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Fibroma of the Tendon Sheath of the Finger in a 6-year-old Girl: A Case Report

Fibroma de la Vaina Tendinosa en el dedo de la Mano de una niña de 6 años: A Propósito de un Caso

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Abstract

We report a case of tendon sheath fibroma, a rare benign tumor of young adults aged 20 to 40 and extraordinary in pediatric patients. The fibroma was at the volar side of the middle phalanx of the third finger of a 6-year-old girl. The diagnosis relied on the histological study because ultrasonography and magnetic resonance imaging studies were inconclusive. Even though marginal resection is the usual treatment, the local recurrence rate is high.

Keywords
- fibroma of the tendon sheath
- finger
- hand tumors
- pediatric hand tumors

Resumen

Se presenta un caso de fibroma de la vaina tendinosa, tumor benigno poco frecuente de adultos de 20–40 años y de extraordinaria rareza en la edad infantil, localizado en la cara palmar de la falange media del tercer dedo de la mano derecha de una niña de 6 años. El diagnóstico se efectuó tras su exéresis mediante el estudio histológico de la lesión, pues los estudios de imagen previos mediante ecografía y resonancia magnética no fueron concluyentes. A pesar de que la resección quirúrgica constituye el tratamiento de elección, existe un alto riesgo de recidiva de la enfermedad.

Palabras clave
- fibroma de la vaina tendinosa
- dedo de la mano
- tumores de la mano
- tumores pediátricos de la mano

Introduction

Tendon sheath fibroma (TSF) is a rare benign tumor usually affecting the upper extremities of young adults aged 20 to 40. It is extraordinarily rare in children. It manifests clinically as a slow-growing tumor, potentially painful.[1] The treatment of choice is marginal resection of the lesion, which has a high recurrence rate.[2]

We present the case of a TSF in the finger of a 6-year-old girl.

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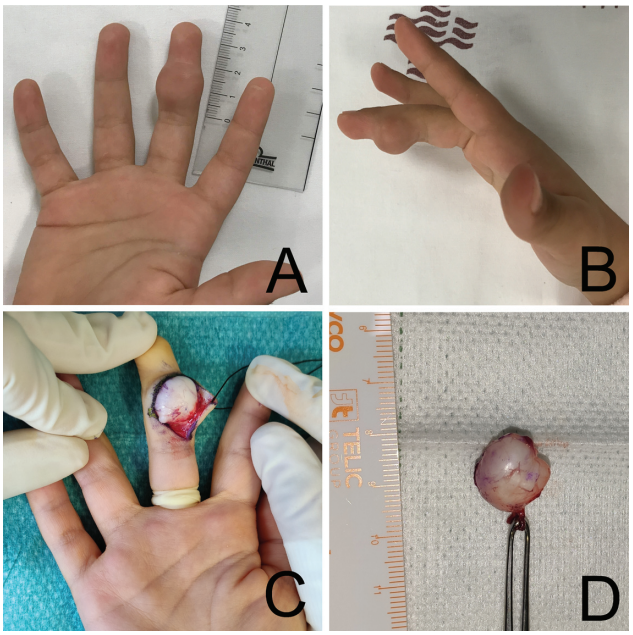

Fig. 1 (A and B): Clinical photography. (C): Intraoperative appearance of the lesion. (D): Macroscopic appearance of the lesion.

Clinical Case

The patient was a 6-year-old girl with no relevant medical history. She attended the outpatient trauma ambulatory due to a painless tumor on the palmar aspect of the middle phalanx of the third finger of the right hand, which appeared three months earlier and was growing progressively.

Physical examination revealed a hard elastic tumor occupying the entire palmar aspect of the middle phalanx of the third finger of the right hand (►***Figures 1A and 1B***). The lesion was attached to deep planes but not to the skin. Although the tumor limited the joint balance, there were active proximal and distal interphalangeal flexion or neurovascular alterations distal to the lesion.

She attended consultations after undergoing a plain radiological and ultrasound study requested by her pediatrician.

