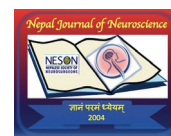


# Lipoma of the corpus callosum: Fat in the brain

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## Abstract

Intracranial lipomas are very rare, slow-growing, and benign tumors usually asymptomatic but occasionally associated with symptoms like a seizure. This rare occurrence is usually diagnosed incidentally and magnetic resonance imaging is the choice of investigation and diagnosis can be confirmed with fat suppression sequences. Management of corpus callosal lipoma is mainly conservative management with surgery not indicated due to the location and its peripheral structures. Managing seizure is the mainstay of the treatment. We present a case of incidentally diagnosed tubulonodular corpus callosal lipoma after having an event of a fall injury.

**Key words:** Corpus callosum, Lipoma, Seizure, Tubulonodular.

## Introduction

Corpus callosal lipoma is a rare, benign, slow-growing, congenital tumor, which are abnormal differentiation of persistent primitive meninx (mesenchymal origin), followed by transformation into mature adipose cells. This was first described by Rokitansky in 1856, occurring in about 0.46-1% of the intracranial tumors, usually located at or near the midline usually in the pericallosal cistern.<sup>1</sup> Other common occurrences are the quadrigeminal cistern, suprasellar/interpeduncular cistern, cerebellopontine angle cistern, and the Sylvian cistern.

Corpus callosal lipoma can be classified into two types tubulonodular and curvilinear due to different imaging morphologies and associated brain anomalies.<sup>2-4</sup> The tubulonodular is anteriorly situated and round or cylindrical measuring 2 cm or more, mostly associated with corpus callosum dysgenesis and/or fronto-facial anomalies and with choroid plexus/lateral ventricles extension. Curvilinear types are thin, elongated, less

than 1cm in diameter, located posteriorly around the splenium. The curvilinear lipomas generally have a low incidence of associated anomalies, sometimes hypoplastic corpus callosum. Tubulonodular is more common one in occurrence.<sup>4</sup>

These are mostly asymptomatic, epileptic seizures are a common symptom and are sometimes refractory to anticonvulsant treatment. Corpus callosal lipoma should be differentiated from radiographically similar lesions such as dermoid, epidermoid, and gliomas, and is important for appropriate therapeutic planning.<sup>5</sup> Due to the rare occurrence and asymptomatic nature its differentiation from other intracranial radiologically similar lesions is necessary as the treatment modality differs. So, we present a case of incidentally diagnosed as tubulonodular corpus callosal lipoma after having fallen from a height and underwent a CT scan of the brain in the emergency room at our center.

## Case Report

A 42-year-old female patient, presented with an alleged history of fall from height (about 10ft) who was neurologically sound. There were no focal deficits but underwent a routine CT scan of the brain. There was a hypodense lesion around the corpus callosum and was confused with pneumocephalus in the view of trauma (Figure 1). MRI of the brain with contrast and fat-saturated sequences, showed features suggestive of a curvilinear shaped area of altered signal intensity surrounding the splenium of the corpus callosum which appeared hyperintense on both T1 and T2 weighted images. There was a thin rim of signal loss around this lesion on all sequences, consistent with calcification (Figure 2). This appearance on MR was consistent with the lipoma of the corpus callosum. The diagnosis was confirmed on fat-suppressed T1 weighted images (Figure 2) in which the lesion showed signal loss confirming the diagnosis.

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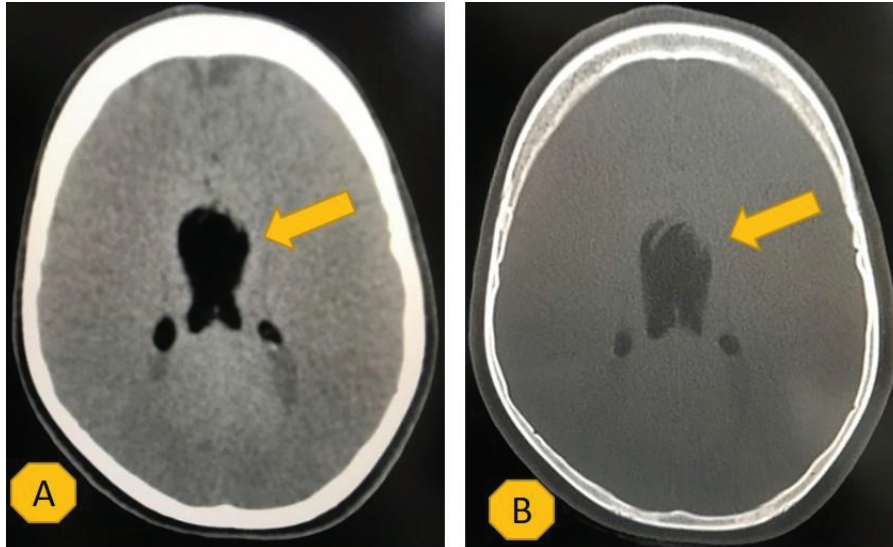


Figure 1: Plain CT axial scan (A) brain window, (B) bone window yellow arrow showing hypodense lesion over the corpus callosum

