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Plastic Surgery

GIANT CELL TUMOR OF TENDON SHEATH - AN EXPERIENCE OF 20 CASES

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ABSTRACT Giant cell tumor of the tendon sheath (GCTTS) is quite commonly encountered by hand surgeons & plastic surgeons. Despite being a non-malignant condition, there is lot of debate regarding high recurrence rate of it and ways of achieving successful recurrence - free outcome . The authors operated on 20 cases of GCTTS, after fine needle aspiration cytology confirmation and using a magnifying loupe for complete excision of the lesion including the satellite nodules. There was no case of recurrence. Preoperative diagnosis and meticulous surgical technique were found the only predictive factor of recurrence. During the 5 year period from 2019 to 2024, 20 patients [19 females, 1 male, mean age 31 yrs, ranging from 17– 50 years] underwent excision of giant cell tumor of tendon sheath of hands &feet . The lesions were found over the thumb [n=4], ring finger [n=2], index finger [n=4], middle finger [n=6]and over the hand [n=2], over distal forearm [n=1], great toe [n=1] The lesions were classified using the Al-Qattan classification. The most common presentation was with a mass over the hand, with a predilection to the middle finger [n=6]. Radiological changes in the form of bony indentation was seen in only 2 cases. FNAC was inconclusive in 2 out of the 12 cases. Due to the high incidence of recurrence, preoperative planning aided by a tissue diagnosis with fine needle aspiration cytology, wide surgical exposure, and meticulous dissection with help of magnification are imperative for a successful outcome in GCTTS.

KEYWORDS :

INTRODUCTION

Giant cell tumor of the tendon sheath (GCTTS) is the second most common tumor of the hand after ganglion cysts[1,2]. It is a slowly growing, usually painless benign lesion of soft tissues. The tumor affects individuals between the age of 30 and 50 years old and is found more often in women than men[3-6]. Despite its benign character, local recurrence after excision has been reported in up to 45% of cases[7]; there is still debate regarding defined treatment protocol and local excision with or without radiotherapy is the treatment of choice to date[1,2,7-13].

MATEIALS & METHODS

A retrospective study was conducted in our Department of Plastic and Reconstructive Surgery and all data were collected from medical records of 20 GCTTS patients within this Department from 2019 to 2024. Medical record included the age, gender, tumor location, presentation and size, clinical features, treatment modality, histopathological report and neurovascular or tendon involvement.

All 20 cases were operated under tourniquet control, using a magnifying loupe. Special care was taken to excise the tumor in total, retaining the capsule, if present, with margin of normal tissue (Fig. 2) . The operating field is searched for presence of satellite lesions. In some cases (n=3) , satellite lesions were identified on table & were excised similarly.

The histopathological diagnosis and immunohistochemical studies were conducted by the Department of Pathology within the same Hospital. Follow-up ranged from 12–54 months.

Post operative functional & aesthetic outcome was assessed in terms of recurrence of tumour, ROM of adjoining joints involved, scar hypertrophy.

No patient within this study had been treated with chemotherapy or radiation prior to treatment at our institution, and no additional adjuvant treatments were performed.

RESULT & ANALYSIS

Age of patients ranged from 15 to 77 years (mean age 45 years) and GCTTS is found more often in the fourth and fifth decade of life. Out of 20 patients, 19 were females and 1 males.

The lesions were found over the thumb [n=4], ring finger [n=2], index finger [n=4], middle finger [n=6]and over the hand [n=2], over distal forearm [n=1], great toe [n=1] (Fig. 1 , 2, 3)

