CLINICAL VIGNETTE

A Challenging Case: Rapidly Progressive Vision Loss in an Elderly Man

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Case

A 70-year-old Caucasian male with history of Type II DM with peripheral neuropathy, multiple myeloma in remission, and prior ischemic stroke, was sent to emergency department from ophthalmology for right eye vision loss for evaluation of giant cell arteritis (GCA). The patient reported three year-history of right eye blurry vision with progressive vision loss for the last six months. He denied eye pain or redness, fever, weight loss, shoulder and hip girdles stiffness, no scalp tenderness, jaw claudication or chest pain. He had some dull headache that he thought was ocular migraine. The patient medical history included antiphospholipid syndrome on life-long warfarin, hyperlipidemia, and migraines. His vital signs were normal except poor controlled blood pressure. Physical exam revealed sensory deficit in both feet, otherwise unremarkable. Ophthalmology exam was notable for "count fingers" acuity, central "scotoma", and temporal pallor of the disc in right eye. Left eye showed 20/25 visual acuity, left optic nerve was swollen with flame hemorrhages and cotton wool spot. His labs shows mild anemia (Hemoglobin 11.9) and creatinine 1.85, INR therapeutic range at 2.2 and ESR of 32 mm/hour (normal for his age group), normal CRP. MRI brain and orbit did not show significant abnormalities. Echocardiogram was unremarkable. Differential diagnoses include GCA (arteritic anterior ischemic optic neuropathy - AAION), non-arteritic anterior ischemic optic neuropathy (NAION) and multiple myeloma infiltrative optic neuropathy.

He was started on methylpredinsolone 1g IV daily for three days, followed by oral prednisone 80 mg daily. PETCT of the neck, chest, abdomen and pelvis did not show abnormal FDG uptake to suggest active arteritis of the aorta and its branches. Left temporal artery biopsy performed within a week of corticosteroid therapy and was negative for active or healed arteritis. At that, his visual acuity remained "counting finger" in right eye and 20/25 in left eye. Overall suspicion for giant cell arteritis was low. Oral prednisone was tapered off in about six weeks. Serum kappa/lambda level returned within range and multiple myeloma causing infiltrative optic neuropathy was thought to be less likely. Presumed diagnosis was non-arteritic anterior ischemic optic neuropathy (NAION).

A week after stopping oral steroid therapy, he experienced rapidly progressive vision loss in his left eye. His inflammatory markers were elevated with ESR 65 mm/hour, and CRP 4.8 mg/dl. Left eye visual acuity was notable for "only counting fingers". He was re-admitted for re-evaluation of GCA. He expressed continuing chronic dull headache, otherwise no other symptoms were reported. He reported of cellulitis of his toe a week prior, which completely resolved with oral antibiotics. Oral prednisone 80-mg/d was started. Color duplex ultrasound of temporal arteries was normal. Contralateral temporal artery biopsy (right) was performed within a week of steroid therapy. The biopsy was again negative for histologic evidence of arteritis. His left eye visual loss had not improved with steroid therapy. Ophthalmic exam was now notable for almost resolution of left optic nerve edema with temporal pallor. Neuro-ophthalmologist concluded that most likely diagnosis is bilateral ischemic optic neuropathy due to "NAION" with progressive course in the left eye. Unfortunately, there is no therapy proven to be effective for "NAION". Management of this patient was essentially treatment of the underlying vasculopathic risk factors-diabetes, hypertension and hyperlipidemia. Oral prednisone was tapered off in a month and his visual acuity in his both eyes maintained at "counting fingers" at two-month follow up.

Discussion

In patients with ischemic optic neuropathy, differentiating arteritic anterior ischemic optic neuropathy (AAION, GCA) from non-arteritic anterior ischemic optic neuropathy (NAION) is an essential step for clinicians. Both can present with acute painless vision loss in those over 50 years of age. GCA has a particular predilection for elderly populations of northern European ancestry and is approximately twice as common in women than in men.[1,2] GCA is known to be associated with scalp tenderness, jaw claudication, headache, and weight loss, fever of unknown origin.[3] NAION is the most common ischemic optic neuropathy and the second most common optic nerve disease after glaucoma.[2] Risk factors for NAION include hypertension, diabetes mellitus, ischemic heart disease, hyperlipidemia, obstructive sleep apnea, nocturnal arterial hypotension and migraine.[4] Some medications, such as PDE5i and amiodarone, may increase the risk of NAION.[5]

GCA is a common rheumatologic disease with potentially devastating complications such as strokes, aortic aneurysm and permanent vision loss.[6] It is a chronic granulomatous arteritis affecting the aorta and its main branches with tendency to affect the ophthalmic and extra-cranial carotid arteries. 15-20% can present with vision loss due to anterior ischemic optic neuropathy (AAION).[3] Diagnosing GCA can be challenging due to a

number of factors. 5% to 38% of cases can have occult GCA in which systemic symptoms and elevation of inflammation markers are absent.[3] Temporal artery biopsy is still considered the gold standard for diagnosis; however, a negative biopsy does not exclude the diagnosis. False negative rate of 5-13% has been reported due to the presence of skip lesions or previous or prolonged corticosteroid therapy.[7] Color duplex ultrasound (CDUS) of temporal arteries and PET scanning of the aorta and its large branches have shown to be helpful in diagnosing GCA. CDUS can detect the typical sign of "halo" (arterial wall swelling in transverse and longitudinal view), with low sensitivity of 77% and high specificity of 96%.[8] PET scan of the aorta and its large branches has shown 80% sensitivity and 79% specificity.[9] A contralateral positive biopsy specimen was found in 5% of those with GCA with negative biopsy.[10]

Therapeutically, there is no universally agreed upon treatment for NAION. High dose oral prednisone use during the first two weeks of vision loss has been shown to be of benefit in some patients with a significant improvement in disc edema and visual outcome. However, its use in clinical practice remains controversial.[11] Bevacizumab and aspirin have been studied as possible treatment with no clear evidence for benefit. However, modifiable risk factors, when applicable, should be addressed. For example, patients should be advised to avoid anti-hypertensive, or vasodilators before bedtime, such as those used for erectile dysfunction disorder, appropriately diagnose and treat obstructive sleep apnea, to mitigate diabetes, and hypertension and hyperlipidemia.[11]

The main goals of treatment of GCA are to prevent worsening in the involved eye as well as involvement of the contralateral eye. If left untreated, 54-95% of patients present with ischemia in the contralateral eye, within four months.[6] The use of steroids reduces contralateral involvement to approximately 15%.[12] Therefore, when clinical suspicion for AAION is high, prompt high dose prednisone (60-100 mg/day; 1 mg/kg per day) should be initiated with the goal of obtaining a temporal artery biopsy within one to two weeks.[12]

The prognosis of NAION is variable and unpredictable, but recurrence in the same eye is rare and opposite eye involvement is uncommon in typical cases. Visual loss from GCA is often profound with possible bilateral involvement if untreated.[6,11]

Conclusion

In summary, this case represents atypical NAION with progressive bilateral vision loss. GCA should be considered as a possible etiology in all patients with ischemic optic neuropathy, regardless of the absence of systemic symptoms or elevated inflammatory markers. GCA is treatable. Early diagnosis and prompt treatment with corticosteroid can prevent devastating outcomes. On the other hand, there are no treatments for NAION that are proven to be effective. Definitive diagnosis of GCA is based on positive temporal artery biopsy. Contralateral temporal artery biopsy should be considered in selected cases to increase diagnostic yield.

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