

Bilateral sudden sensorineural hearing loss as a first symptom of infective endocarditis: two case reports

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Abstract

Background: Septic emboli are an unusual cause of sudden sensorineural hearing loss, for which few reports exist in the literature.

Case report: This paper presents two cases of sudden sensorineural hearing loss, initially considered as idiopathic, but which were caused by septic emboli. Hearing loss in these cases was bilateral, sequential and total. The first patient had mild fever one week prior to their presentation with sudden sensorineural hearing loss; the other patient had no additional symptoms at presentation. These patients were later diagnosed with infective endocarditis, at two and seven months following the sudden sensorineural hearing loss respectively, showing that septic emboli had been the cause of sudden sensorineural hearing loss.

Conclusion: Septic emboli should be considered as a possible cause of sudden sensorineural hearing loss in cases of total hearing loss. This form of hearing loss should prompt the otolaryngologist to further investigate for infective endocarditis.

Key words: Sudden Sensorineural Hearing Loss; Septic Emboli; Infective Endocarditis

Introduction

Sudden sensorineural hearing loss (SNHL) is a frustrating and frightening condition, especially when the hearing loss is bilateral. It is defined as the hearing loss of more than 30 dB in three consecutive frequencies developing in less than 3 days.¹ Multiple causes have been proposed for sudden SNHL, such as viral infection, vascular compromise, autoimmune causes and membrane rupture. As the aetiology of most cases of sudden SNHL is unknown, the majority of sudden SNHL cases are considered idiopathic.²

One of the possible causes of sudden SNHL is septic emboli.³ Regarding pathophysiology, hearing loss caused by septic emboli could be attributed either to cochlear artery occlusion or infection at the site of embolisation.

Infective endocarditis is a deadly disease,⁴ with high mortality, despite improvement in its management. Infective endocarditis is defined as an infection of the endocardial surface of the heart, which may include one or more heart valves or the mural endocardium. Diagnosis of infective endocarditis is difficult as it is rare and symptoms may vary. It can present either as a rapidly progressive infection, or a subacute, chronic disease, with low-grade fever and non-specific symptoms.⁴ Many patients may initially experience a general malaise,⁵ and fever may not be present in elderly or immunocompromised patients.⁶ The incidence of infective endocarditis varies from 4 to 15 per 100 000 population.⁷

We present two cases of bilateral, sequential, total sudden SNHL, in which the patients were later diagnosed with

infective endocarditis. The cause of sudden SNHL in these cases was septic emboli.

Case reports

Case one

A 52-year-old woman was admitted to our clinic for bilateral sudden SNHL accompanied by tinnitus and vertigo. She had first presented with sudden SNHL of the right ear and one week later developed sudden SNHL of the left ear. The hearing loss was profound in both ears.

The patient reported having fever one week prior to the hearing loss of the right ear, with a temperature of 38–38.5 °C recorded two to three times daily, which had been attributed to a viral infection. Otoscopy findings were normal. Eye movement examination revealed horizontal nystagmus to the right. An audiogram showed deafness in all frequencies (Figure 1). The tympanogram was normal. Laboratory tests showed a raised white blood cell count of 12 300. The C-reactive protein level was 7.4 mg/dl. Cerebrospinal fluid results were normal. Auditory brainstem responses and reflexes were absent.

She received treatment with intravenous (IV) prednisolone 1 mg/kg daily for 4 days, followed by oral tapering for 9 days, and acyclovir. There was no improvement of hearing. The fever subsided with treatment. However, the fever recurred one month later, with temperatures reaching 38.6 °C.