The plain radiology showed a soft tissue lesion on the palmar aspect of the middle and distal third of the middle phalanx of the third finger of the right hand, with no apparent bone involvement (►***Figure 2A***).

The ultrasound study revealed a homogeneous anechoic oval image measuring $11.0 \times 4.2 \times 11.3$ mm with no Doppler signal, classified by the radiology service as a synovial cyst (►***Figure 2B***).

The patient underwent a magnetic resonance imaging (MRI), but we obtained only a STIR sequence because she refused to continue with the test. MRI showed a hyperintense lesion subcutaneously and superficial to the flexor apparatus, with a maximum diameter of 12 mm, suggesting a tumor of vascular/pericytic origin.

Given the limited range of mobility and the slow but progressive tumor growth, the patient's parents agreed with the surgical resection of the lesion. Under general anesthesia, we performed a zig-zag volar approach on the middle phalanx of the third finger of the right hand, which revealed a subcutaneous whitish tumor measuring $16 \times 15 \times 14$ mm, not adhered to adjacent tissues. We sent the specimen en bloc for examination by the pathological anatomy service (►***Figures 1C and D***). This study reported a complete resection of a well-defined nodular lesion, with little fibroblast-type cellularity but no atypia or mitosis, and immersed in a dense hyaline collagen matrix, confirming the diagnosis of TSF.

There were no signs of local recurrence after one year of follow-up. The range of motion of the affected finger was normal, and the patient used the affected hand as usual in her daily living activities.

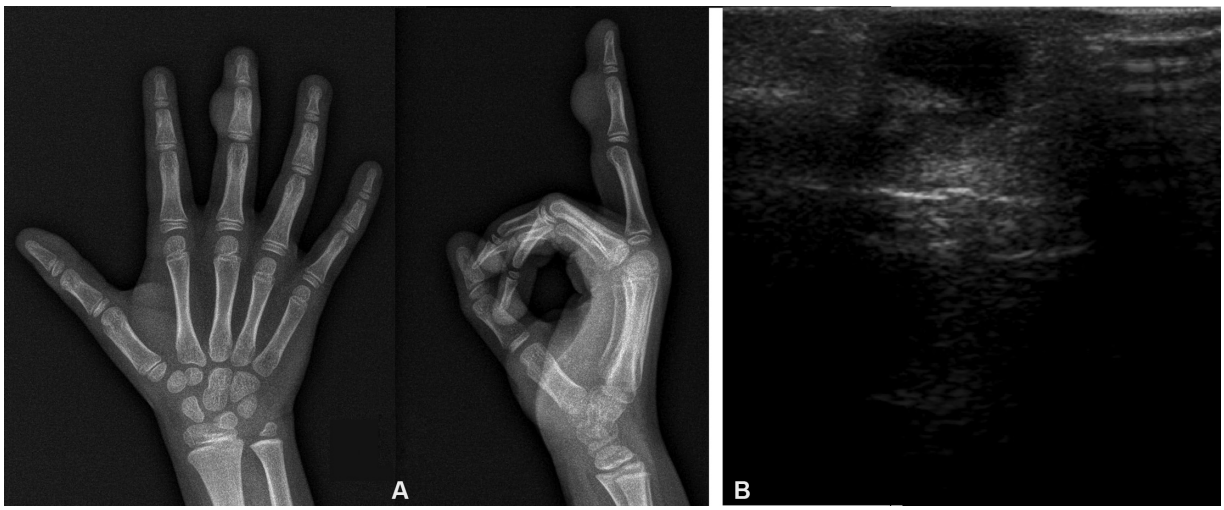

Fig. 2 (A) Plain radiology. (B) Ultrasound image of the lesion.

