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TUMOR RELATED EPILEPSY - CASE REPORT AND LITERATURE REVIEW AND COMPARISON

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ABSTRACT

Tumor-related epilepsy is a recognized entity in pediatric neurology, most often linked to low-grade epilepsy-associated tumors (LEATs). We report the case of a 13-year-old girl presenting with two generalized tonic-clonic seizures, after which MRI revealed a small right occipital/parietal cortical lesion, radiologically suggestive of a low-grade glial tumor, most consistent with ganglioglioma. The patient developed obesity, depressive disorder with suicide attempt, and self-harming behaviors, which complicated her clinical course. Despite antiepileptic therapy, seizure control remained suboptimal due to irregular medication use. Neurosurgical evaluation recommended resection after further imaging with neuronavigation, but surgery was postponed. This case highlights the challenges of managing epilepsy associated with extratemporal LEATs and underscores the importance of a multidisciplinary approach that includes neurology, neurosurgery, psychiatry, and oncology to address both neurological and psychosocial outcomes. The literature case reports comparison highligts the different symptoms, treatment methods and treatment outcomes of treatment of tumor related epilepsy. It is important to perform imagining after seziures occured.

KEYWORDS

Child Epilepsy, Tumor Related Epilepsy, Surgical Treatment, Child Nervous Sustem Tumor, Epilepsy Surgical Treatment

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Introduction

In 2005, the International League Against Epilepsy defined epilepsy as a brain disorder characterized by a persistent predisposition to generate epileptic seizures. The traditional definition required at least two unprovoked seizures occurring more than 24 hours apart. However, a more recent, practical definition proposed by the ILAE in 2014 acknowledges that epilepsy can also be diagnosed after a single unprovoked seizure if there's a high probability (at least 60%) of further seizures, similar to the recurrence risk after two unprovoked seizures over the next 10 years, or if the patient receives a diagnosis of an epilepsy syndrome [1]. Epilepsy, affecting 0.5% to 1% of children, is the most prevalent and one of the most serious chronic neurological conditions in childhood. Based on the Norwegian Mother and Child Cohort Study, the incidence is highest in infancy. Approximately 1 in 150 children receive an epilepsy diagnosis within their first decade [2]. When a pediatric patient manifests seizures, the initial clinical imperative is to determine if the event is epileptic, differentiating it from nonepileptic events such as syncope or movement disorders. Upon confirmation, subsequent management involves classifying the seizure and epilepsy type, using clinical data, EEG, and neuroimaging to elucidate the underlying etiology. Definitive diagnosis is contingent upon the synthesis of clinical and electrophysiological findings [3]. Given the influence of treatment strategies on patient outcomes, determining the underlying cause of epilepsy is a primary concern from the onset. The International League Against Epilepsy classification underscores the importance of etiology at each diagnostic step, categorizing potential causes into structural, genetic, infectious, metabolic, immune, and unknown factors [3]. In pediatric patients diagnosed with epilepsy, a definitive etiology is identified in approximately 30% of cases; structural (21%) and genetic factors (10%) are the most commonly observed etiologies [4] Central nervous system tumors constitute the most prevalent form of solid neoplasms in the pediatric population. Seizures are the second most frequently observed clinical manifestation in pediatric patients presenting with supratentorial tumors, with an incidence of 38%. Common supratentorial tumors encompass low-grade gliomas, including pilocytic astrocytomas, subependymal giant cell astrocytomas, gangliogliomas, and dysembryoplastic neuroepithelial tumors (DNETs). Gangliogliomas and DNETs are recognized for their marked epileptogenic characteristics. Infratentorial tumors demonstrate a less frequent association with seizure activity, wherein seizures typically arise secondary to mass effect, hydrocephalus, or metastatic spread. Furthermore, seizure occurrence is more commonly associated with low-grade tumors compared to high-grade tumors or brain metastases [5]. Histopathological analyses of brain tissue resected from patients undergoing surgical intervention for drug-resistant epilepsy have revealed that tumors represent the second most common histopathological diagnosis in both adult and pediatric cohorts, accounting for 23.6% of examined samples. Gliomas were identified as the predominant tumor type, while DNETs were the second most frequently encountered [6].

Methodology

The specific publications for the article were found using Pubmed and Google Scholar with the use of phrases ‘tumor related epilepsy’, ‘children epilepsy’, ‘child epilepsy surgery treatment’, ‘child tumor related epilepsy’, ‘outcome of surgical treatment of pediatric epilepsy’. The data about childer tumor related epilepsy cases from data bases were compared and presented in the table 1.

