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Giant Cell Tumour of Extensor Tendon Sheath in the Hand–A Case Report and Strategies to Prevent Recurrence

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Report

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ABSTRACT

Aims: Giant cell tumour of tendon sheath (GCTTS) was first described by Chassaignac back in 1852 as a rare benign tumour of uncertain aetiology. GCTTS is a painless slow growing benign tumour that develops over period of months to years. They present a surgical dilemma due to their high incidence of recurrence.

Presentation of Case: A 50 years old Malay lady presented to us with left middle finger pain and swelling for 4 months which was slowly increasing in size. She was diagnosed with giant cell tumour of left middle finger proximal phalanx and underwent excision biopsy and on regular follow up to monitor for any recurrence. So far after one year of follow up there is no recurrence of the disease.

Discussion: Giant cell tumour of tendon sheath (GCTTS) is a locally aggressive, proliferative disorder of the synovium involving a joint, bursa or tendon sheath. Surgery remains the primary treatment of choice for GCTTS. However, surgery alone in GCTTS has high recurrence rate of as high as 30%. We will discuss on strategies to prevent recurrence of this condition.

Conclusion: Every effort should be made to have complete excision of tumour without leaving behind satellite lesions and bony erosions should be thoroughly curetted to reduce the risk of

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recurrence. Patient may also be offered the benefit of radiotherapy if the excised specimen shows evidence of mitosis or if the excision is less than complete. Patients with these risk factors should be offered regular follow up for up to five years to make sure that any recurrences are identified early.

Keywords: Giant cell tumour; tendon sheath; recurrence; hand tumour.

1. INTRODUCTION

Giant cell tumour of tendon sheath (GCTTS) was first described by Chassaignac back in 1852 as a rare benign tumour of uncertain aetiology [1]. It is a locally aggressive, proliferative disorder of the synovium involving a joint, bursa or tendon sheath. It usually presents as a subcutaneous nodule over the hand, but occasionally it may involve other parts of the body like spine, knee and feet [2]. Although it is benign, it still has the potential to turn malignant and metastasise. It has very high recurrence rates. Reports of recurrence ranging from 7% to as high as 44% [3,4]. We are reporting a case of GCTTS of left middle finger proximal phalanx in an otherwise healthy 50 years old lady who underwent excision biopsy of the tumour and on regular follow up to monitor for any recurrence and highlight on strategies to prevent recurrence.

2. PRESENTATION OF CASE

A healthy, 50 years old Malay lady was referred to us from rheumatology clinic for excision biopsy of swelling over left middle finger. She presented with complaint of left middle finger pain and swelling for 4 months which was slowly increasing in size. There was no history of trauma. She also denied any history of constitutional symptoms. She was initially referred from district health clinic to tertiary hospital rheumatology clinic to rule out rheumatoid arthritis in which all rheumatoid serology tests were negative. Physical examination showed a painless mobile swelling measuring 2x1 cm overlying the dorsal surface of middle phalanx of left middle finger. Range of motion of adjacent joints (distal interphalangeal and proximal interphalangeal joints) was preserved and capillary refill time was normal. There were no surrounding skin changes and no palpable regional lymphadenopathy.

Plain radiograph of left hand revealed no bony abnormalities but only unmineralized soft tissue shadow over the proximal phalanx of left middle finger as shown in Fig. 1. MRI of left hand showed lobulated lesion at radial aspect of proximal phalanx of left middle finger measuring 0.9 cm x 0.7 cm x 1.2 cm (AP x W x CC)

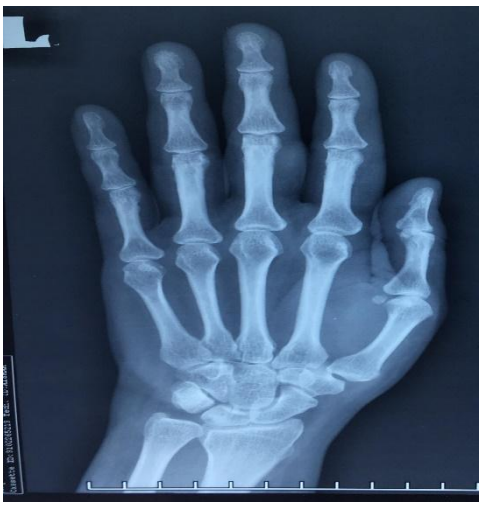

Fig. 1. Plain radiograph of left hand revealed no bony abnormalities but only unmineralized soft tissue shadow over the proximal phalanx of left middle finger

