

# *Fetal Hepatic Hemangioma*

## *Prenatal Diagnosis*

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A case of a fetal hepatic hemangioma, complicated by dilated cardiomyopathy, is presented. In cases of large arteriovenous shunting, emergent treatment is often required following delivery due to ensuing renal failure, pulmonary hypertension, congestive heart failure, and coagulopathy. A thorough perinatal sonogram performed at a screening facility detected the anomaly, providing the patient and her physician time to arrange for a delivery at a tertiary-care center that could accommodate such a critically ill patient.

*Key words:* hemangioma, cardiomyopathy, arteriovenous shunting, high-output cardiac failure

Sonography has become invaluable in the perinatal diagnosis of life-threatening conditions that require emergent treatment upon the delivery of the fetus. A hepatic hemangioma of the liver can be one such pathogenic process. Most hemangiomas are asymptomatic, found incidentally later in life or during postmortem examination.<sup>1</sup> However, rarely, some lead to hepatomegaly and dilated cardiomyopathy. If the condition is undiagnosed, the fetus may deliver at a center unprepared for the rapid cascade of symptoms that can accompany such an anomaly. A thorough perinatal sonogram can uncover these potentially fatal abnormalities. This information is critical to the patient and her physician, allowing them time to assemble the proper team of specialists at a facility that can accommodate a critically ill infant.

### ***Case Report***

A 31-year-old woman was referred to our perinatology office with a history of decreased fetal movement, nonreassuring biophysical profile, and an abnormal sonogram indicating an enlarged fetal heart and a hypoechoic mass in the fetal liver. By her last menses, the patient's gestational age was estimated at 35 weeks and 2 days.

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FIG. 1. Transverse view of the fetal chest, showing dilated cardiac chambers.



FIG. 2. Transverse view of the fetal chest, demonstrating an increased cardiac axis and enlarged heart.

A perinatal sonogram was performed with an Acuson Sequoia 512 (Acuson, Mountain View, California), using sector and curved array transducers (3.5 to 5 MHz). Sonography demonstrated dilated cardiac

chambers suggestive of cardiomyopathy (Fig. 1). The cardiac axis was increased to 69 degrees (Fig. 2), and septal hypertrophy was present. The contractility of the heart was reduced with a measured right



**FIG. 3.** Transverse view of the fetal abdomen (arrows), showing hepatic vessels feeding the hemangioma.



**FIG. 4.** Color Doppler image of fetal hemangioma, demonstrating its size and vascularity.

fractional shortening of 16%. Cardiac hypertrophy may be the result of increased demand due to hemodynamic shunting elsewhere. A careful search

for normal flow elsewhere in the fetus was initiated. An enlarged liver was observed with a  $5.6 \times 3.8$  cm mass composed of numerous dilated vessels (Fig. 3). Color

Doppler revealed the highly vascular nature of the mass, most likely representing a hepatic hemangioma (Fig. 4).

The patient was transferred to a local tertiary-care center where a 2665 g infant was delivered by cesarean section at 36 6/7 weeks gestation. Soon after birth, the baby presented with acute renal failure, pulmonary hypertension, congestive heart failure, and coagulopathy. The infant was intubated for respiratory distress. Sonography and computed tomography (CT) confirmed the diagnosis of a liver hemangioma and high output heart failure with pulmonary hypertension and a decreased ejection fraction.

Two days following delivery, the hepatic artery and two posterior lumbar arteries were embolized in an attempt to reduce the flow of blood in the hemangioma and relieve the volume overload to the infant's heart. Although the embolization was successful, collateral vessels in the liver revascularized and began draining into the hemangioma. Unfortunately, the baby's condition rapidly deteriorated into congestive heart failure, hypoxia, and renal failure. The parents decided against surgery, and the infant died later that day.

### Discussion

A hemangioma is a very common, benign vascular tumor made of dilated blood vessels containing large amounts of blood. It can occur in the skin and in many organs, including the liver, spleen, pancreas, and brain. The hemangioma is the most common vascular liver tumor in infancy.<sup>2</sup>

A hepatic hemangioma can appear sonographically as a mass with hyperechoic, hypoechoic, or mixed echotexture and often with calcifications. Doppler can differentiate a hemangioma from other solid liver masses by demonstrating both venous and arterial signals.<sup>3</sup> The size of this vascular tumor varies, with one reported as large as 7.8 × 6.4 cm.<sup>4</sup>

The arteriovenous shunting in large hemangiomas can increase the volume of blood to the heart, causing high-output cardiac failure and dilated cardiomyopathy.<sup>5</sup> Dilated cardiomyopathy appears as enlarged cardiac chambers with decreased contractility and atrioventricular regurgitation. Hydrops fetalis, with pleural and pericardial effusions, ascities, and skin thickening, is often associated with this condition.<sup>6</sup>

Treatment methods vary depending on the severity of the cardiomyopathy, size of the hemangioma, and other

associated complications such as disseminated intravascular coagulation (DIC). The use of corticosteroids and interferon  $\alpha$  has proven successful in the treatment of these large hemangiomas.<sup>7</sup> More emergent cases may require vascular embolism to reduce the volume of blood to the mass. Surgical resection, radiation, and chemotherapy have also proven helpful.<sup>8</sup>

### Comments

In this patient, perinatal sonography revealed dilated cardiac chambers (Fig. 1), increased cardiac axis (Fig. 2), septal hypertrophy, and a reduced fractional shortening. Hepatomegaly was also observed with a 5.6 × 3.8 cm mass (Fig. 3), demonstrating blood flow with color Doppler (Fig. 4). This presentation was most consistent with a liver hemangioma complicated by dilated cardiomyopathy, later confirmed with sonography and CT exams of the newborn.

Unfortunately, in this case, the infant did not survive, despite the early diagnosis, but others with this potentially life-threatening condition do respond to treatment. Sonographers in screening centers have an enormous responsibility and opportunity to detect these potentially fatal anomalies. This forewarning provides the obstetrician with time to plan for the optimal delivery at a tertiary-care center where the proper treatment steps can be taken. In this case study, the infant's condition, complicated by congestive heart failure, renal failure, and DIC, quickly deteriorated and became unresponsive to treatment. In spite of this tragedy, the parents were grateful their infant had a chance to receive the best care possible, in part due to the early detection of the anomaly.

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