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Another Important Pitfall in the Diagnosis of Dural Sinus Thrombosis in Neonates

There are known diagnostic imaging pitfalls that may lead to signal changes in the dural sinuses during MR imaging. These pitfalls, which include in-plane flow, hypoplastic sinus, and slow flow,¹ require the administration of intravenous gadolinium to definitely exclude sinus thrombosis.

Flow void is usually observed in a patent dural sinus,¹ but due to the soft, flexible skull of neonates,² flattening and slight narrowing or compression of one of the transverse sinuses may be encountered, depending on the head position during the scan. Accordingly, the flow void may be absent, or the slow flow inside the flattened sinus may even result in a hyperintense signal on FLAIR images, which would resemble a thrombus. This narrowing or compression also leads to a loss of flow signal on the venous time-of-flight angiography. Failure to recognize such a cause may require gadolinium administration to exclude sinus thrombosis or may lead to recommendations of unnecessary follow-up scans, which might not be practical in neonates and could increase health care costs because neonates require adequate sedation before undergoing this procedure. Furthermore, this may lead to diagnostic delay, which could have implications for patient management and raise unnecessary parent concern due to the uncertainty of their child's diagnosis. Inspection of the head position on the scout and correlation with the other sequences are simple tactics for circumventing this pitfall, and if there is uncertainty, the sequence should be repeated after rotating the neonate's head to the contralateral side for confirmation (Figure).

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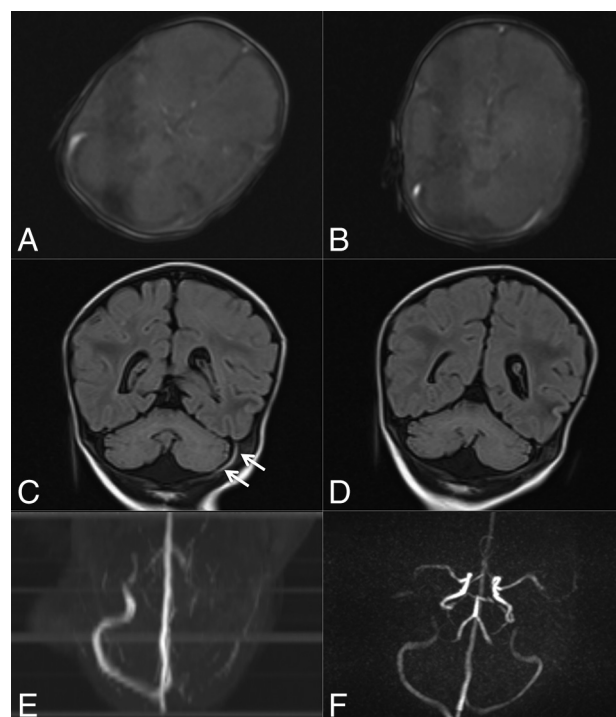


FIGURE. A 20-day-old female neonate with tonic-clonic epilepsy and perinatal asphyxia who underwent MR imaging to exclude cerebral venous thrombosis. The neonate was first placed with her head rotated to the left side, as observed in the scout (A). The FLAIR sequence (C) in this position showed hyperintense signal in the transverse and sigmoid sinuses (arrows). Furthermore, the venous TOF angiography showed no flow signal in the sinus (E). Before completion of the examination, the head rotation was corrected (see scout B), and the FLAIR sequence (D) was repeated; the hyperintense signal disappeared. A venous phase-contrast sequence was also performed (F) and showed normal flow in the left transverse sinus in this position. Therefore, no contrast was necessary to exclude cerebral venous thrombosis.

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