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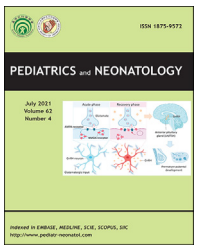

Letter to the Editor

Prenatal and postnatal diagnosis and management of congenital intracranial hemangioma

To the Editor

Fetal intracranial tumors are exceptional, and their prognosis and management depend on the pathology and location. Here, we report a case of an intracranial congenital hemangioma that was successfully treated without surgery.

A routine prenatal ultrasound (US) revealed a macrocephaly and large well-defined tumor within the right temporal fossa at 33 weeks of gestation in a male fetus (Fig. 1a, b). Fetal magnetic resonance imaging (MRI) demonstrated the extra-axial topography of a solid tumor. The structure of the mass was heterogeneous, without fatty components. Flow voids within the mass indicated the presence of high-flow vessels (Fig. 1c—e). Therefore, congenital hemangioma was suspected. The lesion slowly grew upon follow-up prenatal US. A cesarean section was performed at 38 weeks of gestation. Neonatal neurological examination and cardiac US were within normal limits. The brain MRI confirmed the prenatal findings. After intravenous injection of gadolinium, the tumor showed intense heterogeneous contrast enhancement (Fig. 1h). Considering the highly vascular aspect of the lesion, surgical biopsy was considered too dangerous. Therefore, treatment with propranolol was started on day 3 of life (2 mg/kg/day for 2 weeks followed by 3 mg/kg/day for 14 months). Due to the progression of ventricular dilation on follow-up US, embolization was performed at 17 days of life in order to reduce the mass effect on the brain, wherein the predominant external carotid vascular component was embolized with 250- and 400-μm non-resorbable embozene microspheres (Boston Scientific). Images during the follow-up at the ages of 2 and 7 months showed progressive regression of the tumor size and mass effect on the surrounding brain parenchyma (Fig. 1i—k).

The determination of the exact topography of the lesion in fetal intracranial masses is crucial for proper management. The most common intraparenchymal tumors are germ cell tumors, embryonal tumors, gliomas, and choroid plexus papilloma, which often have poor prognosis. In addition, lipomas and hemangiomas are the most common extra-parenchymal tumors, which have better prognosis.[1] In our patient, it was difficult to determine the exact origin of the mass on fetal US due to the size of the lesion. However, fetal MRI provided better tumor visualization and characterization, demonstrating the extraparenchymal location of the tumor and ruling out the presence of fat.

According to the International Society for the Study of Vascular Anomalies, congenital hemangiomas (CHs) are benign vascular tumors that are fully developed at birth; they are a different biological entity from infantile hemangiomas, which appear and grow shortly after birth, although the imaging findings are similar.[2] Some rapidly involute spontaneously after birth (rapidly involuting CH [RICH]), whereas involution is incomplete (partial involuting CH [PICH]) or absent (non-involuting CH [NICH]) in other cases.[2] CHs carry a high risk of bleeding and may cause high-output cardiac failure and thrombocytopenia.[3] Given their very low frequency, no evidence-based management or treatment strategies for congenital intracranial hemangiomas have been established to date. In our case, most of the arterial flow came from the external carotid artery, so the option to embolize this component was considered safe to reduce the mass effect on the brain and limit the hemorrhagic risk. During the follow-up,