As the fever persisted, the patient was re-examined and a heart murmur was noted. She subsequently underwent an

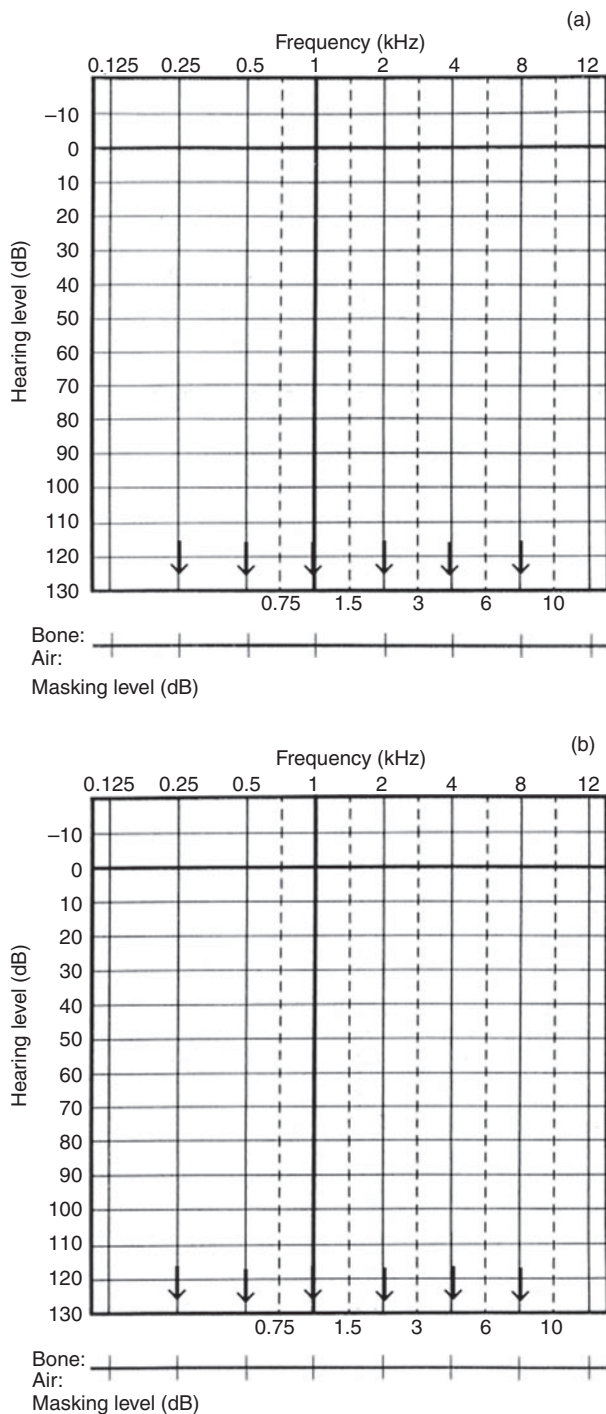


FIG. 1

Audiogram of 52-year-old woman, showing total deafness in all frequencies, in the right (a) and left (b) ears.

echocardiogram, which revealed vegetations of the mitral valve (Figure 2). Blood culture for Gram-positive cocci was positive and a diagnosis of infective endocarditis was established. The patient was treated with proper antibiotics for one month before undergoing surgery for a mitral valve replacement.

Case two

A 64-year-old man was admitted for sudden SNHL of the left ear (Figure 3). Past medical history included diabetes mellitus, chronic mild renal failure and heart failure. He

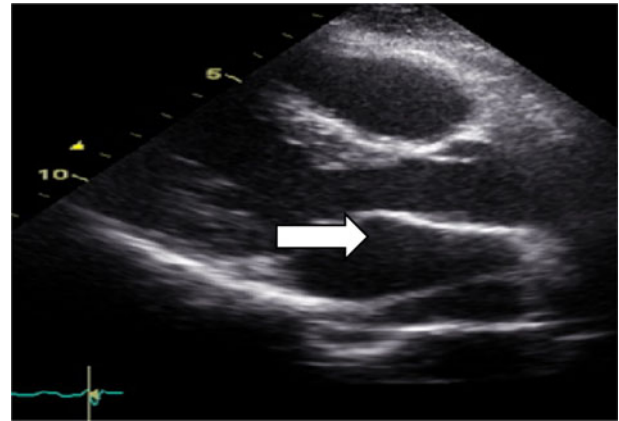


FIG. 2

Transthoracic echocardiography parasternal long axis view in systole. Typical-appearing mitral valve vegetations (arrow) attached to the atrial side of the anterior and posterior mitral valve leaflets.

had undergone coronary artery bypass grafting and mitral valve replacement five years earlier, followed by the implantation of a cardioverter defibrillator two years later.

