

Bifid median nerve and carpal tunnel syndrome: an uncommon anatomical variation

Dear sir,

one of the most common entrapment neuropathy syndromes in clinical practice is "Entrapment of median nerve in carpal tunnel" also called "Carpal tunnel syndrome (CTS)" (Aydin et al., 2007; Huisstede et al., 2010). This syndrome is caused by entrapment of the median nerve in the wrist (Preston and Shapiro, 2005) when the pressure increases in the carpal tunnel.

A high division of the median nerve proximal to the carpal tunnel, also known as a bifid median nerve, is a rare anatomic variation that may be associated with CTS and with persistent median vessels (Lanz, 1977). This anatomic variation has an incidence of 0,8% to 2,3% in patients with CTS.

Lanz (1977) has characterized this anatomic condition of the median nerve in the carpal tunnel. These anatomic variants have been classified into four groups:

- Group 0: extraligamentous thenar branch (standard anatomy);
- Group 1: variations of the course of the thenar branch;
- Group 2: accessory branches at the distal portion of the carpal tunnel;
- Group 3: divided or duplicated median nerve inside the carpal tunnel;
- Group 4: accessory branches proximal to the carpal tunnel.



Fig. 1

During dissection of the wrist performed for the treatment of a CTS under local anesthesia, we found an anatomical variation of the median nerve that was divided in two branches inside the carpal tunnel (Group 3 of Lanz Classification) and in which its radial branch passed through its own compartment. The two parts of the nerve seems to be unequal in size (Fig. 1).

Moreover the nerve passed in carpal tunnel associated with a median artery, so we classified this variation in the group 3b of Lanz Classification (Fig. 2).

The persistence of median artery coexisting with a bifid median nerve has been widely reported in surgical literature (Lanz, 1977; Barbe et al., 2005). Before surgical intervention clinical evaluation of patient and electrophysiological examination showed no differences compared to a non bifid median nerve entrapment syndrome.

In conclusion the bifid median nerve may facilitate compression of median nerve in the carpal tunnel because of its increased cross sectional area even if it has no electrophysiological or clinical differential diagnosis in case of CTS.

The aim of this letter is aware the physicians in order to borne in mind the possible presence of a median nerve variation during dissection of carpal tunnel in order to avoid the damage of this non common anatomical structures.



Fig. 2

References

1. Aydin K, Cokluk C, Piskin A, Kocabicak E: *Ultrasonographically checking the sectioning of the transverse carpal ligament during carpal tunnel surgery with limited uni skin incisions*. Turk Neurosurg, 2007; 17:219-23.
2. Barbe M, Bradfield J, Donathan M, Elmaleh J: *Coexistence of multiple anomalies in the carpal tunnel*. Clin Anat, 2005; 18:251-59.
3. Huisstede BM, Randsdorp MS, Coert JH, Glerum S, van Middelkoop M, Koes BW: *Carpal tunnel syndrome. Part II: effectiveness of surgical treatments-a systematic review*. Arch Phys Med Rehabil, 2010; 91:1005-24.
4. Lanz U: *Anatomical variations of the median nerve in the carpal tunnel*. J Hand Surg, 1977; 2:44-53.
5. Preston DC, Shapiro BE: *Median neuropathy at the wrist*. In: *Electromyography and Neuromuscular Disorders*. 2nd Ed. Philadelphia: Elsevier Butterworth-Heinemann, 2005; 255-79.

*Anna Maria Spagnoli, Pasquale Fino,
Paolo Fioramonti, Giuseppe Sanese, Nicolò Scuderi*

Department of Plastic, Reconstructive and Aesthetic Surgery,
University of Rome "Sapienza",
Policlinico Umberto I, Rome, Italy

READ-ONLY COPY
PRINTING PROHIBITED