

# Paroxysmal Dystonia as a Manifestation of Multiple Sclerosis

Célia Machado, MSc, MD,\* José M. Amorim, MSc, †  
Margarida Rodrigues, MD,\* João Cerqueira, PhD,\*  
Esmeralda Lourenço, MD,\* and João Pinho, MD\*

**Introduction:** Paroxysmal dystonia is a rare manifestation of multiple sclerosis (MS).

**Case Report:** A 41-year-old man presented to our Emergency Department with sudden and repeated episodes of left upper limb flexion and lower limb extension. His medical history included an episode of left facial palsy a year earlier. Neurological examination demonstrated only brisk deep tendon reflexes on the left upper limb. Routine blood and urine analyses were normal. Computed tomography of the brain and cervical Doppler were normal. Aspirin and sodium valproate were started, without improvement. Video-EEG monitoring revealed no electrographic abnormality synchronous with these paroxysmal events, excluding epileptic nature. Cerebral magnetic resonance imaging showed multiple T2 white matter lesions at the midbrain, right diencephalon, corpus callosum, cervical, and thoracic spinal cord. The right diencephalic lesion enhanced with gadolinium. Complete basic and immunologic analysis and serological studies were normal or negative. Oligoclonal bands were positive in cerebrospinal fluid (negative in serum). Methylprednisolone (1 g/d for 5 d) was started without clinical improvement. Carbamazepine (400 mg/d) was promptly effective, and discontinued after 1 month without recurrence.

**Discussion:** The patient met the criteria for the diagnosis of MS according to the 2010 McDonald criteria. The timely and accurate diagnosis of MS requires the recognition of its varied and atypical clinical manifestations.

**Key Words:** multiple sclerosis, paroxysmal dystonia, carbamazepine  
(*The Neurologist* 2015;19:132–134)

Paroxysmal dystonia (PD) is a well-known manifestation of multiple sclerosis (MS), which, despite uncommon, is the most frequent movement disorder in MS.<sup>1</sup> Semiology of these episodes raises several differential diagnoses and auxiliary diagnostic work-up is necessary. Although pathophysiological mechanisms are not well established, symptomatic treatment may significantly improve PD.

## CASE REPORT

A 41-year-old man presented with a history of sudden, repeated, stereotyped, painless episodes of simultaneous left upper limb flexion and lower limb extension, lasting between 5 and 30 seconds, with no alteration of consciousness, loss of sphincter control, or postictal manifestations. These episodes had started 3 weeks earlier and increased in frequency, up to 5 to 6 times per day. Past medical history

From the \*Neurology Department; and †Neuroradiology Department, Hospital de Braga, Braga, Portugal.

The authors declare no conflict of interest.

Reprints: Célia Machado, MSc, MD, Neurology Department, Hospital de Braga, Sete Fontes, São Victor, Braga 4710-243, Portugal.

E-mail: ccarinamachado@gmail.com.

Copyright © 2015 Wolters Kluwer Health, Inc. All rights reserved.