A Case Report

A 12-year-11-month-old girl was admitted to the emergency department after her parents received an abnormal brain MRI result performed following her second generalized tonic-clonic seizure. The first seizure occurred in August 2024 during sleep, and the second in January 2025, both associated with loss of consciousness, hypersalivation, and urinary incontinence.

Perinatal and developmental history were normal (Apgar 10, birth weight 3100 g at 37 weeks). Past medical history included pneumonia at age 3, obesity (BMI 35, >95th percentile), e-cigarette use, and allergy to cow's milk protein. Family history was significant for obesity (mother), cardiovascular disease (maternal grandmother), and nicotine dependence (father). One sibling has aortic regurgitation and clubfoot.

On admission, the patient was stable, with no neurological deficits. Laboratory investigations were largely normal, except for mildly elevated TSH and occasional leukocytosis with thrombocytosis. Infectious serologies were negative. Abdominal ultrasound and chest X-ray showed no abnormalities. EEG recordings were within age-appropriate limits.

MRI in January 2025 demonstrated a 12×9×7 mm enhancing lesion in the posterior right occipital lobe. A follow-up MRI in June 2025 revealed a 10×7×12 mm lesion in the right parietal cortex, with discrete edema and heterogeneous peripheral enhancement. Neurosurgical consultation concluded the lesion most likely represented a low-grade glial tumor, consistent with ganglioglioma (LEAT – long-term epilepsy-associated tumor), and advised surgical resection after further imaging with neuronavigation. Oxcarbazepine was introduced as antiepileptic therapy.

In March 2025, the patient was hospitalized in a psychiatric unit following a suicide attempt with antiepileptic drug overdose. She was diagnosed with depression and started on sertraline and hydroxyzine.

In June 2025, at 13 years and 4 months, she was admitted to the pediatric hemato-oncology unit for evaluation of recurrent nightmares, nocturnal agitation, headaches with photophobia, dizziness, and behavioral changes. She admitted to inconsistent medication use. Physical examination showed obesity and scars of self-harm (scratches, burns, linear lesions); neurological examination remained normal. Repeat MRI confirmed persistence of the parietal lesion with features requiring further neurosurgical assessment.

The patient is currently under multidisciplinary follow-up in pediatric neurology and hemato-oncology clinics. Working diagnoses include intracranial space-occupying lesion (likely low-grade glial tumor, ganglioglioma), epilepsy, depression with suicide attempt, and obesity. She remains on oxcarbazepine, sertraline, and hydroxyzine, with planned repeat MRI and neurosurgical reassessment.

Table 1. A review and comparative analysis of central nervous system tumors associated with seizures in pediatric patients

Case	Age	Gender	Treatment	Tumor type	Location of tumor	Symptoms	Clinical Outcome	Date of public ation
A case of recurrent epilepsy-associated rosette-forming glioneuronal tumor with anaplastic transformation in the absence of therapy	1	female	observation, subtotal surgical resection 5 y.o., three surgical gross total resections 6, 11 and 15 y.o. radiotherapy course	extraventricular neurocytoma	temporal lobe	seizures, delay of development	temporal increased frequency of seizures, no signs of tumor recurrence 11 months after last surgical resection	2019 Aug
Spontaneous regression of epileptogenic pilocytic astrocytoma with FGFR1-TACC1 fusion	14	male	valproic acid, levetiracetam, resection of the mass	Pilocytic astrocytoma	the left middle frontal gyrus	epilepsy tonic–clonic seizure	Three years after epileptic focus resection, he had no seizures or neurological deficits. Postoperative MRI revealed	2025 mar

							complete resection of the mass	
Large Epileptogenic Type IIIb Dysplasia: A Radiological and Anatomopathological Challenge	4	female	valproate, levetriacetam, then carbamazepine, risperidone, and clobazam were added, resective surgery	dysembryoplastic neuroepithelial tumor	left limbic lobe	drug resistant, invalidating epilepsy lasting 16 months, initial seizures were absence-type, lasting 10 to 30 seconds, occurring several times per week	near-total resection in MRI after surgery, patient remained seizure free for 6 months after surgery	2019 Jun
Unusual fundus lesion in mosaic neurofibromatosis type 2	18 months	male	left enucleation	optic nerve sheath meningioma	stable transparent 0.5x0.5 mm flat lesion along the superotemporal arcade in the right fundus and a larger growing, white-colored lesion originating from the left optic nerve with surrounding subretinal fluid with an overlying fibrotic plaque and stalk protruding into the vitreous	At the age of 4-months-old, she was diagnosed with fetal vasculature (PFV) and amblyopia in her left eye. At 6 months of age, she began to have spells of staring, behavioral arrest and was diagnosed with focal epilepsy at the age of 10-months-old.Neovascular glaucoma, pain.	The patient has remained stable after 4 years of follow-up.	Epub 2025 Mar 11
Dense array EEG estimated the epileptic focus in a patient with epilepsy secondary to tuberous sclerosis complex	9	female	resection of right focus, right frontal lobe tuberectomy, tumor removal	giant cell astrocytoma	right frontal lobe, near the right foramen of Monro	daily episodes of choking spells and loss of awareness occurring 3 times per day	No seizures have occurred over the 7 years and 10 months since treatment	2019 Jan
Poliosis With a Rare Association	4	male	epilepsy surgery	ganglioglioma	left parietal cortex	malignant focal epilepsy, poliosis of the left eyebrow	no seizures occurred after surgery, improvement in poliosis	2018 Jun
Appearance of intracranial cottonoids on	12 years	female	okskarbazepinę, left	dysembryoplastic neuroepi	left temporal lobe	grand mal seizure	The patient did well post-operatively, and	Epub 2024 Apr 13.

