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CASE REPORT

Cavernous Haemangioma of the Internal Auditory Canal: A Case Report

Feng Shao-Yan, Fan Yun-Ping, Chen Shulin, Hong Hai-Yv, Zhang Zhi-Gang

Department of otolaryngology, the fifth hospital of Sun Yat-sen university, Zhuhai, Guangdong, China

We report a patient with haemangioma which rarely located in left internal auditory canal, despite only in a very small size; the tumor led to profound sensorineural hearing loss and degree III left facial paralysis in House-Brachman system preoperatively. Radiological imaging revealed it with characteristic uneven calcification. The tumor was removed totally through translabyrinthine approach on the condition of facial nerve monitoring, it was revealed arising from vestibular nerve intraoperatively. No obvious postoperative complications were documented. Postoperative histological findings prove it as a cavernous haemangioma.

Keywords: Hemangioma; Internal auditory canal; Facial palsy

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Hemangioma rarely occurs in internal auditory canal (IAC). Most are thought to arise from the capillary plexus surrounding Scarpa's ganglion causing vascular and neural compression symptoms such as sensorineural hearing loss, tinnitus, dizziness, facial nerve weakness, even when they are relatively small. CT-scan may show unilateral mildly dilated IAC and some stippled patterns of calcifications/ossification in it. A small lesion occupying the IAC is presented in MRI. All above characters should raise the suspicion of a hemangioma. Early recognition and surgical intervention in these benign tumors may improve the chance of preserving the functional integrity of the facial nerve. In this report, we highlight the clinical, radiologic, and pathological characteristics of a recently encountered case of cavernous hemangioma in the left IAC. Some English literature had documented cavernous haemangiomas of the IAC, but there were very few case reports in China.

Case Report

A 47-year-old male presented with 9 months history of left facial weakness and progressive left-sided reduction in hearing which had advanced to total loss of hearing 3 months prior to presentation. He had suffered from intermittent tinnitus during the previous 5 months. The patient denied dizziness. There was a left facial weakness manifested by asymmetry of the nasolabial fold and inability to completely close the left eye (grade III by the House-Brackman system). The external auditory canal and tympanic membrane appeared normal. The corneal reflex was diminished on the left. A pure-tone audiogram showed a total hearing loss on the left side. Auditory brainstem response testing (ABR) showed an excellent definition of waves within the normal range on the right side. On the left, the wave III and V were present and significantly delayed. An interaural difference in wave

Corresponding address:
FAN Yun-ping
52 Meihua east road, Xiangzhou district, Guangdong province, China, 519000
Mobile phone: 86-13005763411
Fax: 86-0756-2261253
E-mail: fanyunping@sohu.com

V latency was obvious. A caloric test using cold water showed a left complete semicircular canal paresis. No spontaneous, gaze-associated, or positional nystagmus was seen. Electroneuromyography showed no denervation of the facial nerve. The stapedius reflex was decreased on the affected side. CT-scan in bone window setting showed a slight widening of the left ICA compared with the right and some calcifications or bone spicules in the left ICA (Figure 1). Magnetic resonance imaging (MRI) showed a 6-10 mm mass isointense with brain in the left ICA lesion on T2 weighted spin echo sequence with several tiny focal hypointensities (Figure 2). There was no extension of the lesion into the cerebellopontine angle. Based on clinical and radiological findings, the diagnosis was assumed to be either acoustic or facial nerve neuroma. Considering the 3-month history of complete deafness, translabyrinthine

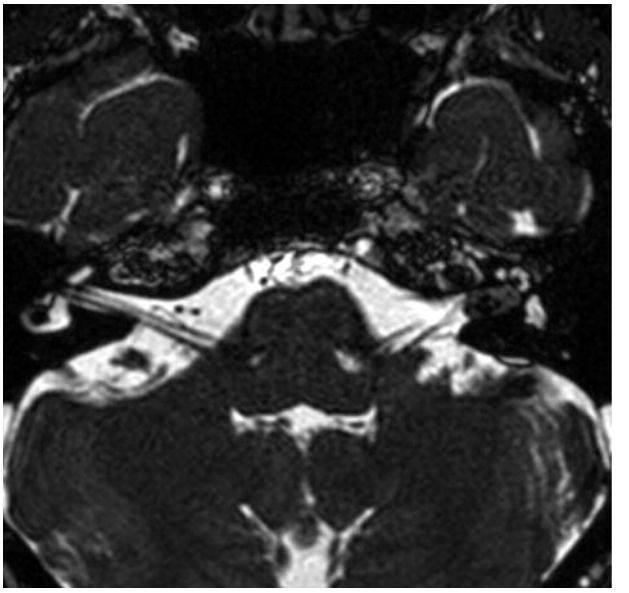

Figure 2. Axial T2 weighted MRI shows a 6-10 mm mass isointense in the left ICA lesion with several tiny focal hypointensities.

