A Rare Case Report of Intracranial Angiolipoma in an Adolescent with Literature Review

Maghalashvili E.[1], Kintsurashvili M.[1], Shalamberidze B.[1], Chkhikvishvili T.[1], Betsuashvili S.[1], Okinashvili R.[1], Nishnianidze N.[1], Tsomaia K.[2], Jangavadze M.[2]

Abstract

Background: Angiolipomas are slow-growing, benign tumors originating from mesenchymal cells, characterized by mature adipocytes and delicate blood vessels. While most angiolipomas occur in subcutaneous tissues, intracranial lesions are exceedingly rare.

Case presentation: We present the case of a 12-year-old female who presented with seizures, upward eye deviation, and slurred speech. MRI revealed a subpial heterogeneous signal conglomerate with adjacent chronic microhemorrhage in the right lateral sulcus along the superior temporal gyrus. A local reactive cortical atrophy with mild sulcal enlargement was noted, without significant mass effect. An abnormally hyperplastic cortical venous shunt, likely a cavernous angioma, was identified. Additionally, a single atrophic focus was observed in the left frontal lobe. Radiological findings classified the lesion as an "other specified congenital malformation of the circulatory system. She underwent craniotomy and excision of the mass, which, upon histological examination, comprised mature adipocytes and blood vessels, consistent with the diagnosis of intracranial angiolipoma.

Conclusions: This case highlights the importance of including ICAL in the differential diagnosis of intracranial lipomatous tumors. MRI findings, coupled with histopathological confirmation, are essential for an accurate diagnosis. Surgical resection remains the preferred treatment, though complete removal may be challenging due to vascular involvement. **(TCM-GMJ August 2025; 10 (2): P36-P39)**

Keywords: Angiolipoma, Intracranial, Adolescence, CNS angiolipoma

Introduction

Intracranial angiolipomas (ICALs) are rare benign tumors composed of mature adipocytes and blood vessels, typically found in peripheral tissues or sometimes growing in the spinal epidural space (1). Initially outlined by Bowen in 1912 as Multiple subcutaneous hemangiomas, together with multiple lipomas (2), but its recognition as a distinct entity was solidified by Howard and Helwig in 1960 (3,4).

Angiolipomas tend to localize in specific anatomical sites, with common locations being the forearm, trunk, and upper arm. They are infrequently encountered on the scalp or face, but also other localizations are reported (5,6).

Central nervous system angiolipomas are very rare. Only 19 cases have been reported in the literature, according to a database search,

We report here a further case of ICAL occurring in the region of the right temporal lobe with a suspected intracranial hemangioma.

Case presentation:

A 12-year-old female presented with seizures, upward eye deviation, and slurred speech. Her symptoms began 3 years earlier, at her 9 years old age and increased by time. She had a history of upward eye gaze. Neurological examination revealed no additional deficits; eye movements, facial motor and sensory functions, as well as reflexes, were within the normal range. No motor or sensory deficits were identified in the upper or lower limbs.

Magnetic resonance imaging (MRI) showed a subpial heterogeneous signal conglomerate with adjacent chronic microhemorrhage in the horizontal part of the right lateral sulcus, following the superior temporal gyrus. There was a local reactive atrophic lesion of the cortex, with mild enlargement of the lateral sulcus, without significant mass effect. An abnormally hyperplastic cortical venous shunt was identified, most likely representing a cavernous angio-

From the [1]American Hospital Tbilisi; [2]Ivane Javakhishvili Tbilisi State University, Aleksandre Natishvili Institute of Morphology
Received July 1, 2025; accepted July 25 , 2025.
Address requests to: Maghalashvili Edisher
E-mail: ketie.tsomaia@tsu.ge
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ma. A single atrophic focus was also noted in the left frontal lobe. Utilizing radiological examinations, lesion was considered as "other specified congenital malformations of circulatory system" (Figure 1).

Electroencephalography (EEG) revealed interictal generalized epileptiform activity during wakefulness and short -duration sleep during photic stimulation, with focal changes in the right frontal and frontotemporal regions.

The patient underwent surgery via a right-sided pterional approach for tumor resection. Intraoperatively, a large mass was observed between the Sylvian fissure and the second segment of the middle cerebral artery (MCA), adherent to a branch of the MCA. The tumor was partially resected, with a small remnant left on the MCA branch to avoid vascular injury. No intraoperative complications occurred.

