Wall-Eyed Bilateral Internuclear Ophthalmoplegia (WEBINO) secondary to multifocal pontine infarction

SIUW Chin P, ABDUL AZIZ Hayati B, VASUDEVAN Suresh
Ophthalmology Department, Hospital Sultanah Aminah, Johor Bahru, Johor, Malaysia

ABSTRACT

Wall-eyed bilateral internuclear ophthalmoplegia (WEBINO) is a rare syndrome with manifestations of bilateral adduction deficits, and exotropia in the primary gaze position. A 58-year-old man with underlying of diabetes mellitus, hypertension and dyslipidemia presented with diplopia for one week duration that was associated with numbness of the lips and anterior tongue, vomiting and giddiness. Ocular examination revealed exotropia in primary gaze, more in the left eye and an adduction deficit in both eyes, nystagmus in the contralateral eye whilst attempting adduction in both eyes. Convergence was absent and the vertical gazes were limited with vertical gaze-evoked nystagmus. Magnetic resonance imaging showed multifocal infarction in the pons and medulla oblongata. The right vertebral artery signal was absent on angiography. The patient was diagnosed with WEBINO secondary to multifocal pontine infarction, which is a rare syndrome. The treatment was targeted on his underlying modifiable diseases and anticoagulant has been started.

Keywords: Pontine infarction, ophthalmoplegia, diplopia, ocular motility disorders

INTRODUCTION

Wall-eyed bilateral internuclear ophthalmoplegia (WEBINO) is a rare syndrome. It was first described by Lubow in 1971. It describes a patient with bilateral adduction deficits and exotropia in the primary gaze position. It is thought to be caused by a lesion in midbrain involving both medial rectus subnuclei and the medial longitudinal fasciculus (MLF). In the literature, different levels of brain stem were found to be involved in WEBINO and not necessarily involving the medial rectus subnuclei. [1] We report a case of WEBINO in association with pontine infarction rather than a midbrain lesion.

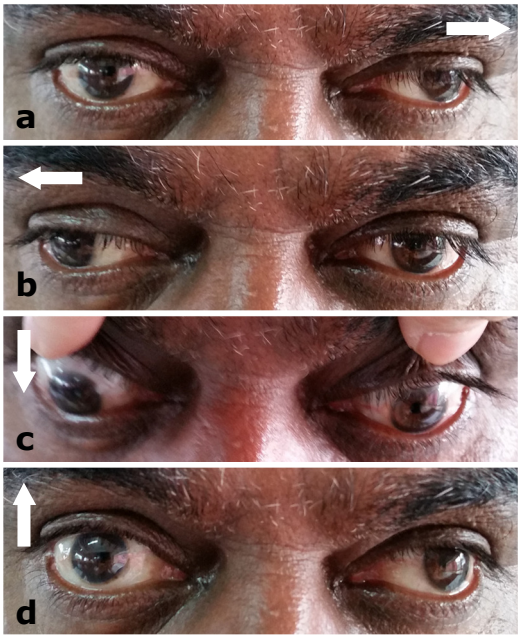
Correspondence author: Siuw, Chin P.
Hospital Sultanah Aminah, Jalan Persiaran Abu Bakar Sultan, 80100, Johor Bahru, Johor, Malaysia.
Tel: +607-2257000
E mail: schinp@yahoo.com

CASE REPORT

A 58-year-old gentleman with diabetes mellitus, hypertension and dyslipidemia presented with diplopia of 1-week duration. It was associated with upper and lower lips as well as anterior tongue numbness, vomiting and gid-

diness. He had no limb numbness or weakness. There was no blurring of vision or eye pain.

Ocular examination revealed visual acuity of 20/30 bilaterally. There was exotropia in primary gaze, about 7 degrees in the right eye and 45 degrees in the left eye by Hirschberg test (Figures 1a). Both eyes did not cross midline while attempting to adduct (Figure 1b) and this was associated with the presence of nystagmus in the abducting eye. Down gaze, up gaze (Figures 1c and d)) and convergence were impaired. The vertical gazes were limited with vertical gaze-evoked nystagmus. The anterior segments of both eyes were normal. Fundoscopy of both eyes showed normal optic discs and retina. Cranial nerves examination was normal. General neurological examination was normal. Magnetic resonance imaging (MRI) of the brain and orbits showed multifocal infarction in the pons and medulla oblongata.



Figs. 1: a) Exotropia in primary gaze position, more on the left and both eyes unable to cross midline while attempting to adduct. Left eye unable to cross midline in (b) right gaze while the right eye unable to cross midline in left gaze, and vertical gazes was limited in both eyes in down (c) and up (d) gaze.

Hypointense and hyperintense lesions were seen in the pons and anterior to the aqueduct of sylvius (Figure 2). The hyperintensity was additionally present at postrema region. There was another lesion in the midline and inferior to interpeduncle cistern. The right vertebral artery signal was absent in angiography. While the left vertebral artery and basilar artery appeared intact.

The patient was diagnosed with WEBINO secondary to multifocal pontine infarction. He was treated as ischemic stroke and anticoagulant, aspirin was started. His diplopia symptom was temporarily relieved with eye patch to one eye.

