJL, Verspoor FGM, Verschoor AJ, Uittenbogaard D, Nemeth B, Mastboom WJB, et al; TGCT study group. Higher incidence rates than previously known in tenosynovial giant cell tumors. Acta Orthop. 2017 Dec;88(6):688-94. doi: 10.1080/17453674.2017.1361126.
4. Shi W, Indelicato DJ, Reith J, Smith KB, Morris CG, Scarborough MT, et al. Radiotherapy in the management of giant cell tumor of bone. Am J Clin Oncol. 2013 Oct;36(5):505-8. doi: 10.1097/COC.0b013e3182568fb6.
5. Cavaliere A, Sidoni A, Bucciarelli E. Giant cell tumor of tendon sheath: immunohistochemical study of 20 cases. Tumori. 1997 Sep-Oct;83(5):841-6. doi: 10.1177/030089169708300514.
6. Briët JP, Becker SJ, Oosterhoff TCh, Ring D. Giant cell tumor of tendon sheath. Arch Bone Jt Surg. 2015 Jan;3(1):19-21. Epub 2015 Jan 15. PMID: 25692164.
7. Al-Qattan MM. Giant cell tumours of tendon sheath: classification and recurrence rate. J Hand Surg Br. 2001 Feb;26(1):72-5. doi: 10.1054/jhsb.2000.0522.
8. Middleton WD, Patel V, Teefey SA, Boyer MI. Giant cell tumors of the tendon sheath: analysis of sonographic findings. AJR Am J Roentgenol. 2004 Aug;183(2):337-9. doi: 10.2214/ajr.183.2.1830337.
9. Brahmi M, Vinceneux A, Cassier PA. Current Systemic Treatment Options for Tenosynovial Giant Cell Tumor/Pigmented Villonodular Synovitis: Targeting the CSF1/CSF1R Axis. Curr Treat Options Oncol. 2016 Feb;17(2):10. doi: 10.1007/s11864-015-0385-x.