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Excision of recurrence of giant cell tumour of the tendon sheath: The correct setting to do it

Mohamed Faizal bin Sikkandar[1], Shafira Mohamad Sha[2], Mohd Fairudz Miswan[3], Sabrilhakim Sidek[4], Marymol Koshy[5]
[1] Department of Orthopaedics, Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh Campus, Sungai Buloh, Selangor, Malaysian
[2] Department of Medicine, Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh Campus, Sungai Buloh, Selangor Universiti Teknologi MARA, Sungai Buloh Campus, Sungai Buloh, Selangor, Malaysian
[3] Department of Orthopaedics, Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh Campus, Sungai Buloh, Selangor, Malaysian
[4] Department of Radiology, Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh Campus, Sungai Buloh, Selangor, Malaysian
[5] Department of Radiology, Faculty of Medicine, Universiti Teknologi MARA, Sungai Buloh Campus, Sungai Buloh, Selangor, Malaysian

Abstract
Introduction: Giant cell tumour of the tendon sheath (GCTTS) is a rare benign slow-growing tumour that arises from the synovial cells of the tendon sheath. We present a case of recurrence of GCTTS of the right index finger following previous excision at a local general practitioner's (GP) clinic.
Case Rpeort :48 year old lady presented to our clinic with progressive swelling of the right index finger of 2 years duration. She had a lesion in the same site 4 years ago which was removed at a GP clinic. She was not sure of the histopathological result and no radiological imaging of any kind was done for her prior to excision of lesion.
Discussion: GCTTS is diagnosed clinically with a radiological and pathological combination. Currently the best method of removal is marginal resection.
Conclusion: The purpose for reporting this case report is to emphasize that where GCTTS is suspected, it is best removed in a hospital setting following radiological imaging and confirmation by histopathological examination (HPE). Owing to the local recurrence varying from 9 to 44%, proper diagnosis and appropriate treatment of GCTTS is crucial. Imaging examinations plays a pivtal role as many factors related to tumour recurrence and can be observed on imaging.

Keywords: giant cell tumor, tendon sheath; benign tumor, prevention of recurrence, imaging examinations

Introduction

GCTTS is a benign lesion of uncertain etiology. Nearly 85% of GCTTS occur in the fingers, while 12% of tumors are located in the knee, elbow, hip and ankle [1]. Recurrence rates of GCTTS depend on surgical approach following radiological imaging. Usually marginal resection results in a lower recurrence rate. The aim here is to report this kind of rare case, which is best treated with marginal resection and to emphasize that it must be done in a hospital setting. Aside from a good physical examination and correct surgical approach, radiological examinations such as plain radiograph, ultrasound, and magnetic resonance imaging (MRI) are fundamental, allowing predictions about any predisposition to lesion recurrence.

Case Report

A 48 year old lady presented in orthopaedic clinic with complain of swelling on the palmar aspect of the right index finger. According to the patient she noticed the swelling for the past 2 years which had been growing gradually. The swelling is now interfering with her function of her finger especially since she needs the usage of her dominant right hand as she is a school teacher

She denied any history of trauma or constitutionsl symptoms however a more detailed history was taken and patient claimed that she had a swelling at the palmar aspect of the same finger 4 years ago which was excised by a local GP. The local excision took place as an outpatient and she was unsure of the pre operative workup and biopsy results

Clinical examination revelead a firm, painless, multilobulated swelling of the proximal phalanx and the metacarphalangeal joint of the dorso-medial aspect of the right index finger measuring approximately 4cm x 5cm (Fig 1). There was restricted movement at the metacarpophalangeal (MCP) joint with no distal neurovascular effect. The proximal interphalangeal joint had normal range of movement. The overlying skin was normal.

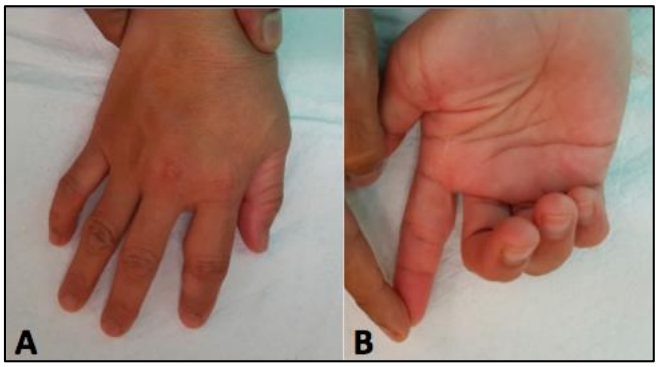

Fig 1: Clinical examination showing swelling of the proximal phalanx and the metacarphalangeal joint of the dorso-medial aspect of the right index finger from the dorsal (A) and palmar (B) views.

