International Journal of Research in Orthopaedics
Mallik MR et al. Int J Res Orthop. 2020 Jan;6(1):102-106
http://www.ijoro.org

Original Research Article

DOI: http://dx.doi.org/10.18203/issn.2455-4510.IntJResOrthop20195801

Giant cell tumour of the flexor tendon sheath of the hand

M. R. Mallik[1], S. S. Nayak[1], R. C. Maharaj[1]*, N. R. Mishra[1], D. K. Chand[1], A. Chaterjee[2]

Department of Orthopaedic, [1]S.C.B. Medical College and Hospital, Cuttack, [2]I.M.S. and S.U.M. Hospital, Bhubaneswar, Odisha, India

Received: 06 September 2019
Revised: 04 December 2019
Accepted: 05 December 2019

***Correspondence:**
Dr. R. C. Maharaj,
E-mail: rameshchandramaharaj@gmail.com

ABSTRACT

Background: Giant cell tumor of tendon sheath is a benign soft tissue lesion most commonly found in the flexor aspect of hand and wrist. Recurrence of the tumor is common even after excision.
Methods: It is an observational study where we present a review of 10 cases for which excision was done and were kept for regular follow up for minimum 6 months.
Results: No recurrences noted in our series with minimum six months to maximum two years follow-up though review literature shows 10-40% recurrence rates.
Conclusions: Complete excision with regular follow up care is indicated for this neoplasm due to its high propensity towards recurrence. The most important factor deciding recurrence pattern is incomplete excision and leaving behind satellite nodules.

Keywords: Giant cell tumor of tendon sheath of hand, FNAC, Excision, Recurrence

INTRODUCTION

Giant cell tumour of tendon sheath (GCTTS) is a firm, non-tender, slow growing, benign soft tissue neoplasm. It is the second most common tumour of the hand, with simple ganglion cysts being the most common.[1] The most frequent tumour location is the index finger. The etiological factors of GCTTS are not known, although an association with trauma, inflammation, metabolic disease and neoplastic have been suggested. It usually affects the people in 3rd to 5th decade of life with female predominance.[2,3] Despite its benign character, local recurrence after excision has been reported in up to 45% of cases. Fine-needle aspiration cytology (FNAC) and imaging studies helps in making an early, accurate preoperative diagnosis. Marginal excision is the treatment of choice. Aim of this study is to through clinical evaluation of any soft tissue swellings of the hand with special reference to flexor aspect of the hand. Followed by radiological and cytological (FNAC) evaluation to reach a concrete diagnosis and then complete surgical excision of the tumour. And then the entire patient followed up regularly to assess the rate of recurrences if any.

METHODS

This is an observational study conducted in Orthopedic Department of SCB Medical College and Hospital, Cuttack, Odisha, India over a period of 2 years (2017 to 2019). A total of 10 cases of GCTTS were operated by the surgeons, after diagnosis confirmed with FNAC and core needle biopsy reports. All patients who were operated were followed up for minimum 6 months to a maximum period of 2 years. Out of the ten patients two patients were not available for follow up and thus had to be excluded from the study. Age of the patient ranged from 25 to 40 years. All patients were investigated with routine radiographs of the affected part. MRI was

performed only in three cases; the appearance was highly suggestive of GCTTS. All patients were subjected to FNAC. The slides were analysed and confirmed to be GCTTS before surgery was planned. X-ray films of the hand showed soft tissue shadow in 6 cases. No evidence of soft tissue calcification or any bony abnormality was seen. All cases were operated under regional anaesthesia, special care was taken to excise the tumour in total and retaining the normal tissues. We used the volar approach by Brunner incision. Operative field was carefully checked for satellite lesions. The entire specimen then was sent for histopathological examination.

