What's Your Diagnosis: Fetal Brain Lesion

By Joe Antony, MD [3]

Our patient presented at 29 weeks gestation for a routine prenatal ultrasound.

**History and Symptoms:** Our patient came in for routine ultrasound examination at 29 weeks gestational age. She had normal menstrual cycles before the pregnancy and did not have a history of any major illness. This was her first pregnancy.

**Family History:** She was one of 4 children.

**Present Pregnancy:** Our patient had a history of 29 weeks amenorrhea which corresponded with the age of the fetus on ultrasound scan. She had no history of abnormal bleeding P/V or spotting during this pregnancy.

**Clinical Examination:** Her vital signs were normal and blood pressure was (BP: 124/ 80 mm. of Hg). Abdominal examination indicated no major clinical findings. The fundal height of the patient corresponded to the age of the fetus (29 weeks).

**Imaging Studies:** This patient underwent routine transabdominal ultrasound imaging to study the biophysical profile of the fetus and to rule out any anomalies.

**Image 1:** Transverse section of fetal head
*Images courtesy of Dr. Jaydeep Gandhi, India.*

**Image 2:** Sagittal section of fetal spine

**Image 3:** Axial section of the fetal skull
What are your findings based on these 3 images?

**Sonographic Findings:** Before we study the obvious lesion in the fetal head, note the appearances of the fetal spine and fetal femur. These two structures of the fetus appear to be normal. The fetal head images show a relatively large mass in the fronto-parietal part of the head, located deep to the side of the fetal scalp and superficial to the fetal skull.

Is this a fetal skull mass or a placental mass?
The answer is obvious in the axial section of the fetal skull (Image 3). The mass is located within the fetal head.

1. What kind of mass would produce this appearance in the fetus?
2. What are the diagnostic possibilities for a mass of this size and location?

**Diagnostic Possibilities**
The first possibility could be fetal encephalocele or herniation of the fetal brain via a defect in the fetal skull. To diagnose a fetal encephalocele, we should expect to see a calvarial defect. Viewing images 1, 2 and 3 this type of defect is not noted in any of the ultrasound scans. This excludes the possibility that the mass is an encephalocele. If this mass does not arise from the fetal brain (intracranial), it must be extracranial in origin.
The more common extracranial masses would be the fetal scalp edema or hematoma (caput succedaneum or cephalhematoma). This is a condition that involves a serosanguinous, subcutaneous, extraperiosteal fluid collection with poorly defined margins. It is caused by the pressure of the presenting part of the scalp against the dilating cervix (tourniquet effect of the cervix) during delivery. This can be produced in a fetus if there is premature rupture of the amniotic membranes. In this pregnancy there is no history of this and the amniotic fluid volume was normal. Cephalhematoma is almost always seen in the occipital region of the scalp, which leads us to the conclusion that the lesion in these images is a neoplasm.

What are the various neoplasms that can produce the appearances we see in this fetus?
Common neoplasms that can cause an extracranial mass in a fetus are:

- hemangioma
- cystic hygroma
- lymphangioma
- teratoma and sarcoma of the scalp

In order to distinguish the various entities and find a suitable diagnosis for this case observe the color Doppler (image 4). In this image, there is a moderate amount of flow within the fetal scalp mass.

**Image 4:** color Doppler
What is your diagnosis?

**Discussion:**
A **cystic hygroma** can be excluded because the mass is solid. Cystic hygroma's are not.
A **teratoma** is possible, but would be inhomogenous, with a complex echotexture.
This leaves the possibility of a **hemangioma** or a **sarcoma**. The low flow vascularity within the mass points us in the direction of this lesion being a hemangioma. However, only further investigation will help clearly to distinguish a sarcoma of the scalp from a hemangioma.

**Final Diagnosis:** fetal scalp hemangioma

**Prognosis:** Hemangiomas are the most common tumors in neonates, and most infantile hemangiomas are medically insignificant. Occasionally neonatal hemangiomas may impinge on vital structures producing ulceration and, bleeding. Others may produce high-output cardiac failure or significant structural abnormalities or disfigurement. Occasionally, a cutaneous neonatal hemangioma may be associated with one or more underlying congenital anomalies.

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