A Case of Benign Lesion of Tendon Sheath of Hand, Fibroma Mimicking Giant Cell Tumor

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Fibroma of the tendon sheath (FTS) is a rare, benign, soft tissue lesion of the tendon sheath of hand. Giant cell tumor of the tendon sheath (GCTTS) is a benign tumor, presenting as the second most common mass of the hand after ganglion cysts. In comparison to FTS and GCTTS both the lesions are more common in 2nd and 4th decade of life, located over the volar aspect whereas rare on dorsal aspect. We herein report a case of FTS of dorsum of the right wrist in a 12 years old young girl with no predisposing factor of its occurrence. MRI illustrate well circumscribed, homogenous oval shaped lesion in dorsal aspect of right hand with linear flow void within, encasing the extensor digitorum tendon as described likely benign lesion. Differential diagnosis was giant cell tumor of tendon sheath. Excision and biopsy were performed. Histologic examination revealed dense fibrous tissue with spindle cell tumor and mesenchymal cells but no atypical mitotic figures and necrosis were present which revealed Fibroma of tendon sheath. Hand therapy was commenced in the early post-operative phase with instructions given for active range of motion exercises. Finger movements were almost too perfect and extension at the distal interphalangeal joint was achieved in three weeks.

Keywords: fibroma, giant cell tumor, histopathology, tendon sheath.

Fibroma of the tendon sheath (FTS) is a rare, benign, soft tissue lesion arising from the synovium of the tendon sheath that occurs mostly around small joints such as the fingers, hands, and wrist. It was first described by Geschickter and Copeland in 1949 but the term "tendon sheath tumor" was coined by Chung and Enzinger.

Giant cell tumor of the tendon sheath (GCTTS) is a benign tumor, presenting as the second most common mass of the hand after ganglion cysts. It was first described by Chassaignac in 1852 as fibrous xanthoma.

In comparison to FTS and GCTTS both the lesions are more common in 2nd and 4th decade of life, located over the volar aspect whereas rare on dorsal aspect. They present with swelling with gradual increment in size with time. They are usually asymptomatic unless an impingement of underlying structures[1] with similar radiological features. Therefore, its difficult to make preoperative diagnosis.

The 3 most common hand and wrist lesions include ganglion cysts, giant cell tumors of the tendon sheath, and hemangiomas. Other common lesions that can be diagnosed radiographically include lipomas, neural sheath tumors, infection and inflammation, and variant soft-tissue or bony structures.[2]

We herein report a case of FTS of dorsum of the right hand in a young female with no predisposing factor of its occurrence. Her MRI results well circumscribed, homogenous oval shaped lesion in dorsal aspect of right hand with linear flow void within, encasing the extensor digitorum tendon as described likely benign lesion. Differential diagnosis was giant cell tumor of tendon sheath. Excision and biopsy were performed.

Case Report

A 12-year-old female presented to HRDC outpatient with slow growing mass over the dorsal surface of dominant right hand for past two years gradually increasing in size with difficulty on gripping and grasping. There was no history of penetrating or blunt trauma. Her long finger of right hand demonstrated full active and passive flexion. However, she was unable to actively extend the metacarpophalangeal joint beyond 15 degrees of extension though this was fully correctable passively. She was diagnosed with camptodactyly since birth, and had underdone release on 3rd December 2018.

On examination there was an oval, non-tender, solitary lump about 4cm X 3cm in dimension, firm to hard inconsistency, and non-pulsatile over the dorsum of right hand. The skin over the lump was normal **(Figure 1)**. Sensation and power of hand and finger on both radial and ulnar aspect was intact.

X-ray of hand was done which showed no bony lesion and any abnormalities. To further evaluate musculoskeletal ultrasound of dorsum of hand was done which revealed a well-defined, oval shape, hypoechoic lesion of heterogeneous mass in relation to extensor digitorum tendons. Magnetic resonance imaging reports well circumscribed, homogenous oval shaped

