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Case 7391
Intraventricular Lesion

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Section: Neuroradiology
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Patient: 37 year(s), male

Clinical History

Progressive nonspecific symptoms

Imaging Findings

37 year old man presented with progressive clinical complaints of headaches, dizziness, gait disturbance for some months. Memory loss was also refered.
On examination, psychomotor slowing was admitted. Otherwise, neurological examination was normal.
Neuroimaging studies were done (brain CT and MR) and showed a huge intra-ventricular (right lateral ventricle) mass.

Discussion

The discovery and evaluation of an intraventricular mass poses the challenge of correct diagnosis. They are rare and have many overlapping imaging features. Although imaging studies may suggest the diagnosis of a particular tumor, all of these tumors may present with varied imaging patterns, none of which is truly pathognomonic. Demographic (age, gender), clinical and imaging findings as well as consideration of the intraventicular location and the tissue within and composing the ventricular lining, helps to limit the differential diagnosis when analyzing an intraventricular mass on imaging studies.
Neoplasms in the lateral ventricles (LV) frequently obstruct the ventricles, producing hydrocephalus

and its associated symptoms. Patients may be asymptomatic or may present with varied nonspecific symptoms.
The differential diagnosis in adults is glioma (astrocytoma, subependymoma, giant cell astrocytoma), meningioma, ependymoma, choroid plexus papilloma, metastasis, and neurocysticercosis; in children, the differential diagnosis is choroid plexus papilloma, ependymoma, PNET, teratoma and astrocytoma.
Ependymomas are more common in children and in the fourth ventricle, are typically calcified and show intense enhancement.
Subependymomas and central neurocytomas have an affinity for the anterior portion of the LV.
Subependymomas are more common in older adults (males), usually don't enhance after contrast.
Central neurocytomas are more common before 40 years of age.
Subependymal giant cell astrocytomas always lie near the foramen of Monro
and are characterized by frequent calcification, usually have intense enhancement
and are typically associated with other stigmata seen in Tuberous Sclerosis.
When a mass is centered on the choroid plexus, a highly vascular tumor (either choroid plexus papilloma, choroid plexus carcinoma, meningioma, or metastasis) should be considered. The heavily lobulated appearance of a choroid plexus tumor favors this diagnosis, although it is not always possible to distinguish between the more common benign form (papilloma) and the less common malignant (carcinoma).
In adults, atrial meningiomas are among the most common tumors seen in the lateral ventricles (most cases in the left LV of middle-aged or older women). The low signal intensity on T2-WI is one of the key features of the diagnosis.
The atrium of the LV is also a known site for the metastatic spread of renal cell carcinoma, lung carcinoma, melanoma, gastric carcinoma, colon carcinoma, and
lymphoma. On MR, metastatic disease may occasionally mimic the signal characteristics of an intraventricular meningioma.
Cysticercosis may also manifest as an intraventricular mass/cyst, hyperintense compared to CSF on T1WI and similar high signal of CSF on T2WI.

