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Giant vertebro-basilar aneurysm: an unusual cerebello-pontine angle lesion

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Abstract

Acoustic neuromas (vestibular schwannomas) comprise more than 90 per cent of all cerebello-pontine angle (CPA) lesions. We present a rare case of a giant vertebro-basilar aneurysm presenting as a CPA lesion. The general condition of the patient precluded the completion of the magnetic resonance (MR) sequences. The clinical and limited radiological results (T2 images alone, the features of which were not specific) initially did not lead to a specific diagnosis. To obtain further radiological information a computed tomography (CT) scan with contrast was performed and this revealed the lesion to be an aneurysm. The diagnostic difficulties and the treatment dilemmas of such a lesion are discussed. The importance of fine, axial, post-contrast CT arteriography with three-dimensional reconstruction, MR angiography and digital subtraction angiography are highlighted. The limitations of MR imaging in patients with CPA lesions are discussed.

Key words: Cerebello-pontine Angle; Neuroma, Acoustic; Intracranial Aneurysm; Tomography, Xray Computed; Magnetic Resonance Imaging

Introduction

The commonest tumour in the cerebello-pontine angle (CPA) is a schwannoma arising from the superior vestibular nerve. Less commonly encountered tumours include meningiomas, neuromas of other cranial nerves, cholesteatomas, dermoid cysts, lipomas, arachnoid cysts, metastases and vascular lesions. Infective and inflammatory lesions are very rare.[1–3]

We report a patient with a vertebro-basilar aneurysm (VBA) occurring in the CPA region. The peculiar diagnostic difficulties encountered in this case are highlighted. A review of literature is presented and the diagnostic and therapeutic aspects are discussed.

Case report

A 73-year-old woman with chronic obstructive pulmonary disease (COPD) was referred by her chest physician with a three-month history of progressive left-sided deafness, rotatory vertigo and imbalance. She had no other associated symptoms such as otalgia, otorrhoea, tinnitus, headaches, hoarseness or dysphagia. Examination revealed a frail, ataxic woman who had a very unstable gait. She was profoundly deaf on the left side but otoscopy revealed normal and intact tympanic membranes on both sides. The nose, throat and larynx were normal. No other cranial nerve deficit was noted.

Both computed tomography (CT) and magnetic resonance (MR) scans were arranged. The patient could not tolerate a supine position for long due to her COPD. However, T2-weighted axial MR images were obtained as well as a CT pre- and post-contrast. The scans revealed a large, left-sided, partially calcified, 4.5×3.5 cm CPA mass that showed areas of avid enhancement with contrast (Figures 1 & 2). The adjacent cerebellum and brainstem showed evidence of oedema and the fourth ventricle was deviated to the right but there was no ventricular enlargement. The lesion was initially thought to be a meningioma.

Neurosurgical opinion was sought and on reviewing the scan the diagnosis was revised. The CT showed avid enhancement of the area anteromedial to the thrombosed wall of the aneurysm in the CPA region. The partly calcified, thrombosed wall

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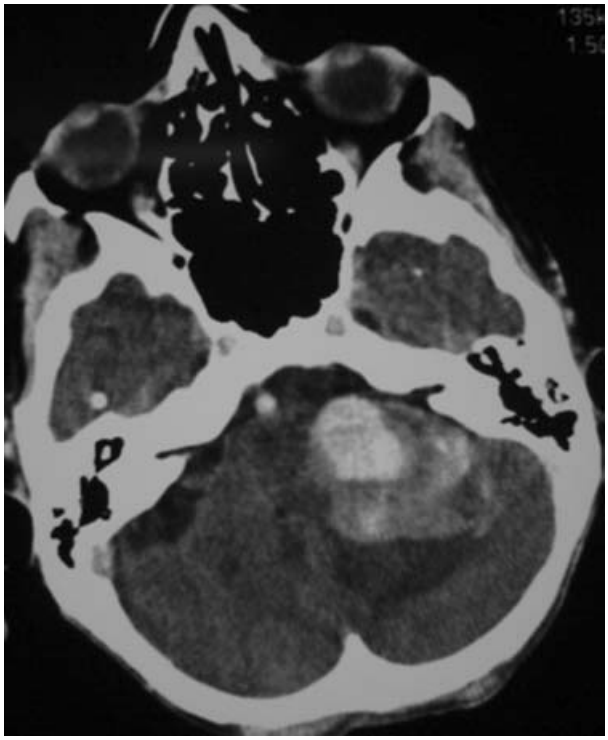

FIG. 1

Computed tomography scan displays the partly calcified, thrombosed wall of the aneurysm (posterolateral) and the patent lumen (anteromedial) showing avid enhancement on contrast injection.

