

A Rare Case of Pericallosal-Interhemispheric Lipoma

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Abstract

We are reporting a case of interhemispheric-pericallosal lipoma, associated with bilateral small lateral ventricle choroid plexuses and third ventricle lipoma as well as partial agenesis of splenium of corpus callosum. Presentation in our case does not correspond to existing classification of pericallosal lipoma and as it is very rare, we are presenting it as a case report. Intracranial lipoma itself is a very rare anomaly and account for 0.06% to 0.46%. It represents a group of developmental abnormality of brain parenchyma that occur during embryogenesis, and it is located more frequently (about 50%) in the pericallosal cistern and may extend into one or both lateral ventricles. Pericallosal lipoma can also be associated with varying degree of callosal anomalies.

Keywords: Pericallosal lipoma; Partial agenesis of corpus callosum; Congenital malformation; Computed tomography; Magnetic resonance imaging

Introduction

Lipoma is a benign noncancerous tumor composed of mature adipocytes, that accounts for less than 5% of primary tumors of the brain. Lipoma has some association with congenital abnormalities of the central nervous system. Lipoma size may vary from few millimeters to multiple centimeters as well as with weight fluctuation [1]. Intracranial lipoma itself is a very rare congenital malformative intracranial lesion due to abnormal differentiation of persistent primitive meninges into lipomatous tissue. Most of the cases are asymptomatic pericallosal lesion, often associated with abnormal development of adjacent structures like agenesis or dysgenesis of corpus callosum [2]. Peripheral calcification may be seen in pericallosal lipomas and extension of lipoma into lateral ventricles may be rarely seen [3].

MR imaging presentations of intracranial lipoma are quite variable. In an MR imaging study, it was presented a 58-year-old male who was complaining of recurrent headache and his CT and MRI showed pericallosal lipoma cephalad to whole length of corpus callosum with peripheral calcification and lateral ventricle choroid plexuses lipoma with no corpus callosal or other central nervous system anomalies.

Rahalkar and colleagues [4] presented two cases investigated for epilepsy, one for a 27-years-old female and the other for a 2-year-old male, both showed large tubulonodular variety of pericallosal lipoma with extension into right lateral ventricle as lipoma of corpus callosum.

Few cases of isolated lipoma of corpus callosum have also been reported previously. One case reported by Uchino, while seven cases have been reported by Sener, all demonstrated isolated lipoma of corpus callosum in the trigone of lateral ventricle without pericallosal lipoma and corpus callosal anomalies.

Case Report

A 34-year-old Arab male patient presented in our hospital for the evaluation of nasal obstruction, snoring and long-standing headache. Clinical and neurological examinations were unremarkable. CT scan paranasal sinuses was performed that revealed the radiological picture of sinonasal polyposis, however incidentally discovered large fatty brain parenchymal lesion, that is further radiologically evaluated by means of CT brain with contrast followed by MRI brain.

The CT scan demonstrated a large pericallosal fatty attenuation lesion and appears more hypodense than CSF, superior to entire antero-posterior course of corpus callosum that continued bilaterally but

asymmetrically into lateral ventricles involving choroid plexuses. Third ventricle lipoma is also appreciated. Another curvilinear fat attenuation lesion along anterior interhemispheric fissure with interrupted calcification along its lateral wall. Associated partial agenesis of splenium of corpus callosum is also noted. No enhancement seen in post contrast images. He underwent MRI brain which showed high signal intensity on T1 and T2 weighted as well as FLAIR images, while hypointense on gradient images. No other central nervous system abnormalities were noted (Figures 1-5).

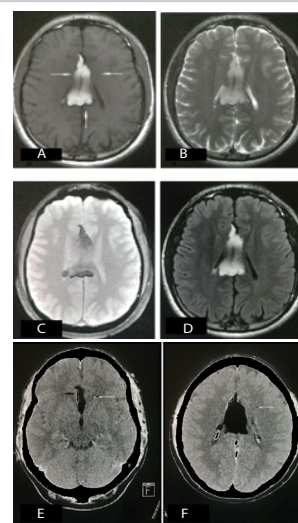


Figure 1: 34-year-old male patient with history of nasal obstruction, snoring and long-standing headaches diagnosed with pericallosal-interhemispheric lipoma associated with bilaterally asymmetrical lateral ventricular choroid plexuses lipomas and partial agenesis of corpus callosum. (a and b) Axial unenhanced CT scan of the head shows midline interhemispheric-pericallosal lipoma (white arrows), linear peripheral calcification (small black arrow) and bilateral small choroid plexuses lipoma (long black arrows).

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Figure 2: 34-year-old male patient with history of nasal obstruction, snoring and longstanding headaches diagnosed with pericallosal-interhemispheric lipoma associated with bilaterally asymmetrical lateral ventricular choroid plexuses lipomas and partial agenesis of corpus callosum.



Figure 3: Axial and sagittal unenhanced CT scan of the head shows thick pericallosal-interhemispheric lipoma (white arrows), third ventricle lipoma (long black arrow) and discrete areas of cortical vein calcification (small black arrow).

