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Anatomy

CAVUM SEPTUM PELLUCIDUM IN ADULT CADAVERIC BRAIN

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ABSTRACT The interval between two laminae of septum pellucidum is known as the cavum septum pellucidum (CSP). CSP is frequent in foetuses with less than 36 weeks of gestation. The presence of CSP in adults is reduced to 20%. Twenty-five adult cadaveric brains were removed intact from the cranial cavity. The cerebrum of each brain was split into two equal halves by a cut in median sagittal plane. Medial surface of each cerebral hemisphere was then examined in detail. Twenty out of the twenty-five samples had septum pellucidum on one side. Septum pellucidum was detected on both sides in five of the brain samples, with a cavity in the middle known as CSP. One of the brains with CSP had a circular deficit with well-defined margins on both the laminae of septum pellucidum which makes it a communicating CSP. Most of the available studies were either on associated clinical conditions of CSP or on the cause of CSP neurosurgical procedures, a greater understanding of CSP would be beneficial.

KEYWORDS : Septum Pellucidum, Cavum Septum Pellucidum, Cadaveric Brain

INTRODUCTION

The septum pellucidum is a thin, vertically placed partition consisting of two laminae, and sometimes separated by a cavity called cavum septum pellucidum.[1]

The Cavum Septum Pellucidum (CSP) was first described by an Italian anatomist Andrea Verga (1851) and later Walter Dandy contributed further regarding the CSP nomenclature (1931). The CSP is a space between the two septum pellucidum which lies anterior to the foramen of Monro, when they are at least 1 mm apart. It is bounded anteriorly, by genu and rostrum of corpus callosum (CC), while posteriorly by the fornix.

In the superior part it is bounded by the body of the CC, whereas in the inferior part by anterior commissure and rostrum of the CC.[2,3] Septum pellucidum has connections with the hippocampus via precommissural fornix fibers and with the hypothalamus via the medial forebrain bundle of Broca. The absence of the septum pellucidum is a phenomenon that occurs in 2-3 of 100,000 births in the general population.[4]

The septum pellucidum is used as an indicator of normal development of the midline structures of the cerebral hemispheres on post-natal neuroimaging studies.[5,6,7]. The increased prevalence of CSP have been reported in the early 1990s.[8, 9, 10] among schizophrenics, people who faced a repeated head trauma and among alcoholics.

METHODOLOGY

The study was conducted in the Department of Anatomy, Govt. Medical College Thrissur after obtaining approval from institutional ethics committee. During gross anatomy dissection, 25 cadaveric brains were subjected to screen for cavum septum pellucidum.

A mid sagittal cut was performed to observe the septum pellucidum. Using a Vernier calliper the gap between two laminae and the diameter of communicating CSP were taken.

RESULT

Septum pellucidum was observed in 80% (n=20) of samples as fused double lamina and 20% (n=5) of the samples showed cavum septum pellucidum. One of the brains having CSP showed communicating CSP with a diameter of 25.86 mm at the right side and 14.4 at the left side. The average gap between right and left lamina for 4 samples of CSP were 2.8±0.6 mm (M±SD).

The communicating CSP showed a large cavity with 5.7 mm gap between the lamina. The variations found during the study is shown in the following figures.

Figure 1: Non communicating Cavum Septum Pellucidum

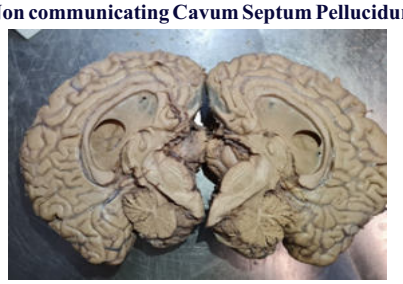

Figure 2: Communicating CSP with large foramen in both lamina of septum pellucidum

Figure 3: Septum pellucidum with fused lamina (Absence of CSP)

DISCUSSION

Developmental abnormalities of the septum pellucidum are very little described in the literature. In the present study, we have dissected 25 cadaveric brains to find out the frequency and presence of CSP. Reported prevalence of various studies are shown in table 1.

Table 1- Prevalence Of Csp In Various Studies

Study	Prevalence of CSP
Degreef et al. 19928	31%
De Lisi et al. 19939	29.8%

Jurjus et al. 199311	18.9%
Rajarethinam et al. 200112	41.9%
Hagino et al. 200113	74.7%
Kwon et al 199814	85%
Present study	20%

The highest prevalence was estimated by Kwon and his associates (1998) – 85% among normal individuals. Estimated CSP prevalence among schizophrenic patients ranged from 45 to 80 % .[9, 12, 13, 14] Controversy exists in the literature over whether CSP represents a true malformation or just a variant of normal. An elevated prevalence of cavum septum pellucidum has been reported in several psychiatric conditions, including schizophrenia and bipolar disorder.[15] CSP is a common finding in fetuses, but over 85% of them fuse by 3–6 months after birth.[16]The communicating CSP shown in one of the five CSPs in the present study is very rare. The clinical significance of communicating CSP has not received enough attention in literatures. Some studies reported that Noncommunicating CSPs may become communicating due to spontaneous rupture or during head trauma.[17.] The limitations of our study were the small sample size and the history of the individuals (cadavers) studied were not available to portrait a clinical relation of the morphological significance.

CONCLUSIONS

A continuous analysis of CSP can be beneficial to evolutionary science. Morphological variations or aberrations can be studied. Analysis using more advanced imaging techniques will be more helpful along with the physical examination of cadaveric brains. A close analysis of more CSPs with past medical history will be useful to conclude the effect of CSPs in our population.

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