

Cortical-hand syndrome

Uditha Dassanayake¹, Thashi Chang^{1,2}

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Abstract

Isolated hand weakness (the cortical-hand syndrome) is a well-recognised, but rare presentation of stroke. The lesion has been isolated to the 'precentral knob' of the motor cortex of the brain. An embolic stroke mechanism has been considered the most frequent cause. The prognosis for recovery of hand function is considered good. A clinical diagnosis is imperative to decide on appropriate investigations and treatment. We describe a middle-aged man who presented with sudden-onset, isolated, global weakness of his left hand with a corresponding cortical infarct to illustrate the key clinical and radiological features in the diagnosis of the cortical-hand syndrome.

Index words: isolated hand weakness, monoparesis, cortical-hand

Introduction

The term 'pseudo-peripheral palsy' was first coined by Lhermitte in 1909 to describe the predominant weakness of fingers following a stroke¹. The isolated paralysis of a limb following a cerebrovascular event can produce considerable diagnostic difficulty on first contact, especially as it is not universally recognized as a distinct stroke syndrome. Reports estimate that only less than 1% of ischemic strokes present with isolated upper limb weakness². The pattern of weakness may be global, ulnar-predominant or radial-predominant³. The syndrome is usually caused by infarcts involving the motor control area for the hand (the 'knob') in the precentral gyrus⁴. However, lacunar infarcts and small intracerebral haemorrhages have also been found to present with isolated hand weakness in some cases⁵.

Case presentation

A 57-year-old, right-handed man, with a background history of poorly-controlled diabetes mellitus, presented with an acute-onset isolated weakness of his left hand, which he noticed when he was unable to pick up a glass of water during a meal. The weakness was not

progressive, but had remained static for over eight hours. There was no pain or numbness of the hand, no facial asymmetry, and the other limbs including his proximal left upper limb were functioning normally. He had no previous episodes of weakness or sensory loss, and no symptoms pertaining to his cervical spine.

On examination, he was found to be alert with no cognitive impairment and normal cranial nerve functions. There was MRC grade 2/5 weakness of all movements of his left hand below the wrist. The left shoulder and elbow power was MRC grade 5/5. The hand weakness was global and not localized to a single nerve distribution. The upper limb reflexes were normal and there was no associated sensory loss. The lower limbs were normal except for a stocking type sensory loss and diminished ankle reflexes, attributable to diabetic neuropathy. His general and other systemic examinations were normal; blood pressure was 160/90 mmHg.

Non-contrast computed tomography (CT) of the brain done ten hours after the onset of symptoms did not show any significant focal lesions. However, diffusion-weighted imaging of the brain showed a well-circumscribed, acute infarct in the right precentral gyrus (Figure 1). There was no significant stenosis of the internal carotid arteries on duplex scan, and the intracranial cerebral vessels were normal on MR angiogram. His ECG and echocardiogram were normal. Blood investigations including blood counts, liver and renal functions were normal but his HbA1c was 10.2% and his blood lipids were elevated.

He was treated with aspirin, atorvastatin and in addition to increasing the oral anti-diabetic medication. He was discharged from hospital six days after admission with improving hand and finger movements (MRC 3/5). On review two weeks later, his hand functions had further improved with a muscle power of 4/5.

Discussion

Isolated hand weakness due to stroke (the cortical-hand syndrome) is infrequently observed, and often misdiagnosed as peripheral nerve lesions. The acute onset, the global weakness involving median, ulnar and radial nerve movements in the hand and the absence of sensory signs, as illustrated in our patient, would favour a cortical-hand syndrome over a peripheral nerve lesion.

¹ University Medical Unit, National Hospital of Sri Lanka, Colombo, ² Department of Clinical Medicine, University of Colombo, Sri Lanka.

Indeed, the diagnosis would have been mostly clinical before the advent of magnetic resonance imaging (MRI) since CT scans are negative in up to 40% of patients presenting with monoparesis⁶. Diffusion-weighted magnetic resonance imaging is the most sensitive diagnostic investigation for a small acute infarct (Figure 1).

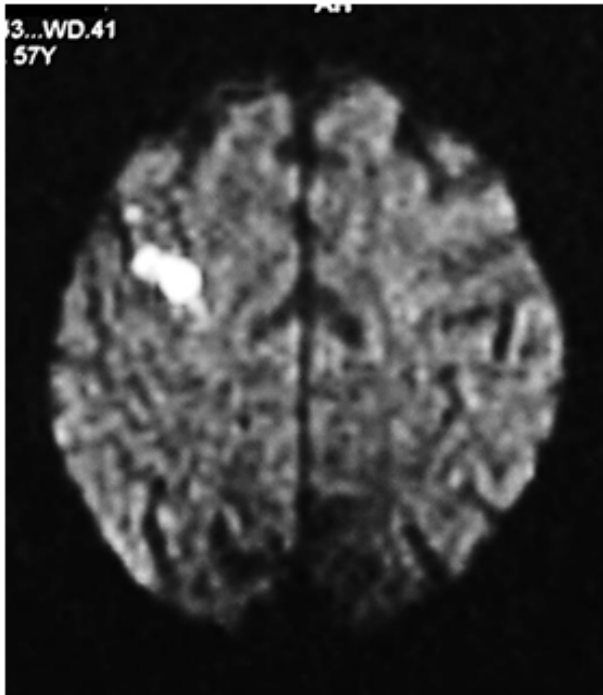


Figure 1. Diffusion-weighted magnetic resonance image of the brain showing an acute infarct in the right motor cortex.

The lesion in cortical-hand syndrome has been localised to an area in the precentral gyrus that is responsible for motor control of the hand. Functional MRI studies have identified this area as a knob-like structure in the precentral gyrus (the 'precentral knob') that appears shaped like an omega on axial scans of brain MRI⁴. However, it has been suggested that finger movements are controlled by a highly distributed network rather than by functionally and spatially discrete groups of neurons controlling each finger⁷.

In most cases of cortical-hand syndrome, a potential source of embolization had been recognised⁸, making it an important diagnosis to consider in view of treatment and secondary preventive measures. Although the underlying aetiology and the co-existent vascular risk factors would contribute to the outcome, the prognosis for recovery of hand function is generally considered good⁹.

Our case report illustrates the key clinical features that would suggest the diagnosis in this uncommon presentation of stroke and highlights the importance of its diagnosis in terms of deciding appropriate investigations and treatment.

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