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Intermittent positional downbeat nystagmus of cervical origin

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ABSTRACT

Intermittent positional down beat nystagmus (p-DBN) is rare. We describe an unusual case of intermittent p-DBN which was induced by rotation, anteflexion, and lateral flexion of the neck. A 59-year-old man complained of loss of consciousness and lightheadedness. Positional testing revealed the p-DBN. The evoked p-DBN had latency and the patient had a feeling of passing out while the p-DBN was present. There were no abnormal findings in the vestibular functional examinations. Findings of the MRI were negative. MRA revealed no stenosis of the vertebral artery bilaterally, but there was an anatomical difference. The p-DBN characteristics were documented by electronystagmography during the positional test. The p-DBN lasted intermittently while maintaining the provoking position. It was found that p-DBN occurred with not only the rotation of the neck, but also in the anteflexion and lateral flexion of the neck. There was no stenosis of the vertebral artery (VA) on angiography, but we speculated that the cause of the p-DBN was the VA occlusion due to rotation, anteflexion, and lateral flexion of the neck.

1. Introduction

Positional down-beat nystagmus (p-DBN) is typically a clinical sign of central nervous system involvement. It occurs with lesions in the vestibulocerebellum or the craniocervical junction and with drug intoxication [1]. Experimental extirpation of the nodulus in the cat has been shown to cause postural DBN [2]. Occasionally, p-DBN is seen in patients without CNS involvement [1,3]. There is one report showing that canalithiasis of the anterior semicircular canal (ASC) causes p-DBN [4]. It is difficult to distinguish the origin of the p-DBN in the peripheral or central nervous system. Intermittent p-DBN is extremely rare.

We encountered a patient with p-DBN due to rotation and bending of the neck, which led us to suspect a cervical origin. In this report, we describe the features of neuro-otological findings, including nystagmus, and the clinical course.

2. Case report

A 59-year-old man complained of brief positional vertigo for 1 year and a feeling of passing out when he looked down to lift a piece of luggage. He also felt the vertigo when his head turned to the left while lying down. He visited our clinic in May 2011.

There was no spontaneous or gaze nystagmus. The positional test revealed p-DBN in the left lateral position without head rotation (Fig. 1). The test also showed p-DBN with head rotation to the left (Figs. 1 and 2), but there was no nystagmus in the supine position or right ear down position. The p-DBN was also observed in the bending forward position. No nystagmus was evoked by changing position from the head hanging position to the sitting position. We carried out the examination in the sitting position, during neck torsion to the left, and p-DBN was not seen. However, during a strong twist of the neck to the left in the sitting position, the patient complained of a feeling of passing out. Therefore, vascular insufficiency was also thought to occur in the sitting position.

His hearing was normal bilaterally. There was no neuro-otological dysfunction and no cerebellar symptoms. Eye movement examinations, including the eye tracking test and the optokinetic nystagmus test, were normal. The caloric test with cold water at 10 °C and the visual suppression test were normal. Cervical and ocular vestibular evoked myogenic potentials were normal bilaterally. The subjective visual vertical test was normal. There were no abnormal findings in the brainstem, cerebellum, or inner ear on brain MRI. On MRA, the left vertebral artery (VA) was narrower than the right VA, but there was no stenosis in the VA bilaterally (Fig. 3). We presumed that the cause of the DBN was not from a central nervous system disorder, because the MRI, MRA, and electronystagmography were normal. We suspected cervical vertigo and performed the body rotation test without neck

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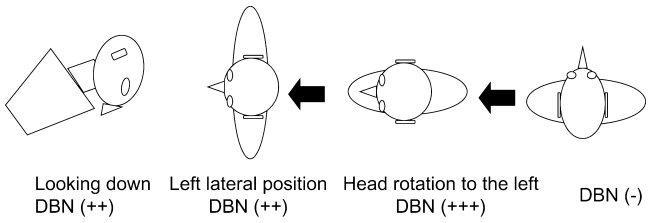

Fig. 1. Diagram representing the positions showing p-DBN. There was no nystagmus in the supine position. DBN was induced by head rotation to the left, the left lateral position without head rotation, and the looking down position.

