

Septum formation of the lateral ventricles

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ABSTRACT

In an MRI study examining anomalies of the septum pellucidum in 505 cases, we detected bilateral septum formation of the lateral ventricles in a 17-month-old baby. In this study, we evaluate 505 (242 males and 263 females) patients referred to the Emaray Imaging Center, Ankara, Turkey with various prediagnoses. We specially selected all the cases from a non-psychotic population. We obtained MRI scans on a 1-Tesla imager (Picker International, Highland Heights, Ohio, USA), with slices of 5 and 6 mm thickness. In axial and coronal sections, we observed septum formation laterally between the anterior horn and the ventricular body of the lateral ventricles. Radio opaque septum formations started from the caudate nucleus and stretched to the genu of the corpus callosum. There was a second septum formation between the posterior horn and the ventricular body of the right lateral ventricle. It started from the caudate nucleus and stretched to the cavum vergae.

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We are reporting this case due to the importance of septum formation in the lateral ventricles. It is also crucial for hydrocephalus caused by superfluity of cerebrospinal fluid (CSF). If we are aware of these types of variations, we can implement possible surgical approaches, such as fenestration. The ventricular system, an important source of CSF, apparently contains, approximately 20 ml of CSF, but there are variations in its' size.¹ The 2 lateral ventricles, in the cerebral hemispheres, are the largest parts, and communicate with the slit-like third ventricle through the interventricular foramina (of Monro). Anatomically, each ventricle is divided into an anterior horn, in front of the interventricular foramen, a pars centralis or body, extending backward into the occipital region, and an inferior horn curving downward and forward into the temporal lobe.² For radiological purposes, however, it is customary to subdivide the lateral ventricle into numbered parts as follows: part 1 is the portion of the anterior horn that turns downward and laterally in front of the head of the caudate

nucleus; part 2 is the remainder of the anterior horn; part 3 is the highest portion of the pars centralis or body; part 4 is the trigone, also called the atrial region; part 5 is the posterior horn, subject to much variation in length; and part 6 is the inferior horn. The choroid plexus, invaginated into the thin medial wall of the ventricle, is particularly well developed in the inferior horn where the anterior choroidal artery supplies it, but curves upward and forward in the trigone, here bulging to form the glomus of the trigone, and in the central part continues through that to reach the interventricular foramen and into the third ventricle.³

Case Report. We performed the prospective MRI investigation to determine the anomalies of the septum pellucidum in 505 (242 males and 263 females) non-psychotic persons. During this study, we coincidentally detected bilateral septum formation of the lateral ventricles in a 17-month-old male infant. We obtained the MRI scans on a 1-tesla

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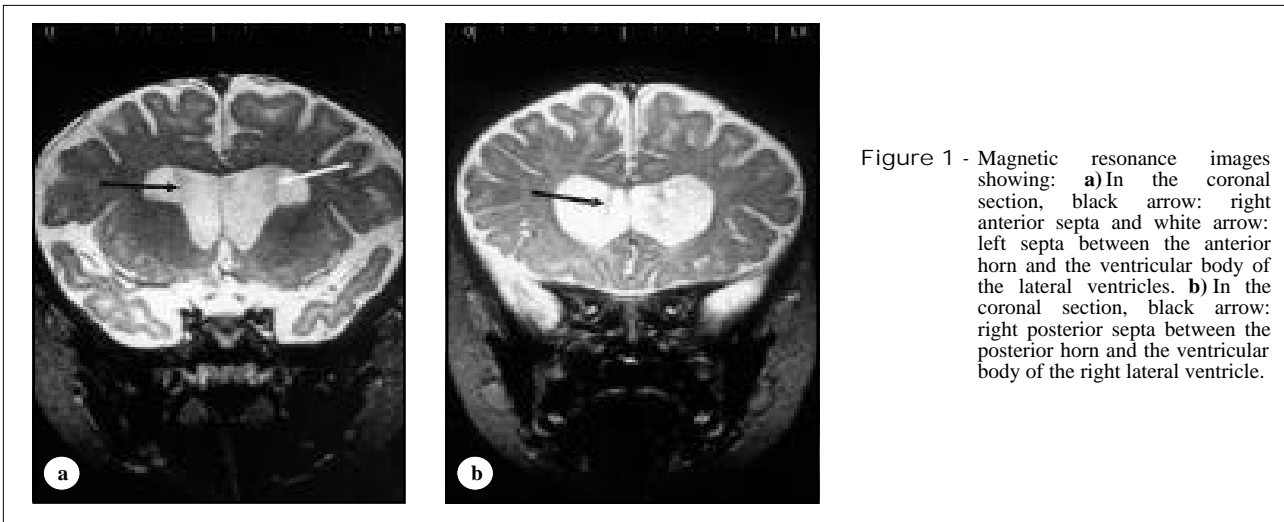


Figure 1 - Magnetic resonance images showing: **a)** In the coronal section, black arrow: right anterior septa and white arrow: left septa between the anterior horn and the ventricular body of the lateral ventricles. **b)** In the coronal section, black arrow: right posterior septa between the posterior horn and the ventricular body of the right lateral ventricle.