RESULTS

Total of 10 cases studied FNAC was positive for all the cases. Mean age of presentation was 32 (25-40) yrs. Male to female ratio was 2:3. Of the 10 cases available, 4 (40%) involved the index finger, 2 (20%) over the little finger, 1(10%) each over the thumb, 1 (10%) ring finger and 2 (20%) over the middle finger. All patients were managed by complete surgical excision of the tumour under regional anaesthesia. In all (100%) cases tumour found to be arising from the flexor sheaths between A1 and A2 pulley regions that is Zone II flexor tendon area. Mostly the gross appearance was a yellow, lobulated mass arising from the tendon sheath. The tumours were removed in all cases, and the surgical excision was meticulous and complete in order to avoid recurrence. Histo-pathological section revealed spindle cells, fibrous tissue, cholesterol laden histiocytes, multi-nucleated giant cells and hemosiderin. 7 (70%) cases were single nodular and 3 (30%) were multi-lobulated. All patients were followed up for a minimum period of 6 months to maximum 2 years with mean follow-up duration of 1 year and 3 months during which movements were normal and without any recurrence of soft tissue mass. No bony changes, and (0%) nil recurrence was noted. Superficial wound infection was noted in 2 (20%) cases that responded well on antibiotic administration. No post-operative stiffness was found and everybody regained full range of movement with early mobilisation.

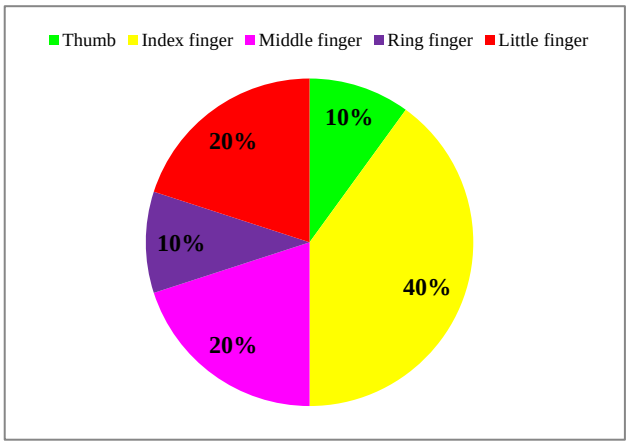

Figure 1: Prevelance of giant cell tumour in finger.

