Case Report

Differential Diagnosis in a Third Ventricular Mass: Vascular or Tumoral Lesion?

Aycicek CECEN¹, Erhan CELIKOGLU², Merih IS², Dilek YAVUZER³, Ali Fatih RAMAZANOGLU²

¹Dr. Lutfi Kirdar Kartal Training and Research Hospital, Department of Neurosurgery, Istanbul, Türkiye ²Fatih Sultan Mehmet Training and Research Hospital, Department of Neurosurgery, Istanbul, Türkiye ³Dr. Lutfi Kirdar Kartal Training and Research Hospital, Department of Pathology, Istanbul, Türkiye

Summary

The third ventricle is the rare mainstay of a mass lesion. There are a variety of vascular or tumoral lesions located in the third ventricle. Colloid cyst is one of the most frequently encountered tumoral lesions in the third ventricle, in the clinical practice. A 65-year-old man was admitted to our outpatient clinic suffering from headache and dizziness which progressed in the last 10 days. On radiological examination, (computerized tomography and Magnetic Resonance Imaging scans) showed a well-circumscribed lesion located in the third ventricle causing hydrocephalus. However, radiologic appearance of the lesion did not allow exact differentiation between typical vascular or tumoral lesion. Additionally, cerebral Digital Subtraction Angiography (DSA) was performed and was normal. Surgical intervention was successfully performed via interhemispheric transcallosal transventricular route. Pathological examination revealed a colloid cyst. The adequate preoperative radiologic imaging studies are essential to avoid unexpected bewilderment during surgery.

Key words: Colloid cyst, intraventricular aneurysm, third ventricle

Bir III. Ventrikül Kitlesinde Ayırıcı Tanı: Vasküler ya da Tümöral Lezyon?

Özet


Anahtar Kelimeler: İntraventricüller anevrizma, kolloid kist, 3.ventrikül
INTRODUCTION

Colloid cysts are rarely seen intracranial lesions, which are usually localized at the anterosuperior roof of the third ventricle. They are slowly growing benign pathologies. The incidence is reported to be 3 per 1,000,000 (1). Among all intracranial tumors they constitute 0.2%-2%, and considering only intraventricular tumors they form 15%-20% (3,5).

In the present report, we describe a patient with a colloid cyst which mimicked a basilar artery aneurysm because radiological features imitated a thrombosed aneurysm with a dome extending into the third ventricle.

CASE PRESENTATION

This previously healthy 65-year-old man was admitted to our outpatient clinic because of headache and dizziness of 6 months duration, which became severe for 10 days. He had no history of any disease or trauma before admission. His neurological examination was normal. A computerized tomography (CT) showed a spontaneous hyperdense lesion sized 19x21mm located in the third ventricle extending into the interpeduncular cistern with a prominent enlargement in the third and lateral ventricles causing hydrocephalus which was reported to be a peripherally thrombosed giant aneurysm of the basilar artery radiologically (Fig 1A).

On MRI, the same nodular lesion at the anterior part of third ventricle, which is 19x21 mm at its widest diameter showing hyperintense on T1-weighted images (T1WI), and centrally hypointense and peripherally hyperintense on T2-weighted images (T2WI). The third ventricular and lateral compartments are significantly enlarged, there is no contrast enhancement (Fig 1B,C,D).

Because of the atypical radiological features and localization of a ventricular mass, we were convinced to perform further radiological evaluation, and the gold standard—that is, selective cerebral angiography—was the preferred modality to rule out any vascular abnormality. Digital subtraction angiography performed completely normal images (Fig 1E,F). After detecting no vascular lesion preoperatively, the surgical planning was arranged according to an intraventricular mass in the third ventricle.

With the patient under general anesthesia, the mass was approached by interhemispheric transcallosal transventricular route. Complete tumor removal was achieved (Fig 2A,B,C). After the operation the recovery was uneventful. The patient had no neurological deficit and was discharged home on the 5th day postoperatively. Pathological examination revealed a colloid cyst (Fig 2D).
Figure 1: Preoperative imaging studies
A-Axial non-contrast CT (NCCT) demonstrating a round spontaneous hyperdense mass (19x21mm.) at the foramen of Monro with associated dilatation of the temporal horns of the lateral ventricles
B-Coronal, FLAIR MRI showing CSF flow void in the lateral ventricles and round centrally hypointense, peripherally hyperintense lesion, with marked hydrocephalus
C- Sagittal, T1-weighted MRI shows hyperintense lesion at the foramen of Monro
D-Gadolinium-enhanced T1WI showing no contrast enhancement
E-Normal cerebral DSA, AP view
F-Normal cerebral DSA, lateral view

