Giant cell tumor of the flexor tendon of the wrist: US and MRI evaluation. Case report

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KEYWORDS

Giant cell tumor of the tendon sheath;
Ultrasonography;
Benign soft tissue tumor.

Abstract Giant cell tumor of the tendon sheath (GCTTS) is a benign proliferative lesion of synovial origin that may affect the joints, bursae and tendon sheaths. We report the case of a giant cell tumor of the tendon sheath arising from the carpal tunnel of the wrist in a 47-year-old woman. The patient underwent ultrasound (US) examination and subsequently magnetic resonance imaging (MRI).

Sommario Il tumore gigantocellulare delle guaine tendinee (GCTTS) è una lesione benigna di tipo proliferativo che origina dalla sinovia e che coinvolge le articolazioni, le borse e le guaine sinoviali. Il caso descritto è quello di un tumore gigantocellulare delle guaine tendinee localizzato a livello del canale del carpo riscontrato in una donna di 47 anni. La paziente ha eseguito esame Ecografico e successivamente esame di Risonanza Magnetica.

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Introduction

Giant cell tumor is a common benign neoplasm of the hand [1]. It usually appears as a localized, solitary, subcutaneous nodule. It most commonly grows on the tendon sheath and in the joints of the digits [2]. It is a benign process that has been seen to involve the surrounding structures and soft tissue, and it may erode bony structures as it grows in a confined space [3]. Peak age is the third to fifth decades of life and it commonly affects the index and middle fingers, involving the volar aspect twice as frequently as the dorsal aspect [4].

Case report

A 47-year-old, right-handed woman, a housewife, complained of decreased sensation and weakness of grip of the right hand. At the time of presentation, the patient showed a palpable swelling and she reported that this swelling had come and gone at various periods of time over the past year. There had been no wrist injury. All laboratory tests were within normal range. Ultrasound (US) examination revealed an uneven solid mass of about 5 cm surrounding the flexor tendons of fingers III and IV displacing the tendons. Color and power Doppler US showed increased vascularity, but the vascular pattern appeared peripheral. It was observed that the tumor did not move with the tendons during flexion and extension as it arose from the tendon sheath and not from the tendon itself (Fig. 1).

US examination provided information about the extent of contact and circumferential involvement of the tendon

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Fig. 1 A, B: Longitudinal projections. Hypoechoic nodule surrounded by a capsule along the course of the flexor tendons; Power Doppler documents low vascularity of the inferior pole (B); C, D: Axial projections documenting the close proximity of the lesion to components of the flexor tendon which appears compressed.

which was helpful in the surgical planning. After US examination, the patient underwent magnetic resonance imaging (MRI). Axial T1-weighted sequences were performed before and after injection of contrast agent as well as axial T2-weighted and short-time inversion recovery (STIR) sequences (Fig. 2). The patient subsequently underwent surgical excision; histological analysis of the surgical specimen confirmed GCTTS. Four months post-operatively the patient had fully restored sensory-motor function of the right hand.

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for inspection by the Editor-in-Chief of this journal.

Discussion

We report a case of a histopathologically confirmed giant cell tumor of the tendon sheath (GCTTS) arising from the tendon of the wrist. Jaffe et al. [5] first described GCTTS in 1941. They claimed that this lesion had a histological origin in common with pigmented villonodular synovitis; the major difference being that GCTTS grows outward from the tendon sheath, whereas pigmented villonodular synovitis grows inward from the synovial lining into the joint. All GCTTS cell types contain hemosiderin in their cytoplasm. As giant cell tumors do not have characteristic clinical

features, they are usually diagnosed by investigation based on clinical suspicion. US pattern of GCTTS has been described as hypoechoic [6] or hyperechoic, heterogeneous and homogeneous [7] soft tissue masses. Typically, a GCTTS shows increased vascularity on color and power Doppler US [6]. US can also provide information about the extent of contact and circumferential involvement of the tendon that can be helpful in the surgical planning.

Localized GCTTS is the second most common palpable mass lesion along the flexor tendons of the fingers after the ganglion cyst, and US may be useful to distinguish between the two types of lesion by showing the typically cystic appearance of the ganglion cyst. One potential pitfall which has been described in the literature is that a ruptured ganglion cyst can appear solid and mimic GCTTS [8]. MRI features of GCTTS reflect the histological characteristics of this group of lesions. The presence of hemosiderin-laden tissue exerts a paramagnetic effect that shortens T1- and T2-relaxation times resulting in low to intermediate signal intensity on T1- and T2-weighted spin-echo sequences [6]. On STIR sequences (fat suppression), the effect is exaggerated due to increased magnetic susceptibility resulting in areas of very high signal intensity. Lesions often show moderate enhancement following intravenous gadolinium-diethylenetriamine penta-acetic acid (Gd-DTPA) administration due to the numerous proliferative capillaries in the collagenous stroma [6].

Fig. 2 A, B, C, D: The nodule affecting the flexor tendons of the wrist shows hypointense signal in axial T1-weighted sequences (A), hypo–hyperintense signal in axial T2-weighted sequences (B), marked hyperintense signal in STIR sequences (C) and uneven enhancement following intravenous gadolinium administration (D).

Surgical removal is the standard treatment of GCTTS; removal of the entire lesion is important in order to reduce chances of recurrence which is common if the lesion is not completely removed. Release of Guyon's canal and the hypothenar tunnel may be indicated at the time of lesion excision to help relieve nerve compression symptoms. US has a role in the initial screening and assessment, which may sometimes suggest the diagnosis. MR imaging is a valuable tool for preoperative diagnosis, surgical planning and postoperative follow-up of GCTTS. However, final diagnosis requires pathological evaluation.

Conflict of interest statement

The authors have no conflict of interest.

Supplementary data

Supplementary data related to this article can be found online at [doi:10.1016/j.jus.2010.12.001](https://doi.org/10.1016/j.jus.2010.12.001).

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