Case Report

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Radio-anatomical aspects of a rare case: interpeduncular lipoma

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Abstract

Intracranial lipomas can be associated with other congenital abnormalities, but they are commonly found incidentally on imaging studies. Although the location of intracranial lipomas can be quite variable, they are extremely rare in interpeduncular fossa. We report a case of interpeduncular lipoma with its radio-anatomical features in terms of distinction with pathologies that can appear similarly, as the unexpected location of rare cases can be challenging for radiologists. The MR images of a 55-year-old male patient suffering from episodic dizziness attacks and impaired walking showed two different lipoma masses in interpeduncular fossa and chiasmatic cistern which are isointense with adipose tissue in T1, T2-weighted and FLAIR sequences. Intracranial lipomas can be located in the corpus callosum and almost in all cisterns, however they are extremely rare in interpeduncular fossa. Due to the mass effect, the structures located in close proximity of the lipomas should be evaluated.

Keywords: anatomy; interpeduncular lipoma; MRI

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Introduction

Lipomas, which are benign masses, are seen rarely in the central nervous system. They account for less than 0.1% of all intracranial tumors.[1] Although intracranial lipomas (ICL) can be associated with other congenital abnormalities, they are commonly found incidentally on imaging studies. The patients present rarely with neurological symptoms that differ according to the location of the lesions. Therefore, ICL can cause persistent headaches, convulsions, mental retardation, and cranial nerve defects.[1–3]

The location of ICL can be quite variable. However, most of them are located in the pericallosal cistern with the incidence of 0.011%.[4] It is less common for ICL to be on the surface of cerebral hemispheres and in the interpeduncular fossa. It could be estimated that interpedicular lipomas account for approximately 2% of all ICL.[5] We report a case of interpeduncular lipoma with its radio-anatomical features in terms of distinction with pathologies that can appear similarly, as the unexpected location of rare cases can be challenging for radiologists.

Case Report

A 55-year-old male patient suffering from episodic dizziness attacks for 23 years applied to the neurology department when his headache was increased over the last two weeks. His past medical history revealed that he used olmesartan and acetylsalicylic acid with the diagnosis of hypertension. The patient's presyncope and dizziness attacks lasted 7–8 seconds in transition to the erect posture. He said that his walking balance was impaired during attacks, regardless of the direction of the motion. Neurological examination showed ataxia without lateralization in the straight line and persistent horizontal nystagmus with a rapid phase in the direction of gaze. The patient had no nausea and objective vertigo tests were negative. There was no signs of diplopia, dysphagia, dysarthria, or facial deficits but there was low frequency tinnitus in the right ear.

Upon these physical examination findings, brain MRI was requested with suspicion of posterior fossa pathology and the patient was scanned with GE™ Signa Explorer device (General Electric Healthcare, Boston,

