Endoscopic fenestration of a cerebellopontine angle arachnoid cyst resulting in complete recovery from sensorineural hearing loss and facial nerve palsy

Case report

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Cerebellopontine angle arachnoid cysts are usually asymptomatic, but are frequently found incidentally because of increased use of neuroimaging. Nevertheless, as these cysts enlarge, they may compress surrounding structures and cause neurological symptoms. Patients may present with vague, nonspecific symptoms such as headache, nausea, vomiting, and vertigo. Cranial nerve palsies, including sensorineural hearing loss and facial weakness, although rare, have also been reported in association with posterior fossa arachnoid cysts. Although surgery for these entities is controversial, arachnoid cysts can be treated surgically with open craniotomy for cyst removal, fenestration into adjacent arachnoid spaces, shunting of cyst contents, or endoscopic fenestration. Reversal of sensorineural hearing loss following open craniotomy treatment has been described in the literature in only 1 adult and 1 pediatric case. Improvement in facial weakness has also been reported after open craniotomy and arachnoid cyst fenestration. The authors report the first case of complete recovery from sensorineural hearing loss and facial weakness following endoscopic fenestration in a patient with a cerebellopontine angle arachnoid cyst. (DOI: 10.3171/2010.11.PEDS10281)

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toms of hydrocephalus. Neuroimaging revealed a right CPA arachnoid cyst and obstructive hydrocephalus (Fig. 1A–C). On initial examination, the patient had a House-Brackmann Grade II right facial nerve palsy, and audiology testing demonstrated moderate-to-severe right-sided sensorineural hearing loss (Fig. 2A).

**Operation.** The patient was brought to the operating room for an endoscopic third ventriculostomy for treatment of hydrocephalus, as well as endoscopic fenestration of the right CPA arachnoid cyst into the third ventricle. The arachnoid cyst was so large and the hydrocephalus was so extreme that the CPA arachnoid cyst and the third ventricle were abutting (Fig. 1A–C). The right CPA arachnoid cyst resolved after endoscopic fenestration was performed (Fig. 1D).

**Postoperative Course.** Postoperatively, the patient’s headache, nausea, and vomiting, as well as his facial nerve palsy, resolved. Audiology testing performed on postoperative Day 3 showed complete resolution of his sensorineural hearing loss (Fig. 2B). At the 3-year follow-up, he continued to have good facial nerve function on clinical examination, and his audiogram showed good hearing function (Fig. 2C).

**Discussion**

Sensorineural hearing loss and facial nerve palsy are both rare presenting symptoms of posterior fossa arachnoid cysts. It has been suggested that long-term compression of the cranial nerves in the CPA may cause irreversible nerve damage. Nonetheless, recovery from sensorineural hearing loss has been reported after craniectomy and posterior fossa cyst fenestration in 1 adult and in 1 pediatric patient. Improvement of facial nerve palsy caused by a CPA arachnoid cyst after craniectomy and cyst fenestration has also been reported in the literature.

Endoscopic cystocisternostomies and ventriculocystostomies are safe and effective, minimally invasive techniques for the treatment of arachnoid cysts. Ottaviani et al. reported a case in which endoscopic cyst decompression stopped the progression of hearing loss in an adult. However, ours is the first reported case of complete recovery from sensorineural hearing loss and facial weakness in a patient with a CPA arachnoid cyst following endoscopic fenestration.

Our patient was a child who was treated within 6 months of the initial onset of symptoms. It is unclear how much of a role the timing of the surgery and the age of the patient played in the resolution of symptoms, although both probably contributed. Children are generally more resilient to neurological tissue trauma, and perhaps our patient had a better chance of neurological recovery because of the plasticity of his nervous system compared with that of an adult. Patients who undergo treatment of posterior fossa arachnoid cysts that were causing hearing deficits should be followed with periodic audiological monitoring and/or brainstem auditory-evoked response testing, because these individuals may be at risk for recurrence. Neuroradiological imaging may be useful for visualizing a recurrent cyst; however, it would not provide information regarding nerve function.

Endoscopic fenestration should be considered for the initial treatment of CPA arachnoid cysts, because it has been shown to lead to recovery from sensorineural hearing loss and facial nerve palsy. Furthermore, if endoscopic management were to fail, an open surgical procedure or shunt placement would still be an option.

**Conclusions**

A CPA arachnoid cyst may cause neurological deficits, including sensorineural hearing loss and facial nerve palsy. Cranietomy and cyst fenestration has been reported to reverse sensorineural hearing loss, and has led to improvement of facial weakness in patients with posterior fossa arachnoid cysts. However, open procedures may cause increased morbidity compared with minimally invasive procedures such as endoscopic fenestrations. Endoscopic arachnoid cyst fenestration is a treatment option for CPA arachnoid cysts that may result in reversal of neurological deficits, as was demonstrated in our case.

**Disclosure**

The authors report no conflict of interest concerning the materials or methods used in this study or the findings specified in this paper.

Author contributions to the study and manuscript preparation
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include the following. Conception and design: Olaya, Rowe, Zouros. Acquisition of data: all authors. Analysis and interpretation of data: all authors. Drafting the article: Olaya. Critically revising the article: all authors. Reviewed final version of the manuscript and approved it for submission: all authors. Administrative/technical/material support: Olaya, Ghostine, Rowe. Study supervision: Rowe, Zouros.

References


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