

## Case Report

# Audiovestibular Loss in the Infarction of the Left Potine Brachium: How to Early Detect?

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## Abstract

The anterior inferior cerebellar artery (AICA) usually supplies the inner ear, middle cerebellar peduncle, lateral pons, and anterior inferior cerebellum. When infarction occurs, hearing loss, as well as dizziness and dystaxia might appear. Here, we present a case of such syndrome, which was misdiagnosed for the first two weeks after feeling dizziness and deafness of his left ear.

**Keywords:** Anterior inferior cerebellar artery (AICA); Deafness; Infarction; Dizziness; Syndrome

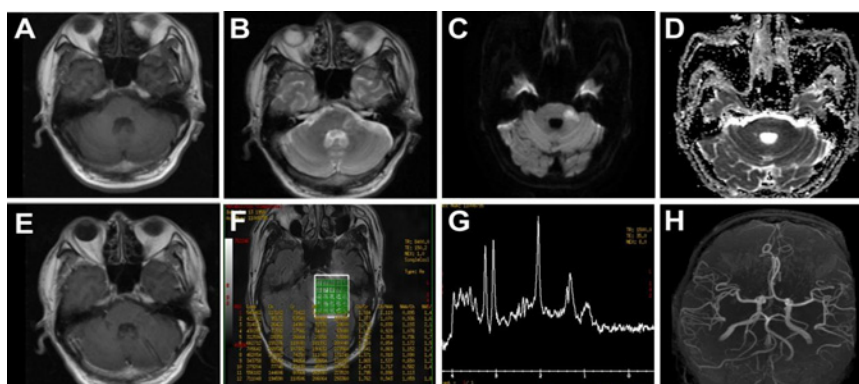
## Case Presentation

A 59-year-old male worker complained of persistent dizziness and deafness of his left ear for two weeks. At first, he went to the otorhinolaryngological department of another hospital and received a neurotrophic and improved circulatory therapy. However, his symptom didn't improve after two weeks' therapy. Magnetic resonance image (MRI) demonstrated left potine brachium lesion. So he went to our hospital for further treatment. Physical examination revealed apart from the deafness of his left ear, hypaesthesia of his left face and some problem in coordination. The patient could not complete both heel-knee-tibia test and finger-nose test, as well as poor performance when walking in a line. Diabetes was discovered one year ago. Although taking metformin twice every day, his blood glucose still had not been controlled well for the past year. He had a history of smoking and drinking. Diffusion weighted imaging demonstrated newly occurring infarction of the left potine brachium. While the signal in apparent diffusion coefficient (ADC) was low. Enhanced MRI showed a light ring-shaped enhancement around the lesion with a T1-low and T2- high signal. Magnetic resonance spectroscopy (MRS) also supported the report of infarction. Luckily, Magnetic Resonance Angiography (MRA) was normal as both anterior inferior cerebellar arteries (AICA) were not displayed (Figure 1).

Three months later, dizziness and dystaxia was significantly relieved while deafness and numbness of his left face was still not improved.

## Discussion

Sudden deafness in patients with cerebrovascular risk factors, especially in the presence of other brainstem signs, like facial hypaesthesia and dystaxia, suggests the possibility of labyrinthine artery ischemia. AICA usually arises from the basilar artery and supplies the inner ear, middle cerebellar peduncle, lateral pons, and anterior inferior cerebellum [1]. The labyrinthine artery usually derives from the AICA [2]. The potine brachium territory, where the seventh and eighth cranial nerves, some nerve nuclei like the spinal trigeminal nucleus, was supplied by the ipsilateral AICA [3,4]. Bilateral AICA infarction might also appear. The reason is that the two AICAs derive from 1 trunk [5-9]. Since Adams first reported the AICA occlusion syndrome [10], more and more cases are discovered. Sometimes, sudden deafness had also been reported as prodrome of AICA infarction [4]. Lee H reported that 81% patients who were followed for at least 1 year after onset with AICA infarction show partial or complete recovery of hearing loss [8]. In our case, deafness was still not improved after 3 months.



**Figure 1:** (A) T1 showing a low signal in the left potine brachium. (B) T2 showing a high signal in the same region. (C) Diffusion weighted imaging (DWI) and apparent diffusion coefficient (ADC) (D) showing newly occurring infarction. (E) Enhanced MRI demonstrating a light ring-shaped enhancement around the lesion. (F, G) MRS showing light declining of NAA value and light elevating of cho value, while the ratio of NAA/cho is in normal range. (H) MRA demonstrating normal, while both AICA not displaying.

In summary, this case highlights the characteristics of the AICA syndrome, like hearing loss, vertigo, facial weakness and sensory loss and ataxia. Therefore, clinicians should recognize that unilateral hearing loss may be related to stroke in the AICA area. We sought to show a case with AICA territory infarction and to call for more attention on it.

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