



Recurrent Giant Cell Tumor of Tendon Sheath: A Case Report

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Authors' contributions

This work was carried out in collaboration between all authors. Authors GTC and NNT designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors HHKS and MFBY managed the analyses of the study. Author FCTF managed the literature searches. All authors read and approved the final manuscript.

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Case study

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ABSTRACT

Giant cell tumor of tendon sheath (GCTTS) is a benign tumor, yet its recurrence appears to be a concern of many surgeons. GCTTS is commonly seen in the hand, and it presents as a slow-growing, painless mass. The best treatment of GCTTS and its recurrence remains controversial. However, it is recommended to perform tissue diagnosis via fine needle aspiration cytology (FNAC) for preoperative planning, then a complete excision under magnification to reduce the recurrence rate of GCTTS. This article illustrates the management of a case of recurrent GCTTS of the flexor digitorum profundus of the right hand by complete excision.

Keywords: Giant cell tumor; treatment; recurrent; complete excision.

1. INTRODUCTION

Giant cell tumor of the tendon sheath (GCTTS), also known as a localised type of tenosynovial giant cell tumor is the second commonest tumor of the hand [1]. It usually manifests as a discrete and solitary nodule, attached to tendon sheath along with wrist and fingers. It is presented as a slow-growing and painless mass, which affects both the sexes equally in their 20's to 40's [2]. The reported recurrence rate ranges from 9% to 44%. It was found that the most important cause of recurrence is due to incomplete excision of the tumor, leaving the satellite nodules behind. Therefore, it is suggested that wide surgical exposure and meticulous dissection of the lesion, as well as the satellite nodules under magnification, should be undertaken to reduce the risk of recurrence of GCTTS. Ultrasound is useful because demonstrate the characterisation of the lesion and relationship with the adjacent tendon. Tissue diagnosis via fine needle aspiration cytology (FNAC) is also recommended for preoperative planning, as it is imperative to reduce the recurrence rate of GCTTS [1]. Here we present a case of GCTTS of the right hand, which was treated with complete excision.

2. CASE REPORT

A 44-year-old Malay man was admitted with the chief complaint of recurrent growth in the palmar aspect of his right thenar eminence. He is a known psychiatric patient diagnosed in 2005, treated with Venlaflexine and regularly follow-ups at the clinic. He had a previous history of Giant cell tumor of the flexor digitorum profundus tendon sheath in 2011, subsequently treated with excision biopsy. In the current presentation, it was a painless growth in the thenar eminence of his right hand. The growth appeared insidiously one year after his operation and has slowly increased in size since then. Upon admission, the growth was of 3 x 6 cm in size. On examination, the growth was non-tender, non-fluctuant, not adherent to the underlying bone and did not restrict the range of movements. MRI was performed and revealed a smooth, homogenous growth with well-defined margins at the same operational site as previously in 2011. T1-weighted scans revealed low signal intensities suggestive of hemosiderin deposition (Fig. 1) [3]. The growth was removed by excision biopsy (Fig. 2) and the specimens were sent for histopathological studies, which revealed to be a

giant cell tumor, confirming the diagnosis of a recurrent giant cell tumor of the flexor digitorum profundus tendon sheath at the same operational site (Fig. 3). The patient was observed for a few days and discharged without any complications.

3. DISCUSSION

Giant cell tumor of tendon sheath (GCTTS) is a localized variant of tenosynovial giant cell tumor. The chromosomal abnormality is commonly a translocation of t(1;2)(p13;q37), which combines the colony-stimulating factor 1 (CSF1) to the collagen type VI alpha-3 gene promoter. This combination, in turn, leads to excessive expression of CSF1, which attracts macrophages to infiltrate the tumor. GCTTS usually presents itself as a benign, slow-growing painless mass in the hand, especially phalanges, which can lead to cortical erosion of the adjacent bones in 15% cases. Histologically, GCTTS are heavily infiltrated by macrophages which contain vacuoles of hemosiderin and along with histiocytes polyhedral, fibrotic material. When these macrophages coalesce, they give the appearance of a multi-nucleated giant cell, hence its' name [1]. It is important to note that these giant cells are different from polyploid/multinucleated giant cancer cells that can give rise to highly metastatic and therapy-resistant progeny with stem cell-like properties [4].

