

## Echocardiographic Detection of Pericardiocentesis-Induced Subepicardial and Intramyocardial Hematoma

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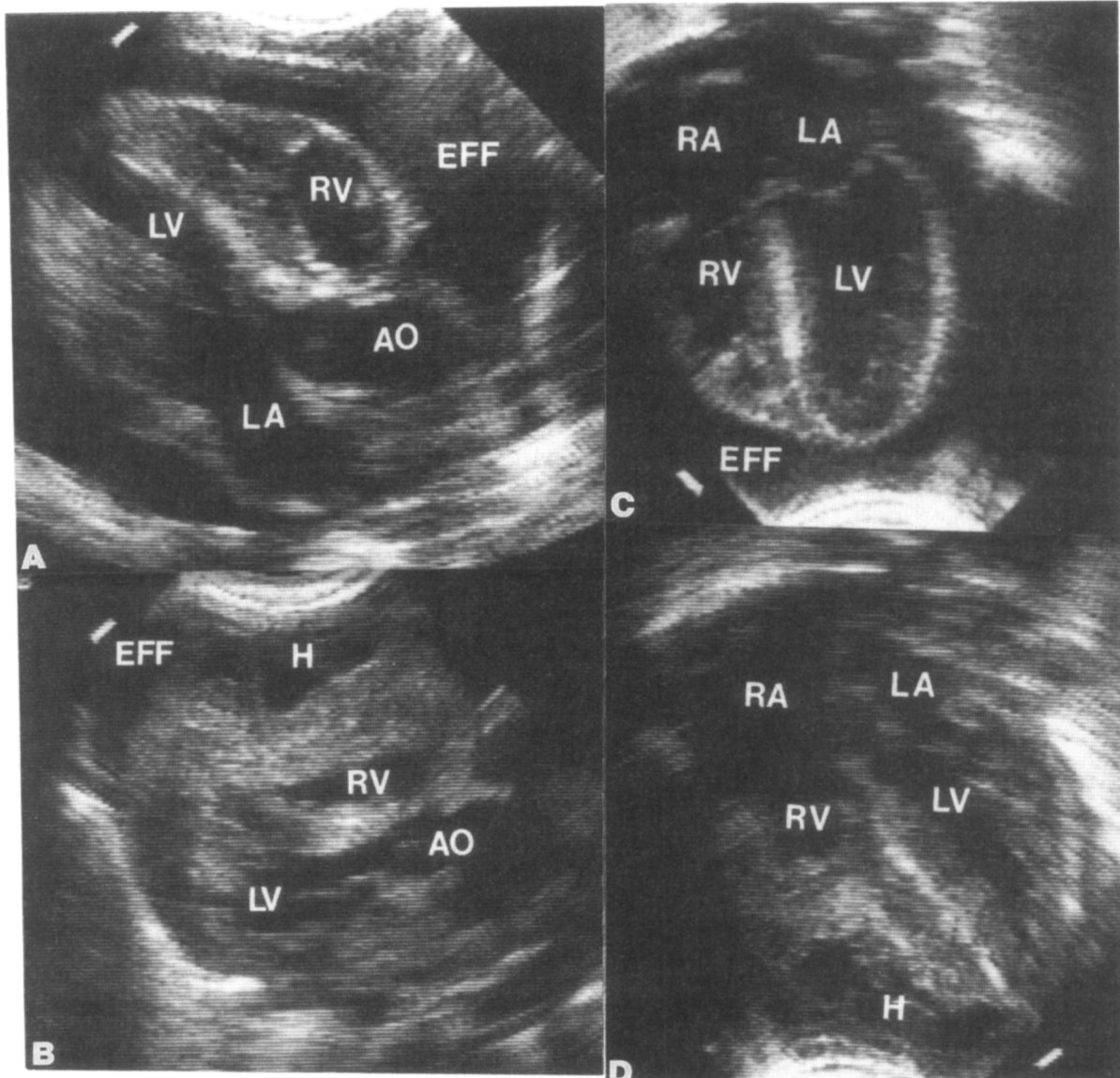
**P**ericardiocentesis has been widely used to relieve significant pericardial effusion and, in most cases, can be performed safely and without complications. We describe a rare complication of pericardiocentesis not previously reported in a pe-

diatric patient. The crucial role of 2-dimensional echocardiography in the detection of this rare complication is illustrated.

