CASE REPORTS

Neonatal Congestive Heart Failure Due to Mediastinal Cyst

David J. Delany, Herbert S. Harned, Jr., and William E. Wright

Department of Radiology, North Carolina Memorial Hospital, Chapel Hill, North Carolina, USA

Abstract. A case is reported of cardio-respiratory failure in a neonate due to the pressure effect of a posterior mediastinal cyst. The plain film and angiographic findings of this lesion are discussed.

Key words: Newborn, heart failure, mediastinal cyst.

Case History

W.W. A 5 lb. 9 oz. male was the product of a full term pregnancy. An Apgar score of 10 was recorded at birth. At 26 hours of age, respiratory distress was evident and at 58 hours there were signs of heart failure. At this time, the blood pressure was 50 mm Hg systolic in all limbs, the pulse rate was 210, and the respiratory rate 86. There were no cardiac murmurs and the second sound was split.

The plain film of the chest (Fig. 1) was interpreted as showing moderate cardiomegaly with normal pulmonary vascularity. There was thought to be consolidation and volume loss in the right upper lobe, the right lower lobe exhibiting compensatory emphysema.

The clinical impression was of severe congestive heart failure of uncertain etiology, but possibly due to congenital heart disease with secondary compression effects in the right lung. Cardiac catheterization was carried out in 100\% oxygen. The right atrial pressure was 27/18 mm Hg and right ventricular pressures ranged between 60 and 75/20 mm Hg. The catheter was passed across a patent foramen ovale and the left atrial pressure was 32/19 mm Hg. There was a significant step-up in oxygen saturation in the right atrium from 60\% in the SVC and 71\% in the IVC to 79\%.

Three angiograms were made, the first being into the right atrium (Fig. 2). This showed a delayed opacification of the right ventricle, anterior displacement of the posterior wall of the right atrium, and right to left shunting across the atrial septum. A second injection was made into the right ventricle which showed moderate tricuspid regurgitation, a normal pulmonary valve and right to left shunting through a patent ductus arteriosus. The peripheral pulmonary arteries showed tortuosity suggesting pulmonary hypertension. The third injection was made into the left atrium (Fig. 3) and this showed a crescentic chamber instead of the normal circular outline in the AP projection. There was a distinct impression on the superior aspect of the right side of the left atrium. The remainder of the left heart appeared normal, and the ductus arteriosus did not opacify from this injection.

A diagnosis of primary pulmonary hypertension was made and thought to be associated with both an atrial septal defect and a patent ductus arteriosus. It was thought that there was bidirectional shunting at the atrial level and right to left shunting at the level of the ductus arteriosus.

The child had a persistent metabolic acidosis throughout the procedure and cardiac arrest occurred the following day.

Resuscitative procedures were unsuccessful, but it was of interest to note that during them, intracardiac Epinephrin was given and aspiration produced a straw-colored fluid.

At autopsy, a 3.5 cm diameter cyst was found in the posterior mediastinum on the right side. The cyst was trilocular, and filled with clear fluid and showed no communication with either bronchial tree or gastrointestinal tract. Fig. 4 is a photograph of the posterior aspect of the lungs showing the location of the cyst in close proximity to the right pulmonary veins and the supralateral aspect of the left atrium.

No atrial septal defect was present. The ductus arteriosus was patent. Both lungs showed compression from the mediastinal cyst and intra-alveolar hemorrhage with some focal atelectasis on the right side, but no other abnormality. Microscopic study of the cyst wall revealed squamous, cuboidal and columnar epithelium. It was thought most likely to be of the gastroenterogenous variety.

Fig. 1. AP chest showing volume loss in the right upper lobe and a retrocardiac density displacing the right main bronchus superiorly (arrow)
Fig. 2. Lateral Projection. Right atrial injection showing anterior displacement of the posterior border of the right atrium (arrow).

Fig. 3. AP Projection. Left atrial injection showing an impression on the superior aspect of the atrium (arrow).

Discussion

This case is reported in order to emphasize the radiological features of a large mediastinal cyst which presented in an unusual manner and which if recognized might have been easily aspirated or surgically removed [2]. Reinspection of the chest radiograph (Fig. 1) shows an area of increased density behind the heart with the right main bronchus elevated by what appears to be a smooth mass. This was particularly evident on one of the radiographs of the chest taken slightly obliquely. The contrast studies again showed ample evidence of a space occupying lesion with extrinsic defects in the outline of both atria compatible with a mass in the posterior mediastinum.

Fig. 4. Posterior view of the lungs showing a 3.5 cm loculated cyst closely related to the right main bronchus and pulmonary veins.