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# Catatonia: Cavum Septum Pellucidum and Vergae, a Cause or a Coincidence?

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## Abstract

**Background:** Many studies in the 20th century have reported an association between Schizophrenia and Catatonia. Structural brain abnormalities have also been found in many psychotic illnesses, including schizophrenia and there are findings of association of large ventricles with chronic and deteriorating psychosis. It is possible that a large ventricular system may increase the likelihood of catatonia with a chronic course. Cavum Septum Pellucidum (CSP) and Cavum Vergae (CV) are structural abnormalities that have been associated with Schizophrenia. This is a case report of the presence of persistent CSP and CV in a patient diagnosed with schizophrenia with catatonia. **Conclusion:** Although there are several reports of the findings of a persistent large CSP and CV in patients with Schizophrenia, it is questionable whether the CSP and CV are the cause of the Catatonia or their occurrence is a mere coincidence.

## Keywords

Schizophrenia, Cavum Septum Pellucidum, Cavum Vergae, Catatonia

## 1. Introduction

Catatonia is a neuropsychiatric syndrome most commonly characterized by refusal to talk, eat or drink, abnormal posturing and stupor among other signs. Many studies have associated catatonia with schizophrenia but it is also significantly associated with affective, medical and neurologic illnesses [1]. Catatonic individuals diagnosed with schizophrenia have been reported to be more likely to have larger ventricle-to-brain ratios than others with catatonia from different causes [2].

We report a case of a 21-year-old man diagnosed with Schizophrenia with

symptoms of Catatonia and a Magnetic resonance image finding of persistent Cavum Septum Pellucidum (CSP) and Cavum Vergae (CV).

In both the 4th edition of the diagnostic and statistical manual, DSMIV and the 10th edition of the international classification of disease, ICD10, schizophrenia with catatonia is one of the classifications of Schizophrenia (Catatonic Schizophrenia). Although the neurotransmitters theory dominates the discussion of the aetiology of schizophrenia, several studies have reported the findings of gross structural abnormalities in the brain of patients with Schizophrenia [3] [4] [5]. [6] It has been reported with emphasis that patients with schizophrenia continue to have significantly greater ventricular/brain ratios among individuals with catatonia [2]. One of the structural abnormalities in association with Schizophrenia that had been reported severally is CSP [7] [8] which has also been reported in some neurologically diseased patients [9].

In the 1870s Karl Kahlbaum described a complex syndrome of bizarre motor behavior, volition, and vegetative states called catatonia [10]. A syndrome of catatonia is associated with several signs and symptoms which are grouped for simplification: "pure motor signs (e.g., posturing, rigor, immobility), disturbances of volition (e.g., ambitendence, negativism, automatic obedience), inability to suppress complex motor activities (e.g., stereotypies, rituals, echophenomena), and autonomic instability (e.g., tachycardia, hyperthermia)" [10].

Many psychiatric and general medical conditions have been reported to present with catatonia [11]. However, idiopathic catatonia also occurs, which is a form of catatonia not attributed to a particular medical or psychiatric condition [11].

## 2. Review of Literature

A study conducted in Nigeria that checked the presence or absence of the CSP, CV, or cavum velum interpositum (CVI) in successive cranial computerized tomography (CT) images of patients who were aged 6 months and above reported that cava variations are relatively common in neurological brain diseases with vergae variety commoner than the CSP [12].

In a Meta-analysis conducted by Liu *et al.*, in which a total of 120 cross sectional studies were reviewed, it was reported that individuals with mental disorders have significantly higher prevalence of CSP of any size as compared with healthy comparison subjects [13]. They also reported that there is no significant difference in the prevalence of CSP in individuals with schizophrenia spectrum and mood disorders [13]. In a study conducted earlier, increased prevalence of CSP was found in females with residual Schizophrenia as compared to control group matched by age and gender [14].

Landin-Romero *et al.* reported the presence of CV in adult patients with varying psychiatric disorders who were also said to have low IQ, present late, have deteriorating executive function and difficulties with memory [15]. Rajasekharan *et al.* reported a case of a 38 year old woman with both CSP and CV who presented with Psychotic symptoms that did not respond to the first antipsychotic

prescribed [16]. Cases had also been reported of a woman who has late onset Schizophrenia [17] and a boy with treatment resistant Schizophrenia [7] both of which MRI findings reported persistence of CV.

A case had been reported of a 40-year-old woman with Bush Francis Catatonia rating scale (BFCRS) score of 9 and Brief Psychiatric Rating Scale (BPRS) score of 37 at presentation whose brain computed tomographic scan revealed a large cavum septum pellucidum [18]. Another case of an elderly woman with a late onset catatonia had been reported by Yasaki *et al.* in which Magnetic resonance imaging revealed the presence of enlarged CSP with CV although with mild frontal and parietal atrophy [11].

Based on our literature search, reports of cases of persistent CSP and CV with Catatonic symptoms are not numerous.

