

## Expert Opinion

### Migraine With Transient Unilateral Hearing Loss and Tinnitus

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In 1861, Prosper Ménière first described his disease.<sup>1</sup> One hundred years later, Edwin Bickerstaff described his basilar migraine variant.<sup>2</sup> This case would have been of interest to both.

#### CLINICAL HISTORY

A 25-year-old man presented with a 1.5-year history of headaches occurring about once every 1-2 weeks. He described a severe back of the head throbbing which would then move to the top of the head associated with nausea, light, and noise sensitivity but no aura lasting up to 24 hours. He was not aware of any triggers. BC Powder and naproxen sodium were of no benefit.

With the last 3 headaches in the prior one month, with the last ending that morning, at the onset of the headache, he developed a constant low pitched buzz associated with greatly decreased hearing in the right ear lasting for the duration of the headache (12-24 hours) and then returning to normal. There was no oscillation of sound during the attack. Past medical history was negative. Neurological examination was normal.

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He was seen by an ENT physician that same day with a normal exam. An audiogram was normal except for 4000-Hertz sensorineural hearing loss, left more than right. A magnetic resonance imaging scan of the brain and internal auditory canals was normal.

**Questions.**—What is your diagnosis? What could be the pathophysiology? Might a triptan be helpful or contraindicated? If the episodes continue on a frequent basis, would migraine preventive medication be of benefit? Can permanent hearing loss be associated with migraine?

#### EXPERT COMMENTARY

This patient meets the International Headache Society (IHS) criteria for migraine, but has clinical symptomatology closely associated with 2 separate entities “basilar migraine” and “cochlear Ménière's disease.” Basilar migraine is a subcategory of migraine characterized by recurrent headaches, often in the occipital region, and multiple neurological symptoms localizing to the posterior circulation. The IHS criteria for basilar migraine require at least 2 symptoms such as double vision, ataxia, numbness, etc., so this patient does not meet criteria for basilar migraine. In a study of 49 patients with basilar migraine, impaired hearing was one of the more common symptoms reported in 20%, but auditory symptoms (other than phonophobia) were less common than vestibular symptoms with vertigo

occurring in 63% of these patients.<sup>3</sup> Bickerstaff<sup>2</sup> had proposed that these neurological symptoms are secondary to vasospasm in the posterior circulation causing ischemia. Olsson<sup>4</sup> and Parker<sup>5</sup> have reported some patients with basilar migraine presenting with a fluctuating low frequency hearing loss, typical of that seen with Ménière's disease, and similar to that seen in this patient.

Some neurotologists refer to recurrent spells of low frequency hearing loss as "cochlear Ménière's disease." Atkinson<sup>6</sup> had suggested that Ménière's disease is "migraine of the ear," with fluctuating hearing loss occurring secondary to vasospasm in the microvasculature of the inner ear and reported that commonly the headache occurs on the same side as the Ménière's symptoms, and there was oftentimes a temporal relationship between the headache and fluctuating hearing. To confound the issue, the initial presentation of classical Ménière's disease, as defined by the American Academy of Otolaryngology Head and Neck Surgery 1995 criteria, is highly variable and may present initially with only fluctuating hearing. Enander and Stahl<sup>7</sup> reported that 22% of patients with Ménière's disease present initially with hearing loss, and in about one-third there was an interval of between 5 and 20 years before the complete triad of fluctuation hearing, aural fullness, and vertigo spells occurred. Thus, it is possible that this patient has early Ménière's disease that is triggered by migraine spells. However, in general, the natural history of migraine-associated audiovestibular symptoms and Ménière's disease differs. With time, in most patients with Ménière's disease, there is a gradual progressive interictal unilateral loss of hearing.

Sudden hearing loss (sometimes permanent) has been described in patients with migraine, and these patients typically have other neurological phenomenon attributable to vasospasm: retinal migraine, hemiplegia, angina, and /or visual aura.<sup>8-10</sup> Migraine has also been associated with vestibulopathy and drop attacks.<sup>11</sup> A recent case study reported a woman with a 16-year history of a migrainous aura of oscillucis, the perceived fluctuation of ambient sounds that was followed by throbbing headaches, who had, at age 53 years, a sudden profound permanent unilat-

eral sensorineural hearing loss following the oscillucis, followed by a migraine headache. The oscillucis is suggestive of a migrainous aura, theorized to be a secondary to vasospasm, while the permanent hearing loss may represent a permanent infarct.<sup>12</sup>

In the patient presented, the normal interictal hearing is more suggestive of migraine than Ménière's disease. Second, there is a clear temporal relationship between the migraine headaches and the hearing loss. However, this patient with migraine-associated fluctuating hearing may be at risk for sudden hearing loss, and we would speculate that in this case triptans are contraindicated because of the risk of inducing vasospasm and permanent hearing loss, although this is not known for certain. A similar phenomenon, retinal migraine, is a transient monocular blindness associated with documented vasospasm of the retinal arteries.<sup>13</sup> Calcium channel blockers with antispasmodic properties halt these spells of monocular blindness.<sup>14</sup> Thus, in a patient with documented hearing fluctuation in association with migraine symptoms, calcium channel blockers may be the drug of choice. Other considerations would be acetazolamide, topiramate, or divalproex sodium.

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