## **Imaging for Residents - Answer**

# A Man with Numbness in the Hands

Siam Tongprasert, Montana Buntragulpoontawee\* Department of Rehabilitation Medicine, Chiang Mai University, Chiang Mai, Thailand

# Section 2 – Answer

## **Case description**

A 38-year-old man had a 4-month history of numbness in both hands. The numbness was triggered by riding a motorcycle. Examination showed no wasting of both thenar eminences. A Phalen's maneuver elicited tingling in the right middle finger after 30 s. Tinel's sign could not be induced on percussion of the median nerves at the wrist. Neither weakness nor sensory loss was found. Electrodiagnostic examination was performed and there is neurophysiologic evidence of moderate median nerve dysfunction at both wrists. Ultrasound imaging was done at both wrists for guiding steroid injection. Figure 1 shows left and right median nerves at the wrists. What is your diagnosis?

### Interpretation

In Figure 1, a linear 5–18 MHz transducer was placed transversely on both wrists at the level of distal wrist creases with the wrists fully supinated on a stable surface, demonstrating left and right median nerves. The left median nerve was enlarged with a cross-sectional area (CSA) of 0.13 cm<sup>2</sup>. Figure 2 shows right median nerve, separating to two parts at the carpal tunnel inlet with the larger lateral part, CSA of 0.1 cm<sup>2</sup> and a smaller medial part, CSA of 0.05 cm<sup>2</sup> compatible with a bifid median nerve.

## DISCUSSION

Carpal tunnel syndrome (CTS) is the most common reported nerve compression syndrome.<sup>[1]</sup> In recent years, high frequency ultrasound (US) has become increasingly used by physiatrists for diagnostic and therapeutic purposes. Ultrasound is now a potential adjunctive tool in evaluation of neuromuscular disease that is an ideal complement to electrodiagnosis (EDx); the latter typically provides functional information, whereas ultrasound provides structural and in some cases additional functional information. The American Association of Neuromuscular and Electrodiagnostic Medicine evidence-based guideline in 2012 recommended that neuromuscular ultrasound measurement

Received: 02-05-2018 Accepted: 07-06-2018 Available Online: 21-02-2019

Access this article online	
Quick Response Code:	Website: www.jmuonline.org
	<b>DOI:</b> 10.4103/JMU.JMU_56_18



Figure 1: Left and right median nerves at the wrist



Figure 2: Bifid median nerve at right wrist with a larger lateral part than medial part

of median nerve cross-sectional area (CSA) at the wrist is accurate and may be offered as a diagnostic test for CTS (level A) and neuromuscular ultrasound probable adds value to electrodiagnostic studies when diagnosing CTS and should be considered in screening for structural abnormalities at the wrist in those with CTS (level B).<sup>[2]</sup>

In the present case, the CSA of the median nerves on the short axis scan of both sides was increased and right bifid median nerve was found. Result from a recent retrospective study performed in 2017, bifid median nerves were found in 66 (4.6%) of the 1425 patients studied with US in screening for EDX

> Address for correspondence: Dr. Montana Buntragulpoontawee, Department of Rehabilitation Medicine, Chiang Mai University, Chiang Mai, Thailand. E-mail: montana.mdcu@gmail.com

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

**How to cite this article:** Tongprasert S, Buntragulpoontawee M. A man with numbness in the hands. J Med Ultrasound 2019;27:56-7.

Tongprasert and Buntragulpoontawee: A man with numbness in the hands

abnormalities in patients with CTS symptoms.<sup>[3]</sup> Another study found the prevalence of bifid median nerve and/or persistent median artery of 8.6% and 3.7%, respectively.<sup>[4]</sup> The knowledge of the existence of bifid median nerve is an important factor in planning surgical decompression of median nerve to avoid nerve and persistent median artery injuries and/ or potential relapse if decompression of both branches is not carried out. Although a bifid median nerve is not an independent factor for the development of CTS.<sup>[5]</sup>

In conclusion, ultrasound provides high-resolution neural imaging that is easily accessible, noninvasive, low cost, fast tool which has novel diagnostic values that might modify the management of CTS by meticulous preoperative evaluation.

#### **Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

#### Acknowledgement

The authors would like to thank Ms. Tarinee Prakobkhong, for technical support.

# Financial support and sponsorship Nil.

Conflicts of interest

There are no conflicts of interest.

## REFERENCES

- 1. Schappert SM, Rechtsteiner EA. Ambulatory medical care utilization estimates for 2006. Natl Health Stat Report 2008;6:1-29.
- Cartwright MS, Hobson-Webb LD, Boon AJ, Alter KE, Hunt CH, Flores VH, *et al.* Evidence-based guideline: Neuromuscular ultrasound for the diagnosis of carpal tunnel syndrome. Muscle Nerve 2012;46:287-93.
- Billakota S, Hobson-Webb LD. Standard median nerve ultrasound in carpal tunnel syndrome: A retrospective review of 1,021 cases. Clin Neurophysiol Pract 2017;2:188-91.
- 4. Walker FO, Cartwright MS, Blocker JN, Arcury TA, Suk JI, Chen H, *et al.* Prevalence of bifid median nerves and persistent median arteries and their association with carpal tunnel syndrome in a sample of Latino poultry processors and other manual workers. Muscle Nerve 2013;48:539-44.
- Kasius KM, Claes F, Meulstee J, Verhagen WI. Bifid median nerve in carpal tunnel syndrome: Do we need to know? Muscle Nerve 2014;50:835-43.