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Lipoma of the Quadrigeminal Plate Cistern: Two Case Reports with Review of Literature

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Abstract **Case Report**

Intracranial lipomas are benign tumors of rare occurrence representing <0.1% of all primary brain tumors, most often discovered incidentally. Most lipomas were incidentally detected by autopsy or computed tomography (CT). These benign, slow-growing lesions are usually asymptomatic and rarely require surgical intervention. We report two cases of lipomas of the quadrigeminal cistern discovered incidentally on brain MRI, the first case was a 15-year-old adolescent with essential tremor, and the second case was a 40-year-old man with chronic tinnitus with vertigo. In both patients no signs of intracranial hypertension or compression of neural structures were found. Radiological findings were not related to symptoms. The imaging appearance of tectal lamina lipomas on CT and MRI, as well as the different differential diagnoses with a brief review of the literature is presented.

Keywords: Tectal plate; quadrigeminal cistern, lipoma; imaging.

LEARNING POINTS

1. Quadrigeminal cistern lipoma is a rare mesenchymal tumor.
2. They are usually asymptomatic and detected incidentally. but can cause significant symptoms of mass effect.
3. 3T and MRI can confirm the diagnosis and rule out other differential diagnoses and thus histopathologic confirmation is almost never required.

INTRODUCTION

Intracranial lipomas are rare tumors with an incidence of 0.1 to 0.5% of all intracranial tumors, pericallear localization accounts for 50% of all intracranial lipomas, followed by localization in the quadrigeminal cisterns (25%) of cases, suprasellar/interpeduncular (14%cerebellopontine angle cisterns (9%) and sylvian (5%) [1].

These tumors are usually detected as incidental findings on imaging studies. They appear as hyperintense on both T1 and T2-weighted sequences which can be easily confused with hemorrhage, hence the need for weighted fat-suppressed sequence or CT scan are necessary for the confirmation of lipoma as demonstrated in our cases. [1].

PRESENTATION OF THE CASES

CASE 1

This is a 15-year-old patient, without any particular medical or surgical history, who was sent to the radiology department for a workup of essential tremors, with a normal EEG workup and in whom cross-sectional imaging (MRI with CT complement) was performed.

On CT scan (Figures 1), this lesion was well defined, homogeneous, fatty density (-110HU), non-enhanced after injection of the contrast medium without detectable calcification within it.

On brain MRI, the lesion was hyperintense on T1 and T2 weighted images (Figure 2), Fat suppressed images show homogeneous suppression of signal intensity within the lesion, (Figure 4) confirming the fatty nature of the lesion. No biopsy was performed in view of the typical appearance of the lesion.

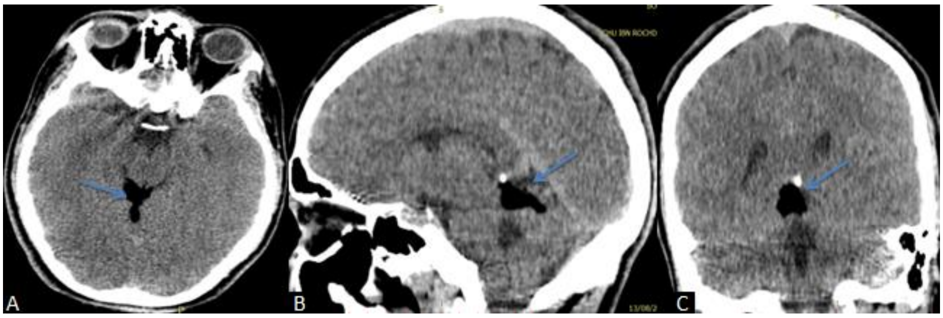

Fig-1: Non-contrast CT brain scan (A: axial, B: sagittal and C: coronal) show a wellcircumscribed focal lesion (arrow), at the level of the quadrigeminal cistern opposite the right tectal and latero-mesencephalic blade, of fatty density (density of - 110 Hounsfield units).

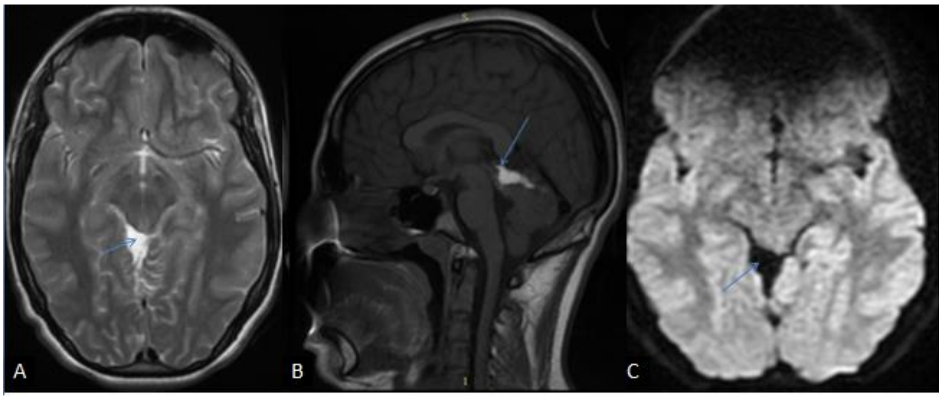

Fig-2: Axial T2 (A), sagittal T1 (B) and axial diffusion (C) sequences in the same patient showing hyperintense on both T1 and T2-weighted sequences of the lesion described above (arrow), with the absence of restriction on the diffusion sequence, suggesting the fatty nature of the lesion.

