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**Case Report**

# A rare finding of left innominate artery arising from the left pulmonary artery in a case of tetralogy of fallot

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## ABSTRACT

Right-sided aortic arch with an aberrant left innominate artery arising from the left pulmonary artery is a very rare finding in the tetralogy of fallot (TOF). A 2-year-old boy presented for routine intracardiac repair of TOF. A routine angiogram raised suspicion of the left innominate artery with abnormal origin. 640-slice CT was done to delineate the anatomy. The left innominate artery was re-implanted in the descending aorta and the intracardiac repair was performed.

**Keywords:** Tetralogy of fallot, Anomalous left innominate artery, Right-sided aortic arch, Left pulmonary artery, Vascular sling anomaly

## INTRODUCTION

Tetralogy of fallot (TOF) is a common congenital cyanotic heart disease. The components include a large ventricular septal defect, overriding of the aorta, right ventricular outflow tract obstruction, and right ventricular hypertrophy. Right-sided aortic arch, coronary anomalies, and additional ventricular septal defects are usually associated conditions in TOF.[2,3] We present a case of the left innominate artery arising from the left pulmonary artery (LPA) in TOF.

## CASE REPORT

A case of a 2-year-old male child who was diagnosed with congenital heart disease soon after birth. He was on regular follow-up. The child did not have any neurological symptoms. His motor milestones were normal. He did not have any signs of upper limb ischemia. Echo showed features of TOF with severe infundibular and valvar pulmonary stenosis. Angiogram was done as a part of the pre-operative workup to delineate the pulmonary anatomy and MAPCA's. It showed anomalous aortic arch vessels. Left innominate arising from the LPA. 640 slice CT angiogram was done to study the arch vessels. It showed a right-sided aortic arch with right subclavian and right common carotid arising from the right-sided arch. An isolated left innominate artery was seen arising from the proximal left pulmonary artery. The above findings were discussed in a multidisciplinary meeting. It was decided to perform a complete intracardiac repair with re-implantation of the left innominate artery in the descending aorta.

He was taken up for surgery under general anesthesia. Median sternotomy and pericardiotomy were done. The left innominate artery was seen arising from the left pulmonary artery. The left innominate was seen dividing into the left sub-clavian and left common carotid artery. The left innominate artery was divided between clamps. The cardiac end was sutured with a 6-0 polypropylene. A partial clamp was applied to the aorta and incised with a 4 mm punch. The left innominate artery was re-implanted on the aorta using a 6-0 polypropylene suture. The side-biting clamp was released. A cardiopulmonary bypass was initiated. The complete intracardiac repair was done. A large subaortic maligned ventricular septal defect was

closed with a 0.4 mm PTFE patch. The main pulmonary artery was opened between stays. The pulmonary valve was inspected and valvotomy was done. The supra-annular patch was reconstructed using an autologous pericardium. The patient was weaned off cardiopulmonary bypass. Hemostasis was secured and the patient was shifted to CT-ICU with moderate support.

The post-operative period was uneventful. He was awake and moving all limbs. The left upper limb pulsation was good and showed satisfactory saturation on plethysmography. He was extubated on the first post-operative day. Chest drains were removed on the second postoperative day. He was then shifted to the ward and discharged on the 5th post-operative day.

