## Giant cell tumour of tendon sheath of the hand

# El ve el bileğinde tendon kılıfının dev hücreli tümörü: 141 hastanın değerlendirilmesi

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Amaç: El ve el bileği yerleşimli tendon kılıfından gelişen dev hücreli tümörler tanı, tedavi ve ameliyat sonrası dönemde oluşan komplikasyonlar açısından retrospektif olarak değerlendirildi.

Çalışma planı: Yirmi bir yıllık bir dönem içinde, el veya el bileği yerleşimli tendon kılıfı dev hücreli tümörü nedeniyle 141 hastanın (83 kadın, 58 erkek; ort. yaş 37.5; dağılım 6-77) 146 lezyonuna cerrahi uygulandı. Lezyonların 134'ü elde, 12'si el bileğinde görüldü. Tutulum 77 olguda sağ, 64 olguda sol tarafta idi. Ortalama izlem süresi 3.5 yıl (dağılım 6 ay-11 yıl) idi.

Sonuçlar: Hastaların en sık başvuru nedeni ağrısız yumuşak doku kitlesi idi. Olguların çoğunda tümör (%76) voler bölgede yerleşim göstermekteydi. Yerleşim yeri en sık işaret parmağında (%27), üçüncü parmakta (%24) ve proksimal falanks düzeyinde (%57) idi. Tümörlerin %40'ına 30-50 yaşlar arasında rastlandı. Bulguların süresi bir ay ile beş yıl arasında değişmekteydi. En sık ilk altı ay içinde başvuru gözlendi. On sekiz olguda radyolojik olarak kemik tutulumu saptandı; bunların 12'sinde kortikal kalınlaşma, sekizinde skleroz görüldü. Ameliyat sonrası dönemde dört olguda dijital sinir hasarı, üç olguda yüzeyel enfeksiyon, 12 olguda eklem sertliği gözlendi. Yirmi üç hastada (%16) ortalama 3.7 yıl içinde (dağılım 2 ay-7 yıl) nüks gelişti.

Çıkarımlar: Tendon kılıfının dev hücreli tümörlerinde yüksek nüks oranı göz önüne alınarak, geniş bir cerrahi sahada, titiz bir cerrahi uygulanmalı ve büyütücü gözlükten yararlanılmalıdır.

**Anahtar sözcükler:** Dev hücreli tümör/patoloji/cerrahi; el/cerrahi; yumuşak doku neoplazmları/patoloji/cerrahi; tendon/patoloji; ksantoma/cerrahi.

**Objectives:** Giant-cell tumors of the tendon sheath localized in the hand or wrist were retrospectively reviewed with respect to diagnosis, surgical treatment, and postoperative complications.

**Methods:** During a 21-year period, a total of 141 patients (83 females, 58 males; mean age 37.5 years; range 6 to 77 years) underwent surgery for 146 lesions that developed in the hand (n=134) or the wrist (n=12). Involvement was on the right side in 77 patients, and on the left side in 64 patients. The mean follow-up period was 3.5 years (range 6 months to 11 years).

Results: On presentation, the most common symptom was the presence of a painless soft tissue mass. The most frequent localization was the volar part (76%) of the second (27%) and the third (24) fingers, or the proximal phalanx (57%). Forty per cent of tumors were encountered at ages between 30 and 50 years. The duration of symptoms ranged from one month to five years and the highest number of presentations fell within the first six months. In eighteen patients, radiologic studies showed osseous involvement, being cortical sclerosis in 12 patients, and erosion in eight patients. Postoperative complications included digital nerve injuries in four patients, superficial infection in three patients, and joint stiffness in 12 patients. Twenty-three patients (16%) developed recurrences within a mean of 3.7 years (range 2 months to 7 years).

**Conclusion:** Taking high rates of recurrences into consideration, surgery for giant-cell tumors of the tendon sheath requires wide surgical exposure, attentive skills, and the use of magnification.

**Key words:** Giant cell tumors/pathology/surgery; hand/surgery; soft tissue neoplasms/pathology/surgery; tendons/pathology; xanthoma/surgery.

