PHOTO ESSAY

Ocular Motor Dysfunction due to Multiple Sclerosis

M. N. Rubin, S. D. Z. Eggers, and E. E. Benarroch

Department of Neurology, Mayo Clinic, Rochester, Minnesota, USA

ABSTRACT

Ocular motor disorders are common in patients afflicted by multiple sclerosis. We present a particularly complex case of multifaceted ocular motor dysfunction as it illustrates the arcane associated neuroanatomy and the interplay between ocular motor systems in the brainstem, midbrain, and cerebellum.

Keywords: Multiple sclerosis, nystagmus, oculography, oscillopsia, pendular

CASE REPORT

A 53-year-old woman with multiple sclerosis and optic neuritis reported 10 years of oscillopsia. Examination and oculography (Video 1, Figure 1) revealed elliptical pendular nystagmus, macro-square wave jerks, bilateral internuclear ophthalmoplegia (INO), and horizontal and vertical gaze-evoked nystagmus. Caloric and post-rotatory nystagmus were preserved. Brain magnetic

resonance imaging (MRI) (Video 1, Figure 1) demonstrated extensive lesions in the dorsal medulla, pons, and cerebellar peduncles affecting vestibulo-cerebellar ocular motor pathways. These include the brainstem neural integrators important for gaze-holding, the medial vestibular nuclei and restiform bodies involved in smooth pursuit, and medial longitudinal fasciculi causing bilateral INO.^{1,2} Optic nerve demyelination may also contribute to the pendular nystagmus.

FIGURE 1 Brain MRI demonstrated prominent T2 hyperintensity suggestive of demyelination through the entirety of the dorsal rhombencephalon. Sagittal T2 FLAIR (A) illustrated the longitudinal expanse. Axial T2 sections showed dorsal medullary (B) and middle cerebellar peduncle (C) involvement.

Received 10 March 2013; revised 31 March 2013; accepted 31 March 2013; published online 19 July 2013

Correspondence: Mark N. Rubin, Department of Neurology, Mayo Clinic, 200 1st St. SW, Rochester, MN 55904, USA. E-mail: Rubin.Mark@mayo.edu

Declaration of interest: The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

Supplemental content available: Video oculography (VOG) demonstrates elliptical pendular nystagmus and macro-square wave jerks in primary gaze that are likely dysconjugate due to superimposed bilateral internuclear ophthalmoplegia. The MRI shows extensive T2 hyperintense lesion burden in the dorsal

medulla, pons and cerebellar peduncles. The video is available online at www.informahealthcare.com/oph.

REFERENCES

- [1] Leigh RJ, Zee DS. The Neurology of Eye Movements. 4th ed. Oxford, UK: Oxford University Press; 2006.
- [2] Tilikete C, Jasse L, Vukusic S, Durand-Dubief F, Vardanian C, Pélisson D, Vighetto A. Persistent ocular motor manifestations and related visual consequences in multiple sclerosis. *Ann N Y Acad Sci* 2011;1233:327–334.