Abstract We report a patient with cerebral venous thrombosis who presented with acute onset of severe prolonged vertigo, nausea, vomiting, unilateral decreased caloric response and occipital headache, simultaneously with acute venous cerebral infarcts on brain MRI. Although the patient had occipital headache, overall symptoms and signs closely mimicked those of acute unilateral vestibulopathy. Cerebral venous thrombosis should be considered in the differential diagnosis of acute unilateral vestibular syndrome.

Keywords Acute unilateral vestibulopathy · Venous thrombosis

Introduction

The clinical syndrome of acute spontaneous prolonged vertigo (lasting several days) without any other accompanying neurologic or audiologic symptoms or signs, and reduced or absent caloric response, corresponds to acute unilateral vestibulopathy, which more frequently is due to a viral or a vascular disorder involving the vestibular nerve and/or the inner ear [1–3]. Although previous studies have shown that circulatory disturbance is associated with the pathogenesis of vestibular neuritis [4–6], there has been no clear evidence that vascular disturbance is an aetiology of acute unilateral vestibulopathy. Both conditions have the same clinical signs with a unilateral decreased or absent caloric response and a positive head thrust sign. Prognosis and management of acute unilateral vestibulopathy of vascular cause differ from those of acute unilateral vestibulopathy associated with viral inflammation.

Case report

A 44-year-old man with a longstanding history of smoking was admitted to our hospital for continuous dizziness and postural unsteadiness. Two weeks earlier, he had developed severe vertigo, nausea and vomiting. At the time of vertigo, he did not notice tinnitus, hearing difficulty or any other neurological symptoms except occipital headache. The vertigo and vomiting resolved over 3 days spontaneously, but he continued to have nonspecific dizziness, nausea and unsteadiness during walking, which significantly interfered with his daily life. At admission, he had no spontaneous nystagmus, but when fixating a target, he had a right-beating nystagmus with a torsional component.
which was detectable on right gaze. A passive head-shaking manoeuvre produced a horizontal right-beating nystagmus. He had corrective saccades when the head was turned toward the left rapidly (i.e., a positive head thrust sign). Other neurological examinations were unremarkable. There was no prior history of vertigo, head trauma, meningitis or autoimmune disease. Standardised bithermal caloric test using the Jongkees’ formula showed hypoexcitability to caloric stimulation (defined as a side difference more than 25% in our laboratory) on the left side that clearly indicated damage to the peripheral vestibular system with inner ear. Pure tone audiometry and brainstem auditory evoked potential were normal. An axial fluid attenuated inversion recovery (FLAIR) MRI showed sulci hyperintensities and brain oedema at the left frontal and parietal area (Fig. 1a) and thrombus within the left internal jugular vein (Fig. 1b). MR venogram showed no flow (due to thrombus) of the third part of the left superior sagittal sinus that might result in venous infarcts in the left cerebral hemisphere (Fig. 1c). Transverse sinus on the left side is also occluded. Routine blood tests including liver enzyme and urinalysis were normal. Erythrocyte sedimentation rate, antiphospholipid and anticardiolipin antibody, protein S and C, antithrombin III, lupus anticoagulant, Leiden factor V mutation, antinuclear antibody, anti-DNA antibodies, neutrophil cytoplasmic antibodies (ANCA) and D-dimer values were unremarkable. Lumbar puncture showed mild elevated intracranial pressure (200 mmH2O) but cell count and chemistry were normal. After anticoagulant medication, dizziness and headache improved over 1 week. At the follow-up evaluation 1 month after onset, the patient had only mild unsteadiness during walking, and reported no dizziness or headache. Follow-up caloric test also showed normal response.

**Discussion**

Thrombosis of the cerebral venous sinus is characterised by the classical features of headache, seizures or various focal neurological deficits with frequent deterioration of consciousness to progressive coma and death. Ameri and Bousser [7] reported that nystagmus as a sign of cerebral venous thrombosis is present in only 3% of all cases. Occasionally, patients with cerebellar venous thrombosis show a slowly evolving vestibular syndrome of dizziness, nausea and unsteadiness, but other cerebellar signs with limb dysmetria or gait ataxia are usually associated [8, 9]. Unilateral peripheral vestibular deficit as the presenting symptom of cerebral venous thrombosis has rarely been reported. To the best of our knowledge, there has been only one prior report of isolated unilateral involvement of the vestibular nerve with absent caloric response associated with lateral sinus thrombosis [10]. However, detailed clinical descriptions such as the result of head thrust test, the direction of nystagmus and outcome of vertigo were not described.

Although our patient showed no spontaneous nystagmus or vertigo at admission, it might be assumed that an absence of spontaneous nystagmus and vertigo on neurological examination was due to time intervals between onset of vertigo and arrival at hospital. It is generally considered that spontaneous nystagmus and vertigo of peripheral origin usually subside within several days after the onset of symptoms, but a unilateral decreased caloric response and an abnormal head thrust test persisted [1, 3]. Although our patient had occipital headache, overall signs closely mimicked those of unilateral peripheral vestibulopathy. His diagnosis could be initially misconceived as acute unilateral vestibulopathy of a viral origin.

![Fig. 1 An axial fluid attenuated inversion recovery (FLAIR) MRI of patient showing sulcal hyperintensities and brain oedema at the left frontal and parietal area (a) and thrombus within left internal jugular vein (arrow) (b). MR venogram showed no flow (arrowheads) of the third part of the superior sagittal sinus and the transverse sinus on the left side (c)](image-url)