

Picture of the Month

Spontaneous resolution of fetal dural sinus thrombosis following term delivery of a live infant

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Prenatal development of dural sinus thrombosis (DST) is a very rare event and has been reported in pregnancies with maternal or fetal complications such as fetal coagulation disorders, asphyxia, sepsis, preterm delivery and congenital vascular defects; the exact cause is not clear in many cases¹.

We report a case of fetal DST detected at 30 weeks of gestation. The mother was 30 years of age. Serial ultrasound examinations of the fetal cranium confirmed a well-defined echogenic mass located above the cerebellum with dimensions of $4 \times 3 \times 3$ cm (Figure 1). A transvaginal ultrasound examination was performed to evaluate the cerebral sinuses as previously reported²; however, the dural sinuses were not clearly visualized. Laboratory readings for all tests, including coagulation parameters, were within normal ranges. Fetal magnetic resonance imaging (MRI) was performed using a 1.5-T system (Gyrosan Intera Master; Philips, Best, The Netherlands). Half-Fourier acquisition single-shot turbo spin echo (HASTE) images showed an infratentorial mass with surrounding extracerebral fluid collection, which was hypointense in T2-weighted sections (Figure 2) and hyperintense in T1-weighted images, consistent with a presumptive diagnosis of fetal DST. The findings were explained to the parents and expectant management of pregnancy was decided upon. Follow-up of the patient was uneventful until term and a Cesarean delivery was performed in the 39th week of gestation. At the time of writing, 10 months after delivery, the infant was in good general condition and spontaneous resolution of the thrombotic focus was observed on contrast enhanced T1-weighted MRI.

Very few reports of spontaneously resolved fetal DST are available in the literature^{1–5}. Although it was not possible in our case, an accurate diagnosis of fetal DST can be made using real-time and color Doppler ultrasound to visualize the dilated dural sinus and absence of blood flow². DST must be distinguished from other



Figure 1 Ultrasound image in transaxial view of the supracerebellar echogenic lesion (dural sinus thrombosis), with dimensions of 4×3 cm.

intracranial masses, including brain tumors, intracranial hemorrhage and aneurysm of the vein of Galen. MRI can be used to confirm findings on ultrasound examination and to support differential diagnosis, with the advantages of MRI over ultrasound being a larger field of view, superior soft tissue contrast, more precise volumetric measurements and greater accuracy in demonstration of cranial lesions^{3–5}.

The natural history of fetal DST is variable, with outcomes including neonatal death, mental retardation and satisfactory neural development of the infant. As in the presented case, in the absence of perinatal asphyxia, spontaneous resolution of the thrombosis and normal neurodevelopmental outcome are likely and the risk of mental retardation is low^{1,2}. Cases with a growing thrombus during follow-up and associated imaging signs such as infarction or intracranial hemorrhage are correlated with a relatively poor prognosis^{1,5–8}. Perinatal mortality following the prenatal diagnosis of DST has been reported to be around 10%, with severe morbidity

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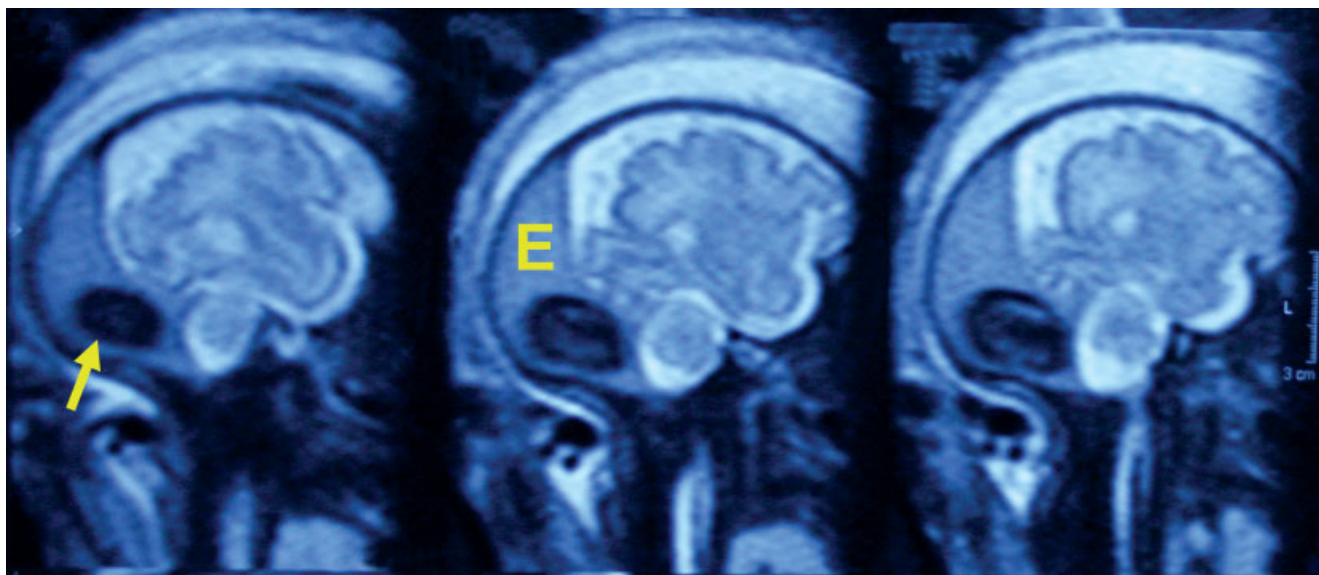


