Very Large Isolated Fetal Pericardial Effusion With Spontaneous Resolution

KIMBERLY A. YEZEWSKI, BA, RT(R), RDMS[*]

KAREN M. FERRONI, MD[†]

This case study describes a fetus with a very large isolated pericardial effusion of unknown etiology. This resolved spontaneously. The authors' review of the literature suggests that this is an unusual presentation. Sonography is an invaluable tool in the detection and monitoring of a fetal pericardial effusion.

Key words: pericardial effusion, prenatal diagnosis, fetal echocardiogram

Pericardial effusion is a collection of fluid in the pericardial space that surrounds the heart. When found in the fetus, pericardial effusions are associated with a variety of abnormalities and generally indicate a poor prognosis. A case is presented of an unusually large isolated fetal pericardial effusion that resolved spontaneously without evident adverse effects.

Case Presentation

A teenage primigravida was referred to our sonography unit because of fluid seen within the fetal chest on a routine mid-trimester sonogram. A sonogram was performed using an Acuson Sequoia (Mountain View, Calif). Images were obtained using a curved-array multi-Hertz transducer at 4 and 8 MHz. The patient's past medical history was unremarkable. She had no known exposure to medication use or to environmental toxins. Her blood type was A positive with a negative antibody screen. She was negative for hepatitis B surface antigen. Her VDRL was nonreactive, and she was immune to rubella. She denied any recent illnesses.

Fetal growth measurements were appropriate for the gestational age of 19 weeks. Obvious, bilateral fluid accumulations were noted in the fetal chest (Figs. 1, 2). These essentially filled the entire fetal thoracic cavity, with the heart seen moving freely within the fluid-filled space. A fetal echocardiogram was performed, which showed no

From [*]West Hartford Obstetrics and Gynecology, Hartford, Connecticut, and [†]Holyoke Medical Center, Holyoke, Massachusetts.

Correspondence: Kimberly A. Yezewski, West Hartford Obstetrics and Gynocology, 100 Retreat Avenue, Hartford, CT 06106. E-mail: yezewski@tiac.net.

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FIG. 1. Fetal pericardial effusion, 19.0 weeks gestation.

FIG. 3. Fetal pericardial effusion, 21.4 weeks gestation.

FIG. 2. Fetal pericardial effusion, 19.0 weeks gestation.

FIG. 4. Fetal pericardial effusion, 32.0 weeks gestation.

evidence of a congenital heart malformation. The remainder of the fetal anatomic examination was unremarkable except for the presence of nuchal thickening. No other markers for Down syndrome were present.

The intrathoracic fluid collection was so large that it was initially thought to be due to pleural effusions. Further evaluation suggested that this was actually a pericardial effusion with the fetal lung tissue compressed dorsally. The pericardial effusion measured 16 mm. Although the fetal heart appeared structurally intact, the myocardial contractions appeared to have a "floppy" motion. It was not certain whether this was as a result of abnormal contractility or caused by the unusually free cardiac motion allowed within the enlarged pericardial space.

The patient was counseled regarding the possible etiologies for the pericardial effusions, including an abnormal karyotype and a possible viral syndrome. There was concern that there might be progression to frank hydrops with its attendant poor prognosis. In addition, the possibility of pulmonary hypoplasia was raised due to possible lung compression from the presence of fluid within the chest. The patient was offered genetic testing, and amniocentesis was performed. The fetal karyotype was subsequently reported as normal. Despite the potential of a poor fetal outcome, the patient elected to continue the pregnancy.

The patient was followed with serial sonograms (Fig. 3). Fetal growth remained appropriate, with estimated fetal weights at the 50th percentile. There were no subsequent findings suggestive of fetal hydrops. By 32.0 weeks gestation, the pericardial effusion was noted to be significantly smaller (Fig. 4), and at 34 weeks, it had essentially resolved (Fig. 5). Labor began spontaneously at 36$\frac{1}{7}$ weeks, and the patient delivered a 2722-g infant with apgars of 8 and 9 at one and five minutes,

FIG. 5. At 34.1 weeks gestation, the fetal pericardial effusion had essentially resolved.

respectively. The infant's neonatal course was uneventful.

Discussion

Pericardial effusion in the fetus is most commonly seen in association with fetal hydrops. In some clinical situations, pericardial effusion may be the initial manifestation of fetal hydrops, appearing prior to the development of ascites or peripheral soft tissue edema. Occasionally, a pericardial effusion may be seen as an isolated finding. Di Salvo et al.[1] reported a series of fetuses with isolated pericardial effusions with good outcome. These were primarily third-trimester fetuses (mean gestational age = 36.4 weeks) with small effusions (2-7 mm). No cases had pericardial fluid entirely surrounding the heart. Dizon-Townson et al.[2] reported on a large series of mid-trimester fetuses with isolated pericardial fluid collections. The perinatal outcome was unremarkable, but no fetus in their series had an effusion more than 3 mm in size.

This fetus had an unusually large pericardial effusion without apparent ill effect. Azancot et al.[3] reported three cases of isolated pericardial effusion. One case was detected in the mid-trimester and measured 10 mm. This fetus also had a good outcome. To the best of our knowledge, our case is the largest reported isolated pericardial effusion with normal outcome.

Sonography is a useful tool in identifying and monitoring a fetal pericardial effusion. A pericardial effusion can be diagnosed sonographically only when there is an apparent separation between the visceral pericardium and parietal pericardium. On a 2D gray-scale sonogram, this appears as two bright echoes separated by an echo-free space.[4] Pericardial fluid thickness should be measured at the widest point, being careful to exclude the normal hypoechoic rim of myocardium.[1,5] Milder pericardial effusions are usually unilateral. In severe cases, a pericardial effusion is bilateral. When an effusion is bilateral, the heart appears to take on a rocking motion within the pericardial cavity.[4]

Color Doppler sonography can be used to identify a pericardial effusion. Using color Doppler, the clearest image of pericardial fluid can be obtained by decreasing the velocity setting. This allows for identifying the lower velocity movement of pericardial fluid.[6] Color Doppler signals of the pericardial effusion will be displayed as opposite the color of blood within the ventricular chambers because blood and pericardial fluid move in opposite directions.[6]

Pericardial fluid can also be detected using spectral Doppler analysis. The typical spectral waveform obtained from pericardial fluid is displayed as a monophasic flow toward the cardiac apex during systole and as a biphasic flow away from the apex during diastole.[7]

The finding of a fetal pericardial effusion usually carries a poor prognosis. Cardiac failure, associated malformations, chromosomal abnormalities, fetal infection, intrauterine growth restriction, nonimmune hydrops, and erythroblastosis have all been associated with the presence of pericardial effusions. This case demonstrates that for early gestations, even large pericardial effusions can resolve without any evident ill effects. However, careful sonographic monitoring of the fetus should be performed during the pregnancy to assess fetal progress.

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