*Cardiology in the Young*

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# Transcatheter closure of a large aortopulmonary window using a Lifetech™ Konar-MF occluder device

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**Brief Report**

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**Abstract**

Aortopulmonary window is a rare CHD, which comprises a communication between the ascending aorta and the pulmonary artery. The standard treatment of aortopulmonary window is surgical; however, few cases are amenable to closure via percutaneous intervention. We present a case of aortopulmonary window closure using Lifetech™ Konar-MF occluder device (Lifetech Scientific Co. Ltd., Shenzhen).

## Introduction

Aortopulmonary window is a rare form of CHD with a prevalence of about 0.1–0.2%.[1,2] The standard treatment of aortopulmonary window is surgical; however, few cases are amenable to percutaneous device closure.[3,4] So far, there have been reports in literature on percutaneous device closure of aortopulmonary windows commonly using duct occluders and muscular Ventricular Septal Defect devices.[3,4,6,7] We report the case of a 10-month-old infant who underwent percutaneous device closure of aortopulmonary window using a Lifetech™ Konar-MF occluder device.

## Case report

A 10-month-old infant was referred to our centre in view of frequent chest infections and poor weight gain. On physical examination, she was between the 3rd and 10th centile for weight, had a 4/6 systolic murmur at the upper left sternal border, bounding peripheral pulses and a saturation of 98%. X-ray showed cardiomegaly and increased bronchovascular markings. On transthoracic echocardiogram, she was found to have a type 1 aortopulmonary window, measuring about 7–8 mm and distant from the semilunar valves and pulmonary artery bifurcation with predominant left to right shunt across it (Figure 1). There was left-sided volume overload with dilation of left atrium and left ventricle, mild mitral regurgitation, and no associated structural cardiac anomalies.

After obtaining informed consent from caregivers, patient was taken to the catheterisation laboratory for haemodynamic cardiac catheterisation and potential device closure of the aortopulmonary window. The procedure was performed under general anaesthesia. Right-sided femoral vessels were accessed and 4 Fr and 6 Fr sheaths were placed in the right femoral artery and vein respectively, followed by 100 IU/Kg of heparin administration. Haemodynamic catheterisation was performed which demonstrated a pulmonary artery pressure of 50/25 mmHg (mean ~ 30 mmHg) with a simultaneous ascending aorta pressure of 80/30 mmHg (mean ~ 48 mmHg). An aortic root angiogram was performed using a 4 Fr Pigtail catheter, which showed a proximal aortopulmonary window measuring about 8 mm and distant from the semilunar valves, pulmonary artery bifurcation, and coronary arteries (Figure 2).

The defect was crossed retrograde using 4 Fr JR catheter over Terumo wire and an Arterio-venous loop was created via a 6 Fr snare and a 5 Fr Multipurpose angiographic catheter placed in the main pulmonary artery. The right femoral venous sheath was upsized to a 7 Fr delivery sheath and was advanced antegrade and positioned into the proximal descending aorta. Size 12 mm x 10 mm Lifetech™ Konar-MF occluder device (Lifetech Scientific Co. Ltd., Shenzhen) was chosen and advanced into the delivery sheath. The aortic disc was deployed in the ascending aorta and the entire assembly was pulled back. After confirming the location of the device on the roadmap of aortic angiogram, the pulmonary disc was deployed (Figure 3). Pullback gradients and angiograms (Figure 4) were performed in the aorta and pulmonary arteries, and the device was released after there was no obstruction documented in the ascending aorta and pulmonary artery (Figure 5). Patient tolerated the procedure well and there were no complications. She was extubated after the procedure and was discharged the next day after a post-procedure echocardiogram showed the device in good position and with no gradients across the ascending

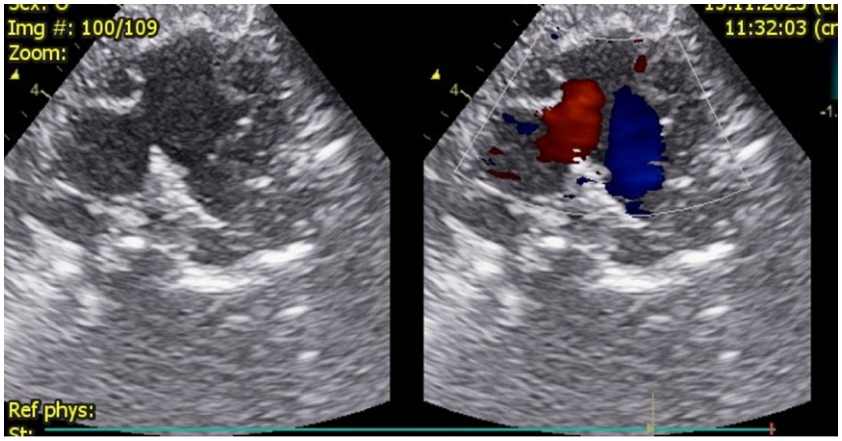


**Figure 1.** Parasternal short axis view of 2D echocardiogram demonstrating the aortopulmonary window and predominant left to right shunt across it.

