

Common Arterial Trunk, Interrupted Aortic Arch, and Crossing Pulmonary Artery Coexistence: Case Report of a Rare Anomaly

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Truncus arteriosus (common arterial trunk) is characterized by a single great artery that arises from the heart, and this single artery supplies the systemic, coronary, and pulmonary circulations. According to the van Praagh classification, truncus arteriosus can be divided into 4 types: type A-1, type A-2, type A-3, and type A-4. In type A-4, the aortic arch is hypoplastic or interrupted, there is a large patent ductus arteriosus (PDA)¹ and 1 or both branches of the pulmonary artery may have intrinsic stenosis, hypoplasia, or both.² In order to prevent pulmonary vascular disease, surgeries should be performed in the first month.³ Therefore, early surgical repair is very important for the control of pulmonary hypertensive disease.⁴

Interrupted aortic arch (IAA) is defined as the absence of connection between the aorta ascendens and the aorta descendens. It is a rare and fatal anomaly. It is divided into 3 types as type A, B, and C. If there is an interruption in the distal of the arteria subclavia sinistra, it is classified as type A; if there is an interruption between a.carotis communis sinistra and a.subclavia sinistra, it is classified as type B; if there is an interruption between a.carotis communis sinistra and a.carotis communis dextra (between a. carotis communis sinistra and truncus brachiocephalicus, it is classified as type C.⁵ Interrupted aortic arch amounts to approximately 1% of all congenital heart diseases.⁶

Crossed pulmonary artery is a rare anomaly. The left pulmonary artery originates above and to the right of the right pulmonary artery and the 2 pulmonary arteries cross each other.⁷ Recognition of this rare pathology is important because it is often accompanied by other congenital heart defects, non-cardiac anomalies, and certain genetic problems. It is often associated with other congenital heart defects such as truncus arteriosus, IAA, tetralogy of Fallot, atrial septal defect, and left superior vena cava.⁶ Patients are usually asymptomatic. Crossed pulmonary artery can often be overlooked. Crossed pulmonary artery is more frequently diagnosed if echocardiographic examination is done carefully.⁸ In our case, it was found that the left pulmonary artery turned to the right and compressed the left main bronchus. In patients with complex cardiac anomalies, bronchial compressions can be detected by tomography and bronchoscopy. Therefore, in cases with complex cardiac anomalies, if there are respiratory symptoms, tomography and bronchoscopy should be performed to detect bronchial compressions.

A 5-month-old male patient who was admitted to our hospital with shortness of breath and cyanosis had a 3/6 systolic ejection murmur. In transthoracic echocardiography (TTE), common arterial trunk, large ventricular septal defect (VSD), and stenosis in the right pulmonary artery were detected. Arterial saturation without oxygen was 80%, and arterial saturation with oxygen was 95%. The possibility of foreign body aspiration was considered, and a bronchoscopy was undertaken which demonstrated extrinsic compression of the left main bronchus. On thorax computed tomography (CT), atelectasis and consolidation areas were detected in the posteromedial parts of the upper and lower lobes in both lungs, and ground glass densities were detected in the lower lobes. Left lung was hypoplastic. On contrast-enhanced

