



## Case Report

## Recanalization of a closed Ductus Arteriosus using carotidian approach: A case report.

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**Publication Data:**  
Submitted: July 23, 2023  
Accepted: September 19, 2023  
Online: November 30, 2023

This article was subject to full peer-review.



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### Abstract

Tetralogy of Fallot (TOF) is the most common cyanotic congenital heart disease. It may be associated with anomalies of the aortic arch and pulmonary branches. In neonatal period, percutaneous stent placement for the patent Ductus arteriosus (PDA) is a safe alternative to surgical treatment in cyanotic duct-dependent heart conditions. We herein report the case of a nine-month-old female patient presenting with rare association of Tetralogy of Fallot, absence of the left pulmonary branch, right aortic arch and subaortic innominate vein. Ductus arteriosus was recanalized lately using percutaneous carotidian approach.

### Keywords

Congenital heart disease; Duct-dependent pulmonary circulation; Patent ductus arteriosus; stent.

### Introduction

Stenting of patent ductus arteriosus (PDA) as first stage palliation in duct-dependent pulmonary circulation is an effective procedure in neonates and young infants as an alternative to surgical shunts. This minimally invasive procedure may reduce shunt-related sequelae that increase the morbimortality of subsequent corrective surgical procedures [1].

### Observation

We present the case of a nine-month-old female patient presenting with tetralogy of Fallot associated to absent left pulmonary branch, right aortic arch and subaortic innominate vein. During cardiac catheterization, only the main and right pulmonary arteries were observed (figure 1). Singh maneuver was performed with retrograde injection of the left superior pulmonary vein. The existence of adequately sized left pulmonary branch was confirmed (Z+2.6).

In the aortic arch, there was no evidence of ductus arteriosus. However, a ductal ampulla was seen without progression of contrast (figure 1). Catheterization with coronary guide towards the pulmonary branch showed the continuity and the ductus was opacified. Due to the position of the duct, it was decided to access through the right carotid with JR catheter 6Fr and coronary guide until it was placed in the lower left lobar, subsequently a plasty was performed at the ductus site with a 2.5x20mm balloon. A4.5x16 mm coronary stent was placed at the level of the ductus, achieving patency towards the left pulmonary branch. Hours after the procedure, findings of reperfusion in the left lung were noticed. The patient was managed in PICU. Forty-eight hours later, echocardiographic and tomographic control showed a decrease in the stent's lumen diameter (figure 2).

New catheterization was indicated. Ultrasound-guided right carotid access was again obtained with JR catheter 5Fr the coronary guide was placed in the lower left lobar. A4.5x16mm stent was placed inside the previous one and a second plasty was performed. The angiographic control performed showed adequate flow through the ductus arteriosus to the left pulmonary branch (figure 3).

Postoperative course was uneventful, and the patient was discharged the first week. Regular clinical and radiological follow showed no complications, and the patient is scheduled for total correction.

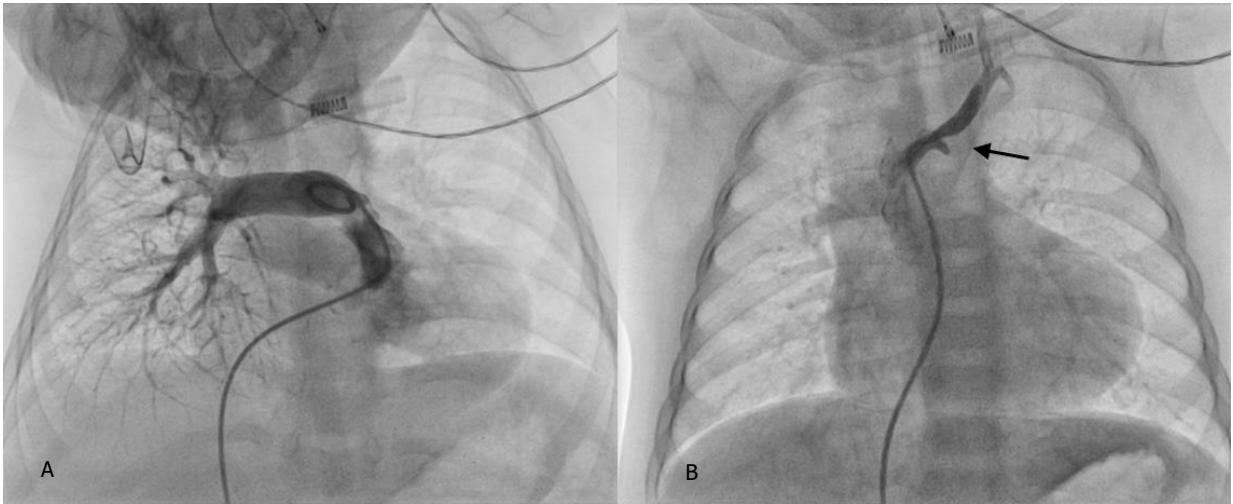


Figure 1: A: evidence of no continuity from the PA to the LPA. B: a closed ampulla in the origin of the LSA (arrow)

