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What are the contents of the cerebellopontine (CP) angle cistern?

- Cranial nerves 7 and 8
- 4th ventricle foramen of Luschka
- Anterior inferior cerebellar artery
- Flocculus of the cerebellum

This CP angle cistern is filled with CSF and is positioned between the anterior cerebellum and the lateral pons, hence "cerebellopontine" angle.

What is the most common cerebellopontine angle mass?

Vestibular schwannomas (aka acoustic neuroma) are the most common cerebellopontine angle masses, accounting for over 75% of CP angle masses.

What is the second most common cerebellopontine angle mass?

A meningioma is likely the second most common CP angle mass.

Note that additional CP angle masses, several of which will be discussed in this episode, include epidermoid and arachnoid cysts, schwannomas of the trigeminal or facial nerve, ependymomas and various metastases to include melanoma, breast and lung cancer metastases, and the two entities that are in most differential diagnoses for masses: lymphoma and sarcoid.

A few mnemonics exist for CP angle masses. My favorite is probably AMEN, not because it is religious in any way, but because it lists, in order, the four most common CP angle masses:

A: Acoustic neuroma (aka vestibular schwannoma)

M: Meningioma

E: Ependymoma

N: neuroepithelial cyst such as epidermoid and arachnoid cysts

The most complete mnemonic in terms of listing the most entities is likely ANGLES:

A: Acoustic neuroma, aneurysm, arachnoid cyst

N: (almost M--lame, I know)--meningioma and metastatic disease

G: Glioma

L: Lymphoma

E: Epidermoid cyst and ependymoma

S: Schwannoma

If you are shown a case with bilateral vestibular schwannomas, what underlying condition should you recognize for board exams?

Neurofibromatosis type 2. Bilateral vestibular schwannomas are a characteristic feature of NF2, especially on radiology board exams.

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What are classic features of a vestibular schwannoma on imaging?

Solid enhancing mass with intracanalicular extension that causes widening of the porus acusticus (the medial opening of the internal acoustic canal). This is a key feature one can use to help differentiate between a vestibular schwannoma and a meningioma. A meningioma does not classically extend into the internal acoustic meatus, whereas a vestibular schwannoma classically does do this and cause the characteristic porus acusticus widening. A meningioma, on the other hand, is more likely to cause hyperostosis of the adjacent bone in comparison to a vestibular schwannoma.

If you are shown a cerebellopontine angle mass that demonstrates CSF density what are the top 2 differential considerations for board exams?

Epidermoid cyst and arachnoid cyst.

What are some imaging features that can help differentiate between an epidermoid cyst and an arachnoid cyst?

The key sequences on MRI to distinguish between an epidermoid cyst and an arachnoid cyst are DWI and ADC. An epidermoid cyst will show restricted diffusion and be very bright on DWI sequences and similar to brain parenchyma on ADC sequences. Arachnoid cysts will not show this hyperintensity on DWI.

Other MRI sequences may show similar imaging characteristics between an epidermoid and an arachnoid cyst. As previously stated, both epidermoid and arachnoid cysts can demonstrate CSF density on CT.

Epidermoid cysts are stated to be the third most common CP angle mass, and about half of all epidermoid cysts will be in the CP angle.

If you see a cerebellopontine angle mass on CT that shows internal fat density, what is the leading consideration for radiology board exams?

A CP angle dermoid cyst. These are partial fat density masses that may show peripheral enhancement and calcifications. A classic imaging appearance you should be familiar with for radiology board exams is the ruptured intracranial dermoid cyst wherein you see scattered fat density material that can be scattered throughout subarachnoid spaces included between sulci and within the intraventricular fluid. This can sometimes cause a chemical meningitis (sometimes symptomatic) that could manifest on imaging with pial enhancement along the surface of the brain.

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What are some imaging features that can help distinguish a cerebellopontine angle lipoma from a dermoid cyst?

An intracranial dermoid cyst may not follow fat density on all sequences on MRI, but signal characteristics can vary. On the other hand, a pure fat containing intracranial mass on MRI that follows fat density on all sequences could be more suggestive of an intracranial lipoma. A T1 hyperintense mass that fully saturates with fat suppression is more likely to be a lipoma versus a dermoid cyst. A CP angle lipoma also often surrounds cranial nerves 7 and 8.

What is a vascular anomaly that can present as a cerebellopontine angle mass?

The answer I am looking for is a thrombosed berry aneurysm. Note that a thrombosed aneurysm, can appear as a solid mass with only mild peripheral or internal enhancement and is in the differential diagnosis of CP angle masses. A calcified rim on CT and hemosiderin signal on MRI is common.

Besides a vestibular schwannoma, what are two additional schwannoma's that can occur in the CP angle?

Trigeminal schwannomas and Facial nerve schwannomas can also be in the CP angle, although by far the most common CP angle mass, whether schwannoma or otherwise, is a vestibular schwannoma.