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Giant cell tumor of tendon sheath of the great toe: A rare case report and surgical management

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Abstract
Giant cell tumor of the tendon sheath (GCTTS) is a benign proliferative lesion arising from the synovium of tendon sheaths. It predominantly affects the hand and wrist, while involvement of the foot, and particularly the great toe, is uncommon; this unusual location and its nonspecific presentation can delay diagnosis or lead to confusion with other soft-tissue lesions. We report the case of a 25-year-old male who presented with pain and progressively increasing swelling over the left great toe of 1.5 years' duration, with discomfort on walking. Examination revealed a localized, firm soft-tissue swelling with preserved distal neurovascular status, and plain radiographs showed a localized soft-tissue mass without cortical erosion or osseous involvement. Complete excision was performed under spinal anaesthesia; a multilobulated yellow-brown mass was identified in relation to the tendon sheath and was meticulously dissected and excised in toto, preserving the adjacent tendon and neurovascular structures. Histopathology confirmed GCTTS, and the postoperative course was uneventful, with intact distal perfusion, sensation, and preserved toe and ankle movement. GCTTS should be considered in the differential diagnosis of chronic, localized great toe swelling; complete surgical excision provides excellent functional outcomes, though long-term follow-up is advisable given the potential for local recurrence.

Keywords: Giant cell tumor of tendon sheath, great toe, foot, soft tissue tumor, tendon sheath, surgical excision, case report

Introduction
Giant cell tumor of the tendon sheath (GCTTS) is a benign, slow-growing proliferative lesion arising from the synovium of tendon sheaths, bursae, and joints [1]. First described by Chassaignac in 1852 and later characterized by Jaffe and colleagues in 1949, it is also known by several synonyms, including nodular tenosynovitis, fibrous xanthoma of the synovium, and benign synovioma [2, 3]. GCTTS is the second most common soft-tissue tumor of the hand after the ganglion cyst, and it predominantly affects the small joints of the hand and wrist [3, 4]. Involvement of the foot is comparatively uncommon, accounting for only a small proportion of reported cases, and lesions confined to the great toe are a particularly rare presentation [5, 6].
Because of its unusual location and typically painless or nonspecific course, GCTTS of the great toe may be mistaken for other soft-tissue swellings of the foot, including ganglion cysts, epidermoid cysts, gouty tophi, or, less commonly, soft-tissue sarcomas, resulting in delayed diagnosis. [7] Plain radiographs are often unremarkable or show only soft-tissue fullness, and definitive diagnosis rests on histopathological examination of the excised specimen [1, 8]. We report a case of GCTTS involving the left great toe in a young adult male, managed by complete surgical excision, and discuss the diagnostic and management considerations relevant to this rare presentation.

Case Report
A 25-year-old male presented with pain and progressively increasing swelling over the plantar aspect of the left great toe of 1.5 years' duration, associated with discomfort during walking. There was no history of trauma, fever, or similar swellings elsewhere. On clinical examination, a localized, firm, non-tender swelling measuring approximately 1 × 0.7 cm was noted over the plantar aspect of the left great toe. The swelling was non-mobile, with no overlying skin changes, and distal neurovascular status was preserved (Figure 1).



Fig 1: Clinical photograph showing a localized firm swelling over the plantar aspect of the left great toe.

Plain radiographs of the foot (anteroposterior and oblique views) showed a localized soft-tissue mass without significant cortical erosion or osseous involvement, favoring a benign extra-osseous soft-tissue lesion (Figure 2). A lateral radiograph of the great toe similarly showed no evidence of bony destruction (Figure 3).



Fig 2: Anteroposterior and oblique radiographs of the left foot showing a localized soft-tissue mass without significant cortical erosion or osseous involvement.



Fig 3: Lateral radiograph of the left great toe showing preserved bony architecture with no evidence of destruction.

Fine-needle aspiration cytology (FNAC) of the swelling was performed prior to surgery. The aspirate was blood-mixed, and cytosmears were hypercellular, showing numerous osteoclast-type multinucleated giant cells and cystic macrophages in a background of mononuclear stromal cells. The cytological impression was giant cell tumor of tendon sheath of the left great toe, and excision biopsy was advised for definitive confirmation.

Based on the clinical, radiographic, and cytological findings, complete surgical excision was planned. The procedure was performed under spinal anaesthesia. Intraoperatively, a multilobulated, yellow-brown mass was identified in close relation to the tendon sheath of the great toe (Figure 4). The lesion was meticulously dissected and excised in toto, with careful preservation of the adjacent tendon and neurovascular structures.

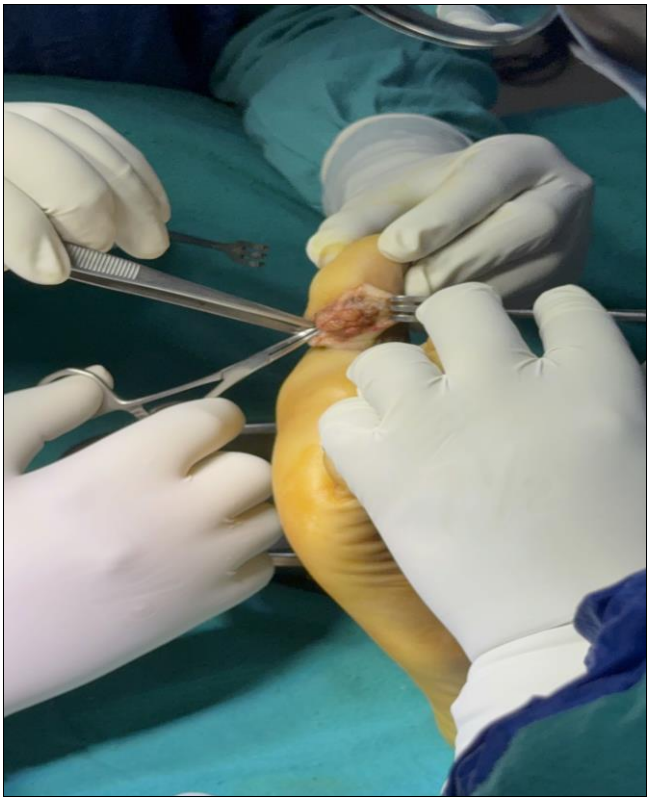


Fig 4: Intraoperative photograph showing the multilobulated mass exposed and grasped with tissue forceps prior to excision in toto from the tendon sheath.