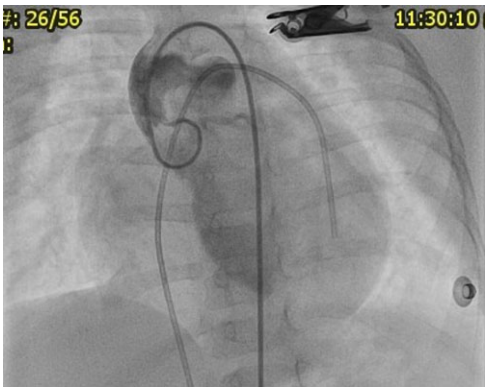


**Figure 2.** Aortic angiogram (LAO 30) demonstrating the aortopulmonary window with opacification of the pulmonary artery.

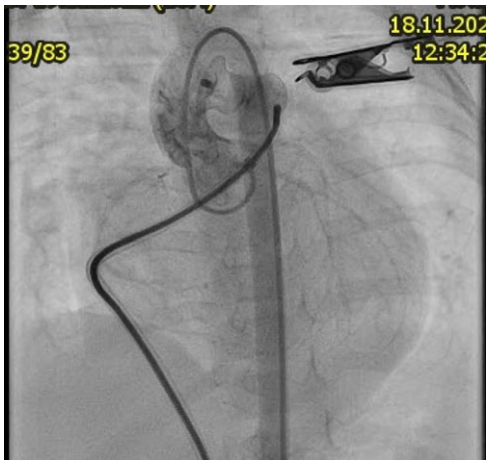


**Figure 4.** Aortic angiogram demonstrating no flow into the pulmonary artery after device deployment.

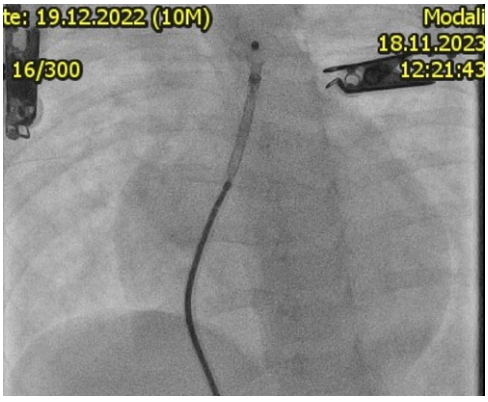


**Figure 3.** Deployment of the left disc in the ascending aorta.

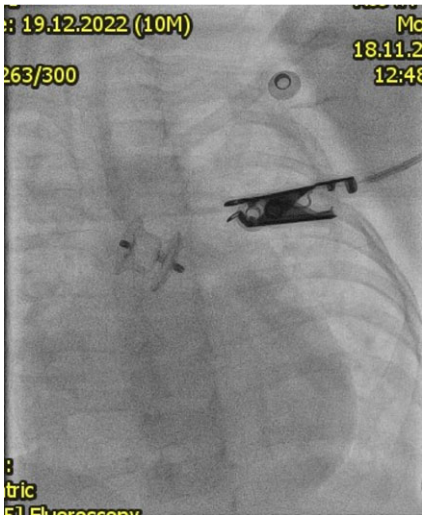


**Figure 5.** Final device position after release.

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aorta and pulmonary artery. The infant is doing well at one-month follow-up and is gaining weight.

## Discussion

Aortopulmonary window is a rare CHD, which requires early treatment and is most often treated surgically. Its classification as given by Mori *et al.* divides aortopulmonary window into three types. Type I is a proximal defect located in the ascending aorta midway between the semilunar valves and pulmonary bifurcation. Types II is a distal defect that is located in the distal portion of the ascending aorta. Type III is a defect that is large and involves the majority of the ascending aorta, pulmonary trunk, and the right pulmonary artery.[5]

Type I defects, which are typically midway between the semilunar valves and pulmonary artery bifurcation and those with no associated cardiac anomalies, can be suitable percutaneous closure.

There have been case reports and case series in literature that have demonstrated percutaneous device closure of this lesion with muscular Ventricular Septal Defect devices and duct occluders.[3,4,6,7] In our patient, we decided to opt for a Konar-MF occluder due to its softer, low-profile design, and the advantage of the device requiring smaller sheath sizes, rendering it safer for smaller infants.[8]

In our patient, a Lifetech$^{TM}$ Konar-MF occluder device was used for closure of an aortopulmonary window. The first case of the use of this device for aortopulmonary window was reported by Abdelrazek Ali Y, *et al;*[9] however, our patient is the youngest to undergo percutaneous device closure of an aortopulmonary window by a Konar-MF occluder.

In the ever-evolving field of paediatric cardiac interventions, aortopulmonary window is one of the lesions that requires further studies and cohort analyses for standard guidelines for percutaneous device closure. Although our patient has so far had device in stable position, we cannot overemphasise the need for regular follow-up, since there have been no cohort studies to demonstrate the long-term safety profile of percutaneous closure of aortopulmonary window.

## Conclusion

We conclude that it is safe to perform transcatheter closure of an aortopulmonary window, provided the lesion has a suitable anatomy and there are no associated cardiac anomalies. There are several devices available to choose from according to operator preference and anatomy; however, in our case, we found the Lifetech$^{TM}$ Konar-MF occluder device to be a good option for consideration for percutaneous closure of an aortopulmonary window.

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