intraoperative magnetic resonance imaging			temporal craniotomy	thelial tumor			on most recent follow-up, there was a small amount of tumor residual, for which the patient has been asymptomatic, and seizure-free.	
Pericallosal lipoma in children: a rare case	8	male	antiepileptic drugs	tubulonodular pericallosal lipoma with corpus callosum agenesis	midline with bilateral ventricular nad subarachnoid extension	after falling from bicycle patient was brought to hospital with no symptoms, 2 hours after the patient experienced a generalized tonic–clonic seizure with a 3-minute duration	discharged from hospital with epileptic drugs	2018 mar
Intractable epilepsy due to a rosette-forming glioneuronal tumor with a dysembryoplastic neuroepithelial background	9	male	intercranial electrodes placement followed up by tumor resection	rosette-forming glioneuronal tumor	right inferomedial parietal lobe	At the age of 5 patient started presenting violent behaviour followed up by generalized tonic seizure, carbamazepine was started. Then complex partial seizures presented by automatisms and progression to generalized tonic seizures, behavioral changes	Resection of parietal lobe and cyngulate gyrus 3 months after previous surgery, then seizure frequency significantly declined	2017 Dec
Clinicopathologic features of infant dysembryoplastic neuroepithelial tumor: a case report and literature review	11 months	-	drug therapy, total surgical resection	dysembrioplastic neuroepithelial tumor	-	partial seizures	no seizures have occurred over 6 months since surgery	2017 Oct
Noonan syndrome, PTPN11 mutations, and brain tumors. A clinical report and review of the literature	16	male	surgical resection	dysembrioplastic neuroepithelial tumor	left temporal lobe, cyst in the right thalamus	patient is diagnosed with Noonan syndrome, at the age of 12 tumor was detected, 2 years after epilepsy was developed	-	2017 Apr
Antiseizure effect of MEK inhibitor in a child with neurofibromatosis	10 years	male	mitogen-activated protein kinase	progressive optic pathway	the optic tracts responsible for a	patient with NF1 and developmental and epileptic	We observed an end to epileptic seizures as well as a significant	2024 Feb

type 1-Developmental and epileptic encephalopathy and optic pathway glioma			inhibitors (MEKi)	glioma (OPG)	significant mass effect on the mesencephalic interpeduncular cistern	encephalopathy (DEE) harboring pharmacoresistant tonic seizures	improvement of interictal EEG abnormalities, despite a lack of tumor reduction.	
Pediatric intracranial primary anaplastic ganglioglioma	11	male	median suboccipital craniotomy	anaplastic ganglioglioma	Extension through the quadrigeminal plate from the cerebellar region to the pineal area	headache, double vision caused by obstructive hydrocephalus	Vertical gaze palsy after surgery lasting for 2 weeks. At the 3-month follow-up, no neurological symptoms were present, and the patient was scheduled to undergo both radiation therapy and chemotherapy(temozolomide)	2016 Dec
A rare cause of epilepsy: Lipoma of the sylvian fissure	9	male	antiepileptic drugs	Lipoma	left temporal lobe at the level of Sylvian fissure	A several-month history of seizures	seizure frequency decreased, 5 years after beginning of the treatment no progression of the lesion was noted	2016 Aug
Characterization of low-grade epilepsy-associated tumor from implanted stereoelectroencephalography electrodes	10	female	Left temporal craniotomy and excision of the lesion was done	Polymorphous low grade neuroepithelial tumor of the young (PLNTY)	left temporal lobe	Patient presented to the Neurosurgery OPD with seizures for the past five years and was given multiple antiepileptics for the same	The child has been epilepsy free since the past one-month post-surgery and is on follow up.	Epub 2023 Nov 8.
Angiocentric glioma from a perspective of A-B-C classification of epilepsy associated tumors	11	female	gross total resection	angiocentric glioma	left frontal lobe	generalized seizures episode	No further seizures or clinical evidence of tumor recurrence were reported during the 16 months following surgery	2016 mar
Lhermitte-Duclos disease with concomitant KCNT2 gene mutation: report of an extremely rare combination	11	female	levetiracetam (500 mg twice daily)	cerebellar dysplastic gangliocytoma, heterozygous	Lhermitte-Duclos disease (LDD) of the right cerebellar hemisphere	At the age of 11 years, while he was in a school camp, he had an absence episode, bradycardia	new MRI showing no disease progression. the available data support that our patient is either the first reported case of a	2023 Jun 27