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### Introduction

Giant cell tumor of the tendon sheath is a slowly growing benign lesion localized at the extremities without any symptom. This mesenchymal tumor, originating from the synovial membrane, is often seen in hands but also in the other regions of the body such as wrist, elbow, foot fingers, ankle, knee, hip and also the spine1,2,3,4,5. These tumors are related to tendon sheath and joints in the lower extremity and they are named as fibroxanthoma, xanthome of the tendon sheath, fibroma of the tendon, villeous arthritis, localized villonodular synovitis6,7,8. Since it contains fibroblasts, macrophages, foam cells and hemosiderin pigment, the lesion is admitted as a reactive tissue2,7. Jaffe claimed that this lesion is a local form of the diffuse pigmented villonodular tenovagosynovitis seen in grand joints because of the histologic resemblance 7,8.

The xanthomes seen in the third or fourth decade and frequently in women, could cause secondary nerve compression, joint degeneration and bone invasion9. There is a solid, lobulated and painless mass on the physical examination. Slowly growing tumor is generally related with the tendon sheath, capsular ligaments and the joint in the finger, and can remain unknown. The recurrence is not rare and can reach 45 %. Malign degeneration is not reported even after multiple recurrences, so the excision is the procedure of choice also for the second operation, but at the same time radiotherapy is suggested in the literature2,8. The purpose of this study is to describe the diagnostic and the therapeutic properties of the giant cell tumor of the tendon sheath frequently seen in hand and to evaluate our clinical findings.

### **Patients And Method**

146 lesions of 141 patients were operated between 1978 and 1999. There was 134 hand and 12

Table 1. Age and sex situation

Decade	Men	Woman	Total	
I	3	2	5	
II	6	9	15	
III	13	17	30	
IV	9	9	18	
V	15	23	38	
VI	8	16	24	
VII	3	5	8	
VIII	1	2	3	

wrist locations. In the retrospective examination, the surgical and pathology reports were evaluated. Radiological study was made in 130 cases. Clinical data, age, sex, admission symptoms, lesion localities and multicentricity were the study parameters and also the bone erosion and degenerative changes were evaluated. The series contained 58 men (41 per cent) and 83 women (59 per cent) and the average age was 37.5 (6–77). The mean length of follow-up was 3,5 years (6 months – 11 years). The most frequent periods of age were the third and the fifth decades (Table 1). The right hand was influenced in 77 cases and left hand in 64 cases.

## **Symptoms**

The most frequent symptom at the admission was the painless soft tissue mass (fig. 1). This subcutaneous mass was mobile and lobulated. Mild pain in 31 cases (21%), loss of sensation in 11 cases (8%) and joint restriction in 9 cases (6%) were present. The admission was most frequently in 6 months after the onset of the symptoms (1 month – 5 years).

### Locality

The tumor was mostly seated at the volar site (76%). The proximal phalanx locality (57%) of the fingers and second (27%) and the third finger (24%) were most frequently influenced (Table 2). In the wrist, the tumor was seated frequently at the dorsal site (67%). Multicentricity was present in five cases. In one case, the tumors were in the dorsal part of the second finger and the volar part of the wrist at the same time. The other multicentic involvement was in hand.

**Table 2:** Tumor sites in hand, v: volar; d: dorsal

Finger	Proximal phalanx	Middle phalanx	Distal phalanx	Total
I Volar	12		4	16
Dorsal	_	_	6	6
II Volar	17	10	4	31
Dorsal	4	_	4	8
III Volar	14	6	6	26
Dorsal	7	1	1	9
IV Volar	12	4	2	18
Dorsal	1	_	_	1
V Volar	9	4	3	16
Dorsal	1	1	1	3
Total	77	26	31	134

### **Surgical Technique**

The principal technique used for tumor excision was marginal excision. The magnifying glasses were used in 48% of cases. Brunner type incision at volar site, longitudinal 'S' incision at dorsal site and midlateral incision at lateral locality were prefered (fig.2). An attentive dissection was carried out at the surroundings of the tumor's pseudocapsule and the







Fig. 1. (a) Mobil and painless xanthoma at the ulnar side of the thumb. (b) Surgical incision and bringing up the xanthoma (c) Careful dissection and excision of the xanthoma with the protection of the neurovascular structures.

operation was finished after the examination of the remaining tissues (fig.3). If there is bony invasion the curettage must be done very carefully. In these cases we used curettage and abondant irrigation. Bone graft was necessary in none of the cases.

