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Cavum septum pellucidum in schizophrenia: a case report

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Different structural alterations of the central nervous system (CNS), such as an increase in ventricular size, decrease in hippocampus and amygdala volume, and other abnormalities that are probably secondary to a loss of neuronal mass and neuropili (axons and dendrite ramifications) linked to a precocious alteration in neurodevelopment are described in patients with schizophrenia in greater proportion than in the general population. The *cavum septum pellucidum* is among the alterations whose role in the disease is more unknown, since the cavity between the two septum laminae draws attention in very few cases. According to several studies, this alteration is more frequent in patients with schizophrenia than in healthy subjects and currently its association to the disease is being studied. In the following, we present the case of a 37 year old patient with no outstanding background, who was admitted to our psychiatry department due to psychotic symptoms.

Key words:

Cavum septum pellucidum. Schizophrenia. Neurodevelopment.

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Cavum septum pellucidum en la esquizofrenia: a propósito de un caso

En los pacientes con esquizofrenia están descritas en mayor proporción que en la población general diversas alteraciones estructurales del sistema nervioso central, como el aumento del tamaño de los ventrículos, la disminución del volumen del hipocampo y la amígdala y otras alteraciones que traducen probablemente una pérdida de volumen neuronal y del neuropilo (arborizaciones axonales y dendríticas) vinculado a una alteración precoz del neurodesarrollo. Entre las alteraciones cuyo rol en la enfermedad es más desconocido se encuentra el *cavum septum pellucidum*. Ésta es una anomalía frecuente, pero poco conocida,

ya que en pocos casos llama la atención la cavidad entre las dos láminas del septo. Según diversos estudios esta alteración es más frecuente en pacientes con esquizofrenia que en sujetos sanos y en la actualidad se está estudiando su asociación a la enfermedad. A continuación presentamos el caso de una paciente de 37 años, sin antecedentes destacables, que ingresó en nuestro Servicio de Psiquiatría por presentar sintomatología psicótica.

Palabras clave:

Cavum septum pellucidum. Esquizofrenia. Neurodesarrollo.

INTRODUCTION

In the clinical practice, brain imaging tests are often performed in patients with first psychotic episode or atypical psychiatric symptoms to visualize the nervous system status in order to understand the disease better. Attention should be paid to the results of these tests. Different structural alterations of the central nervous system (CNS) such as alterations of the limbic system structure volume (amygdala, hippocampus) and of the lateral and third ventricles are described in schizophrenia¹. Furthermore, it has been hypothesized that alterations of the middle brain line (thalamus, *septum pellucidum* and corpus callosum) could be involved in attention and information processing deficit, which would give rise to the appearance of some of the schizophrenic symptoms². The existence has been demonstrated of an increase in size of the septum pellucidum in schizophrenia³⁻⁵, as well as in schizotypal disorder of the personality and affective psychoses⁵. In the following, we present the case of a 37 year-old woman with schizophrenia who had a large-sized *Cavum septum pellucidum* (CSP).

This is a 37 year-old, right-handed, single women without children. Standing out among her family background, there is a first degree relative with personality traits of suspicion and distrust towards the setting, with no known diagnoses. The patient is allergic to penicillin, has smoked half a pack of cigarettes a day since 17 years of age and has no risk alcohol consumption. She denies taking other toxics and has no other outstanding medical-surgical backgrounds.

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Since puberty, the patient has had characteristics of introverted personality, with restricted relationship circle. She reports self-limited hypothyroid mood episodes coinciding with environmental stressors. Her schooling was uneventful until she completed her university studies. She has worked in different companies, in categories that were not adapted to her educational level, leaving them due to relationship problems with her work companions with harmful and self-referentiality ideas.

In the psychopathological examination performed on admission, loss of syntonic contact and suspicious attitude, in addition to sensorial-perceptive and thought content disorders, stand out. She was first hospitalized in the acute unit in the year 2006 due to thought content disorders, being diagnosed of paranoid schizophrenia according to the DSM-IV-TR diagnostic criteria. The patient was treated with antipsychotic drugs and was discharged after two weeks of admission.

During this hospitalization, cranial MRI was performed, observing the existence of a large sized CSP (fig. 1). There were also other alterations in the MRI, such as cerebral atrophy with cortical predominance and other nonspecific ones, such as a small cyst in the left choroid fissure and hyperintense punctiform areas in bifrontal white matter. There were no alterations in the remaining complementary tests.

WHAT IS CSP?

