Case Report

Journal of Emergency Medicine Case Reports

An Uncommon Presentation of Septum Pellucidum Anatomical Variations: A Case Report of Generalized Tonic-Clonic Seizure in a Healthy Adult

Nurullah Parca[1], Ismail Atas[2], Ali Celik[1], Ozlem Bilir[1]
[1]Recep Tayyip Erdoğan University Training and Research Hospital, Department of Emergency Medicine, Rize, Türkiye.
[2]Rize State Hospital, Department of Emergency Medicine, Rize, Türkiye.

Abstract

The septum pellucidum (SP) is a thin, transparent, dual-membrane structure located between the lateral ventricles of the brain. Incidentally identified through imaging modalities, this variation, while rare, may manifest with symptoms such as neuropsychiatric disorders, headache, dizziness, seizures, nausea, and vomiting. In this report, we present the case of a healthy middle-aged man with cavum vergae (CV) and cavum septum pellucidum (CSP), who sought medical attention in the emergency department (ED) due to a generalized tonic-clonic seizure (GTCS). A 40-year-old male without any known medical history presented to our emergency department with a GTCS. Considering this as the first seizure, blood and imaging tests were conducted, all of which showed no abnormalities. Non-contrast computed tomography revealed sequel cystic encephalomalacic areas in the left occipital and right frontal cerebral hemispheres, consistent with a parapharyngeal epidermoid cyst, and the presence of cavum septum pellucidum et vergae. Emergency consultation from the neurological clinic was sought, and an electroencephalogram showed no seizure activity. He was subsequently discharged with a recommendation for follow-up at the neurology outpatient clinic. This case prompts critical considerations in the emergency medicine realm regarding the potential relationship between anatomical variations in the septum pellucidum and emergent seizure activity.

Keywords: Septum pellucidum, seizure, cavum vargae, emergency

Introduction

The septum pellucidum (SP) is a thin, transparent, dual-membrane structure located between the lateral ventricles of the brain. Typically, this bilayered membrane structure tightly closes, separating the two ventricles, either during the late fetal period or shortly after birth (1). Cavum septum pellucidum (CSP) and cavum vergae (CV) indicate persistent variations in the adult brain when SP's membranous layers fail to close properly, with CV denoting the extension of CSP (2). Although this anatomical variation is observed in 85% of term newborns, it usually resolves in the first 3-6 months postnatally. However, approximately 12% of children aged 6 to 16 may retain this variation (2-5).

Incidentally identified through imaging modalities, this variation, while rare, may manifest with symptoms such as neuropsychiatric disorders, headache, dizziness, seizures, nausea, and vomiting (2-4). If the cavity in this anatomical variation is larger than normal, it is defined as a cyst (2). Depending on the CSP and CV size, the severity of clinical symptoms that can be seen in this variant may increase (6). In this report, we present the case of a healthy middle-aged man with CV and CSP, who sought medical attention in the emergency department (ED) due to a generalized tonic-clonic seizure (GTCS).

Case Report

A 40-year-old male without any known medical history presented to our emergency department with a GTCS. According to information obtained from the patient's relatives, he experienced a complete loss of consciousness during the seizure, with approximately half an hour required for normal consciousness to return. The patient did not report any symptoms preceding the episode. Upon arrival, the patient was conscious, oriented, and cooperative, with vital signs within normal ranges. Detailed neurological and systemic examinations revealed no abnormalities. Considering this as the first seizure, blood and imaging tests were conducted. The patient underwent blood tests including complete blood count, biochemical panel, cardiac enzymes, and blood gas analysis. Considering the patient's clinical condition and history, toxicological causes contributing to the seizure etiology were not considered. Therefore, toxicology laboratory tests were

Corresponding Author: Nurullah Parca
e-mail: nrllhprca@gmail.com
Received: 17.01.2024 • **Revision:** 06.02.2024 • **Accepted:** 11.02.2024
DOI: 10.33706/jemcr.1421495

