

Case Report

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Case report of coexistence of two variant anatomy, hypoplastic rostral superior sagittal sinus and hypoplastic right side transverse sinus and internal jugular vein

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Abstract

Both the hypoplasia of rostral part of superior sagittal sinus and right transverse sinus are uncommon normal variant, so the frequency of occurrence of both in one person is more less. This is what have reported here.

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Introduction

The Dural sinuses are venous channels lie between two layers of cranial dura matter, drain cranial venous blood and cerebrospinal fluid to the vascular system via the internal jugular veins. They are multiple and divided to superficial Dural sinuses and deep Dural sinuses, the largess are superior sagittal sinus, inferior sagittal sinus, cavernous sinus, basilar sinus, transverse sinuses and sigmoid sinuses in both sides.

Although, they manifest variable anatomical variability in the size, the shape and wall configuration, but their incidence are very rare, not exceeding 30%. Accordingly, the presence of two or more anatomical variants in the same person is less frequent.

In this study, we explore a case report of coexistence of two

anatomical variability of dural venous sinuses, which are complete hypoplastic rostral superior sagittal sinus and uncommon hypoplasia of transverse and internal jugular veins in the right side rather than in the left side.

Case presentation

A 7-week-old baby boy has NICU admission for 3 weeks as a case of Group B Streptococcal meningitis with bacteremia diagnosed as result of sepsis screening workup and radiological imaging for brain. Cranial ultrasound is requested as base line and the segment of superior sagittal sinus anterior to coronal suture is found small in caliber with suboptimal Doppler flow while the caliber and flow of the posterior segment is within the average (Figure 1).

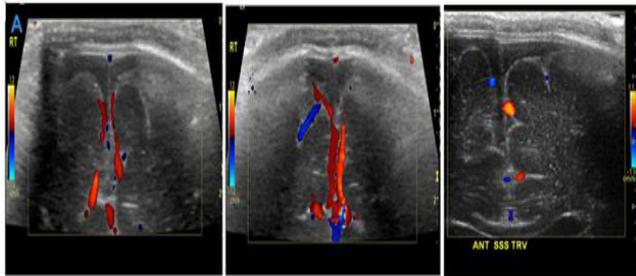


Figure 1A: Small caliber of anterior segment of superior sagittal sinus with grading attenuation of color Doppler flow from anterior to posterior.

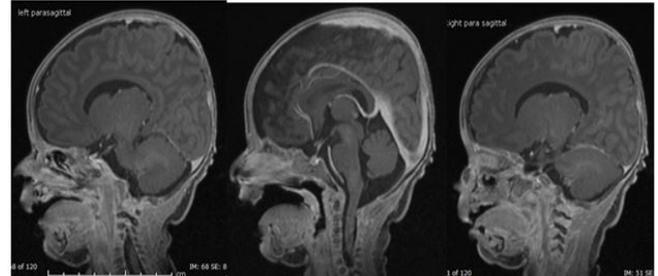


Figure 2B: Magnetic resonance image of brain with intravenous contrast shows no filling defect or evidence of sinus thrombosis.

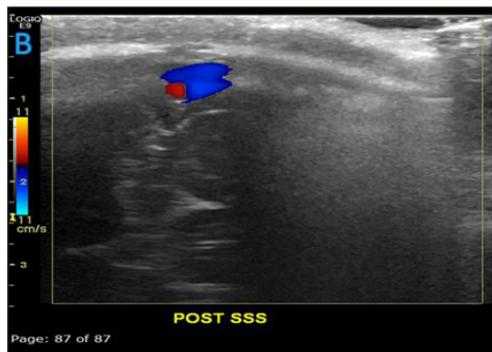


Figure 1B: Average caliber of posterior segment of superior sagittal sinus with optimum color Doppler flow.

Discussion

The Dural sinuses are venous channels lie between two layers of cranial dura matter; they receive venous blood and cerebrospinal fluid from the brain and communicate via sinuses and emissary veins in the cranium with outside the skull via the internal jugular veins into the vascular system. There are multiple sinuses such as inferior sagittal sinus cavernous sinus, basilar sinus etc. and all end in the internal jugular veins [1]. The Superior Sagittal Sinus (SSS) is the largest sinus in the brain. It extends from the foramen cecum anteriorly to its termination at the confluence of sinuses at the internal occipital protuberance posteriorly, where paired transverse sinuses are formed at the right side by the superior sinus and at the left side by straight sinus [2]. The caliber of the superior sagittal sinus is usually between 3.0 to 4.5 mm while its length ranges from 24 to 27 cm [3]. Major anatomical variations of the superior sagittal sinus are rare. Most of variability is found in the rostral (anterior) part which can be duplicated or can be hypoplastic however anatomical variability of the middle part of superior sagittal sinus is also reported [4,5]. The commonest reported variation is hypoplasia of its rostral end, which occurs in about 7% of individuals. In those cases, the absent portion is replaced by a pair of large parasagittal superior frontal cortical veins that run dorsally to join the origin of the superior sagittal sinus close to the coronal suture [4,6].

Subsequent magnetic resonance imaging with added contrast is done for the brain and cerebral venous system, which confirm the diagnosis of meningitis. Failure to detect any filling defect within the sinuses and absence of collateral formation exclude the possibility of sinus thrombosis as complication of meningitis. In addition, prominence of superficial frontal cortical vein in both side is noted. Interesting association of hypoplastic right transverse and internal jugular veins is also coexist (Figure 2). Further serial ultrasounds have followed the management and after full recovery from the infection and no interval changes reported.

Regarding the transverse sinuses, according to standard anatomical textbook, are usually asymmetrical and about 60% are the left sinus is smaller than the right. It is important to note that other anatomical variations are reported with the presence of size discrepancy as fenestrated segment, doubling of the distal superior sagittal sinus, atypical location of the sinus and other. In addition to these variations, total aplasia of one or both transverse sinuses are also reported. Because hypoplasia or aplasia of the left transverse sinus is more common than on the right, the left jugular system will often have small size [6,7].

Strong association of sinus thrombosis and missed diagnosis of venous hypoplasia are raising the importance of knowing, surveying and reporting these anatomical variations specially the attenuating and hypoplastic part veins [8].

Many studies evaluated the variability of Dural sinuses but non-shows presence of more than one variant in same candidate [6].



Figure 2A: Magnetic resonance venography shows hypoplastic rostral superior sagittal sinus and hypoplastic right transverse sinus and internal jugular vein.

Conclusion

- Co existence of hypoplastic rostral superior sagittal sinus and uncommon variant of small right transverse sinus rather than the left.
- The differential diagnosis of attenuating Doppler flow of cerebral venous system include hypoplastic/aplastic vessels as well as the sequel of cerebral infection such as thrombosis, vasculitis or compressing diffuse brain oedema.

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