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Giant Cell Tumor of FDP Tendon Sheath in Young: A Rare Case Report

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Abstract

Introduction: Giant cell tumor of the tendon sheath of the hand (GCTTS) is a benign tumor of unknown cause. The clinical diagnosis is supported by pre-operative imaging. The standard of care is surgical resection along with histological confirmation. It appears as a palpable enlargement that is painless. Although pre-operative imaging and fine-needle aspiration cytology (FNAC) corroborate its suspicion, histology following surgical resection is mostly responsible for establishing its diagnosis. Due to its rarity, a case of GCT of the flexor tendon sheath of the right index finger is reported here.

Case Report: We give an example of a patient with giant cell tumor (GCT) of the flexor digitorum profundus tendon sheath in a male patient who is 18 years old. On examination, a 1.8 × 1.2 × 1.0 cm swelling was seen covering an adjoining tendon on the palmar surface of the right index finger at the middle phalanx. The swelling was well-defined, had a smooth surface, was consistently firm, and could be easily pushed in a sideways direction. An isolated soft-tissue shadow was visible in the affected area of the hand's X-ray, but there was no bone involvement. As a professional shooter, the patient utilizes his right index finger as a trigger finger.

Conclusion: In adults with hand soft-tissue tumors, GCTTS should be considered as a possible differential diagnosis, especially when there's any evidence of repeated inconsequential minor trauma. The patient should be monitored to find and treat recurrences.

Keywords: Giant-cell tumors, FDP tendon, GCTTS.

Introduction

The tendon sheath giant cell tumor of (GCTTS) usually presents as a firm, well-defined nodular enlargement that is painless and usually proximal to the distal interphalangeal joint on the dorsal or volar side of the finger. After ganglion cysts, giant cell tumor of the tendon sheath (GCTTS) is the second most commonly occurring tumor in the hand. Among the fingers, index finger, followed by the middle, ring, little, and thumb, is the one most frequently affected. In addition, it can also be seen in elbow, hip, knee, and ankle [1,2].

The frequency is 1 in 50,000 people overall, with adults between the ages of 30 and 50 making up the majority of those affected. With a female-to-male ratio of 3:2, it is more prevalent in females [3]. Radiation may be used in conjunction with or without complete local excision as the form of treatment. In 10–20% of patients, local recurrence has been reported to occur.

There is dispute over the origin of giant cell tumors, as seen by the wide variety of nomenclature. The tumor has been referred to by several different names in the literature, including benign synovioma, sclerosing hemangioma, giant cell fibrohemangioma, pigmented nodular synovitis, tenosynovial GCT, localized nodular tenosynovitis, and fibrous xanthoma [4,5].

Whether GCTTS is a neoplasm or a mass reactive proliferation is still subject to debate [1]. About 15% of patients recall some trauma occurring before swelling, although there is no proof that this trauma caused the swelling [6]. The discovery of aneuploidy in some cases and the identification of clonal chromosomal aberrations support a neoplastic origin, contrary to earlier assumptions that it was an inflammatory swelling.

Case Report

An 18-year-old male patient with the primary complaint of swelling across the

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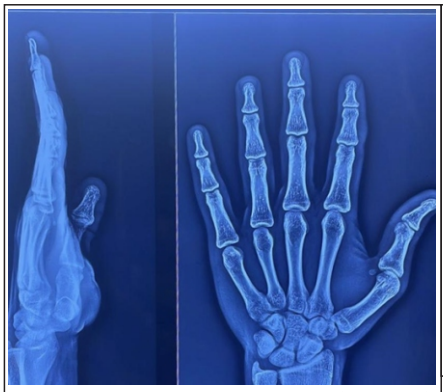

Figure 1: Pre-operative radiograph anteroposterior and lateral view of the right hand.