GCTTS is notorious for its' recurrence rates, ranging from 9-45%. The recurrent swellings can commonly be found occurring in the phalanges. Many theories have been proposed and studies conducted to identify the cause for the high recurrence rates [5]. Due to the presence of adjacent cortical erosions in 15% of the cases, this has prompted researchers to believe that the presence of erosion leads to the infiltration of tumor cells on the neighboring structures, which leads to recurrence. However, a study conducted by Lowyk and De Smet found no significant correlation between cortical erosions and recurrence [6]. In addition to that, research into grading GCTTS to predict the recurrence rate has also been conducted. Byers graded GCTTS into a nodular and a diffuse variant and found that the diffuse variant had higher recurrence rates due to its diffuse nature making complete excision difficult. However, the diffuse variant is commonly found in joints [2]. Al-Qattan has also



Fig. 1. Shows the MRI of the right hand. T1 weighted scan reveals areas of low signal intensity, suggestive of hemosiderin depositions in the growth



Fig. 2. Shows excision biopsy being performed. Dissection of the skin, subcutaneous tissue and superficial fascia revealed a multi-nodular growth attached to the tendon sheath of the flexor digitorum profundus

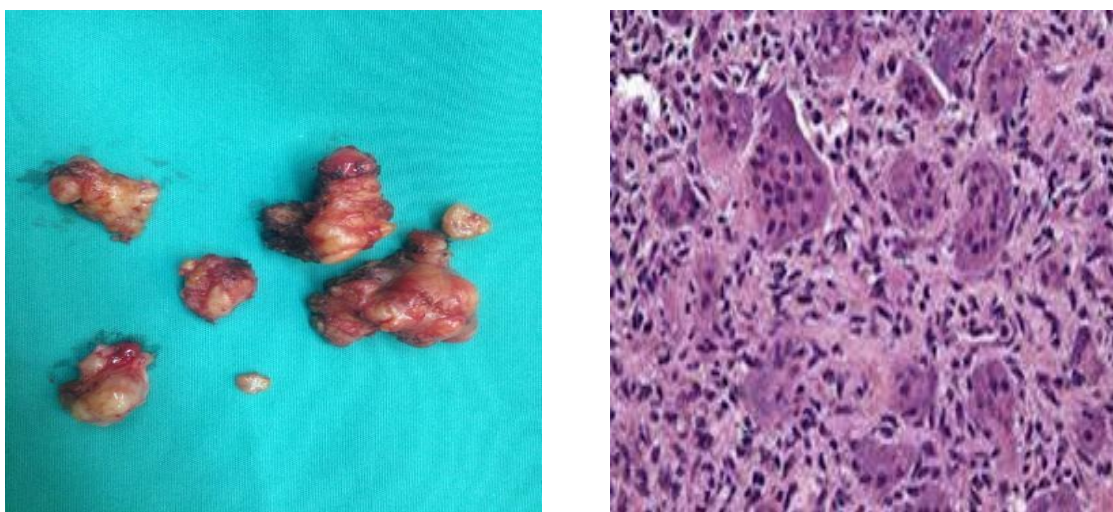


Fig. 3. Shows the excised giant cell tumor originating from the tendon sheath. The specimens were sent to for histopathological studies, confirmed the specimens as giant cell tumor

graded GCTTS into Type I and Type II based on the number of tumors, thickness of capsule, lobulations of the tumor and the satellite lesions. This method of classification is done intra-operatively and it has been found that recurrence happens only in Type IIb and Type IIc [7]. These classifications have shown significant relations between the morphology of GCTTS and its' recurrence, hence prompting some orthopedic surgeons to advocate using microscopic excision to be able to completely excise all tumor tissues [2]. Another theory states the synovium of tendon sheath, bursa and joint to be one anatomical unit in which GCTTS can occur. This makes complete excision difficult as GCTTS can spread to the neighbouring synovium. A study was conducted on the usage of radiotherapy as a post-operative prophylaxis to recurrence. It was found that patients who underwent radiotherapy did not have any recurrence, hence stating that post-operative radiotherapy can be used as a treatment modality in cases where complete excision of GCTTS is not possible [8].

In this patient, the GCTTS occurred in his hand, and later recurred within a year at the exact same location in his hand, not in the phalanges, which is more common [5,9]. The recurrence was likely due to the incomplete excision performed previously. In short, in order to prevent further recurrences, a complete excision and biopsy were performed.

4. CONCLUSION

Giant cell tumor of tendon sheath is commonly a benign tumor of the hand. As the tumor adheres

to the tendon sheath, through the process of excising of the tumor, some remainder tumor cells may be left on the tendon sheath or adjacent structures, leading to recurrence. Hence, complete excision and biopsy are recommended as the treatment for giant cell tumor of the tendon sheath to prevent further recurrences in the future.

CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the authors.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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