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A rare case of bilateral ocular neuromyotonia

Unilateral ocular neuromyotonia (ONM) is a rare entity, and bilateral ONM even more so, with and only 1 case having been reported previously in the literature. We present a rare case of bilateral ocular neuromyotonia whose course of treatment was complicated by side effects of carbamazepine.

Case Report

A 35-year-old female was referred by her oncologist with a 12-month history of blurring that was most noticeable on right lateral gaze. During the episodes of blurring, she felt a tugging sensation that could last for up to 1 minute. These episodes had become more frequent over the past 6 months, increasing to 6 to 7 times per day. Notable medical history included nasopharyngeal cancer (NPC), which was treated with 4 cycles of cisplatin and 5-fluorouracil (5FU) and concurrent daily radiotherapy for 6.5 weeks, 8 years prior. One month after completing her treatment, she experienced paraesthesia in her left lower face, neck, and left arm. Investigation of this led to a diagnosis of hypopituitarism and hypothyroidism, well controlled with growth hormone injections and thyroxine. Four years later, she experienced dysphagia, which was attributed to late deterioration from radiotherapy-induced damage. Her dysphagia caused significant weight loss, and she was referred for a feeding tube.

On examination, best-corrected visual acuity was –0.15 logMAR bilaterally. At rest, there was a stable near exophoria of 4 prism diopters. In primary position, the patient was orthophoric. After sustained gaze to the right,

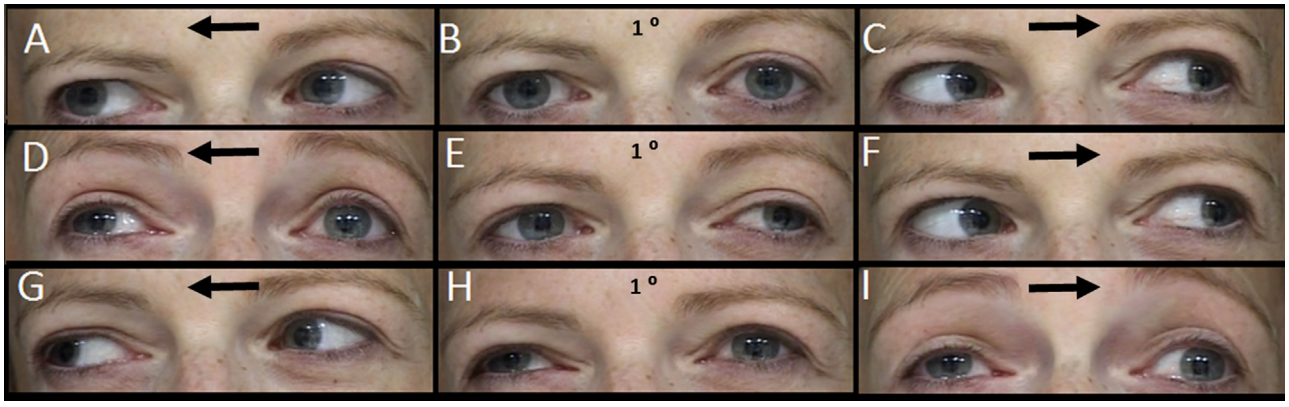

Fig. 1—Horizontal eye movements. Direction of gaze indicated on image by arrow or stated as being in primary position (1°). (A) Right gaze: no abnormality seen; (B) primary position: no abnormality seen; (C) left gaze: no abnormality seen; (D) right gaze after sustained left gaze: left exotropia; (E) primary position after sustained left gaze: left exotropia; (F) sustained left gaze: no abnormality seen; (G) sustained right gaze: no abnormality seen; (H) primary position after sustained right gaze: right exotropia; and (I) left gaze after sustained right gaze: right exotropia.

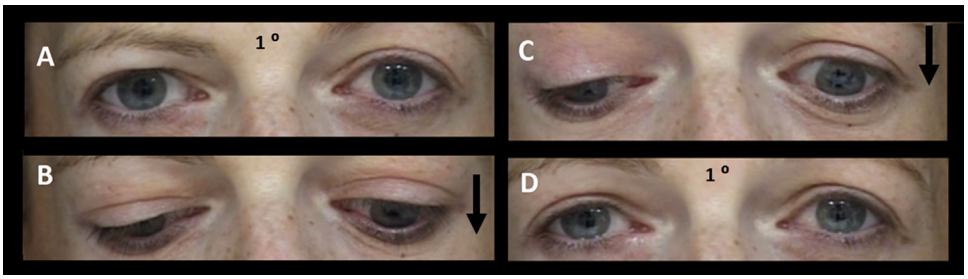

Fig. 2—Vertical eye movements. Direction of gaze indicated on image by arrow or stated as being in primary position (1°). (A) Primary position: no abnormality seen; (B) left lid lag on down gaze; (C) downgaze after sustained upgaze: left levator and SR myotonia; and (D) primary position.

the divergent deviation increased to 25 prism diopters. After sustained gaze to the left, the divergent deviation increased to a lesser extent by 16 prism diopters. Following prolonged gaze testing, she was noted to have reduced adduction of the right eye with left abducting nystagmus. She also was noted to have reduced adduction of the left eye. Horizontal eye movements are demonstrated in Fig. 1. After sustained upgaze, she consistently showed upper lid lag in depressed positions (bilateral pseudo von Graefe sign) and a depression deficit in the left eye (Fig. 2). There was no anisocoria, and both pupils were reactive to light and accommodation.

Anterior segment intraocular pressures and fundus examination were unremarkable. Investigations included serology, electromyography (EMG), and magnetic resonance imaging (MRI). Serology, including acetylcholine receptor antibodies, was unremarkable. The divergent position of the eyes was noted during the short tau inversion recovery sequence of the MRI. Repetitive stimulation EMG and single-fibre EMG were normal. Findings were consistent with bilateral ocular neuromyotonia, and treatment with carbamazepine 200 mg twice a day was initiated.