Histopathological analysis of the excised tumor revealed mature adipocytes interspersed with blood vessels of varying diameters. There was no evidence of atypia, pleomorphism, or mitotic activity. No ischemic necrosis was present [Figure 2]. These findings confirmed the diagnosis of ICAL.

Postoperatively, the patient recovered well and was discharged six days after surgery.

H&E Stain. Digital Slides by Motic Digital Scanner/ MoticEasyScan Pro 6, Resolution 40X: 0.26 μm/pixel.

A postoperative follow-up was conducted after one month, all clinical symptoms had resolved. MRI showed a partially resected vascular-lipoid area in the right lateral sulcus. A residual fragment with a centrally contrasted blood vessel was noted, likely representing a loop of the lower division of the second (insular) segment of the right MCA. Within this loop, a 2-mm layer of fat and a thin rim of siderosis were observed (Figure 3).

In the right insula, there was an 8/6 mm area of CSF leakage intensity/malacia. There was no sign of perifocal swelling. The right lateral sulcus was mildly deformed. The ventricular system and subarachnoid spaces were within the normal range. Basal cisterns were without deformation. In the sellar area, there were no pathological changes in the retrobulbar tissue. The pontocerebellar angle and vestibulocochlear nerve were without damage. The paranasal sinuses were pneumatized.

Discussions

Lipomas are thought to arise from embryonic sequestration of multipotential mesenchymal cells, which remain dormant until triggered by adolescent hormonal changes, leading to differentiation into mature fat cells. Repeated trauma may contribute to vascular differentiation and the formation of angiolipomas (7). A rare familial predisposition has been reported in approximately 5% of cases, with an autosomal dominant inheritance pattern (8).

Angiolipomas are composed of mature fat cells interspersed with abnormal vascular structures. The vascular component can vary, including capillary, sinusoidal, venular, or arterial elements (9). Most central nervous system angiolipomas are spinal and extradural, intracranial cases are exceedingly rare(10). Spinal angiolipomas account for merely 1.2% of all tumors affecting the spinal axis and typically arise in intradurally, whereas ICALs are predominantly sporadic in nature (11). ICALs mostly located in sellar/parasellar region (12,13).

Diagnosing ICALs is challenging due to their nonspecific clinical and radiological features (14). However, MRI can reveal characteristics of both adipose and vascular tissues, aiding in preoperative diagnosis (1). Surgical resection is the primary treatment for symptomatic cases (14). Intraoperatively, excessive bleeding and complex anatomical relationships can hinder complete removal (1).

Histopathological examinations are crucial for definitive diagnosis (14,15).

This histological variant of lipoma is rare mesenchymal tumor and typically occurs as subcutaneouse lump of trunk and extremities and manifests as multiple, painful nodule in young adults. Angiolipomas primarily impact young adults, usually appearing during the late second to early third decade of life. While relatively prevalent within this age bracket, they are considerably uncommon in both children and individuals over 50 years old (16).

Additionally, there seems to be a higher incidence among males affected by this tumor (17). Typically, histologically they manifest along the midline, categorized into non-infiltrating, so call encapsulated and infiltrating non-encapsulated types. Recurrence of the non-infiltrating is rare after simple enucleation, while infiltrating form of the tumour occurs, usually in muscle without capsule (18). There is no correlation between the degree of vascularity and the intensity of pain (3).

Conclusion

Intracranial angiolipomas are exceptionally rare lesions with nonspecific clinical presentations. This case highlights the importance of including ICAL in the differential diagnosis of intracranial lipomatous tumors. MRI findings, coupled with histopathological confirmation, are essential for an accurate diagnosis. Surgical resection remains the preferred treatment, though complete removal may be challenging due to vascular involvement.

