

# Meningioma in the internal auditory canal

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## Abstract

A case is presented of an entirely intracanalicular meningioma in a 48-year-old woman that was excised via a conventional translabyrinthine approach to the internal auditory canal (IAC). Pre-operative magnetic resonance imaging (MRI) suggested that the tumour was a vestibular schwannoma (VS). Histological examination confirmed the intra-operative impression that the tumour was a meningioma. Although VS is by far the commonest intracanalicular tumour, the differential diagnosis includes meningioma. MRI is unable to distinguish between these two entities when the tumour is located entirely in the internal auditory canal.

**Key words:** Meningioma; Temporal Bone; Magnetic Resonance Imaging

## Case report

A 48-year-old female was referred from her local Department of Otolaryngology with a nine-month history of progressive left hearing loss, tinnitus and unsteadiness. Physical examination was unremarkable but audio-vestibular testing demonstrated a left sensorineural hearing loss averaging 70 dB in the low frequencies (250 Hz to 1000 Hz) and 40 dB in the high frequencies (two kHz to eight kHz) with zero speech discrimination and a normal caloric response. A MRI head scan revealed a 10 mm left

intracanalicular lesion (Figures 1 and 2). The diagnosis was consistent with VS in the left IAC.

After adopting an initial observational policy for six months, the patient opted for surgical excision of the tumour via a translabyrinthine approach. At surgery the tumour was found to be tightly packed within the IAC. It was more friable and vascular than usually seen with VS. A loop of the anterior-inferior cerebellar artery (AICA) extended halfway along the IAC. The tumour was dissected free from the AICA and the facial nerve, preserving them in continuity. In view of the unusual



FIG. 1

Axial T2-weighted MRI scan of the cerebellopontine angle showing an isointense mass filling the left internal auditory canal.



FIG. 2

Axial T2-weighted image with gadolinium-DTPA contrast (MRI). The same mass appears strongly enhanced after infusion of gadolinium.

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Accepted for publication: 16 July 2000.

appearance generous dural excision was performed before sending the specimen for histological examination. Post-operatively the patient had a grade V House/Brackman facial nerve palsy with electroneuronography showing a 3.3 per cent response at seven days.

The histological findings showed a meningothelial meningioma with typical whorled architecture and cytological features, and containing scattered psammoma bodies. The tumour nodule is adjacent to, but does not involve, a segment of myelinated nerve and a small ganglion. The tumour shows no evidence of mitotic activity or tumour necrosis, hence any adverse histological features.

## Discussion

Meningiomas are common tumours accounting for 17 per cent to 19 per cent of all intracranial tumours.<sup>1,2</sup> They are most common in females in their fifth decade of life. The incidence of meningioma in the cerebellopontine angle has been reported to be between three and 12 per cent of all intracranial tumours,<sup>3-5</sup> and from these a few tumours have been found spreading into the IAC.<sup>6-8</sup> Only five documented cases of entirely intracanalicular meningioma exist in the literature.<sup>9-13</sup> None of them were diagnosed pre-operatively because of the paucity of differentiating features between meningiomas and VS on MRI at this anatomical site.

Some authors postulate that there is a difference in signal on the T2-weighted image, where meningiomas appear hyperintense with respect to the pons, and VS are generally isointense.<sup>13,14</sup> Others found a higher T1 relaxation increment in VS (two fold) than meningiomas.<sup>15</sup> In another study from Japan, the signal enhancement in the vascular phase (filling of arteries and veins during the first passage of contrast media) after administration of gadolinium-DTPA was approximately four times higher in meningiomas than in neuromas,<sup>16</sup> although in a previous observation from the Department of Radiology of Wisconsin the contrast enhancement of the meningiomas was found to be less than that of VS (180 per cent vs 310 per cent).<sup>17</sup> However, the most reliable signs distinguishing between these two entities is firstly the eccentric position of the tumour mass in relation to the porus acusticus and the seventh and eighth cranial nerves that occurs in meningioma,<sup>14</sup> and secondly the angle between the posterior face of the temporal bone and the tumour is more than 90° in meningioma and less than 90° in the case of VS. This results from the flat base of the meningioma and the spherical shape of the VS. Both these characteristics are impossible to appreciate in an entirely intracanalicular meningioma, making it virtually indistinguishable from a VS. Even after reviewing this patient's imaging retrospectively it was impossible to distinguish it from a VS.

The recurrence rate for meningiomas after total excision varies from seven per cent (at five years) to 32 per cent (at 15 years).<sup>2</sup> Meticulous surgical technique is important to minimize the recurrence rate. Because of the difficulty in making a pre-operative diagnosis, the neurotological surgeon must be aware of the possibility that an intracanalicular tumour may be a meningioma and they may need to adjust the surgical technique accordingly.

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Mr P. Martinez Devesa takes responsibility for the integrity of the content of the paper.

Competing interests: None declared

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