

CASE REPORT

Extra-Articular Diffuse Giant Cell Tumor of the Tendon Sheath: A Report of 2 Cases

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Abstract

Two rare cases of extra-articular diffuse variant giant cell tumor of the tendon sheath are presented, at the elbow of a 68-year-old female and the foot of a 56-year-old male. Both patients presented with a palpable masses and marginal excision was performed; histological sections confirmed the diagnosis of extra-articular giant cell tumor. No adjuvant therapy was administered. At the last follow-up, minimum 24 months after excision both patients were disease-free.

Keywords: Diffuse variant, Giant cell tumor of the tendon sheath, Pigmented villonodular synovitis (PVNS)

Introduction

Giant cell-rich tumors are classified according to their site of origin into bone, soft tissue and tenosynovium. The latter can be divided into a localized or nodular and a diffuse type or pigmented villonodular synovitis (PVNS) (1). The nodular type is confined to a distinct area of synovium, it affects the smaller joints of the fingers, and it is generally extra-articular. In contrast, the diffuse type shows extensive involvement of the synovial membrane and capsule, it usually affects larger joints and it is often intra-articular and infiltrative. Rarely, the diffuse type can be extra-articular (1). The extra-articular diffuse type, unlike its intra-articular counterpart, presents a diagnostic challenge. The tumors are slow growing with atypical presentation, difficult differential diagnosis, higher local recurrence rate(1,2). There are only very few cases of extra-articular diffuse type giant cell tumors of the tendon sheath (GCTTS) have been reported (3–6). Two patients with extra-articular diffuse type GCTTS are presented herein and the clinical, imaging, histopathological findings and treatment are discussed.

Case 1

A 68-year-old woman presented with a tender palpable mass at the ulnar side of her left elbow. The mass was slow growing during the past 2 years. Physical examination showed a tender, mobile lesion extending below the skin. Radiographs of the elbow were normal. Magnetic resonance imaging (MRI) showed an ill-defined soft tissue mass adjacent to the ulna with closed proximity to the ulnar nerve. The lesion was hypo-intense in both T1 and T2-weighted images. The bone was not involved by the tumor [Figure 1]. A true cut needle biopsy was done, however, histopathology was inconclusive and open biopsy was performed. Macroscopically, the tumor was brownish yellow and solid [Figures 2 & 3]. A complete, marginal excision was performed. Microscopically, the tumor was composed of multinucleated giant cells, xanthoma cells, mononuclear cells and stromal cells [Figure 4]. The cells were positive for CD68 and negative for keratins (AE1/AE3, CAM 5.2), S-100, actin, and desmin. These findings were consistent with the diagnosis of extra-articular diffuse type giant GCTTS. At 2-year follow-up, the patient is disease-free with no evidence of local recurrence.

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Figure 1. Magnetic resonance imaging shows an ill-defined soft tissue mass adjacent to the ulna. The bone is not involved by the tumor.

Case 2

A 56-year-old man presented with a long-standing tender and solid mass to the dorsum of his left foot [Figure 5]. Radiographs of the foot were normal. MRI showed a well-defined mass with low signal intensity on both T1- and T2-weighted images. Open biopsy was performed. Macroscopically, the tumor was brownish yellow, solid and multi-lobulated adjacent to the extensor tendons of the toes [Figure 6]. Microscopically, the tumor was composed of multinucleated giant cells, xanthoma cells, mononuclear cells and stromal cells. The cells were positive for CD68 and negative for keratins (AE1/AE3, CAM 5.2), S-100, actin, and desmin. These findings were consistent with the diagnosis of extra-articular diffuse type giant GCTTS. Complete, marginal resection of the tumor was done [Figure 7]. At 2.5-year follow-up, the patient is asymptomatic with no evidence of disease recurrence.

Discussion

Tenosynovial giant cell tumor, giant cell tumor of the tendon sheath, fibrous histiocytoma of synovium, pigmented villonodular synovitis (PVNS), localized nodular tenosynovitis, benign synovioma and fibrous xanthoma of the synovium are all names that have been

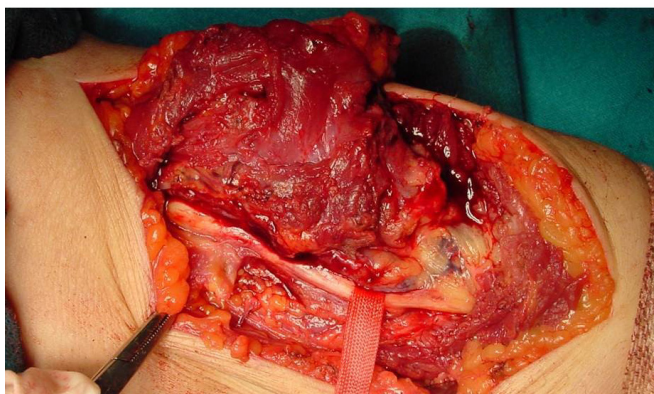


Figure 2. Macroscopically, the tumor is brownish and solid.