Figure 2 Magnetic resonance images of the fetal brain demonstrating thrombosis of the superior sagittal sinus with surrounding hematoma (arrow) which was hypointense in T2-weighted sections. Edema (E) was observed surrounding the lesion.

including mental retardation, seizures and hydrocephalus occurring in around 10% of surviving neonates⁹. Therefore, the management of pregnancies diagnosed with fetal DST should include extensive counseling of the parents regarding the potential complications and termination of pregnancy should be offered as a possible management option if permissible.

References

1. Laurichesse Delmas H, Winer N, Gallot D, Lopes K, Perrotin F, Fluncker S, Geissler F, Beaufriere AM, Vendittelli F, Couture C, Lemery D. Prenatal diagnosis of thrombosis of the dural sinuses: report of six cases, review of the literature and suggested management. *Ultrasound Obstet Gynecol* 2008; 32: 188–198.
2. Visentin A, Falco P, Pilu G, Perolo A, Valeri B, Santini D, Bovicelli L. Prenatal diagnosis of thrombosis of the dural sinuses with real-time and color Doppler ultrasound. *Ultrasound Obstet Gynecol* 2001; 17: 322–325.
3. McInnes M, Fong K, Grin A, ter Brugge K, Blaser S, Halliday W, Shannon P. Malformations of the fetal dural sinuses. *Can J Neurol Sci* 2009; 36: 72–77.
4. Merzoug V, Fluncker S, Drissi C, Eurin D, Grangé G, Garel C, Richter B, Geissler F, Couture A, Adamsbaum C. Multicentric study of the GRRIF (Groupe de Recherche Radiopédiatrique en Imagerie Foetale), part of SFIPP (Société Francophone d'Imagerie Pédiatrique et Périnatale). Dural sinus malformation (DSM) in fetuses. Diagnostic value of prenatal MRI and follow-up. *Eur Radiol* 2008; 18: 692–699.
5. Jung E, Won HS, Kim SK, Shim JY, Lee PR, Kim A, Kim JK. Spontaneous resolution of prenatally diagnosed dural sinus thrombosis: a case report. *Ultrasound Obstet Gynecol* 2006; 27: 562–565.
6. Gicquel JM, Potier A, Sitruk S, Girard N. Normal outcome after prenatal diagnosis of thrombosis of the torcular Herophili. *Prenat Diagn* 2000; 20: 824–827.
7. Spampinato MV, Hardin V, Davis M, Chang E, Rumboldt Z. Thrombosed fetal dural sinus malformation diagnosed with magnetic resonance imaging. *Obstet Gynecol* 2008; 111: 569–572.
8. Barron TF, Gusnard DA, Zimmerman RA, Clancy RR. Cerebral venous thrombosis in neonates and children. *Pediatr Neurol* 1992; 8: 112–116.
9. Legendre G, Picone O, Levallant JM, Delavaucoupet J, Ozanne A, Frydman R, Senat MV. Prenatal diagnosis of a spontaneous dural sinus thrombosis. *Prenat Diagn* 2009; 29: 808–813.