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The Role of Echocardiography in Pulmonary Sequestration

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SUMMARY

Echocardiography has four properties consist of non-invasive, inexpensive, radiation safety, and portability, so it has always been widely used. The role of echocardiography was check cardiac structure and pulmonary artery for exclude the contraindication of transcatheter occlude, and guide device position in peri-procedure, after procedure used echocardiography to check the position of the device. Therefore, it is necessary to practice how to use it. echocardiography In examining and following up on the treatment of pulmonary sequestration.

General Characteristics and Incidence

Pulmonary sequestration It is a type of hypervascularity that carries blood to the lungs (feeding) outside of normal channels. Derived from the Latin verb sequestare, which means "to separate," giving one lobe of the lung a separate route for receiving blood from a branch other than the normal pulmonary artery (pulmonary artery), usually found in the lower lobe. It is classified as a vascular malformation that is rare. Its reported incidence is only 1 in 10,00-35,000 cases per year [1]. A 10-year retrospective study in China found the intralobar type to be the most common at 90 percent, followed by the extralobar type at 10 percent, all of which were treated with surgery [2]. This is close to the information in the article by Galanis M and colleagues who estimated the incidence at 0.15-1.8% [3].

Etiology

The cause is still a matter of speculation, divided into five groups: vascular traction, vascular insufficiency, and accidental occurrence. co-incidental occurrence, acquired pathology following infection, and common developmental theory. The most accepted hypothesis states that Pulmonary sequestration It results from the formation of accessory lung nodes in the back (accessory lung). The majority of pathologies occurring outside the lobe are congenital abnormalities that may originate from the original foregut. It is often accompanied by other congenital abnormalities, such as congenital diaphragmatic hernia. and congenital lymph node abnormalities. Similarly, the abdominal intestines and trachea begin to develop at 3 weeks of gestation and later rupture into right and left lung lobes around the 4th week of gestation. The lung lobes develop until they become evident between the 5th and 8th weeks. Therefore, Pulmonary sequestration Therefore, it is most likely to occur during the 4th - 8th week of pregnancy. At this stage, there are other conditions that may be related, namely the hernia and diaphragm being higher than normal that may be related to extralobar sequestration. It will occur before the 6th week of pregnancy as well [4,5].

Cardiac Imaging Examination

Although the standard tool for diagnosing pulmonary sequestration is computed tomography (CT) [6], The method of treatment for transcatheterization, angiography can be used to locate and confirm the lesion. (Figures 1A,1B & 2) However, both of the above methods are usually ordered after an initial Transthoracic echocardiography for detecting lesions and detecting concomitant pathologies [7], The standard view of echocardiography was including Parasternal view, Apical view, Subcostal view, and Suprasternal view. But the necessary view for diagnosing pulmonary sequestration are modified two chambers view and modified subcostal view (Figures 1 & 3).

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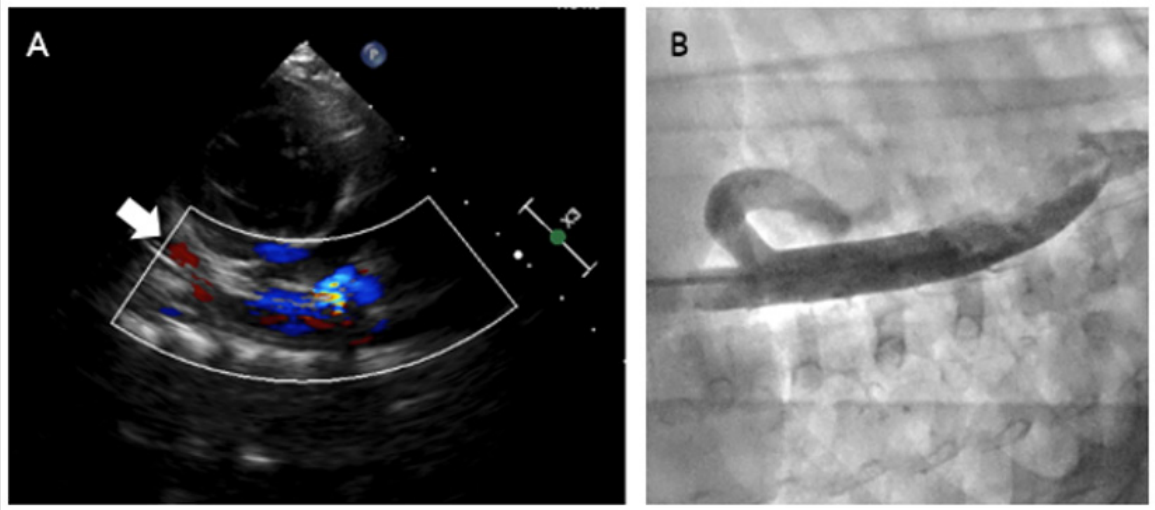

Figure 1:

A. Transthoracic echocardiogram in Modified two chambers view or Modified subcostal view shows blood vessels beyond the pulmonary sequestration (arrow) which carry arterial blood from the descending aorta to the lungs. Branches at the thoracic level can be seen behind the ventricles. This view like apical area and adjusted marker to the head with anterior angulated transducer.

B. Image Angiogram in Anteropostrior; AP (sideways image consistent with Figure 2A) injected radiopaque contrast media shows the location and characteristics of blood vessels beyond Pulmonary sequestration. It branches at the thoracic level somewhat downward and then upwards, which carries arterial blood from the descending aorta to nourish the lungs.

Figure 2: Angiogram image obtained from cardiac catheterization to inject radiopaque contrast media to check the position and orientation of the lattice device (Device) to complete occluded abnormal blood vessels. It was found that the device was able to close completely, leaving no more blood flowing back into the lungs through the extra blood vessels.

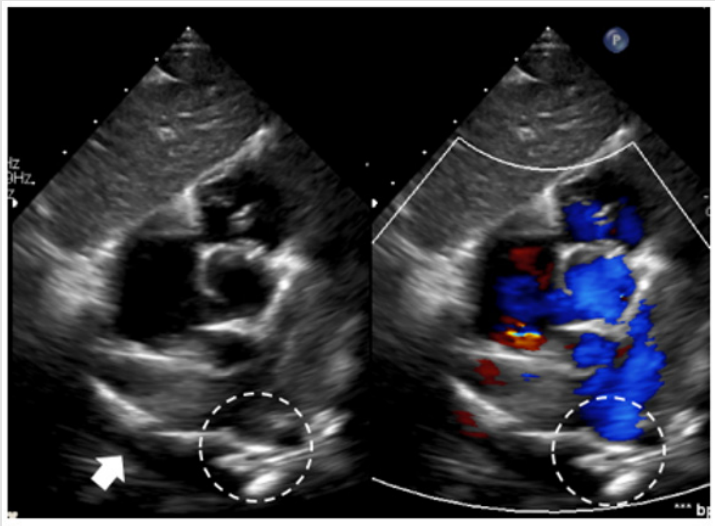

Figure 3: Echocardiogram 2D compare with color mode in Modified subcostal view showing the location and efficiency of filling. and the placement of the device beyond pulmonary sequestration (dotted line) in the area of the thoracic descending aorta (arrow) behind the heart. This is to check for side effects that may occur, which is the device protruded and blocked the blood flow in the aorta.

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