

A Case Report on Cystic Giant Cell Tumour Over Dorsum of the 5th Metacarpophalangeal Joint Managed by Excision of the Tumour and Tendon Repair

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Abstract: ***Introduction:** The giant cell tumour of the tendon sheath (GCTTS), also known as tenosynovial giant cell tumour, is the second most common soft tissue tumour of the hand. These tumours are typically benign, but their propensity to recur necessitates careful management. While GCTTS commonly presents in the flexor tendon of the fingers, occurrence in the extensor tendons is rare. Here, we discuss a unique case of GCT involving the extensor tendon of the 5th finger and its successful management through surgical excision. **Case Presentation:** an observational prospective analysis of a 19-year-old female patient presented with complaints of swelling over the dorsum of the right hand managed by excisional biopsy of the swelling. The patient was followed up for 6 weeks postop. The diagnosis was confirmed by Histopathological examination. **Conclusion:** This case underscores the importance of considering GCTTS in the differential diagnosis of dorsal hand masses and highlights the efficacy of excisional biopsy in managing this condition. Early diagnosis and appropriate surgical intervention are key to preventing recurrence and ensuring good functional outcomes.*

Keywords: GCT - Giant Cell Tumour, Excisional biopsy, HPE - Histopathological examination.

1. Introduction

Giant cell tumours (GCT) of the tendon sheath are soft tissue neoplasms that typically affect the hand and fingers. The second most common tumour of the hand after synovial cysts are the giant-cell tumour of the tendon sheath (GCTTS). It is a common lesion^[1]. It is a benign soft tissue lesion that grows slowly and typically causes no pain. The tumour often affects people between the ages of 30 and 50, with women being affected more frequently than men^[2, 3]. The best course of treatment for this benign tumour, which can occasionally exhibit aggressive activity, is surgery with large excision margins while avoiding injury to the nearby vascular, nerve, and tendon structures^[4]. It is characterized by a painless nodule that usually develops proximally to the distal interphalangeal joint on the dorsal or volar side of the finger^[5]. According to radiographic analysis, GCTTS typically manifests as a soft-tissue mass that could leave a bone impression on the adjacent phalanx's volar surface. GCTTS can occasionally mimic an intraosseous lesion, which is an osteolytic lesion that is well-defined, cortical, or intramedullary. About 5% of cases result in true bone invasion^[6]. Histologically, it is distinguished by a variety of cell populations, such as foam cells loaded with lipids and hemosiderin deposits, multinucleated giant cells, and stromal round cells^[7]. When it comes to surgical options, two options are more commonly employed: the circumferential incision suggested by Braga Silva^[5] et al., and the longitudinal or transversal incisions suggested by Glowacki^[4] and Weiss for dorsal lesions, and the Brunner or mediolateral incisions for volar lesions.

2. Methodology and Materials

A Case Report

A 19-year-old female came to our OPD with complaints of painless, gradually enlarging swelling over the dorsal aspect of her right 5th finger. The mass had been growing over the past six months, causing discomfort and a slight restriction in finger extension. There was no history of trauma or systemic illness.

Clinical examination:

On physical examination, a cystic, non-tender nodule measuring approximately 1 cm in diameter was palpable over the extensor tendon of the right 5th finger. The overlying skin was normal, and there were no signs of infection. The range of motion was mildly restricted in extension due to the mass effect.

Radiological investigation:

Radiological investigation X-ray right hand Anteroposterior and oblique view has been taken and to confirm the finding we took an MRI right hand which shows a small linear oval-shaped mixed signal lesion along the dorsomedial aspect of the little finger subcutaneous plane at the fifth metacarpophalangeal joint cystic giant cell tumour.

Histopathological investigation:

The tumour sample after the excisional biopsy was sent for histopathological examination which revealed a cystic giant cell tumour. The specimen showed typical features of multinucleated giant cells scattered within a background of mononuclear stromal cells.