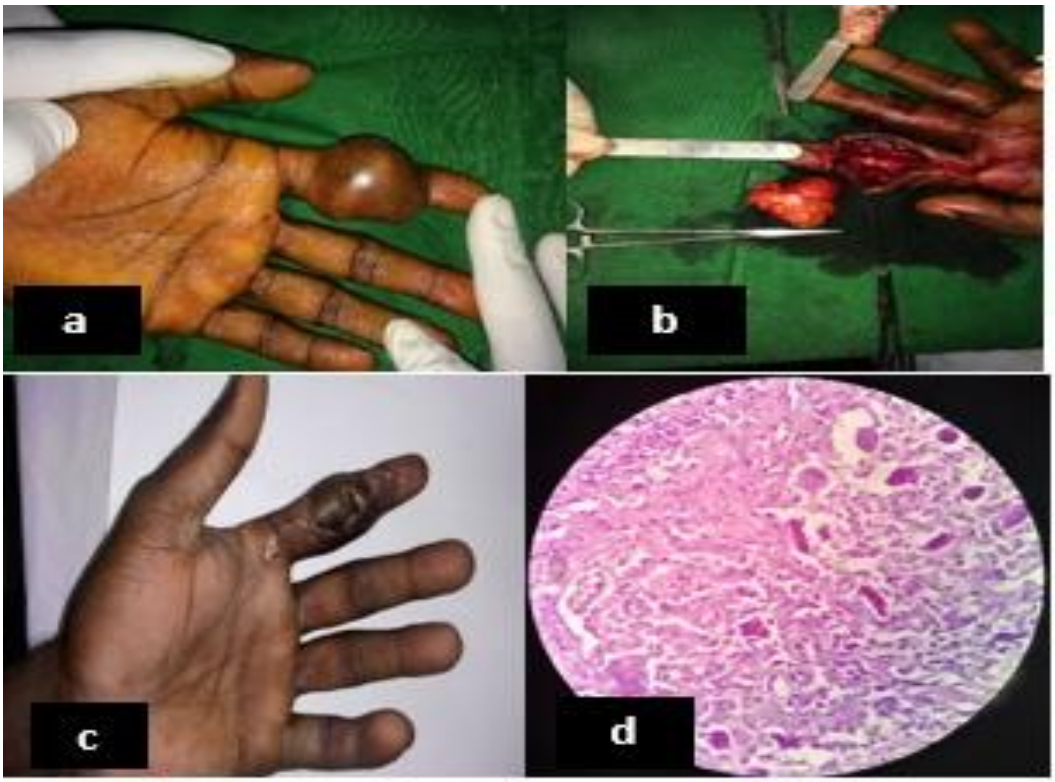

Figure 2: (a) Swelling over the index finger of left hand, (b) exposure and complete excision of the tumor, (c) closure with reductant skin and (d) histopathology of giant cell tumor tendon sheath.

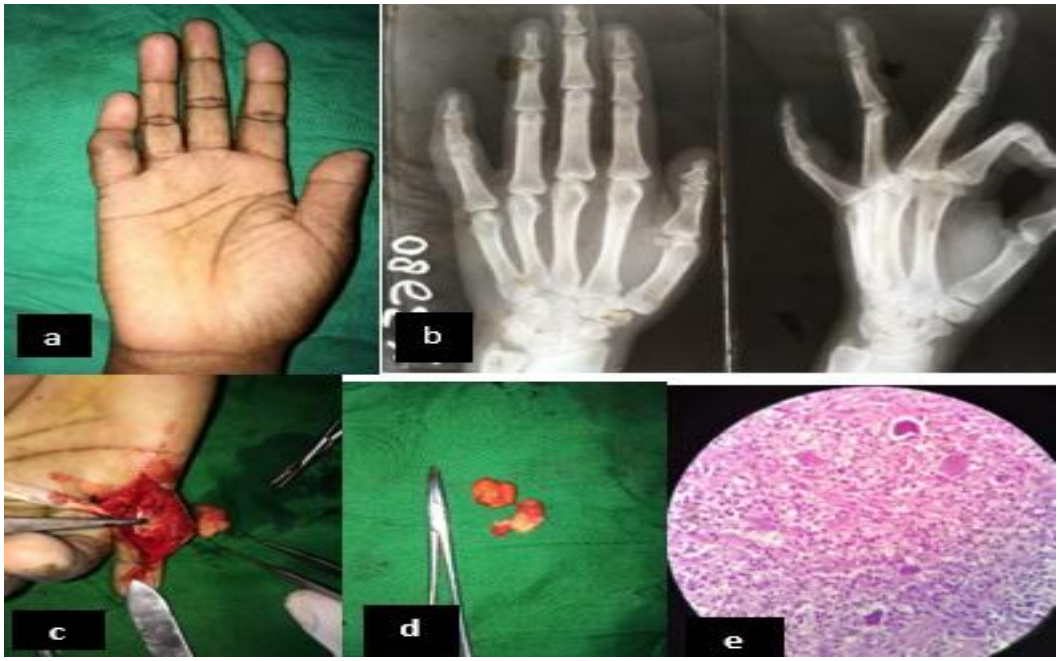

Figure 3: (a) Swelling of the little finger of right hand, (b) X-ray of right hand, (c) exposure and complete excision of the tumor, (d) tumor mass and (e) low power histopathology appearance.