At this stage the differential diagnosis of giant cell tumor of tendon sheath, ganglion cyst or sebaceous cyst of the index finger, lipoma of the hand and hemangioma were taken into consideration.

The laboratory tests were normal. MRI revealed a well-defined, lesion at the mid right index finger on the palmar, dorsal and medial regions measuring approximately 2.5cm (length) x 2.0cm (Width) x 2.0cm (AP). It was located within the subcutaneous fat layer abutting and with minimal mass effect to the flexor tendon of the respective digit. The tendon was intact without any obvious extension of infiltraton of the lesion into it. There was blurring of the cortex of underlying bone, most likely due to pressure erosion, however, there wasn't any aggressive periosteal reaction. This lesion demonstrated homogenous isointense signal to muscle on T1W(Fig 2), slightly hyperintense signal to muscle on T2W(Fig 3A), heterogenously hyperintense on T2FS (Fig 3B), and fairly homogenous enhancement following intravenous contrast(Fig 4). Within this lesion no internal calcification or necrotic component were seen. The MRI was complemented by an ultrasound examination which demonstrated a well defined hypoechoeic lesion at the region aforementioned.

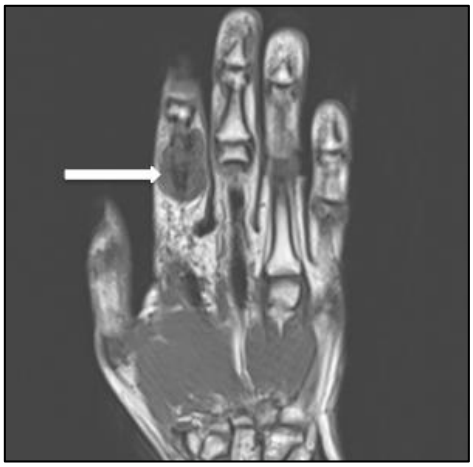

Fig 2: T1W on coronal view showing is intense signal intensity of the lesion (white arrow)

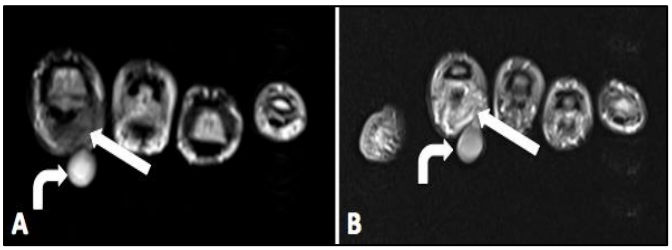

Fig 3: T2W on axial view (A) showing slightly hyperintense signal intensity and T2WFS on axial view (B) showing heterogenously hyperintense signal intensity of the lesion (white arrow). External Marker (curved arrow)

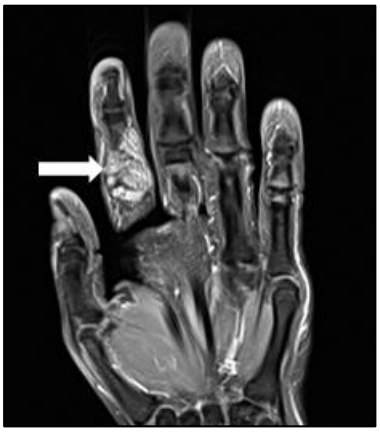

Fig 4: On the contrast-enhanced T1W the lesion (white arrow) demonstrated fairly homogenous enhancement.

The patient was planned for marginal excision and underwent excision of the lesion under digital anesthetia. Intraoperatively a glistening white smooth, ovoid lesion was seen arising from the tendon sheath of the extensor tendon of the right index finger *(Fig 5).* The lesion was completely excised without any injury to the underlying tendon *(Fig 6).* Biopsy material sent for HPE showed giant cell tumour. Postoperatively, active and passive range of movement exercises of the digits were done and the patient eventually gained full functional range of movement at MCP joint. Recovery looked propitious, hence she was discharged and followed up in the clinic. There was no wound issues and HPE results was informed.

