

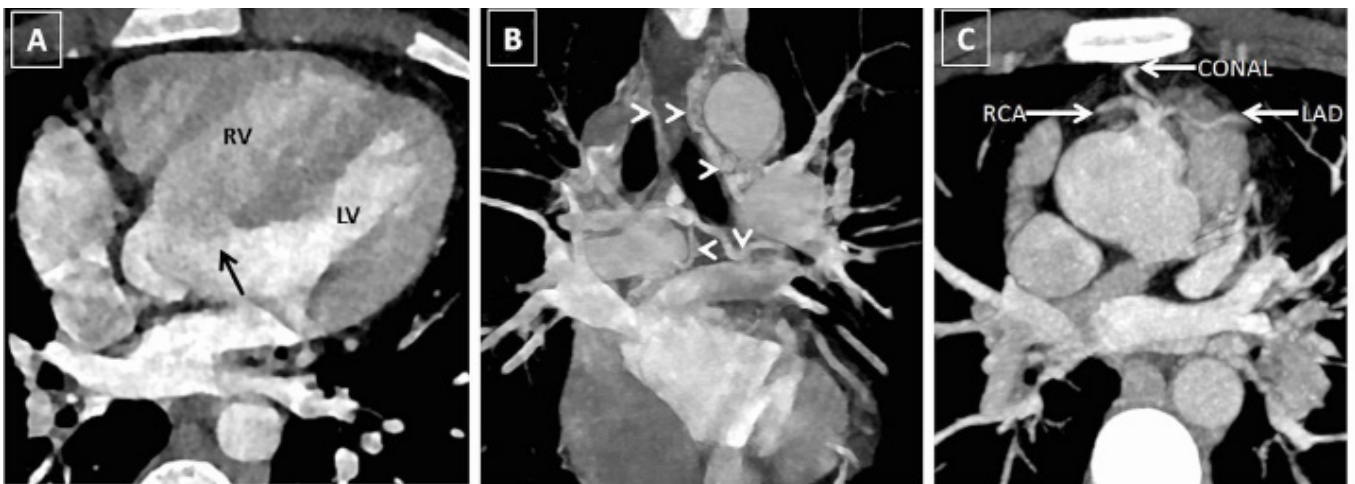


# Major Aortopulmonary Collaterals From Coronary Arteries and Dual Left Anterior Descending Artery in an Adult With Tetralogy of Fallot

Yamasandi Siddegowda Shrimanth, MD DM; Anil Kumar Choudhary, MD; Arun Sharma, MD DM; Sanjeev Hanumanthacharya Naganur, MD DM; Neelam Dahiya, MD DM

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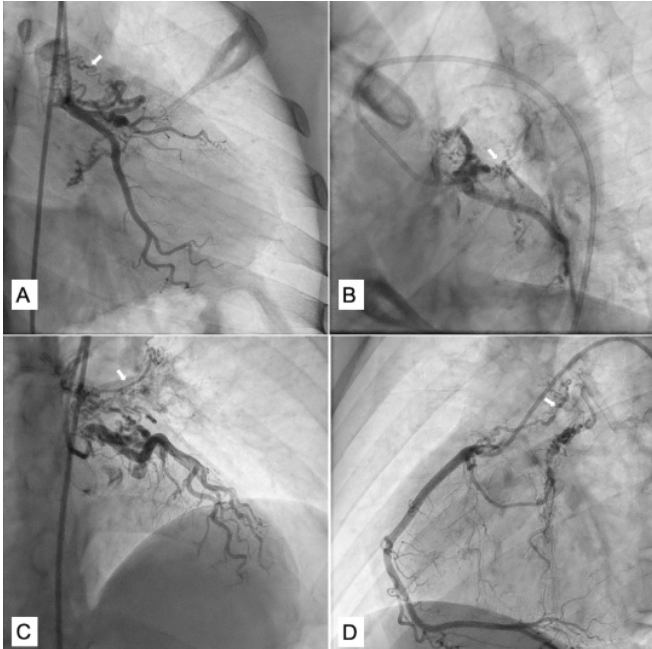


**FIGURE 1.** (A-C) Computed tomography angiography images in a patient of tetralogy of Fallot showing subaortic ventricular septal defect (A, arrow) with presence of multiple aortopulmonary collaterals (B, arrowheads) from branches of bilateral subclavian arteries, aorta and the coronaries, and dual left anterior descending artery (LAD) with dominant LAD from the right coronary artery.

A 19-year-old male presented with history of cyanosis noted since early childhood, dyspnea, and angina on exertion New York Heart Association class II for the past 3 years. Physical examination revealed central cyanosis, pan digital grade 3 clubbing, saturation of 74%, and a grade 3 ejection systolic murmur in the left 3rd intercostal area. Echocardiography showed a large non-restrictive ventricular septal defect with severe pulmonary stenosis and aortic override, suggestive of tetralogy of Fallot (TOF). Computed tomography (CT) angiography confirmed the diagnosis of TOF and showed the presence of multiple aortopulmonary collaterals (APCs) arising from bilateral subclavian arteries, coronaries, and

aorta with presence of dual left anterior descending artery (LAD) with dominant LAD from the right coronary artery (RCA) (**Figure 1**). CT angiography nicely depicted the type 3 APCs arising from both the coronaries supplying bilateral lungs with delineation of dual LAD (**Figure 2** and **Video 1**). Pulmonary arteries were well developed. The patient is planned for intracardiac repair of TOF along with surgical ligation of the APCs.

Major APCs are more common with TOF with pulmonary atresia. Collateral arteries, when present, arise most commonly from the descending thoracic aorta, less commonly from the subclavian arteries, and rarely from the abdominal aorta or



**FIGURE 2.** (A) Left coronary angiogram in anteroposterior caudal view shows major aortopulmonary collateral (MAPCA) arising from the proximal portion of left anterior descending artery (LAD) and supplying the left lung. (B) Left coronary angiogram in left anterior oblique (LAO) caudal view shows MAPCA arising from the proximal LAD. (C) Left coronary angiogram in anteroposterior cranial view shows MAPCA arising from the proximal LAD and supplying the left lung. (D) Right coronary angiogram in LAO cranial view showing MAPCA arising from the proximal right coronary artery and supplying the right lung.

its branches or from the coronary arteries. Collaterals arising from the coronary arteries can cause myocardial ischemia due to coronary steal phenomenon. They can be addressed either by endovascular interventions like coiling or surgical ligation during the intracardiac repair. Coronary anomalies are seen in 5%-7% of TOF patients. In approximately 4% of TOF patients, the left anterior descending artery (LAD), or an accessory LAD, takes its origin from the right coronary artery (RCA) or right coronary sinus and crosses the right ventricular outflow tract in its course toward the left ventricle. The presence of such anomalous coronary anatomy poses certain challenges during intracardiac repair of TOF.

From the <sup>1</sup>Department of Cardiology and <sup>2</sup>the Department of Radiodiagnosis and Imaging, Postgraduate Institute of Medical Education and Research, Chandigarh, India.

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Address for correspondence: Neelam Dahiya, MD, DM, Associate Professor, Department of Cardiology, Advanced Cardiac Center, PGIMER Chandigarh, 160012 India. Email: drneelamdahiya@gmail.com

