Case Report

A RARE CASE OF ENORMOUS GIANT-CELL TUMOR OF THE TENDON SHEATH OF RING FINGER

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Summary

A giant-cell tumor of the tendon sheath (GCTTS) was reported for the first time in 1852 as "cancer of the tendon sheath". It is the second most common benign space-occupying lesion in the hand. GCTTS occurs most commonly in the third to fifth decades of life in the flexor tendons of the hand, and only rarely involves other soft tissues or bone. It usually presents as a painless soft tissue mass which grows slowly in size for many years. Conventional radiographs are usually normal or may show a soft tissue mass, and only rarely reveal some bone involvement. Treatment of GCTTS is still controversial, mainly because of the high recurrence rate of its frequent extensions that enclose critical structures, precluding function-sparing surgery. We present an interesting case of an enormous GCTTS, encircling the middle phalanx of the left ring finger with hourglass bone erosion in a 60-years-old woman which was successfully treated by surgery through a double approach.

Key words: benign fibrous histiocytoma, bone remodelling, electrosurgery, finger phalanges, limb salvage

Introduction

Giant-cell tumor of the tendon sheath (GCTTS) is the second most common benign space-occupying lesion presenting in the hand (2-5%) after ganglion [1, 3]. Numerous terms have been used to designate this pathological condition, including benign synovioma, localized nodular tenosynovitis, tenosynovial giant-cell tumour, fibrous histocytoma of synovium, histiocytic giant-cell tumour, pigmented villonodular synovitis, xanthomatous giant-cell tumour, xanthoma of the synovium, xanthogranuloma, xanthosarcoma, fibrous xanthoma, fibroma of tendon, myeloid endothelioma, endothelioma, villous arthritis, sclerosing haemangioma, fibrohemosideric sarcoma, giant-cell fibrohaemangioma, and localized nodular synovitis [2-6]. GCTTS occurs most commonly in the flexor tendons of the hands, followed by the ankles, toes, and knees [3]. This tumor usually presents as a painless soft tissue mass

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which grows slowly and can remain the same size for many years [4].

Herein, we present an interesting case of an enormous GCTTS encircling the middle phalanx of the left ring finger with hourglass bone erosion in a 60-years-old woman, which was successfully treated by surgery through a double approach.

Case report

A 60-years-old woman was referred to our department with a tumor engaging her left ring finger (Figure 1a, b). The tumor had been growing slowly for over ten years causing increasing discomfort and occasional mild pain. At presentation, the tumor encircled the middle phalanx of the finger as a firm mass, virtually immobilizing the distal interphalangeal joint and allowing about 45 degrees of flexion in the proximal interphalangeal joint; circulation and sensation of the finger were unaffected by the tumor growth. The condition was clinically diagnosed as a giant-cell tumor of the tendon sheath and no further imaging studies were required except from the initial plain radiographs, showing hourglass bone erosion of the middle phalanx (Figure 2a, b). Surgery was performed through two separate incisions: a straight dorsoulnar, and a volar lazy-S incision.