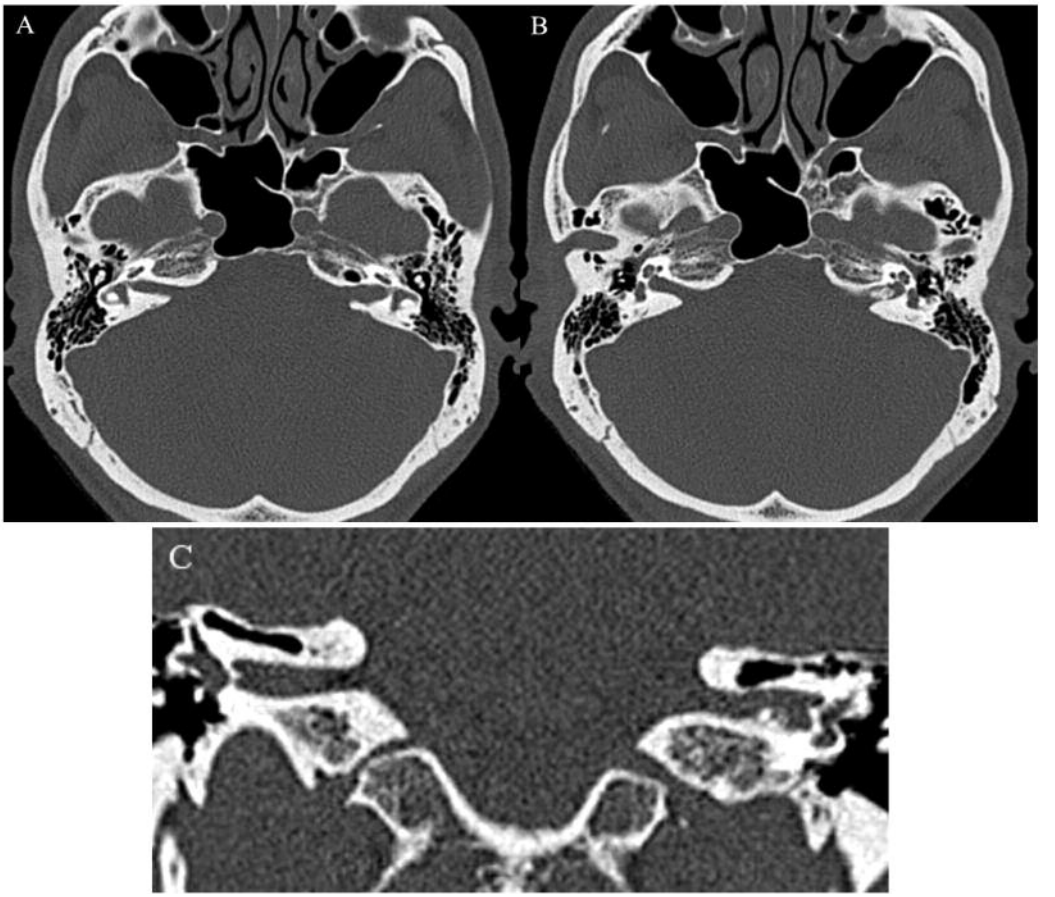

Figure 1. High-resolution CT of the internal auditory canal (ICA). (**1A**)Axial view shows a slight widening of the left ICA compared with the right. (**1B**)Axial view shows some calcifications in the left ICA. (**1C**)Coronal view shows the calcifications in the fundus of left ICA.

approach with intraoperative monitoring of the facial nerve was selected for tumor removal. The mass in the IAC about 8 mm in diameter was red and soft; it adhered to the vestibular nerve. The cochlear nerve and facial nerve were only compressed, and were preserved throughout the operation. The tumour was removed totally in a whole fashion with minimal bleeding. Histologic sections revealed convoluted, dilated vascular channels lined by a single flat layer of endothelial cells and separated by thick collagenous stroma containing fibroblasts (Figure 3). But no calcification were found. The endothelial cells were positive for CD31, CD34 and VEGF, whereas S-100 and EMA were negative. These findings were compatible with a diagnosis of cavernous haemangioma. There were no complications post-operatively, and the patient was discharged 2 weeks after operation.