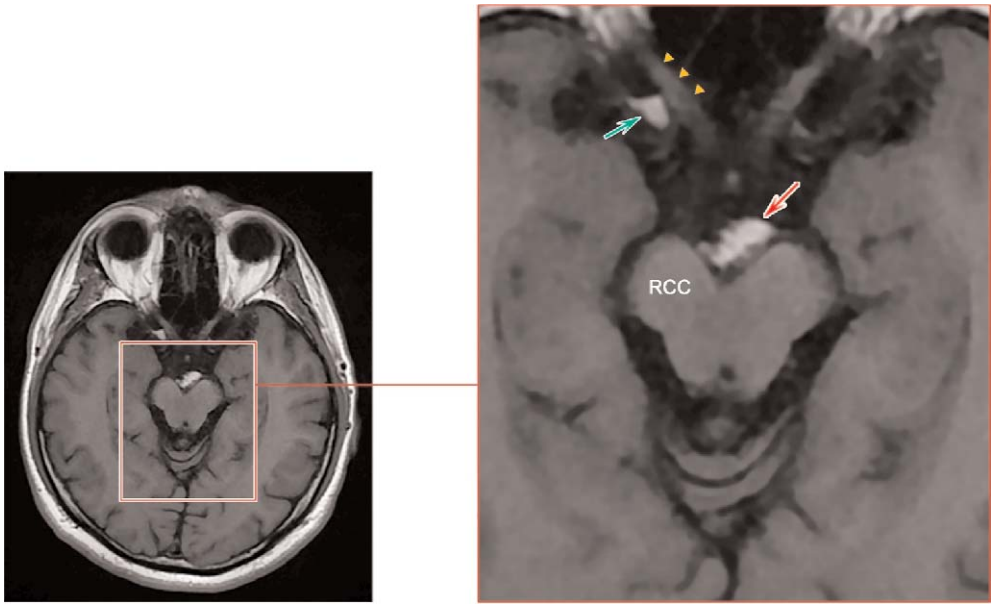

Figure 1. T1-weighted axial image. Hyperintense lesions in interpeduncular fossa (**red arrow**) and chiasmatic cistern (**green arrow**) in close proximity of the optic nerve (**orange triangles**) were defined as lipomas. **RCC:** right cerebral crus.

MA, USA). Images were taken in sagittal T1-weighted (T1W) (TR: 2534, TE: 10.8), coronal T2-weighted (T2W) (TR: 4133, TE: 96.5), axial T1W (TR: 2115, TE: 9.3), T2W (TR: 7885, TE: 108) and fluid attenuated inversion recovery (FLAIR) (TR: 9000, TE: 94.6) sequences with a slice thickness of 5 mm. There was no pathology in the posterior fossa on imaging.

In all sequences, two lipoma masses which are isointense with adipose tissue were detected. First one, which was extended more prominently to the left of the midline, was approximately 12.2×8.5 mm in size and localized in the interpeduncular cistern (**Figures 1** and **2**). Second one was approximately 6.2×5.1 mm in size and located at the lateral side of right carotid artery and optic nerve in the anterolateral of the chiasmatic (suprasellar) cistern (**Figures 1**, **3** and **4**). Lesions were suppressed in the FLAIR images (**Figure 5**). There were no signs of restricted diffusion but mild chronic ischemic-gliotic changes were observed in the cerebral parenchyma.

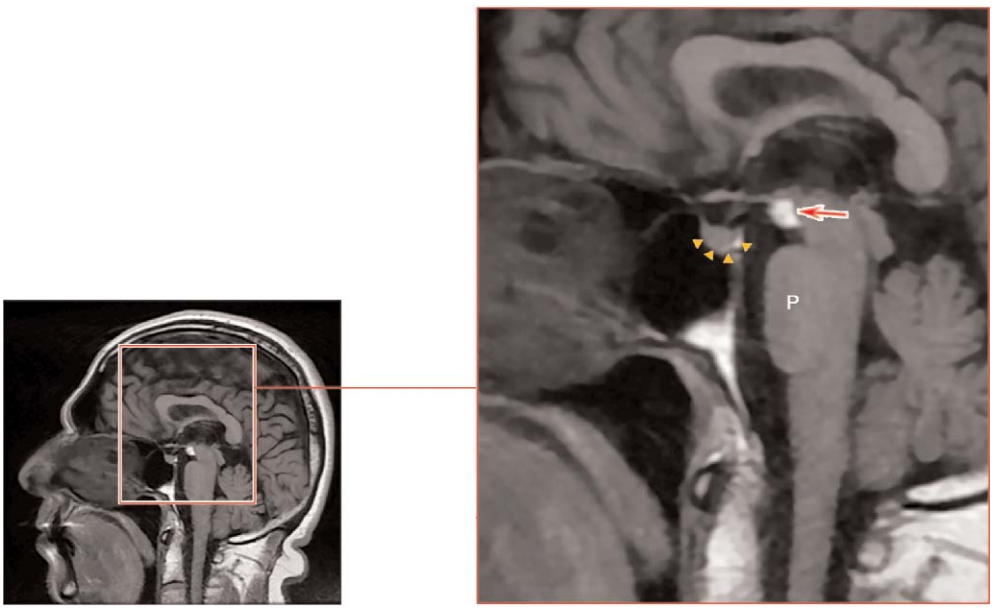

Figure 2. T1-weighted sagittal image. Interpeduncular lipoma (**red arrow**), sella (**orange triangles**) and pons (**P**) were demonstrated.