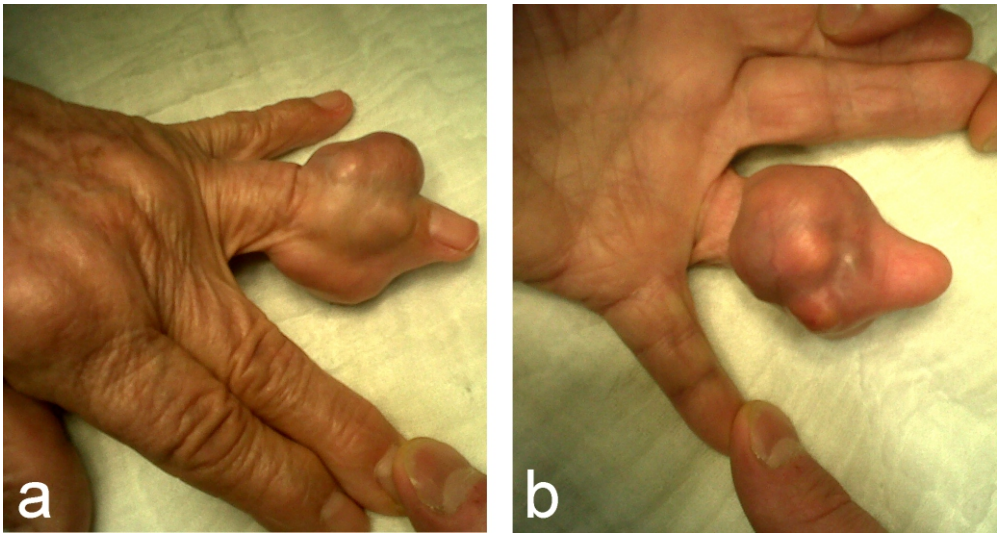

Figure 1a, b. Preoperative view of the tumor in the left ring finger

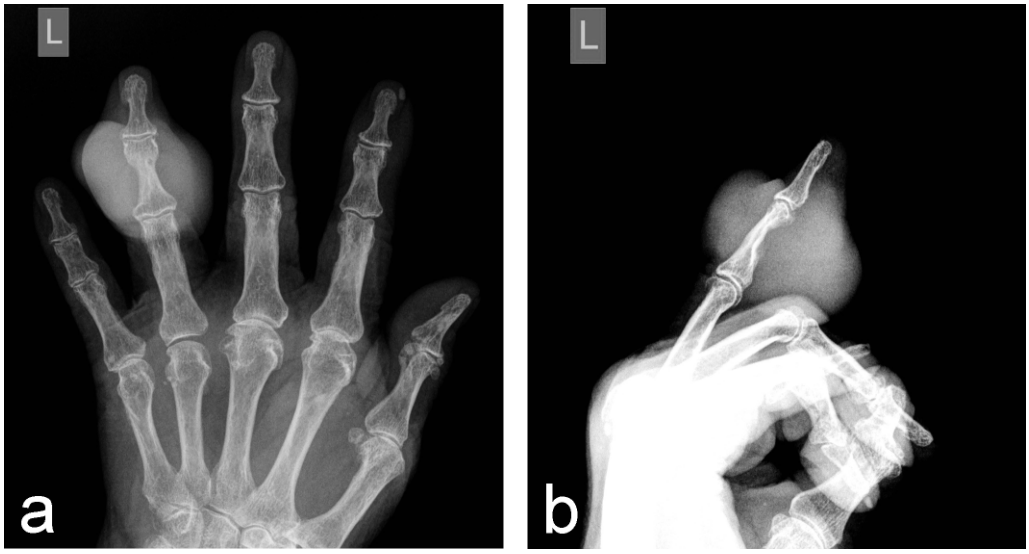

Figure 2. a) Antero-posterior radiograph showing mild cortical depression of the middle phalanx of the left ring finger
b) Lateral radiograph showing mild cortical depression of the middle phalanx of the left ring finger

Undermining the skin flaps and very scarce subcutaneous tissue revealed a capsulated lobulated tumor mass with the only identifiable neurovascular bundle of the finger running along a deep groove on its voloradial aspect. The tumor was dissected from the underlying extensor tendon and flexor tendon sheath including parts of it extending between the flexor tendon sheath and the periosteum. The intraosseous extension of the tumor was thoroughly curetted. Although the voloradial neurovascular bundle was completely dissected from the tumor surface, its tight adhesion prevented removal of the tumor. It had to cut longitudinally, using electrocautery along the course of the neurovascular bundle. The excess skin was removed, the remaining skin flaps were sutured over narrow corrugated drains and a soft compressive bandage was applied. A tumor sample was fixed in 10% buffered formalin. Histological findings were characteristic of a GCTTS and presented with histiocyte-like foamy, multinucleated giant-cells, fibroblast-like cells and hemosiderin deposits (Figure 3).

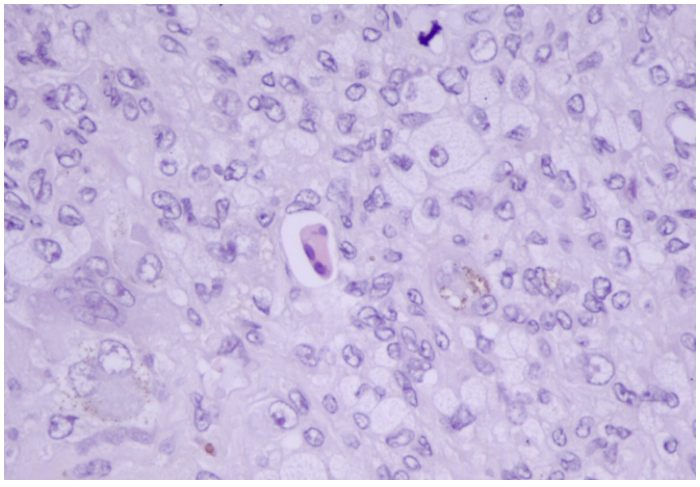

Figure 3. Characteristic histology of the GCTTS lesions: colagenized stroma, multinucleated giant-cells and polyhedral histiocytes. (Hematoxylinand Eosin stain; original magnification x 400)

The drains were removed after forty-eight hours and soft compression dressing was applied until the twelfth postoperative day. Apart from mild skin maceration at drain removal, the wounds healed uneventfully with no sensory loss or vascular compromise of the finger. The sutures were removed two weeks after operation (Figure 4a, b). One month after surgery nearly full-range motion was regained with practically no functional deficit. Twelve months after surgery no clinical recurrence was detected.