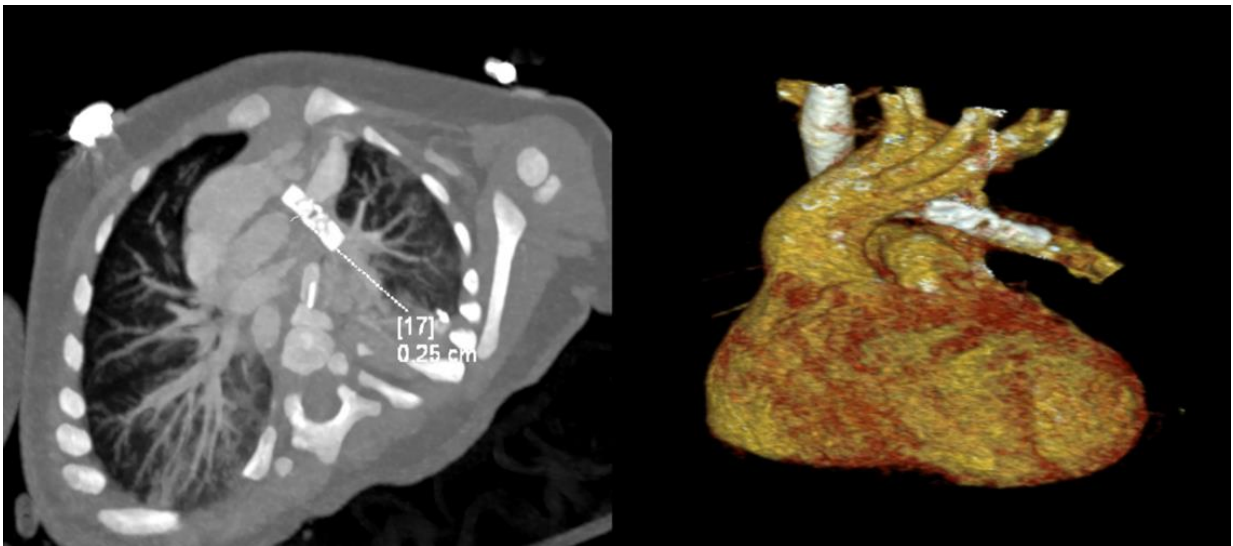


Figure 2: angio-CT showing stent position from the origin of LSA to the Left pulmonary artery.

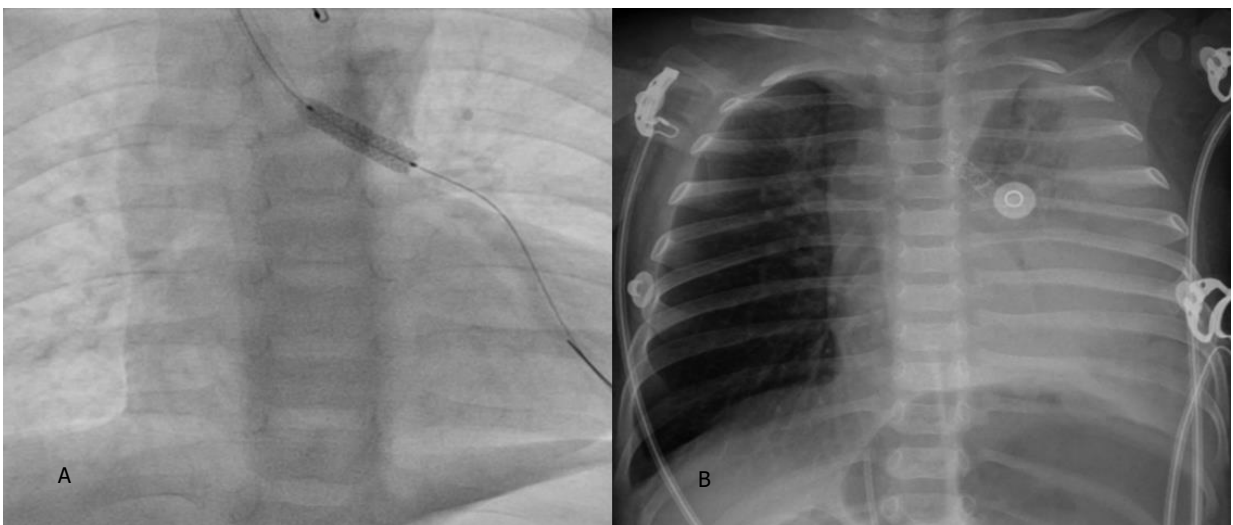


Figure 3: A: Stent placement in the ductus. B: Post-recanalization effusion

## Discussion

cyanotic congenital heart disease patients are generally dependent on alternative sources of pulmonary blood flow (PBF) such as a patent ductus arteriosus (PDA) [2,3]. Most of these patients need palliative procedure to ensure sufficient PBF until definitive corrective surgery. The emergence of percutaneous PDA stenting has significantly decreased the morbimortality of surgical palliative procedures and contributed to objective enhancement of the prognosis of these cardiopathies [4]. As a less invasive method for palliative maintenance, percutaneous PDA stenting showed better feasibility in risky cases, shorter intensive care unit and hospital length of stays and lower complication rates. PDA stenting for patients with duct-dependent pulmonary circulation has lower mortality rates than systemic-pulmonary surgical shunt procedure [5-7].

Our case was technically challenging because of the delay of the intervention (>6months), the impossibility of visualization of the ductus and variant ductal ampulla disposition. The successful use of the carotid approach may propose a safe and effective alternative to the femoral access point. The outcome of this procedure is dependent of PDA origin and morphology. Stenting of younger patients with straight and large PDA at the pulmonary end has significantly higher successful procedure rate.

## Conflict of Interest: None

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