International Journal of Research in Medical Sciences
Alfallaj MI. Int J Res Med Sci. 2025 Apr;13(4):1665-1667
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20250997

Case Report

Secondary carpal tunnel syndrome caused by an occult ganglion cyst in the carpal tunnel: a case report

Muath Ibrahim Alfallaj*

Department of Surgery, College of Medicine, Qassim University, Unaizah, Kingdom of Saudi Arabia

Received: 04 February 2025
Revised: 11 March 2025
Accepted: 13 March 2025

***Correspondence:**
Dr. Muath Ibrahim Alfallaj,
E-mail: MI.ALfallaj@qu.edu.sa

ABSTRACT

Carpal tunnel syndrome (CTS) is the most common peripheral compressive neuropathy that begins with pain and sensory symptoms initially and eventually leads to motor impairment. Most cases of CTS are primary (idiopathic), but space-occupying lesions in the carpal tunnel can occasionally be the cause. This article presents a case wherein an occult ganglion cyst caused secondary carpal tunnel syndrome in a 29-year-old female patient. The patient had complained of left index and middle finger pain, numbness, and weakening for five months. Clinical examination revealed positive Phalen's test and Tinel's sign in the left hand with hypoesthesia over the palmar side of the index and middle fingers. Nerve-conduction studies of the median nerve revealed a prolonged median to abductor pollicis brevis (APB) distal latency (4.9 m/s). Ultrasonography was suggestive of a ganglion cyst in the left carpal tunnel. Under local anesthesia, an open release of the left carpal tunnel with ganglion excision was effectively performed, and the symptoms were alleviated. It was concluded that space-occupying lesions should be ruled out in patients with carpal tunnel syndrome who do not have any known risk factors.

Keywords: Carpal tunnel syndrome, Ganglion cyst, Ultrasound, Space occupying lesion, Decompression, Median nerve

INTRODUCTION

Carpal tunnel syndrome (CTS) accounts for 90% of all neuropathy cases and is the most common focal mononeuropathy.[1] The carpal tunnel is a tiny, isolated anatomical space comprised of the carpal bones and fibrous tissue, and nine flexor tendons and one median nerve pass through. The compression of the median nerve as it traverses the carpal tunnel results in CTS.[2] Based on etiology, there are two types: primary (idiopathic) and secondary, which result from other conditions.[3]

The incidence of space-occupying lesions (SOLs) is higher in unilateral CTS than in bilateral CTS, and SOLs are one of the etiologic factors implicated in secondary CTS.[4] In this report, a ganglion in the carpal tunnel of a patient exhibiting unilateral CTS symptoms was successfully identified on imaging and treated.

CASE REPORT

A 29-year-old woman, a banker by profession, presented with pain and numbness of her left index and middle fingers for about five months. She also felt that the left index finger is getting weaker as she feels some difficulty in buttoning the clothes. On clinical examination, there was hypoesthesia over the palmar surface of the left index and middle fingers. Phalen's test and Tinel's sign were positive on the left side. There were no abnormal features in the right hand. Nerve-conduction studies of the median nerve revealed a normal study on the right side and prolonged median to abductor pollicis brevis (APB) distal latency (4.9 m/s).

Based on clinical features and the neurophysiological studies, grade 2 carpal tunnel syndrome on the left side was diagnosed. But since the contralateral (right) hand was normal, hence a secondary disease was suspected, and

ultrasonography of the carpal tunnels was arranged. The study showed a well-defined, hypoechoic, thin, smooth-walled SOL, measuring 4×4×3.5 mm, suggestive of a ganglion cyst, lying deep to flexor tendons and abutting the median nerve in the left carpal tunnel (Figures 1a and b).

Although a magnetic resonance imaging (MRI) research was planned, logistical limitations prevented it from being carried out. Patient was counselled and informed consent was obtained. Open left carpal tunnel release and ganglion excision were performed through a palmar incision under local anesthesia (Figure 1d). Histopathological analysis confirmed the diagnosis of a unilocular ganglion filled with mucoid material. The patient was symptom-free at 18-months follow-up and satisfied with the outcomes.

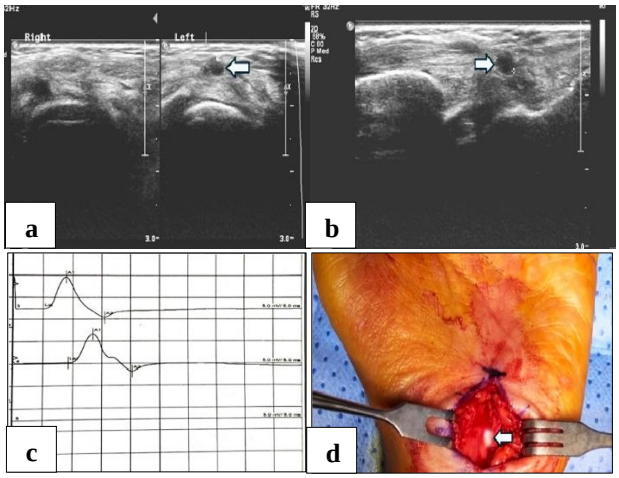

Figure 1: (a) Ultrasound of bilateral carpal tunnels revealing normal features on right side and a hypoechoic lesion on left side (white arrow); (b) ultrasound of left carpal tunnel a hypoechoic lesion on left side (asterisks); (c) nerve conduction velocity (NCV) graph showing shows left median nerve to APB prolonged distal latency; and (d) intraoperative photograph showing the ganglion in the carpal tunnel (white arrow).

