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Case Studies

Clonic Perseveration after Acute Ischemic Stroke: An Insight into the Pathophysiological Mechanisms

José Luiz Pedroso, MD, PhD,* Thiago Cardoso Vale, MD, Msc,† Marcos Knobel, MD,* Rodrigo Meirelles Massaud, MD,* and Elias Knobel, MD, PhD*

Poststroke movement disorders may manifest as parkinsonism, dystonia, chorea, ballism, athetosis, tremor, myoclonus, stereotypies, and akathisia. In this article, we describe a patient with clonic perseveration 2 days after an acute ischemic stroke. We discuss the phenomenology and provide insights on possible pathophysiological mechanisms involved. **Key Words:** Movement disorders—stroke—clonic perseveration—stereotype.

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Introduction

Poststroke movement disorders may manifest as parkinsonism, dystonia, chorea, ballism, athetosis, tremor, myoclonus, stereotypies, and akathisia. Clonic perseveration, and asymmetrical, rhythmic, and stereo-

Case Report
A 93-year-old

A 93-year-old hypertensive man with chronic atrial fibrillation and pacemaker user presented with a 2-hour history of left hemiplegia, slurred speech, and impaired consciousness. Examination disclosed left hemiplegia, hemineglect, conjugate gaze deviation to the right, impaired consciousness, and left hemianopia (NIHSS [National Institutes of Health Stroke Scale] score 18). Cranial computed tomography (CT) scan showed loss of sulcal effacement in the territory of the right middle cerebral artery (ASPECTS [Alberta Stroke Program Early CT score] score 6/10), prior lacunar stroke in the left striatum, subcortical periventricular leukomalacia, and a severe parenchymal atrophy. Transthoracic echocardiography showed increased left atrium, and carotid Doppler showed no stenosis. Cardioembolic ischemic stroke related to atrial fibrillation was diagnosed. Thrombolysis was not performed because of advanced age and high NIHSS score. He received aspirin and statin. A follow-up brain CT scan 4 days later disclosed massive right middle cerebral artery infarction (Fig 1). From the second day of hospitalization, the patient developed motor restlessness on the right side. He presented with continuous and wide involun-

typed complex movements occurring hours to days after infarction have seldom been reported in literature.¹⁻³

From the *Hospital Israelita Albert Einstein (HIAE), São Paulo, São Paulo, Brazil; and †Universidade Federal de Juiz de Fora (MG), Juiz de Fora, Minas Gerais, Brazil.

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Ethical statement: Full consent was obtained from the patient for the case report and video publication.

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Pedroso J.L.: 1A, 1B, 1C, 2A, 2B. Vale T.C.: 1A, 1B, 1C, 2A, 2B. Knobel M.: 1A, 1B, 1C, 2A, 2B. Massaud R.M.: 1B, 2A, 2B. Knobel E.: 1B, 2A, 2B.

Address correspondence to José Luiz Pedroso, MD, PhD, Hospital Israelita Albert Einstein (HIAE), Avenida Albert Einstein, 627 Morumbi, São Paulo, SP 05652-900, Brazil. E-mail: jlpedroso.neuro@gmail.com.

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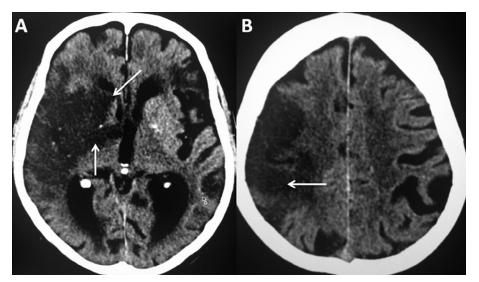


Figure 1. Follow-up cranial computed tomography scan disclosed massive right middle cerebral artery infarction. Note the clear involvement of the basal ganglia (A) as well as the parietal and frontal right lobes (B). Note also the severe parenchymal atrophy and a left basal ganglia lacunar infarct

tary movements of the right lower limb and mild movements of the right hand, contralateral to the hemiple-gic side. The movements were repetitive, rhythmic, suppressible, devoid of urgency and unpleasant feelings, and accompanied by head rotation, as shown on Video S1. Mirtazapine and quetiapine were tried without response. There was mild improvement after low doses of clonazepam. Four weeks after the stroke, the movements persisted. He did not recover his previous neurologic deficits in subsequent follow-up visits.

Discussion

Our patient presented with a large right hemispheric stroke involving the frontoparietal lobes and the basal ganglia and developed a repetitive stereotyped and rhythmic movement disorder contralateral do hemiplegia, interpreted as clonic perseveration. First coined by Liepmann,⁴ clonic perseveration is a form of motor perseveration that can be induced by passively moving a body part or by an external cue and its persistence occurs even after cessation of the external cue. It has been documented in thalamic infarction^{3,5} and Japanese encephalitis.⁶ It differs from stereotypy because it can occur in response to external cues or repetition of passive movements and can be suppressed temporarily on command. Clonic perseveration is frequently misinterpreted as ballism, focal seizures, and tremors. It is suggested that it results from disconnection of the prefrontal cortico-basal gangliathalamo-cortical loops causing interruption of dorsolateral prefrontal projections at the thalamic level.³

In our case, we postulate that the less affected hemisphere has been released from interhemispheric transcallosal inhibition from the more affected side and might have triggered perseverative behaviors, which can only become evident in the nonplegic hemibody. In addition, bifrontal and bithalamic (with thalamofrontal network) involvement might also have contributed to the perseverative behaviors.

Appendix: Supplementary Material

Supplementary data to this article can be found online at doi:10.1016/j.jstrokecerebrovasdis.2016.04.017.

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