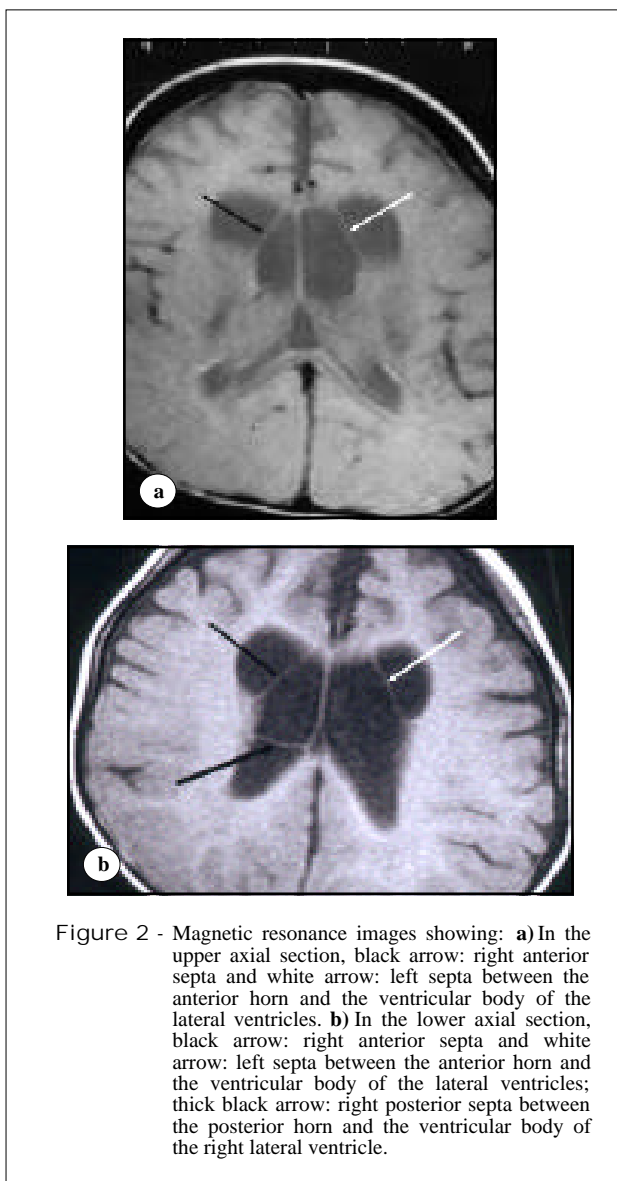


Figure 2 - Magnetic resonance images showing: **a)** In the upper axial section, black arrow: right anterior septa and white arrow: left septa between the anterior horn and the ventricular body of the lateral ventricles. **b)** In the lower axial section, black arrow: right anterior septa and white arrow: left septa between the anterior horn and the ventricular body of the lateral ventricles; thick black arrow: right posterior septa between the posterior horn and the ventricular body of the right lateral ventricle.

imager (Picker International, Highland Heights, Ohio, USA). We acquired T1-weighted scans using the spin echo technique with a repetition time (TR) of 540 milliseconds, echo time (TE) of 16 milliseconds in transverse, coronal, and sagittal planes. We obtained T2-weighted images with a TR of 2140 milliseconds, TE of 20, and 80 milliseconds. The slice thickness is defined as 5 and 6 mm. In axial and coronal sections, we observed septum formation laterally between the anterior horn, and the ventricular body of the lateral ventricles. Radio opaque septum formations started from the caudate nucleus, and stretched to the genu of the corpus callosum. The right septa had a length of 12 mm, while the one on the left was 14 mm long. (Figures 1a & 1b). There was a second septum formation between the posterior horn, and ventricular body of the right lateral ventricle. It started from the caudate nucleus, and stretched to the cavum vergae, and it had a length of 8 mm. (Figures 2a & 2b).

Discussion. Ventricular septa (VS) in the neonatal age group is not widely recognized. In 1986,⁴ sonography evaluated 24 cases, and one case was detected in 1992.⁵ Postmortem histological examination showed a ventricular septa formed by glial protrusion into the ventricles, and unilateral hydrocephalus. There is no reported case since 1992. Sonography is the preferred method in the prenatal age group,⁴ however, MRI is best to evaluate the size, and extension of ventricular septa, and tissues in the neonatal age as hydrocephalus, intraventricular hemorrhage, and infections are a major cause of true intraventricular septa,^{4,6} while periventricular leukomalacia, and head trauma may cause pseudosepta and 62% of shunt failures.⁴ Clinically, it is important to evaluate the condition before the shunt operations with MRI, due to

compartmentalization of the ventricles, and fenestrations may be required. We report our case detected by MRI, and according to our findings, the incidence is 0.2%.

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