Cavum septum pellucidum or *cavum septi pellucidi* refers to the cavity that is formed between two layers of the

Septum pellucidum. It also has other names, such as sixth ventricle, cavum vergae. It is considered to be a normal part of neurodevelopment and is commonly present until shortly after birth, persisting in approximately 10% of the adult population. The CSP may or may not be communicating with the ventricles, respectively containing cerebrospinal fluid or extracellular fluid. The communicating CSP is the result of late onset hydrocephaly or previous cranioencephalic traumas⁵. Non-communicating CSP is produced by neurodevelopment alteration and is that which would be associated to schizophrenia. According to several studies, its estimated prevalence in schizophrenia⁶ is approximately 15%-44.8%.

CASE DISCUSSION

There is evidence that alterations of the septi pellucidi are associated with schizophrenia^{7,8}, although there are varied conclusions which have not been sufficiently compared. In general, they indicate that CSP, especially the forms of more than 6 mm in length according to the Nopoulos et al.⁹ classification, would be associated to CNS vulnerability. This would result in the increase of prevalence of schizophrenia in subjects who have it. A relationship between large size CSP and worse prognoses of schizophrenia¹⁰, as well as decrease of Intelligence Quotient has been established¹¹. Some of the recent studies performed have not found any relationship between large-size CSP and schizophrenia¹². However, they also have not ruled this out, concluding that small size CSP is an anatomical variety and that more studies are necessary to clarify the relationship between large-size CSP and schizophrenia. On the other hand, in chronic

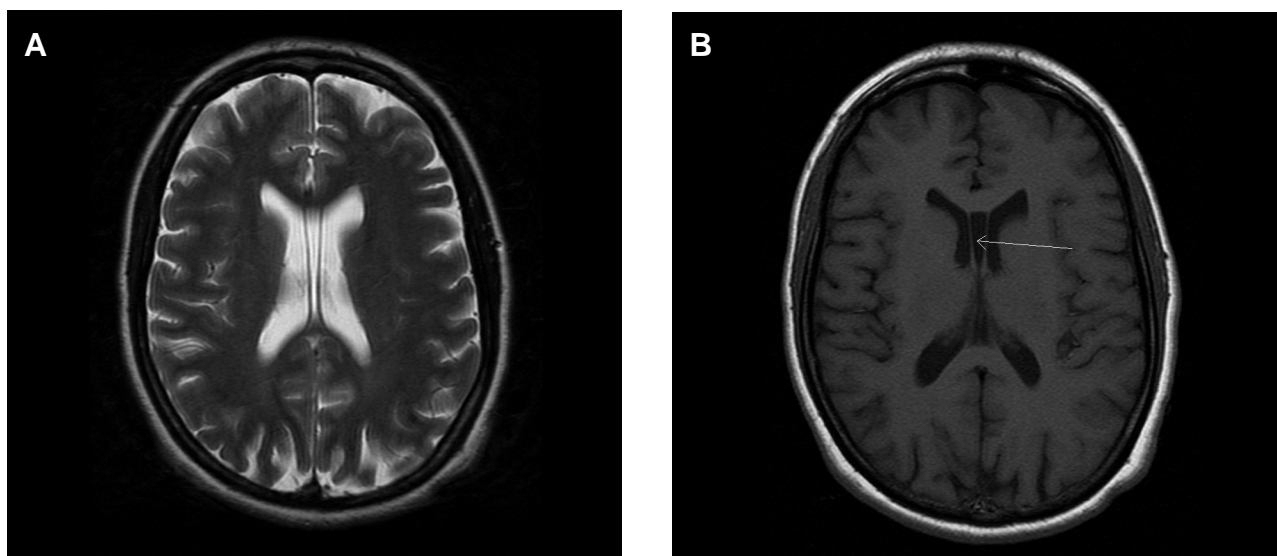


Figure 1 | Images of axle cuts of T2 weighted MRI in T2 (left) and T1 (right). Observe the cavum septum pellucidum (see white arrow in the image on the right). To consider large-size CSP, it must be observed in cuts equivalent to 6 mm or more, depending on the inter-cut distance of the test.

schizophrenia and in the first psychotic episodes, there is a greater prevalence of CSP and other alterations in the middle line brain structures⁶. In one of the last studies performed on this subject¹³, it was concluded that CSP is more frequent and statistically of larger size in the schizophrenic population than in the general population and that it also correlates with a greater suicide rate within the schizophrenic group.

CONCLUSIONS

This case may be useful to analyze the association between CSP and schizophrenia. Recent literature concludes that there are many structural alterations of the CNS, among them CSP, that are associated to schizophrenia. These morphological alterations that occur in patients with schizophrenia are indicative that this is a disease linked to early alteration of neurodevelopment.

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