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Images in Congenital Cardiac Disease

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Corresponding author:
Q. An; Email: anqi@scu.edu.cn

Congenital dual anterior interventricular artery

Miao Hao[1], Qi An[2] and Shuhua Luo[2]

[1]Operating Room, Department of Anesthesiology, West China Hospital, Sichuan University/West China School of Nursing, Sichuan University, Chengdu, SC, China and [2]Department of Cardiovascular Surgery, Pediatric Heart Center, West China Hospital, Sichuan University, Chengdu, SC, China

Abstract

Dual anterior interventricular artery is a rare type of CHD. We reported a fifteen-year-old girl who underwent CT angiography that demonstrated one anterior interventricular artery from aorta and another from pulmonary artery.

A fifteen-year-old girl was admitted for chest tightness and shortness of breath after activity. The echocardiography showed an anomalous origin of the coronary artery from the main pulmonary artery (Fig. 1). Further CT coronary angiography revealed dual anterior interventricular artery with one arising from pulmonary artery (Fig. 2a). The left main coronary artery originated from the left coronary cusp, which gave rise to a long anterior interventricular artery and a left circumflex artery (Fig. 2b). The short anterior interventricular artery showed an anomalous origin from the anterior non-facing pulmonary sinus, which had a dilated and tortuous course on the right ventricular aspect of the interventricular groove (Fig. 2c). The intraoperative explorations confirmed the CT findings. In addition, multiple collaterals were identified between short and long anterior interventricular arteries intra-operatively (Fig. 3a). A posterior flap of main pulmonary artery wall was harvested with the coronary artery sinus button and augmented anteriorly with an autologous pericardial patch to elongate the coronary artery (Fig. 3b,c).

Dual anterior interventricular artery with one anterior interventricular artery abnormally originating from the pulmonary artery is an extremely rare congenital anomaly with few cases being reported in the previous literature.[1] The current patient remained asymptomatic till adolescence, which might be due to the presence of extensive collaterals between two anterior interventricular arteries. We believed this type of left anterior descending artery was a variant of the Type IX dual left anterior descending artery with the left anterior descending artery origin from the pulmonary artery.[2] We especially emphasised that one of the left anterior descending arteries originates from the pulmonary artery, and as a result, the haemodynamic and pathophysiological abnormalities in the patient are very distinct. Our case also highlighted the important role of a CT scan in coronary artery anomaly diagnosis as it can provide accurate anatomic information regarding the origin and course of coronary arteries.

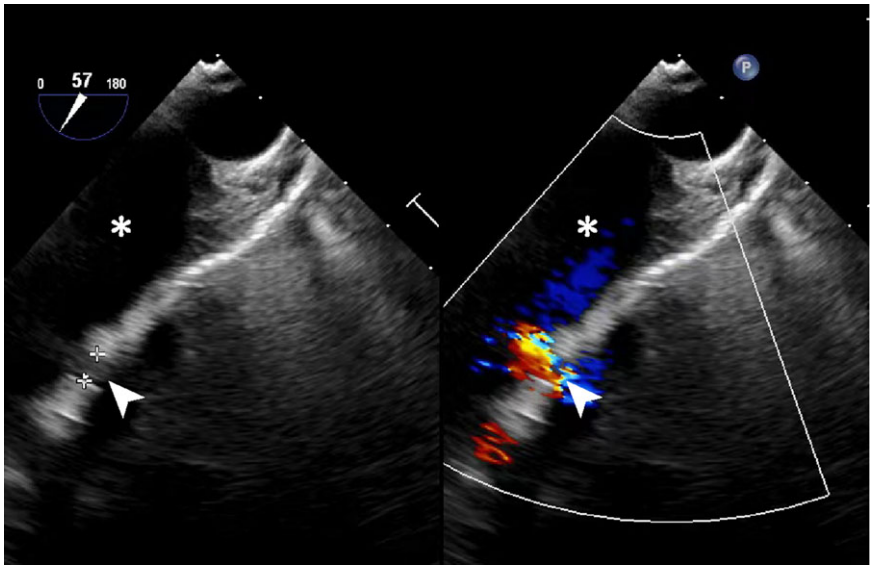


Figure 1. Echocardiography revealed anomalous left coronary artery (white arrowhead) originated from pulmonary artery (white asterisk) with the diameter of 4.9 mm.