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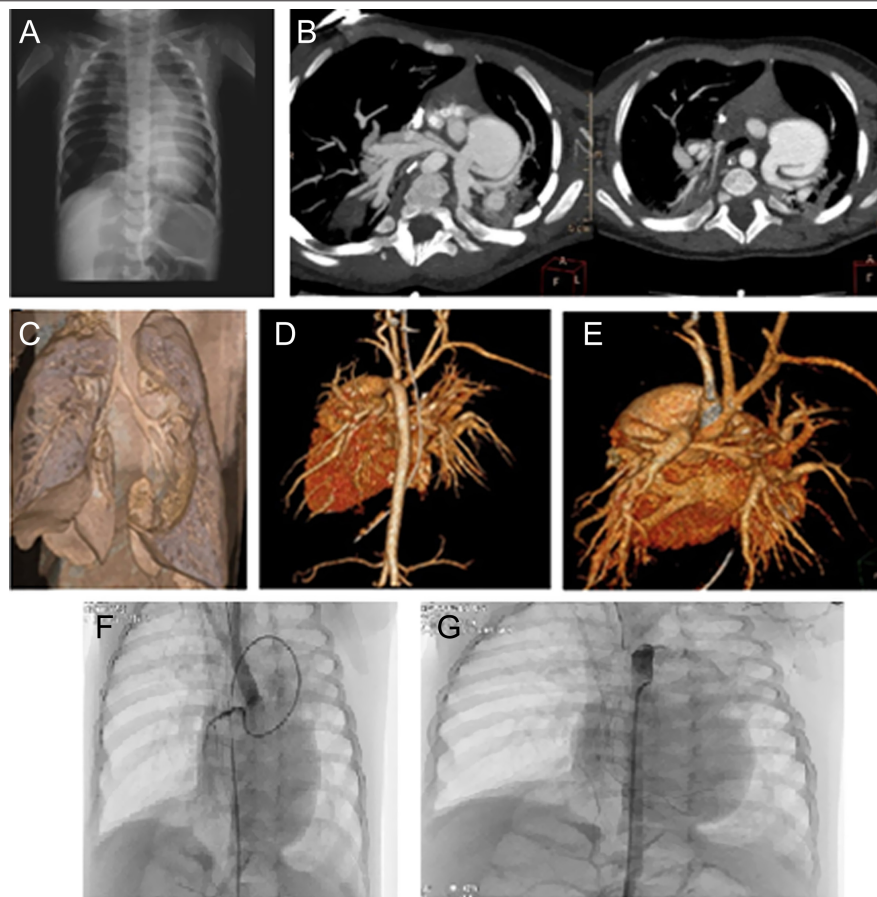


Figure 1. (A) Lung x-ray. (B) The exit of the pulmonary arteries from the truncus. Crossing of the pulmonary arteries. (C) Hypoplastic image of the left lung. (D and E) Three-dimensional view of vessels. (F and G) Angiographic view of the interrupted aortic arch.

CT angiography, large VSD, single large vessel originating from both ventricles. The left common carotid artery branches off from the ascending aorta early. The aortic arch is interrupted (type B). The descending aorta is filled with PDA. The right pulmonary artery arises from the left of the truncal artery, and the left pulmonary artery arises from the right of the truncal artery and shows a cross course (Figure 1A, B, C, D, E, F, G). The patient had no coronary anomaly. Cardiac catheterization was undertaken to assess pulmonary vascular resistance and suitability for operation and following are the observations: aortic pressure: 79/53 (mean 66) mmHg, right pulmonary artery pressure: 30/25 (mean 27) mmHg, and left pulmonary artery pressure: 54/41 (mean 47) mmHg. Although the patient was 5 months old, he was operable according to the catheterization findings (since the pulmonary arterial pressure is suitable for the operation), so aortic interruption repair, Lecompte maneuver (it is to bring the pulmonary artery anterior to the aorta during the reconstruction of the great vessels), right and left pulmonary artery reconstruction, unifocalization of the pulmonary arteries, right ventricle-pulmonary artery (RV-PA) continuity with a 14 mm Contegra® Conduit (Medtronic Inc, Minneapolis, Minn, USA), and VSD closure with a pericardial patch were performed. No complications developed during or after the operation. Six months follow-up TTE showed normal ventricular functions and pressures.

In our case, it was found that the left pulmonary artery turned to the right and compressed the left main bronchus. In patients with complex cardiac anomalies, bronchial compressions can be detected by tomography and bronchoscopy. Therefore, in cases with complex cardiac anomalies, if there are respiratory symptoms, tomography and bronchoscopy should be performed to detect bronchial compressions.

As a result, coexistence of common arterial trunk, aortic interruption, and crossed pulmonary arteries is very rare. We aim to present this rare case and contribute to the literature.

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