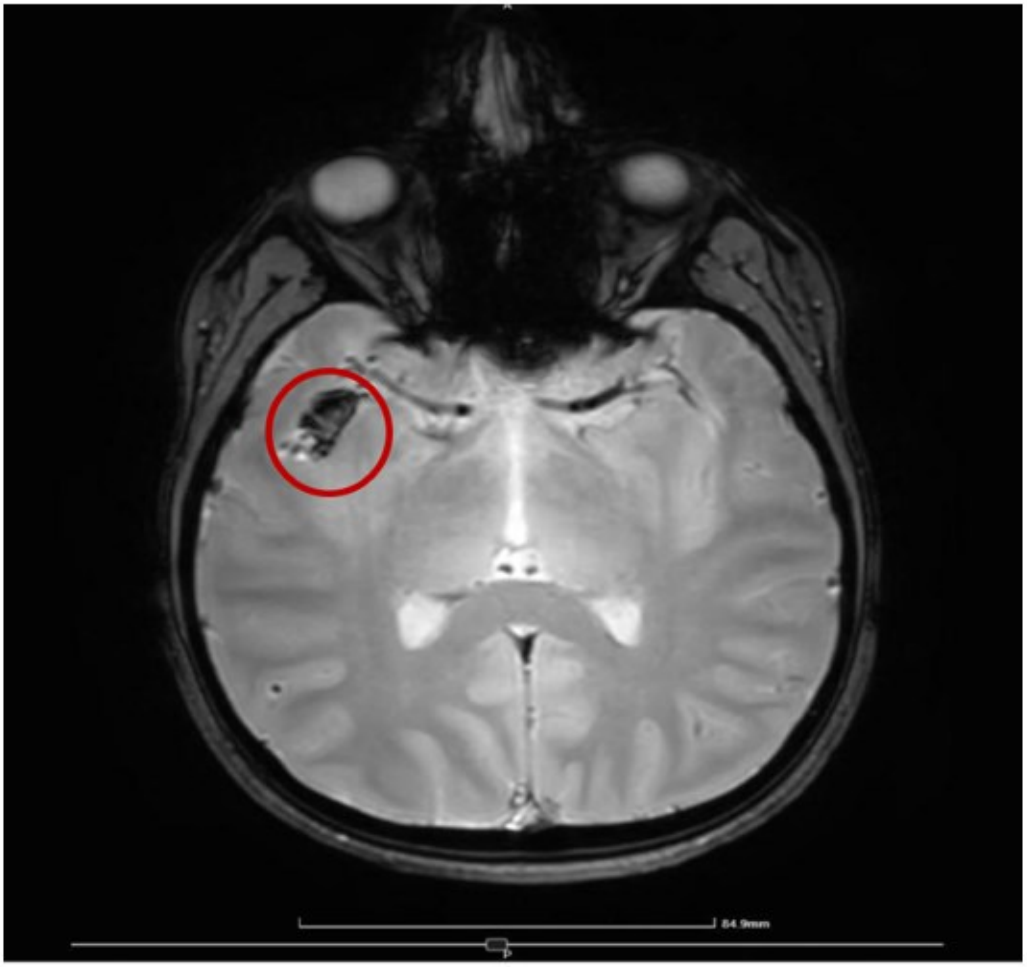

Figure 1: Presurgical MRI; Subpial heterogeneous signal conglomerate with adjacent chronic microhemorrhage in the horizontal part of the right lateral sulcus (red circle).

