

“Who seeks finds, who compares discovers”. Usefulness of ultrasound to assess small nerve branches

DANIELE CORACI¹⁾, LUCA GENTILE²⁾, JULIANNE TANNOUS CORDENONSSI³⁾, CLAUDIA LORETTI¹⁾, CRISTINA CUCCAGNA⁴⁾, LUCA PADUA^{1,5)}

¹⁾IRCCS Fondazione Don Carlo Gnocchi, Milan, Italy

²⁾Department of Clinical and Experimental Medicine, University of Messina, Messina, Italy

³⁾Hospital das Clínicas da Universidade de São Paulo, São Paulo, Brazil

⁴⁾Neuroriabilitazione Alta Intensità, Fondazione Policlinico Universitario A. Gemelli IRCCS, Rome, Italy

⁵⁾Department of Geriatrics, Neurosciences and Orthopedics, Università Cattolica del Sacro Cuore, Rome, Italy

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Dear Editor,

We have read with interest the paper by Bale *et al.*, about the anatomical variations of median nerve terminal branches [1]. In this case, the authors described a particular and uncommon neural loop involving the common and the proper palmar digital nerve [1]. The case is very important, because underlines the possible presence of tricky anatomical abnormalities, which can affect the very small nerves. When these structures are impaired, the anatomical irregularities may cause difficult interpretation of clinical and nerve function findings. For this reason, in routine medical activity, a precise morphological evaluation is very useful for a correct patient's management. This approach can allow the identification of patient's specific anatomical condition and support the diagnostic process. For this purpose, ultrasound (US) can be applied to complete physician's evaluation [2]. In particular, US can visualize the morphological features of the nerves and provide meaningful information helpful for diagnosis, prognosis, rehabilitation and surgical treatment [3, 4]. Finally, US can support the nerve assessment clarifying doubtful clinical and neurophysiological conditions, for example in cases of anatomical variations [5].

We present a case of finger sensory deficit, in which US evaluation of very small nerve structures was useful to define type and severity of the nerve damage. A 14-year-old girl came to our observation complaining of hypoesthesia in the third finger of her left hand, after surgical tenolysis for removing a tendon cyst of the third *flexor digitorum superficialis* tendon. Neurological examination showed hypoesthesia in the left third finger (medial and lateral sides). Neurophysiological examination of the left median nerve revealed absence of the sensory action potential at the third finger-wrist segment and normal amplitude at the first finger-wrist segment. A normal motor conduction of the left median nerve was found, recording from *abductor pollicis brevis* muscle. US evaluation of the left median nerve was performed with an 18 MHz linear probe, from axilla to wrist. No alterations in nerve size or echogenicity were found. US evaluation was extended along the palm to assess the distal sensory branches, originating from the median nerve. US identified the nerve branches supplying the third finger and showed, proximal to the scar, two hypoechoic focal enlargements with cross-sectional area of 5 mm² (Figure 1). Distally proceeding, these two nerve branches were not more visible. In the right side, the same nerve branches showed a cross sectional area less than 2 mm², along their whole course. Neurotmesis of the left median nerve sensory branches of the third finger was diagnosed. In our case, the final diagnosis was possible because of the morphological features of the lesions. However, the comparison with the healthy side was essential to confirm the nerve branches involvement.

We highly appreciated the paper by Bale *et al.* and we underline that the anatomical knowledge of each single patient is decisive for a correct diagnosis. We suggest the importance of US to complete clinical and neurophysiological examination, even when the very small body parts have to be assessed [1]. As illustrated in our case, US was able to safely visualize the median nerve terminal branches. However, in cases of small nerves, we suggest the comparison between the two sides to increase the diagnostic accuracy of US. We highlight the importance of nerve US for routine activity, because of its decisive benefits in the assessment of neuropathies.

Conflict of interests

The authors report no conflict of interests.

