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Ulnar Nerve Entrapment in the Guyon's Canal Secondary to Compression by a Ganglion Cyst: A Case Report

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Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Ulnar nerve compression in the Guyon's canal is in most cases secondary to repeated trauma, fracture of the hamate or a thrombosis or arterial aneurism of the ulnar artery. Tumoral etiologies such as a compression by a lipoma or a ganglion cyst are uncommon.
The development of a ganglion cyst in the Guyon's canal as a possible cause of ulnar nerve entrapment needs to be considered in the case of a sudden onset of hand grip weakness.
We believe that an early surgical decompression by removing the ganglion is essential for a full recovery.

Keywords: Ulnar nerve entrapment; Guyon's canal; ganglion cyst; neurolysis.

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1. INTRODUCTION

Ulnar nerve entrapment at the wrist is rare and that caused by compression from a ganglion cyst in the Guyon's canal (GC) is even rarer [1]. Compression in the GC is usually caused by repeated trauma, tumors such as ganglions ore lipomas, pisiform instability and pisotriquetral arthritis etc… [2].

In the event of a sudden decrease of the hand strength or sensory fallout, a careful and appropriate examination is important to identify the cause [3].

We hereby report the case of a patient who rapidly lost hand strength because of ulnar nerve entrapment at the GC due to compression by a ganglion cyst.

2. CASE REPORT

A 45 year old right handed female patient working in a garment factory presented to our outpatient clinic with the main complaint of unilateral progressive weakness of the right hand and numbness of the ulnar side of the hand extending to the ring and pinkie fingers. Her symptoms started 3 months ago with no history of trauma.

Clinical examination revealed an early wasting of the hypothenar eminence muscles and S2 sensitivity at the pulp of the 5th digit according to the British Medical Council classification. No mass was palpated. Clinical examination of the opposite hand was normal.

Ultrasound, electromyography (EMG), nerve conduction velocity (NCV) and X-ray of the cervical spine were requested.

The EMG study revealed abnormal spontaneous activity in the right 1st dorsal interosseous muscle and 5th digit abductor.

Ultrasound of the wrist found a ganglion cyst measuring 22x11x09mm between the ulnar nerve and the wrist joint (Fig. 1).

The patient was operated under axillary bloc. A longitudinal incision was made over the GC. The ulnar nerve and artery were identified at the wrist. The transverse retinaculum was incised to expose the cyst that was compressing the ulnar nerve on its radial side (Figs. 2, 3). A neurolysis of the ulnar nerve was performed and the ganglion cyst was removed. A quick and steady recovery was noted and no complications reported aver the two weeks following surgery. At the last follow up the patient had regained full strength and did not complain of any pain. The soft tissue removed from the wrist was confirmed to be a ganglion cyst on pathology report.

3. DISCUSSION

Ulnar nerve entrapment at the elbow is the second most commonly diagnosed peripheral nerve compression syndrome in the upper limb. However, the compression of the ulnar nerve at the wrist is rare [4].

The fibrous compartment described by Felix Guyon in 1861 [5] is actually not a tunnel as it is not rigid enough. Its anatomical boundaries consist of an osseous floor formed by the triquetrum and the hamate covered by the ulnar insertion of the flexor retinaculum; a roof formed by a strong ulno-pisiform ligament and a superficial aponeurotical expansion blending radially with the flexor retinaculum; and a medial wall formed from proximal to distal by the tendon of the Flexor Carpi Ulnaris and the pisiforme.

Inside this space the ulnar nerve runs vertically than posterolateral to give its two terminal branches: a superficial sensory branch to the two ulnar digits of the hand; and a deep motor branch that innervates the hypothenar muscles, the two last lumbricals, all the interossei muscles and the adductor of the thumb. Together with the ulnar nerve runs the ulnar artery and vein [6].

Distal ulnar nerve lesions are classified in three stages according to the level of the nerve compression [1]: Type I syndrome associates both motor end sensory fallout. This is caused by a compression at the proximal part of the Guyon's canal. Type II syndrome presents as a pure motor deficit. It is the most frequently seen. The compression occurs at the piso-hamate hiatus or more distal. The amount of muscles involved depends on the site of the compression along the deep motor branch. The type III syndrome involves an isolated sensory deficit and is the result of a compression of the superficial sensory branch further distal in the canal. The case we report on is a type I syndrome.

As previously mentioned, repeated trauma, fracture of the hook of the hamate, thrombosis or arterial aneurism can compress the ulnar nerve

in the Guyon's canal. Few cases of ulnar nerve compression at the Guyon's canal by an arteriovenous malformation were reported [4]. Gan reported on one case of ulnar nerve entrapment at the Guyon's canal by a concomitant ganglion cyst and a lipoma [7]. The development of a ganglion cyst is thought to be the commonest etiology of this syndrome.

