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A Case Report of Giant Cell Tumor of Tendon Sheath

Dr. Addepalli Srinivasa Rao[1], Dr.C V Dasaraiah[2],Dr. Sameer Chaitanya Sahini[3]
[1]*M.S (ORTHO), M. Ch (ORTHO) Asst professor department of orthopaedics, Siddhartha medical college, Vijayawada* **,**
[2]*M.S (ORTHO),professor &HOD department of orthopaedics, Siddhartha medical college, Vijayawada,*
[3]*junior resident, Siddhartha medical college, Vijayawada.*

Abstract: *Giant cell tumor of tendon sheath (GCT-TS) is a slowly progressing benign tumor arising from synovial cells of tendon sheaths.They occur more in the upper limb than the lower limb.Giant cell tumour of the tendon sheath (GCT-TS) has been described as the most common tumour following ganglion cysts.We hereby, report two cases of GCT-TS, one over the right middle finger in a 23 year old male patient, other over the lateral aspect of right foot and ankle in a 48-year-old female.Radiographs shows soft tissue globular swelling .No evidence of soft tissue calcification is seen. Biopsy confirmed the diagnosis of giant cell tumor of tendon sheath.*

Keywords: *Giant cell tumor[1], tendon sheath, hand[1, 2], foot& ankle [2, 3]*

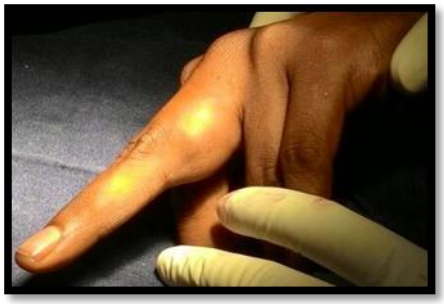
I. Introduction

Giant cell tumour of the tendon sheath (GCT-TS) is a benign, solitary, proliferative tumour that arises from the complex of the tendon sheath of small joints in the hands[1] and feet[3, 4]. GCT-TS occurs most commonly in the fourth to fifth decades, but can occur between 10 and 60 years [2]. The female to male ratio is 3:2 and there is no racial preponderance [2, 3]. GCT-TS has been described as the most common tumour of the hand after ganglion cysts[4, 5, 6]. In contrast it is much rarer in the foot, with only 3-10% of GCT-TS being described in the foot[3], and is reported to make up 0.8% of foot and ankle masses.[13]

There is debate as to whether the tumor is a true neoplasm or a pseudo- neoplastic inflammatory response to soft-tissue trauma [4]. This lesion arises from the synovium of the tendon sheath or synovial lining of joints or bursa and is characterized microscopically by synovial cells, histiocytes, multinucleated giant cells, inflammatory cells, macrophages, xanthoma cells, and collagen[1, 2]. Grossly, it appears as a rubbery, multinodular, well-encapsulated, greyish, tan brown, orange, or yellow mass; the colour depends on the proportion of foam cells and degree of hemosiderin deposition [2, 3]. It is most commonly found in the flexor aspect of hand and wrist and is rare in the foot and ankle. GCT-TS of the hand is a well-described entity in which there is a reported local rate of recurrence[10, 11] of up to 45% after excision. Adjuvant radiotherapy[10, 11] is recommended if there is a high risk of recurrence or when there has been incomplete excision of a histologically aggressive tumour with involvement of bone. Although it occurs much less frequently in the foot, this is the second most common anatomical site.

Case 1:

A male patient aged about 23 years, came with a history of painless nodular swelling on medial aspect of right middle finger since 2 years (fig1). Swelling was insidious onset, initially swelling small in size and progressively increase in size of 3×2×2 cm. No history of any trauma or prick injury. No history of any kind of immobilization and massage treatment. No history of constitutional symptoms and any other similar swellings in the body.



