

Case Report

A Case of Temporal Intracerebral Hemorrhage That Presented with Sudden Bilateral Hearing Loss as the Initial Symptom

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A 57-year-old man presented to the outpatient department with sudden bilateral hearing loss. The otological examination suggested bilateral severe sensorineural hearing loss. After several hours, the patient complained of a headache and became drowsy. The brain computed tomography showed a 3 x 4 cm intracerebral hemorrhage (ICH) of the left temporal lobe. Surgery was performed and 34 days after the procedure the patient was discharged from the hospital with severe bilateral sensorineural hearing loss (SNHL). Temporal lobe ICH should be considered in the differential diagnosis of patients with sudden bilateral hearing loss, regardless of the other neurological symptoms.

KEY WORDS : Intracerebral hemorrhage · Sudden hearing loss · Temporal lobe.

INTRODUCTION

An intracerebral hemorrhage (ICH) is characterized by direct arterial bleeding in the cerebral parenchyma. The clinical symptoms of ICH are associated with their location and size. An ICH is frequently located at the basal ganglia, thalamus, cerebellum, subcortical areas and brain stem regardless their recurrences⁸⁾. The presenting symptoms vary according to the location of the ICH; some of the common symptoms include decreased consciousness, dizziness, headache, nausea, vomiting, hemiparesis, ataxic gait, and swallowing difficulty⁹⁾. We report an unusual case with sudden hearing loss due to an ICH without any neurological symptoms on presentation, which confused the differential diagnosis.

CASE REPORT

A 57-year-old man presented to a local clinic with sudden

bilateral hearing loss noticed during the morning of that day. The patient was referred to the ENT out-patient clinic. The patient had hypertension but was not on any medication. There was no other significant medical history. The patient was alert. The tympanic membranes appeared normal. Weber test showed deviation to the left ear, and the Rinne test was positive in the right ear. The results of pure tone audiometry (PTA) showed decreased hearing bilaterally at three consecutive waves. The history and clinical findings were compatible with the definition of sudden sensorineural hearing loss (SNHL) (Fig. 1A). The auditory brainstem response (ABS) of the left and right ears showed a V wave at 70 dB and 80 dB, which suggested bilateral SNHL (Fig. 1B). The patient was diagnosed with sudden bilateral SNHL and admitted for further evaluation.

Twelve hours after the initial presentation of sudden bilateral SNHL, the patient complained of a headache. Aphasia, apraxia and agraphia were detected on the neurological examination. Brain computed tomography (CT) showed a 3 x 4 cm ICH of the left temporal lobe (Fig. 1C). In addition, a 5 mm unruptured aneurysm of the anterior communicating artery was noted on magnetic resonance angiography (MRA). The patient was therefore transferred to the neurosurgery department. Emergency surgery for an ICH and unruptured aneurysm were performed. Thirty-four days

• Received : April 22, 2010 • Revised : June 8, 2010

• Accepted : November 22, 2010

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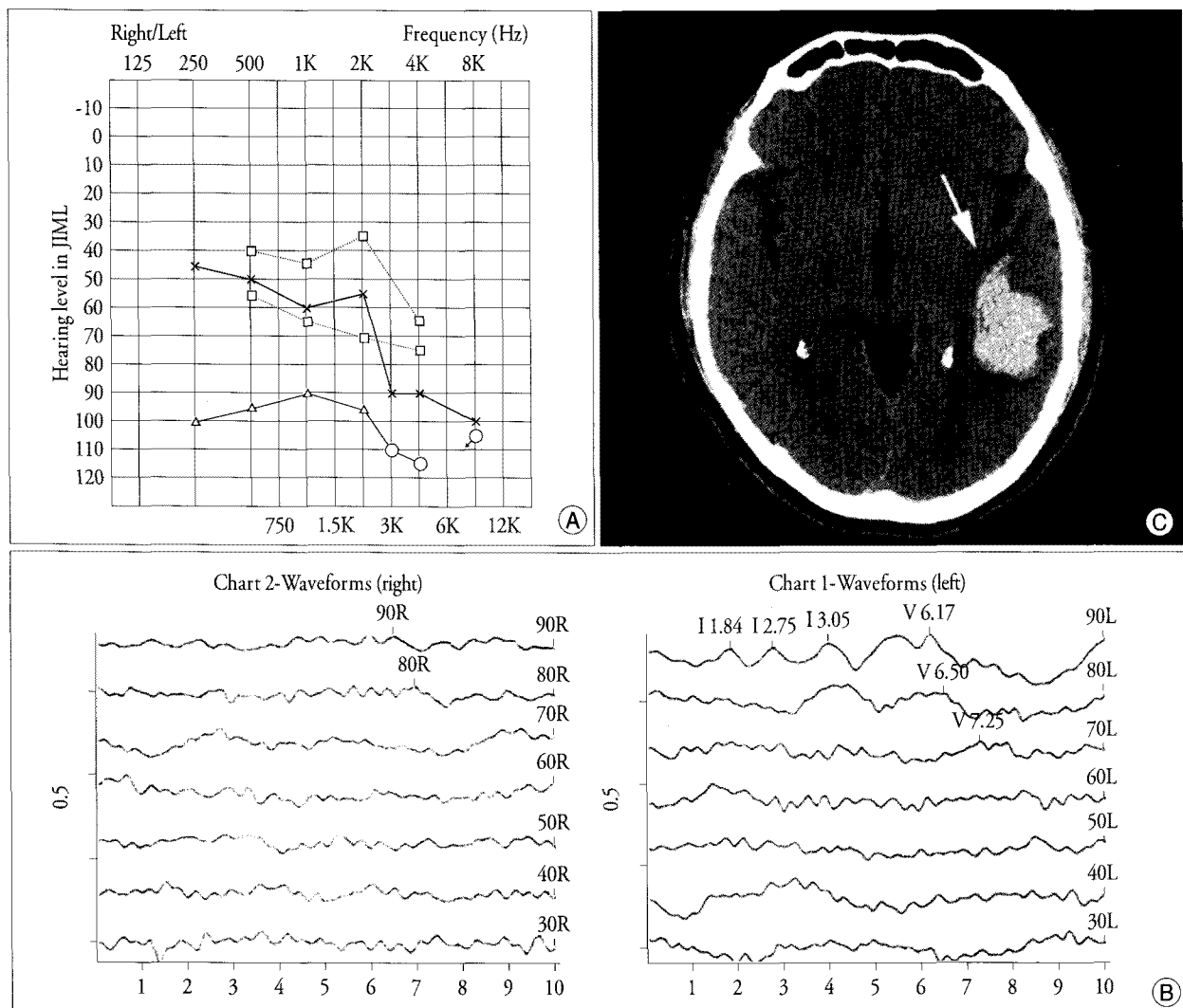