He was treated with four intratympanic dexamethasone injections, IV prednisolone 1 mg/kg for 4 days, followed by tapering with oral steroids, and acyclovir, with no improvement.

Three months later, the patient presented with profound sudden SNHL of the right ear as well. His audiogram was similar to that in case one (Figure 1). He received the same treatment as in case one, with no improvement.

Four months later, the patient was re-admitted with fever (39.9 °C), deterioration of renal function and stroke. A computed tomography scan of the brain showed infarction of white matter on the left side. Blood culture for Gram-positive cocci was positive. Cerebrospinal fluid examination findings were normal. Transoesophageal echocardiography revealed vegetations of the prosthetic mitral valve, establishing the diagnosis of infective endocarditis (Figure 4). He was treated with proper IV antibiotics, but subsequently died as a result of sepsis and acute heart failure.

Discussion

Septic emboli are considered to be a cause of sudden SNHL.⁸ Several reports in the literature mention hearing loss as a result of infective endocarditis. In a case report by Lau *et al.*, a patient with staphylococcus endocarditis presented with bilateral and profound sudden SNHL.⁹ Mikaberidz *et al.* reported a case of hearing loss caused by *Pasteurella multocida* infective endocarditis, and attributed hearing loss to undiagnosed meningitis.¹⁰ In addition, Ahmed *et al.* presented a case of unilateral hearing loss caused by septic emboli in a case of biventricular mural vegetations.¹¹

Our case reports suggest that sudden SNHL may be a first symptom of infective endocarditis, as the latter can remain undiagnosed for a long period of time. In case one, the only symptom was fever; the time interval between sudden SNHL and infective endocarditis diagnosis was two months. In case two, the predisposing factor was a prosthetic valve; the time interval between sudden SNHL of the first ear and infective endocarditis diagnosis was seven months. Patients with a prosthetic valve (such as patient two) have a higher risk of infective endocarditis; in addition, they