				KCNT2 mutation			subclinical KCNT2 mutation or the first case of its clinical expression in late childhood so far. Until then, the ideal management of our patient remains challenging.	
Dysplastic Cerebellar Epilepsy: Complete Seizure Control Following Resection of a Ganglioglioma	4	female	complete resection at the age of 17 months	grade I gangliog lioma	right celebellar peduncle	Since the age of 2 years clonic twitching of the right eyelid and hemiface began, they were acompannied by deviation of the eyes to the right, dystonic extension of the right arm, increase in respiratory rate and groaning, followed by short-lasting apnea. The patient remained conscious; the seizure duration was under 20 seconds, at the age of 10 months afebrile tonic-clonic seizure occured	There has been no seizure recurrence for 3 years after surgery, antiepileptic drugs were discontinued	2015 Jul
Behavioral Improvements following Lesion Resection for Pediatric Epilepsy: Pediatric Psychosurgery? Case1	10	female	right mesial temporal lesion and amygdalo-hippocampect omy were performed, and gross total resection (GTR) was achieved.At the 13-month follow-up, she remained seizure free.	Patholog y revealed WHO grade 1 gangliog lioma (BRAF V600E mutation), cortical dysplasi a, and ILAE (Internat ional League Against Epilepsy) type 1	right temporal lobe with concomita nt T2-hyperinten se mesial temporal sclerosis and a small right hippocamp us	She presented with daily, cluster seizures characterized by inattention, oral automatisms, and tonic posturing of the arms that began around age 3.At that time, she also experienced psychomotor regression and was diagnosed with autism.She was placed in special education and had progressive decline in	At the 13-month follow-up, she remained seizure free. Her parents described dramatic improvement in impulsivity and cessation of self-injurious behavior. They also reported that she was more affectionate, social, inquisitive, creative, and less hyperactive. Although she remains in special	2023 Feb 14

				hippocampal sclerosis.		academic performance. She exhibited self-injurious behavior (head banging and self-biting), sensory deficits, pica, and reduced social skillsspectrum disorder (ASD) and attention-deficit/hyperactivity disorder (ADHD).	education, she has been more attentive and able to retain more information at school since surgery.	
Behavioral Improvements following Lesion Resection for Pediatric Epilepsy: Pediatric Psychosurgery? Case 2	15	male	levetiracetam ,The patient two times underwent lesion resection	WHO grade 1 pilocytic astrocytoma	right temporal lobe	1-year history of focal impaired awareness seizures 3-4 times per week. The patient was diagnosed with ASD at age 3 with deficits in speech, language, social/emotional communication, requiring placement in special education. His mother noted staring spells for 4 years prior to presentation	He reported 1 or 2 seizures immediately after surgery, but he was otherwise seizure free at the 14-month follow-up, remaining on levetiracetam.	2023 Feb 14
Behavioral Improvements following Lesion Resection for Pediatric Epilepsy: Pediatric Psychosurgery? Case4	8	female	eslicarbazepine and zonisamide but remained refractory, naext resection	WHO 1 gangliglioma	left temporal lobe, hippocampus	1-year history of nocturnal focal seizures occurring 4 times per week and daytime seizures once per week. His seizures were characterized by unresponsiveness, drooling, body stiffness, and occasional urinary incontinence. Around the time of seizure onset, he began to exhibit aggression, inattention, and hyperactivity.	He was seizure free at the 7-month follow-up on continued eslicarbazepine and zonisamide. His parents noted significant improvements in impulsivity, hyperactivity, attention, communication, and resolution of suicidal ideation. He returned to school where he has shown academic improvement and no aggression to teachers or other children.	2023 Feb 14

