



Carpal Tunnel Syndrome Caused by a Ganglion Cyst of the Wrist: Report of a Case and Review of Literature

**Amira Gallas^{1,2*}, Mohamed Ali Sbai^{1,2}, Walid Saidane^{1,2}, Rami Ben Arab^{1,2},
Walid Bouaïcha^{1,2}, Monia Boussen^{1,3}, Nesrine Attia², Khaled Bchir^{1,4}
and Riadh Maalla^{1,5}**

¹Faculty of Medicine of Tunis, University of Tunis El Manar, Tunisia.

²Department of Orthopedic and Trauma Surgery, Mohamed Taher Al Maamouri Hospital, Nabeul, Tunisia.

³Department of Emergency, Mongi Slim Hospital, La Marsa, Tunisia.

⁴Department of Legal Medicine, Mohamed Taher Al Maamouri Hospital, Nabeul, Tunisia.

⁵Department of Plastic Surgery, Rabta Hospital, Tunis, Tunisia.

Authors' contributions

This work was carried out in collaboration among all authors. Authors AG and MAS designed the case study, managed the literature searches and wrote the first draft of the manuscript. Authors WS and RBA managed the analyses of the study. Authors WB and MB reviewed the literature searches and the references. Authors KB and RM corrected the first draft. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Carpal tunnel syndrome is usually idiopathic and presents bilaterally. An etiologic factor should be suspected in patients with unilateral symptoms, Ganglion cysts are the most common tumours of the wrist and are often listed among the possible causes of carpal tunnel syndrome but cases of carpal tunnel syndrome caused by ganglion cysts are underreported in literature. The clinical presentation consists of swelling and pain of the wrist with paresthesia in the median nerve

distribution. Tinel's sign and Phalen's manoeuvre are positive. Electromyogram (EMG) should be accompanied by ultrasonography or magnetic resonance imaging (MRI) investigation before surgery. Although the current trend is to perform endoscopic carpal tunnel release, this technique can't allow a good exploration of the carpal tunnel, and open carpal tunnel release surgery with removal of the ganglion cyst remains the gold standard of treatment with an excellent prognosis. We present the case of a 45-year-old woman with carpal tunnel syndrome caused by a ganglion cyst to highlight its characteristics, the interest of imaging studies (ultrasonography or MRI) in patients with unilateral symptoms, and the importance of early recognition with adequate treatment.

Keywords: Carpal tunnel syndrome; ganglion cyst; wrist; hand surgery.

1. INTRODUCTION

Carpal tunnel syndrome caused by a space-occupying lesion is rare [1]. Ganglion cysts are well recognized and often listed among the causes of carpal tunnel syndrome in large series but are poorly documented [2,3]. Patients who have carpal tunnel syndrome caused by a ganglion cyst generally present with typical symptoms of swelling and pain of the wrist with numbness in the typical median nerve distribution. Examination findings are essentially positive Phalen's manoeuvre and Tinel's sign with a local swelling or a palpable mass of the wrist that require further exploration by ultrasonography or magnetic resonance imaging (MRI) [1]. Although the endoscopic release of the carpal tunnel is becoming more and more common, it may miss the lesion. This syndrome is successfully treated with open carpal tunnel release and cyst removal, with an excellent prognosis [1,2].

2. CASE REPORT

A 45-year-old right-handed housewife, with no notable pathological history, was seen in our plastic surgery department for a volar swelling with the pain of the left wrist that appeared spontaneously a year ago. She reported paresthesia and numbness in the median nerve distribution of the left hand that has been evolving for 06 months. These symptoms increased with wrist movements. No decrease in the grip force of the left hand has been mentioned. Physical examination showed swelling of at most 0.5 cm of long axis with no evident palpable mass, developed at the radial volar slope of the left wrist, adherent to the deep plane with preserved mobility of the wrist (Fig. 1a, 1b). Tinel's sign and Phalen's manoeuvre at the left wrist were positive. The median nerve quotation according to the British medical research council was S3 M5. No atrophy has been noticed.



Fig. 1a. Palmar view of the left wrist



Fig. 1b. Good trophicity of the thenar eminence

An ultrasonography imaging of soft tissues of the left wrist was performed and showed a cystic multi-lobed formation of the flexor retinaculum measuring 20 mm * 7 mm in contact with the median nerve (Fig. 2).

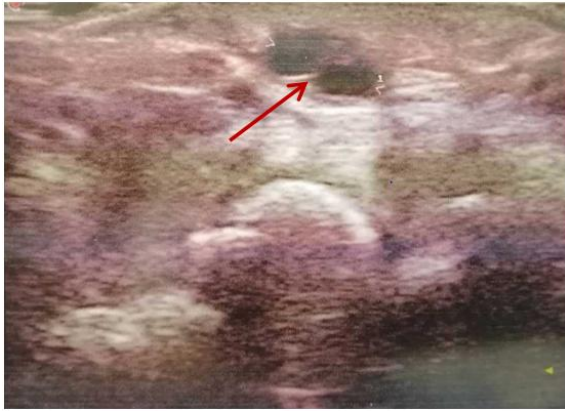


Fig. 2. Ultrasound image of the multi-lobed cyst of the flexor retinaculum

We didn't complete with needle electromyogram (EMG) as clinical and ultrasonography findings were consistent.