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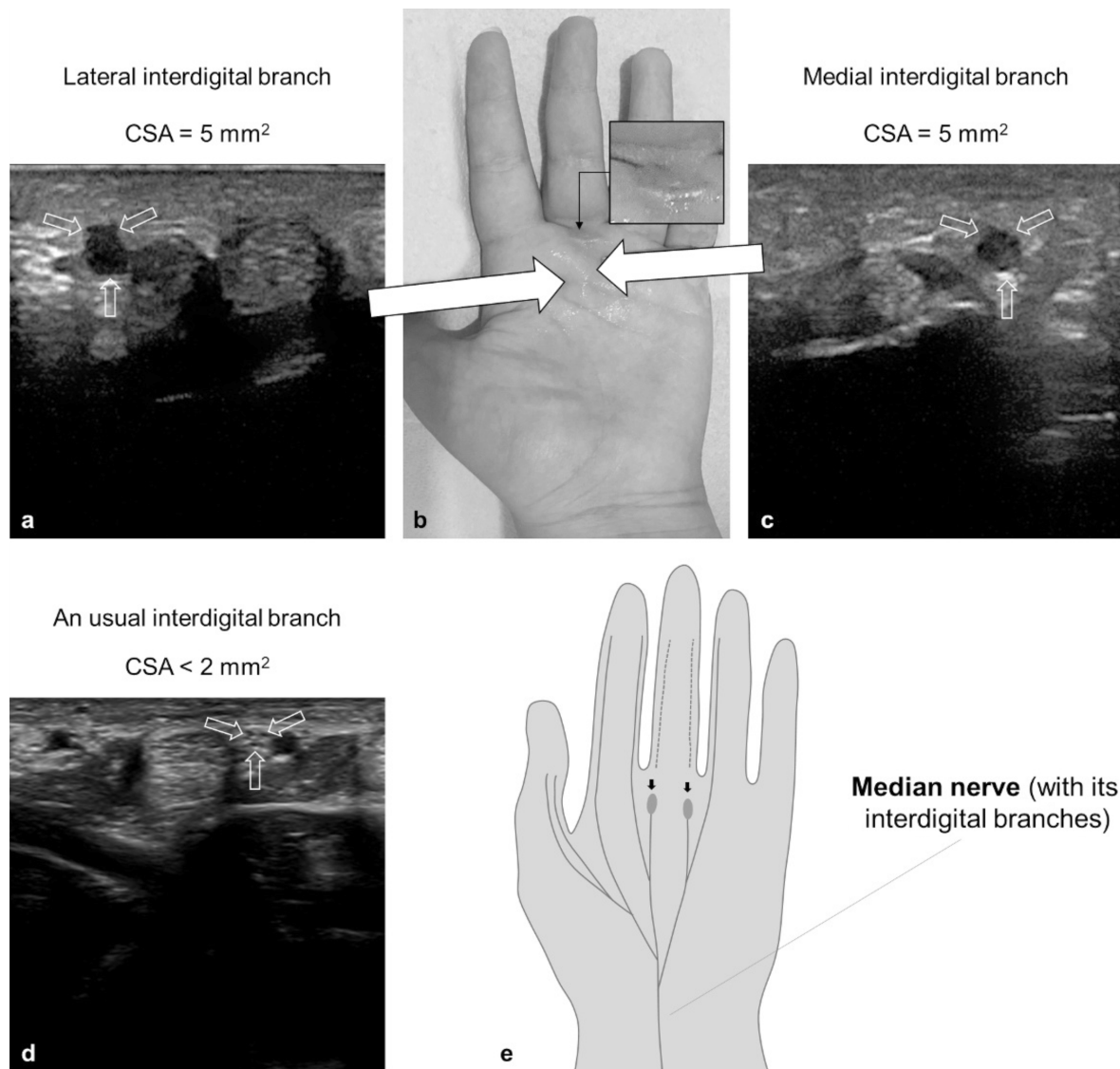


Figure 1 – Ultrasound (US) picture of the lateral interdigital branch (arrows), showing a hypoechoic pattern and increased dimension. CSA indicates the cross-sectional area (a). Patient's hand. The position of the US findings is indicated by the white arrows. The picture-in-picture shows the zoom on the surgical scar, whose location on the hand is indicated by the thin arrow (b). US picture of the medial interdigital branch (arrows), showing a hypoechoic pattern and increased dimension. CSA indicates the cross-sectional area (c). US picture of an example of a normal usual interdigital branch in the contralateral side (d). Schematic representation of the impaired nerve branches. The arrows indicate the neurotmesis of the two involved interdigital branches presenting the neuromas (e).

Corresponding author

Daniele Coraci, MD, IRCCS Fondazione Don Carlo Gnocchi, 6 Piazzale Morandi, 20121 Milan, Italy; Phone +39–06–3015–6623, Fax +39–06–3550–1909, e-mail: danielecoraci@aol.com