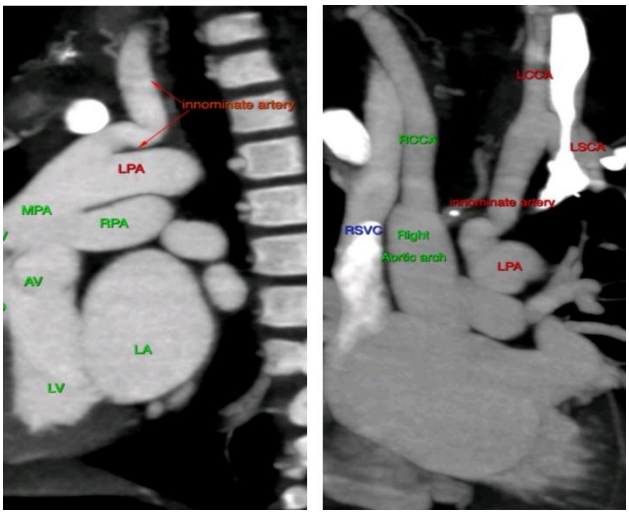


**Figure 1: Pre-operative 640-slice CT showing anomalous origin of the left innominate artery from the LPA.**

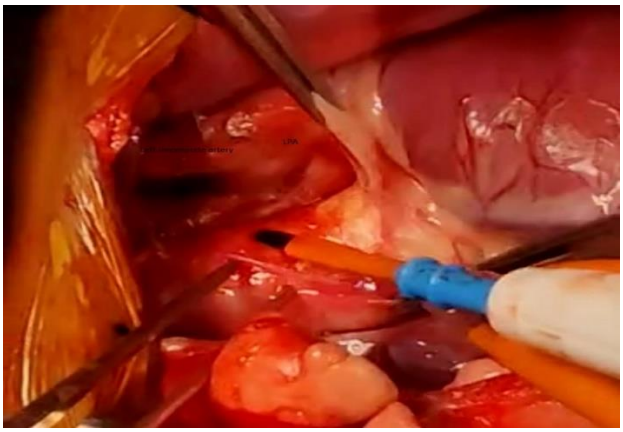

**Figure 2: Figure showing left innominate artery arising from the LPA.**

## DISCUSSION

The left innominate artery arising from the left pulmonary artery in a right-sided aortic arch is an extremely rare anomaly. These are incidentally diagnosed in children and adults with symptoms of vertebral basilar insufficiency.[1] Its association with the TOF has sparsely been reported.

Major aortopulmonary collaterals (MAPCAs) are common in TOF as a source of blood supply to pulmonary circulation. A routine angiogram is done in many centers to study pulmonary anatomy, MAPCAs, and other coronary anomalies. The aortic arch is also looked for any abnormalities.[2,3] Any suspicion should be taken into serious account and further CT can be done.

640-slice CT can be further done to better delineate the arch vessel anomaly. Pre-operative diagnosis of arch vessel aberration is very important to differentiate them from the MAPCAs. Any neurological symptoms pre-operatively should rise a high degree of suspicion. Signs of upper limb ischemia should also be looked for carefully. The presence of these points toward the abnormal origin of arch vessels (the left subclavian artery and the left innominate).

Pre-operative diagnosis of the aberrant left innominate artery is essential from the left pulmonary artery is essential. It should not be mistaken for a MAPCA and ligated. The reimplantation of the left innominate artery into the descending aorta solves the issue. Regular intracardiac repair for TOF can be performed after the re-implantation. Postoperatively, the limb pulses and the neurological status should be monitored.

## CONCLUSION

An aberrant left innominate artery from the left pulmonary artery in a TOF should be appreciated and to be differentiated from the MAPCAs. We should try to diagnose it pre-operatively so that we can avoid plugging or ligation and it can be reimplanted onto the aorta before proceeding with the cardiopulmonary bypass for the routine intracardiac repair for TOF. We should confirm the findings with an angiogram and high-resolution CT prior to the surgery.

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## REFERENCES

1. Siddarth M, Datta SK, Mustafa M, Ahmed RS, Banerjee BD, Kalra OP, etal. Increased level of organochlorine pesticides in chronic kidney disease patients of unknown etiology: role of GSTM1/GSTT1 polymorphism. Chemosphere. 2014;96:174-9.
2. Banka P, Geva T, Powell AJ, Geggel R, Lahiri T, Valente AM. Images in cardiovascular medicine. Right aortic arch with aberrant left innominate artery: a rare vascular ring. Circulation. 2009;120(3):264-5.
3. Koppel CJ, Jongbloed MRM, Kiès P, Hazekamp MG, Mertens BJA, Schalij MJ, et al. Coronary

anomalies in tetralogy of Fallot - A meta-analysis. Int J Cardiol. 2020;306:78-85.
4. Lim ZN, Chew BJW, Yong S, Corno AF. Tetralogy of Fallot With Right Aortic Arch and Retro-Aortic Innominate Vein. Front Pediatr. 2018;6:331.

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