Fig. 1. Audiological and radiological findings A : Pure tone audiometry (PTA) shows severe hearing loss of the right ear (red) and moderate-severe hearing loss of the left ear (blue). B : Auditory brainstem response (ABR) shows that the V wave was present at 70 dB and 80 dB on the left and right side, respectively. This suggests bilateral sensorineural hearing loss. C : Axial view of the computed tomography (CT) shows a 3×4 cm high density area at the left temporal lobe (white arrow), suggesting an acute hemorrhage.

after the surgery, the patient was discharged from the hospital with severe bilateral hearing loss; the right ear was more severely affected than the left ear. During 12-months of follow-up, there was no interval change of the bilateral hearing loss including PTA and ABR findings.

DISCUSSION

Sudden hearing difficulty may be due to inflammation of the inner ear from viral infections, ototoxic drugs, Meniere's disease, and autoimmune diseases. However, in rare cases, a central origin such as an acoustic tumor or infarction of the anterior inferior cerebellar artery might be the cause⁹. In rare cases, superficial hemosiderosis, cytomegalovirus, borreliosis, radiation therapy, neurosyphilis, non-hodgkin's lymphoma, malignant melanoma and paraneoplastic cerebral syndrome

might cause hearing loss^{1-3,5,10,11,14}. However, hearing loss as the presenting symptom of an intracerebral hemorrhage is very rare; it may be overlooked because patients usually present with disabilities such as hemiplegia, paresthesia, gait disturbance, and dizziness, which are more commonly associated with pathology of a central origin¹².

Hearing loss associated with an ICH may be understood by the anatomy of the auditory pathway of the central nervous system⁷. Converted action potentials are produced from sound stimulation of the hair cells and the auditory nerve that enters the dorsal cochlear nucleus and the ventral cochlear nucleus of the afferent pathway. This pathway from the cochlear to nucleus sets up the initial exchanges of information between the right and left sides. Most fibers travel to the brainstem, then to the contralateral superior olivary complex, with a minimal number of fibers entering the ipsilateral

superior olivary complex. There are many areas of intersection of the nerve fibers in the central nervous system pathway; this makes it possible for the hearing in one ear to be transmitted to the other ear⁴⁾. Next, the nerve fibers enter the inferior colliculus, a nucleus junction composed of at least 18 different types of cells and five specialized areas. It is known to be associated with all types of auditory activity including differentiation of frequency, intensity, and volume. After the inferior colliculus, the pathway reaches the contralateral and ipsilateral medial geniculate body. The signal reaches the cortical auditory area (Heschl's area) located in the superior temporal gyrus of the cerebrum where it is finally perceived as sound¹³⁾.

In this case, hemorrhage of the left temporal lobe may have damaged the incoming signal of the right pathway and also affected the left pathway, resulting in severe hearing loss of the right ear and moderate-severe hearing loss of the left ear. This explains how sudden bilateral hearing loss was the initial presenting symptom, which differs from most cases of ICH. Advanced brain swelling and neural ischemia cause other symptoms, such as headaches and the Gerstman syndrome. It is unclear why severe instead of moderate bilateral SNHL occurred in this case. The reason might have been that the ICH occurred in the dominant hemisphere.

An intracerebral hematoma is easily diagnosed by brain CT. Patients at high risk for a stroke such as those over the age of 50, with hypertension, diabetes mellitus, or has coronary artery disease, or other heart related disease, should be considered for CT as soon as possible with sudden sensorineural hearing loss. In this case, the hematoma was removed and the patient recovered although bilateral the hearing loss persisted after surgery.

CONCLUSION

As an initial presenting symptom, sudden bilateral hearing loss can occur with temporal lobe ICH. Temporal lobe ICH should be considered in the differential diagnosis of bilateral

sudden hearing loss, even when there are no other neurological symptoms.

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