

Case

Blurred Vision Following Transcatheter ASD Closure: Device Embolization to the Aortic Arch

Authors & Affiliations

¹Münevver Tuğba Temel, ²Osman Başpınar

¹Gaziantep City Hospital, Department of Pediatric Cardiology, Gaziantep, Türkiye

²Gaziantep University, School of Medicine, Department of Pediatric Cardiology, Gaziantep, Türkiye

Corresponding Author: Münevver Tuğba Temel, M.D., Gaziantep City Hospital, Department of Pediatric Cardiology, Gaziantep, Türkiye.

E-mail: t_bilgic@yahoo.com

Submitted at: 17.07.2025 - Accepted at: 15.11.2025 - Published at: 19.11.2025

The journal is licensed under: Attribution 4.0 International (CC BY 4.0)

Avicenna Anatol J Med. Year; 2025, Volume: 2, Issue: 2

 [10.5281/zenodo.17646618](https://doi.org/10.5281/zenodo.17646618)

Abstract

Atrial septal defect (ASD) is one of the most common congenital heart diseases in childhood. Transcatheter closure has become the first-line treatment due to its minimally invasive nature and high success rates. However, device embolization is a rare but potentially serious complication. Herein, we present a case of blurred vision following ASD closure, where the occluder device was found to have embolized to the aortic arch. The clinical course, diagnostic work-up, and retrieval of the device are discussed, along with possible pathophysiological mechanisms.

Keywords: Atrial Septal Defect, Heart Septal Occluder Devices, Cardiac Catheterization/methods, Embolism/adverse effects, Aortic Arch

INTRODUCTION

Atrial septal defect (ASD) occurs as an isolated anomaly in 3% to 10% of all congenital heart disease (CHD) with an estimated incidence of 3–8 per 1000 live births. About 30% to 50% of children with CHDs have an ASD as a part of the cardiac defect. Non surgical closure using a catheter delivered closure device has become the preferred method in suitable patients offering a less invasive alternative to surgical repair. These procedures are associated with high success rates (90–95%) and faster recovery (1).

Nevertheless, device-related complications such as embolization are extremely rare but may occur in approximately 1–3% of cases (2). Prompt recognition and intervention are essential in managing such complications.

In this report, we discuss a case of blurred vision following transcatheter ASD closure and investigate its association with device embolization to the aortic arch. Understanding the underlying mechanism provides valuable insight for postprocedural monitoring and patient safety.

CASE

A 17-year-old female patient was referred to our outpatient clinic for evaluation of a secundum-type atrial septal defect. Transthoracic echocardiography revealed a 17 mm left-to-right shunting ASD, with a total septal length of 49 mm. Mild mitral valve prolapse and minimal mitral regurgitation were also noted, along

with right ventricular dilatation.

Under transesophageal echocardiography (TEE) guidance, a transcatheter ASD closure was performed using an 18 mm septal occluder device. Postprocedural echocardiography confirmed the correct placement of the device, and no immediate complications were observed.

However, during evening rounds, the patient reported new-onset blurred and foggy vision. When the patient was asked about the onset of blurred vision, they stated that it began after the angiography. Subsequently, an urgent chest X-ray (PAAC) was requested, which revealed that the device was not in its proper position (**Figure 1**). An urgent transthoracic echocardiogram performed immediately afterward revealed that the device was no longer in place and had migrated to the transverse aortic arch (**Figure 2**).

In light of the device embolization, urgent cardiac catheterization was promptly performed. A 12F Mullins sheath was advanced via the femoral artery, and the device was snared (**Figure 3**). Due to difficulty in retrieving the device into the sheath, the tip of the sheath was obliquely cut to enlarge its opening. The device was successfully retrieved from the descending aorta via femoral access. Post-retrieval angiography confirmed the absence of any vascular injury.

Following device removal, the patient's blurred vision resolved completely.

