Migraine-Associated Hearing Loss

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Abstract

Objectives: 1. Propose migraine associated hearing loss after general anesthesia as a distinct entity. 2. Suggest vasospasm as a possible etiologic mechanism for migraine associated hearing loss after general anesthesia. 3. Discuss management strategies.

Methods: A retrospective review of our tertiary medical center from September 2003 to January 2007 identified three patients with a history of migraine headache who developed sudden hearing loss after general anesthesia, all of whom had no history of vertigo or vestibular dysfunction. Patient charts were reviewed for relevant medical history, audiometric data, anesthesia records, management strategy and outcome.

Results: All patients met IHS diagnostic criteria for migraine headache. Unilateral hearing loss developed either immediately post-operatively (n = 2) or within one week post-operatively (n = 1). The hearing loss was purely sensorineural in three patients and mixed (with a slight conductive component) in one patient. PTA at peak hearing loss ranged from 42 to 95 dBHL. One patient identified herself immediately after surgery with sudden SNHL, was treated with high dose steroids and fully recovered. Another patient was seen one month post-operatively with sudden SNHL developed and revealed intracranial dehiscence without improvement. The third patient presented to our clinic six months after undergoing general anesthesia for bone marrow donation at another institution and did not receive hearing. The fourth patient underwent distal percutaneous and experienced unilateral sensorineural hearing loss and was subsequently lost to follow up.

Conclusions: We have identified three cases of sudden hearing loss after general anesthesia in patients with migraine headache. Hearing loss may occur as a result of cochlear damage from migraine related vasospasm. Cochlear vasospasm may have a role in improving hearing, especially if initiated quickly after the onset of hearing loss.

Introduction

Migraine is a chronic disorder, afflicting nearly 26% of women and 6% of men. Migraine has specific diagnostic criteria and is divided into migraine with aura and migraine without aura (Figure 1). The majority of patients experience migraine with aura, while one fifth experience migraine without aura. Migraine affects 12% of the population and is related to the migraine networks and vascular abnormalities. Migraine is a vascular headache characterized by recurrent attacks of photophobia, phonophobia and nausea. Migraine affects 12% of the population and is related to the migraine networks and vascular abnormalities. Migraine is often associated with secondary headache disorders such as vertigo, otitis media, and tinnitus. Migraine and vertigo may be related to shared vascular abnormalities.

Discussion

In this report are four migraineurs who suffered sensorineural hearing loss in the postoperative period. One of these patients experienced intense headache rapidly after the first of the cochlear nerve, but before other cranial nerves. This patient had severe hearing loss and was noted to have a history of migraine headaches. The patient was seen one week post-operatively with sudden SNHL developed and revealed intracranial dehiscence without improvement. The third patient presented to our clinic six months after undergoing general anesthesia for bone marrow donation at another institution and did not receive hearing. The fourth patient underwent distal percutaneous and experienced unilateral sensorineural hearing loss and was subsequently lost to follow up.

Case Reports

Case 1

A 64 year old female underwent bilateral total knee replacements for osteoarthritis approximately two months prior to presenting to our clinic. She had a history of migraine headaches but no family history of migraine. Her preoperative medications included aspirin, naproxen, and albuterol. She had no history of vertigo or vestibular dysfunction. Her preoperative anesthesia records were not available.

Prior to the procedure, the patient received midazolam (3 mg intravenously). On induction of anesthesia, the patient received propofol 200 mg, rocuronium 50 mg, fentanyl 250 mg and lidocaine 1% 80 mg. She was maintained in anesthesia on nitrous oxide 50%, 100% oxygen and propofol 160mg. Immediately post-operatively, she noted right aural fullness, tinnitus and diminished hearing in her right ear. This was documented and appears to be related to cerebrospinal fluid losses causing a change in perilymph pressure via the cochlear duct. For the three patients with anesthesia records available, the administered anesthesia was standard. Two of the patients experienced mild hearing loss and the other of the two did not. Vascular code had been proposed as a cause of perioperative hearing loss by causing a cerebral fistula due to fundus vascular in-patients with malignant tibia bone metastases. These patients were reported to have hearing, walking or balance after operation. In our patient, and without evidence of vascular code, they also seem to be a symptom of vestibular dysfunction and otitis media. There is no evidence they experienced hearing loss.

Conclusions

Hearing loss after general anesthesia in migraine patients is a separate clinical entity. Cochlear vasospasm is the likely cause of hearing loss in these patients. Patients may benefit from immediate treatment with steroids.