#### CASE REPORT

# Sudden deafness without vertigo as a sole manifestation of AICA infarct

Carmela Gerace · Claudio Pianura

Received: 5 March 2008 / Accepted in revised form: 8 July 2008 © Springer-Verlag 2008

#### Introduction

Sudden sensorineural hearing loss is a striking clinical condition characterised by a sudden onset of unilateral or bilateral loss of hearing, frequently associated with tinnitus, a sensation of pressure in the ear and disequilibrium or vertigo. Even if numerous aetiologies have been postulated as an explanation for this syndrome, viral and vascular causes have been considered the most important.

### Case report

Eight days after an uncomplicated operation of abdominal surgery a 55-year-old hypertensive man developed transient light-headedness, followed after some minutes by tinnitus with deafness on the left-side. On admission, he complained of a subjective total loss of hearing on the left-side. The remainder of the neurological examination proved normal, including the absence of nystagmus (also absent after use of Frenzel glasses) and ataxia.

Hearing impairment was severe and shown to be localized to the left cochlea from the findings of pure tone audiometry (PTA: 80 dB of hearing loss), speech discrim-

ination testing (roll-over: 30%), stapedial reflex testing (positive Metz-test on the left side) and ABR (typical cochlear intensity-latency). Cold caloric responses were normal bilaterally, no nystagmus was observed after head shaking test.

Magnetic resonance revealed high intensity areas on T2-wighted images, within the left medial cerebellar peduncle and left cerebellum – the lateral pons was not involved (Fig. 1). These lesions were compatible with a partial AICA (anterior inferior cerebellar artery) infarct. Transthoracic echocardiography, electrocardiography and Doppler sonography of neck arteries were normal. After eight months pure tone audiometry showed no improvement of hearing loss.

## Discussion

Sudden sensorineural deafness is often considered an idiopathic disease because no aetiology can be given in the majority of cases. Even though it has been defined that sudden deafness occurs within 72 hours, most patients suffer acute hearing-loss within minutes: hence a vascular mechanism should be taken into consideration, at least in such cases. In recent years sudden deafness has frequently been described in the anterior inferior cerebellar artery and as presenting symptoms of, or being associated with, other brainstem or cerebellar signs.

Vertigo is the clinical manifestation most frequently associated with this because of contemporary damage to the vestibular labyrinth. Adams was the first to describe the syndrome as being associated with an AICA occlusion. His patient had vertigo, tinnitus and bilateral hearing-loss as early symptoms. An acute ischaemic stroke in the distribution of the anterior inferior cerebellar artery (AICA) is associated with facial weakness, hypalgesia, ataxia, vertigo, hearing loss and nystagmus [1]. However,

C. Gerace (☒)
UOC Neurologia
Ospedale S.Camillo c.ne Gianicolense
00151 Rome, Italy
e-mail: C.Gerace@tiscali.it

C. Pianura UOC ORL Azienda Ospedaliera S.Camillo-Forlanini Rome, Italy



372 Neurol Sci (2008) 29:371–372

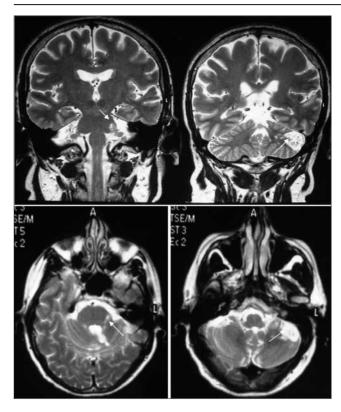


Fig. 1 Axial and coronal T2 MRI images showing left partial AICA infarction (*arrow*)

it is only in recent reports that there has been a focus on the hearing-loss that occurs with AICA infarction. In our patient neurological symptoms and signs were absent, probably because of limited extension of infarction, but the ischaemic lesions revealed by MRI are sufficiently evident to demonstrate AICA territory involvement.

The internal auditory artery arises from the anterior cerebellar artery (AICA) and supplies the inner ear, usually dividing into two main branches – the common cochlea artery and the anterior vestibular artery. The

auditory artery and its subdivisions are end arteries with minimal collateral branches from other major arterial branches [2]. We can therefore surmise that a posterior circulation event should be evident only in the cochlea or inner ear and either embolic or haemodynamic in nature, because it concerns a terminal territory. In this patient we considered a haemodynamic mechanism, probably related to transient orthostatic hypotension.

In the inner ear ischaemic lesions cannot be shown by current magnetic resonance techniques and so the diagnosis of cochlear infarct must be based on indirect indications of involvement from the posterior circulation territory [3]. Clinicians should consider performing MRI on all patients showing sudden deafness, although as sole manifestation, especially where there are vascular risk factors and a very acute onset of the condition exists. MRI is extremely useful in detecting small asymptomatic vascular lesions within AICA territory or alteration of the perfusion, which starting from the vertebral artery may have repercussions on the circulation of the inner ear.

Patients showing a sudden loss of hearing accompanied by vertigo have been described as showing these symptoms in association with an AICA infarction [4].

In the patient here described sudden deafness was the only manifestation of an ischaemic lesion that involved AICA territory.

# References

- Lee H, Sohn SI, Jung DK et al (2002) Sudden deafness and anterior inferior cerebellar artery infarction. Stroke 33:2807–2812
- Kim JS, Lopez I, Di Patre PL et al (1999) Internal auditory artery infarction. Clinicopathologic correlation. Neurology 52:40–44
- 3. Mort DJ, Bronstein AM (2006) Sudden deafness. Curr Opin Neurol 19:1–3
- Son EJ, Bang JH, Kang JG (2007) Anterior inferior cerebellar artery infarction presenting with sudden hearing loss and vertigo. Laringoscope 1173:556–558