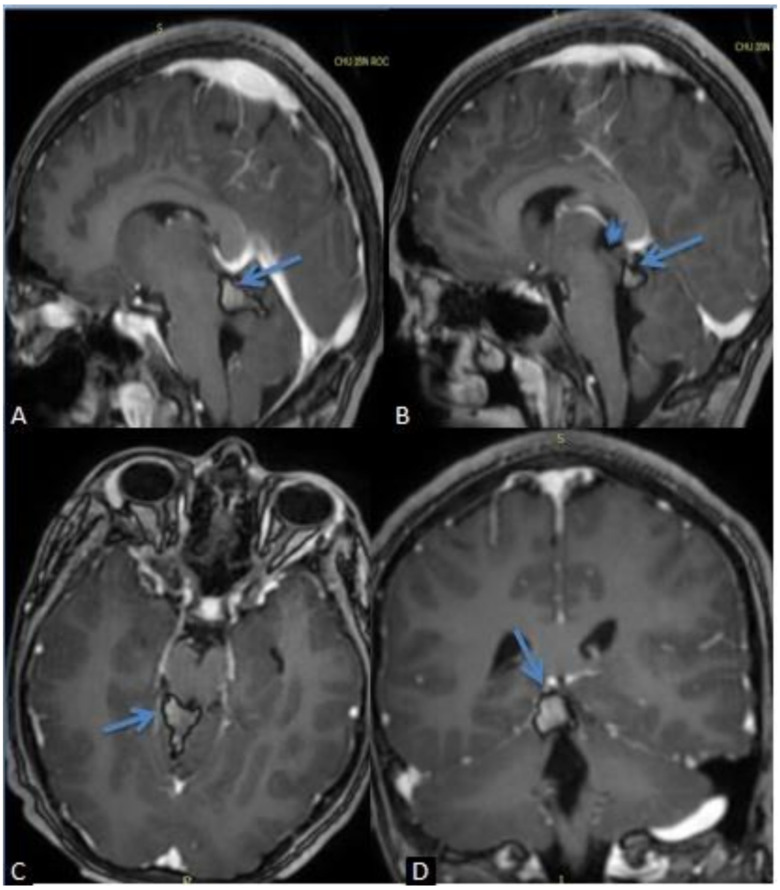

Fig-3: MRI 3D T1 EG weighted sequence, the lesion in hyper signal surrounded by a border in hypo signal realizing an aspect in Indian ink in connection with an artifact of chemical displacement (arrows).

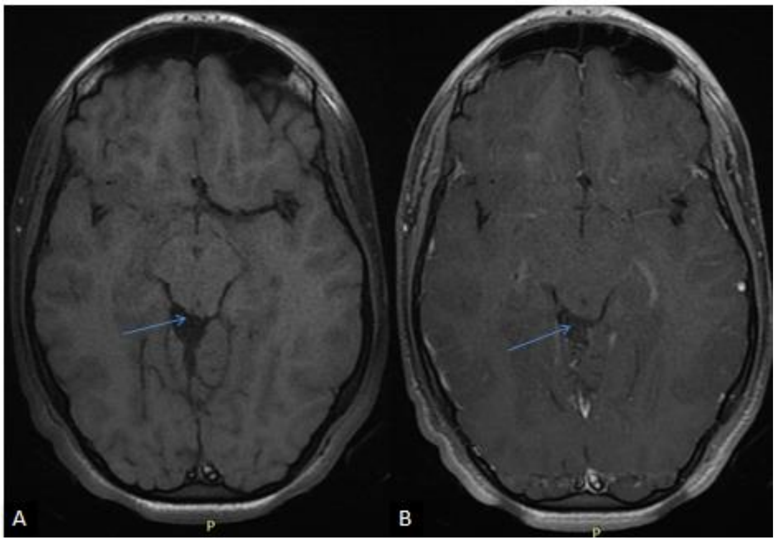

Fig-5: Axial T1 weighted sequence with fat saturation (A: without injection) (B: with gadolinium injection) showing suppression of the T1 hyper signal of the lesion (arrow), and the absence of enhancement, suggesting the fatty nature of the lesion.

CASE 2

This is a 40-year-old woman, without any particular medical or surgical history, who was referred to the radiology department for tinnitus with chronic vertigo. On brain MRI, the lesion was hypersignal on T1 and T2 weighted sequences (Figure 6).

