CASE IMAGE

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MV-flow in the assessment of fetal vein of Galen aneurysmal malformation

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A 38-year old gravida 2 para 1 woman was referred at 33 + 2 weeks of gestation for management of a vascular abnormality of the brain. Fetal neurosonography performed with a high-frequency transvaginal probe (EV2-12 and Samsung Hera W10, Samsung, Seoul, South Korea) showed the presence of an anechoic extra parenchymal structure in continuity with a dilated falcine sinus (Figure 1A). Color Dopper demonstrated turbulent flow within the mass (Figure 1B), confirming the diagnosis of vein of Galen aneurysmal malformation (VGAM), choroidal type.[1] The application of MV-Flow and Lumi-Flow algorithms to a 3D acquisition allowed a better delineation of the VGAM and its venous drainage, as well as the identification of feeder vessels (Figure 2). There were no signs of parenchymal brain injury. The fetus also presented with moderate cardiomegaly and mild tricuspid regurgitation. A male infant was delivered at 37 + 5 weeks of gestation and underwent early endovascular treatment successfully.[2]

The MV-Flow is a tool that enables to acquire spatially and temporally coherent data on low-speed blood flow information. It removes tissue motion artifacts and allows to assess blood microvascular perfusion at higher definition and resolution than conventional Doppler techniques, while maintaining a high frame rate.[3,4] Lumi-Flow allows a more realistic visualization of the blood vessels and improves their identification.[3,4] The application of the two algorithms has been proposed to improve the assessment of fetal brain circulation, allowing to obtain a 3D fetal angioscan. In our case, MV-Flow and Lumi-Flow allowed a better definition of VGAM morphology, venous drainage and feeder vessels than standard ultrasound techniques, confirming its potential in advanced fetal neurosonography.
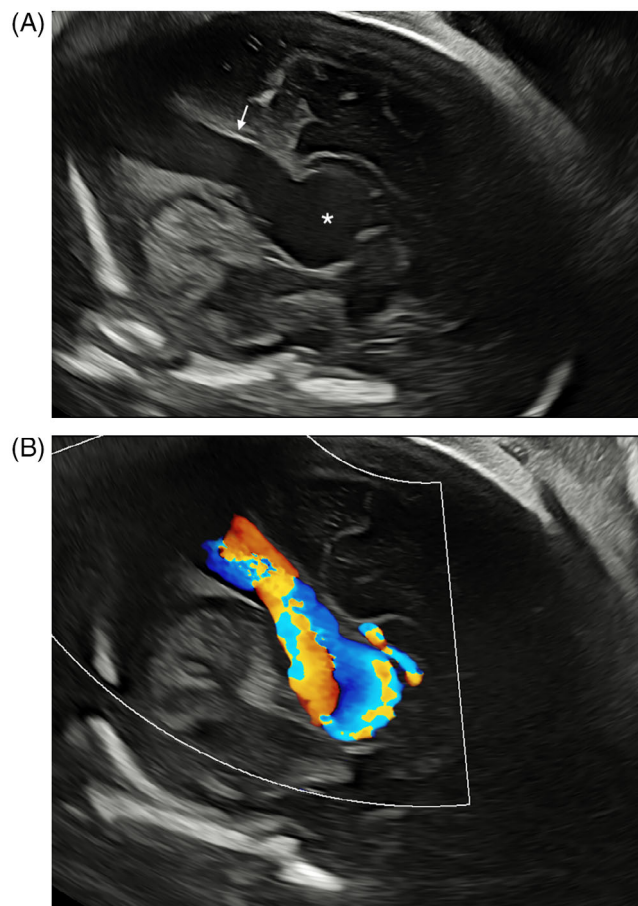

FIGURE 1 Transvaginal sagittal section of the fetal brain showing the vein of Galen aneurysmal malformation (star) draining into a dilated falcine sinus (white arrow) (A). Color Doppler shows turbulent flow within the structures (B).
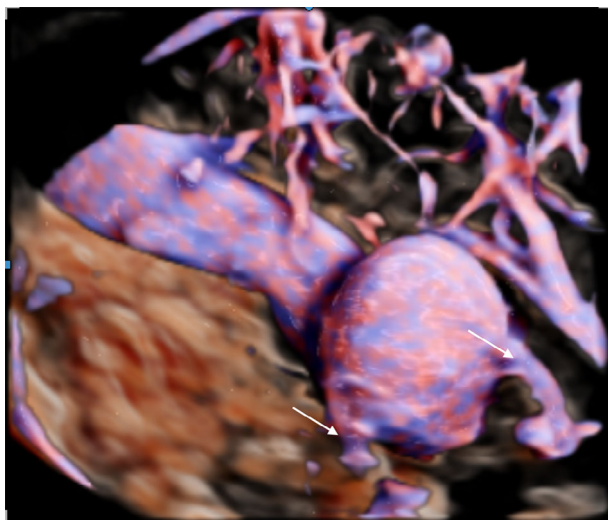
FIGURE 2 3D rendering obtained using a transvaginal volumetric 2–12 MHz probe and MV-Flow and Lumi-Flow (Samsung Hera W10, Samsung, Seoul, South Korea) showing the vein of Galen aneurysmal malformation draining into the dilated falcine sinus and demonstrating feeder vessels (white arrows).

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from thecorresponding author. The data are not publicly available due to privacy or ethicalrestrictions.

PATIENT CONSENT STATEMENT

The patient gave her written informed consent.

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