



Case report

Severe unilateral abducens nerve palsy from cavernous sinus carotid vascular ectasia



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ABSTRACT

Purpose: Carotid cavernous sinus ectasia is a rare cause of abducens nerve palsy.

Observation: We present a case of severe unilateral progressive esotropia resulting from cavernous sinus carotid vascular ectasia in a 67 y/o female. She had progressive esotropia over the years with no neuroimaging despite having regular ophthalmic care. Magnetic resonance imaging determined the etiology of her chronic severe esotropia.

Conclusion and importance: Carotid cavernous sinus ectasia should be considered in the differential of severe progressive unilateral abducens nerve palsy. Magnetic resonance imaging with magnetic resonance angiography is important to determine etiology of severe progressive esotropia.

1. Introduction

Carotid cavernous sinus ectasia has been described in the literature as a cause of intermittent esotropia in adults that is typically self-limiting.¹ To our knowledge, this is the first case of severe progressive unilateral esotropia from carotid cavernous sinus ectasia.

2. Case report

A 67 year-old female presented to the adult strabismus clinic with complaint of progressively worsening esotropia of the left eye. Her symptom onset has been chronic with no associated pain, transient visual obscurations, headaches, flashes of light, nausea, vomiting, or seizure activity. She has a past ophthalmic history of myopia, strabismic amblyopia of the left eye, and posterior vitreous detachment in the right eye. She underwent a left medial rectus recession of 5 mm at the age of 5 years to correct an esotropia of 20 prism diopters. She reported that for approximately 15 years, her left eye remained well aligned, but still had poor vision. She noted a gradual and progressive worsening of the esotropia over the next 30 years in personal photographs. Her past medical history is significant for coronary artery disease, chronic obstructive pulmonary disease, hypothyroidism, depression, hypertension, hyperlipidemia, osteoarthritis, pancreatitis, and vitamin D deficiency. The patient had a myocardial infarction in 2013, treated with coronary artery angioplasty. Her other past surgical history is significant for an appendectomy, hand surgery, and routine colonoscopy.

The patient's clinical exam was significant for 20/20 best corrected

visual acuity in the right eye and light perception visual acuity of the left eye. Her motility exam revealed full ocular motility of the right eye, but a complete abduction deficit of the left eye, Fig. 1. The remaining cranial nerve exam was unremarkable. At the time of evaluation, no prior neurological imaging had been performed to rule out an intracranial process despite multiple visits to her ophthalmologist and the presence of the severe esotropia. After evaluation in our Adult Strabismus Clinic, an MRI/MRA of the brain and orbits was performed. There was significant vascular ectasia of the left internal carotid artery, to the extent that it had completely filled the left cavernous sinus, Fig. 2. This severe and likely progressive vascular ectasia has subsequently led to complete paralysis of the left abducens nerve. MRA demonstrated dolichoectasia, but no evidence of carotid dissection or aneurysms, Figs. 3 and 4.

3. Discussion

Previous reports of cavernous sinus pathology have been associated with a variety of cranial neuropathies; however, no case reports have demonstrated this unilateral severity of strabismic change associated with vascular ectasia.¹ A case report by Foroosan detailed an acute left abducens nerve palsy in the setting of vascular ectasia, but symptom onset was sudden and self-resolved after 3 months. Based on their discussion, it was unclear whether the etiology was the ipsilateral cavernous carotid vascular ectasia or a vasculopathic left sixth nerve palsy.² Blumenthal reported a case in which a healthy patient with cavernous carotid vascular ectasia experienced seven recurrent, but

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Fig. 1. Clinical photograph at presentation demonstrating severe left esotropia.

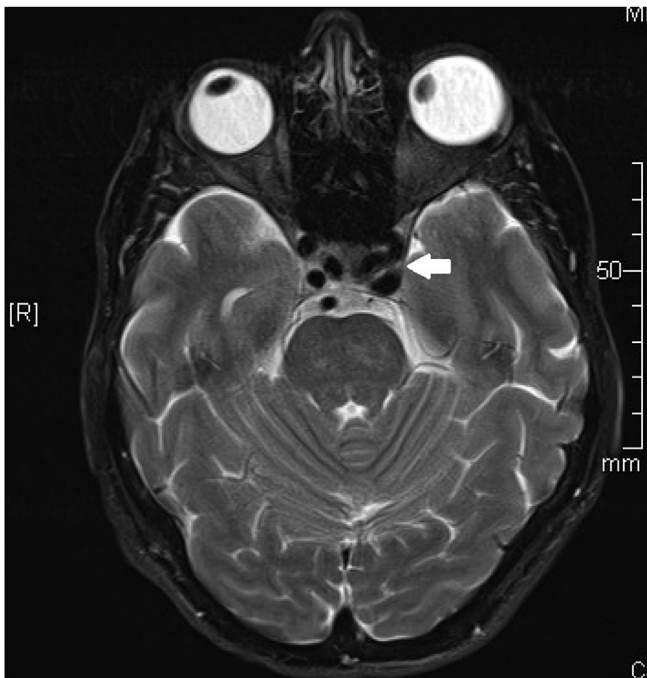


Fig. 2. Magnetic resonance imaging in axial T2 fat suppressed with gadolinium demonstrating bilateral, left greater than right, cavernous sinus carotid vascular ectasia, (white arrow).