#### Results

18 patients had bony affection in radiologic examination. Twelve of theme had cortical thickness and 8 had sclerosis. There was no pathologic fracture. In the postoperative period we saw hypoesthesia on the fingertip in four cases and three of them returned in three months. In the last one a surgical exploration was required and a digital nerve injury had been found. In other three cases, there was a superficial infection treated simply by local wound care. In six patients, joint stiffness was cured by physical therapy. In three patients mild stiffness in proximal interphalangial joint resisted. There was recurrence in 23 cases (16%) at 3.7 years (2 months - 7 years). One of these cases who had been operated from his wrist in another center, three cases who had polycentric involvement and 18 cases who had recurrence in the primary operation sites had been reoperated. One case did not accept the second operation. Second recurrence had been found in three cases and had been realized more wide excision. Radiotherapy was not applied for recurrent tumors and no amputation was needed.

## **Discussion**

Giant cell tumor of the tendon sheath is the second most frequent subcutaneous tumor of the hand. The other localities are hip, knee, foot, wrist and shoulder 10,11.

This lesion originated from the synovial membrane is seen in three different form: Isolated lesion originating from the tendon sheath (giant cell tumor of the tendon sheath), solitary intraarticular nodule (localized nodular synovitis) and villeous and pigmented lesion frequently concerning the synovial tissue (pigmented villonodular synovitis)10. The retinacular cells, fibrous tissue elements, cholesterol carrying histiocytes, polynucleated giant cells and hemosiderin are seen in the histologic examination6,8. Jones think that these lesions are due to the proliferation or metaplasie of the synovial histiocytes and consequently are related to the extrasynovial histiocytic tumors12. Multiple xanthomatosis

is seen with hypercholestrolemie but it is different from fibrous xanthomas. These two different lesions are distinguished by Pinkus12. Some atypical forms can be problematic in the diagnosis. The presence of mitotic figures can lead to a mistaken diagnosis of a malign tumor 4,14.

Giant cell tumors of the tendon sheath, are slow-ly growing lesions situated at the palmar parts of the fingers and can be seen in every decade. There is frequently single joint involvement; multiarticular lesions are less then 1%15. Juxtaarticular settlements can cause joint stiffness. These benign masses are more frequent in hand than the other regions. The lesions are frequently dorsal according to Glowacki and Jones but volar according to Reilly7,8,12. In our series the localization is generally on the volar part of the extremity. The most influenced region is the index finger and the tumor is seen in third and fifth decade.

Macroscopically, the tumor is a yellow, lobulated mass. In the x-ray, a soft tissue mass and bony impression, cortical erosion and thickness in the 8 to 14% of the cases9,16. Magnetic resonance imaging show a hypointensity in T1 and T2 sequences and the appearance is the same as the pigmented villon-odular synovitis17.

Surgical treatment is indicated in these lesions. The conservative treatment is not appropriate because of the presence of the fibrous tissue implying the histiocytic cells in spite of some ideas claiming the inflamatory origin of the tumor9. Involvement of the flexor tendon sheath, extensor tendons, digital arteries and nerves make the dissection difficult and can facilitate the recurrences. For this reason it is important to work in a wide area to bring up the totality of the tumor. It is essential to protect the neurovascular structures. In our series, there were three cases of neuropraxie and one digital nerve injury.

The rate of recurrences went up to 45%. In this series, the recurrence rate is 14% with one recurrence in 18 cases and two recurrences in 3 cases. Because of the excess of the recurrence rate, it is important to follow the tumor resection principles and to search carefully the surgical area between the mass lobules. Using magnifying glasses are appropriate during surgery. In our cases, some operations

had been realized without magnification in the beginning of the series. It is considered that the high recurrence rates at the first operations and in polycentric cases are related the insufficiency of the mass excision.

In conclusion, giant cell tumor of the tendon sheath, is a benign, slowly growing lesion without any symptom, frequently seen in hand and surgically treated. The recurrence rate can be high. To decrease this rate it is appropriate to apply a careful surgery in a wide area and to use the magnifying glasses.

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