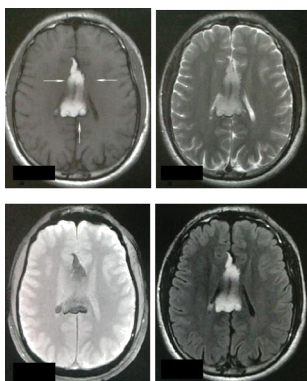


Figure 4: 34-year-old male patient with history of nasal obstruction, snoring and longstanding headaches diagnosed with pericallosal-interhemispheric lipoma associated with bilaterally asymmetrical lateral ventricular choroid plexuses lipomas and partial agenesis of corpus callosum. Axial T1, T2, FLAIR and Gradient MRI sequences of the brain shows thick pericallosal-interhemispheric lipoma (white arrows) and right lateral ventricle choroid plexus lipoma (black arrow).

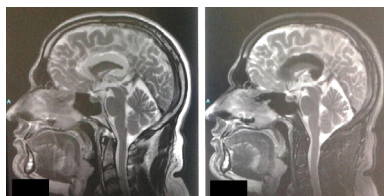


Figure 5: 34-year-old male patient with history of nasal obstruction, snoring and longstanding headaches diagnosed with pericallosal-interhemispheric lipoma associated with bilaterally asymmetrical lateral ventricular choroid plexuses lipomas and partial agenesis of corpus callosum. Sagittal T2 and FAT SAT MRI sequences of the brain shows thick pericallosal lipoma along entire anterior and posterior aspect of corpus callosum with partial agenesis of splenium of corpus callosum, that shows signal attenuation on FAT SAT sequences

Discussion

Intracranial lipomas are very rare, benign, slow growing congenital anomalous maldevelopment that accounts for 0.1% to 0.5% of all primary brain tumor [4]. Usually these lipomas are either midline or adjacent to midline structures, commonest sites are Pericallosal-interhemispheric region (45%), followed by quadrigeminal cistern (25%), cerebellopontine angle (9%), suprasellar/interpeduncular and sylvian cisterns (9%) respectively [5].

It occurs due to abnormal development and incomplete resorption/regression of meninx primitive (primitive meningeal tissue), that persist longer than usual period of resorption (between 8-10 weeks) and eventually will differentiate into mature adipose tissue. During embryonic development, primitive meningeal tissue occupies the future cistern and after its resorption will create subarachnoid space, however due to incomplete regression, adjacent neural structures fail to develop or develop improperly and may form lipoma. This explains presence of lipomas at multiple locations. The nerve and vessels of subarachnoid space may traverse through these lipomas [3,4,6].

Fifty percent cases of lipoma of corpus callosum are incidentally discovered and mostly are asymptomatic, however if associated intracranial abnormalities and malformation is present, patient can present with seizures, headache, limb weakness and dementia [4].

Pericallosal lipoma can be classified into two distinct types based on imaging features and location; Anterior or tubulonodular and posterior or curvilinear types. The anterior tubulonodular variety is rounded or lobular, larger than 1 cm and usually 2 cm in thickness and are situated anterior to corpus callosum with associated callosal and frontonasal anomalies. Posterior curvilinear variety is usually thin and elongated along callosal margin, more than 1 cm in length and greater than 1 cm in thickness. Corpus callosum and intracranial anomalies are less significant in posterior lipoma [3,5,7,8]. In our case pericallosal lipoma is seen along superior aspect of corpus callosum throughout its entire extent and its of rather mixed variety (tubulonodular and curvilinear variety) and to best of our knowledge this mixed atypical variety of pericallosal lipoma is very rare.

Approximately 50% of intracranial lipoma is associated with other malformation of brain particularly dysgenesis/agenesis of corpus callosum, because of occurrence of maldevelopment of meninx primitive prior to development of interhemispheric commissural fissure [3,4].

Pericallosal lipoma is also associated with choroid plexuses lipoma with variable incidence varying from 20% to 50%. Usually during development of choroid plexuses, a portion of interhemispheric cistern and tela choroidea will invaginate through choroidal fissure and infolding primitive meninx will attach to developing choroid plexuses [3,4,9].

From a radiologic perspective, pericallosal lipomas can be described by different imaging modalities including CT and MR imaging. Unenhanced CT brain can be diagnostic, demonstrating low attenuation fat density (ranging from -39 to -80 HU). Curvilinear calcification may also be seen. MRI is the modality of choice to evaluate the full extent of lesion and also to assess associated anomalies. MRI shows characteristic fat signal intensity on all sequence, hyperintense on T1-weighted images and intermediate to low signal on T2-weighted image and signal attenuation on fat suppression sequences but not on FLAIR. While no enhancement on contrast images [2,5,7,8].

Majority of the patients are asymptomatic and they are conservatively managed. Surgery is usually not indicated due to high vascularity and

close attachment of lipoma to adjacent structures, however surgical intervention may be considered due to associated central nervous system abnormalities or due to pressure on adjacent structure causing symptoms or disability [3,5].

Conclusion

The described radiological appearance of pericallosal lipoma in our case is very rare and therefore it is essential to be aware of this atypical variant of pericallosal lipoma, for making correct diagnosis and planning treatment. Our case is a mixed variant, extending anteriorly as well as posteriorly around corpus callosum along with involvement of lateral ventricles choroid plexuses and third ventricle as well as interhemispheric fissure and does not correlate with the previously described morphological types of pericallosal lipoma.

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