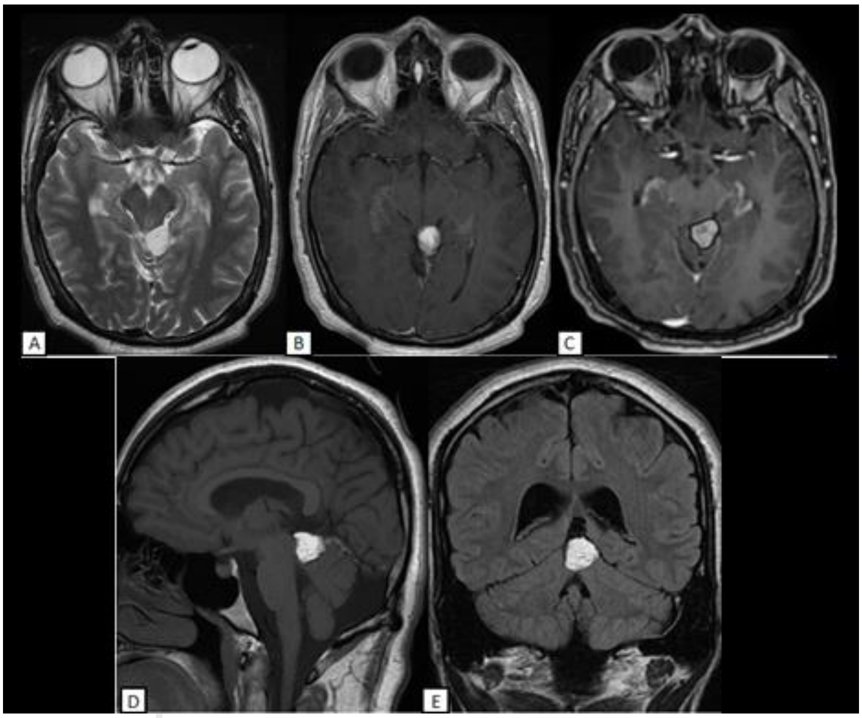

Fig-6: Magnetic resonance imaging (MRI) showed a well-defined, coarsely rounded formation, opposite the tectal lamina, in the left paraspinal region of the quadrigeminal cistern (perimesencephalic cistern), this formation was markedly hypersignal on T1 weighting (B and D) and of intermediate signal on T2 weighting (A). The presence of a hyposignal border related to chemical shift artifact testifying to its fatty nature (C).

DISCUSSION

Lipomas are benign tumors of mesenchymal origin, of rare localization in the brain. Of unknown incidence, usually discovered incidentally on cross-sectional examinations (MRI and CT).

Sometimes, when they are large, they can produce symptoms such as headache, psychomotor retardation, cranial nerve damage or convulsions due to a local mass effect [2].

These lipomas have typical imaging features that allow a correct diagnosis without histopathological confirmation.

Histologically, the lipoma is an encapsulated mass of mature fat cells arranged in lobules, and may contain thin connective tissue septa within.

Finally, radiology allows the differential diagnosis with other pathologies that can be mistaken for an ICL. An example is a dermoid cyst with a density of 20 to 40 HU and an often heterogeneous signal, or a teratoma with tissue of 03 embryonic lineages. The treatment of intracranial lipomas causing epilepsy is often symptomatic and surgery is deleterious [3]. Surgery is rarely recommended, and would be indicated only in intracaranial lipoma (ICL) associated with mass effects on the cranial pairs, and in ICL associated with hydrocephalus, example because of the location at the level of the compressive quadrigeminal cistern [4].

CT is the gold standard for the detection of intracranial lipomas. On CT, they appear homogeneous, well-defined, fatty density (HU -50 to -100) without central or peripheral enhancement after injection of the contrast medium. On MRI, lipomas appear hypersignal on T1 and T2 sequences, a fat signal similar to that of fat with the presence of a chemical shift artifact; this artifact is related to the differences in resonance of the protons of water and fat. This artifact is related to the differences in the resonance of the protons of water and fat. It results in a shift along the axis of the frequency gradient. It increases with the magnetic field and with the size of the lesion. On T1 gradient echo sequences, it appears as a hypointense border surrounding the lesion, called Black boundary or "India ink" artifact [1].

Sequences with fat saturation show a signal suppression of the lesion, indicating its fatty nature. Like CT, MRI does not show contrast. The main differential diagnoses are lesions with a fatty component: essentially dermoid cysts.

The imaging characteristics of lipomas are very similar to those of dermoid tumors. On CT scan, these two lesions appear hypodense without contrast. The density of lipomas varies from 50 to 100 HU, whereas the density of dermoid tumors varies from 20 to 40 HU. On MRI, both lesions show high signal intensity on T1-weighted sequences. However, due to its triple component dermoid tumors may be inhomogeneous on MRI [6].

In our first case, CT was performed, objectifying a well-defined lesion of fat density (density-101 HU) in the quadrijunal cistern region [Figure 1]. MRI findings in both of our cases showed a hypesignal T1 appearance of the lesions, with no contrast uptake or diffusion restriction.As with all intracranial lipomas, conservative management of a lipoma located in the quadrigeminal cistern is reasonable unless the patient becomes symptomatic.

However, most investigators still believe that histopathologic confirmation is not essential for a diagnosis in the presence of imaging features typical of a lipoma.

CONCLUSION

Quadrigeminal cistern lipomas are rare benign tumors. They have typical imaging features that allow the correct diagnosis to be made without the need for biopsy.

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