						Because of these symptoms, he was required to transition to home-school and was diagnosed with ADHD and impulse control disorder. He developed suicidal ideation and self-mutilation (e.g., cutting his wrists),		
Behavioral Improvements following Lesion Resection for Pediatric Epilepsy: Pediatric Psychosurgery? Case 5	12	male	His seizures were controlled with oxcarbazepine for a period but subsequently had 3 more GTC seizures, next resection	dysembryoplastic neuroepithelial tumor	left parietal lobe	He presented with unprovoked GTC seizures lasting <2 min which have occurred four times at the time of presentation and began at age 11. He was previously diagnosed with ADHD at age 5, ODD at age 6, and disruptive mood regulation disorder at age 9. He was described as defiant and physically aggressive with his teachers, parents, and peers. He has had several psychiatric hospitalizations due to threatening homicidal behavior and aggressive behavior. He frequently ran away from home, destroyed household objects, and punched holes in walls.	At 8-month follow-up, he was seizure free on oxcarbazepine. Although no formal neuropsychological testing was performed, his mother noticed significant improvements in his behavior. She reported that he was less oppositional and has been compliant with medication. He no longer has episodes of running from home and shows no aggression to family members. She is no longer seeking a psychiatric shelter/residential facility for him. He also returned to school where he has shown significant academic improvement. Teachers have reported no problems with attention, hyperactivity, or aggression to other students.	2023 Feb 14

		female						2023 Feb 14
Imaging in a new pediatric brain tumor-a supratentorial neuroepithelial tumor with PLAGL1 fusion	10	male	The total surgical resection	The newly identified entity is not yet a part of a formal classification	left posterior parietal lobe	pharmaco-resistant focal epilepsy	After five months since the resection, with no evidence of recurrence on follow-up, and she is currently seizure-free	2023 Jan 26
Case Report: Detailed Clinical Course and Management Plan for Status Epilepticus Pediatric Patient with Resected Choroid Plexus Papilloma: A Case Report and a Single Center Experience	6	female	Keppra, surgical intervention	choroid plexus papilloma (CPP)	left lateral ventricular	epilepsy,hydrocephalus and developmental delay	today lives in her 10th years of age in her usual state of health	2022 Jun
Multinodular and vacuolating neuronal tumour of the cerebrum: an incidental diagnosis in a child presenting with absence seizures	7	male	valproate therapy and observation	multinodular and vacuolating neuronal tumor	left parietal lobe	recurrent absence seizures with sudden activity arrest and staring, lasting 10 to 20 sec long, several times a day	No change in lesions was observed on follow-up MRI scans	2020 May
Seizure freedom from recurrent insular low-grade glioma following laser interstitial thermal therapy	11	male	oxycarbazepine and lacosamide, open resection by frontotemporal craniotomy with transsylvian approach, achieved gross total resection, laser ablation with magnetic resonance guided laser interstitial thermal therapy 6 months after surgery	WHO grade II diffuse astrocytoma	left insula	focal partial right-sided seizures with perioral and right upper limb numbness, extending from shoulder to fingertips, lasting 30–45 seconds; the patient remained conscious but experienced dysphasia	recurrence of tumor and seizures, 6 months after last surgery no seizures occurred, lowe of tumor volume and mitigation of associated seizures	2020 Jan
The missing falx: a potential surgical pitfall during interhemispheric	18 months	male	bilateral ventriculoperitoneal shunts, frontoparietal craniotomy	subependymal giant cell	right lateral ventricle	recurrent episodes of seizures, developmental delay, multiple	MRI after surgery showed no residual tumor, reduction	2017 Aug

transcallosal approach			with gross total excision	astrocytoma		hypo-pigmented macules over the trunk and limbs and shagreen patch over the back	of seizure frequency	
Sylvian Fissure Meningioma in Childhood: Report of 3 Cases and Review of the Literature	5	female	right frontal craniotomy	meningothelial matous meningioma	right posterior frontal region	headache, generalized seizure attack occurring over a period of 4 months, bilateral papilledema and left hemiparesis	no regrowth of tumor 5 years after surgery	2019 Jun
Sylvian Fissure Meningioma in Childhood: Report of 3 Cases and Review of the Literature	7	male	left frontopterioteal craniotomy	meningothelial matous meningioma	left temporomedial, parasellar region	headache, photophobia, generalized epilepsy attack occurring over a period of 2 months, papilledema and right hemiparesis	no regrowth of tumor 2 years after surgery	2019 Jun
Negative or positive imaging: ganglioglioma in a boy with epilepsy	12	female	Although taking oxcarbazepine and levetiracetam, he still had one or two seizures a month.Next left temporal craniotomy and excision of left p-STG	1 typ WHO Ganglioglioma	left posterior superior temporal gyrus (p-STG)	repeated partial seizures for 2 years. Most of the seizures begin with auras, which may be auditory or visual hallucinations (heard someone singing or saw some skull heads), followed by machinements. Sometimes they might evolve into generalized tonic-clonic seizures.	The outcome of surgery was well. He got seizure-free after surgery.	Epub 2021 Nov 25.
Left-Right Brain Mystery in a Child With a Focal Cortical Lesion	3	male	Initiation of levetiracetam led to notable seizure reduction. Next complete resection of the lesion in order for tissue diagnosis because Continuous video-EEG monitoring	anaplastic astrocytoma (isocitrate dehydrogenase wild type, World Health Organization grade 3).	right perirolandic region	He presented several months of recurrent stereotyped episodes concerning focal with impaired awareness seizures, characterized by right-sided facial twitching, behavioral arrest, and drooling. The episodes	Repeat brain MRI after proton radiation treatment showed no tumor recurrence at six months. Levetiracetam was tapered off, and she remained seizure free for 18 months after resection. A repeat routine EEG was normal without focal	Epub 2021 Aug 8.