*RB was hospitalized at 3 months of age for failure to thrive, hydrocephalus and dysmorphism. On ad-*

*mission, the infant's weight was 3.08 kg (< fifth percentile), his hemoglobin was 8.7 g/dl, and he had severe diarrhea and vomiting. On the tenth hospital day, RB developed septicemia and Candida parapsilosis was grown from blood cultures. Therapy was begun with amphotericin B and*

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**FIGURE 1.** Two-dimensional echocardiographic images from the parasternal long-axis view before (A) and after (B) pericardiocentesis. Before pericardiocentesis, a large pericardial effusion (EFF) is seen anteriorly and posteriorly. After pericardiocentesis, a large subepicardial and intramyocardial echo-dense hematoma (H) is present. Note the severe compression of the right ventricular cavity by the hematoma. Two-dimensional echocardiographic images from the apical 4-chamber view before (C) and after (D) pericardiocentesis. Before the pericardiocentesis, a large pericardial effusion (EFF) is noted. After pericardiocentesis, a large echo-dense hematoma (H) is seen in the diaphragmatic surface of the right ventricle (RV) extending to the cardiac apex. There is near total obliteration of the RV cavity by the hematoma. AO = aorta; LA = left atrium; LV = left ventricle; RA = right atrium.

5-fluorocytosine. Despite therapy, respiratory distress worsened and the infant was intubated on the twenty-fourth hospital day. Serial chest roentgenograms demonstrated an increasing cardiothoracic silhouette, and a 2-dimensional echocardiogram performed on the twenty-eighth hospital day showed a moderate pericardial effusion. On the thirty-third hospital day, RB developed acidosis, increased central venous pressure, increased heart size and decreased perfusion. An emergent 2-dimensional echocardiogram demonstrated a large pericardial effusion with tamponade (Figure 1).

Pericardiocentesis was performed from a subxiphoid approach with a 16-gauge needle. Sixty-two ml of straw-colored fluid was withdrawn without difficulty. Shortly after the procedure, the infant developed a heart rate of 200 beats/min, central venous pressure of 20 mm Hg and blood pressure of 60/45 mm Hg. A chest roentgenogram showed a right pneumothorax, which was relieved by placement of a chest tube. An electrocardiogram showed evidence of myocardial injury with massive elevation of the ST-T wave

segments in the anterior chest leads. An emergent 2-dimensional echocardiogram was performed; it showed an echo-dense fluid mass within the myocardium of the right ventricle (Figure 1). The fluid mass involved the anterior and diaphragmatic surfaces of the right ventricle and was associated with severe right ventricular compression. The infant was taken immediately to the operating room where a large subepicardial and intramyocardial hematoma was found in the anterior and diaphragmatic walls of the right ventricle. The hematoma was evacuated and a pericardial tube was placed. Despite relief of the tamponade and inotropic support, the infant died approximately 2 hours after surgery. At autopsy, a subepicardial and intramyocardial hematoma was confirmed.

Pericardiocentesis can be difficult in infants and this case represents a rare complication not previously reported in a pediatric patient. A review of previous reports disclosed 4 adult patients with this unusual complication.<sup>1-4</sup> The use of echocardiography for the diagnosis of pericardial effusion and for guidance of the need

dle during pericardiocentesis has been well described.<sup>5</sup> Our case illustrates that echocardiography can also provide important information concerning the results and complications of pericardiocentesis. In any patient with deterioration after pericardiocentesis, 2-dimensional echocardiography provides a technique for the rapid, noninvasive diagnosis of complications. This application of 2-dimensional echocardiography is especially important in the critically ill, unstable infant.

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