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Clinical Observations

# Brain Tumor Presenting as Somnambulism in an Adolescent

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ABSTRACT

**BACKGROUND:** Sleepwalking is typically a benign and self-limited non–rapid eye movement parasomnia of childhood. **PATIENT:** We describe an unusual 15-year-old boy referred to our sleep center for new-onset sleepwalking. **RESULTS:** An overnight polysomnogram was normal from a respiratory standpoint, but a concurrent extended electroencephalogram montage showed frequent epileptiform discharges from the right parietal-temporal region and two electroclinical seizures arising from the right-frontal-central-temporal region during sleep. Magnetic resonance imaging scan revealed a right parasagittal parietal region lesion consistent with a low-grade neoplasm, and surgical resection of the lesion demonstrated a right parietal dysembryoplastic neuroepithelial tumor. Complex partial seizures and sleepwalking remitted completely with anticonvulsant therapy following surgery. **CONCLUSIONS:** This patient highlights the differential diagnosis of nocturnal events appearing to be typical parasomnias, especially when they arise abruptly at an older age.



## Introduction

Somnambulism is a common, benign, and self-limited parasomnia of childhood, and onset beyond early childhood is unusual.[1] Affected individuals may also have other symptoms along with a spectrum of arousal parasomnias that include confusional arousals and sleep terrors (pavor nocturnus).[1] Because arousal parasomnias normally occur out of stage 3 non–rapid eye movement (REM) or slow wave sleep, sleepwalking episodes typically occur in the first third of the major sleep period. Although most children have events unassociated with other sleep disturbances, they can be precipitated by conditions that disrupt this vulnerable sleep state, such as obstructive apnea, periodic limb movements, environmental noise, and so forth.

The differential diagnosis of somnambulism includes REM behavior disorder presenting as sleep terrors and epileptic seizures, particularly those arising from the frontal lobe. Most sleepwalkers usually remain calm and do not have agitated, rhythmic, stereotypical, or repetitive behaviors compared with those with nocturnal seizures. If these features are present, further investigation is warranted including polysomnography or electroencephalography (EEG).[1] We describe a teenage boy who presented with new onset sleepwalking-like behaviors that were found to be complex partial seizures in the setting of a brain tumor.

## Case Report

A previously healthy 15-year-old boy presented with nightly episodes of apparent sleepwalking that began abruptly 1 month earlier. The first episode occurred after the patient fell asleep in the living room while watching a movie with his family. He suddenly bolted up from the sofa

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and ran upstairs; his parents found him confused and agitated when they tried to converse with him. He subsequently had nightly episodes approximately 1.5 hours after falling asleep, between 11:30 pm and 12:30 am. He would jump out of his bed, run into his parents' bedroom, and stand in front of his parents holding his comforter. His parents noted agitation, prominent sweating, and a distant gaze. He was minimally interactive during episodes, with monosyllabic answers to his parents' questions. Within a few minutes he would walk slowly to his room and return to sleep. The patient had no immediate or subsequent recall of the episodes.

His parents did not describe any posturing of extremities, head or eye deviation, rhythmic twitching, tongue biting, or enuresis. No symptoms of sleep-disordered breathing or restless leg syndrome were reported. He denied any use of alcohol or illicit drugs or any incidents of trauma or abuse. He attended ninth grade with stable academic and athletic performance. There was no history of parasomnias in any family members. Physical examination showed a well-developed and nondysmorphic boy, and a detailed neurological examination was normal.

Polysomnography, including an extended 16-channel EEG, was obtained because of the unusual presentation of these episodes, namely the sudden onset of nightly, sleepwalking-like behaviors in adolescence, with no history of arousal parasomnias in early childhood. Furthermore, there was suspicion for seizures because all spells were brief and stereotypical (involving either a sudden, dramatic rise from bed with running or agitation or standing next to his bed with a vacant stare).

The polysomnography was normal from a respiratory standpoint, and no periodic limb movements were recorded. The expanded EEG montage, however, showed occasional right parietal-temporal sharp waves during wakefulness, which activated during non-REM sleep. Almost 2 hours after sleep onset, he had an unprovoked arousal from stage 3 non-REM sleep. The initial 20 seconds appeared to be a simple arousal without EEG abnormalities; he suddenly became violently agitated, with initial synchronous spiking in all leads, then mainly in the right hemisphere. A second clinical-electrographic seizure occurred in stage 2 non-REM sleep (Fig 1) beginning with repetitive spikes in the right-frontal–central-temporal region maximal at EEG channels P4-T4 (parietal-temporal) for 4 seconds before violent agitation again obscured the EEG. At no time did he have focal tonic or clonic activity, bicycling, or pelvic thrusting typical of frontal seizures. The patient was urgently reevaluated in the sleep center and prescribed oxcarbazepine. That night he experienced his first generalized seizure. A few days later, a magnetic resonance imaging scan of the brain with contrast revealed a well-circumscribed, lobulated, cortically based mass involving the right parasagittal superior parietal lobe (Fig 2A), with a small focus of ring enhancement along the inferior aspect (Fig 2B).