Discussion

TSF is a benign, slow-growing tumor. Its first description dates from 1949, by Geschickter et al.[3] Although these tumors originate from the synovial membrane of the tendon sheath, they can also arise from the joint capsule due to their similar histological structure.[4] The most frequent locations, accounting for approximately 80% of the cases, are the wrist, hand, and fingers.[2,4] Regarding fingers, the most commonly affected are the first, second, and third fingers. It is more common in men than in women, with a 3:1 ratio, mainly affecting patients aged 20 to 40.[2] It is very rare in children under 9 years old, and, as far as we know, only 18 cases were reported in the literature indexed in English.[1,2,4–7] These cases included two tumors in the hand[1,7] and one in the patellar tendon;[4] there were no details about the location of the remaining lesions.

Clinically, TSF is a slow-growing tumor, occasionally causing pain due to irritation or pressure in adjacent structures.[4] These lesions are well-circumscribed, nodular or multinodular, with a predominantly smooth surface and no skin adherence.[6]

TSF etiology remains unknown. Approximately 10% appear after trauma,[8] which did not occur in our case. As such, it could be a reactive or neoplastic process. Dal Cin et al.[9] found chromosomal abnormalities in the cytogenetic analysis consistent with a t(2;11)(q31–32;q12), suggesting this latter hypothesis. Similarly, Carter et al.[10] found a USP6 genetic rearrangement usually observed in nodular fasciitis, suggesting a common origin for both conditions.

Due to its exceptional nature, TSF diagnosis often occurs during physical examination and imaging tests for a giant cell tumor (GCT) or a synovial cyst, as in our case.[1,4] TSF is usually confused with GCT since it is one of the most common tumor lesions in hands and shares similar clinical characteristics. Both tumors are well-circumscribed, nodular, or multinodular fibrous tissue lesions.[6] The single difference in the ganglion is its rubbery consistency, and given the high CGT frequency, the initial diagnosis erroneously attributed to our patient is not unreasonable. The differential diagnosis, in addition to GCT and synovial cyst, includes nodular fasciitis and, in children, infantile digital fibromatosis.[1,4]

In children, and since these are subcutaneous soft tissue lesions, ultrasound should be the first imaging test.[1] Theoretically, ultrasound could differentiate a synovial cyst from a TSF, even though our case was initially diagnosed sonographically as a synovial cyst. The ganglion on ultrasound appears as a well-circumscribed, anechoic lesion with posterior acoustic enhancing and thin walls; TSF would have characteristics more similar to GCT, i.e., a hypoechoic lesion with well-defined margins and no subsequent enhancing.

TSF appears on MRI as a well-defined soft tissue mass with a slightly hypointense or isointense muscle signal on T1-weighted images.[4] However, its heterogeneity on T1-weighted images could lead to erroneous diagnoses, such as GCT.[1,4] T2-weighted imaging findings are variable due to differences in lesion hyalinization and the number of proliferating fibroblasts, reporting patterns of peripheral, patchy, homogeneous, or simply no enhancement.[4]

Plain radiography and computed tomography (CT) only show a nonspecific soft tissue mass.[4]

The treatment of choice is surgical excision. TSF is usually firmly adhered to the adjacent tissues,[1] which did not happen in our patient. Even so, the authors of the clinical cases consulted performed marginal surgery in most cases. As for our patient, we believe that since the flexor apparatus and the radial and ulnar digital neurovascular bundle were around the lesion and considering the benign nature of the lesion and the recurrence rate reported in the most recent cases (discussed later), if we had had adherence to these structures, we would not have attempted a complete resection to preserve finger viability.

The histopathological study of the lesion gives the definitive diagnosis. TSF consists of spindle-shaped fibroblast-like cells embedded in a dense collagenous stroma, usually with no atypia. There may be slit spaces corresponding to empty blood vessels.[1] This description is consistent with our hospital's pathological anatomy service report for the lesion removed from our patient.

The risk of local TSF recurrence has been classically considered high, up to 24% at 4.3 years.[2,5] However, more recent studies report much lower recurrence rates, even close to zero.[1] Our patient, with only one year of follow-up, has not shown signs of lesion recurrence, although careful follow-up will continue to ensure that this does not occur.

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Conflict of Interests
The authors declare no conflict of interests.

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