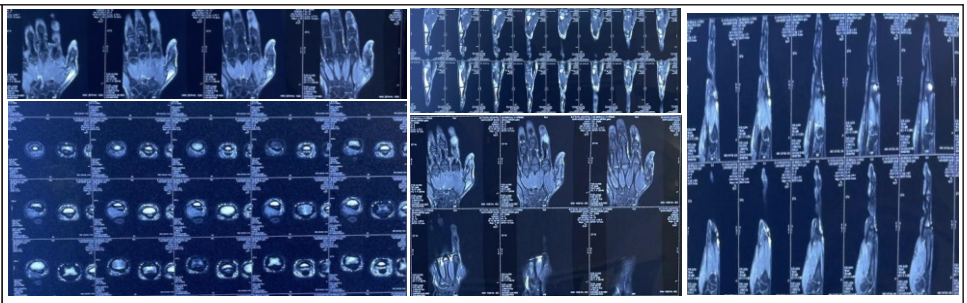

Figure 2-6: Pre-operative MRI of the right hand showing oval lesion involving the palmar surface of index finger at the middle phalanx overlying the flexor digitorum profundus.

front of the right index finger for 6 months presented to the orthopedic outpatient department of our tertiary healthcare facility in Navi Mumbai. The swelling appeared spontaneously with no immediate history of previous trauma. However, the patient is a professional shooter and uses his index finger as a trigger finger. Repeated uneventful traumas could have a correlation with the pathology. It grew gradually and did n'ot interfere too much with daily life or domestic chores.

Physical examination

On examination, a 1.8 cm × 1.2 cm × 1.0 cm swelling was found involving the palmar surface of the right index finger at the middle phalanx overlaying adjacent tendon. There was no local elevation of temperature or involvement of the skin. The swelling had a clearly defined shape, a smooth surface, and a consistently hard consistency. Although the edema was easily mobile in a sideways direction, it was not as mobile in a proximal to distal direction. Clinically, there was no involvement of the bone. As the finger moved, the swelling fluctuated.

Hemoglobin, total and differential cell counts, random blood sugar, kidney and liver function tests, as well as other blood examinations, all fell within normal bounds.

Radiological findings

X-ray of the right hand AP and lateral views showed no involvement of bone with the swelling but a localized soft-tissue shadow over the middle phalanx can be observed (Fig. 1).

MRI showed a 1.8 cm × 1.2 cm × 1.0 cm (AP × TR × CC) sized well-defined oval-shaped lesion involving the palmar surface of the index finger at the middle phalanx overlying adjacent tendon. Posteriorly, it is seen scalloping and displacing the flexor digitorum profundus toward the ulnar aspect with loss of intervening fat planes. Distally, it is seen reaching the proximal end of the distal phalynx. It is not seen crossing the joint space. No obvious cortical erosion of the underling bone or intraosseous extension is noted.

The rest of the visualized muscles, bones around the wrist, metacarpals and phalanges appear, small joints of the hand, .that is, inter-phalangeal, meta-carpophalangeal and intercarpal joints, tendons, and neurovascular bundle appear normal. There is no involvement of articular cartilages. No joint effusion is seen (Figs. 2a-e).

FNAC

A fine-needle aspiration cytology was advised to the patient, on histopathology, multinucleated large cells were visible on histopathology, and they were scattered across a stroma of round to polygonal histiocytes, fat, and fibrous tissue, which is typical of GCTTS (Fig. 3).

Management: The patient was planned for a en bloc excisional surgery. A tourniquet created by chopping off the little finger of a sterilized surgical glove was employed while the patient was sedated and under local anesthetic. The encapsulated tumor was removed in one piece with clear margins on all sides. It was affixed to the flexor digitorum profundus tendon and laid deep to the fascial plane. The tumor's cut section revealed whitish, reddish fibrofatty tissue that was 1.5 × 1 × 1 cm in size (Fig. 4).

