Case 10724

Posterior fossa meningioma as a cause of obstructive hydrocephalus
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Section: Neuroradiology
Area of Interest: Neuroradiology brain
Procedure: Diagnostic procedure
Imaging Technique: CT
Special Focus: Calcifications / Calculi Neoplasia
Obstruction / Occlusion Case Type: Clinical Cases
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Patient: 50 years, male

Clinical History:

A 50-year-old male patient was brought to the emergency department with history of loss of consciousness for the past 2 hours. He had been complaining of worsening headache and giddiness for the past 10 days. He was referred for a CT scan of the brain to rule out a cerebrovascular accident.

Imaging Findings:

A well-defined homogeneously enhancing extra-axial space occupying lesion with dense nodular calcification is seen in the posterior cranial fossa. Anteroinferiorly the lesion causes erosion of the clivus on the left side and abuts the left petroclival junction region. Superiorly the lesion extends into the left cerebellopontine angle region. The mass is located predominantly medial to the plane of the trigeminal nerve. No definite extension into the internal auditory canal is seen.

The lesion causes significant mass effect on the left middle cerebellar peduncle, medulla and the inferior aspect of the fourth ventricle, displacing the medulla to the right side and causing near total effacement of the inferior aspect of the fourth ventricle. Significant dilatation of bilateral lateral ventricles, third ventricle and the superior aspect of fourth ventricle is seen with bilateral symmetrical periventricular hypodensity suggestive of transependymal CSF leakage.

Discussion:

Meningiomas are usually benign slow growing neoplasms arising from the arachnoid cap cells of the arachnoid villi [1]. They constitute about 20% of all intracranial neoplasms of which about 14.5% are located in the posterior cranial fossa [2]. Within the posterior fossa these tumours are classified as cerebellar convexity/lateral tentorial, cerebellopontine angle, jugular foramen, petroclival, foramen magnum and unclassified types [3]. It is however regarded better to consider posterior fossa meningiomas (PFM) as a continuum because many tumours traverse both petroclival and CPA regions and extend out of these regions [4].

When dealing with a well-defined mass lesion in the CPA region of the posterior fossa the primary diagnostic considerations are schwannoma and meningioma. From a neurosurgical point of view preoperative differentiation is essential for technical reasons. On CT, meningiomas are classically described to be hyperdense relative to the brain on unenhanced images. Intense contrast enhancement, internal calcification and lack of extension into the internal auditory canal (IAC) are features in favour of a meningioma, all of which were demonstrated in our case [1]. Even in cases where meningiomas extend into the IAC, widening of the canal is rare [5]. Meningiomas also commonly cause
hyperostosis or erosion of adjacent bones. MRI also demonstrates most of the characteristic features of a meningioma in addition to providing additional details about the relation of the tumour to adjacent cranial nerves and vessels. Calcification and adjacent bony changes are, however, better depicted on CT. MRI was not done in our case for financial reasons.

Our case showed an area of bony erosion in the clivus on the left side close to the left petroclival junction suggesting possible tumour origin from this region. Predominant location of the mass medial to the plane of the trigeminal nerve also favoured the diagnosis of a petroclival meningioma extending into the CPA region.

Obstructive hydrocephalus is a relatively common presenting finding and was seen in 28 out of 64 cases in one study [2]. The degree of ventricular dilatation does not always correlate with patient symptoms as was seen in our case with the patient presenting unconscious for relatively moderate ventriculomegaly. Features of transependymal CSF leakage are however suggestive of high grade obstruction.

Microsurgical excision is the treatment of choice for meningiomas. A lateral suboccipital retrosigmoid approach is preferred for PFM [2, 4]. Our patient underwent external ventricular drainage, following which his condition improved. Surgical excision of the tumour was performed at a later date. Histopathology revealed the mass to be a meningothelial meningioma.

**Differential Diagnosis List:** Left petroclival meningioma causing obstructive hydrocephalus, Cerebellopontine angle meningioma, Vestibular schwannoma

**Final Diagnosis:** Left petroclival meningioma causing obstructive hydrocephalus.

**References:**


Description: Axial precontrast CT image showing dense nodular calcification in the lower posterior cranial fossa on the left side indenting the medulla and left cerebellar hemisphere. Origin: Ramnad MRI and CT Scans, Ramnad, India.
Description: Part of a well-defined enhancing lesion is visible adjacent to the medulla on the left side indenting and minimally displacing the medulla to the right side. Mild image degradation is seen due to motion blurring. Origin: Ramnad MRI and CT Scans, Ramnad, India.
**Description:** A well defined extra-axial mass lesion showing significant contrast enhancement and calcification is seen abutting the left petroclival junction laterally and indenting the medulla medially. Posteriorly the lesion abuts the left cerebellar hemisphere. **Origin:** Ramnad MRI and CT Scans, Ramnad, India.
Description: A well defined enhancing calcified extra-axial mass lesion adjacent to the left petrous bone indenting and displacing the medulla to the right side. Origin: Ramnad MRI and CT Scans, Ramnad, India.
**Description:** The enhancing mass lesion is seen extending into left CP angle region with no definite extension into the internal auditory canal. Significant effacement of the inferior aspect of the fourth ventricle is seen. **Origin:** Ramnad MRI and CT Scans, Ramnad, India.
Description: The superior aspect of the enhancing mass lesion is seen indenting the left middle cerebellar peduncle and causing effacement of the inferior aspect of the fourth ventricle due to mass effect. Origin: Ramnad MRI and CT Scans, Ramnad, India.
Description: Axial image above the level of the posterior fossa mass lesion shows prominence of the superior aspect of the fourth ventricle which appears mildly displaced to the right side. Origin: Ramnad MRI and CT Scans, Ramnad, India.
Description: Moderate dilatation of the third ventricle is seen with prominence of the atria of bilateral lateral ventricles. Origin: Ramnad MRI and CT Scans, Ramnad, India.
Description: Moderate dilatation of the third ventricle and bilateral lateral ventricles is seen. Bilateral symmetrical periventricular hypodensity is also seen, suggestive of transependymal CSF leakage.

Origin: Ramnad MRI and CT Scans, Ramnad, India.
Description: Moderate dilatation of bilateral lateral ventricles is seen with bilateral symmetrical periventricular hypodensity, suggestive of transependymal CSF leakage. Origin: Ramnad MRI and CT Scans, Ramnad, India.
Description: Bony erosion of the clivus is seen on the left side close to the left petroclival junction (white arrow). Calcification is seen within the mass adjacent to the region of erosion. Origin: Ramnad MRI and CT Scans, Ramnad, India.
Description: The calcified lesion is seen abutting the anterior aspect of the left petrous bone. No definite hyperostosis or bony erosion is seen in this region. Origin: Ramnad MRI and CT Scans, Ramnad, India.
**Description:** No definite widening of the left internal auditory canal is seen. Calcification in the mass lesion is also located outside the internal auditory canal. **Origin:** Ramnad MRI and CT Scans, Ramnad, India.