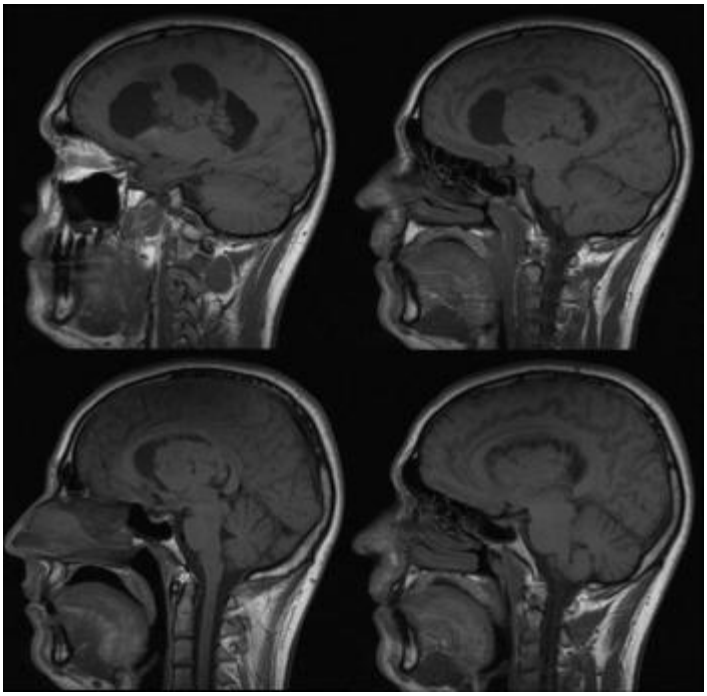
Central neurocytomas (CN) are uncommon tumors of the CNS. Usually, they affect lateral ventricles of young adults and display characteristic neuroimaging and histomorphologic findings. Neurocytomas often mimic oligodendrogliomas. Owing to this rare incidence, the management of this neoplasm remain controversial. Typically, CN are associated with a favorable outcome although some cases have more aggressive clinical course with recurrences. Maximal resection is considered the ideal therapeutic option, with best long-term prognosis (local control and survival). The role of adjuvant radiotherapy apparently seems to benefit patients with incomplete resection and in atypical neurocytoma.

Final Diagnosis

Central neurocytoma

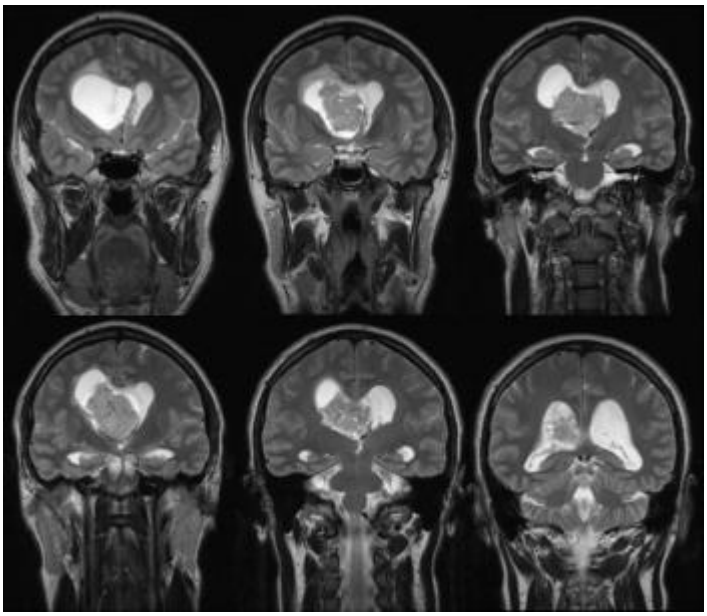
Figures

Figure 1 MRI - sagittal T1WI



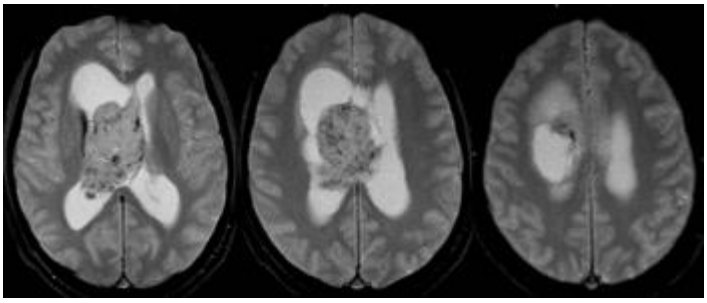
It shows a huge well-circunscribed intraventricular mass in the body of right lateral ventricle, mainly isointense to gray matter, with small areas of low signal intensity. Note - the isosignal intense of the mass to gray matter is typicall and important in differncial diagnosis of intraventricualr tumors.