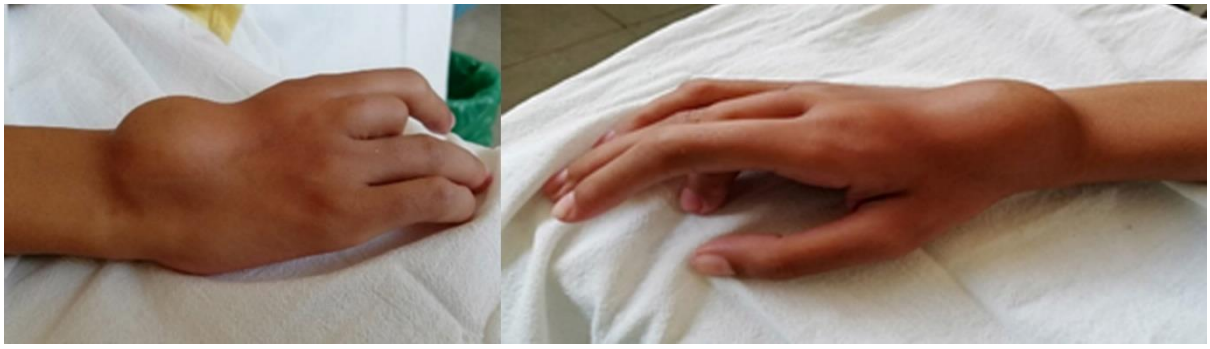

Figure 1: An oval, non-tender, solitary lump about 4cm X 3cm in dimension, firm to hard inconsistency, and non-pulsatile over the dorsum of right hand

lesion in dorsal aspect of right hand with linear flow void within, encasing the extensor digitorum tendon as described likely benign lesion. Differential diagnosis was giant cell tumor of tendon sheath **(Figure 2)**.

Further she was planned for excisional biopsy of the mass. Patient under general anesthesia with proximal tourniquet, longitudinal incision was given over the swelling to expose the extensor tendons. The nodule was arising distal to the extensor retinaculum and on the extensor tendon of the index and long finger was noted to impinge upon the retinaculum in full extension (Fig. 3). It was encapsulated, pushing the retinaculum to become subcutaneous. The tumor was excised with its capsule from the surrounding structures. Tumor was adhered to the tendon sheath of the extensor tendons which was then meticulously separated by blunt and sharp dissection. Neurovascular bundles were well preserved. Skin was closed with 4/0 prolene suture. Gross examination of the tumor revealed well circumscribed firm, ovoid, tan-white soft tissue which measured 4cm X 5cm **(Figure 3).** Histologic examination revealed dense fibrous tissue with spindle cell tumor, mesenchymal cells but no atypical mitotic figures and necrosis were present which confirmed Fibroma of tendon sheath.

Patients recovery was uneventful. Stitches

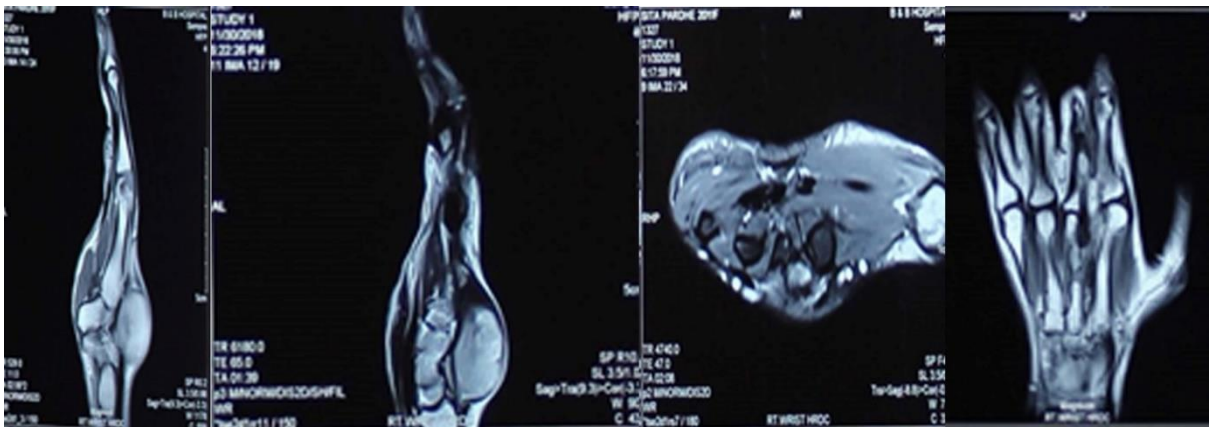

Figure 2: T1W and T2W MRI shows well circumscribed, oval shaped lesion in dorsal aspect of right hand with linear flow void within, encasing the extensor digitorum tendon as described likely benign lesion

Figure 3: Intraoperative findings: Nodule arising distal to the extensor retinaculum on the extensor tendon of the index and long finger. Complete excision of the encapsulated mass. Gross examination of the tumor revealed well circumscribed firm, ovoid, tan-white soft tissue which measured 4cm X 5cm

were removed after 10 post-operative day with no complications. Hand therapy was commenced in the early post-operative phase with instructions given for active range of motion exercises. Finger movements were almost to perfect and extension at the distal interphalangeal joint was almost achieved in three weeks.