Three months after onset of the ill-

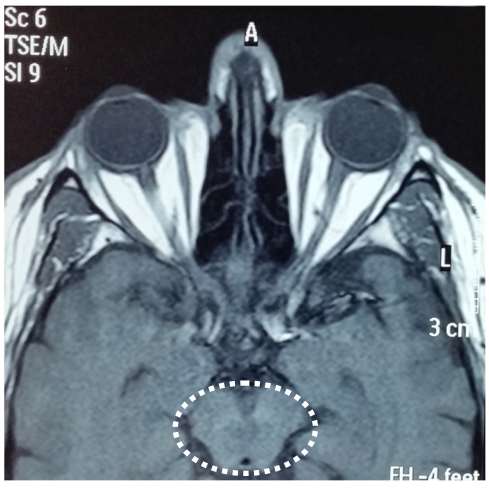


Fig. 2: Magnetic resonance imaging showing multifocal infarctions in the pons which is highlighted as hyper-intense areas (broken oval).

the exo-deviation in primary gaze, adduction and convergence deficit had resolved. The patient had no more diplopia, with best corrected vision of 20/20. However, the numbness over the lips and anterior tongue persisted.

DISCUSSION

Our patient presented with features typical of WEBINO. There were consistent MRI findings of multifocal infarction in the pons and medulla oblongata. Ocular motility disorder is common with brainstem and cerebellum lesion due to vertebrobasilar insufficiency. WEBINO can occur in patients with pons involvement and it may be accompanied by vertical ocular misalignment which is caused by otolithic inputs in skew deviation. [2] Patients with bilateral internuclear ophthalmoplegia associated with pontine lesion also can have impaired vertical vestibular and pursuit eye movements and impaired vertical-holding with gaze-evoked nystagmus on looking up and down. [3] He also had numbness over upper and lower lip as well as anterior portion of the tongue, corresponding to involvement of the main sensory nucleus of trigeminal nucleus which receives sensory inputs from the lips and the anterior portion of the tongue, which is located in the pons. [4]

Besides midbrain and hindbrain infarction, other most common causes of WEBINO include demyelination. [5] A series of four cases of WEBINO were reported in the literature by Chen *et al*. with different levels of the brainstem involvements. [1] Three cases were found to have midbrain lesions and the medial rectus subnuclei were not necessarily involved. The remaining one case involved a pontine lesion. Two cases were caused by infarction; one involving a brain tumour, while in the fourth case, the pons was involved (patient had died of hepatic cirrhosis and no autopsy was obtained). [1]

A case of WEBINO in progressive supra nuclear palsy was reported by Ushio *et al*. [5] The patient showed adduction deficit on lateral gaze bilaterally, vertical eye movements were limited and convergence was absent. Brain MRI revealed atrophy of the midbrain tegmentum. [5] Inocencio *et al.* reported a case of WEBINO secondary to tuberculosis granuloma involving the midbrain at the level of third ventricle. [6]

The management of WEBINO depends on the underlying cause and also measure to address the visual problems. In our patient, management for vertebrobasilar insufficiency was targeted on the modifiable vascular risk factors including his diabetes mellitus, hypertension and dyslipidaemia. As the underlying cause was ischaemic stroke, anticoagulant was also initiated. The main visual disorder in our patient was horizontal diplopia due to ocular motility disturbance. Our patient was treated symptomatically with simple eye patch. Other measures such as blurring one lens of the glasses with semi-opaque surgical tape can be used. Fresnel prism can be used to realign the visual axes and may be incorporated on the glasses. [7] In this case, our patient was comfortable with the patching of one eye to prevent the diplopia. However, patching over one eye producing only monocular vision and may cause some difficulty for patient. By three months after onset, the visual signs and symptoms have resolved except the numbness over lips and anterior portion of the tongue which persisted.

This clinical improvement seen in our case is similar to the two cases of WEBINO reported by Chen *et al.* which were also due to ischaemic stroke. [1] One of their patient had resolution of the convergence deficit but the right adduction deficit persisted for nine months while the second case with left adduction, upgaze deficits and exotropia reported some improvement after six weeks, but the right adduction and convergence deficits persisted. [1] Our patient was generally well with good medical optimisation. He was under medical care for the underlying diseases and anticoagulant has been continued for him.

In conclusion, WEBINO is a rare presentation and it can occur with lesions at different level of the brain stem. It should be suspected in atypical cases.

REFERENCES

1: Chen CM, Lin SH. Wall-eyed bilateral internuclear ophthalmoplegia from lesions at different levels in the brainstem. J Neuro-ophthalmol 2007; 27:9-15.

2: Costello F. Carotid artery dissection and vertebrobasilar insufficiency. Int Ophthalmol Clin 2009; 3:1-14.

3: Zee DS, Newman-Toker D. Supranuclear and internuclear ocular motility disorders. In: Walsh and Hoyt's clinical neuro-ophthalmology 6th edi. 2005. p907-68.

4: Chalam KV, Ambati BK, Beaver HA, et al. Fundamentals and Principles of ophthalmology 2013-2014. Am Acad Ophthalmol. 87-109.

5: Ushio M, Iwasaki S, Chihara Y, Murofushi T. Wall-eyed bilateral internuclear ophthalmoplegia in a patient with progressive supranuclear palsy. J Neuro -ophthalmol 2008; 28:93-6.

6: Inocencio FP, Ballecer R. Tuberculosis granuloma in the midbrain causing wall-eyed bilateral internuclear ophthalmoplegia (Webino). J Clin Neuro-ophthalmol 1985; 5:31-5.

7: Danchivijitr C, Kennard C. Diplopia and eye movements disorders. J Neurol Neurosurg Psychiatry 2004; 75:24-31.