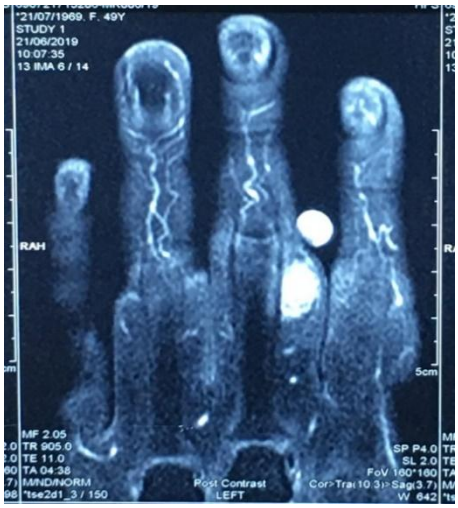

Fig. 2. MRI image of left hand showed lobulated lesion at radial aspect of proximal phalanx of left middle finger measuring 0.9 cm x 0.7 cm x 1.2 cm (AP x W x CC)

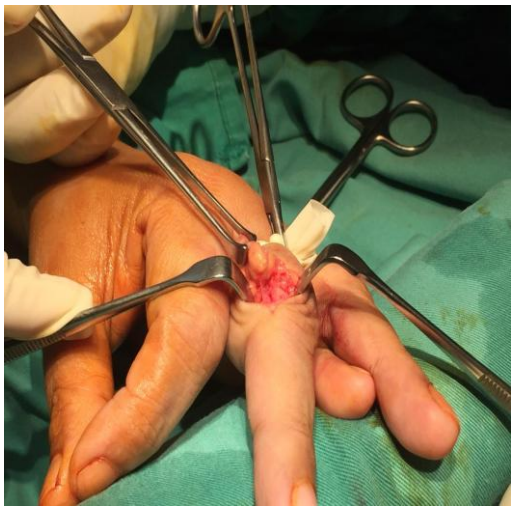

Fig. 3. Intraoperative photo showing of GCTTS arising from extensor digitorum tendon

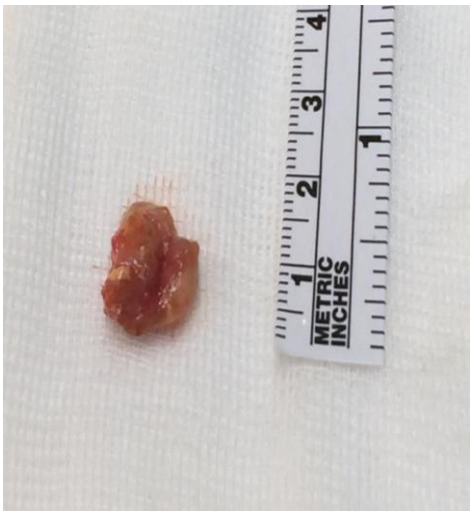

Fig. 4. Intraoperative photo showing an excised mass measuring 1.5 cm x 1 cm

which showed similar signal intensity to the adjacent muscles and heterogenous enhancement in post Gadolinium as shown in Fig. 2. The lesion abuts the adjacent periosteum but no reaction or erosion noted. It has closed proximity to the adjacent extensor digitorum tendon. No significant intraarticular or intrasynovial involvement. The rest of the bone, muscles and tendons are normal in outline and signal intensity. Neurovascular bundles are preserved and findings likely represent giant cell tumours of tendon sheath of left middle finger.

We proceeded with excision biopsy of the left middle finger GCTTS. Intraoperatively noted a nodular swelling measuring 1.5cm x 1cm arising from the extensor digitorum tendon of the left middle finger as shown in Figs. 3 and 4. It has a well-defined margin and not encapsulating overlying tendon, blood vessels and nerves. It was sent for histopathological assessment which revealed a moderately cellular infiltration of mononuclear cell with occasional osteoclast like multinucleate giant cells suggestive of GCTTS. Patient was discharged on the same day and seen back at clinic regularly with no residual functional debility and recurrence. So far after one year of follow up there is no recurrence of the disease.