Discussion

The most common tumor in IAC and the cerebellopontine angle (CPA) is vestibular schwannoma. Other space-occupying lesions of this position include meningioma, primary cholesteatoma, facial nerve neurinoma, various vascular tumors, metastatic tumors, and others. Cavernous angioma rarely occurs in the IAC. The first case of IAC cavernous angioma was reported by Sundaresan[1] and coworkers in 1976. Since that time, other case reports have documented and corroborated the occurrence of IAC cavernous angiomas. Most of these previous reports considered these tumors originate from the capillary bed of the epineurium surrounding the nerve[2,3,4].

Depending on location and the nerve of origin, these lesions can cause severe and progressive sensorineural hearing loss, tinnitus, facial nerve palsy, or vertigo and disequilibrium even when they are relatively small. The pathophysiology behind these phenomena may be a vascular steal mechanism where blood is directed toward the tumor instead of the nerve trunk, leading to severe loss of function regardless of the small tumor size[2]. Tumour sizes cited in papers, whether measured in images or at operation, have consistently been less than 10 mm. In general one characteristic of the vascular tumors of the internal auditory canal is that the degree of hearing loss and facial nerve palsy is out of proportion to those usually expected with a small intrameatal tumor [5]. In our case, the patient had total hearing loss combined with marked preoperative facial palsy and a small space-occupying lesion in the IAC, which suggested a diagnosis of cavernous haemangioma.

CT-scan in our patient showed a slight widening of the left ICA compared with the right and some calcifications in the fundus of it. In some previous reports stippled patterns of calcification at CT scanning preoperatively sometimes help to distinguish cavernous haemangioma from facial or acoustic neuroma in ICA[6]. Vaquero et al[7] reported approximately one-third of all cavernomas will demonstrate calcification, and this interstitial calcifications between the vascular channels are visible on CT imaging. MRI in our patient showed a 6-10 mm mass isointense with brain in the left ICA lesion on T2 weighted images with several tiny focal hypointensities. In retrospect, high intensity suggested cavernous haemangioma rather than acoustic neurinoma. However, as in our case, some haemangiomas do not show high intensity. So diagnosis by imaging alone was difficult because the lesion was small. Consideration of clinical and imaging findings together is important for accurate preoperative diagnosis.

Cavernous haemangiomas must be resected surgically, since radiotherapy may promote growth and haemorrhage[8]. Approaches should be chosen according to hearing deficit and tumour size, as with acoustic neurinomas. We chose a translabyrinthine approach considering the patient's profound hearing loss and the small size of the tumor. The cavernous haemangioma was adherent to the vestibular nerve in our case, while the facial nerve was only compressed. It is often possible to remove the tumor with preservation of the facial nerve continuity, as in our patient. The final outcome of the surgery with regard to preserving facial nerve function is highly dependent on early intervention [5].

A cavernous angioma of the IAC can be difficult to diagnose and distinguish preoperatively from an acoustic neuroma or facial neuroma. These tumors cause profound nerve deficits despite their small size.

