

## Unilateral Hearing Disturbance could be an Isolated Manifestation Prior to Ipsilateral Anterior Inferior Cerebellar Artery Infarction

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### Abstract

A 50-year-old man presented with a sudden onset of right-sided hearing disturbance. His hearing disturbance improved gradually, however, dysarthria, right-sided facial weakness and dysesthesia, and gait disturbance was developed 11 days after the onset of hearing disturbance. MR imaging revealed fresh infarctions of the right dorsolateral pons and middle cerebellar peduncle localized in the territory of anterior inferior cerebellar artery. Unilateral hearing disturbance could be an isolated manifestation prior to ipsilateral anterior inferior cerebellar artery infarction.

**Key words:** hearing disturbance, preceding manifestation, anterior inferior cerebellar artery, infarction

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### Introduction

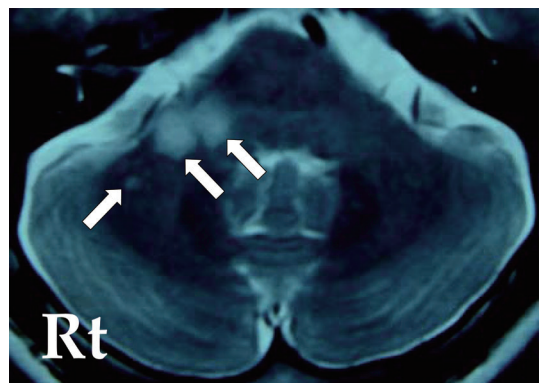
Infarction in the distribution of the anterior inferior cerebellar artery (AICA) is known to be associated with hearing disturbance, vertigo, cerebellar ataxia, facial weakness, and hypalgesia. Characteristically, sudden hearing disturbance due to AICA infarction is associated with multiple brainstem or cerebellar symptoms (1). Here, we describe a patient of AICA infarction with preceding transient hearing disturbance.

### Case Report

A 50-year-old man with untreated hypertension and hyperlipidemia suddenly developed right-sided hearing disturbance. Other symptoms such as tinnitus and vertigo were not observed. Although hearing disturbance disappeared gradually in a week without any treatment, dysarthria, right-sided facial weakness and dysesthesia, and gait disturbance developed 11 days after the onset of hearing disturbance. The patient admitted to Naze Tokushukai Hospital.

On admission, the patient presented ataxic dysarthria,

right-sided peripheral facial nerve palsy, right-sided trigeminal nerve palsy, right-sided limb ataxia and gait ataxia, however, hearing disturbance was not observed. The Weber test was not lateralized. T2-weighted MR imaging of the brain demonstrated high-intensities involving the right dorsolateral pons and middle cerebellar peduncle (Fig. 1). Right AICA was shown in MR angiography and neither stenosis nor dis-

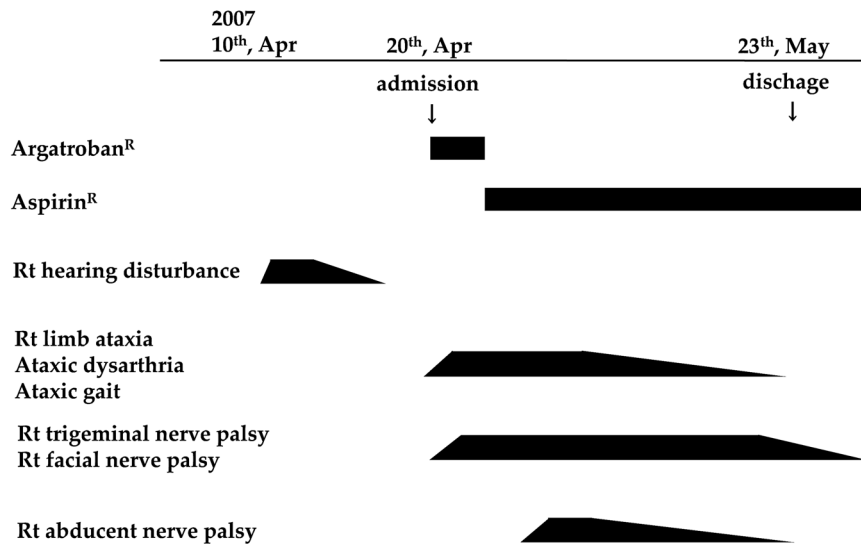


**Figure 1.** Brain MR imaging (T2-weighted image): High intensity lesions were in the right dorsolateral pons and middle cerebellar peduncle (arrow).

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**Figure 2.** The clinical course.

section was observed. Ultrasonography showed mild intimal thickening in the right common carotid artery. On brainstem auditory evoked potentials (ABR), the right sided latency of wave I and the interwave latencies between III and V were mildly delayed. Regarding blink reflex, there were no right-sided R1 and R2 components evoked on right stimulation and no right-sided R2 component on left stimulation. Anti-thrombin agent followed with anti-platelet agent was administered. During the course, diplopia due to right-sided abducent nerve palsy developed transiently; however, the clinical symptoms were improved (Fig. 2).

## Discussion

AICA supplies the anterior inferior cerebellum, middle cerebellar peduncle, dorsolateral pons, inner ear, and vestibulocochlear nerve (2). Accordingly, AICA infarction presented ipsilateral cerebellar ataxia, peripheral facial nerve palsy, facial sensory disturbance, Horner sign, hearing disturbance, and vertigo. Among these symptoms, the combination of hearing disturbance and cerebellar ataxia or hearing disturbance and vertigo were considered important for the diagnosis of AICA infarction (1, 3) and the reported incidence of hearing loss ranged from 30% (4) to 100% (5). Recently, preceding symptoms of AICA infarction have been

noted. Sudden deafness and vertigo could precede other neurological symptoms in AICA infarction (4, 6). The characteristic of this patient was that hearing disturbance developed suddenly and improved spontaneously before the onset of ipsilateral AICA infarction. The result of ABR indicated the existence of subclinical disturbance in the cochlear nerve. Therefore, the preceding hearing disturbance could have resulted from transient ischemia of the internal auditory artery, which had originated from the AICA. As the preceding ischemia was limited to the cochlear nerve, vertigo might be absent. AICA was identified on MR angiography, however, vascular risk factors and the stepwise development of a stroke with a prodromal episode indicated that the pathomechanism of this patient was atherothrombosis.

In general, transient unilateral hearing disturbance with or without vertigo has been considered to indicate a benign inner ear lesion involving an obstacle of semicircular canals. However, brain MR imaging and ABR should be considered to exclude an ischemic lesion of the brainstem when hearing disturbance occurs in a patient with vascular risk factors, even when brainstem or cerebellar signs are absent.

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