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Giant cell tumour of tendon sheath and synovial membrane: A review of 26 cases

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ABSTRACT

Aim: Aim of our study is to highlight the incidence and benign nature of Giant cell tumour of tendon sheath and need for complete removal, thus minimizing the chances of recurrence.
Material and methods: A total of 26 cases of Giant cell tumour of tendon sheath operated in the department of Orthopaedics, Patna Medical College & Hospital, Patna from 2003 to 2010 were included in this study. The surgery was performed after clinical evaluation of the lesion and Fine Needle Aspiration Cytology (FNAC). The tumour underwent en bloc marginal excision. The patients were followed up for minimum two year.
Results: Our study population consisted of 18 females and 8 males. The mean age at the time of surgery was 38.3 years (range, 18–62 years). Twenty three cases were found in the 3rd and 4th decade. Twenty two cases involved upper extremity and only 4 cases in lower extremity. MRI was done in 2 cases where diagnosis was in doubt. Bony indentation on X-ray film was found in 7 cases and thorough curettage of cortical shell was done. All the cases were treated by marginal excision. Three cases developed post-operative stiffness but regained full range of movement with physiotherapy. Sensory impairment was seen in 3 cases. Recurrence occurred in 2 case and they were treated by repeat marginal excision.
Conclusion: Meticulous en-masse marginal excision of the giant cell tumour of tendon sheath in blood less field using magnification is the treatment of choice.

1. Introduction

Giant cell tumour of the tendon sheath (GCT-TS) is the second most common tumour in the hand, after ganglion cysts.[1] It usually presents as a painless, firm, well defined nodule on the dorsal or volar side of the finger, generally located proximally to the distal inter-phalangeal joint.[2]

Giant cell tumour of the tendon sheath (GCT-TS) is a disease of disputed etiology and pathogenesis.[3] Trauma, inflammation, metabolic disease and neoplastic etiology are considered as its etiological factors.[4,5] GCT-TS was considered to be a neoplasm arising from the lining and sublining cells of the tendon sheath.[1,6] Studies demonstrating cytogenetic abnormalities[7] (anaeuploidy DNA, high proliferative rate), the natural behavior of local recurrences and multifocality[1] has raised the idea that GCT-TS is a neoplasm. Clonal chromosomal aberrations were observed suggesting a neoplastic etiology in one study,[8] however,Recently some investigations indicate a neoplastic origin of the tumors; others indicate that they are polyclonal and inflammatory. The cytogenetic and molecular genetic features of GCT-TSs are still largely unknown.[3,9]

Radiographically, it presents as a soft-tissue mass that may cause a bone impression on the volar face of the adjacent phalanx due to pressure effect. Sometimes it resembles an intraosseous lesion, i.e. cortical or intramedullary, well defined and osteolytic. True bone invasion occurs in around 5% of the cases.[6] Ultrasonography shows a solid, homogeneous, hypoechoic mass generally in relation to the flexor tendons of the fingers, with increased vascularity on Doppler studies.[10] Magnetic resonance imaging reveals decreased signal intensity on T1- and T2-weighted images.[9,11]

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There is no certain treatment protocol but complete local excision is the treatment of choice. Recurrence is a major concern in GCT-TS, with rates of up to 44% being reported.[5] In the case of recurrence, marginal excision of the tumour should be repeated. Functionality of the involved digit should be considered and may result in the decision to amputate for large tumors that interfere with function.

The aim of the present study is to highlight the misdiagnosis of giant cell tumors of tendon sheath as synovial ganglion which are treated by less experienced surgeons by local injection and/or incomplete removal resulting in recurrence.

2. Material & methods

This retrospective study was conducted in the Department of Orthopaedics, Patna Medical College & Hospital. A total of 26 cases of GCT-TS operated by the senior surgeon from 2003 to 2010 were included in this study.

Preoperatively patients were evaluated clinically and radiologically. Prior to surgery FNAC was done in all cases for diagnosis. All cases were operated under regional or general anaesthesia. Pneumatic tourniquet was used to achieve bloodless field however exsanguination was not done before inflation so that vessels remain prominent. In case of large tumour lazy S incision was used for complete access and en masse excision of the tumour. In two of our cases tumour was encircling more than two third circumference of the digit and in these cases double (volar and dorsal) incision was used to completely excise the tumour. The tumour underwent meticulous en bloc marginal excision (Fig. 1A–C) and was sent for cytopathological examination for confirmation of diagnosis. In cases of bony erosion thorough curettage of cortical shell was done. The patients were followed up for a mean period of 4.3 years (range 3–6 years).