Table 1: The Case Series

No	Age	Sex	Site	FNAC	Al Qattan type	X-ray changes	Re-currence
1	19	F	index finger	Positive	Ib	Nil	Nil
2	17	F	thumb	Positive	Ia	Nil	Nil
3	35	F	middle finger	In-conclusive	Ia	Nil	Nil
4	24	F	ring finger	Positive	IIb	Nil	Nil
5	43	F	middle finger	Positive	IIa	Soft tissue shadows	Nil
6	48	F	thumb	Positive	Ia	Bony inden-tation	Nil
7	27	F	thumb	In-conclusive	IIb	Nil	Nil
8	39	F	middle finger	Positive	IIb	Nil	Nil
9	21	F	index finger	Positive	Ib	Nil	Nil
10	26	F	index finger	Positive	Ib	Nil	Nil
11	50	M	middle finger	Positive	IIa	Nil	Nil
12	40	F	distal forearm	Positive	Ic	Nil	Nil
13	47	F	thumb	Positive	IIa	Soft tissue shadows	Nil
14	38	F	middle finger	Positive	IIa	Nil	Nil
15	26	F	hand	Positive	Ib	Nil	Nil
16	28	F	ring finger	Positive	IIa	Nil	Nil
17	25	F	index finger	Positive	IIc	Nil	Nil
18	46	F	great toe	Positive	Ia	Nil	Nil
19	18	F	middle finger	Positive	Ib	Bony inden-tation	Nil
20	25	F	hand	In-conclusive	IIa	Nil	Nil

Table 2: Post Operative Outcome

Post op outcome	1 mnth	3 mnth	6 mnth	12 mnth
Recurrence	0	0	0	0
Scar hypertrophy	5	4	0	0
Joint stiffness	4	3	0	0

Giant cell tumour of tendon sheath is the second most common tumour of the hand. There is no general agreement as to the nomenclature of the lesion, as exact pathological nature is still not Different names that have been used to describe the lesions include giant cell tumour of tendon sheath, pigmented villonodular synovitis, fibrous xanthoma, benign synovioma and sclerosing haemangioma. Initially it was suggested that the lesion may be neoplastic, inflammatory, trauma-induced, immune-mediated or associated with abnormal lipid metabolism (Flandry and Hughston, 1987; Froimson, 1987; Glowacki and Weiss, 1995; Hansen et al., 1988). However, later reports, including deoxyribonucleic acid (DNA) analysis by fow cytometry, support a truly neoplastic origin. (Abdul-Karim et al., 1992).

Surgical Removal has been the standard of care for this patients, though recurrence is not so uncommon in literatures.

Many factors are considered as causing recurrence, including proximity to the distal interphalangeal joints, presence of degenerative joint disease, pressure erosions in the radiographs, increased mitotic activity, and type 2 lesions described by Al-Qattan[7-9]. But the only consistent observation by various authors in preventing recurrence is complete surgical excision with removal of all satellite nodules if present [10,12]. The use of an operating microscope[10] or magnifying loupe ensures radical excision. Most authors agree that incomplete removal of the tumour due to poor surgical technique is the most important cause of recurrence (Byers et al., 1968; Flandry and Hughston, 1987; Ushijima et al., 1986), and the overall low recurrence rate in our study is probably due to adherence to proper surgical principles.

Concerning the recurrence there is a large statistical heterogeneity in the literature. In more recent studies, on average, 14.8% of patients developed recurrence[2,7-13]. Various factors have been described predictive of recurrence, including pressure erosion on radiographs, location at the interphalangeal joint, presence of degenerative joint disease and incompletely excision. Reilly et al (1999) and Grover et al (1998) noticed that bone erosion, as confirmed in plain X-rays, might be a reason for recurrence[8].However, Kitagawa (2004) did not support this theory, he advocated the bone involvement was due to simple erosion, caused by the pressure effect of the tumor, and was not a true invasion[11].

However, the site of the tumor has been associated with recurrence rate by many other Authors[8,9]. Reilly et al observed that recurrence of giant cell tumor was much higher at the thumb interphalangeal (IP) joint and digital distal interphalangeal (DIP) joints[8,9]. This finding might be attributed to the inherent difficulty of adequately excising the tumor distally at the IP and DIP joint levels, where the neurovascular structures are quite close to tumor margins and the surrounding soft tissue envelope is not ideal[2,9,11]. Williams et al (2010) reported that the high risk group was defined as tumor involvement of the extensor tendon, flexor tendon or joint capsule[13].

Type-II tumors have been associated with a higher recurrence rate compared to Type-I giant cell tumors, probably due to an undetected satellite lesion and subsequent incomplete excision, therefore it cannot be always considered as a true recurrence[10]. The lower recurrence rate in prospective studies might reflect the surgeon's concern of identifying tumor margins and subsequently achieving a good result. In addition there may simply not be enough follow-up in these prospective studies to show the true recurrence value.