Surgical procedure:

procedure done was an excisional of the tumour and primary suturing - right - hand zone V extensor tendon region of V MCP joint. Under general anaesthesia, under strict aseptic precaution, parts are painted and draped. Under tourniquet control, Incision was made around the swelling of the dorsum of the right hand, and the flap raised - the tumour was visualized over the extensor tendon of the 5th metacarpal joint, and tumour excision was done intoto. Tendon repair is done by approximating and suturing the tendon through modified Kessler technique. Tourniquet released. Sterile saline wash was given, and Hemostasis was secured. Skin suturing was done with 5 - 0 ethilon after placing the IF tube drain. A sterile dressing is done. Arm sling applied.

The Tumour specimen was sent for histopathology examination.

Postoperative period:

Postoperatively the patient was treated with IV antibiotics, IV antacids, IV analgesics, and other supportive medications. The plastic surgeon reviewed the patient at regular intervals. Wound dressing and inspection were done on postoperative days 2, 5, 9 and 14. She was advised on gentle finger exercises to prevent stiffness. Rehabilitation was done with sponge ball compression daily for 4 settings. At the 6 - month follow - up, there was no evidence of recurrence, and the patient had regained full range of motion with no residual pain.

3. Discussion

These tumours are usually benign but can be locally aggressive and recur if not completely excised. Multinucleated giant cells, polyhedral histiocytes, fibrotic material, and hemosiderin deposits make up the histological composition of GCTTS; histological features like cellularity

and mitosis do not appear to have an impact on the prognosis of malignancy^[8, 9]. In 1941, Jaffe was the first to characterize GCTTS as a nonneoplastic response, namely tenosynovitis^[10]. Numerous other authors have connected the tumour's location to the likelihood of recurrence, nevertheless. Reilly et al. found that the thumb interphalangeal (IP) and digital distal interphalangeal (DIP) joints had significantly greater rates of giant cell tumor recurrence^[11, 12]. This observation may be explained by the intrinsic difficulties of sufficiently excising the tumor distally at the IP and DIP joint levels because the surrounding soft tissue envelope is not perfect and the neurovascular systems are fairly close to the tumor margins^[12]. With regard to GCTTS, Al - Qattan offered a new classification scheme. He defined Type - I as a single, spherical, or multilobulated tumor, and Type - II as the presence of two or more separate, non - joint tumors^[12]. According to Williams et al. (2010), tumor involvement of the extensor tendon, flexor tendon, or joint capsule was the definition of the high - risk category^[13]. Less than 1% of cases include several joints, with most cases involving just one joint. Joint stiffness may result from juxtaarticular settlements. Compared to the other areas, these benign tumors are more common in hand^[14]. Though uncommon in the hand, intra - osseous giant cell tumor invasion may be linked to an increased risk of recurrence^[15].

After surgical excision, the reported recurrence rates for giant cell tumors of the tendon sheath range from 7 to 29% (Table 2). Potential factors that may lead to a high rate of recurrence of giant cell tumours are summarized in (table3).

The gold standard treatment is surgical excision, aiming for complete removal to minimize recurrence risk. Careful dissection is crucial to preserve tendon function and surrounding structures.

Table 1: Classification of Tumours

Type	Number of patients	Number of recurrences
I. The entire tumour is surrounded by one pseudo - capsule		
a.	Single nodule with a thick whitish capsule	
b.	Single nodule with a thin capsule	
c.	Multi - lobulated lesion surrounded by a common pseudo - capsule	
II. The entire tumour is not surrounded by one pseudo - capsule		
a.	One main nodule (with a pseudo - capsule) accompanied by separate satellite lesions within the same anatomical area	
b.	Diffuse type with multiple granular - like lesions with no pseudo - capsule	
c.	Multicentric type with separate discrete lesions in the same digit	

Table 2: Examples of Recurrence Rates Reported in the Literature.