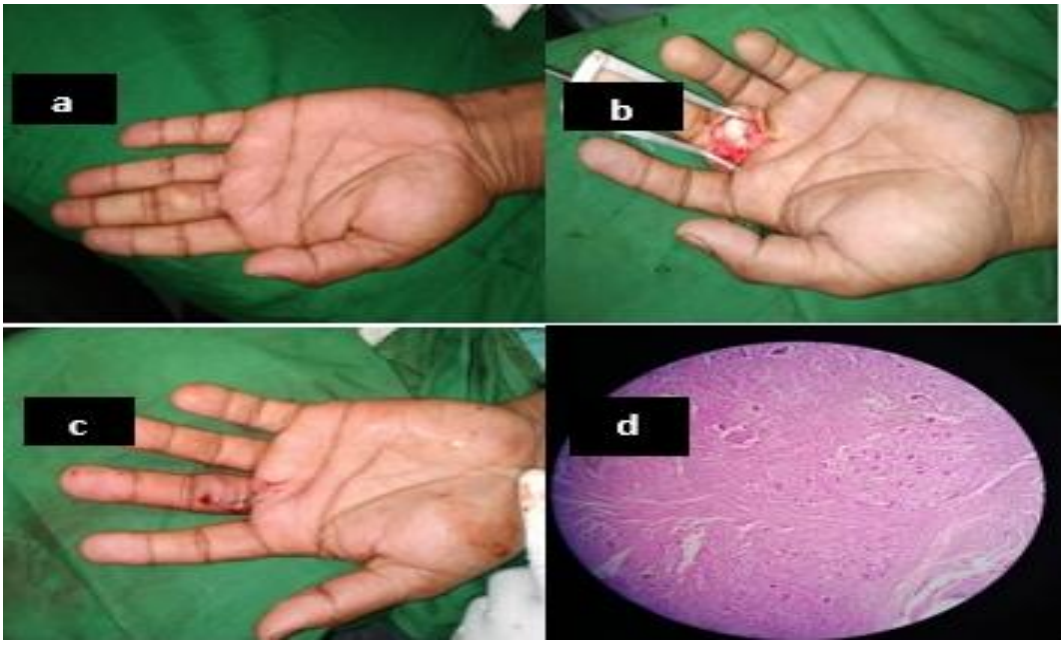

Figure 4: (a) Swelling of the middle finger of left-hand, (b) exposure of the mass through Brunner's incision, (c) closure and (d): low power histopathology appearance.

DISCUSSION

Giant cell tumor of the tendon sheath (GCTTS) is a slow growing, firm, non-tender and localized benign soft tissue neoplasm. The tumor usually affect the people in 3rd to 5th decade of life with 3:2 female predominance.[1-3] Incidence 1:50,000 individuals .The most common location for this tumor is hand but it can also occur in other part of the body such as the spine, ankle, knee and feet.[4] It is the second most common tumor of the hand after ganglion.[1] The tumor in hand most frequently located close to the distal interphalangeal (DIP) joint, with a volar location in around 2/3 of cases.[5,6] Frequency of the tumors among the fingers of hand: index (29.7%) greater than long (24.6%) greater than ring (16.8%) greater than little (16%) greater than thumb (12.9%).[5,6]

The etiological factors of GCTTS are not known, although an association with trauma, inflammation, metabolic disease and neoplastic have been suggested.

Diagnosis of the tumor is mostly by clinical and radiological examination. X-rays might show soft tissue densities with or without adjacent bony cortical erosion. Sonography detects whether the tumor is solid or cystic. It is also describes the relationship of the lesion to the surrounding structure.[7]

MRI helps in differentiating the GCTTS from other soft tissue lesion such as lipoma, synovial sarcoma, malignant fibrous histiocytoma, synovial cyst andganglion. T1 weighted images reveals lesion to be isointense or hypointense to that of muscle and hypointense on T2 weighted image.[8] The characteristics low signal on T1and T2 weighted images is attributes to the paramagnetic effect of hemosiderin and abundance collagenous stroma.[9]