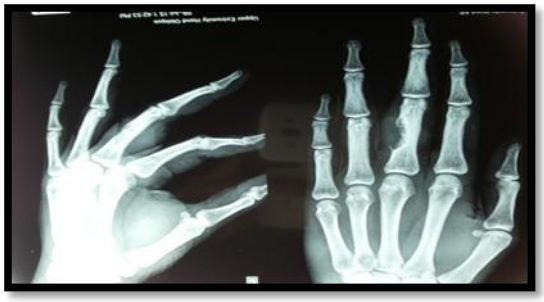


Fig1: Nodular swelling of the right middle finger **Fig2:** x-ray

On examination proper solitary swelling confined to volar aspect of proximal phalanx region, Globular in shape with overlying skin being normal. Swelling was non tender and no local rise of temperature, firm in consistency, nodular surface. It was non reducible, non-translucent, mobile in horizontal direction and fixed in vertical direction. PIP joint flexion range of 0˚ to 40˚degrees, DIP, MCP joint movements normal. There isno neurovascular deficit. Haematological investigations and lipid profile are within normal limits.

X-ray[5] (fig2) shows radiolucent nodular soft tissue shadow and bony erosion[14] of proximal phalanx on antero-medial aspect. Histopathological examination done with Fine Needle Aspiration Cytology (FNAC)[9] which reported features suggestive of giant cell tumor of tendon sheath.

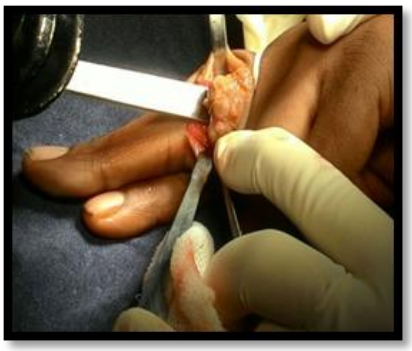


Fig3a: surgical exposure of GCT

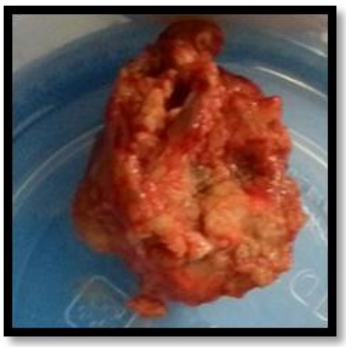


Fig 3b: gross specimen

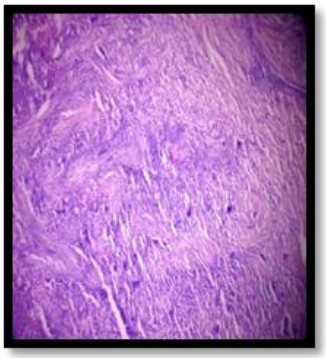


Fig 4: histopathology

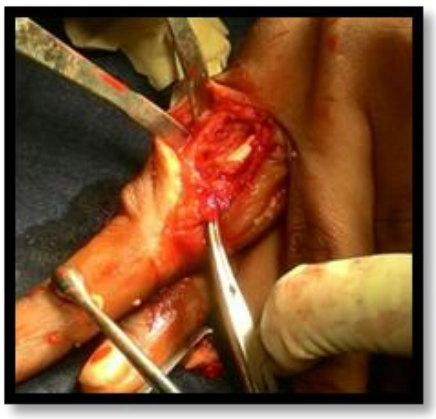


Fig5: After excision of GCT

Patient was operated under supraclavicular block and the entire tumor was excised through mid-medial incision between volar and dorsal aspect of finger. Biopsy confirmed it as GCTTS. The gross appearance is a tan brown colored (fig 3a&3b), lobulated mass arising from tendon sheath. Histopathological section [14](fig4) revealed round to oval with scanty cytoplasm and vesicular nuclei with plenty of multinucleated giant cells, xanthoma cells, focal areas of myxoid change, pigment deposition, necrosis are seen. Biopsy findings confirmed the diagnosis of giant cell tumor of tendon sheath. Patient was followed up to a period of twelve months; there were no signs of recurrence. Normal range of movements of MCP, PIP and DIP joints.

