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Visual Case Discussion

Isolated hand weakness as a presentation of acute stroke

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Case discussion

A 76-year-old male patient with past medical history of hypertension was brought to the emergency department for left wrist and hand weakness. The patient first noticed the weakness when he woke from sleep and was unable to remove the covers from his bed. Symptoms had been present for three hours and his last known well time was nine hours prior to his arrival in the ED.

In the emergency department, the patient was at his baseline mental status. He was comfortable appearing, alert, oriented and attentive. His speech was fluent without parapharsic errors or dysarthria. There was no facial weakness or asymmetry of the uvula or tongue noted on exam. He retained full sensation and his only motor deficits were an inability to dorsiflex his left wrist and extend his left fingers. Arm and forearm strength were normal, and there were no motor or sensory deficits in the right upper extremity or bilateral lower extremities.

Patient was sent to CT immediately after initial evaluation. At his return, he showed improvement of symptoms and was able to weakly dorsiflex his left wrist but remained unable to extend his fingers. CT brain showed age indeterminate infarcts of the left basal ganglia and posterior parietal periventricular corona radiata. Radial nerve palsy was entertained as a diagnosis but since the patient showed improvement of his symptoms, MRI was done. A small acute infarction of the right frontoparietal junction was demonstrated on MRI (Figs. 1 and 2).

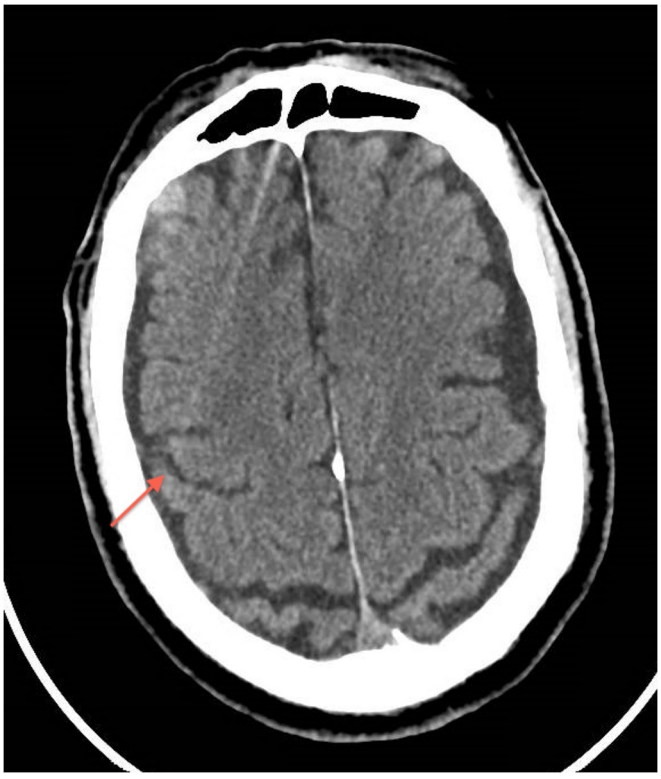

Fig. 1. CT Brain with age indeterminate findings.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.visj.2018.12.002.

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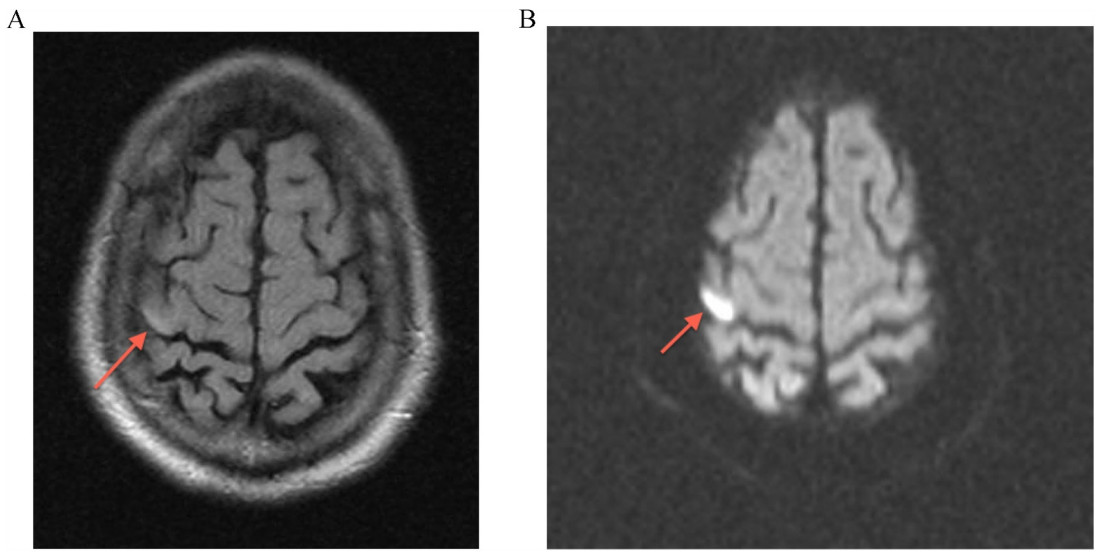

Fig. 2. Brain MRI. (A) Axial flair image, and (B) Axial DWI diffusion series, both showing acute stroke in primary motor cortex.

Questions

1. What region of the brain is responsible for primary motor hand control?
   a. Parietal lobe
   b. Cerebellum
   c. Frontal lobe
   d. Occipital lobe
   e. Temporal lobe

2. Isolated arm monoparesis comprises what percentage of strokes?
   a. 1%
   b. 5%
   c. 8%
   d. 10%
   e. 15%

Answers

1. Frontal lobe. Explanation: The precentral gyrus of the primary motor cortex in the posterior frontal lobe is largely regarded to be the site involved in motor hand control. This region is commonly referred to as the hand knob area and has often been described as inverted omega or horizontal epsilon given its characteristic appearance on MRI. It typically supplied by the anterior division of the middle cerebral artery. Reference: Parekh N, Desai N, Feeko K. A localized brain lesion resulting in isolated hand weakness. PM&R 2015; 7 (2): 220-221.

2. 1%. Explanation: Isolated hand weakness is a commonly encountered clinical presentation. Cerebral ischemia, however, is a rare cause and is estimated to comprise less than 1% of ischemic strokes. Differentiation between central from peripheral etiologies of pure motor distal arm, hand or finger weakness is important to determine treatment and address risk factors. Given the radial nerve's susceptibility to compression, isolated distal arm weakness from cerebral ischemia can easily be overlooked and misdiagnosed as a peripheral lesion. MRI should be considered in patients presenting with acute monoparesis of the distal arm with risk factors for cerebrovascular accidents, such as hyperlipidemia, smoking, diabetes or atrial fibrillation. Reference: Piukla A, Stefanidou, M, Romero J, Kase C. Pure motor upper limb weakness and infarction in the precentral gyrus: Mechanisms of stroke. Journal of Vascular and Interventional Neurology 2011; 4(1): 10-13.