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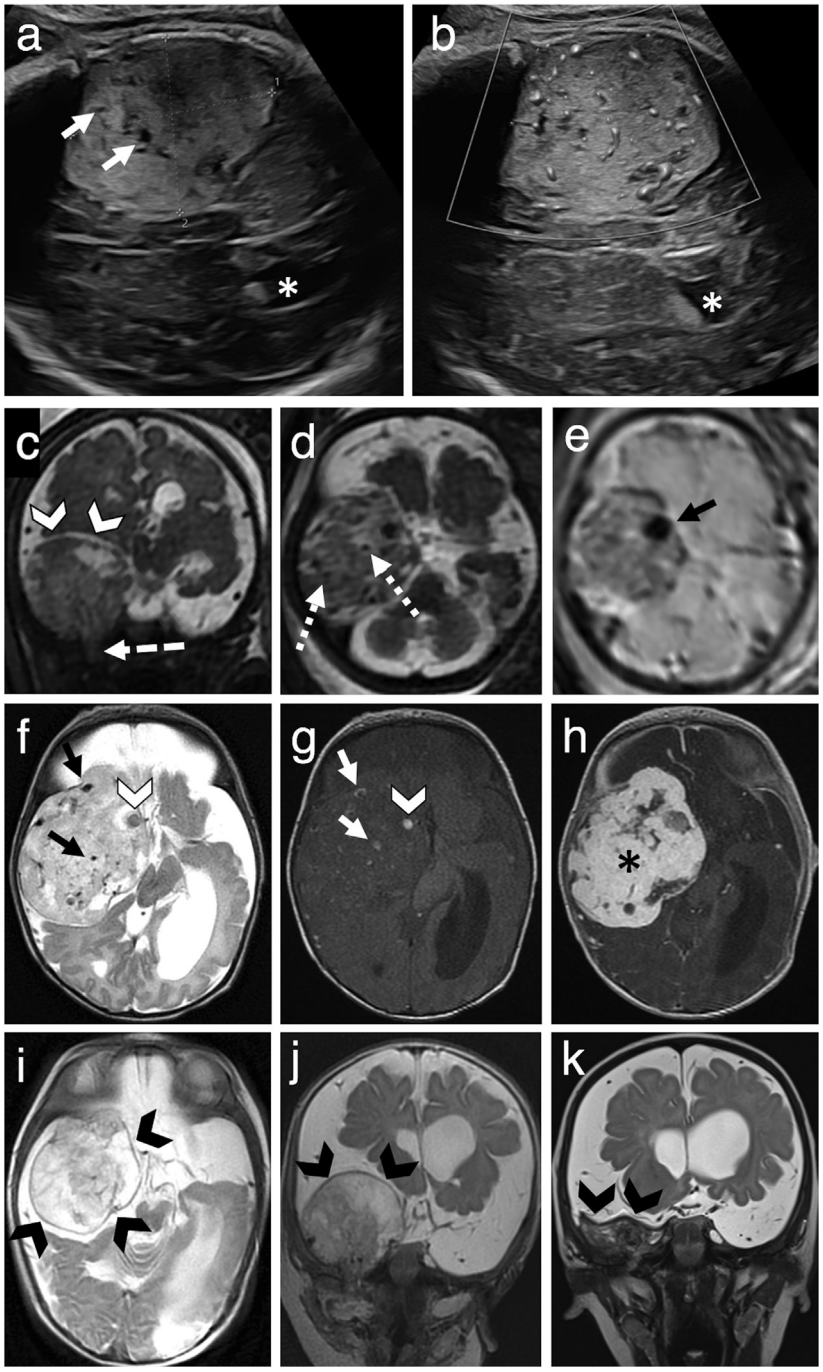

Figure 1 **(a)** Fetal US at 33 weeks of gestation showing a well-defined hyperechoic right supratentorial mass, with small hypoechoic foci (*white arrows*) corresponding to the vascular structures at color Doppler. **(b)** The tumor generated compression of the right lateral ventricle and left ventricular dilatation (*asterisk*). **(c, d, e)** Fetal MRI. Coronal and axial SE-T2-weighted planes demonstrated an extraparenchymal topography of the tumor (*arrowheads*), with an extracranial infratemporal extension (*large dotted white arrow*). In the transverse plane, the well-defined tumor had a heterogeneous intermediate signal on SE-T2 **(d)**, with low signal curvilinear vascular structures (*small dotted white arrows*) on SE-T2 and focal hemorrhagic low signal foci on GE-T2 (**e**, *black arrow*). **(f, g, h)** Postnatal MRI at day 1 of life. Axial SE-T2- and T1-weighted planes showed low T2/high T1 vascular structures (*arrows*) and one high T1 hemorrhagic focus (*arrowhead*) within the tumor. Axial SE-T1-weighted after intravenous administration of gadolinium demonstrated heterogeneous and intense contrast enhancement of the tumor (**h**, *asterisk*). **(i, j)** Follow-up MRIs at age 2 months. Axial and coronal T2-weighted planes demonstrated global size reduction (*black arrowheads*) with the regression of vessels size within the tumor. (**k**) At the age of 7 months, coronal T2-weighted images showed progressive involution of the right temporal fossa tumor (*black arrowheads*).

remarkable reduction in size was demonstrated, and the child continues to grow well 1 year after the initial diagnosis, with mild residual left hemiparesis.

In conclusion, physicians should be aware about the typical imaging features of the benign extra-axial congenital hemangioma, as those features may have paramount implication for the prenatal decision-making and postnatal management.

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Declaration of competing interest

The authors declare that they have no competing interest.

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