Case 2:

A 48-year-old lady presented with swelling over the lateral aspect of the foot& ankle which was painless in nature and gradually increasing in size over a period of 10 months. There was no history of trauma at onset. The patient had mild discomfort on walking. . No history of any kind of immobilization and massage treatment. No history of constitutional symptoms and any other similar swellings in the body.

On examination, there was a 6×3 cm non-tender firm swelling (figure6) over the lateral aspect of the foot& ankle below and in front of the lateral malleolus. Swelling was non tender and no local rise of temperature, firm in consistency, nodular surface. It was non reducible, non-translucent, mobile in horizontal direction and fixed in vertical direction. The skin over the swelling waspinchable. There was free mobility of the swelling over the underlying bone. Range of movements inversion about 20^0 and with 5^0 of eversion movement present.

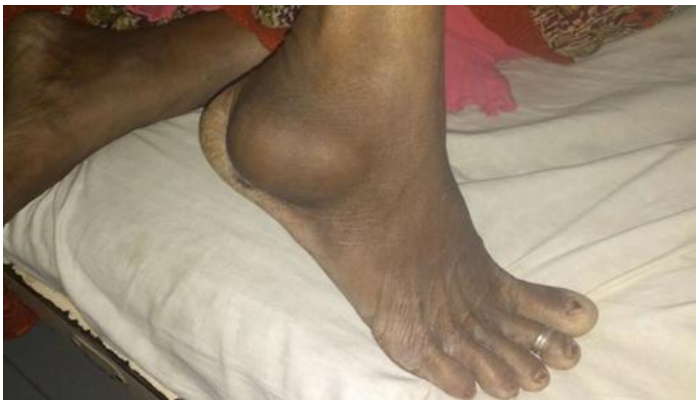


Figure6: clinical swelling

X-ray showed a soft tissue lesion over the lateral aspect of the foot& ankle. MRI [15]showed a well-defined soft tissue lesion along the anterior aspect of peroneus tendon sheath. The lesion was iso-intense to muscles on T1, and mildly hyper intense on T2, suggestive of giant cell tumour of peroneal tendon sheath (figure7). The patient had a report of fine needle aspiration cytology (FNAC) [9] of the swelling. It showed a moderately cellular smear with mononuclear cells having round to oval nucleus & scant cytoplasm, foamy macrophages and plenty of lymphocytes and cholesterol clefts – findings suggestive of giant cell tumour of tendon sheath. The patient was posted for excisional biopsy.