rotation, which still showed DBN. We thought that the cause of the DBN was not exclusively of cervical origin, because the DBN was observed not only in the rotating head position, but also in the left lateral position, without rotating the head. Therefore, initially, we suspected that the cause of the nystagmus was due to the variants of anterior canal BPPV, or otolithic dysfunction. During the follow-ups in the outpatient clinic, the symptoms did not improve. After observing the nystagmus for several times at the clinic, we were able to rule out inner ear disease as a cause of the DBN. The nystagmus continued intermittently while maintaining the provoking position (Fig. 4). The p-DBN started with small increments and the amplitude became gradually larger and attenuated. The duration of a single p-DBN was approximately 20 s and restarted after an interval of 30–40 s. With regard to the left lateral position, the nystagmus, which started with small increments, was induced in the lateral position with lateral flexion (without pillow), but the DBN disappeared after placing a pillow in order to eliminate the lateral flexion of the neck (Fig. 5). We postulated the cause of the p-DBN to be VA occlusion due to compression by the cervical vertebrae. The patient was instructed to avoid the provoking position, and the frequency of the DBN and dizziness symptoms gradually decreased. For the convenience of the patient, angiography was performed only after the symptoms were alleviated. The angiography revealed no obstruction in the vertebral or basilar artery. The p-DBN disappeared 18 months later.

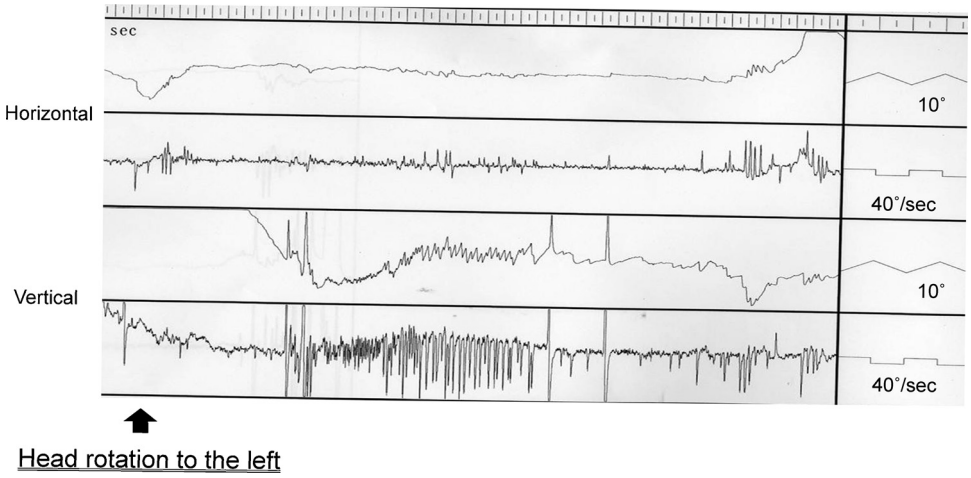

Fig. 2. Electronystagmograph of p-DBN in the present case during the positional test. The p-DBN was induced by head rotation to the left from the supine position. The evoked p-DBN had latency and was gradually reduced. The p-DBN was also observed at the left lateral position without head rotation.

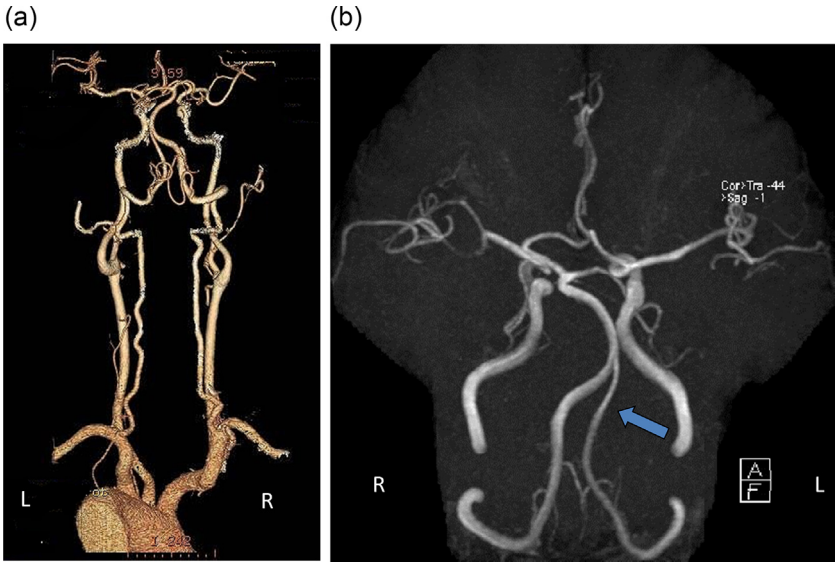

Fig. 3. (a) 3D-CT angiography (rear view) and (b) MRA (front view). There was no stenosis of the vertebral artery (VA) bilaterally. The left VA was narrower than the right VA (i.e., the right VA was dominant).