



Images in Cardiology

The importance of recognizing the prominent Eustachian valve in the evaluation of atrial septal defects before percutaneous or surgical closure



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ABSTRACT

Atrial septal defect closure is now routinely performed using a percutaneous approach under echocardiographic guidance. Since some echocardiographic features play an important role in the assessment of the defect and safety of the procedure, the salient features of the anatomical variations seen in adults undergoing transcatheter device closure should be well known to prevent inadvertent adverse effect or complications. It has been reported that the valve of the inferior vena cava, Eustachian valve, could be mistaken as the atrial septum thus ending in a wrong diagnosis and causing inadvertent surgical or percutaneous closure of an Eustachian valve to interatrial septum. We present a concise article that brings out a practical issue encountered during device closure of atrial septal defects.

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Atrial septal defect closure is now routinely performed using a percutaneous approach under echocardiographic guidance. Since some echocardiographic features play an important role in the assessment of the defect and safety of the procedure, the salient features of the anatomical variations seen in adults undergoing transcatheter device closure should be well known to prevent inadvertent adverse effect or complications.¹ In addition to the size of the defect, the distance of the defect from the surrounding structures called rims play an important role in deciding whether a defect can be closed or not. In addition to this, associated abnormalities of the superior and inferior vena cava, coronary sinus, pulmonary veins and atrioventricular valves that may hinder the device closure should be carefully evaluated.¹ The color flow

entering the right atrium from vena cava and coronary sinus should not be misdiagnosed. The valve of the inferior vena cava, Eustachian valve can be mistaken as the atrial septum (Fig. 1; Videos 1–4) thus ending in a wrong diagnosis and causing inadvertent surgical^{2–4} or percutaneous⁵ closure of a Eustachian valve to interatrial septum. The finding of a redundant Eustachian valve can also add technical difficulties for the percutaneous treatment of atrial septal defect. Passing the guidewire may also be difficult. Therefore, it is fundamental the identification of this structure to avoid misdiagnosis and complications in atrial septal defect patients requiring percutaneous or surgical closure. Even though echocardiography is one of the most widely used echocardiographic modalities, it requires expert imaging personal

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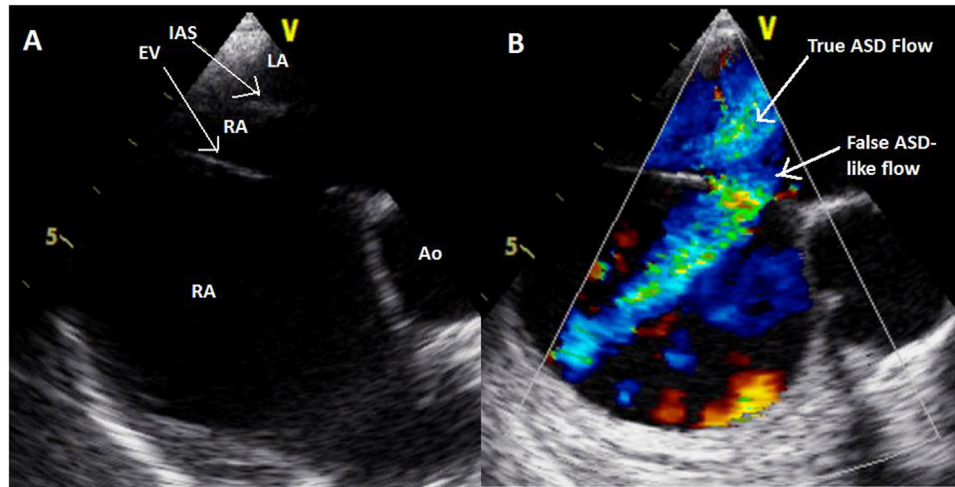


Fig. 1. Transesophageal echocardiography in the mid-oesophageal short-axis view at the aortic valve level with (B) and without (A) color Doppler showing the prominent Eustachian valve with the atrial septal defect-like flow that can be easily misdiagnosed resulting in an unnecessary percutaneous or surgery intervention. RA, right atrium; LA, left atrium; Ao, aorta; EV, Eustachian valve.

to avoid any wrong diagnosis from misinterpretation of normal and abnormal anatomy of the heart, atrial septum and the defect, particularly during percutaneous closure procedure.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at [10.1016/j.ihj.2017.04.018](https://doi.org/10.1016/j.ihj.2017.04.018).

References

1. Masani ND. Transoesophageal echocardiography in adult congenital heart disease. *Heart*. 2001;86(Suppl (2)):II30–II40.
2. Akpınar I, Guray Y, Demirkan B, et al. Rare postsurgical complication of atrial septal defect closure: right inflow obstruction due to inadvertent suturing of eustachian valve to interatrial septum. *Can J Cardiol*. 2011;27:868 e869–810.
3. Becker A, Buss M, Sebening W, Meisner H, Dohlemann C. Acute inferior cardiac inflow obstruction resulting from inadvertent surgical closure of a prominent Eustachian valve mistaken for an atrial septal defect. *Pediatr Cardiol*. 1999;20:155–157.
4. Desnick SJ, Neal WA, Nicoloff DM, Moller JH. Residual right-to-left shunt following repair of atrial septal defect. *Ann Thorac Surg*. 1976;21:291–295.
5. Onorato E, Pera IG, Melzi G, Rigatelli G. Persistent redundant Eustachian valve interfering with Amplatzer PFO occluder placement: anatomico-clinical and technical implications. *Catheter Cardiovasc Interv*. 2002;55:521–524.