DISCUSSION

CTS occurs when the median nerve is compressed as it travels through the carpal tunnel and is characterized by pain, numbness, and paresthesias along the distribution of the median nerve. If it is not adequately identified and treated, it can result in permanent sensory and motor neurodeficits in the hand. Primary (idiopathic) CTS is generally bilateral and is associated with various risk factors, including obesity, frequent monotonous wrist activity, hypothyroidism, menopause, pregnancy, genetic predisposition, and rheumatoid arthritis.[2] The lifetime prevalence of primary CTS is about 8%. It is more prevalent in women, and the prevalence increases linearly with age.

If the features of CTS are unilateral or arise without any known risk factors, then the possibility of secondary CTS due to SOLs must be considered, and proper imaging is mandatory, as SOLs have been found to contribute to about 3% of CTS cases.[4-6] Its pathophysiology involves a combination of direct mechanical trauma and ischemic damage to the median nerve induced by increased pressure within the carpal tunnel. A wide range of SOLs have been reported in the literature as the causative agents of secondary CTS.[5-7] Chen et al retrospectively audited 779 patients managed surgically for CTS over ten years and found that 23 (2.95%) resulted from SOLs, which included gouty tophi, tenosynovitis, ganglion cysts, lipoma, and fibroma of the tendon sheath.[5]

Kerrigan et al retrospectively analyzed 12 cases of CTS caused by ganglion cysts and found that about 50% were associated with direct trauma in the form of wrist hyperextension.[3] Tinel's sign was present in all the cases, and nerve conduction studies showed an abnormal pattern in seven of the eight studied cases. Cyst excision and incision of the flexor retinaculum relieved the symptoms in 11 (91.6%) cases, and one case resolved after spontaneous rupture of the ganglion.

Imaging plays an important role in the diagnosis and planning of the surgical operation for secondary CTS, as it documents the structural abnormalities in the carpal tunnel and delineates the relationship between the SOL and adjacent structures.[4] Sprouse and Johnson have stressed the value of point-of-care (POC) ultrasound in the evaluation of suspected carpal tunnel SOLs.[8]

MRI confirms the findings of the ultrasound study and more clearly delineates the distortion of anatomy within the carpal tunnel.[4] MRI study could not be undertaken due to logistic issues in the presented case, and the operation was planned on clinical assessment, neurophysiology, and ultrasound studies.

Open carpal tunnel release and SOL excision is the preferred definitive management approach mentioned in the literature, and the same was adopted without any complication in the presented case.[3] In the case of ganglion cysts, however, Sprouse and Johnson have documented the role of ultrasound-guided cyst aspiration as a management option.[8] They managed a 2.0×0.8×1.8 cm ganglion cyst within the left carpal tunnel of a 49-year-old female patient by aspiration of 7 cc of thick serous fluid and corticosteroid injection. The treatment had to be repeated at 6 months and resulted in symptomatic relief.

CONCLUSION

If a patient present with symptoms of unilateral median nerve compression neuropathy and there are no known risk factors for carpal tunnel syndrome, a space-occupying lesion must be considered and investigated with proper imaging modalities.

ACKNOWLEDGEMENTS

The authors would like to thank the patient for allowing the usage of case history and ultrasound images for academic purposes including publications.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Kang HJ, Jung SH, Yoon HK, Hahn SB, Kim SJ. Carpal tunnel syndrome caused by space occupying lesions. Yonsei Med J. 2009;50(2):257-61.
2. Genova A, Dix O, Saefan A, Thakur M, Hassan A. Carpal Tunnel Syndrome: A Review of Literature. Cureus. 2020;12(3):e7333.
3. Kerrigan JJ, Bertoni JM, Jaeger SH. Ganglion cysts and carpal tunnel syndrome. J Hand Surg Am. 1988;13(5):763-5.
4. Nakamichi K, Tachibana S. Unilateral carpal tunnel syndrome and space-occupying lesions. J Hand Surg Br. 1993;18(6):748-9.
5. Chen CH, Wu T, Sun JS, Lin WH, Chen CY. Unusual causes of carpal tunnel syndrome: space occupying lesions. J Hand Surg Eur Vol. 2012;37(1):14-9.
6. Yalcinkaya M, Akman YE, Bagatur AE. Unilateral carpal tunnel syndrome caused by an occult ganglion in the carpal tunnel: a report of two cases. Case Rep Orthop. 2014;2014:589021.
7. Sbai MA, Benzarti S, Msek H, Boussen M, Khorbi A. Carpal tunnel syndrome caused by lipoma: a case report. Pan Afr Med J. 2015;22:51.
8. Sprouse RA, Johnson M. Point-of-Care Musculoskeletal Ultrasound Evaluation of an Occult Carpal Tunnel Ganglion Cyst Causing Median Neuropathy at the Wrist. Ann Sports Med Res. 2017;4(6):1122.

Cite this article as: Alfallaj MI. Secondary carpal tunnel syndrome caused by an occult ganglion cyst in the carpal tunnel: a case report. Int J Res Med Sci 2025;13:1665-7.