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Case presentation

Fetal cerebral hyperechogenic parenchymal lesions represent a diagnostic challenge, as destructive, vascular, infectious, and developmental etiologies may present with overlapping prenatal imaging features. We report an unusual prenatal presentation of intraparenchymal lipoma, diagnosed by postmortem histology, mimicking vascular malformation with associated cortical malformation, highlighting key imaging considerations for differential diagnosis.

A singleton pregnancy was referred at 32 weeks' gestation following suspected unilateral ventriculomegaly. Dedicated neurosonography demonstrated a large hyperechogenic lesion affecting the right frontal brain lobe, with irregular margins and adjacent vascular signals, associated with ventricular asymmetry and abnormal cortical morphology suggestive of polymicrogyria. Differential diagnosis included cerebral injury and developmental venous anomaly, therefore an MRI was performed, depicting a mesial frontal parenchymal defect with abnormal cortical architecture, callosal thickening ((T1-, T2- and SWI sequences). Genetic assessment including CMA and ES was normal. Serial imaging showed no change in size or morphology or vacuolization of the hyperechogenic area, ruling out hemorrhagic/ischemic nature of the lesion. At 34 weeks, the possibility of a frontal lipoma was considered as a differential diagnosis. After multidisciplinary counseling, due to the severity of the lesion, the couple requested termination of pregnancy. PM examination demonstrated an extensive mesial frontal leptomeningeal lipoma associated with cortical maldevelopment and polymicrogyria, explaining the atypical prenatal imaging appearance.

Intracranial lipomas may present prenatally as irregular hyperechogenic parenchymal lesions mimicking disruptive or vascular cerebral pathology. Recognition of lesion location, temporal stability, and combined neurosonography–MRI assessment is essential for accurate diagnosis. Among vascular-appearing lesions, intraparenchymal lipoma should be considered when no interval changes occur and a typical developmental venous anomaly is absent. Although rare, these lesions may be associated with cortical malformation and potentially significant neurodevelopmental consequences.

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Figure 1. Parasagittal neurosonographic view demonstrating a large irregular hyperechogenic right mesial frontal parenchymal lesion, later confirmed as an intraparenchymal lipoma.