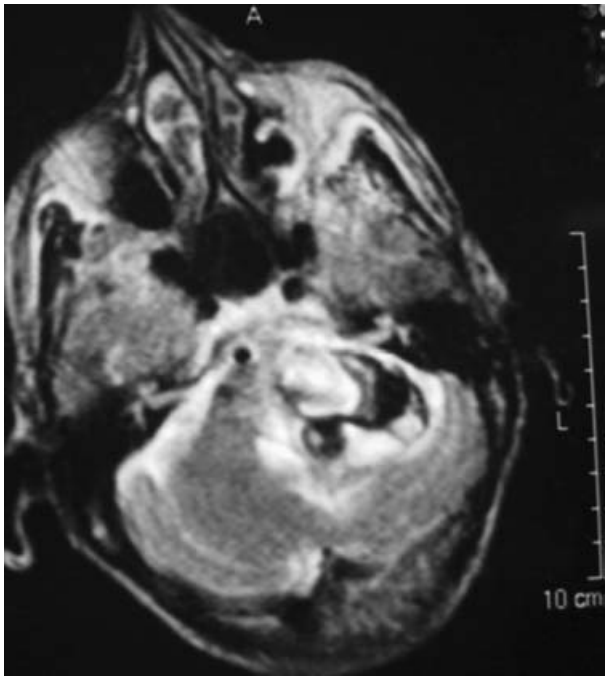

FIG. 2

Magnetic resonance scan, T2-weighted image, showing a 4.5 × 3.5 cm mass in the left cerebello-pontine angle. The posterolateral part of the mass has a layered appearance and represents the partly calcified thrombosed aneurysm. The anteromedial part is the patent lumen of the aneurysm. The adjacent cerebellum and brainstem show evidence of oedema.

of the aneurysm itself showed no significant enhancement in various sections. It was concluded that the features were in fact that of a giant vertebrobasilar aneurysm, with ectasia of the left vertebral system.

The patient's condition deteriorated a week later, when she developed left-sided facial weakness, dysarthria, frank cerebellar signs (dysdiadochokinesia, intention tremor, past-pointing and poor left limb co-ordination), grade-two nystagmus on left gaze and left hemiparesis.

Although endovascular obliteration under a general anaesthesia was the ideal management option had she been well enough, the patient's general medical condition precluded this.

Discussion

Vestibular schwannomas, meningiomas and congenital cholesteatomas comprise the majority of CPA lesions, but a wide variety of other pathologies can occur, including: infective lesions; granulomas and abscesses such as syphilitic gummas; foreign body granulomas (of retained foreign matter, e.g. cotton wool and bone wax); and suppuration extending from the middle-ear cleft.[4–6] Fungal infections occur in immunocompromized hosts, although occasionally this has been reported in immunocompetent individuals too.[7] Table I shows the various incidences of non-infective and non-vestibular schwannoma lesions in a total of nearly 2000 cases, in three large series.[1–3]

Diagnosis of these rare lesions by clinical presentation alone may be extremely difficult. Magnetic resonance with gadolinium enhancement is helpful in differentiating most non-infective and non-vestibular schwannoma lesions, such as meningioma, cholesteatoma, neuromas of other cranial nerves and arachnoid cysts (which account for 60 per cent of non-vestibular schwannoma lesions). Most of the remaining (rarer) group of CPA lesions may lack specific features (with certain exceptions such as lipomas and haemangiomas) and now and again may surprise the unwary. Many patients are elderly

TABLE I

NON-INFECTIVE AND NON-VESTIBULAR SCHWANNOMA LESIONS OF THE CPA[1–3]

Lesion	Incidence
Meningioma	3–6%
Cholesteatoma	2–5%
Other schwannomas	1–3%
Arachnoid cyst	0.5%
Haemangioma	0.5%
Metastatic tumour	0.5%
Lipoma	0.2–1%
Dermoid	0.25%
Others*	0.2–2%

*Includes ependymoma, lymphoma, pontine glioma, angioleiomyoma, cholesterol cyst and choroid plexus papilloma. Note that vascular aneurysms in the cerebello-pontine angle are extremely rare lesions and have not been noted in the above reports. CPA = cerebello-pontine angle

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and frail, and may not be able to tolerate the procedures for MR or CT scanning.

Intracranial aneurysms are estimated to occur in about 0.2–9.9 per cent of the population.[8–10] The incidence of vertebro-basilar aneurysms ranges from 5–10 per cent of all aneurysms.[11,12] Hamby classified vertebro-basilar aneurysms into three types that give information on the clinical course and presentation: large, tortuous, dilated, S-shaped, atherosclerotic, saccular aneurysms; large, spherical aneurysms; and small, saccular aneurysms with subarachnoid haemorrhage.[13]

Aneurysms have also been classified according to their size: small (<12.5 mm), large (12.5–25 mm) and giant (>2.5 cm).[14] Unruptured intracranial aneurysms usually present with symptoms of raised intracranial pressure, such as headaches, nausea, vomiting and blurring of vision, or with cranial nerve deficits, embolic ischaemia and mass effects.[9] Otological symptoms are extremely rare and include pulsatile tinnitus, vertigo, and progressive and sudden sensorineural hearing loss. The optimum management strategy is determined by comparing the risk-to-benefit ratio of surgical clipping with that of embolization of the aneurysm by a Guglielmi detachable coil. Many recent studies[8–10,15–17] favour intervention, once the size criteria are fulfilled. Our patient's general condition, however, prevented any form of intervention.

This case highlights the diagnostic difficulties presented by this type of lesion. Such aneurysms are easily mistaken for solid tumours,[18] and close interaction between the otolaryngologist, radiologist and neurosurgeon is essential. In cases of doubt, vascular imaging techniques such as digital subtraction angiography will facilitate an accurate diagnosis and ensure a correct management plan before further intervention. Alternatively, fine, axial, post-contrast CT arteriography with three-dimensional reconstruction or MR angiography is an equally effective and less interventional method of confirming the diagnosis.

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