Case Report

A high-risk challenging PDA device closure: Closing the window percutaneously in a sick infant

Vinothkumar.S.P[1]*, Balakrishnan.N[2], Manikandan[3], Nandhini[4]

[1]Consultant Pediatric Cardiologist, Maa Kauvery & Heart City, Trichy, Tamil Nadu
[2]Consultant Cardiac Anaesthetist, Heart City, Trichy, Tamil Nadu
[3]Senior Cathlab Technician, Heart City, Trichy, Tamil Nadu
[4]Asst Scrub Nurse, Heart City, Trichy, Tamil Nadu
*Correspondence

Abstract

Background: Patent ductus arteriosus (PDA) in symptomatic infants often leads to failure to thrive and recurrent lower respiratory tract infections (LRTI). While surgical ligation was traditionally the gold standard for small, sick infants, percutaneous device closure. While surgical ligation was traditionally the gold standard for small, sick infants, percutaneous device closure is increasingly performed as a less invasive alternative, despite significant technical challenges in low-weight patients.

Key words: Patent ductus arteriosus (PDA); Lower respiratory tract infections (LRTI)

Citation: Vinothkumar.S.P, Balakrishnan.N, Manikandan, Nandhini. A high-risk challenging PDA device closure: Closing the window percutaneously in a sick infant. Kauverian Med J. 2026;3(7):24—28.

Academic Editor: Dr. Venkita S. Suresh

ISSN: 2584-1572 (Online)

1. Case Presentation

A 5-month-old female infant referred to us with h/o failure to thrive and recurrent LRTI for cardiac evaluation. The baby gained only 700gm over 5 months with the current weight of 3.5kg (birth weight 2.8kg).

Clinical Examination

She had mild tachypnea and retractions with RR 68/min, HR 140bpm. Cardiovascular examination had hyperkinetic precordium, cardiomegaly with continuous murmur in Gibson's area.

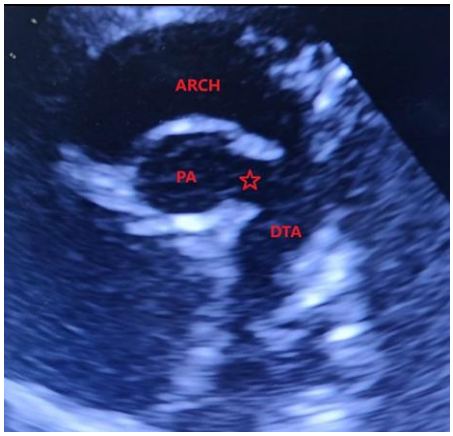
Echocardiogram revealed dilated left atrium & left ventricle due to 6mm large Patent ductus arteriosus with short length s/o Type B window like PDA with Qp:Qs >2:1.

Further plan & challenges: In the current era, most of the PDA can be closed percutaneously except few like this window Type PDA which might have inherent risk of device embolization due to absent constriction at the pulmonary end and also high potential to cause obstruction in the descending aorta / left pulmonary artery. Hence surgical PDA ligation should be the ideal recommendation in such cases. Considering the age & sick condition of the baby as well the parents were keen for non -surgical option we planned for percutaneous device closure.

Procedure: The procedure was done under intravenous sedation in the catheterization lab. Right femoral vein access obtained under ultrasound guidance with 6Fr short sheath. The PDA was crossed from the venous end with 4Fr Judkins Right catheter and 0.035 angle tip guide wire (RFV ⊚ IVC⊚RA⊚ RV ⊚PA⊚PDA⊚DTA). A 6Fr Balkin's delivery sheath was exchanged over the wire. Angiogram by controlled hand injection confirmed short length window like Type B PDA. We made an attempt to position 8*6mm duct occlude initially. But the position was not satisfactory with high risk of embolization - due to the absence of constriction in the device even at the pulled aortic end of 8mm at the duct width of 6mm. Hence, we were destined to upsize the device. Considering the small femoral vein size we don't want to upsize the device to 10*8 mm duct occluder which requires 7Fr sheath. Instead, we chose 10*8mm Lifetech Multifunctional Occluder Device (KONAR -MF) which is mainly meant for VSD closure. We could be able to close the duct with 10*8mm MFO device successfully. The post deployment angiogram in lateral and RAO view showed good position of the device without residue and no obstruction to the DTA & LPA.

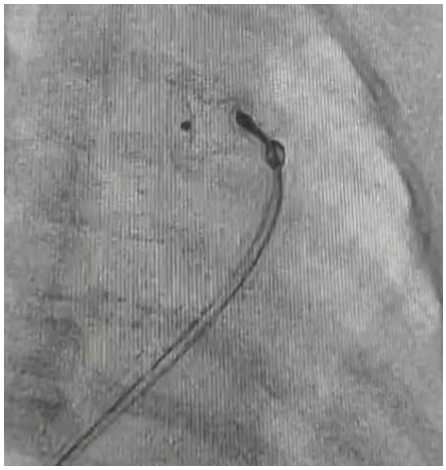
Rationale: The reason for choosing the MFO device - it is a low-profile device which can go through 6Fr sheath itself and it has double disc with less chance of embolization. Though it carries the risk of LPA obstruction, we were able to safely in the index baby as the LPA was quite roomy.