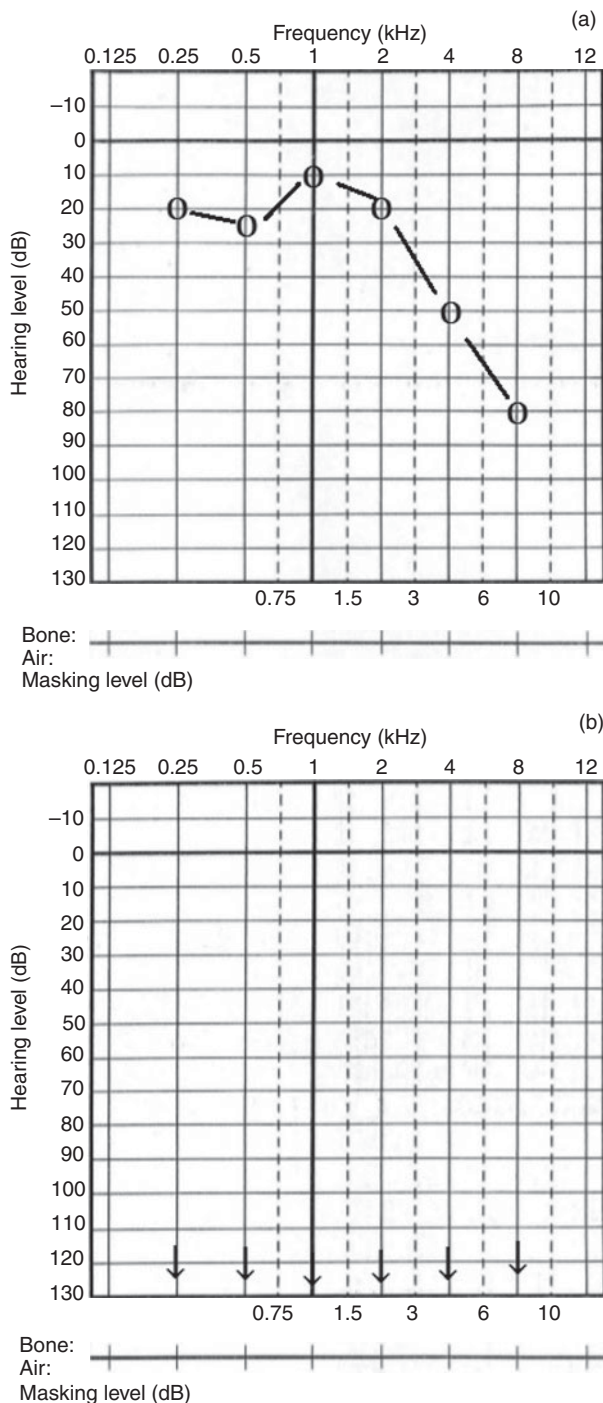


FIG. 3

Audiogram of 64-year-old man, showing high frequency sensorineural hearing loss (SNHL) of the right ear (a) and profound SNHL of the left ear (b).

develop disease complications more often and have a higher mortality risk than patients with a native valve.¹²

Our two case reports highlighted two features that are not common among sudden SNHL patients: hearing loss was bilateral-sequential and profound in both cases. Bilateral sudden SNHL is rare. Nearly all cases are unilateral; less than 2 per cent of sudden SNHL patients have bilateral involvement.¹³ Furthermore, hearing loss is profound in the minority of sudden SNHL cases, and even in those

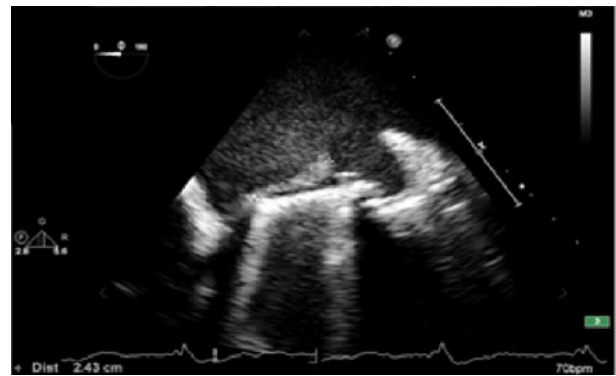


FIG. 4

Transoesophageal echocardiography, four-chamber view, zoomed image, showing bi-leaflet mechanical prosthesis in mitral position. A large (24 mm) mobile vegetation is clearly seen originating from the prosthesis ring and prolapsing into the left atrium, attached to the atrial side of the valve occluders.

cases hearing loss is not total. Therefore, these characteristics should enable differentiation from sudden SNHL with idiopathic causes and prompt appropriate investigations.

- There have been sporadic reports of sudden sensorineural hearing loss (SNHL) caused by septic emboli, due to infective endocarditis
- The pattern of hearing loss in septic emboli cases is not well discussed in the literature
- Our case reports show that hearing loss in such cases is profound, can be bilateral and is not reversible
- Sudden SNHL can be a first symptom of infective endocarditis and long precede its diagnosis, which has not been previously reported

Conclusion

Sequential, bilateral, profound sudden SNHL should prompt the otolaryngologist to further investigate for aetiologies that are not limited to otological causes. Infective endocarditis should be considered as a possible cause, even in cases where there are no obvious predisposing factors, ensuring prompt diagnosis of a life-threatening condition.

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