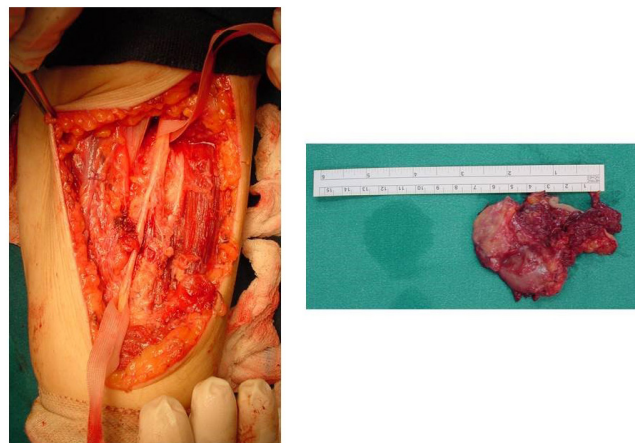


Figure 3. Marginal excision was done.

used for the same pigmented villonodular proliferative lesions originating from the synovium of joints, tendon sheaths or bursae(1,5,7-9).

Findings from flow cytometric DNA analysis suggest that the diffuse and the localized type of GCTTS are histopathologically similar but clinically distinct lesions(10). When the origin of these poorly defined soft tissue masses is uncertain, Enzinger and Weiss classified them as diffuse, whether or not they involve the adjacent joint (11). In the past, diffuse type CGTTS were thought to be of reactive or inflammatory origin. Recently, it has been found that they share a common chromosomal aberration and they are driven by the overexpression of macrophage colony stimulating factor-1 (CSF1) which suggests a neoplastic rather than a reactive origin (12).

Because of its rarity, the extra-articular diffuse type GCTTS is often misdiagnosed. It usually occurs in young patients, with an equal distribution between genders (1). It may involve more than one joint and/or tendon sheath. The more common location is the knee (75%), followed by the hip (15%), the ankle (7%) and

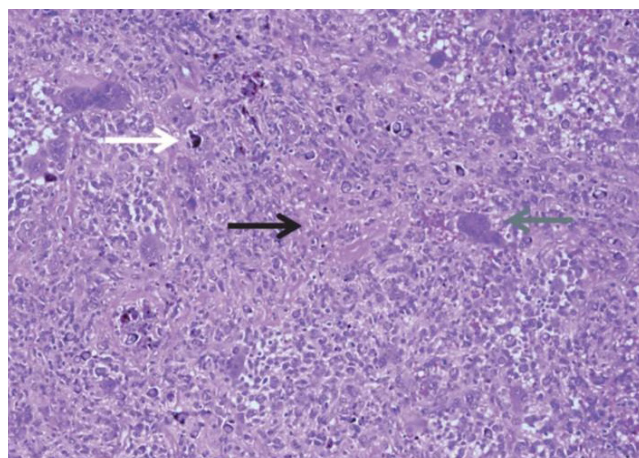


Figure 4. Microscopically, the tumor was composed of multinucleated giant cells, xanthoma cells, mononuclear cells and stromal cells.



Figure 5. A 56-year-old man with a mass at the dorsum of the left foot.

foot (2%); exceptionally, the tumor may be located at the wrist, shoulder or elbow (11). The extra-articular diffuse type GCTTS is characterized by the presence of an infiltrative soft tissue mass that can be purely intramuscular or predominantly subcutaneous, with or without involvement of the adjacent joint or bone. Most cases are believed to represent extra-articular extensions of primary intra-articular disease. Clinical diagnosis is difficult. It may present with a long-standing history of a painful or painless mass, non-adherent to the skin (1,12).

Imaging studies usually show an ill-defined extra-articular mass that may involve and erode the bone (13). Ultrasonography can provide useful information on tumor vascularity, tumor size, and its relationship to the surrounding tissue, and diffuse type GCTTS appears as a solid homogeneous hypoechoic mass (14). Magnetic resonance (MR) imaging is the modality of choice for the diagnosis, determination of size and localization, and differentiation of malignant and benign lesions (15). On MR imaging, the tumor shows predominantly low signal intensity on T1- and T2-weighted images that reflects hemosiderin deposition (13). Imaging differential diagnosis should include slow-growing tumors of the synovium such as synovial hemangioma, synovial chondromatosis and synovial sarcoma, lipomas, ganglia, and fibromas (9,13,15).