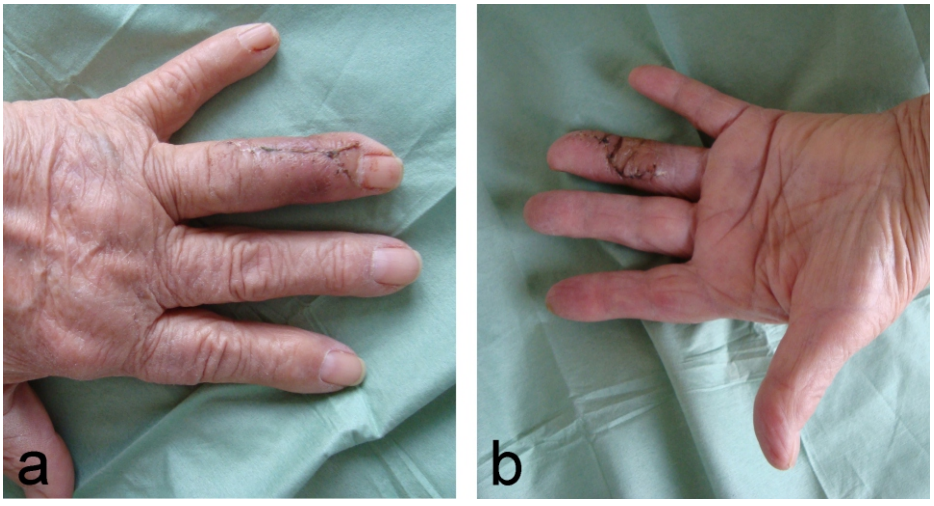

Figure 4a, b. Photograph of the left ring finger two weeks after surgery

Discussion

GCTTS was first reported by Chassaignac in 1852 as "cancer of the tendon sheath" [2]. It may occur at any age but usually presents in patients between the third and fifth decades of life with a peak incidence during the fifth decade [2, 7]. There is a slight female predominance, ranging from 1.5:1 to 2:1, although equal sex distribution has been reported [8]. Most commonly, this tumor occurs on the volar aspect of the hand as compared to the dorsal soft tissues [1,9]. Rarely, it could involve both the dorsal and volar aspects of the hand [2].

Although different causes have been proposed, the aetiology of this pathological condition is still unclear [2, 3, 10]. Most authors consider traumatic inducement or truly neoplastic origin as possible causes [1, 4]. Lipid metabolic disturbances, inflammatory disease, and immune-mediated processes have also been proposed [2,10].

In 2001, Al-Qattan presented the most popular classification of the GCTTS. He classified this tumor into two types, determined by the presence of a pseudocapsule surrounding it. Each type was also sub-classified depending on the thickness of the capsule, lobulation of the tumour, the presence of satellite lesions, and the diffuse or multicentric growth of the tumor [4].

Usually, patients have no particular symptoms or present with a palpable, often painless, soft tissue mass that gradually increases in size over a long period of time [1-4, 7]. The tumor mass may vary from solitary to multiple discrete soft-tissue nodules [1]. Usually, GCTTS are tendon-based, well circumscribed and localized [4]. However, some of them may grow diffusely or expand, as in our case, to involve surrounding structures or erode their surfaces [5].

Conventional radiographs commonly present completely normal radiological view or may show a soft tissue mass [5, 7]. Rarely, radiographs may present cystic changes without cortical expansion, bony pressure erosion or indentation, periosteal reaction, calcification, and degenerative changes of the adjacent joints [2, 5, 7]. MRI, CT, ultrasonography and color Doppler sonography images may reveal the precise topography of the tumor and are very useful in preoperative planning [2,3,7].

Treatment of GCTTS remains controversial because recurrence rates as high as 30% have been reported [5]. This is due to the fact that in many cases GCTTS has extensions that go around and under critical structures, including the neurovascular bundle, as in the case we report. Difficulties excising the lesion and using sparing surgery to maintain function have been cited by many authors as a factor contributing for recurrence [2, 5, 11]. Recently, some authors have proposed that the high recurrence rate might be also attributed to the nature of the tumour, its location, and its ability to invade bone or joints [4, 12]. In addition, all patients should be informed about possible complications, such as local recurrence, numbness, joint stiffness, painful scar, and skin necrosis [3]. Postoperative radiotherapy has been advocated by some authors to reduce the recurrence rate [13].

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