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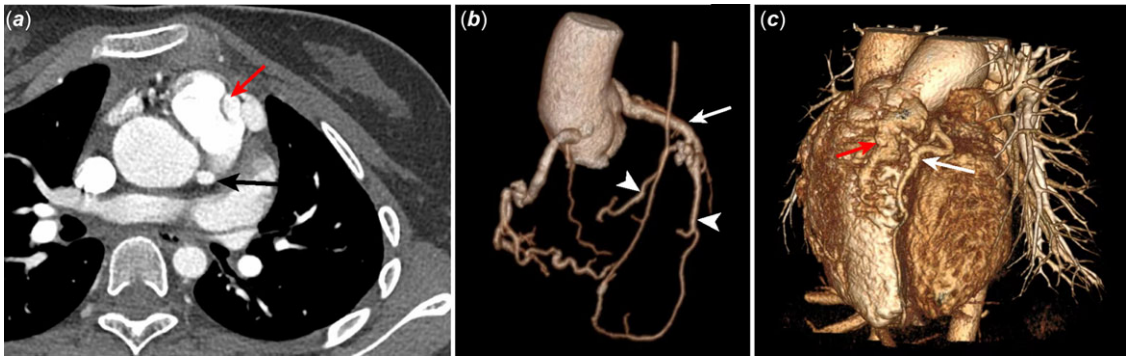


Figure 2. ***a***. CT angiography image showed anomalous origin of left coronary artery from pulmonary artery (red arrow), while another normal left coronary artery arose from coronary sinus (black arrow). ***b***. Three-dimensional reconstruction revealed normal pattern of left main coronary artery (white arrow) and branches (white arrowhead). ***c***. The short anterior interventricular artery had a dilated and tortuous course on the right ventricular aspect of the interventricular groove (red arrow), while multiple branches between dual anterior interventricular artery (white arrow) were clearly revealed through reconstruction.

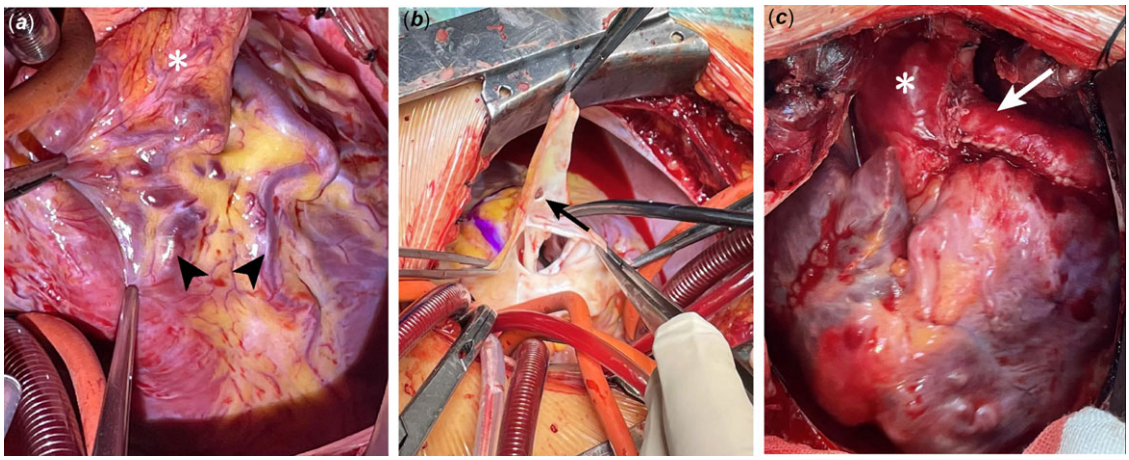


Figure 3. ***a***. Intraoperative images revealed dual anterior interventricular artery (black arrowhead) originated from the root of pulmonary artery (white asterisk) and left coronary cusp. ***b***. Anterior flap of pulmonary wall was harvested with the anterior interventricular artery sinus button to correct the anomaly (black arrow indicated orifice of the short left anterior descending artery). ***c***. The anomalous anterior interventricular artery (white arrow) was connected to the aorta (white asterisk).

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Competing interests. None.

Ethical standards. All procedures contributing to this work do not involve human and/or animal experimentation.

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