Cite this article as: Parca N, Atas I, Celik A, Bilir O. An Uncommon Presentation of Septum Pellucidum Anatomical Variations: A Case Report of Generalized Tonic-Clonic Seizure in a Healthy Adult. Journal of Emergency Medicine Case Reports. 2024;15(1): 23-25

DOI: 10.33706/jemcr.1392555
Journal of emergency medicine case reports. 2024;15(1): 23-25

not conducted in our emergency department, and referral to a specialized center was not deemed necessary due to the absence of clinical suspicion. The initial finger stick blood glucose measure ment upon the patient's presentation to the emergency department was 115 mg/dL. Serum electrolytes were within normal limits, and the lactate level measured in the blood gas analysis was 2.8 mmol/L. Non-contrast computed tomography revealed sequel cystic encephalomalacic areas in the left occipital and right frontal cerebral hemispheres, consistent with a parapharyngeal epidermoid cyst, and the presence of cavum septum pellucidum et vergae (Figure 1). No specific treatment was given to the patient, who did not have an active epileptic seizure when he was admitted to the emergency department. Emergency consultation from the neurological clinic was sought, and an electroencephalogram showed no seizure activity. The patient was monitored for seizures in the emergency department and remained free of active complaints or recurring seizures throughout the observation period. He was subsequently discharged with a recommendation for follow-up at the neurology outpatient clinic.

Discussion

In the etiology of epileptic seizures; There are acute hemorrhagic and ischemic stroke, metabolic diseases, electrolyte disorders, substanceabuse, head trauma, medications, infective processes and other causes. Additionally, in a study, it was thought that air temperature, relative humidity, wind speed and moon cycle may also cause epileptic seizures (7). In our patient, septumpellicidum anatomical variation was considered as a rare etiological cause.

This case underscores the uncommon occurrence of GTCS in an otherwise healthy middle-aged patient with persistent septum pellucidum anatomical variations—specifically CSP and CV. While CSP and CV are typically considered benign, their association with emergent neurological symptoms raises important considerations in emergency medicine.

Typically observed in 85% of term newborns, anatomical variations in the septum pellucidum often resolve spontaneously early in postnatal life (2). However, our case diverges from this pattern, presenting a healthy adult with GTCS, prompting an in-depth emergency investigation. Non-contrast computed tomography revealed sequel cystic encephalomalacic areas and a parapharyngeal epidermoid cyst. While evidence linking CSP and CV to seizure disorders is limited, these imaging findings suggest potential structural abnormalities contributing to the observed clinical manifestation, especially in the context of an emergency department presentation.

In the blood gas analysis performed in our patient, pH: 7.35, pCO2: 41 mmHg, pO2: 14 mm Hg and lactate: 2.8 mmol/L. A study found a negative and significant correlation between pH and pO2, pCO2, lactate (8). We could not find such a finding in our case. For this purpose, case series that are multicenter and have a large sample size can be studied.

The absence of abnormal findings in blood tests and electroencephalogram complicates interpretation. Despite identifying structural anomalies through imaging, the lack of abnormal electrical activity challenges the direct link between anatomical variations and seizures. This discrepancy highlights the intricacies of understanding structural brain changes and their impact on emergent clinical scenarios.

Surgical procedures may be considered in the event of disruption of cerebrospinal fluid flow, direct compression on adjacent brain structures, or the occurrence of focal neurological deficits, contingent upon the magnitude of this variation's size (3).