## 3. Materials and Method

This is a case of a 21-year-old man who presented with a six-week history of pacing movement back and forth, purposeless facial movements, repeating components of a sentence or a syllable continuously and difficulty in initiating an action. He also hears voice of a lady coming from his abdomen while in his clear consciousness and sees abnormal creatures crawling on the wall. He was not on any medication at that time, has no history of trauma to the head, not febrile and not known to have any chronic medical illness. He was first consulted in a psychiatry out-patient clinic at the age of 18 years when he presented with predominance of positive symptoms, stabilized with monthly intramuscular Flupentixol 40 mg and daily oral Olanzapine 10 mg on out-patient basis. He remained stable until the current episode due to medication noncompliance and irregularities in follow ups. There is a positive family history of Bipolar illness in his sister. No history of use of psychoactive substance or alcohol. At the time of presentation, he was mildly restless with stereotypes, mannerisms and ambitendencies. His speech was hesitant, mostly monosyllabic and perseverative. The nature of his presentation necessitated hospitalization. Bush Francis Catatonia Rating scale (BFCRS) score and positive and negative syndrome scale (PANSS) were administered, routine laboratory investigations and magnetic resonance imaging (MRI) done.

## 4. Result

He has a Bush Francis Catatonia Rating scale (BFCRS) score of 19 and scores of 15, 27 and 41 respectively in the positive, negative and general psychopathology scales of the positive and negative syndrome scale (PANSS) There are no significant findings in his general physical and neurological examinations. Parameters from routine laboratory investigations were all within normal reference ranges. However, the brain MRI using T1 weighted, T2 weighted, PD and FLAIR sequences noted a persistent Cavum septum Pellucidum and vergae (**Figure 1** and **Figure 2**) [19] [20].

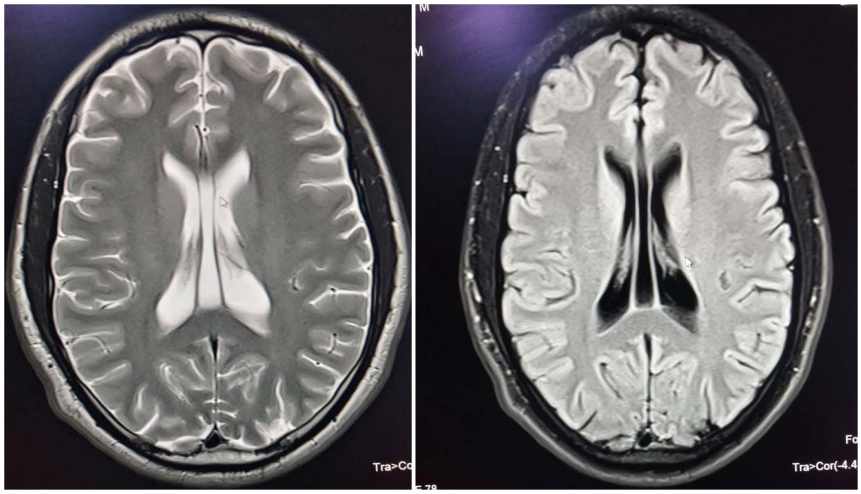

**Figure 1.** Brain MRI image of the patient T2 (right) and T1 (left) showing persistent cavum septum pellucidum and vergae [19] [20].

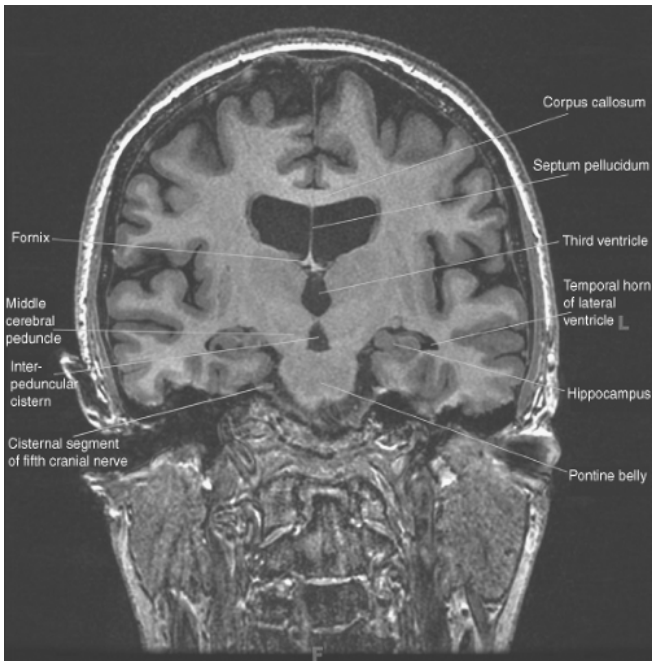


**Figure 2.** Brain MRI. Coronal plane T1-weighted image showing the third ventricles and a normal septum pellucidum [20].