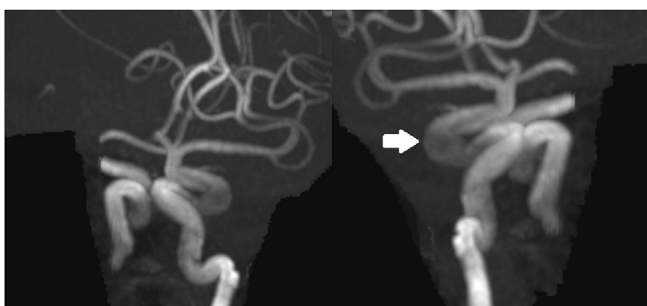


Fig. 3. Magnetic resonance angiography demonstrating dolichoectasia, but no evidence of carotid dissection or aneurysms, (white arrow).

self-limited episodes of horizontal diplopia, each lasting 2–5 weeks in duration.³ Neugebauer reported a case in 2001, in which a patient experienced bilateral sixth nerve palsies secondary to bilateral carotid dolichoectasia.⁴ In the neurosurgical literature, Anson has reported ectatic carotid artery vasculature without extra-ocular motility deficits.⁵ As well, ocular motility defects have been reported by Mizutani in the case of dissecting intracranial carotid aneurysms; however, imaging of our patient revealed no evidence of acute or chronic dissection.⁶ Our case demonstrates a unilateral progressive esotropia. We propose the mechanism in our case is a slow continued compression of the



Fig. 4. Magnetic resonance imaging in coronal view demonstrating bilateral, left greater than right, cavernous sinus carotid vascular ectasia, (white arrow).

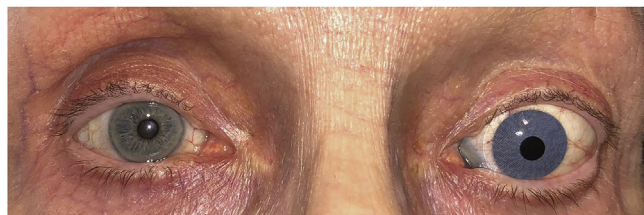


Fig. 5. Clinical photograph with prosthetic colored contact lens.

cavernous sinus portion of the abducens nerve by the carotid artery ectasia. After being presented with treatment options, our patient chose a non-surgical treatment. She was fitted with a prosthetic colored soft contact lens which gave her a satisfactory cosmetic result, Fig. 5.

4. Conclusion

In summary, this is a case of a patient with chronic and progressive severe unilateral esotropia in the setting of cavernous sinus carotid vascular ectasia. Although previous reports discuss cases of esotropia related to vascular ectasia, no cases have demonstrated this degree of severity or a chronic progressive unilateral course. This case also demonstrates a satisfactory non-surgical treatment for severe esotropia using a prosthetic colored soft contact lens.

Patient consent

Written consent was obtained from the patient to publish case details.

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Conflicts of interest

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Authorship

All authors attest that they meet the current ICMJE criteria for Authorship.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.ajoc.2018.04.006>.

References

1. Yu YL, Moseley IF, Pullicino P, et al. The clinical picture of ectasia of the intracerebral arteries. *J Neurol Neurosurg Psychiatry*. 1982;45:29–36.
2. Foroozan R. Spontaneous resolution of sixth nerve palsy with ipsilateral cavernous carotid dolichoectasia. *Br J Ophthalmol*. 2004;88(4):586–587.
3. Blumenthal EZ, Gomori JM, Dotan S. Recurrent abducens nerve palsy caused by dolichoectasia of the cavernous internal carotid artery. *Am J Ophthalmol*. 1997;124:255–257.
4. Neugebauer A, Kirsch A, Fricke J, et al. New onset of crossed eyes in an adult. *Surv Ophthalmol*. 2001;45:335–344.
5. Anson JA, Lawton MT, Spetzler RF. Characteristics and surgical treatment of dolichoectatic and fusiform aneurysms. *J Neurosurg*. 1996;84:185–193.
6. Mizutani T, Aruga T. “Dolichoectatic” intracranial vertebrobasilar dissecting aneurysm. *Neurosurgery*. 1992;31:765–773 discussion 773.