			showed frequent interictal epileptiform discharges over the left central region and rarely over the right central region, with habitual symptoms confirmed as left central onset focal seizures			occurred two to three times a day and lasted 15-30 seconds.	slowing or epileptiform abnormality.	
Atypical presentation of large intracranial epidermoid tumour in a child	16	female	The patient underwent successful left craniotomy and gross total resection	epidermoid tumour	left intra-axial cerebral tumor	Patient with negative past medical history presented to an outside hospital with a first time right-sided focal seizure	The patient suffered transient post-operative aphasia that lasted 3 days with full recovery. There is no evidence of recurrent disease 12 months after diagnosis and he remains seizure free with a normal neurologic exam more than 1 year after diagnosis.	2021 Aug 3
Long-term epilepsy-associated tumor in the amygdala of a 16-year-old boy: report of a rare case having intranuclear filaments	16	male	electrocorticography-guided right hippocampal-sparing temporal lobectomy	long-term epilepsy-associated tumor	right uncus and amygdala	complex partial seizures of eye opening when sleeping or aura when awaken, sitting with tonic posturing, early unforced head turning, eye blinking, agitation, and glancing around, progressing to ipsilateral hand automatism with contralateral late version and oral automatism	low-level aura activity remained, no seizure occurred 14 months after medication	2017 Aug
Vomiting and retching as presenting signs of focal epilepsy in children	5	female	resection (1 resection 3 year old)	progression of the dysembryoplastic neuroepithelial tumour (DNET)	MRI showed a parietal non-enhancing progression of the tumour	She subsequently presented with recurrent episodes of retching and vomiting, diagnosed as	led to seizure freedom	2020 Dec 1

					residue at the edge of the right parietal post-operative cavity, extending to the right thalamus.	migraine. Video-EEG showed ictal discharge, clinically correlated with retching, vomiting, and clonic facial convulsions, with interictal activity		
Hippocampal non-von Hippel-Lindau hemangioblastoma -a rare case	16	male	craniotomy	Supratentorial hemangiol blastomas	left hippocampus	Persistent seizures despite treatment with various antiepileptic medications for three years	1,5 years after surgery antiepileptic drugs were discontinued and no recurrence of the tumor or epileptic seizures were observed	2017 Aug
Epileptic seizure in primary intracranial sarcoma: a case report and literature review	17	female	debulking surgery, radiotherapy after. After recurrence of the seizures antiepileptic drug with oxcarbazepine was initiated on, oxcarbazepine, levetiracetam, and clobazam	high grade sarcoma	left frontal area	First seizure at the age of 17 - yelling, upward gaze, and drooling, followed by generalized tonic seizures - 5 minutes long, this was followed by a trance-like episode and significantly reduced reactivity to external cues lasting more than 30 minutes	recurrence of seizures 1 month after surgery in the form of trance-like state lasting 20/30 minutes, ocurring 2 to 3 times a month. After 8 months tumor recurrence iover the left frontal area was revealed in MRI, second surgery and radiotherapy were carried out. 2 years and 7 months after first diagnosis clumsiness of the right upper limb occured - craniotomy was performed. During 3,5 years no focal neurological signs were shown, but seizures persisted, they included right facial twitching followed by right eyelid blinking with no response, with the seizure duration of 3 to 5 minutes, and	2016 Jul

