



Giant Cell Tumor of Tendon Sheath Affected Guyon Canal: A Case of Ulnar Tunnel Syndrome

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Abstract

Introduction: Despite its low prevalence, giant cell tumor of tendon sheath (GCTTS) is considered as one of the most common benign tumors in the hand. GCTTS mostly affects tendon sheaths and finger joints; however, its presence in the wrist and Guyon canal is scarcely reported.

Case Presentation: In this report, we describe the case of a 32-year-old female with signs and symptoms of ulnar tunnel syndrome in her right hand while the MRI illustrated a soft tissue mass in the Guyon canal. Excisional biopsy was performed, confirming the diagnosis of GCTTS.

Conclusions: This report proposes the consideration of GCTTS as a differential diagnosis in patients suffering from ulnar tunnel syndrome. In addition, it could be concluded that an excisional biopsy might be considered as a therapeutic and diagnostic method in this disease.

Keywords: Giant Cell Tumor of Tendon Sheath, Guyon Canal, Ulnar Tunnel Syndrome

1. Introduction

Giant cell tumor of tendon sheath (GCTTS) is one of the most common benign tumors of the hand, which mostly involves tendon sheaths and digital joints while it may possess local aggressive traits (1, 2). GCTTS, having an incidence rate of 1 in 50000 individuals, is considered as a rare tumor. Research has indicated that GCTTS is mostly seen in the hand, specifically fingers. However, the ankle and foot are considered as the second most common location for this tumor (3, 4). According to our review of the current English literature, only 7 cases of GCTTS located at Guyon's canal have been previously reported (5, 6).

Ulnar tunnel syndrome (UTS) is considered as ulnar nerve neuropathy, which is usually caused by compression of the nerve in the Guyon canal leading to pain, tingling, and weakness in the ulnar innervated regions. Handbrake palsy is another symptom for UTS. Chronic and repetitive trauma is considered as a major cause for UTS. Nevertheless, many of the published case reports describe various pathologies for this impairment (7). GCTTS is considered as a very rare cause for UTS affecting the wrist and Guyon canal (5, 6). In this case, we report a case of GCTTS in the Guyon canal leading to UTS.

2. Case Presentation

A 32-year-old female patient presented with right-hand paresthesia and progressive clawing in her 4th and 5th fingers over the last year. The patient was a right-handed housewife with no previous significant drug or medical history.

Clinical evaluations showed significant atrophy in the hypothenar eminence and dorsal interossei of the affected hand. The hypothenar eminence was also tender and Tinel's sign was positive in the continuum of Guyon canal. The abduction was impaired in the 3rd, 4th, and 5th finger and Froment's test was positive as well. Physical examination revealed that the sensory component of the ulnar nerve was intact.

Electromyogram (EMG) Test and nerve conduction velocity (NCV) test were indicative of compression lesion in Guyon canal at wrist level. Plain X-ray radiography of the right hand did not represent any lesion or abnormalities although clawing was visible in the 4th and 5th fingers.

Magnetic resonance imaging (MRI) was performed to evaluate soft tissue changes in the affected hand. MRI showed a solid hetero/homogeneous soft tissue mass (4 × 5 mm) at the Guyon canal of the right hand within the hypothenar muscle compressing the ulnar nerve. The tumor

was described with low T1 and T2 signal and moderate enhancement (Figure 1).

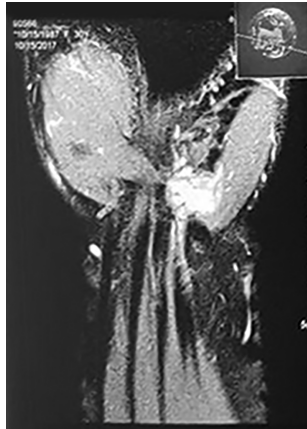


Figure 1. Coronal cut on T2 MRI obtained from the patients right upper limb shows a solid hetero/homogenous soft tissue mass (4×5 mm) at the Guyon canal within the hypothenar muscle. The radiology report described a tumor with low T1 and T2 signal and moderate enhancement.

As the X-ray and MRI findings suggested the presence of a benign soft tissue tumor, which was compressing the contents of the Guyon canal, an excisional biopsy was planned for the patient. Prior to surgery, the soft tissue tumors such as ganglion cyst and fibroma were considered as differential diagnosis. The skin was incised over the Guyon canal. The ulnar nerve and artery were explored and preserved while the capsulated tumor, sized 6×8 mm, was completely excised from the canal. The benign characteristics of the tumor were confirmed intraoperatively, thus, frozen section evaluation was not performed. As the deep branch of the ulnar nerves was noticeably compressed by the tumor, decompression was provided by total removal of the mass (Figure 2).

Pathological assessment of the excised biopsy revealed the presence of abundant multinucleated giant cells with benign spindle cell background and condensed eosinophilic fibrous stroma in the sample tissue. According to these findings, an expert pathologist confirmed the diagnosis of GCTT tumor in the right Guyon canal (Figure 3).

After surgery, clawing was improved in our patient and her pinch and grip forces were increased from 8 and 22 to 11 and 30, respectively, over a 6 month follow up period.

3. Discussion

In this report, we presented a case of GCTT affecting the Guyon, which led to ulnar tunnel syndrome. Giant cell tumor of the tendon sheath is mostly diagnosed by the presence of firm non-fluctuant volar nodules in the hand.