3. Results

Our study population consisted of 18 females and 8 males. The mean age of the patients at the time of surgery was 38.3 years (range 18–62 years). Twenty three cases were found in the 3rd and 4th decade. Only 1 case was found in 2nd, 5th and 7th decade each. Twenty two cases were found in upper extremity and only 4 cases were found in lower extremity. (Fig. 2) Foot preponderance was seen in men.

Five cases in our series were wrongly diagnosed as a case of synovial cyst (ganglion cyst) before presenting to us and were primarily treated by steroid injection in the lesion.

Out of the 26 cases FNAC was positive for giant cells in 24 cases, whereas in 2 cases it was inconclusive. MRI was done in these 2 cases to know the nature & extent of tumour. Bony indentation was found in 7 cases in our series, all these tumours were of large size. (Fig. 1D) All the cases were treated by marginal excision. Thorough curettage of the cortical shell was done in cases with bony involvement to prevent recurrence. In case of large tumours, liberal preservation of skin was done.

There was superficial wound infection in 2 cases which responded to wound care under antibiotic cover. Two cases in the thumb and one in the little finger developed post-operative stiffness but regained full range of movements with physiotherapy. Sensory impairment was seen in 3 cases which were due to involvement of digital nerves during dissection. Recurrence occurred in 2 case and they were treated by repeat marginal excision with no further recurrence in available follow up. Both these patients were having large multinodular tumour initially and recurred mass appeared as a small swelling which increased in size gradually in close proximity to primary site of lesion.

4. Discussion

Jaffe et al. regarded the synovium of the tendon sheath, bursa and joint as an anatomical unit in which giant-cell tumour of the tendon sheath, also called pigmented villonodular synovitis, may occur.[12] According to the World Health Organization classification system for bone and soft tissue tumours, it is classified as a "fibriohistiocytic tumour."[13] It can be divided into localized nodular type (common in hand) and diffuse type (common in joints). Diffuse form is hyper cellular with several giant cells, while localized form is relatively hypocellular with numerous giant cells. Another classification proposed by Al Qattan classified GCT-TS into Type I (single tumour, round and multi-lobulated) and Type II (two or more distinct tumours, not joined together).[14] Type II is more often related with recurrence as satellite lesions when microscopic excision is not done.

In our study, we found female preponderance (70% cases). Cases mostly belonged to 3rd and 4th decades. Most of the cases in our series showed involvement of upper extremities. The most frequent location of GCT-TS is the hand, especially the fingers and in many cases, it involves the volar surface of the fingers more often than the dorsal one. The tissue mass expands areas of least resistance.[15] There were 4 cases (15%) seen in foot. Out of these 4 cases, 3 were found in males. The presenting symptom in most of our patients was painless swelling for many years. This is

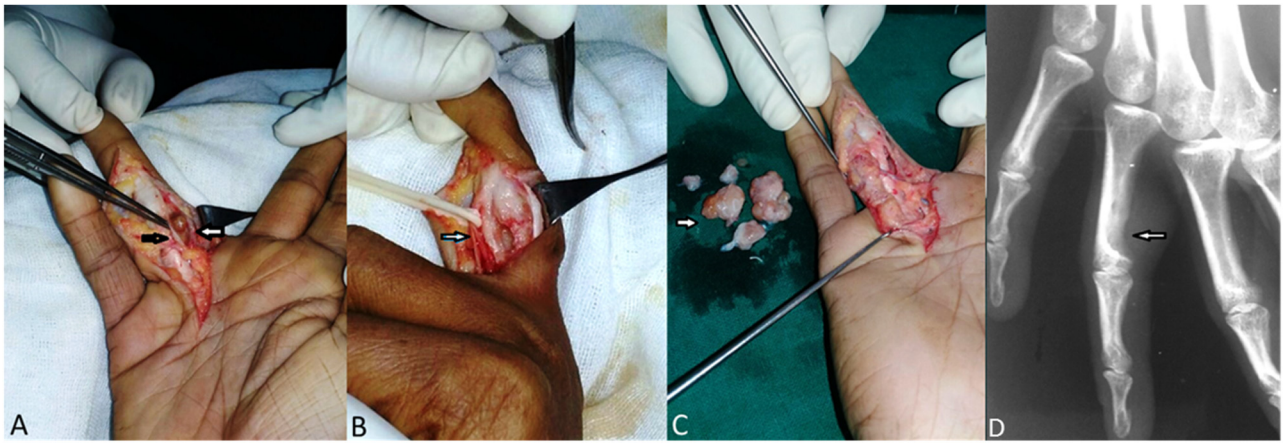

Fig. 1. (A) Digital nerve (black arrow) and vessels (white arrow) snugly adhered with tumour mass. (B) Neurovascular bundle meticulously dissected and protected (white arrow). (C) en-block dissection of multiple nodular lesions (white arrow). (D) Radiograph showing indentation of volar aspect of proximal phalanx with cortical erosion.

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