Figure 2: Postoperative imaging studies
A- Axial CT after contrast administration (CCT) demonstrating total excision of the third ventricular mass
B-Sagittal T1-weighted MRI showing empty foramen of Monro
C-Axial T2-weighted MRI showing marked ventricular enlargement
D-Histopathologic examination reveals pseudostratified epithelium and amorphous proteinaceous material consistent with colloid cyst (H&E x200)
DISCUSSION

The lesions of the third ventricle, including the tumoral or vascular masses, can be challenging according to the radiological appearances on CT and MRI findings.

Colloid cysts are known as rare mass lesions of the third ventricle. They are hyperdense lesions settling at the foramen of Monro. Although most of them are localized in the third ventricle, they rarely occupy septum pellucidum, the lateral ventricle, the fourth ventricle, or out of the ventricular system(2,4,10).

Their size may vary from few mm to 3 cm. They are well-demarcated round/ovoid/lobulated masses(12).

Though on non-enhancing CT imaging colloid cysts usually appear as hyperdense lesions related to their hydration content; they can also be iso/hypodense in 1/3 of the cases(12).

MRI findings depend on cholesterol, protein, calcium, hemosiderin and water content of the cyst(1,7,13,16). On T1-weighted images, they are usually hyperintense (2/3) and isointense in less cases. T2-weighted images can be variable according to water content, most of them are isointense. The mixed hyper/hypo images can be seen 25% of the cases; (‘black-hole’ effect). Fluid-fluid level can also be demonstrated. On T1-weighted images after contrast administration there is usually no contrast enhancement, rarely peripheral rim enhancement can be demonstrated.

On differential diagnosis of colloid cyst of the third ventricle; vertebrobasilar dolicoectasia and aneurysm, cavernous angiomas, cerebrospinal fluid (CSF) flow artifact, neurocysticercosis, neoplasms including glioblastoma, subependymoma, craniopharyngioma, pituitary adenoma, meningioma, metastasis, choroid plexus masses (choroid plexus papilloma/carcinoma, xanthogranuloma, choroid plexus cyst) must be considered(6,8,9,11).

Basilar tip aneurysm manifesting as third ventricular mass and obstructive hydrocephalus is rare but clinically important indeed, for determining treatment strategy because such pathology usually needs definitive management for both aneurysm obliteration and hydrocephalus. CT scans reveal a hyperdense mass in the third ventricle with triventricular dilation(15). A calcified shell, a densely organized mural thrombus, blood, or a blood clot in the lesion shows hyperdensity; or on contrast administration the image of an unclotted aneurysm may enhance. Large aneurysms may demonstrate mixed intraluminal signal intensity on MRI scans. The lumen of a large aneurysm may be partially thrombosed, has a lamellar or concentric appearance(14).

In our case, the patient was admitted to our outpatient department with headache and dizziness that became unbearable recently. His CT showed marked hydrocephalus associated with a hyperdense lesion at the foramen of Monro. The lesion advanced into the interpedincular cistern. Radiologist reported a peripherally thrombosed giant aneurysm of the basilar artery.

Therefore, an MRI evaluation and also a DSA were carried out. The spontaneous hyperdense appearance on T1WI, changed into a centrally hypointense and peripherally hyperintense lesion on T2WI, with no contrast enhancement and with significant hydrocephalus. Hypodensity on T2WI can show either calcified or dense parts inside the lesion or hemorrhage in late subacute phase. However, the mixed density of the lesion was matching with the ‘black hole’ effect on T2WI. DSA was normal.

As a result of performed radiological studies, the lesion was concluded to be a mass lesion, therefore the patient underwent interhemispheric transcaldosal transventricular surgical approach appropriate for the lesion. The postoperative course was uneventful.
Consequently, colloid cysts are one of the most common lesions of the third ventricle. Because of the fact that there are many vascular/tumoral lesion to be considered in differential diagnosis of the third ventricular masses, the CT, MRI and DSA studies performed in need preoperatively would avoid unexpected surprises during surgery.

Correspondence to:
Merih Is
E-mail: merihis@yahoo.com

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REFERENCES