On gross examination, the excised specimen was a single grey-white soft-tissue mass measuring 2.8 × 1 × 0.4 cm. Microscopic examination showed mononuclear spindle-to-polygonal cells admixed with numerous osteoclast-like multinucleated giant cells, scattered foam cells, and haemosiderin-laden macrophages, confirming the diagnosis of giant cell tumor of tendon sheath; an ancillary immunohistochemistry panel (CD68, RANKL, SATB2, TRAP) was advised for further characterization. The immediate postoperative period was uneventful. Distal perfusion and sensation were intact, and active toe and ankle movements were preserved at discharge.

Discussion

GCTTS is a benign but locally aggressive lesion arising from the synovial lining of tendon sheaths.[1] While it is well recognized in the hand, involvement of the foot accounts for only approximately 3-5% of reported cases, and great toe involvement in particular remains a rare, sporadically reported presentation [4, 5, 6]. Most reported foot cases occur in adults between the third and fifth decades, without a strong sex predilection, and typically present as a slow-growing, painless or mildly painful mass over months to years, closely mirroring the presentation in this patient [6, 9].

Plain radiography, as in this case, frequently shows only nonspecific soft-tissue fullness; cortical erosion or bony scalloping is seen in a minority of cases and, when present, may raise suspicion for a more locally aggressive process [1,

[5]. Magnetic resonance imaging, although not required for diagnosis in this case, is valuable where available for delineating tumor extent and its relationship to adjacent tendons and neurovascular structures, and for preoperative planning [6, 8]. Fine-needle aspiration cytology, as performed in this case, can support a preoperative diagnosis by demonstrating characteristic multinucleated giant cells and mononuclear stromal cells, though excision biopsy remains necessary for definitive confirmation. Ultimately, the diagnosis of GCTTS is established only on histopathological examination, which typically demonstrates a mixture of mononuclear synovial-type cells, multinucleated giant cells, foam cells, and haemosiderin-laden macrophages within a fibrous stroma [1, 3].

Complete marginal excision, with meticulous dissection to preserve adjacent tendon and neurovascular structures, remains the treatment of choice and was the approach used in this case [4, 7]. Reported local recurrence rates after excision range widely, from approximately 10% to over 20% in some series, and are generally attributed to incomplete excision at the initial surgery [3, 9]. Long-term clinical follow-up is therefore advisable even after apparently complete excision. Functional outcomes following complete excision are generally excellent, as reflected by the preserved toe and ankle movement and intact neurovascular status observed in this patient postoperatively [6, 7].

Conclusion

GCTTS should be considered in the differential diagnosis of a chronic, localized swelling of the great toe, even though this is an uncommon site of involvement. Accurate clinical and radiographic assessment, followed by complete surgical excision with careful preservation of adjacent tendon and neurovascular structures, can provide excellent functional outcomes. Given the recognized potential for local recurrence, long-term follow-up is advisable in all cases.

Conflict of Interest

None declared.

Source of Funding

None.

Informed Consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

References

1. Fadel ME, Schulz A, Linker R, Jerosch J. Giant cell tumour of the tendon sheath in the foot. Foot and Ankle Surgery,2005:11(4):225–228.
2. Jadhav S, Awasthi A, Deshpande S, Jadawala V, Salwan A. Giant cell tumor of extensor tendon sheath in ring finger, a case report. Cureus,2022:14(9):e29605.
3. Chen Y, Yu XC, Xu SF, Wang B. Giant cell tumor of the tendon sheath originating from the ankle capsule, a case report and literature review. Oncology Letters,2016:11(5):3461–3464.
4. Akahane T, Mori N, Yoshida K. Giant cell tumor of the tendon sheath extending around the patellar tendon and invading the knee joint and tibia, a case report. Oncology Letters,2014:8(6):2800–2802.
5. Asaad SK, Bapir R, Salh AM, Abdullah AM, Tahir SH, Mikael TM, *et al*. Giant cell tumor of the tendon sheath in a 5-year-old child, a case report. Annals of Medicine and Surgery,2021:68:102599.
6. Al Aswad MK, Das D, Najjar M, Toulaymat M. Giant cell tumor of the tendon sheath, a rare case of big toe involvement. Cureus,2025:17(4):e81601.
7. Inamdar A, Gattani RG, Shinde RK. A giant cell tumor of the tendon sheath of the foot, a rare presentation. Cureus,2024:16(6):e63276.
8. Stefanou N, Varitimidis S, Samaila EM, Koutis A, Karachalios T, Dailiana Z. Tenosynovial giant cell tumors in the hand and foot. Cureus,2025:17(9):e92785.
9. Chaurasia P. Giant cell tumor of tendon sheath of distal phalanx of thumb, a case report. Journal of Nepal Medical Association,2023:61(262):567–569.