We practised an open transverse carpal ligament release for better exploration. We proceeded to the excision of the cyst that was adherent to the flexor retinaculum and pressing on the median nerve in the carpal tunnel. It was sent to the pathology department for histopathological examination (Fig. 3a, 3b). We performed neurolysis of the median nerve that was compressed to 20% of its calibre (Fig. 3c).

The postoperative follow-up was uneventful with wound healing at 20 days postoperative, the disappearance of the paresthesia and full grip force of the left hand.

3. DISCUSSION

Most carpal tunnel syndromes are idiopathic; however, some local or systemic factors could contribute to it. Both an increase in content or decrease in size of the carpal canal may elevate the pressure in the carpal tunnel and cause symptoms [1].

Patients with idiopathic carpal tunnel syndrome have typical characteristics; female gender, middle-aged, bilateral involvement. When patients present with an atypical feature, especially when the condition is unilateral, we

should consider the probability of a certain aetiology of carpal tunnel syndrome such as space-occupying lesions [1,4,5,6].



Fig. 3a. Open carpal tunnel release



Fig. 3b. Cystic formation adherent to the opened flexor retinaculum



Fig. 3c. Photo of the excised cyst and the median nerve on lac

Although carpal tunnel syndrome is the most common compressive neuropathy and ganglion cysts are the most common tumours of the wrist, carpal tunnel syndrome caused by ganglion cyst of the wrist is uncommon and under-reported in literature [2,4]. They arise from joint spaces or tendon sheaths and consist of clear mucinous fluid encased in a fibrous capsule [2]. Volar wrist ganglion cysts can be quite extensive, tracking under the thenar muscles, into the carpal canal, or along the flexor carpi radialis tendon [7].

Brooks published for the first time in 1952, a review of 13 cases of median nerve compression by simple ganglia [8].

A retrospective chart review was conducted by Chen et al. in the department of orthopaedic in Shuang-Ho Hospital (Taiwan) on 779 patients operated for carpal tunnel syndrome between 1999 and 2008. The authors identified 23 patients (12 men and 11 women) with space-occupying lesions with 10 cases of tophaceous gout, 7 cases of tenosynovitis and 6 cases of specific swellings. Only two of these swellings consisted of ganglion cysts, the others were two lipomas, one epidermal cyst, and one fibroma of tendon sheath [1].

Ganglion cysts have been associated with compressive neuropathy but a causal relationship has not been well demonstrated and the association may be coincidental in some of the cases [2,3]. In the reported case, the results of ultrasound studies and intraoperative findings showed the location of the cyst and its direct compression of the median nerve.

Patients generally present with typical symptoms of paresthesia in the median nerve distribution with a volar wrist swelling. According to the location of the ganglion in the carpal tunnel, it may selectively interfere with a branch of the median nerve, resulting in varying symptoms and signs. When the ganglion only interferes with the motor branch, the signs are weakness and atrophy of the thenar muscles without sensory disturbance of the fingers [9,10]. Shimizu et al. reported the case of the 34-year-old woman with a carpal tunnel syndrome caused by a ganglion with an atypical palsy. The ganglion was adjacent to the radial side of the median nerve and its distal side was excluding the motor branch at the distal part of the transverse carpal ligament, although the trunk itself showed no evident abnormality [8].

Although EMG is accepted as a gold standard in the diagnosis of carpal tunnel syndrome, it should be accompanied by ultrasonography or magnetic resonance imaging (MRI) investigation before surgery [1,9]. Some authors report that ultrasound is an accurate and useful diagnostic tool in patients with carpal tunnel release, with a sensitivity of 99% and specificity of 100%, that can be used as the initial diagnostic test in patients presenting with clinical symptoms of carpal tunnel syndrome, because it is equivalent to neurophysiological studies and provides additional valuable anatomical information [11].

As for the interest of MRI, Onen et al. applied it to 69 wrists of 55 patients who received a diagnosis of carpal tunnel syndrome and detected 71 additional pathologies of which 28 were ganglion cysts. They concluded that wrist MRI is recommended, especially for young cases with unilateral carpal tunnel history accompanied by dubious clinical symptoms and lacking any pronounced predisposing factors [12].

Endoscopic or minimally invasive surgery to release the transverse carpal ligament has become more and more common, but such surgery may miss the lesion and the symptoms may not subside [1]. The two patients with ganglion cysts whose cases were reported in Chen et al. study were first treated with an endoscopic release but the symptoms were not improved. Release of the transverse carpal ligament was thought to be inadequate and an open transverse carpal ligament release was done when ganglion cysts attached to flexor tendons were found. This allows concluding that open carpal tunnel release surgery is the only guarantor of a good exploration of the carpal tunnel with excision of the ganglion cyst.

Cases of spontaneous cyst rupture with a total resolution of the symptoms were described in the literature. The frequency of spontaneous rupture is not known, but it is most certainly underreported [2]. Early recognition with appropriate treatment of ganglion cysts that are developed in the carpal tunnel is successful in most of the cases.

4. CONCLUSION

It is well known that ganglion cysts are one of the causes of carpal tunnel syndrome. In patients with volar wrist swelling, atypical features or with recurrent carpal tunnel syndrome, space-occupying lesions like ganglion cysts should be

considered as etiologic factors and radiological evaluation should be performed using ultrasonography or MRI. Open carpal tunnel release and removal of the ganglion cyst remains the gold standard with the relief of all symptoms post-operatively.

CONSENT

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

ETHICAL APPROVAL

As per international standard, ethical approval has been collected and preserved by the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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