Figure 2 MRI - coronal T2WI



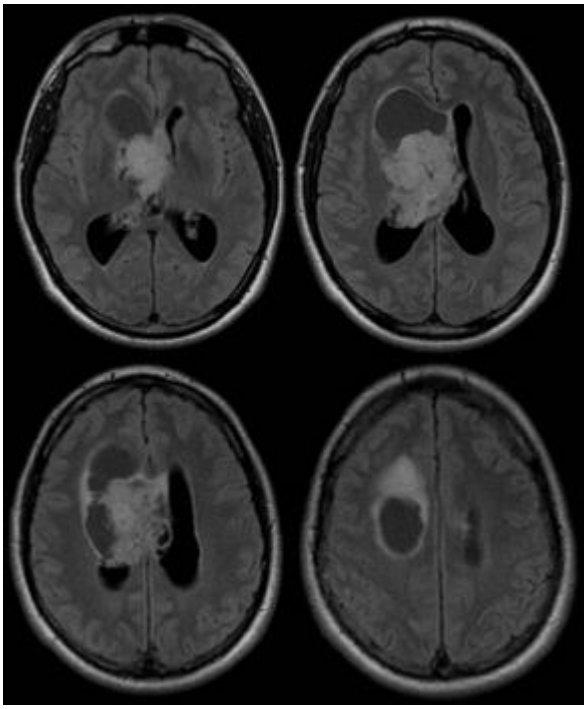
It shows a huge circunscribed, lobular "bubbly" mass attached to the septum pelucidum. The heterogeneous intraventricular mass is associated with ventricular dilatation (related to foramen of Monro obstruction). Extension across midline is present but less typical of central neurocytoma.

Figure 3 MRI - axial T2*



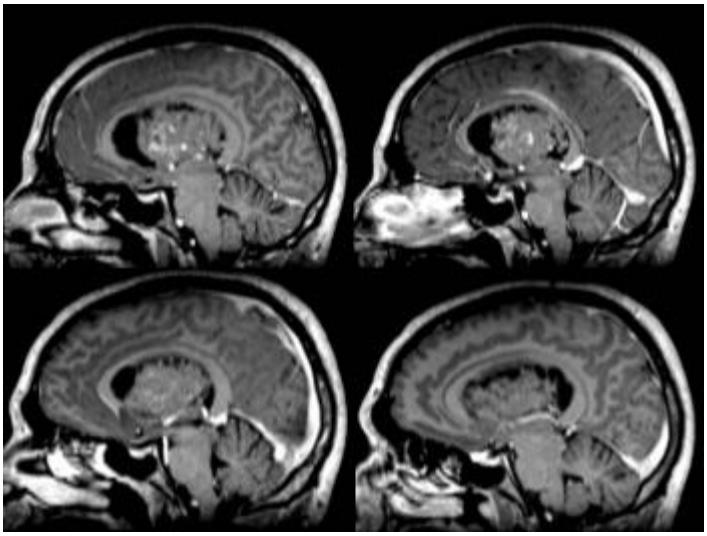
The mass just refered has heterogeneous signal intensity and small hypointense foci due to calcification (areas of "blooming"). Calcification is common in Central Neurocytoma (50-70%). Hemorrage is rare in these tumors.

Figure 4 MRI - axial FLAIR



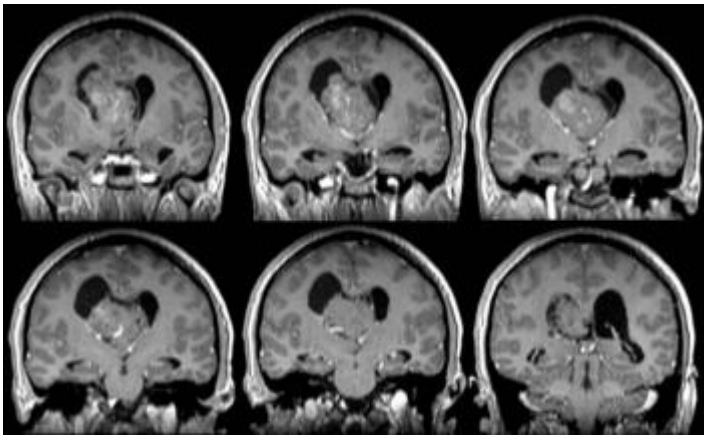
Heterogeneous, predominantly hyperintense mass. Some flow-voids can be seen in the large mass.