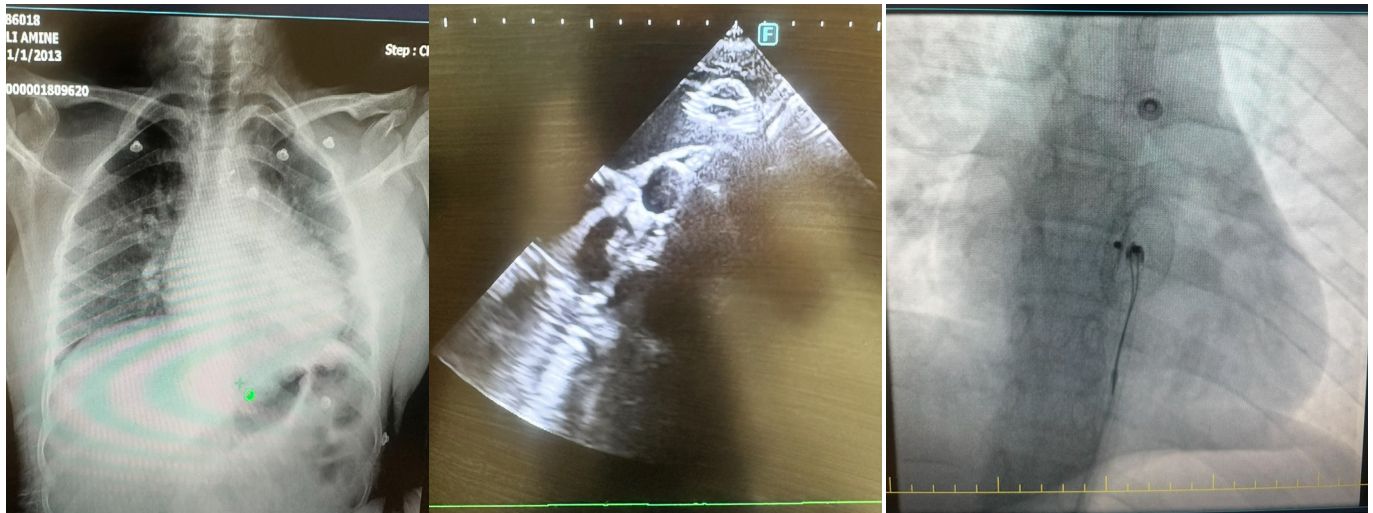


Figure 1. Postprocedural chest X-ray **Figure 2.** Control echocardiography **Figure 3.** The ASD device was snared in the aortic arch

DISCUSSION

The aortic arch gives rise to the major arteries supplying the brain and eyes, including the brachiocephalic trunk, left common carotid artery, and left subclavian artery. These vessels further branch into the internal carotid arteries, which play a crucial role in perfusing the anterior circulation of the brain as well as the optic structures, including the retina and optic nerve (3). Any pathological condition affecting the aortic arch—such as thromboembolism, dissection, or mechanical obstruction caused by an embolized intracardiac device—can compromise blood flow through these critical vessels. A reduction in perfusion pressure or flow velocity within these arteries may lead to ischemia of the optic nerve head or retina, potentially manifesting as visual disturbances such as transient or persistent blurred vision, visual field defects, or even acute vision loss, depending on the severity and duration of the insult.

In our patient, the embolized device may have partially impeded blood flow through the aortic arch or its major branches, such as the brachiocephalic trunk or the left common carotid artery. This mechanical obstruction could have led to a transient reduction in perfusion to the cerebral and ocular circulations, particularly affecting the internal carotid artery and its ophthalmic branch, which supplies the retina and optic nerve. As a result, our patient may have experienced temporary ischemia of the visual pathways, manifesting as blurred vision or other transient visual disturbances. Although these symptoms resolved spontaneously, they may represent an early warning sign of compromised cerebral perfusion.

This case highlights the importance of vigilant postprocedural monitoring for early detection of complications such as device embolization. Timely diagnosis and intervention can prevent serious neurological or vascular sequelae in patients undergoing transcatheter ASD closure.

CONCLUSION

This case underscores the importance of vigilant postprocedural monitoring following transcatheter atrial septal defect closure, as device embolization—although rare—may present with subtle or atypical symptoms such as blurred vision. Early recognition of visual disturbances and prompt imaging facilitated the timely diagnosis of device migration to the aortic arch. Rapid catheter-based retrieval resulted in complete symptom resolution and prevented potentially serious cerebrovascular complications. Clinicians should maintain a high index of suspicion for device-related complications, particularly when neurologic or visual symptoms appear after ASD closure, to ensure patient safety and optimal outcomes.

DECLARATIONS

Funding: None

Competing Interests: The author declares no conflict of interest.

Consent Statement: Patient's parents consent was obtained.

REFERENCES

1. Hoffman JJ, Kaplan S. The incidence of congenital heart disease. *J Am Coll Cardiol.* 2002;39(12):1890-1900.
2. Harper RW, Mottram PM, McGaw DJ. Closure of secundum atrial septal defects with the Amplatzer septal occluder device: techniques and problems. *Catheter Cardiovasc Interv.* 2002;57(4):508-524. doi:10.1002/ccd.10353
3. Ergun E, Şimşek B, Koşar PN, Yılmaz BK, Turgut AT. Anatomical variations in branching pattern of arcus aorta: 64-slice CTA appearance. *Surg Radiol Anat.* 2013;35(6):503-509. doi:10.1007/s00276-012-1063-3