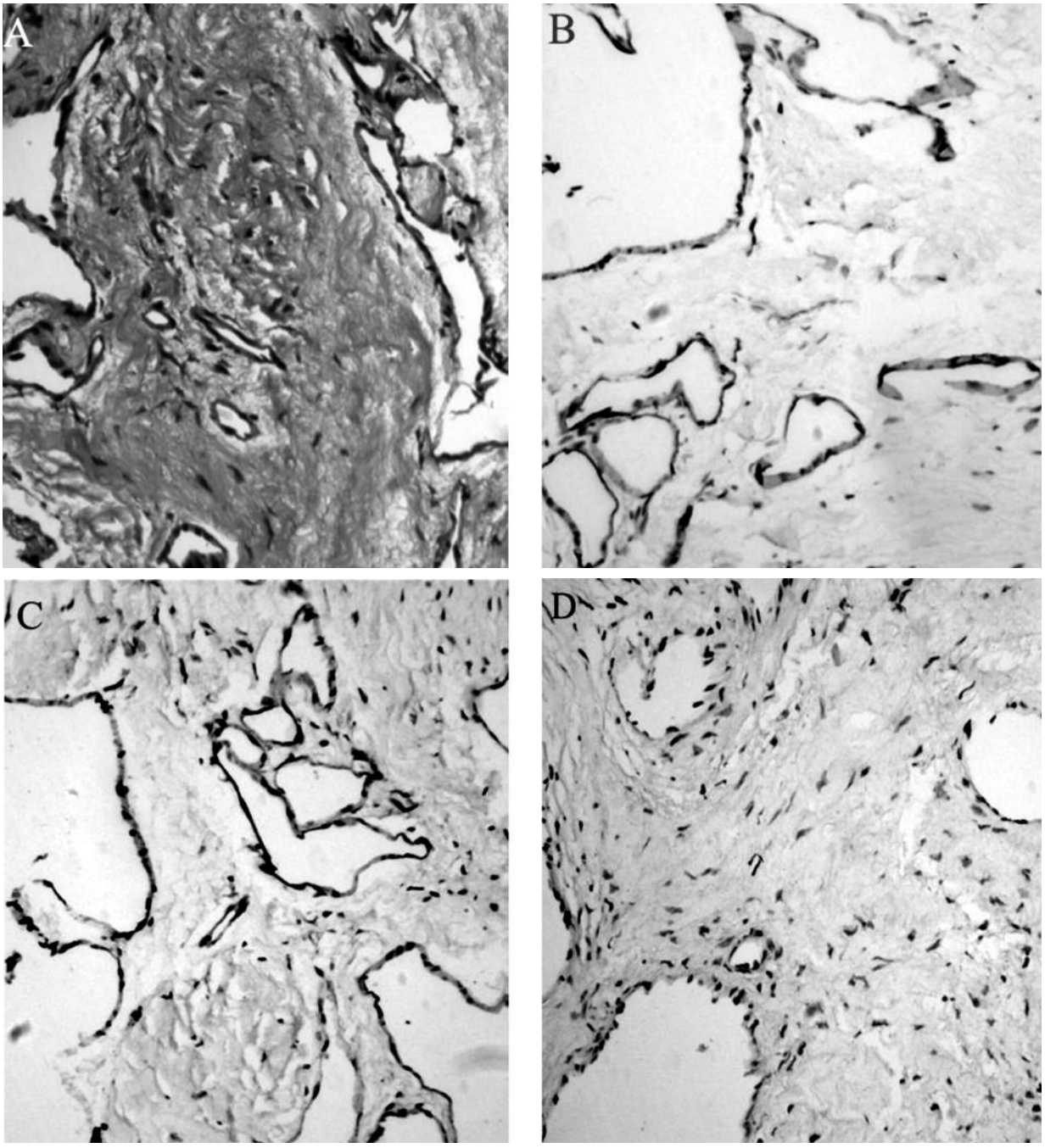

Figure 3. Histological (**3A**) and immunohistochemical (**3B, 3C, 3D**) findings (original magnification, × 200). (**3A**) shows convoluted, dilated vascular channels lined by a single flat layer of endothelial cells and separated by thick collagenous stroma containing fibroblasts. (**3B**) CD34 positive. (**3C**) CD31 positive. (**3D**) S-100 negative.

Clinically they mimic other more common lesions in this region and they are rarely diagnosed preoperatively using the currently available techniques. CT and MRI play an important role in accurately establishing the presence of a space-occupying lesion in the IAC, but there are no definitive criteria for diagnosing a cavernous angioma with certainty and for differentiating it from an acoustic or facial neuroma.

References

1. Sundaresan N, Eller T, Ciric I. Hemangiomas of the internal auditory canal. Surg Neurol 1976; 6: 119-121.

2. Lenarz M, Durisin M, Kamenetzki P, Becker H, Kreipe HH, Lenarz T. Cavernous hemangioma of the internal auditory canal. Eur Arch Otorhinolaryngol. 2007; 264:569-571.

3. Hanamitsu M, Okumura K, Yazawa Y, Fukui J, Suzuki M. Cavernous haemangioma of the internal auditory canal: a case report. J Clin Neurosci. 2004; 11:337-340.

4. Barrera JE, Jenkins H, Said S. Cavernous hemangioma of the internal auditory canal: a case report and review of the literature. Am J Otolaryngol. 2004; 25:199-203.

5. Pappas DG, Schneiderman TS, Brackmann DE, Simpson LC, Chandra-Sekar B, Sofferman RA.Cavernous hemangiomas of the internal auditory canal. Otolaryngol Head Neck Surg 1989; 101:27-32.

6. Lo WW, Shelton C, Waluch V, Solti-Bohman LG, Carberry JN, Brackmann DE, et al. Intratemporal vascular tumors: detection with CT and MR imaging. Radiology. 1989; 171:445-458.

7. Vaquero J, Salazar J, Martínez R, Martínez P, Bravo G. Cavernomas of the central nervous system: clinical syndromes, CT scan diagnosis, and prognosis after surgical treatment in 25 cases. Acta Neurochir (Wien). 1987; 85:29-33.

8. Karlsson B, Kihlstrom L, Lindquist C, Ericson K, Steiner L. Radiosurgery for cavernous malformations. J Neurosurg 1998; 88: 293-297.