He continued on oxcarbazepine therapy but surgery was delayed for family reasons. During that time he had no further parasomnia-like events, but he did have another tonic-clonic seizure and one episode during basketball practice (described as aimless wandering around the court). In the more than 6 months since surgery, there have been no further paroxysmal events of any kind.

Gross total resection of the lesion was performed. The final pathology report showed a 1 × 1.5 cm dysembryoplastic neuroepithelial tumor, World Health Organization histologic grade I (Fig 2C). His treatment plan includes continuing pharmacotherapy for at least 1 year depending on resolution of seizures and EEG abnormalities.

## Discussion

Dysembryoplastic neuroepithelial tumors are comprised of cortical dysplasia and multiple cell lineages of neuronal, astrocytic, and oligodendrocytic components.[2] They are primarily found in children and are associated with complex partial seizures; seizures typically remit following surgical resection. This boy is unusual because his tumor at presentation was not associated with any symptoms other than sleepwalking-like episodes.

Pediatric brain tumors presenting with seizures as the only clinical sign are rare, and those with exclusively nocturnal seizures mimicking parasomnias are seldom encountered.[3] The differential diagnosis of agitated sleep-walking includes nocturnal frontal epilepsy, which can present as paroxysmal arousals, paroxysmal dystonia, or

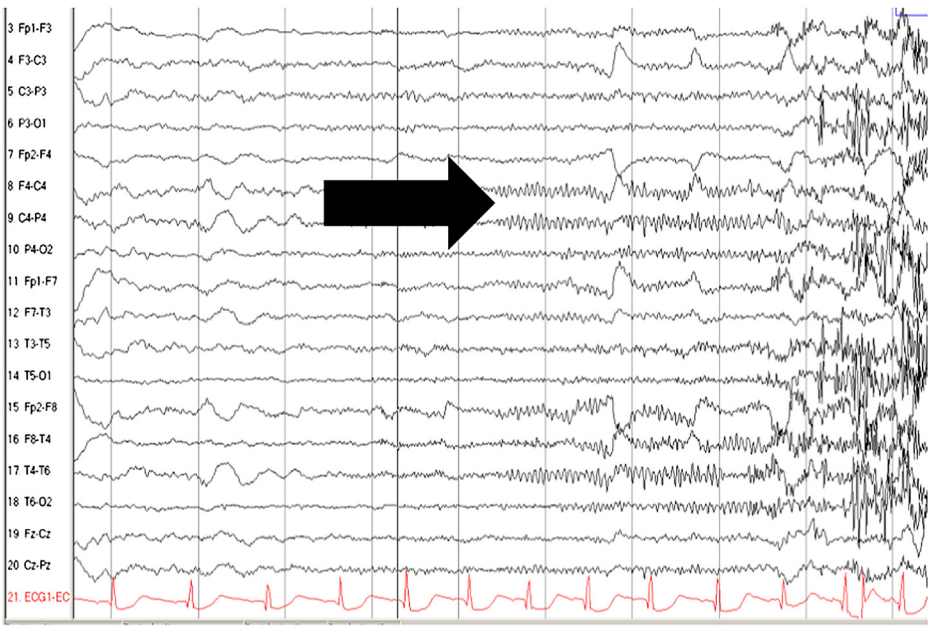


**Figure 1.** An episodic nocturnal awakening out of stage 2 non-rapid sleep, which began with repetitive spikes in the right-frontal-central-temporal regions (*arrow*) maximal at P4-T4 (parietal-temporal) before violent agitation obscured the electroencephalogram (EEG). Expanded EEG montage with standard 10-20 electrode placement using a 16-channel longitudinal bipolar montage. Electrode sites used: Fp1, Fp2, F7, F3, F4, F8, T3, C3, C4, T4, T5, P3, P4, T6, O1, and O2. Fp, frontopolar; F, frontal; T, temporal; C, central; P, parietal; O, occipital.