Study	Number of Cases	Recurrence Rate (%)
Byers ^[16] et al. (1968)	26	27%
Grover ^[17] et al. (1998)	52	15%
Jones ^[18] et al. (1969)	91	18%
Looi ^[19] et al. (1999)	53	7%
Rao and Vigoritta ^[20] (1984)	46	29%
M. M. Alqattan ^[12] (2001)	43	12%

Table 3: Potential factors that may lead to a high rate of recurrence of giant cell tumours

1. POOR SURGICAL TECHNIQUE/INCOMPLETE EXCISION.
2. BONY INVASION BY THE TUMOUR.
3. CELLULARITY AND MITOTIC ACTIVITY ON HISTOLOGICAL EXAMINATION.
4. THE TUMOUR IS NM 23 NEGATIVE.
5. TYPE II TUMOURS.

4. Conclusion

This case underscores the importance of considering GCTTS in the differential diagnosis of dorsal hand masses and highlights the efficacy of excisional biopsy in managing this condition. Early diagnosis and appropriate surgical intervention are key to preventing recurrence and ensuring good functional outcomes.

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Figure 1: Preoperative Xray

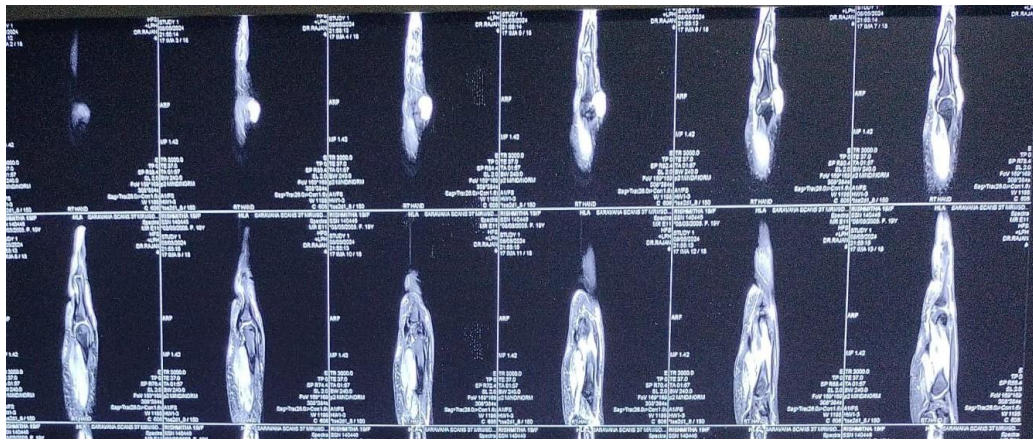


Figure 2: MRI Right Hand- Sagittal Section



Figure 3: MRI Right Hand – Coronal Section

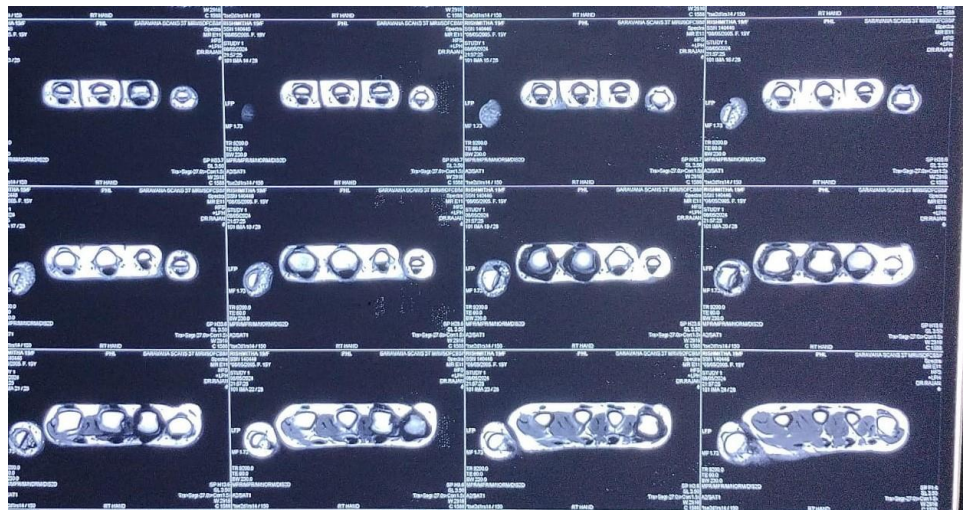


Figure 4: MRI Right Hand Axial Section