

Case Report

Intracranial lipoma in Quadrigeminal Cistern

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Abstract

A 37-year-old rural lady with an intracranial lipoma of the quadrigeminal region with persistent headache is reported. We describe findings of imaging studies such as CT & MRI with review of literature. Diagnosis of Quadrigeminal Cistern Lipoma is always certain on imaging, and therefore histopathological confirmation is never practically required. However from a theoretical point of view, there are many other lesions which can present in this cistern on imaging.

Keywords: Computed Tomography, Lipoma, MRI, Quadrigeminal Cistern

1. Introduction

Intracranial lipoma are slowly growing benign congenital lesion accounting for 0.1-0.5% of all primary brain tumors and are usually detected as incidental findings at any age when the brain is imaged for other reasons. ¹ Most lipomas were incidentally detected by autopsy or computed tomography. The incidence on CT findings in no more than 0.03 to 0.06% and autopsy incidence is 0.08 to 0.46%. ² Most intracranial lipomas are found incidentally during neuroradiological investigation with CT & MRI examination. These slowly growing benign lesions rarely require surgery ³.

2. Case Report

We report the case of a lipoma in the quadrigeminal cistern in a 37 year-old female presenting with headache. She was referred to our hospital by a local physician. Neurological and systemic examinations were normal. Blood analysis was within normal limits and EEG did not show abnormal discharges.

Cranial CT revealed a non-enhancing ovoid mass in the quadrigeminal plate cistern which has very sharply demarcated homogeneous low density indicative of a lipoma (Figure 1). MR demonstrated marked hyperintensity on T1-weighted (T1-W) images (Figure 3) and relatively high intensity on T2-weighted (T2-W) images (Figure 4). These signal intensities were consistent with fat. Sagittal MR revealed a normal corpus callosum. No postcontrast enhancement was seen in CT or MRI.

There was no symptom related with lesion, so no surgical intervention was done. The patient headache subsided with conservative management.

Figure 1: CT scan brain showing fat-density lesion (-80 Hounsfield units) in the right quadrigeminal cistern

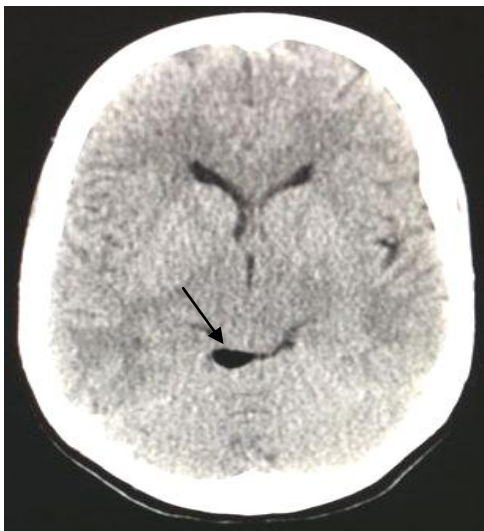


Figure 2: FLAIR MRI scans reveals homogenous intensely hyperintense lesion in the quadrigeminal cistern