The recovery time went without

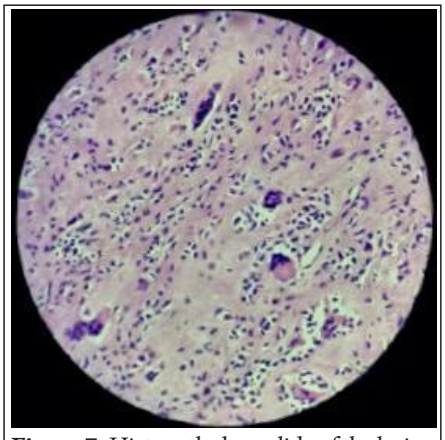

Figure 7: Histopathology slide of the lesion showing round to polygonal histiocytes, fat, and fibrous tissue.

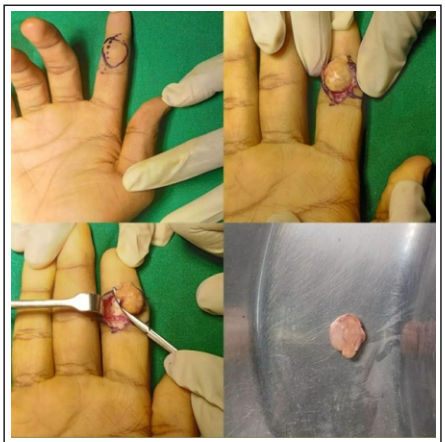

Figure 8: Intraoperative photograph showing the lesion involving the tendon sheath of flexor digitorum profundus.

incident. The patient's 6-month follow-up has ended without any clinical signs of edema. The patient gained full range mobility of the digit post-surgery.

Discussion

There are two clinical manifestations for GCTTS, nodular or diffused. Nodular form is more prevalent. A small number of malignant GCTTS cases have also been documented. The diffuse kind is a second, less frequent variety that recurs frequently and can be treated with a number of increasingly morbidity-causing operations. The medicine pexidartinib has been used successfully to reduce the growth of this tumor [7]. Eighty-four instances of GCTTS were examined by Lautenbach et al. [2]. His research did not provide a superior soft-tissue imaging technique for pre-operative planning or diagnosis. On sonography, tumors have been described as both hypoechoic and hyperechoic.

GCTTS appears as a low signal intensity on T1- and T2-weighted MRI scans, and accurate measurements of its size and extent can be made, aiding the surgical strategy. Histopathological confirmation is necessary since MRI cannot distinguish between GCTTS, villonodular synovitis, synovial chondromatosis, and synovial sarcoma.

According to several reports, the local recurrence of GCTTS ranges from 4.7% to 45% [8, 9, 10, 11, 12, 13, 14, 15]. Di Grazia et al. [8] evaluated 64 cases and found that 4.7% of them had recurred, 10.9% had tendon involvement, and 4.7% had bone erosion. The presence of osteoarthritic alterations, pressure erosion on X-rays, the position of the tumor at the IP joints, and insufficient surgical excision are all indicators of recurrence.

In instances with predictive indicators, Kotwal et al. [10] post-operative radiation recommendation of 20 Gy in daily dosages of 2 Gy was found to have a 0% recurrence rate in a series of 14 cases.

The described instance manifested as a benign tumor in the typical manner. On FNAC, the diagnosis was suspected, and the surgical specimen's histology confirmed it. At 6 months, the patient exhibits no clinical or ultrasound indications of a recurrence. A minimum 2-year follow-up period is also planned to detect any recurrence.

Conclusion

GCTTS should be considered as a potential differential diagnosis in adults with hand soft-tissue tumors, particularly if there is any indication of past mild repetitive trauma. To identify and treat recurrences, the patient has to be followed closely.

Clinical Message

The aim of this study is to demonstrate the unknown etiology associated with the GCTTS which, in this case, was a young adult an army personnel using the index finger to trigger the firearm weapon.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his/her consent for his/her images and other clinical information to be reported in the Journal. The patient understands that his/her name and initials will not be published, and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

Conflict of Interest: NIL; **Source of Support:** NIL

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