

Chronic Traumatic Encephalopathy Presenting as Psychogenic Nonepileptic Seizures on a Psychiatric Consult Liaison Service

Hope Russell, MD; Marygayle Radley, MD; and Gopakumar Panikkar, MD

Traumatic brain injury (TBI), chronic traumatic encephalopathy (CTE), and the physiological and psychological sequelae are areas of research gaining traction in many medical specialties. Although protective gear in sports has improved over time, athletes continue to suffer from head injuries, risking the development of both short- and long-term consequences. The case of a 14-year-old boy highlights the evolution of neuropsychiatric effects, leading to multiple differential diagnoses attempting to explain his symptoms.

Case Report

The patient is a 14-year-old boy with a history of 4 TBIs: a 2017 bicycle accident and 3 concussions while playing high school football leading to 2 emergency department visits. His parents reported an episode during which the patient was unable to recognize them, running out of the home, and later coming to realize he had eloped without recollection. There were also reports of multiple seizure-like episodes and command auditory hallucinations. The initial psychiatric consultation revealed a maternal cousin with schizophrenia. Computed tomography/magnetic resonance head imaging and basic laboratory studies were unremarkable. He received 24-hour electroencephalography (EEG), during which he had multiple convulsive spells, none of which were associated with epileptiform changes. The major differential diagnoses being considered included CTE with psychogenic

nonepileptic spell, amygdala-based seizures, and prodromal period for a primary thought disorder.

Discussion

There have been several case reports highlighting the development of neuropsychiatric symptoms following head trauma¹; therefore, the goal of this report is to add to existing literature. Psychogenic nonepileptic seizures (PNES) are considered a form of conversion disorder, meaning psychological symptoms are converted into physical neuropsychiatric symptoms. PNES resemble epileptic seizures although without abnormal cortical electrical discharge.² PNES include time-limited changes in behavior, thinking, and feeling that may resemble epileptic seizures³ and may be best managed by a multidisciplinary clinical team.⁴

Prolonged video EEG is the preferred diagnostic method, and other diagnostic testing such as laboratory testing is of limited diagnostic utility.⁵ Hypersynchronous excitability after TBI as a putative factor in posttraumatic epileptogenesis has been reported.⁶ However, the possibility of such mechanism in the causation of PNES remains unknown. There is consideration for the presence of amygdala-kindled seizures, but they are difficult to diagnose with basic EEG scalp electrodes; patients usually require electrode placement on the sphenoid bone.⁷ Suffering from TBI is a risk factor to develop PNES and often is associated with increased psychiatric comorbidities, severity of

symptoms, poorer functioning, and increased disability.⁸ CTE can develop following 1 or more TBIs; symptoms include behavior changes, mood changes, memory loss, confusion, and difficulty with organization.⁹ The episodes observed while the patient was undergoing EEG monitoring did not show epileptiform changes. Following discussion regarding the patient's command auditory hallucinations, the team observed an episode appearing consistent with PNES, with eyes darting horizontally and bilateral upper extremity shaking. The spell lasted 10–20 seconds, and the patient was not postictal.

Prodromal period for a primary thought disorder is considered because the patient does have a family history of schizophrenia and reported hearing command auditory hallucinations. Concerns for negative symptoms arose due to the patient appearing unbothered by his decision to quit his favorite sport, football. Finally, the patient's elopement from home and abnormal behaviors could be related to paranoid thinking. Individuals with TBI with genetic predisposition usually have symptom onset within 12 months of injury.¹⁰

The patient is potentially suffering from multiple pathophysiological processes, as the diagnoses considered are not mutually exclusive. It is known that individuals suffering from epilepsy are more likely to experience PNES, so both could be present. Some studies report up to 60% increased risk to development of schizophrenia in those who have suffered from TBI.¹¹ Changes

in the patient's symptomatology are likely to occur over time, but hopefully, with prevention of further brain damage with his decision to quit football, these changes may be mitigated to some degree.

Article Information

Published Online: June 11, 2024.

<https://doi.org/10.4088/PCC.23cr03701>

© 2024 Physicians Postgraduate Press, Inc.

Prim Care Companion CNS Disord 2024;26(3):23cr03701

Submitted: January 5, 2024; accepted February 26, 2024.

To Cite: Russell H, Radley M, Panikkar G. Chronic traumatic encephalopathy presenting as psychogenic nonepileptic seizures on a psychiatric consult liaison service. *Prim Care Companion CNS Disord*. 2024;26(3):23cr03701.

Author Affiliations: University of Texas Health Science Center at San Antonio, San Antonio, Texas (Russell, Radley); United States Air Force, Washington, DC (Radley); Brooke Army Medical Center, Fort Sam Houston, Texas (Radley, Panikkar); United States Army, Arlington County, Virginia (Panikkar); Department of Psychiatry, NYU Grossman School of Medicine, New York, New York (Panikkar).

Corresponding Author: Hope Russell, MD, University of Texas Health Science Center, 5788 Eckhart Rd, San Antonio, TX 78240 (russellh@uthscsa.edu).

Relevant Financial Relationships: None.

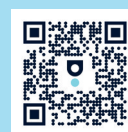
Funding/Support: None.

Patient Consent: Informed consent was obtained from the patient to publish the case report, and information was de-identified to protect anonymity.

References

- Scévola L, D'Alessio L, Saferstein D, et al. Psychogenic nonepileptic seizures after head injury: a case report. *Case Rep Med*. 2009;2009:712813.
- Lortie A. Psychogenic nonepileptic seizures. *Handb Clin Neurol*. 2013;112:875–879.
- Ristić AJ, Petrović I, Vojvodić N, et al. Phenomenology and psychiatric origins of psychogenic non-epileptic seizures. *Srp Arh Celok Lek*. 2004;132(1–2):22–27.
- Beimer NJ, LaFrance WC Jr. Evaluation and treatment of psychogenic nonepileptic seizures. *Nerol Clin*. 2022;40(4):799–820.
- Siket MS, Merchant RC. Psychogenic seizures: a review and description of pitfalls in their acute diagnosis and management in the emergency department. *Emerg Med Clin North Am*. 2011;29(1):73–81.
- Golub VM, Reddy DS. Post-traumatic epilepsy and comorbidities: advanced models, molecular mechanisms, biomarkers, and novel therapeutic interventions. *Pharmacol Rev*. 2022;74(2):387–438.
- Hamanah MB, Limotai C, Lüders HO. Sphenoidal electrodes significantly change the results of source localization of interictal spikes for a large percentage of patients with temporal lobe epilepsy. *J Clin Neurophysiol*. 2011;28(4):373–379.
- LaFrance WC Jr, Deluca M, Machan JT, et al. Traumatic brain injury and psychogenic nonepileptic seizures yield worse outcomes. *Epilepsia*. 2013;54:718–725.
- Insera CJ, DeVrieze BW. Chronic traumatic encephalopathy. In: *StatPearls [Internet]*. StatPearls Publishing; 2023. Accessed August 7, 2023. <https://www.ncbi.nlm.nih.gov/books/NBK470535/>
- Schwarzbold M, Diaz A, Martins ET, et al. Psychiatric disorders and traumatic brain injury. *Neuropsychiatr Dis Treat*. 2008;4(4):797–816.
- Molloy C, Conroy RM, Cotter DR, et al. Is traumatic brain injury a risk factor for schizophrenia? A meta-analysis of case-controlled population-based studies. *Schizophr Bull*. 2011;37(6):1104–1110.

Scan Now



Cite and Share
this article at
Psychiatrist.com