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CASE REPORT

Acute Onset of Dizziness Caused by a Cavernous Malformation Lateral to the Fourth Ventricle: A Case Report

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Dizziness, diplopia, and nystagmus may be nonspecific symptoms and in part attributed to central causes. We report a case with brain stem lesion and discuss these nonspecific symptoms. A 13-year-old boy presented to our emergency department with a lasting dizziness for 1 week and diplopia for 5 days. New onset horizontal nystagmus was also noted during the physical examination. A cavernous malformation in the right middle cerebral peduncle lateral to the fourth ventricle was suspected by brain computed tomography and confirmed by magnetic resonance imaging. Without progression of the lesion, conservative treatment and regular follow-up were performed. This case report demonstrates the importance of primary physicians paying attention to children with dizziness, diplopia, and nystagmus for considering possible central nervous problems.

1. Introduction

Dizziness is a general term for a sense of disequilibrium. Vertigo is a subtype of dizziness, defined as an illusion of movement caused by asymmetric involvement of the vestibular system. To approach dizziness is to first

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distinguish peripheral or central causes of dizziness. A previous study indicated that central causes are responsible for about one-fourth of the dizziness experienced by patients.[1] Peripheral causes of dizziness, such as benign paroxysmal positional vertigo, are disorders of the vestibular system in the inner ear in which the altered function of the semicircular canals causes dizziness.[2] Central vestibular lesions affecting the pons, medulla, or cerebellum cause vertigo, nausea, vomiting, severe ataxia, and multidirectional nystagmus that are not suppressed by optic fixation or other neurological signs. In short, compared with peripheral causes, central cause dizziness has less severe nausea and vomiting, more severe imbalance, rare hearing loss, more severe oscillopsia, more neurologic signs, longer duration, and slower compensation.[1–3] Accordingly, careful history taking, neurological examinations, and imaging studies are most important for the differential diagnosis of peripheral or central causes of vertigo.

Nystagmus, dizziness, or diplopia may be nonspecific symptoms and also signs of lesions over the central nervous system (CNS). Therefore, approaching these symptoms is undoubtedly a tough challenge for clinicians in the emergency department (ED). Fortunately, there are still some clues indicating the problems in the CNS. Herein we present the case of a 13-year-old boy with dizziness lasting for 1 week and diplopia for 5 days, who presented to our ED. He was finally diagnosed as cavernous malformation (CM) in the right middle cerebral peduncle lateral to the fourth ventricle.

2. Case Report

A 13-year-old boy, without a prior medical history or any head injury history, experienced dizziness with vomiting lasting for 1 week. He had been to a clinic and was diagnosed with acute gastroenteritis, but the symptoms persisted after treatment. A sudden acute onset of severe dizziness and diplopia occurred, and he was sent to the ED for help. The vital signs taken revealed blood pressure 119/82 mmHg, heart rate 65 beats/min, respiratory rate 16 breaths/min, and body temperature 36.5°C. Vertigo and headache were denied. On physical examination in the ED, gait disturbance, rightward gaze nystagmus, and binocular diplopia were found. Neurological examinations revealed symmetric pupil size, intact light reflex, intact visual field, normal motor and sense function, and symmetric muscle power.

Because of these clinical presentations, a diagnostic study, head computed tomography, was immediately performed to rule out suspected CNS disorders. The head computed tomography showed an approximately 11 × 12-mm hyperdense nodule in the right middle cerebral peduncle lateral to the fourth ventricle without resulting in significant mass effect or ventricular obstruction. This led to a suspicion of CM or focal hemorrhage (Figure 1). Subsequent magnetic resonance imaging (MRI) and magnetic resonance angiography (MRA) revealed mixed hypointensity and hyperintensity on T1-weighted imaging and T2-weighted imaging, indicating different stages of blood products and mild enhancement (Figure 2). No evidence of hyperintensity in the diffusion-weighted imaging and

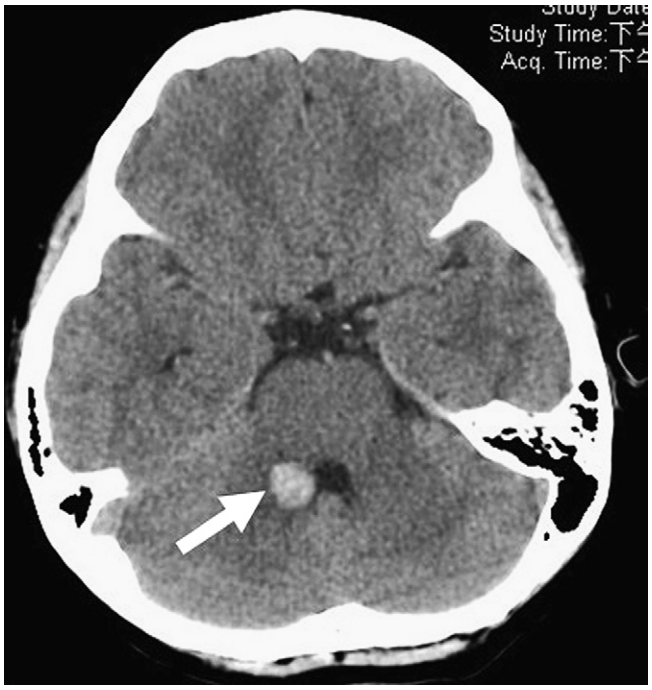

Figure 1 Brain computed tomography showed a hyperdense nodule in the right middle cerebral peduncle lateral to the fourth ventricle.

hypointensity in the apparent diffusion coefficient were noted, indicating no cytotoxic edema lesions. No other abnormally enhanced lesions were noted in the brain, and no significant ventricular dilatation was noted. Furthermore, the results of MRA showed no definite narrowing of the intracranial vasculatures, and no aneurysm was noted. Based on the findings of the imaging studies, CM was diagnosed. The patient was administered with piracetam and received regular follow-up in our outpatient department.

3. Discussion

CMs, also known as cavernous hemangiomas, with a prevalence of 0.37—0.53%,[4] are benign sporadic or familial low-pressure vascular lesions with a tendency to bleed. There are two age peaks in demographics: 6 months to 3 years and 11 years—16 years.[4] Although most patients are asymptomatic, the two most common clinical presentations of CMs of the brain and the spinal cord are hemorrhage and seizures. After hemorrhage develops, CMs of the brain cause progressive morbidity from repetitive hemorrhage, which can be fatal.[5] Our patient presented with dizziness, nystagmus, and diplopia; these are not common symptoms correlated with CM. It is important for clinicians to differentiate the various disorders causing these atypical presentations of CM.

CMs of the brain stem carry a higher risk than CMs of the cerebrum for progressive morbidity from repetitive hemorrhage.[6,7] A typical MRI finding is a "popcorn ball" appearance, demonstrating blood in different phases with hemosiderin rim. The major locations of CMs in the brain are supratentorial (frontal, temporal parietal, cortical), and only 20% are located