Discussion

Benign tumours were originally classified as four types by Buxton in 1923: lipoma, fibroma, chondroma and ganglion.[3] However it was not till 1949 that the term 'tendon sheath fibroma' was first used. Chung and Enzinger described the largest series of these benign tumours and reported that they are well circumscribed tumours. Fibroma of the tendon sheath (FTS) is a rare, benign, soft tissue lesion with unknown etiology but about 20% of cases have microtrauma as a predisposing factor. It is usually a slow growing, painless and nodular mass over the finger, palm or wrist, 82% involving thumb, index and long finger. Lesion were commonly located over the flexor surface and being more common in men of 20-50 years of age.[4] It has an indistinct and generic macroscopic appearance that means they are commonly misdiagnosed amongst the different types of tumour such as a ganglion cyst or a giant cell tumour. Therefore, the diagnosis is based upon the distinct microscopic features. 80% involves upper extremity though our case is atypical since they tend to be more common in males and also in flexor compartments.

Giant cell tumor of the tendon sheath (GCTTS) is a benign tumor, as the second most common mass of the hand after ganglion cysts. It was first described by Chassaignac in 1852 as fibrous xanthoma and has since been referred to by multiple names, including localized nodular tenosynovitis, myeloxanthoma, and fibrous histiocytoma.[5] The tumor has undetermined etiology most commonly diagnosed in the fourth and fifth decades of life affecting women more commonly than men. GCTTS most commonly presents in a digit of the hand, it may also present in the palm, wrist, foot, knee, ankle, elbow, or hip. Grossly, GCTTS is a multilobular and generally well-circumscribed tumor with partial or completely encapsulated and may have extensions and/or satellite lesions connected by as little as a few strands of

fibrous tissue. Coloration varies from gray to yellow-orange with some brownish areas, depending on the amounts of hemosiderin, collagen, and histiocytes present in the tumor. Histologically, giant cell tumor is composed of 4 main cell types, namely the principal synovial cell, multinucleated giant cell, foam cell, and histiocyte-like cell. These cells are contained within a fibrous collagenous stroma, form synovial-lined spaces, and are often surrounded by a thin, fibrous capsule. The GCTTS and FTS are benign fibrohistiocytic lesions of the tendon sheath. Both these lesions share similar clinical features. Ultrasonography shows a solid, homogeneous, hypoechoic mass generally in relation to the flexor tendons of the fingers, with increased vascularity on Doppler studies. Magnetic resonance imaging reveals decreased signal intensity on T1- and T2-weighted images.

However, in comparisons to GCTTS, FTS can be distinguished histologically by the lack of giant cells, foamy histiocytes and synovial cells except for a variant degree of collagen formation and hyalinization. Satti reports that fibroma is probably one end of the morphological spectrum of regression of GCTTS, evidenced by the hyalinization characteristic of the former. (5).

Treatment for GCTTS and FTS is local excision. Care must be taken to preserve the tendons, and neurovascular structures. All surrounding tissues should be examined for satellite lesions, and connections to these lesions should be excised with gentle and slow dissection. If any erosion of the bone has occurred, curettage to remove the cortical shell is advised.

Major concern after treatment has been recurrence, with rates of up to 44% in GCTTS (1) whereas 24% in FTS.[6] In the case of recurrence, marginal excision of the tumor 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. However, radiotherapy has been indicated as an adjuvant therapy for the prevention of recurrence in case of GCTTS (1).

Conclusion

FTS and GCTTS are benign tumor of hand with dilemma for diagnosis which requires a pathological confirmation due to absence of characteristic clinical and imaging findings. A definite provisional diagnosis would help planning the surgery and complete local excision would probably prevent recurrence.

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