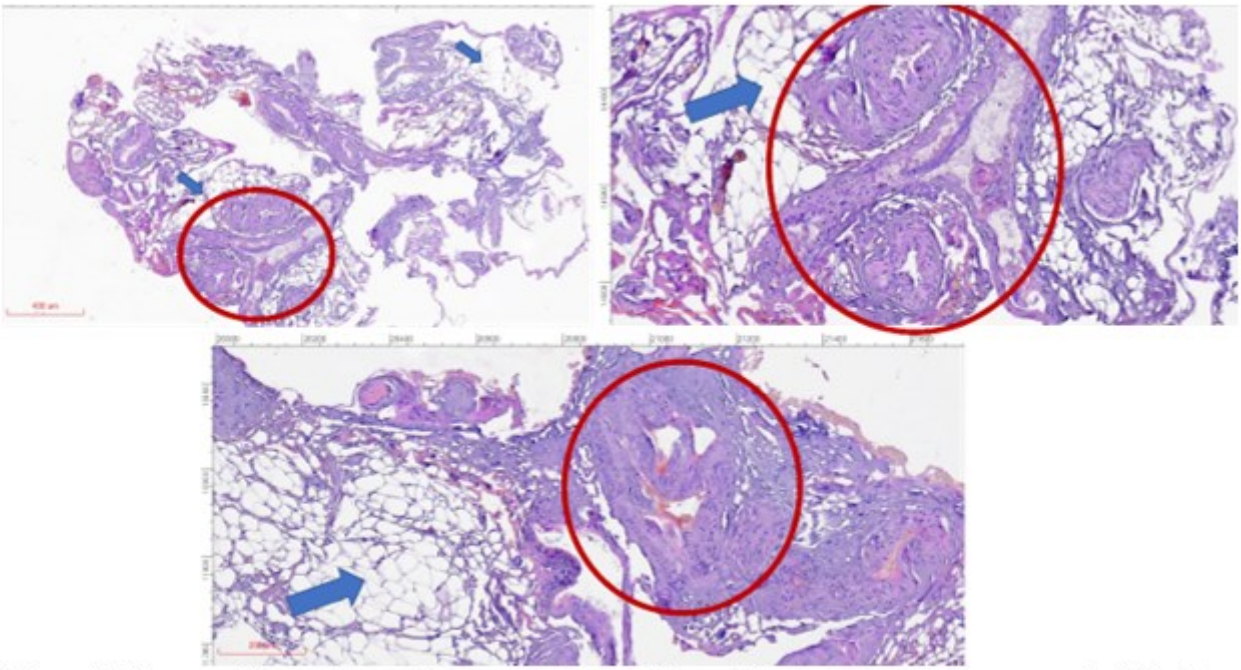

Figure 2: Mature adipose tissue (Blue arrow) containing dilated and ramifying muscular blood vessels (red circle);

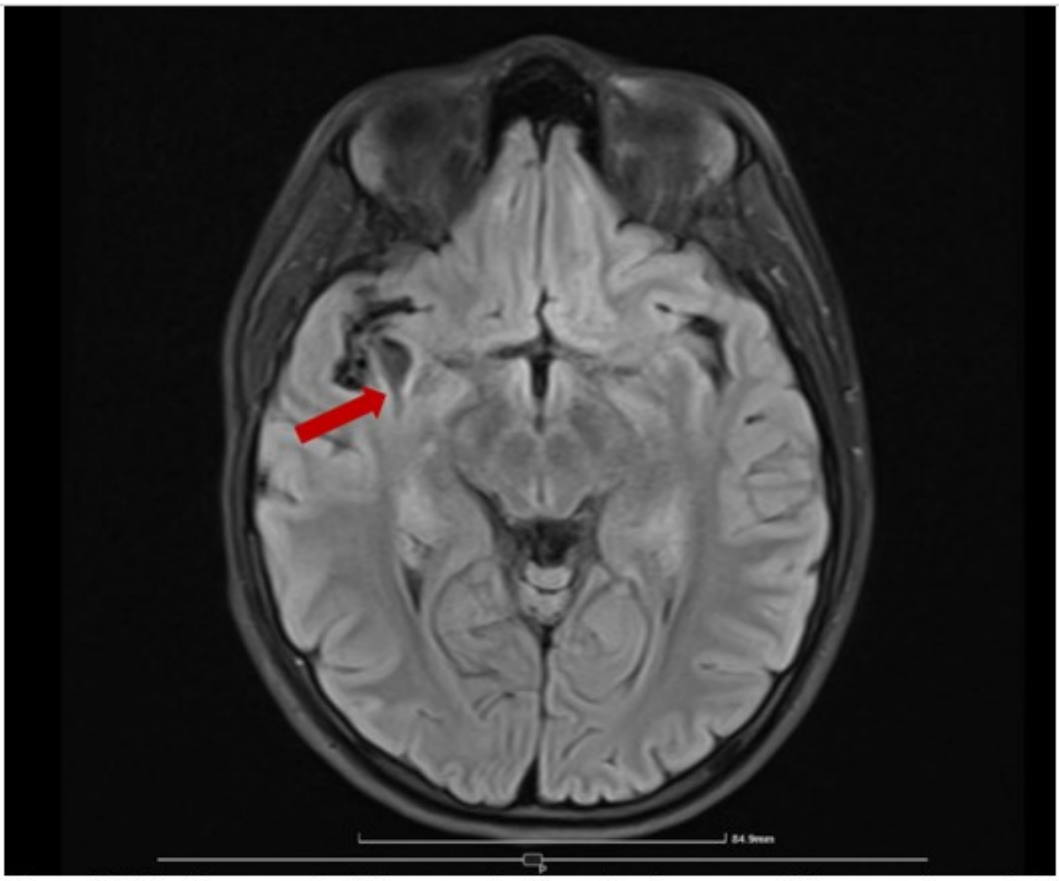

Figure 3: MRI. Postoperative follow up after 1 month. Arrow – partially resected vascular-lipoid area in the right lateral sulcus. A residual fragment with a centrally contrasted blood vessel, likely representing a loop of the lower division of the second (insular) segment of the right MCA. Within this loop, a 2-mm layer of fat and a thin rim of siderosis were observed

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