Texas Society of Neuroradiology (TSNR)
Excerpta Abstract
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Intraventricular Cavernous Malformation: A Rare Entity in an Unusual Location

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Clinical History

A 51-year-old male presented to the Emergency Department with persistent occipital headaches for one month, accompanied by neck stiffness, low-grade fever, and night sweats. He denied focal neurological deficits, visual symptoms, or recent travel. Past medical history included hypertension, alcohol abuse with withdrawal seizures, and esophageal ulcer. He was initially treated for presumed migraine (sumatriptan), and a 10-day course of amoxicillin yielded no improvement.

Non-contrast CT and MRI revealed an intraventricular mass suspicious for neoplasm. Stereotactic biopsy demonstrated organizing hematoma with reactive changes; special stains excluded neoplasm and infection, consistent with cavernous malformation. The patient underwent surgical resection. Postoperative recovery was uneventful, with no recurrence or new neurological deficits.

Imaging Findings

CT demonstrated a lobulated, heterogeneous hyperdense lesion within the frontal horn of the left lateral ventricle, attached to the septum pellucidum, without calcifications or enhancement on angiographic CT.

MRI (Stealth protocol) revealed a well-defined, irregular intraventricular mass in the frontal horn of left lateral ventricle, with associated minimal T2/FLAIR hyperintensity in the genu of the corpus callosum, septum pellucidum and left frontal periventricular white matter suggestive of minimal perilesional edema related to recent intralesional hemorrhage. The lesion appeared isointense on T1W with peripheral hyperintense areas, heterogeneously hyperintense on T2W with a thin hypointense rim, and showed prominent blooming artifacts on SWI sequence, related with internal hemosiderin deposition. Contrast-enhanced images showed minimal heterogeneous enhancement, and there was restricted diffusion within the lesion corresponded to evolving recent hemorrhage. No hydrocephalus or midline shift was identified.

Discussion

Cerebral cavernous malformations (CCMs) are low-flow vascular malformations composed of dilated sinusoidal channels without intervening neural tissue. They represent 10–15% of central nervous system (CNS) vascular malformations, with intraventricular cavernomas accounting for only 2.5–10.8% of cases. The lateral ventricles are most frequently affected, followed by the third and fourth ventricles.

The absence of adjacent brain parenchyma allows these lesions to grow larger than parenchymal CCMs, and recurrent microhemorrhage contributes to enlargement. Symptoms typically arise from mass effect, hemorrhage, or hydrocephalus.

MRI is the diagnostic modality of choice, showing a characteristic “popcorn-like” appearance with mixed signal intensities and a hypointense rim on T2W and GRE/SW sequences, with prominent blooming artifact due to hemosiderin deposition. Minimal enhancement and lack of significant edema help differentiate CCMs from neoplastic lesions. The differential diagnosis includes central neurocytoma, ependymoma, or hemorrhagic metastasis.

Histologically, cavernous malformations consist of thin-walled vascular channels lined by endothelium with insignificant intervening parenchyma. Complete surgical excision is recommended for symptomatic or enlarging intraventricular CCMs, while conservative management may be considered in asymptomatic lesions.

Teaching Point

Intraventricular CCMs are rare vascular lesions that can mimic intraventricular tumors on imaging. Recognizing their characteristic MRI features can prevent misdiagnosis and unnecessary biopsy. Although rare, cavernous malformation should be included in the diagnosis of intraventricular masses due to their high risk of intraventricular hemorrhage.

References

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Figures