							a trance-like state and loss of memory followed by postictal aphasia lasting 30 minutes. When patient was 20 years and 9 months age old Wechsler Adult Intelligence Scale-III test was performed with score of verbal scale IQ 57, performance scale IQ 83, and full scale IQ 69	
[Low grade glioma with MYBL1 alteration: Case report of an uncommon pediatric neoplasm]	7	male	resection, levetiracetam	an isomorphic diffuse glioma with MYBL1 alteration	right frontal brain lesion	Girl was referred to the hospital for seizures with loss of consciousness. Questioning revealed that the girl had been experiencing episodic headaches associated with visual disturbances for several weeks.	Since surgical management, the patient has been asymptomatic under levetiracetam treatment. A follow-up brain MRI performed 17 months after resection did not reveal any lesion recurrence.	2020 Jul 27.
Material specificity of memory deficits in children with temporal tumors and seizures: A case series	8	female	-	low-grade neuroglial cyst	medial right temporal lobe	history of obsessive-compulsive features and learning difficulties, 2 episodes of unresponsiveness and lip smacking	patient remains under neurological and neurosurgical observation	2016 Jul
Material specificity of memory deficits in children with temporal tumors and seizures: A case series	14	male	levetiracetam	grade 1 gangliog lioma	right medial cranial fossa	seizure; found unresponsive after falling	surgical resection	2016 Jul
Material specificity of memory deficits in children with temporal tumors and seizures: A case series	9	male	levetiracetam, clobazam,	low-grade glioma	right occipital temporal/inferior temporal gyrus	poor motor skills, seizure occurred at the age of 7 with symptoms: body trembling, left hand fisting, and right hand automatisms	-	2016 Jul

Material specificity of memory deficits in children with temporal tumors and seizures: A case series	16	female	levetiracetam, lamotrigine, anterior inferior temporal lobe resection	ganglioglioma	left temporal lobe	at the age of 1 seizure occurred presented by: unresponsiveness and urinary incontinence,	-	2016 Jul
Material specificity of memory deficits in children with temporal tumors and seizures: A case series	16	male	anitepileptic drugs	cavernous angioma	left temporal lobe	at the age of 9 episodes of "blanking out" occurred, at the age of 14 auditory hallucinations were reported,	-	2016 Jul
Material specificity of memory deficits in children with temporal tumors and seizures: A case series	12	female	Trileptal	dysembryoplastic neuroepithelial tumor	anteromedial left temporal lobe	The first episode of seizures occurred when the patient was 1 year old, at the age of 10 recurrence occured. All seizures were presented by behavioral arrest, facial grimacing, and right arm shaking	-	2016 Jul
E ´ pilepsie focale centrale re´ve´latrice d'une tumeur neuro-e´pithe´liale dysembryoplastique DNET underlying focal central epilepsy	6	-	Valproate (25 mg/kg/day)	dysembryoplastic neuroepithelial tumor	right parietal lobe	clonic motor epileptic seizure of the left hemiface and upper limb, of nocturnal onset and brief duration	no seizures occurred after treatment, MRI after 1 year showed no changes	2016 Apr
Resection of a dysembryoplastic neuroepithelial tumor in the precentral gyrus	6	male	oxcarbazepine 150mg x2, lamotrigine 25mg x 2, clonazepam 1 mg, craniotomy with implantation of the intercranial electrodes then complete lesionectomy	Dysembryoplastic neuroepithelial tumor	right premotor area or precentral gyrus	Persistent seizures since 6 months of age; 15 simple seizures during the day were noticed in EEG, characterized by paroxysmal clonus and spasms of the patient's left face	left arm and left facial paralysis 2-3 days after the second surgery lasted 10 days, the patient has experienced no seizures for two years and has successfully discontinued antiepileptic drugs	2015 Aug
Glioblastoma Multiforme in a Child with Tuberous Sclerosis Complex	5,5	male	complete surgical resection, levetriacetam, valproate,cisp	Glioblastoma Multiforme	left cerebral hemisphere	West Syndrome was diagnosed at the age of 6 months and later daily focal seizures	1 year after surgery recurrence of tumor was detected, surgery was carried out	2015 May