Outcome: The murmur disappeared on table and the distress settled as well. She restarted breast feeding within 2 hours after procedure and got discharged home very next day at good health. The baby is on a week follow up and started gaining weight without any feeding difficulty or distress. Echo also showed normal position of the device without any residual PDA and good antegrade flow across DTA & LPA without obstruction.



Fig(1): Modified suprasternal view showing short length wide 6mm Type B window like PDA (*) connecting descending thoracic aorta (DTA) & pulmonary artery (PA).

Fig (2): Angiogram in lateral view showing short length wide 6mm Type B window like PDA (*) connecting descending thoracic aorta (DTA) & pulmonary artery (PA).



Fig(3): Fluoroscopic in RAO view showing 8* 6mm Duct occluder device without any holding constrictions – high risk for embolization

Fig (4): Fluoroscopic image in Lateral view showing well placed 10* 8mm MFO device.

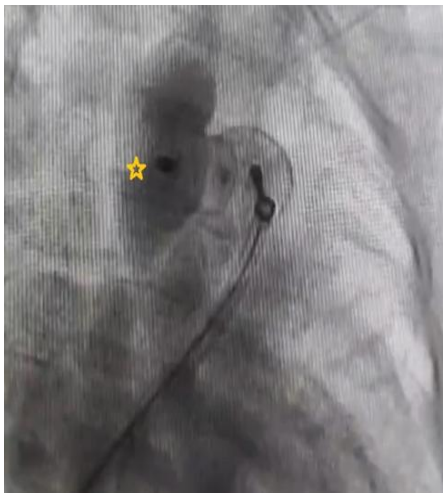


Fig (5): Angiogram in RAO view showing unobstructed DTA flow.

Fig (6): Angiogram in lateral view showing unobstructed LPA flow.

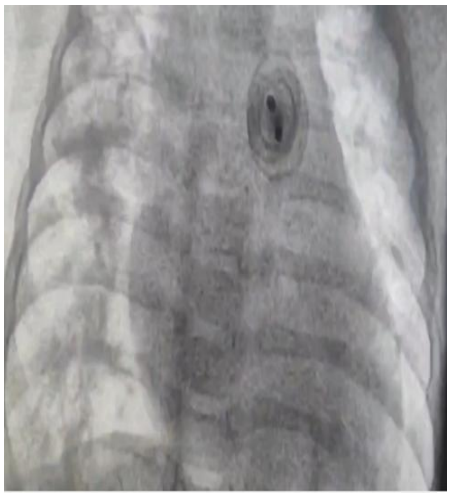


Fig (7): Fluoroscopic image showing final satisfactory position of the MFO device in the ductal region.

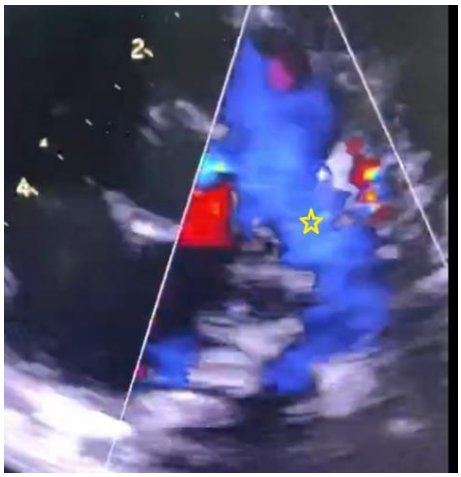


Fig (8): Echo in short axis view showing unobstructed LPA flow.

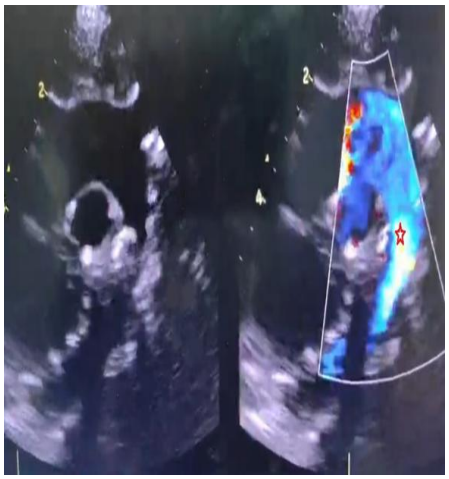


Fig (9): Echo in supra sternal view showing unobstructed DTA flow & no residual PDA flow.