FNAC of the tumor helps in making an accurate diagnosis. Some authors ever have advocated image guided FNAC as a diagnostic tool.[10,11] Grossly GCTTS includes a rubbery, well encapsulated, lobulated or multi lobulated mass with varying degree of hyalinization, The color is brown to yellow depending on the proportion of the foam cell and degree of hemosiderin deposit. Microscopically the lesion composed of predominant uniform population of spindled cell to polygonal stromal cells admixed with multinucleated osteoclastic type giant cell. Other cell type frequently present includes hemosiderin laden macrophages and foamy histiocytes. Mitosis, necrosis and high cellularity are typically not seen in GCTTS.[10,11] Byers classified GCTTS in to 2 types i.e., localized nodular which is most commonly occurs in hands and diffuse type which is most common in joints.[12]

Differential diagnosis of GCTTS includes benign neoplasm like ganglion, synovial cyst, fibrous histiocytoma and malignant neoplasm such as synovial sarcoma, malignant fibrous histiocytoma and clear cell sarcoma. However, the characteristic cytology features with the help of clinical and radiological finding helped to arrive at the diagnosis of GCTTS.[13] Treatment of GCTTS of hand is challenging. The treatment requires a balance between extensive dissections for excision versus the risk of recurrence. William et al reported that the chance of recurrence is high if there is direct involvement of the extensor tendons, flexor tendons or joint capsule by the tumor.[14] Recurrence rate varies from 0-45%.[15] The complete removal of the tumor is utmost importance in preventing recurrence. Recurrence is attributed to incomplete excision of the tumor. To minimize recurrence, complete margin excision should be performed.

In our setup all cases were operated under regional anaesthesia, special care was taken to excise the tumour in total and retaining the normal tissues. We used the volar approach by Brunner incision. Operative field was carefully checked for satellite lesions. The entire specimen then was sent for histopathological examination. The patient should be counselled in the preoperative period with regard to the probability of recurrence. Complete surgical excision remains the main stay of treatment, assisted either with an operative microscope or a magnifying loupe. Radiotherapy has been suggested after inadequate excision and in patient with high mitotic activity to prevent recurrence.[15] In 2012 Lancigu et al retrospectively studied 96 patients with an average follow up of 12 years and concluded that these tumors have a risk recurrence (8.3% in our series) that cannot be ignored.[16] As a consequence, the patient must be informed of the possibility of this risk, even in cases of complete excision and especially if the tumor extends into the joint or invades the tendons. Hamdi et al published a retrospective study of 27 proven GCTTS of the hand in the year 2011. The mean length of follow-up was 4.5years.[17] The recurrence was noted in two surgically managed cases. Thus, they suggested that pre-operative evaluation with MRI is important for planning complete resection, especially in the recurrent forms. In order to avoid recurrence, it is appropriate to apply a careful surgery in a wide area. Similarly, Suresh et al operated on fourteen cases of GCTTS, after FNAC confirmation and using a magnifying loupe for complete excision of the lesion including the satellite nodules and concluded that incomplete excision and leaving behind satellite nodules is considered as the most important factor deciding recurrence pattern.[18] Adequate surgical exposure, meticulous dissection and use of magnification are necessary to reduce recurrence and should remain the mainstay of surgical management. Following the above surgical protocol, the authors were able to achieve complete clearance of the tumor with recurrence in only one case (8.3%). The reported recurrence rate of recurrence in various studies is about 27 percent but in our case series recurrence was not noticed in follow up. Movements were normal in follow up and the skin was also not involved.

CONCLUSION

Giant cell tumor of the tendon sheath is a rare tumor of hand. Nevertheless, giant cell tumor of the tendon sheath should not be eliminated from the index of suspicion in nodular swellings of the hand. The basic aim of management should be early diagnosis and operative excision. Complete excision with regular follow up care is indicated for this neoplasm due to its high propensity towards recurrence (10–44%). The most important factor deciding recurrence pattern is incomplete excision and leaving behind satellite nodules.