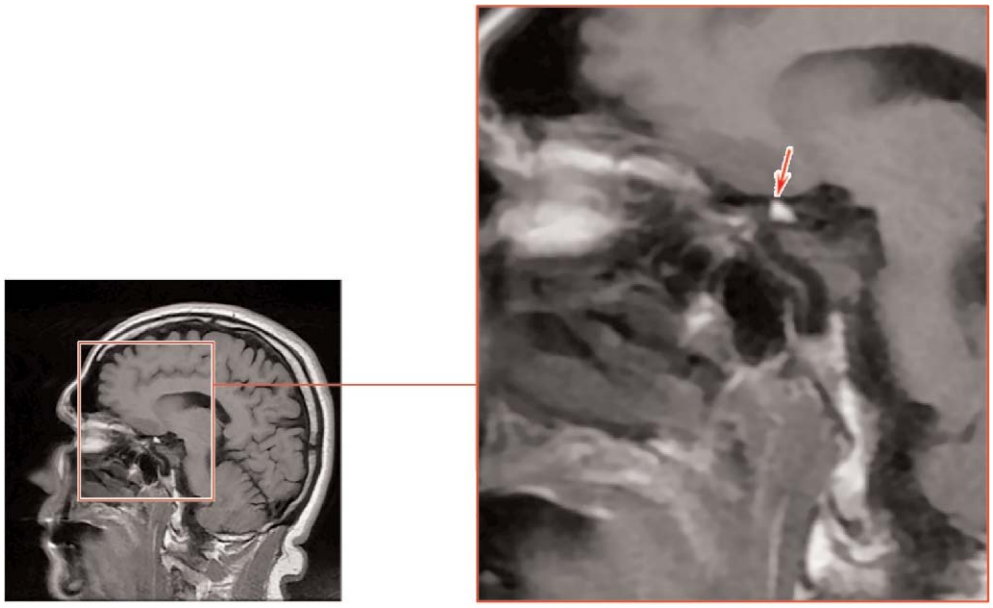

Figure 3. T1-weighted sagittal image of the lipoma in chiasmatic cistern (**red arrow**).

Significant inflammatory mucosal changes in the right frontoethmoidal sinus and chronic mucosal retention cyst in the lateral wall of the left maxillary sinus were present in the sinonasal cavities on imaging.

Discussion

ICL can be located in the corpus callosum and in almost all cisterns, however they are extremely rare in interpeduncular fossa.[5] It can be said that the incidence of ICL are not related to age or gender. These lesions are considered as congenital midline malformations. Although there are several explanations for development of the ICL in the central nervous system, it is widely accepted that abnormal persistence and differentiation issues of the primitive meninges lead to expand adipose tissue in the subarachnoid space and ultimately cause lipomas which might be supported by the cisternal localization of the most ICL.[6]

Neurological symptoms are rare due to the fact that ICL grows very slowly. Therefore, these cases are often detected incidentally. Headaches, epilepsy and rarely hydrocephalus might be associated with ICL.[7] They may need to be surgically removed to relieve pressure or open blockages. Due to the mass effect, the immediate neighborhoods of the lesion should be described in detail. The absence of any vision problems or strabismus in our case is due to the fact that the tumor did not exert any pressure on the optic nerve or other motor nerves of the eye, as seen in the scans. However, it can be thought that ataxia, nystag-

