CASE REPORT

Concurrent Vestibular Schwannoma and Meningioma Mimicking a Single Cerebellopontine Angle Tumor

Joe Walter Kutz, Jr., M.D.,¹ Samuel L. Barnett, M.D.,²
Kimmo J. Hatanpaa, M.D., Ph.D.,³ and Dianne B. Mendelsohn, M.D.⁴

ABSTRACT

Vestibular schwannomas account for ~80% of cerebellopontine angle (CPA) tumors, with meningiomas being the second most common tumor of the CPA. The occurrence of both a schwannoma and a meningioma in the cerebellopontine angle is rare. After obtaining Institutional Review Board approval, we present a case of a concurrent vestibular schwannoma and meningioma in the CPA mimicking a single tumor.

KEYWORDS: Acoustic neuroma, vestibular schwannoma, meningioma, cerebellopontine angle

CASE REPORT

A 43-year-old woman presented with an 18-month history of severe bifrontal headaches. One month before presentation, she noticed right-sided hearing loss and imbalance. She denied facial numbness or diplopia. She reported no family history of schwannomas or meningiomas. Her physical examination was normal except for a decreased right corneal reflex and decreased sensation over the right V1 distribution of the trigeminal nerve. She had no evidence of cerebellar dysfunction. Audiometry revealed an asymmetric mild sensorineural hearing

loss in the right ear with a 3-frequency pure tone average (PTA) of 23 dB and 100% speech discrimination. Magnetic resonance imaging (MRI) of the brain and internal auditory canal with gadolinium contrast was obtained (Figs. 1 and 2).

She underwent a translabyrinthine craniotomy and was found to have two distinct tumors. The tumor involving the internal auditory canal was more typical of a schwannoma with a soft consistency and little bleeding. The tumor adjacent to the brainstem and petrous temporal bone was fibrous and vascular. The petrous temporal bone around the internal auditory canal and inferior toward the

¹Department of Otolaryngology, ²Department of Neurological Surgery, ³Department of Pathology, ⁴Department of Radiology, University of Texas Southwestern Medical Center, Dallas, Texas.

Address for correspondence and reprint requests: Joe Walter Kutz, Jr., M.D., Assistant Professor, Department of Otolaryngology, University of Texas Southwestern Medical Center, 5323 Harry Hines Blvd., Dallas, TX 75390 (e-mail: walter.kutz@utsouthwestern.edu).

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Figure 1 T1 axial magnetic resonance imaging (MRI) with gadolinium demonstrates a less intensely enhancing vestibular schwannoma filling the internal auditory canal (broad arrow) with a more intensely enhancing concurrent meningioma more medially (narrow arrow).

jugular foramen was grossly involved with tumor. Intraoperative frozen section analysis as well as subsequent review of permanent sections and immunohistochemical stains confirmed the suspicion that the more lateral tumor was a schwannoma and the medial tumor was a meningioma (Figs. 3 and 4). Subtotal resection was performed due to involvement of the jugular foramen and petrous temporal bone. She had no postoperative complications, and her postoperative facial nerve function was grade I on the House-Brackmann scale. Careful review of her family history and MRI revealed no evidence of neurofibromatosis type 2.

DISCUSSION

Simultaneous schwannomas and meningiomas of the cerebellopontine angle are rare unless associated with neurofibromatosis type 2 (NF2). There have

Figure 2 T1 coronal magnetic resonance imaging (MRI) with gadolinium shows the enhancing mass filling the canal and extending into the cerebellopontine angle (CPA) cistern. The two masses cannot be clearly separated from one another on this view. The enhancing mass extends inferiorly to contact the jugular tubercle and extends laterally toward the jugular fossa.

been very few case reports of simultaneous tumors in patients without NF2.^{1,2} The occurrence of simultaneous tumors should be differentiated from mixed tumors, which are schwannomas with meningeal cell proliferations. Up to 21% of schwannomas in NF2 have meningeal cell proliferations.³

The radiographic differentiation of schwannomas and meningiomas of the cerebellopontine angle have been well described.⁴ Meningiomas tend to be broad based, eccentric to the internal auditory canal, and often have adjacent dural enhancement (dural tails). Vestibular schwannomas usually involve and are centered on the internal auditory canal, are more rounded, and rarely have adjacent dural enhancement. Another distinguishing feature is the hyperostosis seen with ~70% of meningiomas, which rarely occurs with vestibular schwannomas. In this case, a distinct enhancement difference could be appreciated through the mass and raised the suspicion of simultaneous tumors. In addition, the tumor entered the jugular foramen, which is

Figure 3 A fragment of meningeoma (left) demonstrates membranous positivity for epithelial membrane antigen (EMA) by immunohistochemistry, which is consistent with meningeoma, whereas a fragment of schwannoma (vestibular schwannoma; right) in the same specimen is negative (original magnification $\times 40$).

Figure 4 The same fragment of vestibular schwannoma (right) demonstrates cytoplasmic positivity for S-100 by immunohistochemistry, which is consistent with schwannoma, whereas the fragment of meningeoma (left) in the same specimen is negative (original magnification $\times 40$).

uncommon in the setting of a vestibular schwannoma. Magnetic resonance imaging with gadolinium contrast is essential for accurate preoperative diagnosis and subsequent patient counseling regarding treatment, outcomes, and prognosis.

In general, the occurrence of two tumor types in the same location may be due to collision of two separate tumors, metaplasia of an existing tumor, or differentiation for the same cell line into two distinct tumors. In this case, collision of two separate tumors is most likely as indicated by the sharp contrast demarcation on the MRI and distinct histology of the specimens. If this were a mixed tumor, the likelihood of the patient having NF2 would be greater.

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