She responded well to treatment, and her symptoms resolved after 1 week. However, she developed a widespread itchy skin rash. Her treatment was reduced to 100 mg twice daily, her rash resolved, and her symptoms remained controlled.

Discussion

ONM is a rare clinical entity, characterized by episodic involuntary contraction of ≥ 1 extraocular muscles.[1–3] The most common cranial nerve affected is the oculomotor nerve,[3] followed by the trochlear and abducens nerves.[4] There is no preponderance for either sex.[1] To our knowledge, ONM has been reported to be bilateral in only 1 other case in the literature.[5]

The spasmodic neuronal dischargers in ONM result in deviation of the affected eye accompanied by diplopia.[6] Symptoms can occur spontaneously but are usually elicited after a period of prolonged gaze in the direction of the affected muscle.[1] Length of episodes can vary from seconds to several minutes.[1,3,6]

The pathophysiology behind the aberrant firing of the affected neurons is still debated but is thought to be linked to unstable neuronal membranes, especially in view of its successful treatment with membrane-stabilizing medications.[3,6]

As in the case presented here, ONM often is associated with radiation therapy ($\leq$60% of cases) and can present as late as 18 years after treatment.[1–3,6,7] Of particular note is the suggestion by Kau et al that cisplatin and 5FU, which were used in the present case, are known to cause cranial nerve toxicity. It was hypothesized this may increase sensitivity to radiation and increase the chance of developing ONM.[8]

Differential diagnosis of ONM includes ocular myasthenia gravis, demyelination, cyclic oculomotor paresis, superior oblique myokymia, cyclic oculomotor paresis, and Graves' disease.[9] Appropriate serologic and EMG testing should be undertaken. Imaging is imperative to exclude any space-occupying legion,[3,6] particularly in those patients with a history of nasopharyngeal cancer (NPC), as NPC is associated with cranial nerve palsy in nearly 25% of cases.[8]

Management includes treatment with carbamazepine, with dosage varying from 100 to 600 mg.[7] A good response has been reported, with 87.8% responding to this treatment.[7] However, as demonstrated with the present case, side effects may complicate management.

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Mydriasis due to Opcon-A: an indication to avoid pharmacologic testing for anisocoria

Case Report

A 35-year-old woman presented to the Emergency Department with an acute, painless, dilated left pupil. Her medical history was notable for myopia and truncal herpes zoster infection that had completely resolved 2 years ago. Ocular history was significant for bilateral contact lens wear, and her preferred wetting and cleaning solution was Opcon-A (naphazoline and pheniramine). Her surgical, social, and family history and a complete review of systems were unremarkable. On examination, the visual acuity was 20/20 OU. The left pupil measured 8 mm in the dark and 7 mm in the light, and the right pupil measured 5 mm in the dark and 2 mm in the light. The left pupil did not react as well to light compared with the right and did not demonstrate light near dissociation OS. The slit-lamp examination showed no iris abnormality or uveitis, and its findings were otherwise normal.

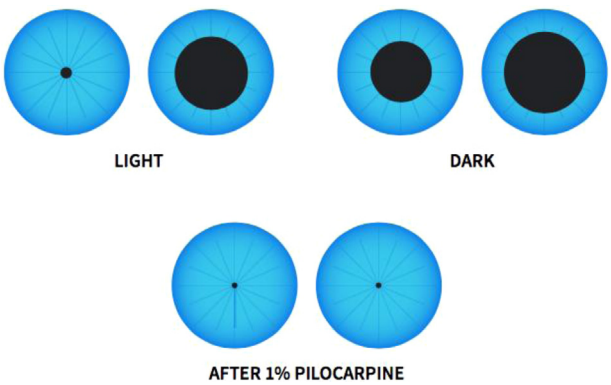

Fig. 1—Pictorial representing pupil measurements of 8 mm OD and 5 mm OS in the light, 7 mm OD and 2 mm OS in the dark, and 1 mm OD and 1 mm OS after 1% pilocarpine.

The anisocoria was measured as worse in the light, and thus topical 1% pilocarpine was administered to confirm a possible pharmacologic dilation OS. After 5 minutes, it was noted that both pupils had constricted to 1 mm OU (Fig. 1). The examining ophthalmology resident became concerned about the possibility of a compressive lesion, and the findings of computed tomography scan of the head were negative. The neuro-ophthalmologist recommended to closely follow the patient without further intervention for the presumed diagnosis of inadvertent topical sympathomimetic use as the cause for the anisocoria. The next morning the patient reported that the anisocoria had completely resolved and has not returned for follow-up.

Discussion

Opcon-A is an over-the-counter combination eye drop containing pheniramine maleate, an antihistamine used for ocular allergies, and naphazoline hydrochloride, a decongestant and vasoconstrictor used for ocular hyperemia.[1] To our knowledge, there have been 5 prior case reports of transient mydriasis attributed to the use of this agent in the literature.[2–4] Ogidigben et al. reported a dose-dependent mydriasis that occurred with topical naphazoline, suggesting the mechanism of mydriasis as a direct sympathomimetic effect and an indirect parasympathetic blockage.[5] In our patient, who was a soft contact lens wearer, the drug was being used as a wetting solution and may have had a greater effect because of increased corneal penetration. There may have been an asymmetric effect of topical Opcon-A between the 2 eyes in our patient presumably because of either differential topical dose exposure or perhaps asymmetric dose response. Contact lenses can produce changes in the corneal epithelium that in turn can lead to differential absorption rates of topical agents.

Traditional flow charts and topical diagnostic pharmacologic recommendations for anisocoria include the fol-