A lower rate of recurrence should be expected when magnifying glasses or microscope are used at the time of mass resection[10]; Ikeda had only one recurrence in 18 patients with GCTTS after microscopic excision of the lesion[10].

Kotwal et al recommended postoperative radiotherapy of 20 Gy in divided daily doses of 2 Gy in case of possible incomplete excision, presence of mitotic figures[9] and bone involvement[7]. In their study, recurrence rate by following the protocol was 0%

However, in our cases, we haven't used any post operative radiotherapy. We have used pre operative Imaging (MRI with contrast) for precise localisation, (Fig. 4) specially to localize all satellite lotions. During Surgery , we have used loupe magnification to ensure complete excision of all satellite nodules as well as preservation of all important neurovascular structures in relation to the nodules. This protocol has helped us to achieve 0% recurrence in our series after 12 – 54 months follow up.

Regarding post operative functional outcomes, we have observed 4 (20%) of our patients had mild joint stiffness at 1 month follow – up , which disappeared after 6 months in all cases after proper physiotherapy. Similarly, 5 patients (25%) had scar hypertrophy initially at 1 month follow – up, which were successfully treated with conservative management (scar massage, silicone sheet, pressure garments) in all cases.

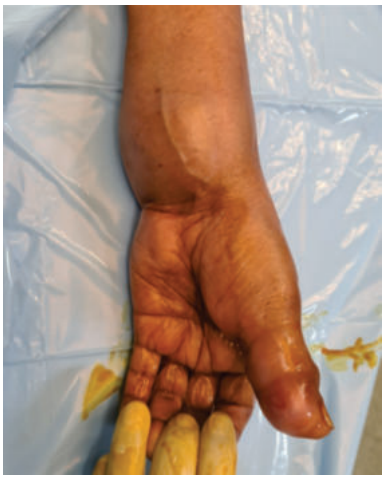

Fig .1

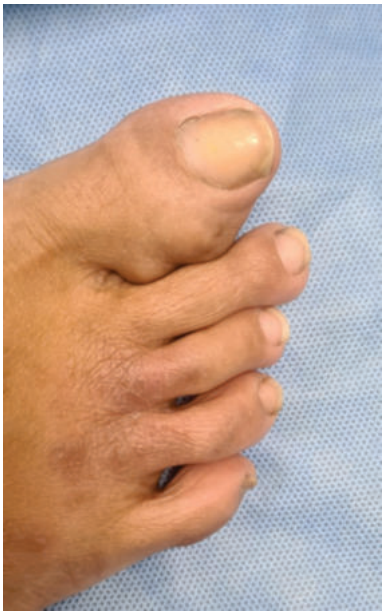

Fig . 2

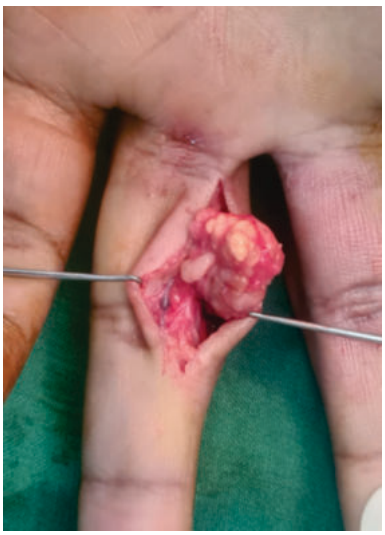

Fig. 3

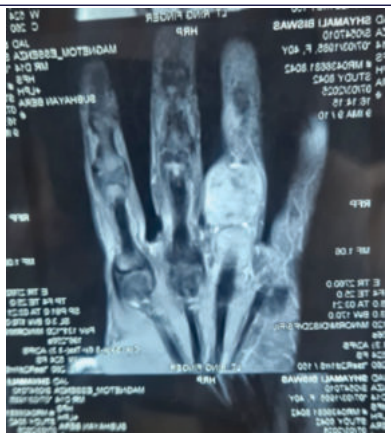

Fig. 4

CONCLUSION

We have concluded that with clinical features along with investigations like contrast enhanced MRI these tumors can be easily diagnosed and precisely localized . Excision of these tumors completely with proper magnification gives very satisfying outcome with almost no recurrence. No adjuvant therapy is needed to prevent recurrence.

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