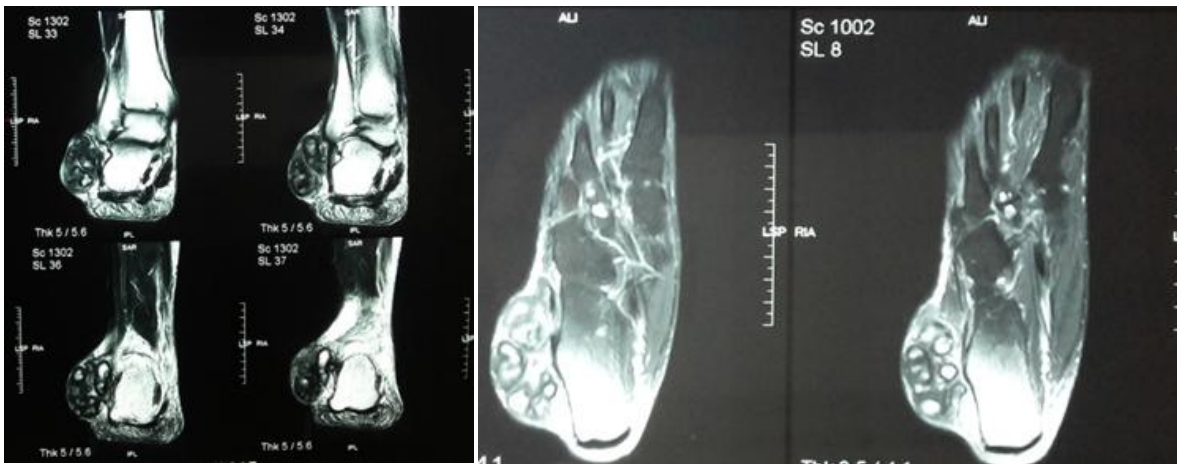


Figure 7: MRI pictures of swelling T1 and T2 images

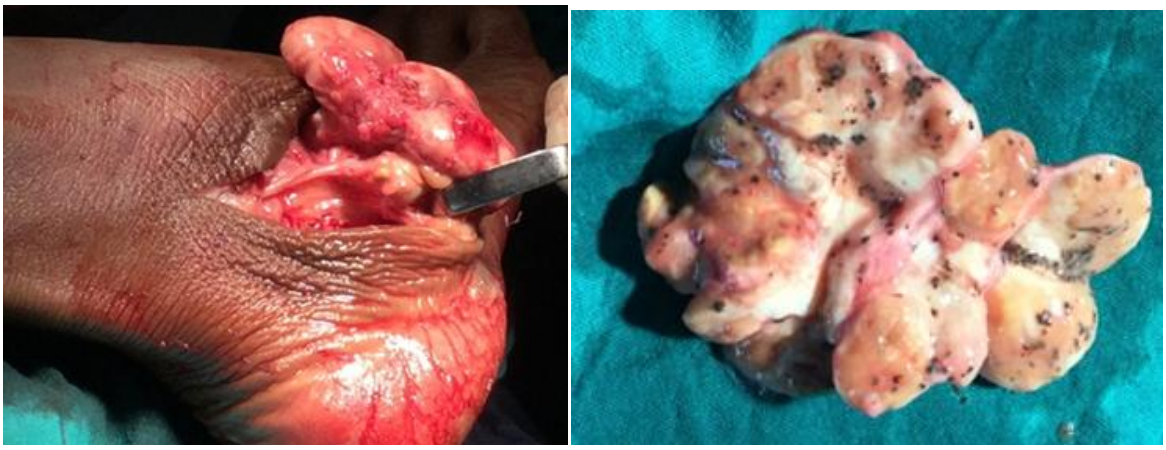


Figure 8: intra op picture of GCT **Figure 9:** Gross specimen

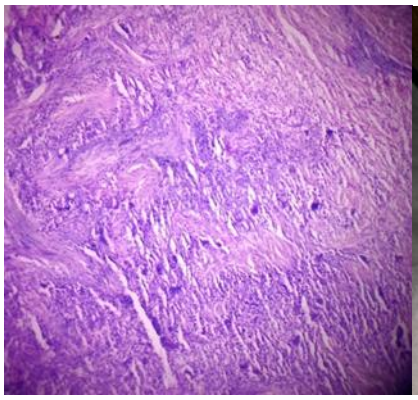


Figure 10: Histopathological slide

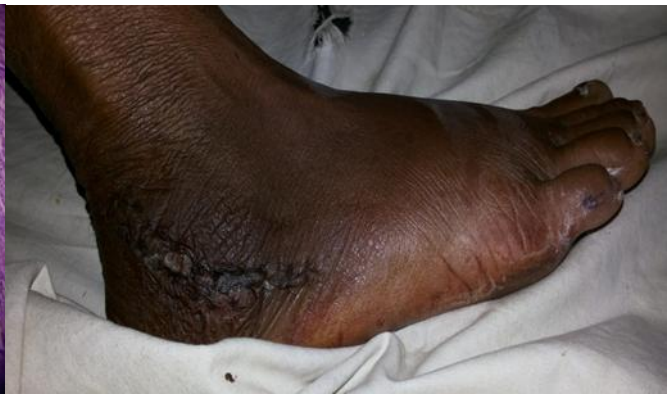


Figure 11: postoperative picture

Intraoperatively (figure8) a soft tissue mass was seen arising from the peroneus tendon sheath. Grossly the mass measuring 6x4x2 cm (figure9). External surface grey white to grey brown structure. Cut section nodular. The excisional biopsy showed a well-encapsulated tumour composed of fibro collagenous tissue infiltrated with prominent giant cells. Focal areas of foamy cells, hemosiderin laden macrophages and cholesterol clefts were also seen – all findings consistent with the diagnosis of giant cell tumour of tendon sheath (figure 10). Patient was followed up to a period of twelve months; there were no signs of clinical and radiological recurrence. Post op wound (figure 11) and movements are satisfactory.

II. Discussion

Giant cell tumour of tendon sheath is a slowly growing benign mesenchymal tumour arising from the synovial membrane. Their nature is unclear whether these lesions represent reactive lesions or true neoplasm[8].These lesions usually present in the third to fifth decades with a slight female predilection. The most common site of occurrence is hand and wrist especially the flexor tendon sheath of fingers. Although ankle and foot constitute the next common site after hand and wrist, it is rare when compared with upper limb lesions.[5, 6]

Giant cell tumors of connective tissue are slow growing and of two types diffuse and localized[12].Sometimes itmimics other lesions like lipoma, synovial sarcoma, malignant fibrous histiocytoma, synovial cyst and ganglion [6, 7]. Hence, it is important to include this lesion in differential diagnoses especially if the lesion is presented as a slow-growing longitudinally oriented mass and found to be anchored to any of the surrounding tendons [6, 7]. The most common presenting clinical feature is a slowly growing painless mass of long duration, as seen in our cases. X-rays might show soft tissue densities with adjacent bony cortical erosions as in case1 or without as in case2.