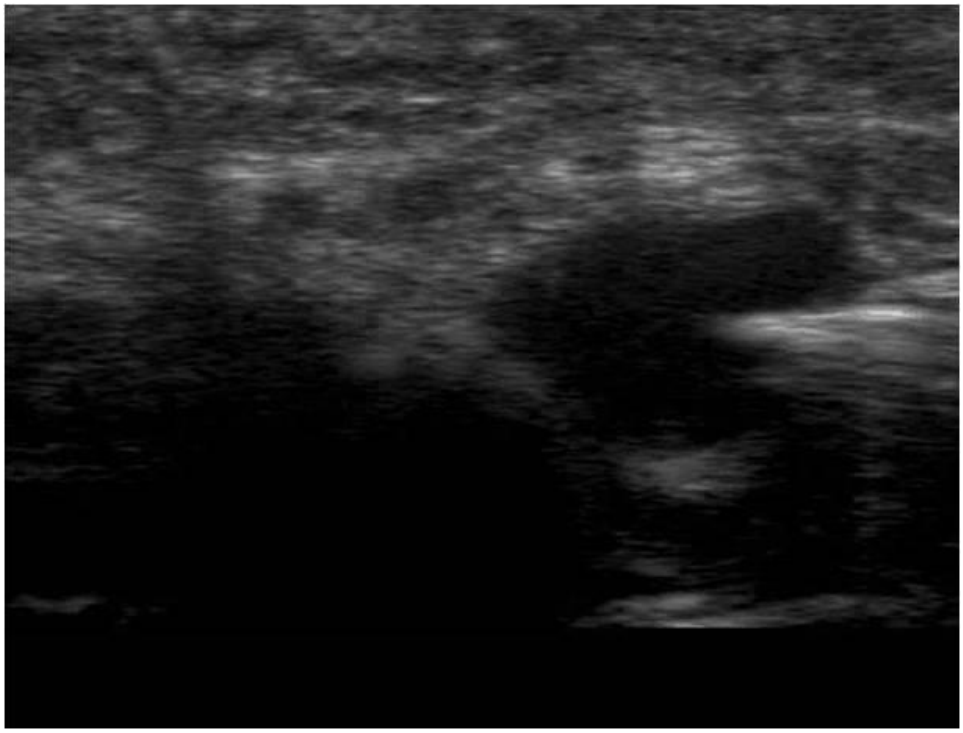

Fig. 1. Ultrasound appearance of a ganglion cyst

Fig. 2. Intraoperative view showing the ganglion cyst and its relationship with the ulnar nerve

Fig. 3. Intraoperative view showing the cyst in the radial aspect along the ulnar nerve

Ganglion cysts in the wrist appear more often between the second and fourth decades of life, more frequently in female patients who usually complain of an asymptomatic lump which have been there for months or even years [6]. The size of the tumor may fluctuate according to the degree of activity. These tumors can develop suddenly ore more progressively and can disappear spontaneously as rapidly as they developed [8.9]. No history of trauma is reported in most cases. The reasons why patients with ganglion cysts consult are mainly esthetic concerns and fear of malignant transformation [10]. Our patient's main complaint extended over 3 months. Interestingly, she had a sudden onset of her symptoms with a progressive weakness of the hand. Most probably the rapid increase in size of the ganglion cyst and her manual occupation explain the subacute presentation of the symptoms.

In our patient, an ultrasound examination of the wrist and EMG/NCV studies were done. Clinical examination and nerve conduction studies could determine the exact position of the cyst and the surgical decompression of the GC resulted in a full recovery.

MRI scan allows for a better visualization of the compression as well as a better understanding of the ganglion cyst and its relationship with regards to the ulnar nerve and its branches [11]. However, this examination was not done in our case for economical considerations.

It has been reported that ulnar nerve compression at the wrist by a ganglion was successfully treated with percutaneous puncture and corticosteroid injection [12,13].

Complete neurolysis of the ulnar nerve as well as of its motor and sensory branches together with the resection of the ganglion cyst result very often in a full recovery if surgery is done early [14,15].

4. CONCLUSION

The compression of the ulnar nerve by a ganglion cyst in the GC with subsequent

unilateral sudden weakness of the hand is extremely rare.

The diagnosis is based on clinical and electromyography findings. Ultrasound helps in determining the cause of the compression which is better seen on MRI scan.

Early surgical decompression usually results in full recovery.

CONSENT

As per international standard or university standard, patient's consent has been collected and preserved by the authors.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

The authors declare that they have no conflicts of interest concerning this article.

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