Figure 5 MRI - sagittal T1 postgadolinium



Intraventricular mass shows moderate to strong enhancement, typically heterogeneous.

Figure 6 MRI - coronal T1WI postgadolinium



Moderate to strong heterogeneous enhancement of intraventricular mass. Hypointense (nonenhancing) foci are due to small calcifications and possible small cysts.

Figure 7 MRI - axial T1 postgadolinium

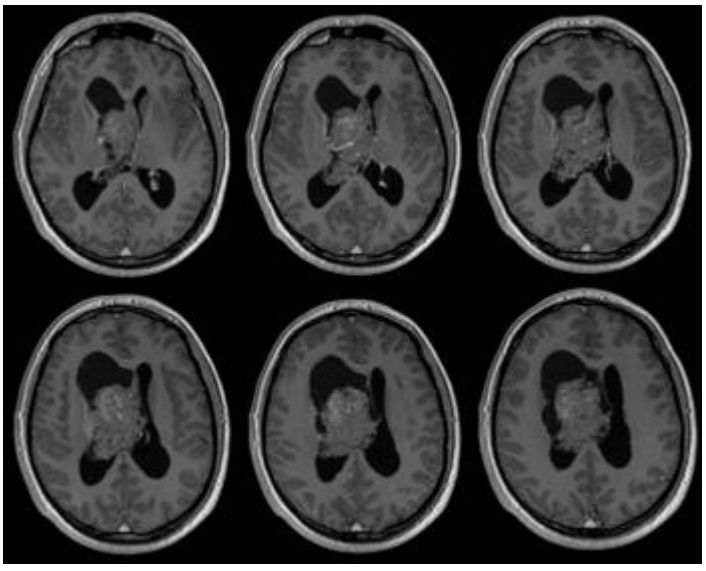


Figure 8 Intraventricular Tumors - Differential Diagnosis

Tumor type	Typical location	Intensity characteristics on T2-weighted images	Contrast enhancement
Central neurocytoma	Lateral (attached to septum pellucidum)	Isointense to gray matter	Usually dense
Ependymoma	Fourth, lateral	Heterogeneous	Heterogeneous
Subependymoma	Lateral, fourth	Hyperintense to gray matter	None
Oligodendroglioma	Lateral	Heterogeneous	
Pilocytic astrocytoma	Lateral, third, or fourth	Hyperintense to gray matter	Variable; irregular
Meningioma	Lateral (atrium)	Isointense to gray matter	Dense
Choroid plexus tumor	Lateral (atrium) or third in children, fourth in adults	Heterogeneous	Dense
Epidermoid	Any ventricle	Slightly hyperintense to CSF	None
Subependymal giant cell astrocytoma	Lateral	Hyperintense to gray matter	Generally enhance
Colloid cyst	Third	Hyperintense to gray matter	Limited enhancement at periphery
Arachnoid cyst	Any ventricle	Isointense to CSF	None

MeSH

Cerebral Ventricle Neoplasms [C04.588.614.250.195.205]
Neoplasms located in the brain ventricles, including the two lateral, the third, and the fourth ventricle. Ventricular tumors may be primary (e.g., CHOROID PLEXUS NEOPLASMS and GLIOMA, SUBEPENDYMAL), metastasize from distant organs, or occur as extensions of locally invasive tumors from adjacent brain structures.

References

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