MR imaging is the investigation of choice. MRI[15] helps in differentiating giant cell tumour of tendon sheath from other soft tissue lesions such as lipoma, synovial sarcoma, malignant fibrous histiocytoma, synovial cyst and ganglion, all of which constitute the differential diagnosis of the former. Characteristic MR imaging findings include the presence of fibrosis, which is manifested as areas of low signal intensity on all pulse sequences, and hemosiderin deposition, which results in blooming artifact on gradient echo images [3, 15]. Heterogeneous signal intensity may occur depending on the histological composition [5, 6].

The gross pathological [3, 5, 6] features include a well-circumscribed lobulated or multi-nodular encapsulated mass with varying degrees of hyalinisation. On microscopy, the cellular infiltrate is constituted by macrophage-like mononuclear cells, epithelioid histiocyte-like cells, osteoclast-like giant cells and xanthomatous cells [1].Hemosiderin laden macrophages and cholesterol clefts are also seen.

Treatment is by marginal excision. The most bothering fact to the surgeon is the high rate of local recurrence of upto 45%, after excision [110, 11]. Complete removal of the affected tissue is of utmost importance in preventing recurrence [10, 11]. Careful meticulous dissection and use of magnification devices aids in achieving this goal. Osseous involvement, radiologically evidenced by the presence of bony erosions, is a risk factor for local recurrence [10, 11.] Radiotherapy[16] can be used to prevent recurrence after excision. Despite recurrences no malignant transformation has been reported. Complete surgical excision remains the mainstay of treatment, assisted either with an operating microscope or a magnifying loupe. Radiotherapy [16]has been suggested after inadequate excision and in patients with high mitotic activity to prevent recurrence. In our two cases recurrence was not noticed during twelve months follow up period. Movements are not affected.

III. Conclusion

Giant cell tumor of the tendon sheath is a rare, benign tumor of hand and uncommon condition in the foot and ankle. Nevertheless, giant cell tumor of the tendon sheath should not be eliminated from the index of

suspicion in nodular swellings of the hand and foot. The basic aim of management should be early diagnosis with operative excision.Follow up is required to look for recurrence.

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