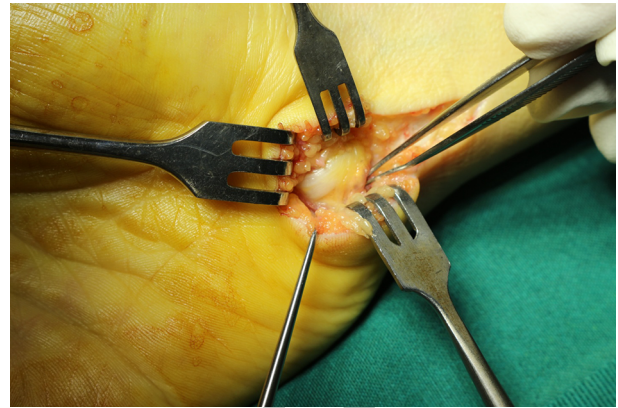


Figure 2. Solid tumor in the Guyon canal exposed during surgery

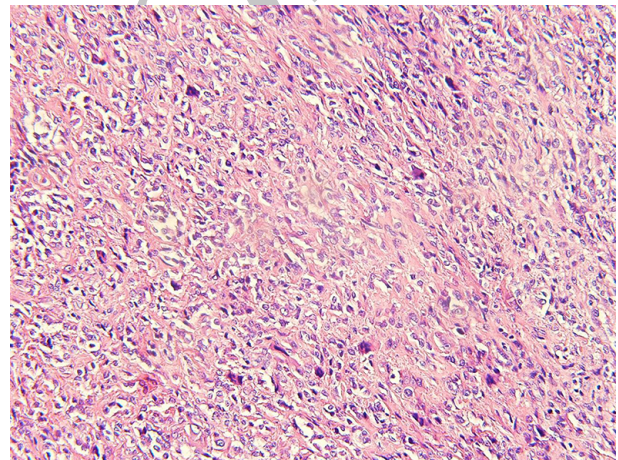


Figure 3. Histopathological assessment of the excised biopsy of the tumor revealed the nature of the tumor being giant cell Tumor of tendon sheath (GCTTS). Abundant abundant multi nucleated giant cells with benign spindle cell background and condensed eosinophilic fibrous stroma could be spotted in this image which is taken at 100X magnification from a slide stained with hematoxylin and eosin.

About 4.1% of GCTT cases are reported to occur in the wrist region. There are no specific radiographic features defined for this disease, although direct X-rays of the affected area are imperative in order to eliminate other differential diagnosis, in this case, the X-ray showed no specific pathological findings (8). On the other hand, MRI is considered as the most definitive imaging method showing a low-signal lesion of the soft tissue (9). Definite diagnosis of GCTT was made by surgical excision and histopathological assessment of the tumor in this case (10).

Our report represents a case of giant cell tumor of the tendon sheath, affecting the right Guyon canal, which led to sensory and motor impairment in the 4th and 5th fingers. Review of the present literature indicates that this is

a very rare presentation for GCTT, which has been reported in only seven cases worldwide (5, 6, 11, 12). Previous studies have described three anatomical zones, which ulnar nerve compression could occur within the Guyon's canal. Compression of the first zone, which is located distal to the bifurcation of the ulnar nerve into superficial and deep palmar branches could lead to complete sensory and/or motor deficits. Compression on the second zone, which surrounds the deep motor branch of ulnar nerve might lead to the paralysis of the intrinsic muscles; depending on the location of compression in the second zone, the hypothenar muscles could also be affected. The third zone merely surrounds the superficial branch of ulnar nerve, which its compression could result in sensory impairments (5, 13, 14). In the current study, our evaluation showed that the second zone was involved by the GCTT of the Guyon canal. The clinical findings of paresthesia and motor deficits also confirm the involvement of this zone.

As shown by previous studies, GCTTS could spread to adjacent structures such as nerves and arteries, which could lead to severe complications in this disease (1, 15). The Guyon canal contains important structures such as the ulnar artery and nerve. Guyon Canal Syndrome, which presents symptoms of ulnar nerve entrapment, is caused by injury to the distal portion of the ulnar nerve leading to ulnar neuropathy. Ganglion cysts, injuries to the hook of hamate, tumors such as lipoma, repetitive trauma, and ulnar artery impairments are some of the known causes for ulnar nerve injury in this narrow canal (16). This case report shows that although rare, GCTTS could also be a cause for this syndrome. Thus, considering GCTTS as a differential diagnosis, it might have substantial clinical importance as timely diagnosis and excision is the curative management (1, 15).

The therapeutic and diagnostic approaches as well as clinical outcomes of the current report were similar to most of the previous cases. Interestingly, the clinical and paraclinical presentations of the current case were also similar with the majority of the previous studies, for instance, this patient experienced compression of the ulnar nerve, which like most of the previous reports lead to both sensory and motor deficits (5, 6, 11, 12). These findings were different from the case reported by Kim et al. (6), in which the patient did not experience any sensory defects. On the other hand, our patient had a 2-month longer recovery time compared to the previous case report by Francisco et

al. (5). The mentioned differences could be due to the variety of individual cases, which include tumor size, tumor invasion, and the time period between the presentation of the disease and treatment.

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