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Case Report

Rare combination of a persistent anterior falcine sinus with developmental venous anomaly: A case report and literature review

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ABSTRACT

A 21-year-old woman was admitted with a 1-day history of headache. Her neurological examination findings were normal. Computed tomography angiography revealed an oval, well-enhanced dilated vascular lesion in the anterior interhemispheric fissure with a developmental venous anomaly characterized by caput medusae centripetally in the right hemisphere. On the magnetic resonance image, an anterior persistent falcine sinus was connected with the middle portion of the superior sagittal sinus. Cerebral angiography revealed the persistent falcine sinus located in the anterior falx and the parenchymal developmental venous anomaly with caput medusae. In addition, the venous phase of cerebral angiography demonstrated the obstruction of both the inferior sagittal sinus and the bridging vein between the superior thalamostriate and the internal cerebral vein. To our knowledge, this is a very rare case of the combination of an anterior persistent falcine sinus and a developmental venous anomaly.

1. Introduction

During the embryonic period, the falcine sinus is a normal anatomic venous structure located between the dural leaves of the falx cerebri that normally appears in the 20-mm embryo stage and closes after birth [1–3]. A persistent falcine sinus (PFS) has been commonly reported in pediatric patients [4], and it is considered to be a rare vascular lesion in adults [1,2,5,6]. Since 1915, the falcine sinus has been defined as a grid forming an anastomotic channel between the superior sagittal sinus and the straight sinus [7]. Several studies have reported that a PFS is mostly located in posterior falx cerebri and is combined with the obstruction of the straight sinus or superior sagittal sinus or is associated with congenital vascular lesions, such as vein of Galen malformation, arteriovenous malformations, absence of the corpus callosum, acrocephalosyndactyly, and Chiari malformation [4,8–10].

Here, we describe a very rare case in which a PFS in the anterior falx occurred along with a developmental venous anomaly (DVA) in an adult.

2. Case report

A 21-year-old woman with a 1-day history of headache visited our hospital. There were no other systemic complaints. She had no family history of cerebrovascular disease. Her neurological and physical examination results were normal. Her computed tomography angiography (CTA) scan at admission revealed an oval, well-enhanced dilated vascular lesion in the anterior interhemispheric fissure directly coursing toward the superior sagittal sinus [Fig. 1A]. This occurred along with vascular lesions characterized by caput medusae centripetally in the right hemisphere [Fig. 1B].

On her magnetic resonance image (MRI), the vascular lesion measured 17 × 14 mm in the anterior falx and was connected with the middle portion of the superior sagittal sinus. It was hypointense on the T1-weighted image (WI), isointense with multiple signal voids on the T2-WI [Fig. 1C], and well enhanced on the T1-contrast-enhanced (CE) image [Fig. 1D]. In addition, the sagittal view on the T1-CE MRI showed small, dilated vessels, which appeared as multiple linear enhancing lesions in the right hemisphere. The lesion was compatible with a DVA in the white matter of the right hemisphere.

Conventional cerebral angiography with arterial catheterization was performed. On her right internal cerebral angiogram, the arterial phase revealed normal findings [Fig. 2A]. However, four abnormalities were identified in the venous phase. First, an oval PFS was located in the anterior falx. Second, wedge-shaped dilated medullary veins, which were DVAs, converged in the subependymal collector in the right hemisphere [Fig. 2B, C]. These DVAs drained in two ways: into the

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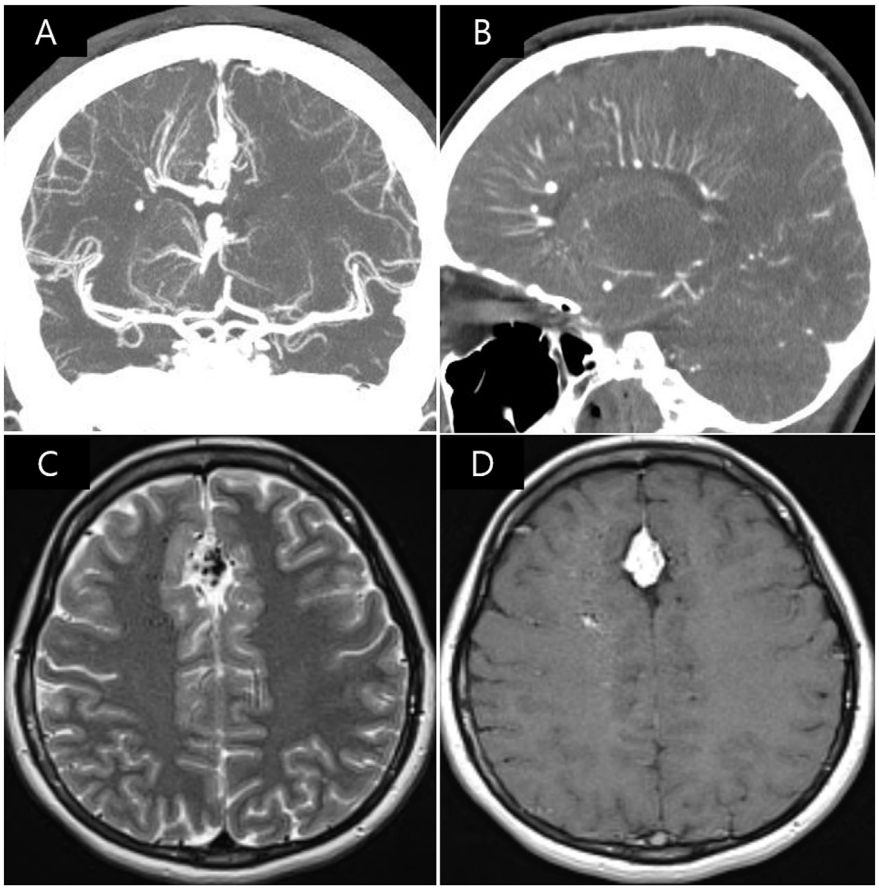