			latin, etoposide, radiotherapy, vincristine and lomustine for 1 year as a maintenance phase methotrexate, cyclophosphamide,			presented by motor arrest, deviation of head. At the age of 5,5 years fever and mild right hemiparesis occurred and eyes to the left, hypertonia and dystonic posture of the right arm manifested	and Everolimus 3 mg/mq/day, plasmatic dosages ranging between 7.6 and 10.2 ng/mL then reduced due to side effects was started for 4 months with no effect, patient died at the age of 8 years	
Malignant transformation of a dysembryoplastic neuroepithelial tumor verified by a shared copy number gain of the tyrosine kinase domain of FGFR1	4	female	tumor resection, gross total resection at the age of 6 due to the tumor growth and ifosfamide, cisplatin, and etoposide were started feter surgery, then radio- and chemotherapy with temozolomide were started	dysembryoplastic neuroepithelial tumor	right parietal lobe	History of drug-resistant epilepsy secondary to a neoplasm in the right parietal lobe, for which the patient underwent subtotal resection at the age of 1 year. At the age of 4 tumor recurrence was observed	No signs of tumor relapse have been observed for 16 months after starting radio- and chemotherapy	2020 Apr
Multinodular and vacuolating neuronal tumour of the cerebrum: an incidental diagnosis in a child presenting with absence seizures	7	male	Valproate therapy and observation	multinodular and vacuolating neuronal tumour	left parietal lobe	Frequent absence seizures characterized by sudden behavioral arrest and brief staring spells lasting 10–20 seconds, occurring multiple times per day	Follow-up MRI scans showed no progression of the lesions.	2020 May
Multinodular and vacuolating neuronal tumor associated with focal cortical dysplasia in a child with refractory epilepsy: a case report and brief review of literature	10	male	left anteromesial temporal lobectomy,	Multinodular and vacuolating neuronal tumor	left hippocampus	headache and drug-resistant epilepsy started when patient was 6 years old, presented by focal seizures with automatisms such as chewing movements and followed by a state of drowsiness. They progressed	The patient achieved seizure freedom, allowing for the gradual tapering of antiepileptic medications. At 2-year follow-up, he remains asymptomatic with no radiological evidence of disease on MRI	2020 Jan

						to an unspecific aura, accompanied by impaired awareness and post-critical aphasia		

Discussion

In the presented case of a 13-year-old patient with focal epilepsy and a radiologically suspected occipital lobe ganglioglioma, we are dealing with an atypical extratemporal localization of a low-grade epilepsy-associated tumor (LEAT). Most reports of LEAT in the literature describe temporal lobe lesions, which constitute the most common epileptogenic focus in children [5, 7]. Extratemporal locations, such as the one described here, occur less frequently and may pose both diagnostic and therapeutic challenges. As in other cases of tumor-associated epilepsy, the primary treatment modality remains radical surgical resection of the lesion. Evidence indicates that complete tumor excision increases the likelihood of achieving Engel class I seizure freedom by as much as sevenfold compared with subtotal resection [8]. Despite the unusual localization, our patient could potentially derive comparable benefits from early surgical intervention. It is worth emphasizing that antiseizure pharmacotherapy has limited efficacy. Studies indicate that satisfactory seizure control is achieved in only about 12% of patients [9], while adverse effects occur in up to 40% of cases [10]. Radiotherapy and chemotherapy also influence seizure frequency only indirectly through reduction of tumor mass. Moreover, in benign cortical tumors, radiotherapy may additionally induce gliotic foci and increase the risk of epilepsy [11, 12]. From a diagnostic perspective, an important challenge remains the inability to reliably differentiate ganglioglioma, DNET, and other low-grade glioneuronal lesions solely based on neuroimaging [13]. Therefore, histopathological confirmation of tumor type is essential, including for the potential use of targeted therapies. LEAT-type tumors, such as gangliogliomas, frequently harbor the BRAF V600E mutation, which allows the application of BRAF inhibitors in unresectable cases or when seizures persist after surgery [14, 15]. Our patient, given the current diagnostic stage and the feasibility of resection, does not presently qualify for this type of therapy. This case illustrates the clinical dilemma between early resection, which according to the literature offers the highest chance for long-term seizure freedom, and a short period of watchful observation to assess tumor growth dynamics and optimize the surgical plan [16]. In situations of radiological uncertainty, surgical decisions must be individualized, particularly in less common extratemporal locations. In summary, this case highlights the importance of early diagnostics and personalized treatment strategies in children with LEAT tumors. Histopathologically confirmed tumor type and complete excision may provide the patient with durable seizure freedom and allow for eventual discontinuation of antiseizure pharmacotherapy.

Conclusions

We presented a case of a 13-year-old patient diagnosed with focal epilepsy and a radiologically suspected ganglioglioma in the rare occipital lobe location comorbid with obesity and adaptive disorders. An epileptic seizure may be the first sign of a brain tumor, which renders neuroimaging studies vital to exclude it. Epilepsy may be attributed to a brain tumor in approximately 30% of cases.

The patient was not qualified for primary neurosurgical intervention and was treated with antiseizure medication. Unfortunately full therapeutic success was not achieved probably due to irregular medication adherence and the presence of other comorbidities. This case indicates that an individualized approach is essential in patients with tumor-induced epilepsy.

According to the literature and our comparative analysis of central nervous system tumors associated with seizures, surgical resection of the tumor is the most effective treatment for epilepsy secondary to brain tumors. To implement alternative therapies, such as BRAF inhibitors, histopathological analysis of tumor tissue is required.

In certain cases, current knowledge and available therapeutic options are insufficient, and further research is needed.

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