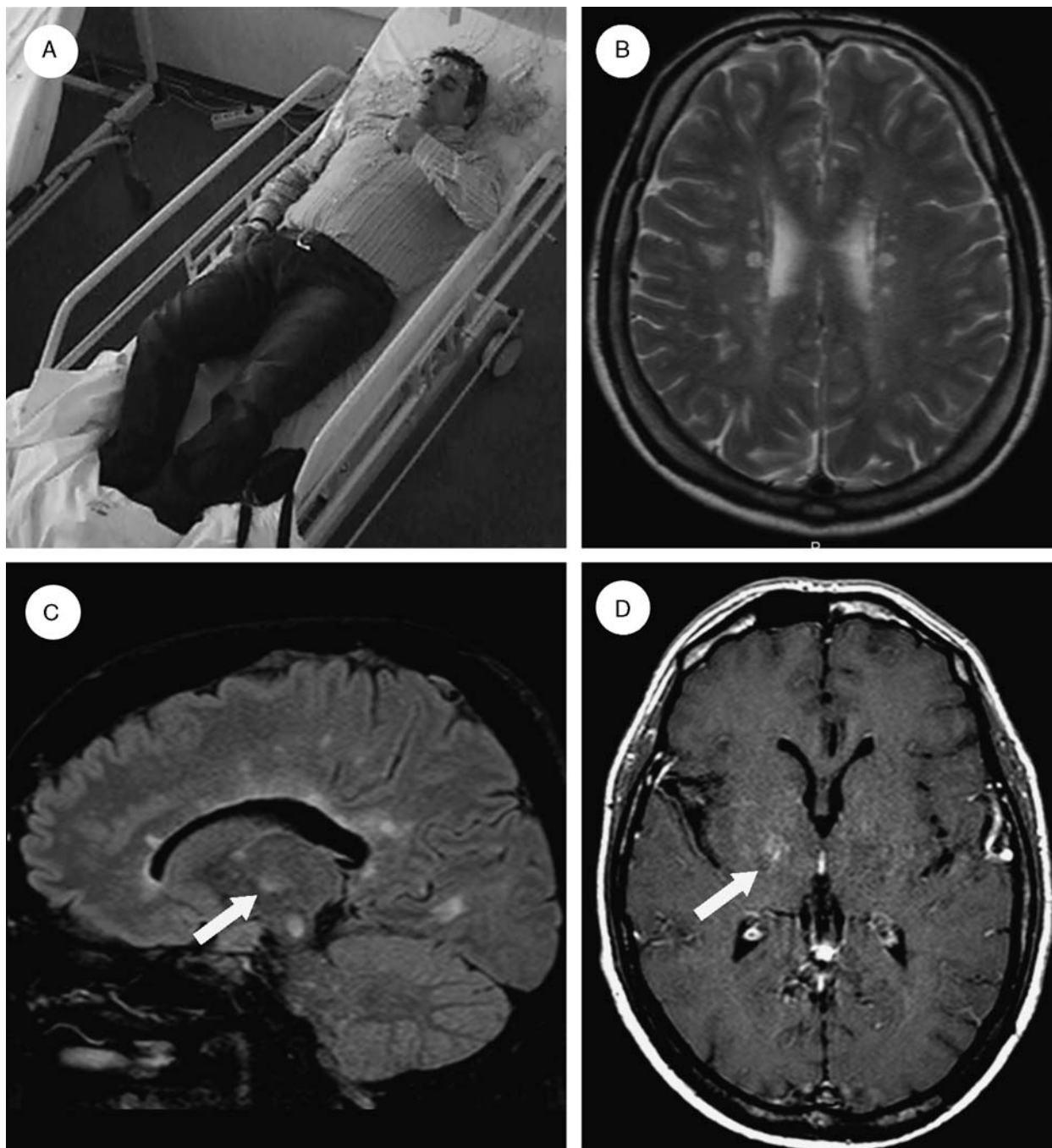
ISSN: 1074-7931/15/1905-0132

DOI: 10.1097/NRL.0000000000000025

included an episode of left inferior facial palsy a year earlier, objectivated by his general physician, which was not investigated. Interictal neurological examination demonstrated left upper limb hyperreflexia and was otherwise normal. Routine blood and urine analyses were normal. Noncontrast cerebral computed tomography did not show any abnormality and Doppler ultrasonography of cervical arteries was normal. Treatment with aspirin 150 mg and sodium valproate 1000 mg/d was started, however, frequency of episodes remained unchanged. During video-EEG, 3 episodes were recorded: the patient reported feeling his left limbs different, rapidly developed left arm and hand flexion posture, and simultaneous extension of the left lower limb, without facial movements or altered state of consciousness (Fig. 1A). No electrographic abnormalities synchronous with these paroxysmal events occurred. An epileptic nature was deemed unlikely and PD was suspected. Cerebral magnetic resonance imaging (Figs. 1B–D) showed multiple T2 hyperintense white matter lesions in the midbrain, right diencephalon, corpus callosum, as well as in the cervical and thoracic spinal cord (C3–C4, D1, D5). Only the right diencephalic lesion enhanced after gadolinium. Complete basic and immunologic analysis and serological studies including HIV, Borrelia, Brucella, Herpes virus, Epstein-Barr virus, and *Treponema pallidum* were normal. Cerebrospinal fluid study showed mildly elevated protein content (0.99 g/L), normal white cell count and glucose; positive unmatched oligoclonal bands. A 5-day pulse of intravenous methylprednisolone (1 g/d) did not improve symptoms. Two days after steroid therapy, carbamazepine 200 mg bid was started, and episodes stopped in <24 hours. Carbamazepine treatment was discontinued 4 months later and PD did not recur. Three months later, after left retrobulbar optic neuritis, treatment with interferon  $\beta$ -1b was started.

## DISCUSSION

The timely and accurate diagnosis of MS requires the recognition of the varied and atypical clinical manifestations. PD was considered the second clinical relapse and it was this event that led to the diagnosis of MS. Acute demyelinating lesions thought to be responsible for PD have been described in various locations, namely the spinal cord, contralateral cerebral peduncle, posterior limb of the internal capsule, thalamus, subthalamus, and semiovale center,<sup>2</sup> but anatomic correlates are often difficult to establish, because of multiple cooccurring lesions and nonenhancement after gadolinium. In this patient, we believe that the lesion responsible for the recent development of PD was the right thalamic lesion which presented contrast enhancement. The pathophysiology of PD in MS is not clear, and it was proposed that an ephaptic activation of axons within a demyelinating plaque at any level in a motor pathway may cause dystonia.