3. DISCUSSION

Giant cell tumours of tendon sheath (GCTTS) are the second most common benign tumours affecting the hands after ganglion cysts. The incidence is higher in women than in men and is most commonly seen in third to fifth decades of age. GCTTS is a painless slow growing tumour that develop over a period of months to years [5]. GCTTS may be intra- or extraarticular. It is classified by clinical presentation and biological behaviour as localized or diffuse; the latter is more aggressive [6]. The localized form of GCTTS is most prevalent and generally follows an indolent course. It frequently affects the tendon sheath and joints of the hands [7]. In contrast, diffuse type GCTTS are less common and typically affect the knee, hip, or shoulder. The knee is commonly involved in 80% of cases, but any joint may be affected [8].

The aetiology for this condition remains unclear. Various causes had been postulated including trauma, disrupted lipid metabolism, immune mechanisms, inflammations and neoplasms [9]. The most widely accepted theory is a reactive or regenerative hyperplasia associated with an inflammatory process developed from synovial linings of tendon sheath as proposed by Jaffe et al. [10]. Patients usually present with painless swelling over the hand. However, they can come with painful swellings when it occurs elsewhere in the body. Cytogenetic data indicates that 1p11-13 is the region most frequently involved in structural rearrangements [11]. The primary diagnostic tool is ultrasonography of the mass which usually shows homogenous hypoechoic mass. It can provide useful information about tumour size, vascularity and its relationship with surrounding tissues [12]. MRI should remain the most conclusive preoperative tool to diagnose GCTTS. Characteristic features include low signal T1 and T2 weighted images, similar to that

of skeletal muscles [13]. Preoperative diagnosis with FNAC can help in preoperative planning to avoid recurrence. Microscopic features of most GCTTS cases are moderately cellular and composed of sheets of rounded-to-polygonal cells that are found alone or in papillary clusters and blend with hypocellular collagenized zones. These cells are mononuclear cells and they are predominant in GCTTS. Variable numbers of giant cells are present. Haemosiderin containing xanthoma cells are common and often seen at the periphery of the lesion [14,15].

Surgery remains the primary treatment of choice for GCTTS. Most authors agree that the best way to prevent recurrence is complete surgical resection. The use of microscopic excision with operating microscope or magnifying loupes, tourniquet, meticulous dissections and thorough exploration for satellite lesions are of great importance for total excisions of tumours [16]. The involvement of bone should be managed with bone debridement and curettage.

Surgery alone in GCTTS has high recurrence rate of as high as 30%. The associated risk factors include proximity to the distal interphalangeal joints in fingers, proximity to interphalangeal joints of thumb, radiological osseous erosions and proximity to the arthritic joint [17]. This could be due to the reason that it is difficult to adequately excise the tumour distally in the interphalangeal and distal interphalangeal joint level whereby the neurovascular structures are near to the tumour. Patients with these risk factors should be followed up annually for five years and be warned about possibility of recurrence [18]. Incomplete excision and leaving behind satellite lesions are considered as the most important factors in association with recurrence.

Postoperative radiotherapy in dosage of 20 Gy in divided doses of 2 Gy may have a role in cases where complete excision is not possible, presence of mitotic figures or bone involvement [19]. In a study done by Kotwal et al, the recurrence rate following this protocol was 0% (0 out of 14 patients).

Differential diagnosis of tumours of the hand include ganglion cyst, lipoma, haemangioma, foreign body, myxoid cyst, synovial carcinoma, tophaceous gout, glomus tumour, aneurysmal bone cyst, tuberous osteitis, epidermal cyst, fibroma and metastasis [20-23]. Granuloma annulare and erythema elevatum diutinum should also be taken into consideration. Aspiration of the mass can help rule out tophaceous gout, however the definitive diagnosis is confirmed only with surgical excision and histopathological examination of the lesion [24]. Only 20% to 30% of GCTTS are clinically diagnosed before surgery. Thus, histopathology is crucial since the lesion can resembles other medical conditions.

4. CONCLUSION

In conclusion, every effort should be made to have complete excision of GCTTS without leaving behind satellite lesions and bony erosions should be thoroughly curetted to reduce the risk of recurrence. Patient may also be offered the benefit of radiotherapy if the excised specimen shows evidence of mitosis or if the excision is less than complete. Patients with these risk factors should be offered regular follow up for up to five years to make sure that any recurrences are identified early.

CONSENT AND ETHICAL APPROVAL

Informed consent was taken from the patient and no ethical clearance is required.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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