Title: Internuclear Ophthalmoplegia As the Only Sign of a Cerebrovascular Accident
Authors: Biana Gekht OD, Rachel Goretsky OD

I Case History
Patient Demographics: 77-year-old African American male.
Chief complaint: Patient noticed that he sees double with right gaze; it has been present since the night before but patient states that he was “optimistic” that it would resolve once he “slept it off”.
Ocular, Medical History: Optic Disc Drusen OU, Cataracts OU, Hypertension, Hyperlipidemia.
Medications: Atorvastatin, Nifedipine
Other pertinent information: Patient denied any concurrent headaches, nausea, dizziness, numbness, or tingling sensations.

II Pertinent Findings
Initial Presentation
Clinical:
- **BCVA:** OD: 20/30, OS: 20/40
- **Motility:** OD: Nystagmus with right lateral gaze, otherwise full range of motion. OS: Adduction deficit of a -3, otherwise full range of motion.
- **Pupils:** PERRL (-)APD
- **Blood Pressure:** 144/89 mmHg

Physical:
- **External:** Healthy lid position without evidence of ptosis OU.
- **Biomicroscopy:** Cataracts OU otherwise unremarkable.
- **Dilated fundus examination:** C/D ratio 0.30/0.30 OU, Optic Disc Drusen OU, otherwise unremarkable.

Radiology studies:
- CT of the brain was obtained from skull base to vertex without contrast and found patchy hypodensity in the periventricular white matter most compatible with microvascular ischemic disease. There was no evidence of hemorrhaging.

Three Days After Presentation
- **BCVA:** OD: 20/30, OS: 20/40
- **Motility:** OD: Mild nystagmus with right lateral gaze, otherwise full range of motion. OS: Adduction deficit of a -1, otherwise full range of motion.

Three months later
- **BCVA:** OD: 20/30, OS: 20/40
- **Motility:** OD: Full range of motion. OS: Full range of motion.

III Differential Diagnosis
Primary: Left Internuclear Ophthalmoplegia caused by a microvascular ischemic event in the pons.
Others: Right Gaze Palsy, Left Oculomotor Nerve Palsy

IV Diagnosis and Discussion
The patient was able to abduct with his right eye but unable to adduct with his left eye in right gaze. This finding points to a disturbance of the Medial Longitudinal Fasciculus (MLF), which connects the signal from the Abducens Nerve to the
contralateral Oculomotor Nerve. Internuclear Ophthalmoplegia (INO) is caused by a lesion to the MLF. Neurological imaging is crucial in identifying the cause of the obstruction whether it be vascular, neoplastic, or demyelination. The patient was sent for a CT scan, which confirmed the presence of a Pontine Infarct.

The uniqueness in the case lies in the lack of underlying neurological symptoms thus making a stroke diagnosis unclear at first. Aside from right gaze diplopia, the patient did not experience paresis, dizziness, or headache. The patient lacked any symptoms to the point that he was comfortable going to sleep while experiencing a stroke. This case also serves as a reminder of the importance of a proper diplopia work up and case history. Complaints of diplopia cannot be neglected, as they may be signs of something far graver.

V Treatment and Management

The patient’s underlying pathology was sectorial ischemia to the pons including to the MLF. Unfortunately, the patient presented outside the treatment window where tissue plasminogen activators (tPA) may have been useful in preventing further damage. As per the Expansion of the Time Window for Treatment of Acute Ischemic Stroke with Intravenous Tissue Plasminogen Activators study, treatment with tPAs should be initiated within 3 to 4.5 hours of initial stroke presentation. Per the patient’s case history, he presented about 12 hours too late and was thus started on Aspirin 325mg daily. The patient was followed up three days later with ophthalmology where his diplopia symptoms had mostly subsided and he had regained most of his ability to adduct with his left eye. The patient had made a relatively quick recovery most likely due to the small nature of his infarct. According to Internuclear Ophthalmoplegia: Causes and Long-Term Follow-Up in 65 Patients, resolution usually takes between 3 to 9 months if at all. The patient was seen for a three-month optometric evaluation and his extraocular movements were full and extensive in both eyes without evidence of restriction in any gaze. The patient will continue to be monitored every three months with ophthalmology and neurology and has been tapered to an 81mg dose of Aspirin.

VI Conclusion

When a patient presents with an INO it is important to recognize this as a neurological finding and not as a finite diagnosis. It is most critical that the patient undergo neurological imaging to conclude the proper underlying diagnosis and to initiate further co-management with neurology.

Bibliography