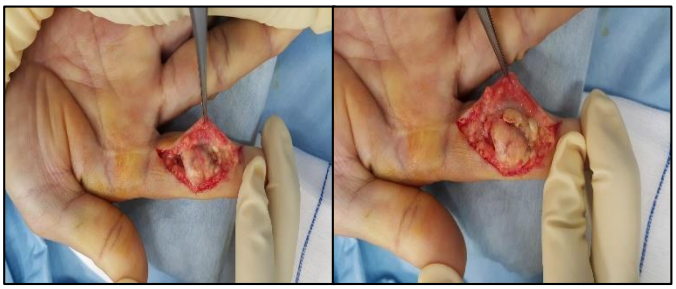

Fig 5: Intraoperative findings revealed a glistening white smooth, ovoid lesion arising from the tendon sheath of the extensor tendon of the right index finger

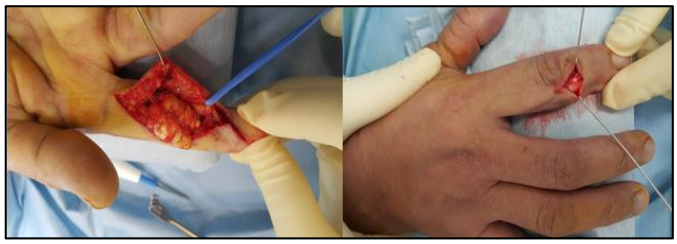

Fig 6: Postoperative, showing lesion completely excised without injury to the extensor tendon

Discussion

GCTTS is a rare benign tumor that develops from the synovial cells in the tendon sheaths. The tendon sheath is a layer of membrane that surrounds the tendon hence allowing the tendon to move smoothly. GCTTS can grow anywhere in the body where there is tendon sheath present, however it is most commonly seen in the hand and wrist. It primarily affects the fingers usually 2/3rds of the volar aspect of the index finger and long fingers. It is the second most common tumor of the hand after ganglion cyst. In 1852, Chassaignac first described these benign masses as cancers of the tendon sheath [2]. He referred to them as fibrous xanthoma. In the later years, it was renamed fibrous xanthoma of synovium, pigmented nodular tenosynovitis, benign synovioma, tenosynovial giant cell Tumour, localized nodular tenosynovitis, and fibrous histiocytoma of synovium [3]. Based on the World Health Organization classification system for bone and soft tissue tumours, it is classified as a "fibriohistiocytic tumour". The tumor is further divided into the diffuse type and localized nodular type. The diffuse type is hypercellular with several giant cells, whereas the localized type is hypocellular with numerous giant cells. The diffuse type is referred as pigmented villonodular synovitis (PVNS) and the localized type giant cell tumor of the tendon sheath. Al-Qattan classified GCTTS as Type I, which is a single tumor, either round or multi-lobulated, and Type II, consisting of two or more distinct tumours that are not joined together. Type I and II were further subclassified. This classification was found to be useful in prediction of recurrence since satellite lesions are often missed [4].

These lesions are classically described in individuals between the ages of 30-50 years with a female predominance. GCTTS are usually slow growing and present as a non-painful lump. The etiology of the disease is unknown hence the tumor is usually considered idiopathic. In about 15% of cases the patients have history of trauma, however in most cases the reason cannot be determined [5] Aside from trauma, other postulated theories include infection, vascular disturbances, inflammation, osteoclastic proliferation, and immune mechanisms [6]. Initially GCTTS was regarded as an inflammatory disease, however due to the finding of aneuploidy in some cases and the demonstration of clonal chromosomal abnormalities, it strongly supported a neoplastic origin [7].

Local recurrence ranges from 9% to 44%. This varying range is possibly due to incomplete excision of the lesion, especially if satellite nodules are present. Factors such as presence of adjacent degenerative joint disease, injury at the adjacent joint or presence of osseous pressure erosions can also increase the risk for recurrence. Hence prior to surgery imaging examinations can prepare the patient and surgeon for recurrence. As many factors such as bone invasion is generally related to tumour recurrence and can be observed on imaging examinations. Type I tumours were more frequently detected (78.7%) than type II tumours (21.3%) but the latter were associated with a higher recurrence rate ($p < 0.001$) [8].

Radiological imaging such as plain, radiograph, ultrasound and MRI are extremely helpful in pre-operative planning to prevent recurrence. Plain radiography can depict signs of bone pressure and/or cortical erosion due to long-term pressure. Ultrasound is convenient and cheap and it can demonstrate the echogenicity, location, size and vascularization of the tumor. MRI is extremely important for preoperative diagnosis. The distinguishing features on MRI include low signal intensity on T1 and T2 weighted images with iso or hyperintense signal intensity when compared to the skeletal muscle with homogenous enhancement following intravenous gadolinium.

The treatment of choice for GCTTS is marginal excision[9]. Due to the close proximity of the tumor with the tendon sheath or synovium of the joint, complete excision can be difficult. In the presence of joint arthritis, debridement or fusion of the small joint may be necessary

Conflict of Interest

The authors declare that they have no conflict of interests and no financial support was received for this study.

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