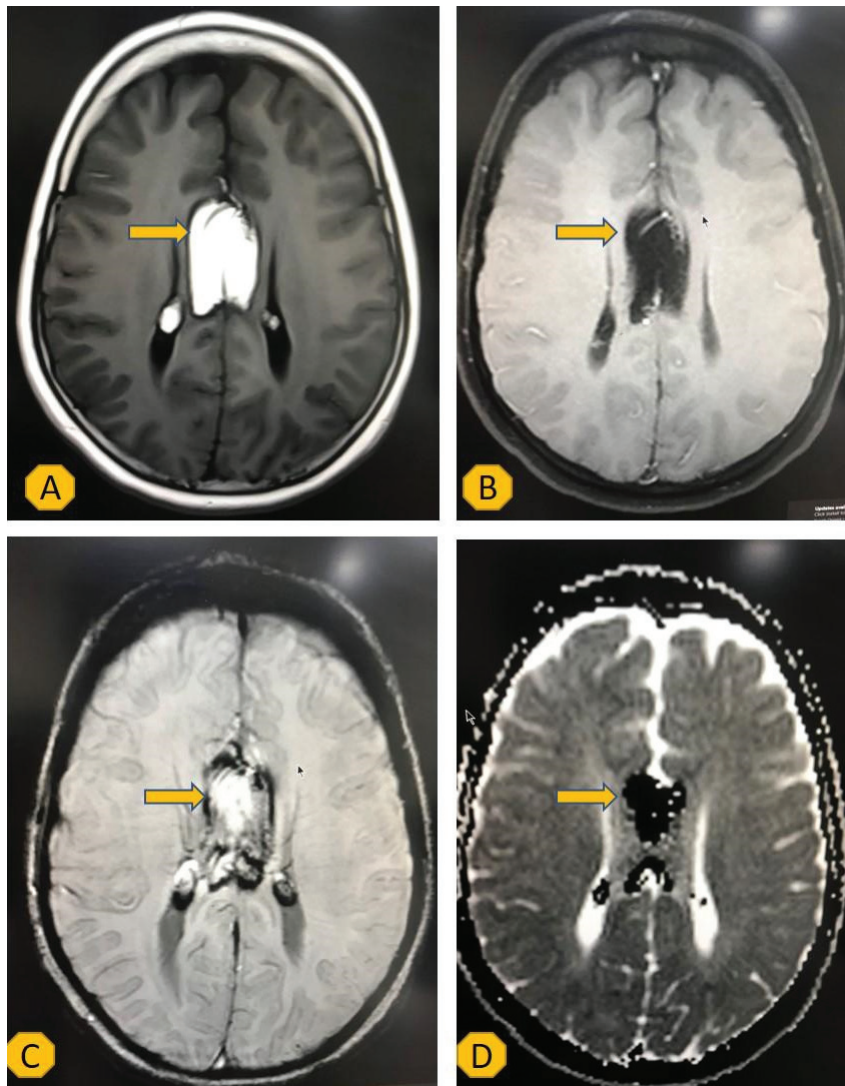


Figure 2: (A and B) Axial T1 weighted image showing corpus callosal lipoma with and without fat saturated images, (C) SWI images showing predominantly peripheral blooming, (D) ADC images showing lesion

## Discussion

About 0.45 to 1% of all primary brain tumors are intracranial lipomas. Associated with varying degrees of corpus callosal dysgenesis, pericallosal comprises about 50% of all intracranial lipomas.<sup>1,9</sup> The abnormal resorption of the meninx primitive or primitive meninges is the underlying pathogenesis of the corpus callosal lipoma. During the 8<sup>th</sup> and 10<sup>th</sup> week of development subarachnoid spaces are created and reabsorption occurs. Failure of reabsorption of the primitive meninges which persists longer into mature lipomatous tissue. These may develop in any of the cerebral cisternae so, the intracranial lipomas are malformations rather than a true neoplasm, but they are much more frequent in the area of the corpus callosum where it may interfere with the normal growth of corpus callosum between the 11<sup>th</sup> and 20<sup>th</sup> weeks. So, the coexistence of corpus callosal anomalies (agenesis, hypoplasia) is inevitable and the degree depends on the size and location of the lipoma. The normal subarachnoid nerves and vessels may also become traversed through these lipomas.

Intracranial lipomas are diagnosed mainly with the help of radiological imaging, curvilinear calcification in plain X-rays is seen especially in the tubulonodular variety. On CT scan, a well-demarcated, hypodense mass with a density of -50 to -100 HU can be appreciated. The lesion often has a margin of nodular or curvilinear calcification. On MRI, lipomas appear homogeneously hyperintense on both T1 and T2 weighted images appear homogeneously hyperintense except the areas of peripheral calcification with low signal intensity. The fat suppression sequence is often diagnostic showing signal loss due to suppression of fat. Sometimes central flow voids representing pericallosal arteries coursing through the substance of the tumor are seen.<sup>8-10</sup>

Management of corpus callosal lipoma is mainly symptomatic, anticonvulsant therapy being the mainstay.<sup>1</sup> The management of symptomatic central nervous system abnormalities, cranial nerve involvement should be done accordingly. Obstructive hydrocephalus may occur requiring temporary drainage or permanent shunting. The prognosis depends on the presence of additional central nervous system abnormalities.<sup>7</sup> Surgery is usually not indicated because the risks of the surgical intervention outweigh the potential benefits in most cases and may result in high morbidity and mortality rates, given the perilesional vasculature and strong adhesion to surrounding corpus callosum and other tissues.<sup>1,2,11,12</sup> If there are associated developmental abnormalities like frontal encephalocele, frontonasal dysplasia, and other bony defects surgical correction predominates the management.<sup>2</sup> This case report emphasizes the diagnosis and the management strategy of corpus callosal lipoma

which was mostly asymptomatic but occasional brief episodes of seizures.

## Conclusion

Corpus callosal lipoma is a rare entity, usually asymptomatic and mostly incidental in finding. MR imaging is the mainstay of diagnosis and to be differentiated from other intracranial tumors as the treatment modality differs. Corpus callosal lipoma mostly requires no treatment but symptomatic patients require management and anticonvulsants remain the mainstay of the treatment. Surgical excision has minimal role due to the location, perilesional vasculature, and its adhesion to the surrounding structures.

**Conflict of Interest:** None

**Source(s) of support:** None

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