Title: Stroke Induced Binocular Internuclear Ophthalmoplegia

Abstract
Sudden onset of double vision and vertigo prompt visit to emergency room and subsequent stay at rehabilitation hospital. Brainstem stroke develops into wall-eyed binocular internuclear ophthalmoplegia.

I. Case History
Patient demographics- 59-year-old white female
Chief complaint: concern for having a stroke with symptoms of double vision, weakness, vertigo and inability to stand
Ocular history: cataract surgery March, April 2017
Medical history- smoking, hypertension, diabetes mellitus, non-Hodgkins lymphoma, seizure disorder, depression, CVAx2 in 1997
Medications: Lorazepam, dilantin, aspirin, cozaar, lipitor, Novolog, Levemir, Vitamin D
Other salient information: NKDA

II. Pertinent findings
Clinical: Patient first presented with an eye patch covering the right eye. Pupil testing was PERRL. On EOM testing patient was unable to adduct OD and OS and upon abduction horizontal nystagmus was noted OD and OS. Vertical upbeat nystagmus was also present upon upgaze. Cover test revealed a wide angle 40 diopter exotropia. At near, patient’s visual acuities were 20/20 OU and patient was unable to fixate using the OD. Confrontational fields were full with no field loss OD, OS. Convergence was affected.
Physical: Difficulty standing
Laboratory studies: Lipid panel triglyceride 280, cholesterol 65, LDL 82, HDL 27
Radiology studies: MRI of brain revealed acute midbrain and pons ischemia at the periaqueductal gray matter of midbrain with involvement of the right cerebral peduncle and the central pons. There were chronic microvascular ischemic changes in the periventricular and subcortical white matter. CT of head revealed calcific atherosclerosis of the intracranial internal carotid arteries without evidence of significant stenosis or aneurysm in the Circle of Willis. There was focal hypoattenuation in the right paracentral midbrain corresponding to ischemia on MRI. MRA of head and neck showed no vessel occlusion or evidence of significant stenosis.

III. Differential diagnosis
Primary/leading: Wall-eyed binocular internuclear ophthalmoplegia
Others: Brainstem stroke, brainstem mass lesion, late onset multiple sclerosis (more common in younger patients, usually bilateral), myasthenia gravis which can cause a pseudo INO.

IV. Diagnosis and discussion
Wall-eyed binocular internuclear ophthalmoplegia
Internuclear ophthalmoplegia correlates with a lesion in the medial longitudinal fasciculus which is a bundle of fibers that connects the sixth nerve nucleus of the pons to the contralateral
medial rectus subnucleus of the midbrain. INO classically presents with limited adduction of the ipsilateral eye and the contralateral eye demonstrating nystagmus during abduction. Wall-eyed bilateral internuclear ophthalmoplegia arises from a lesion in the mesencephalon and patients are exotropic. The causes for WEBINO are identical to INO.

V. Treatment, management
There is no specific treatment for BINO and so patients are treated depending on the underlying cause. BINO is more common in younger patients with multiple sclerosis and these often resolve with time. Older patients as with this case typically have an INO from a cerebral vascular accidents and these are more commonly unilateral and may resolve spontaneously usually within 2 to 3 months. If no resolution occurs other treatment options are available beginning with prism. Murphy et al. showed a positive outcome from using botulinum toxin injection and Roper et al. proved an 85 percent reduction in exodeviation from extraocular muscle surgeries. Treatment and response to treatment: In this case patching was recommended for the first week. The second week binasal occlusion was done to alleviate double vision with success and Dynavision tracking was recommended in the rehabilitation hospital. Further follow-up care is ongoing.

VI. Conclusion
Internuclear ophthalmoplegia is a condition that is very rare. When a lesion occurs in the MLF, horizontal gaze is affected. Wall-eyed internuclear ophthalmoplegia is less common but when it happens can cause distress in a patient. Binasal occlusion is a way to treat the patient to alleviate symptoms of diplopia.

Bibliography


