

## LETTER TO THE EDITOR

### Sensory innervation of the dorsomedial segment of the hand due to the radial nerve as deviation from normal: Traumatic injury of this anomalous branch<sup>☆</sup>



### Inervación sensitiva de la porción dorsomedial de la mano por parte del nervio radial como variante de la normalidad: lesión traumática de esta rama anómala

Dear Editor,

Anatomical variations often exist in the innervation of the upper and lower limbs. The best-known of these are Martin-Gruber medial-cubital anastomosis and the presence of an accessory peroneal nerve; nevertheless, there are many others. Although they do not imply the existence of disease, it is of crucial importance to know them for diagnostic purposes as well as to minimise inappropriate treatment and prevent iatrogenic lesions. The sensory-cutaneous innervation of the dorsomedial segment of the hand and the 4th and 5th fingers habitually depends on the cubital nerve (the dorsal cubital branch); nevertheless, the presence of a variation from normality has been described, in which this area of the skin is innervated by a branch of the superficial radial nerve. In these cases the back of the hand is therefore completely innervated by sensory branches of the radial nerve<sup>1</sup> (Fig. 1). Very few cases have been published in the literature of lesions to variant branch, all of which occurred following surgery to the back of the wrist. We present the case of a lesion to this anomalous branch after local trauma.

This is the case of a 20-year-old patient who after falling from his bicycle and bruising his left hand presented pain in the distal part of the radius and tingling in the dorsomedial segment of the hand and the back of his 4th and 5th fingers.

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**Figure 1** Variation in the pattern of cutaneous innervation in the back of the hand from the radial nerve. Published by permission of the editor. Source: García-Elías et al.<sup>1</sup> © Masson, S.A. 2007. All rights reserved.

He was referred by his traumatologist for electromyography due to the suspicion of an injury to the cubital nerve. Physical examination showed pain in the distal edge of the radius and a positive Tinel sign towards the dorsomedial segment of the hand. He presented hypoesthesia in the dorsomedial area of the hand and the 4th and 5th fingers, with normal motor balance and bone-tendon reflexes. MRI showed a

small focus of bone oedema in the anteromedial edge of the radius, while the rest was normal. Before commencing the study it was striking that the painful point did not coincide with the theoretical route of the nerve which supposedly had been injured. Neurophysiological study using a conventional electroneurograph showed normal medial and cubital motor and sensory branches. However, when testing sensory conductivity in the dorsal branch of the cubital nerve a lack of response was found in the left and right hands, even though the latter had not been injured at all and was symptom-free. Given this finding the possibility of a variation from normality was considered, so that the radial edge was stimulated while keeping the detector in the dorsomedial part of the hand. An anomalous response was obtained, and the potential was lower left hand than it was in the other. The clinical symptoms together with the findings of the electroneurogram suggest a partial lesion in the superficial radial branch of the nerve which innervates the dorsomedial segment of the hand.

Innervation of the dorsomedial segment of the hand by the superficial radial nerve, either completely in the absence of the dorsal cubital nerve or by both nerves simultaneously, was described by Hepburn<sup>2</sup> in 1887. Since then several anatomical as well as electrophysiological series have corroborated this finding. In 6.6% of hands innervation is exclusively by the superficial radial nerve,<sup>3</sup> while innervation is by both nerves in up to 60% of cases,<sup>4</sup> through a connection between them or by dual innervation. In spite of its frequent occurrence there is very little awareness of this variation, and very few cases of a lesion to this branch have been published. All such cases were iatrogenic, following wrist surgery.<sup>5,6</sup> The case we describe is caused by trauma, and this cause has not been described before in the literature. The suspicion of an anatomical variation in cases with atypical symptoms, together with adequate knowledge of the same, is fundamental for the correct diagnosis of nerve lesions, as well as to prevent iatrogenic injuries.

## Ethical responsibilities

**Protection of people and animals.** The authors declare that no experiments took place with human beings or animals for this research.

**Confidentiality of data.** The authors declare that this paper contains no patient data.

**Right to privacy and informed consent.** The authors declare that this paper contains no patient data.

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