On gross pathology, extra-articular diffuse type GCTTS is usually large (often more than 5 cm), firm or sponge-like. The typical villous pattern of PVNS is usually lacking in the extra-articular variant. A multinodular and multicolored appearance with alternation of white, yellowish and brownish areas depending on the hemosiderin content is common (1,11). Microscopically, tissue is composed by proliferative synovial-like mononuclear cells, compacted fibrous stromal cells, foam and hemosiderin-laden cells, mixed round cell infiltration, mononuclear polyhedral cells of fibrohistiocytic origin, and multinucleated giant cells (16). The sections show increased vascularity and

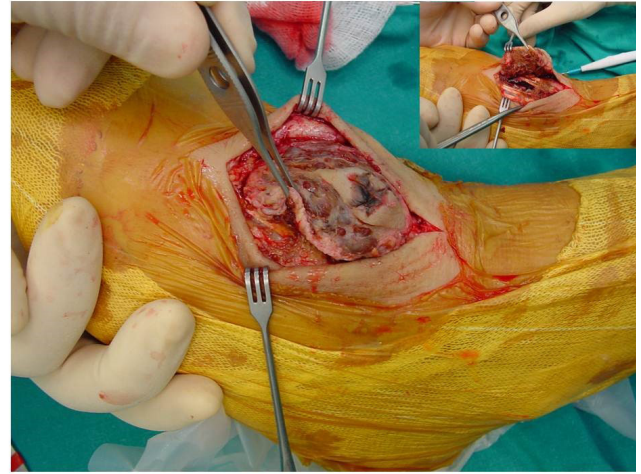


Figure 6. Macroscopically, the tumor was brownish, solid and multilobulated adjacent to the extensor tendons of the toes.

haemosiderin deposition and a typical villous pattern that is absent in the localized GCTTS. Histological differential diagnosis should include foreign body granulomas, necrobiotic granulomas, tendinous xanthomas, fibromas and clear-cell sarcomas (16).

Current treatment of choice for extra-articular diffuse type GCTTS is surgical excision (12). Given the locally aggressive nature and significant rate of recurrence complete excision is necessary. A local adjuvant treatment is usually not necessary (12). However, radiation therapy has been reported as primary treatment for unresectable disease or as local adjuvant treatment after incomplete excision or locally recurrent tumors (12). Novel alternative treatments include isotopic synoviorrhesis using Yttrium 90 or Rhenium 186 as an adjunct to surgical excision, and systemic targeted therapies using tyrosine-kinase inhibitors such as imatinib or sunitinib, or CSF1-receptor inhibitors. Although these treatments

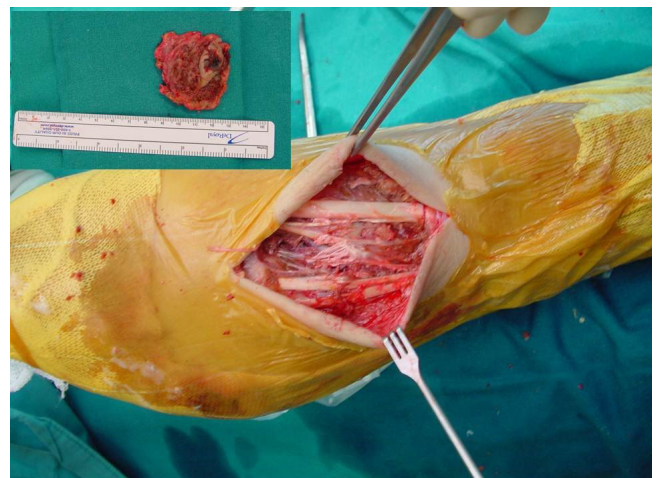


Figure 7. Marginal excision was performed.

have been associated with increased toxicity, they may prove useful in refractory, aggressive or unresectable lesions, and in patients in whom surgery would produce significant functional impairment (12).

The extra-articular diffuse type GCTTS is more aggressive than the localized type, with a local recurrence rate ranging from 25% to 50% (12). Although these tumors are benign in the vast majority of patients, malignant transformation has been reported (1). Therefore, close follow-up is recommended after tumor excision.

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