Fig. 1. Computed tomography angiography (CTA) and magnetic resonance imaging performed at admission. A: A coronal computed tomography angiogram shows an oval, well-enhanced dilated vascular lesion in the anterior interhemispheric fissure coursing directly toward the superior sagittal sinus. B: Paramedian section of the right hemisphere on the sagittal computed tomography angiogram with vascular lesions characterized by caput medusae centripetally. C: An axial T2-weighted image shows multiple signal voids in the falx area. D: An axial enhanced image shows a well-enhanced mass-like lesion in the falx cerebri.

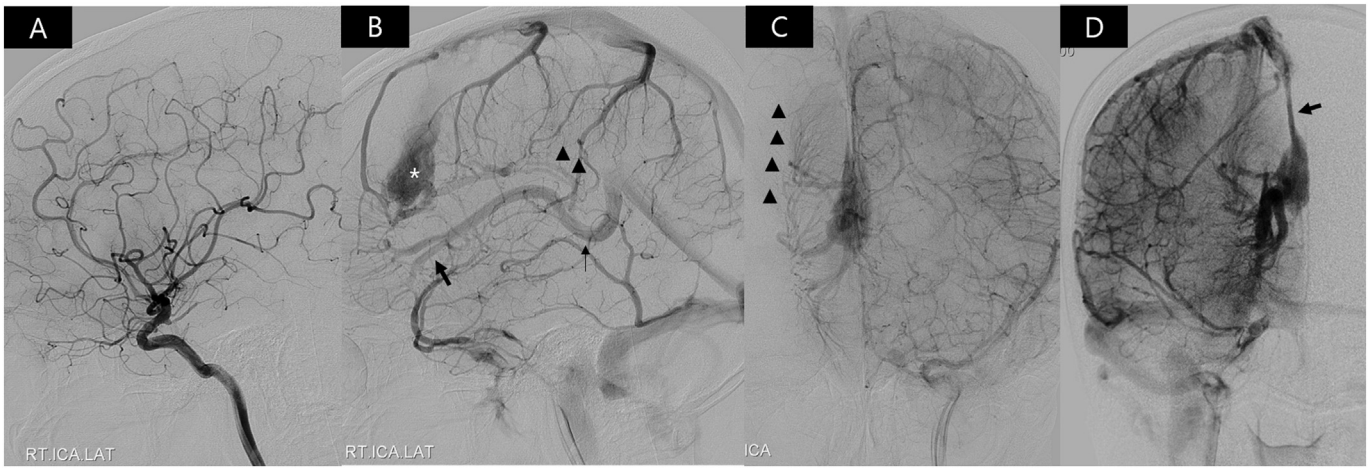

Fig. 2. Conventional cerebral angiography of both internal cerebral arteries. A: Arterial phase of the right internal cerebral angiogram shows normal findings. B: Midline section of the venous phase of the right internal cerebral angiogram. An oval, persistent falcine sinus is present in the anterior falx area (white*). There is no trace of an inferior sagittal sinus and no communicating vein between the dilated superior thalamostriate vein (arrow heads) and the internal cerebral vein (thin arrow). There are enlarged anterior septal vein (thick arrow) and internal cerebral vein (thin arrow). C: On the left internal cerebral angiogram, developmental venous anomalies are present in the contralateral hemisphere, which converge in the subependymal collector (arrowheads). D: The rotational image for 3D reconstruction image shows the falcine sinus fully communicating with the superior sagittal sinus (thick arrow).

superior sagittal sinus through the PFS and into the dilated internal cerebral vein through the anterior septal vein. Third, the inferior sagittal sinus on the right hemisphere could not be detected. Fourth, there was no communicating vein between the dilated superior thalamostriate vein and the internal cerebral vein. Therefore, the superior thalamostriate vein was connected with the anterior PFS through the anterior vein of the caudate nucleus. There was no finding of obstruction of the straight sinus or superior sagittal sinus [Fig. 2B].

No surgical treatment was suggested. Clinical and radiological follow-ups were recommended without any prescription. At the time of the last follow-up 1 year after discharge, the patient was neurologically normal and did not have any problem.

3. Discussion

The falcine sinus is a normal anatomic intrauterine venous structure located between the dural leaves of the falx cerebri that normally involutes after birth [1,2]. If the falcine sinus does not involute but