<sup>3</sup> We argue that absence of a spreading march of motor manifestations, normality of ictal EEG, and absence of benefit with sodium valproate does not support an epileptic nature of PD. Although the episodes consisted of a fixed tonic posture suggesting overactivity of nonpyramidal motor system, namely the rubrospinal tract, cocontraction of agonist and antagonist muscles could be objectivated during the episodes, supporting the term PD. Although we are not able to definitely exclude a beneficial



**FIGURE 1.** Clinical and imaging presentation. A, Episode recorded during video-EEG: left arm and hand flexion posture and simultaneous extension of the left lower limb. B–D, Cerebral magnetic resonance imaging showed multiple T2 white matter lesions at the cerebral hemispheres, midbrain, and right diencephalon [(C)—arrow]. The right diencephalic is the only lesion which enhanced with gadolinium [(D)—arrow].

effect of steroid therapy, the remarkable temporal association of complete PD cessation and start of carbamazepine is in agreement with what is reported in literature.<sup>4</sup> Mechanisms of the apparent selective response to carbamazepine are not known. The main action of carbamazepine, inhibition of voltage-activated sodium channels, and additional inhibition of voltage-gated calcium channels may explain cessation of ephaptic activation of neurons, but it is known that other

antiepileptic drugs, namely valproic acid, may also share this mode of action.

**CONCLUSION**

This case shows the importance of recognizing MS as a cause of PD. This movement disorder is a rare manifestation of MS, but it is treatable with symptomatic therapy such as carbamazepine.

**REFERENCES**

1. Tranchant C, Bhatia KP, Marsden CD. Movement disorders in multiple sclerosis. *Mov Disord.* 1995;10:418–423.
2. Mehanna R, Jankovic J. Movement disorders in multiple sclerosis and other demyelinating diseases. *J Neurol Sci.* 2013;328:1–8.
3. Ostermann PO, Westerberg CE. Paroxysmal attacks in multiple sclerosis. *Brain.* 1975;98:189–202.
4. Thompson AJ, Toosy AT, Ciccarelli O. Pharmacological management of symptoms in multiple sclerosis: current approaches and future directions. *Lancet Neurol.* 2010;9:1182–1199.