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Cristina Granziera
T. Kuntzer
F. Vingerhoets
C. Cereda

Small cortical stroke in the "hand knob" mimics anterior interosseous syndrome

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Sirs: Monoparesis caused by cerebral insult is rare and is usually caused by mass lesions rather than by vascular damage [1, 7]. At the beginning of the 20th century, J. Lhermitte reported that small cortical strokes could cause weakness restricted to a particular group of fingers ("pseudoperipheral palsy") [6]; recent imaging studies showed that these symptoms are due to motor hand area ("hand knob") lesions [4, 5, 9, 13] and affect predominantly muscles supplied by the "ulnar" or the "radial" nerve [4, 12]. To date, no reports are available about strokes leading to paresis of the muscles exclusively controlled by the median nerve.

We describe a patient with a point-lesion in the right "hand knob", who presented with a predominant deficit of the left thumb-index pinch, a weakness usually encountered in the anterior interosseous syndrome.

In January 2007, a 67-year-old female with hypertension and hypercholesterolemia, presented with a sudden onset of an isolated left hand paresis. Detailed examination revealed severe paresis of thumb and index flexion (thumb-index pinch deficit) and light paresis of the flexion of the other fingers and interosseous muscles (M5-). Pronatus quadratus muscle function, tested with a flexed elbow, as well as fingers extensors' were spared. Deep tendon reflexes were symmetric. No other neurological symptoms were observed. Acute perfusion cranial CT scan did not visualize any cerebral lesion. Brain MRI performed after 8 days revealed a hyperintense signal in T2 and a point-shaped Gadolinium enhancement in T1 WI localized in the "hand-knob" [2, 5] (Fig. 1). Vascular investigations were negative and transthoracic echocardiography showed a moderately patent foramen ovale; procoagulant factors were negative. Electromyography was planned but not performed after visualizing the lesion in brain MRI. Clinically, the patient recovered almost completely within 7 days.

This patient presented with an acute hand palsy affecting predominantly two forearm muscles, the flexor pollicis longus and the flexor digitorum profundus of the 2nd finger, which control the thumb-index pinch movement. These two muscles are supplied by the anterior interosseous nerve (AIN), which is a pure motor branch of the median nerve. Peripheral nerve lesions involving the AIN are associated with brachial neuritis, trauma and extrinsic compression [11]. In our patient, the hypothesis of a vascular central nervous system etiology was supported by the acute instauration of the symptoms, the presence of a very mild diffuse paresis in other muscles of the hand and the presence of multiple cerebrovascular risk factors. A small cortical stroke was confirmed by a brain MRI and an embolic etiology was considered, based on the location of the lesion and on the presence of a patent

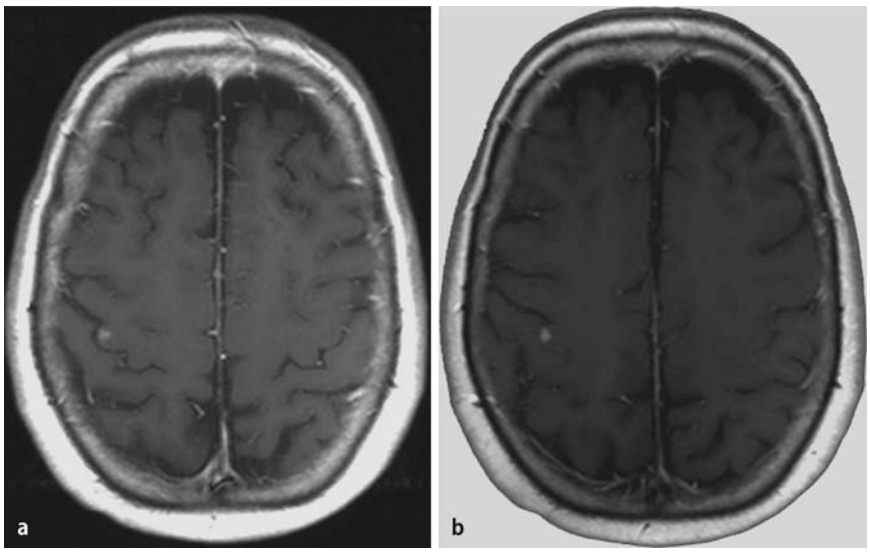

Fig. 1 **a** MRI, T2WI. Horizontal slice showing a point-shaped hyperintense lesion in the omega-shaped "hand knob" area. **b** MRI, T1WI (gadolinium): Horizontal slice showing a point-shaped contrast enhancement corresponding to the T2 hyperintensity

Dr. C. Granziera, MD, PhD (✉) ·
T. Kuntzer, MD · F. Vingerhoets, MD ·
C. Cereda, MD
Service de Neurologie
CHUV BH 19
1011 Lausanne, Switzerland
Tel.: +41-21/314-1184
Fax: +41-21/314-1256
E-Mail: Cristina.Granziera@hospvd.ch

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foramen ovale. The lesion was localized in a region of the hand-knob, which has been described to control the muscles innervated by the radial nerve [3, 4], though the location of ulnar and radial representation shows some degree of flexibility within the knob.

It is actually debated whether the predominance of weakness in a certain muscle group (ulnar, radial, median) is due to lesions of areas controlling selected muscles movements [4] or could be not spatially segregated [10]. This case report supports the theory that the motor representation in the hand area does not follow the classical topography in the human motor hand area. Future fMRI [8], transcranial magnetic stimulation [8] and fiber tracking studies should be performed to better elucidate this point.

Conflict of interest The authors declare no conflict of interest.

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