Conclusion

In conclusion, this case prompts critical considerations in the emergency medicine realm regarding the potential relationship between anatomical variations in the septum pellucidum and emergent seizure activity. Further research and collaborative efforts across emergency and neurology

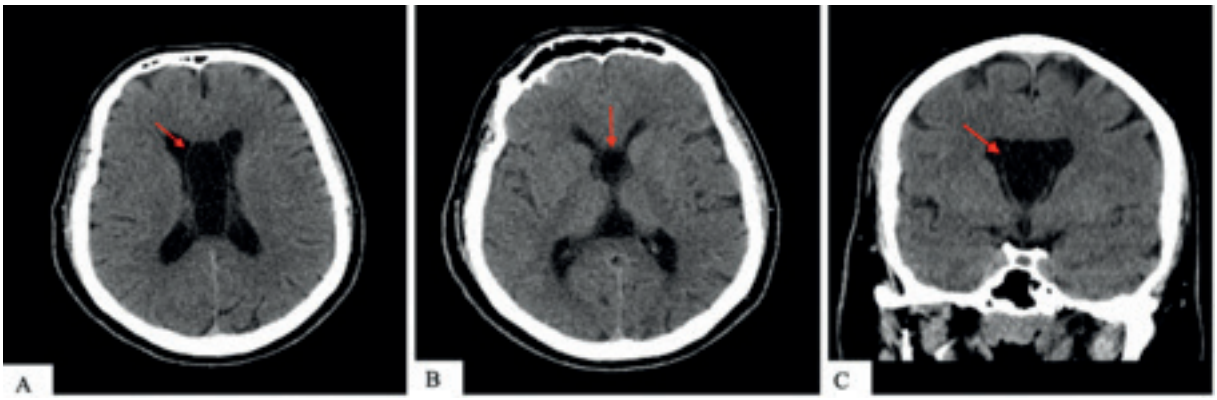

Figure 1. A-B axial section view of cavum septum pellucidum et vergae on non-contrast cranial tomography, C. Coronal section view of cavum vergae on non-contrast cranial tomography.

disciplines are crucial for unraveling this potential causal relationship, especially when routine diagnostic tests yield inconclusive results in the acute setting.

References

1. Rajasekharan C, Karthik V, Harikrishnan M, Lekshmi S. Cavum vergae and psychiatric illness: substantive or serendipity? BMJ Case Rep. 2018 Jun 28;2018:bcr2018225511. doi: 10.1136/bcr-2018-225511. PMID: 29954773; PMCID: PMC6040555.
2. Ferreira DBCO, Medeiros JW, Cwajg E, Ferreira-Pinto PHC, de Carvalho LU, Nigri F. Cavum septum pellucidum and vergae cyst: A symptomatic case with intracranial hypertension and multiple nerve involvement. Surg Neurol Int. 2022 Dec 2;13:564. doi: 10.25259/SNI_822_2022. PMID: 36600739; PMCID: PMC9805640.
3. Das JM, Dossani RH. StatPearls. Treasure Island, FL: StatPearls Publishing; 2022. Cavum septum pellucidum. Available from: https://www.pubmed.ncbi.nlm.nih.gov/30725733 [Last accessed on 2022 Apr 13]
4. Kryukov EV, Stanishevsky AV, Gavrilov GV, Gizatullin SK. Cysts of septum pellucidum, cavum vergae and cavum veliinterpositi. Meta-analysis of 368 cases. ZhVoprNeirokhirIm N NBurdenko. 2020;84:111–8.
5. Oktem H, Dilli A, Kurkcuoglu A, Pelin C. Prevalence of septum pellucidum variations: A retrospective study. Open Access Libr J. 2018;5:e5017.
6. Martins LP, Leitão AM, de Lucena JD, Gondim FA. Cavum septum pellucidum, da embriologia à clínica: Uma revisão da literatura. J Sağlık Biol Bilim. 2018;7:89–96.
7. Sahin L, Gur A. Association of the Meteorological Parameters and Epileptic Seizures. Int J Crit Care Emerg Med 2023, 9:151.
8. Ekmekyapar T. The effects of systemic inflammatory indices, lactate, and blood gas parameters on drug-resistant and drug-nonresistant epilepsy. Journal of Experimental and Clinical Medicine. 2023:40(3); 640-645.