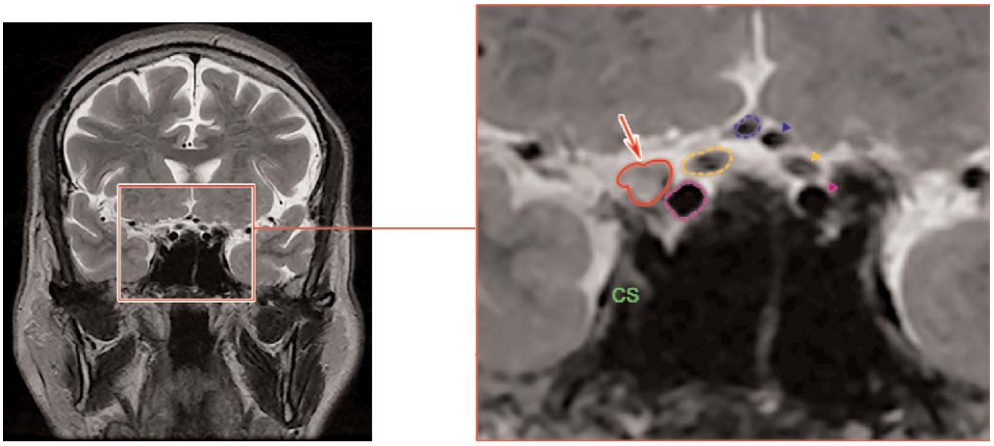

Figure 4. T2- weighted coronal image. Lipoma in chiasmatic cistern (**red arrow and circle**), right and left optic nerves (**orange dashed circle-orange triangle**), right and left anterior cerebral arteries (**blue dashed circle-blue triangle**), right and left internal carotid artery (**purple dashed circle-purple triangle**), right cavernous sinus (**CS**).

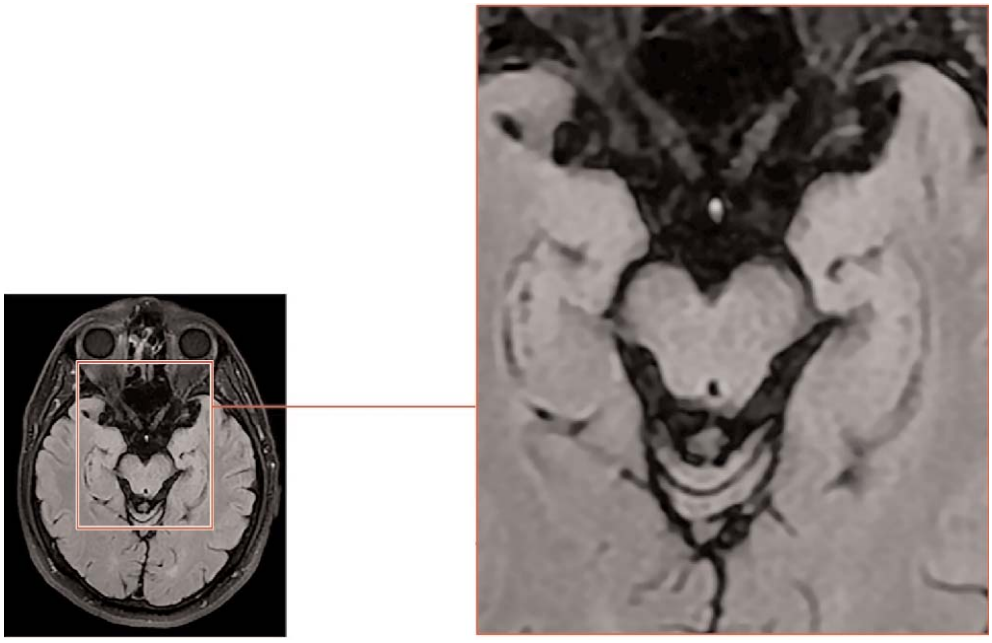

Figure 5. FLAIR axial image taken from the same level as the **Figure 1**. Lipomas are suppressed in this sequence.

mus, tinnitus and presyncope attacks may occur due to increased intracranial pressure or instant pressure peaks in the associated vascular network.