ACKNOWLEDGEMENTS

No benefits in any form have been received or will be received from any commercial party related directly or indirectly to the subject of this article.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Adams EL, Yoder EM, Kasdan ML. Giant cell tumor of the tendon sheath: Experience with 65 cases. Eplasty. 2012;12:e50.
2. Walsh EF, Mechrefe A, Akelman E, Schiller AL. Giant cell tumor of tendon sheath. Am J Orthop. 2005;34:116-21.
3. Schultz RJ, Kearns RJ. Tumors in the hand. J Hand Surg. 1983;8:803-6.
4. Briët JP, Becker SJ, Oosterhoff TC, Ring D. Giant cell tumor of tendon sheath. Arch Bone Jt Surg. 2015;3:19-21.
5. Braga Silva J, Calcagnotto GN, Scolari J, Fridman M. Tumor de célulasgigantes da bainhatendinosa no nível dos dedos: exéreseatravés daincisãocircunferencial. Rev Bras Ortop. 2002;37(4):129-32.
6. Gibbons CL, Khwaja HA, Cole AS, Cooke PH, Athanasou NA. Giant-cell tumour of the tendon sheath in the foot and ankle. J Bone Joint Surg Br. 2002;84(7):1000-3.
7. Middleton WD, Patel V, Teefey SA, Boyer MI. Giant cell tumors of the tendon sheath: an analysis of sonographic findings. Am J Roentgenol. 2004;183(2):337-9.
8. De Beuckeleer L, De Schepper A, De Belder F, Van Goethem J, Marques MC, Broeckx J, et al. Magnetic resonance imaging of localized giant celltumour of the tendon sheath (MRI of localized GCTTS). Eur Radiol. 1997;7(2):198-201.
9. Jelinek JS, Kransdorf MJ, Shmookler BM, Aboulafia AA, Malawer MM. Giant cell tumor of the tendon sheath: MR findings in nine cases. Am J Roentgenol. 1994;162(4):919–22.
10. Darwish FM, Haddad WH. Giant cell tumour of tendon sheath: Experience with 52 cases. Singapore Med J. 2008;49:879-82.
11. Batra VV, Jain S, Singh DK, Kumar N. Cytomorphologic spectrum of giant cell tumor of tendon sheath. Acta Cytol. 2008;52:152-8.
12. Ikeda K, Osamura N, Tomita K. Giant cell tumour in the tendon sheath of the hand: importance of the type of lesion. Scand J Plast Reconstr Surg Hand Surg. 2007;41:138-42.
13. Cherla D, Hahn E, Datiashvilli R. Meticulous surgical excision of a localized giant cell tumor of the tendon sheath. Eplasty. 2013;13:ic36.
14. Williams J, Hodari A, Janevski P, Siddiqui A. Recurrence of giant celltumors in the hand: a prospective study. J Hand Surg Am. 2010;35:451-6.
15. 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. 2000;82B:571-3.
16. Lancigu R, Rabarin F, Jeudy J, Saint Cast Y, Cesari B, Fouque PA, et al. Giant cell tumors of the tendon sheaths in the hand: review of 96 patients with an average follow-up of 12 years Orthop Traumatol Surg Res. 2013;99S:S251-4.
17. Hamdi MF, Touati B, Zakhama A. Giant cell tumour of the flexor tendon sheath of the hand: analysis of 27 cases Musculoskelet Surg. 2012;96:29-33.
18. Suresh SS, Hosam Z. Giant Cell Tumor of Tendon Sheath: Case Series and Review of Literature. J Hand Microsurg. 2010;2(2):67-71.

Cite this article as: Mallik MR, Nayak SS, Maharaj RC, Mishra NR, Chand DK, Chaterjee A. Giant cell tumour of the flexor tendon sheath of the hand. Int J Res Orthop 2020;6:102-6.