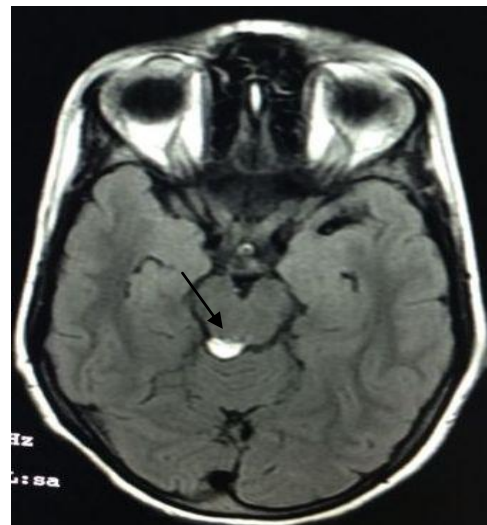


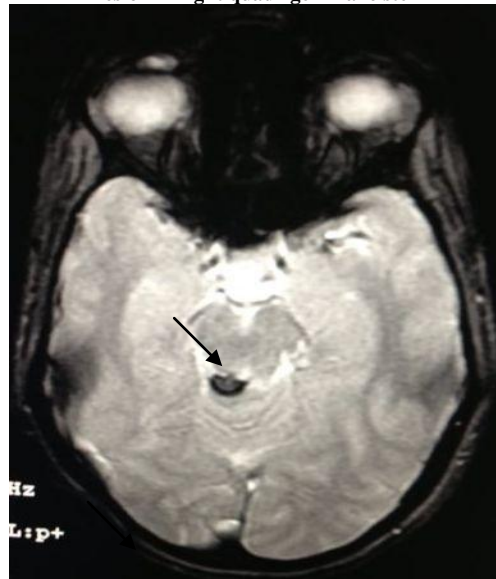
Figure 3: T1 weighted MRI scans reveals homogenous intensely hyperintense lesion in the right quadrigeminal cistern



Figure 4: T2 weighted MRI scans reveals homogenous intensely hyperintense lesion in the right quadrigeminal cistern



Figure 5: MRI T2 weighted fat suppressed images showing the suppression of fat lesion in right quadrigeminal cistern



3. Discussion

Intracranial lipomas are not tumours as such, but rather a result of abnormal differentiation of embryologic meninx primitiva. They are frequently associated with abnormal development of adjacent structures. Intracranial lipomas are widely distributed in the intracranial compartment and although they can be found essentially anywhere, certain regions are characteristic:

- Pericallosal Lipoma (45%) – It is associated with agenesis of the corpus callosum in ~ 50 % of the cases. It is divided morphologically into tubonodular and curvilinear types
- Quadrigeminal cistern lipoma (25%) - This variant is associated with underdevelopment of inferior colliculus.
- Suprasellar cistern lipoma (15%)
- Cerebellopontine angle lipoma (10%)
- Sylvian fissure (5%)

The characteristic finding on both CT and MRI is of a mass which has appearances consistent with fat. Intracranial lipomas are more frequent in quadrigeminal region of brain, most are asymptomatic, and generally caught incidentally⁴. Intracranial lipomas are accepted congenital malformation stemming from abnormal differentiation of persistent meninx primitive, an area that constitute the inner level of pia, arachnoid and dura mater⁴. Lipoma in the quadrigeminal regions has been reported as lipoma in quadrigeminal cistern, quadrigeminal plate, ambiens cistern or superior medullary velum⁵.

Radiographic features

CT: Typically appears as a mass with uniform fat density (negative HU values). It has a lobulated 'soft' appearance, conforming to adjacent anatomy. No enhancement. Some peripheral calcification may be present.

MRI: MRI with and without fat saturation are able to make the diagnosis easily. In the absence of fat saturated images, then chemical shift artifact may be useful. Signal characteristics are not surprisingly that of fat:

- T1 - high signal intensity
- T2 - high signal intensity
- T1 C+ (Gd) - no enhancement
- Fat saturated sequences - low signal

Often the lipomas are traversed by cranial nerves and adjacent vessels, best seen on high-resolution sequences. The differential is essentially that of masses which contain fat, and therefore includes the following:

- Intracranial Dermoid - if ruptured will often have multiple droplets scattered through the subarachnoid space. Usually midline.
- Intracranial teratoma
- Lipomatous transformation of neoplasm - PNET, ependymoma, glioma

On MRI, if no fat saturated sequences are available then a number of other possibilities should be entertained, which also have high T1 signal.

- Thrombosed berry aneurysm- often will have calcified rim, and haemosiderin staining on gradient echo / SWI sequences.
- White epidermoid - rare, and will restrict on DWI.

Treatment and prognosis

Intracranial lipomas are in most cases asymptomatic, and even when associated with symptomatic malformations (e.g. callosal dysgenesis) they usually require no treatment per se (as adopted for our patient). In fact attempts at resection have had relatively high morbidity with little benefit. Treatment of seizures or hydrocephalus is of course necessary if these are present⁶. The deep location of this lipoma & their adherence to the sylvian & branches of MCA vessels radical removal is impossible & dangerous.

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