Lipomas appear as homogeneous and hyperintense masses on T1W and T2W images, while they are hypointense on fat suppressed T1W and T2*W. The reason why they are hypointense in T2*W is magnetic susceptibility and chemical shift effect. The visibility of lipomas is not enhanced with contrast material. Computerized tomography (CT) scans may help in diagnosis. Lipomas usually have density of between -50 UH and -100 UH on CT.[8]

It can be said that it is not difficult to make a diagnosis on MR images, since the lesion is in adipose tissue intensity in all sequences. However, fat suppressed sequences should not be ignored for more reliable diagnosis. Additionally, in some cases, calcification may accompany these lesions.[9] If fat suppressed sequences or diffusion weighted images are not taken into consideration, ICL may be confused with pathologies such as dermoid cyst, white epidermoid cyst, hemorrhagic intracranial metastasis, metastatic melanoma or subacute hematoma, which may give a similar appearance on other sequences.[5,10] Moreover, a confusing appearance may occur due to lipomatous transformation of neuroectodermal tumors which notably is rare. Dermoid cysts are high intensity on T1W images and more heterogeneous than lipomas.[11] Consequently, radio-anatomic features of these lesions could be essential for management of the cases.

Conflict of Interest

The authors have no conflicts of interest to disclose.

Author Contributions

FÇ: scanning and clinical follow-up, critical revision of manuscript; MAG: manuscript writing and editing.

Ethics Approval

This report has been prepared in accordance with the Helsinki Declaration and does not require any kind of approval of the Ethical committee. However, informed consent obtained from the patient for the report to be published.

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References

1. Kulhari A, Manjila S, Singh G, Kumar K, Tarr RW, Bambakidis N. Auditory hallucinosis as a presenting feature of interpeduncular lipoma with proximal p1 segment fenestration: report of a rare case and review of literature on peduncular hallucinosis. J Vasc Interv Neurol 2016;9:7–11.
2. James LE, Roberts SAG, Beltechi R, Hussain R. Complete third nerve palsy as a presenting feature of an interpeduncular lipoma. Br J Neurosurg 2020;35:32–4.
3. Eghwrudjakpor PO, Kurisaka M, Fukuoka M, Mori K. Intracranial lipomas: current perspectives in their diagnosis and treatment. Br J Neurosurg 1992;6:139–44.

4. Taydas O, Ogul H, Kantarci M. The clinical and radiological features of cisternal and pericallosal lipomas. Acta Neurol Belg 2020; 120:65–70.
5. Venkatesh SK, Phadke R V, Kumar S, Mishra UK. MR appearance of interpeduncular lipoma. Singapore Med J 2003;44:39–41.
6. Truwit CL, Barkovich AJ. Pathogenesis of intracranial lipoma: an MR study in 42 patients. AJR Am J Roentgenol 1990;155:855–64.
7. Friedman RB, Segal R, Latchaw RE. Computerized tomographic and magnetic resonance imaging of intracranial lipoma. Case report. J Neurosurg 1986;65:407–10.
8. Jabot G, Stoquart-Elsankari S, Saliou G, Toussaint P, Deramond H, Lehmann P. Intracranial lipomas: clinical appearances on neuroimaging and clinical significance. J Neurol 2009;256:851–5.
9. Zarour CC, Yaldoo B, Kendra J. Sphenoclival intraosseous lipoma. Applied Radiology 2020;49:39–40.
10. Mishra SS, Panigrahi S, Dhir MK, Pattajoshi AS. Intrinsic brainstem white epidermoid cyst: an unusual case report. J Pediatr Neurosci 2014;9:52–4.
11. Özsunar Y, Şenol U. Atlas of clinical cases on brain tumor imaging. Cham: Springer International Publishing; 2020.

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