## 5. Discussion

The patient described in this report has a diagnosis of schizophrenia with catatonia. He did not improve on adequate doses of Risperidone, Olanzapine, and Haloperidol, each given at a time in the same sequence for adequate duration. Catatonic symptoms did not improve despite adequate dose of lorazepam. He had 5 sessions of Electroconvulsive therapy but was switched to Clozapine due to slow progress and persistence of symptoms. He responded to treatment at 150 mg of Clozapine in divided doses. At the time of writing this report the patient is on daily 800 mg in divided doses and all of the presenting symptoms have re-

mitted and has been discharged and been followed up. He has been on outpatient for three (3) months at the time of writing this report and has been stable except for auditory hallucinations, albeit at a reduced frequency and intensity.

The most evident finding from the results of investigations of this patient is the presence of persistent cavum septum pellucidum and vergae.

"The septum pellucidum is a thin midline translucent (pellucidum = transparent) plate of two laminae that extends from the anterior part of the body, the genu, and the rostrum of the corpus callosum to the superior surface of the fornix" [21]. It is a membrane with two leaflets that creates a barrier between the lateral ventricles of the brain [16]. In between the leaflets of the membrane is a space which gradually closes and completely disappear within the first year of life [16]. Cavum septum pellucidum (CSP) is a space formed due to abnormal lack of fusion of the leaflets of the septum pellucidum (SP) [21] [22]. Sometimes, CSP occurs concurrently with Cavum vergae (CV) which is a posterior extension of CSP that lies in front of the splenium of corpus callosum and behind the anterior columns of fornix [16]. Both CSP and CV can be found as separate entities without any clinical significance, but studies have suggested that their persistence could result in some abnormalities of the limbic system and some midline structures [23]. CSP had been found to vary in both length and diameter. Varying width reported in certain study were 2 mm, 16.3%; 3 mm, 8.4%; 4 mm, 5.4%; and 5 mm or more, 0.3% [19]. An average longitudinal length found was 7.5 mm and 25 mm if there is a concurrent cavum vergae [21].

The abnormalities in midline brain regions such as the corpus callosum septum pellucidum and cerebellar vermis have been reported to be significant in patients with Schizophrenia (**Figure 3**) [26]. Of these, the abnormal closure of the leaflets of the septum pellucidum forming CSP has gained attention [13] [26]

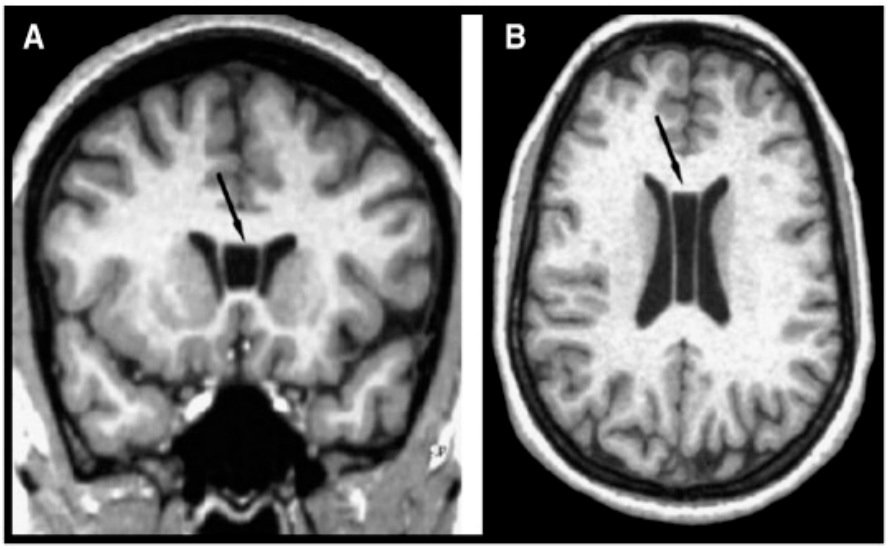


**Figure 3.** Complete fusion defect of the septum pellucidum leaflets in Coronal (A) and axial (B) MR images showing (arrow) the presence of Cavum Septi Pellucidi/Cavum Vergae severely enlarged in a patient with schizophrenia (18 years old) [24] [25].

[27]. Despite this attention, it is not very clear whether the presence of CSP is significant in Schizophrenia [26]. It is however suggested that a large CSP could be an anomaly during development which could contribute to neuropsychiatric presentation [28]. Interestingly, many studies have reported the presence of a larger CSP in patient with schizophrenia as compared to apparently healthy individuals [14] [29] [30].

## 6. Conclusion

Our report concluded that the finding in this patient is comparable with those found in earlier reports of structural abnormalities in the brain of some patients with schizophrenia. However, even though there are several reports of the findings of a persistent large CSP and CV in patients with Schizophrenia, the infrequent reports of same in patients with Catatonia makes it questionable whether the CSP and CV as seen in this patient are the cause of the Catatonia or their occurrence is a mere coincidence.

## 7. Recommendation

The use of brain imaging in patients with catatonia and chronic psychotic illnesses should be given attention as more reports on similar occurrences as above will help elucidate the association of catatonia with CSP an CV.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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