Diagnosis and Treatment of Intrapericardial Teratoma

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SUMMARY. Intrapericardial teratoma is a rare mediastinal tumor that originates from aberrant clusters of multipotential cells from three germinal layers. Previous reports have used the combination of cardiac angiography, CT scan, and echocardiogram to establish the diagnosis prior to surgery. We report a case of intrapericardial teratoma diagnosed noninvasively and removed surgically within the first three days of life. Furthermore, we compare the diagnostic accuracy of echocardiography and computerized tomography (CT), and discuss the superiority of noninvasive evaluation in the management of these critically ill infants.

KEY WORDS: Teratoma — Computerized tomography — Echocardiography

Case Report

The infant was the 2.1-kg product of a 34-week uncomplicated gestation born to a 19-year-old primagravida woman. After spontaneous rupture of the membranes, the infant delivered precipitously at home; 1 h after birth, the baby arrived at the University Hospital cyanotic, hypothermic, and bradycardic. He underwent immediate endotracheal intubation and ventilation to increase heart rate and systemic perfusion. Initial arterial blood gas revealed the following results: pH, 7.01; Pco2, 58 mmHg, and Po2, 40 mmHg. After the establishment of adequate ventilation and correction of acidosis, there was no clinical evidence of tamponade.

The initial chest radiograph revealed hypoinflation of the lungs, and diffuse alveolar infiltrates. These lung findings precluded adequate visualization of the cardiothymic silhouette. A repeat chest radiograph taken after 3 h of adequate ventilation demonstrated a large cardiomediaslial shadow. Two-dimensional echocardiography performed with an Aloka 730 mechanical scanner using a 5-MHz medium-focused transducer demonstrated an anterior multicystic mass compressing the right atrium and ascending aorta (Figs. 1 and 2). In addition, a large pericardial effusion was seen (Fig. 3). A contrast-enhanced computed tomographic (CT) scan of the mediastinum was performed with a Siemens Somatom DR to assess tissue characteristics such as regions of calcium. It demonstrated a pericardial effusion and a mass that contained a single large cyst (Fig. 4).

At three days of age, the infant underwent surgical excision of the teratoma. Through a median sternotomy, the pericardium was opened and the clear serous fluid was drained. The teratoma was peeled off the surface of the right atrium and ascending aorta. The tumor's vascular supply off the anterior ascending aorta was isolated and ligated. The infants immediate postoperative course was uncomplicated and the child is now 11 months old and asymptomatic.

The lesion consisted of a 4.5 x 3.4 x 2.5-cm tumor surrounded by a mesothelial covered fibrous capsule. The multicystic feature of the mass is shown in Fig. 5. Tissues of endo-, meso-, and ectodermal origin were present. Immature elements, principally neural tissue, comprised less than 10% of the lesion. Malignant features, such as embryonal carcinoma, choriocarcinoma, and endodermal sinus tumor, were not present. Selected histologic features are presented in Fig. 6. The lesion was classified as a benign teratoma.

Discussion

A teratoma is a well encapsulated, multicystic tumor that is joined frequently by a vascular pedicle to the adventitia of the great arteries. The feeding vessels arise primarily from the aorta, but may originate from the pulmonary artery. Infants with intrapericardial teratoma present with mild-to-severe respiratory distress. Various degrees of cardiac tamponade contribute to the severity of cardiorespiratory compromise. Direct compression of the trachea or esophagus by the cystic tumor is uncommon [4]. Pericardial effusion, usually massive, is present in all reported cases and the absence of effusion indicates lack of involvement of the pericardium by tumor. The pericardial fluid is a straw-colored serous transudate devoid of malignant cells.

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Fig. 1. Two-dimensional echocardiogram. Subxiphoid long-axis cross section of the left ventricle (LV) and ascending aorta (AAo). Aortic arch and descending aorta (DAo). A large cystic tumor (C) is seen on the right atrium (RA) and ascending aorta. RV, right ventricle. Compass: A, anterior; I, inferior; P, posterior; and S, superior.

Fig. 2. Two-dimensional echocardiogram. Subxiphoid sagittal scan depicting the tumor anterior to the ascending aorta (AAo). There are multiple cysts (c) within the mass. DAo, descending aorta; LA, left atrium; and RA, right atrium. Compass: same as Fig. 1.

Suggested etiologies of the pericardial fluid include: (a) direct irritation of the pericardium by tumor, (b) rupture of cystic areas of the tumor into the pericardium, and (c) obstruction of the cardiac and pericardial lymphatics by the tumor [2].

Previous reports utilized the chest radiograph in combination with echocardiography, CT scan, and angiography to diagnose these tumors. Moreover, angiography is considered necessary for a complete diagnostic evaluation. We report the utility of real-time two-dimensional echocardiography in the diagnosis of these tumors and demonstrate its superiority to radiography and CT scan. It is apparent from this case that the radiographic evaluation may be impeded by pulmonary pathology. Both the CT scan and the echocardiogram identified correctly the precise location of a mediastinal tumor mass and the associated pericardial fluid. CT scanning displayed a single large cyst within the mass. The multiple smaller cysts were not seen. Moreover, contrast enhancement did not identify vascular supply. The two-dimensional echocardiogram charac-

Fig. 3. Two-dimensional echocardiogram. Subxiphoid parasagittal short-axis scan demonstrating a large pericardial effusion (PE) around the heart. LV, left ventricle; and RV, right ventricle. Compass: A, anterior; L, left; P, posterior; and R, right.

Fig. 4. Contrast-enhanced computerized tomographic scan of the structures in the midthorax. A large cyst is seen to the right of the heart. In addition, the pericardial effusion (PE) is visualized as an area of decreased attenuation anterior to the heart.