

# Neglected Inferior Sinus Venosus Atrial Septal Defect Diagnosed Late after Surgical Closure of Secundum ASD

Maryam Esmailzadeh MD, Soheila Talebi MD,  
Mohammad Mehdi Peighambari MD\* and Gholamreza Omrani MD\*\*

## Abstract

We describe neglected inferior sinus venosus atrial septal defect in a patient with history of surgical repair of secundum type ASD nineteen years ago. The defect was in the inferior portion of the interatrial septum just at the orifice of the inferior vena cava, far from the previous surgical patch of the secundum ASD repair. Preoperative and/or intraoperative transesophageal echocardiography is necessary for detection of multiple ASDs and reveals the successful repair of sinus venosus defects (*Iranian Heart Journal 2009; 10 (4):49 -51*).

**Key words:** atrial septal defect ■ congenital heart disease ■ cardiac surgery

**R**epair of atrial septal defects (ASD) is a relatively common surgical procedure. Studies of patients who have undergone repeat catheterization after surgical closure of ASD have suggested that residual defects may be found in up to a third of these patients.<sup>1</sup> In the majority of these cases, the residual shunt is of little hemodynamic significance because the shunt ratio is frequently less than 1.5. The defects are often not clinically detectable because the auscultatory and the electrocardiographic findings may decrease or disappear, and the heart size may return to normal.<sup>2</sup> Drainage of the inferior vena cava into the left atrium after surgical closure of ASD is a well-known complication, particularly in the era before cardiopulmonary bypass when the Eustachian valve was mistaken for the inferior rim of the atrial septum. We have recently encountered a case of unusual residual atrial septal defect of the sinus venosus type located near the entrance of the inferior vena cava (IVC) in a middle-

## Case report

A 43-year-old lady with previous history of ASD closure nineteen years ago presented for increasing dyspnea. Transthoracic echocardiogram revealed right ventricular overload and the presence of a residual left-to-right shunt of about 1.4:1.

Transesophageal echocardiography (TEE) showed an intact previous patch without any residual defect and identified a second defect measuring 10mm in diameter close to the entrance of the IVC (Fig. 1), far from the previous surgical patch of secundum ASD repair (Fig. 3), with relatively significant left-to-right shunt. The IVC was overriding the interatrial septum (Fig. 2) with positive contrast during femoral vein contrast injection (Fig. 4).

There was no anomalous pulmonary venous drainage, coronary sinus defects, or persistent left superior vena cava. Re-do operation was done successfully without complication.

Received Aug 20, 2009; Accepted for publication Jan. 5, 2010

From the Department of Echocardiography, \*Cardiology and \*\*Cardiac Surgery, Shaheed Rajaie Cardiovascular Medical and Research Center, Iran University of Medical Sciences, Tehran, Iran

Correspondence to M.Esmailzadeh MD, Shaheed Rajaie Cardiovascular Medical and Research Center, Vali-Asr (A.S.) St, Mellat Park, Tehran, Iran.

E-mail: [m\\_eszadeh@yahoo.com](mailto:m_eszadeh@yahoo.com)



**Fig. 1.** Transesophageal echocardiography shows inferior sinus venus ASD, overriding of IVC.



**Fig. 4.** Agitated saline solution injection via left leg shows positive contrast effect in left atrium (LA).



**Fig. 2.** Transesophageal echocardiography shows left-to-right shunt by color Doppler.



**Fig. 3.** Neglected inferior sinus venus ASD far from the previous surgical patch is shown.

### Discussion

Residual postoperative atrial shunting in patients with ASD repair is well recognized. Many of these patients do not have a significant hemodynamic shunt; thus the presence of a small left-to-right atrial shunt in the postoperative period does not necessarily indicate unsuccessful repair.<sup>3,4</sup> One known cause of a persistent ASD after surgical repair is when the eustachian valve is mistaken for the inferior margin of the ASD. This mistake has become less common ever since cardiopulmonary bypass has been routinely performed, which provides improved visibility during the surgical repair. A residual defect may also occur when some of the sutures tear through, resulting in an incomplete repair. This may be more common when direct suture closure is performed in the setting of a large defect. In these cases, the residual defect is located at the site of surgical repair. The residual defect in our patient was an unusual sinus venus defect located near the IVC orifice. Therefore, the patient actually had two ASDs, one secundum type and the other a sinus venus defect, but the latter remained undiagnosed at the time of the first surgery when TEE was not introduced widely. The sinus venus ASD may have escaped recognition during surgery because the IVC

cannula might have obscured visibility. This case underscores the importance of preoperative TEE in patients with ASD. Although transthoracic echocardiography is highly reliable in the detection of primum and secundum ASDs, its ability to detect sinus venosus defects is limited, and TEE has been demonstrated to be far superior.<sup>5-7</sup> As illustrated in this patient, more than one defect may be present. Thus in patients suspected of ASD; the atrial septum needs to be comprehensively imaged by TEE, even after a secundum defect has been identified. The connections of both the superior vena cava and the IVC need to be specifically examined, to avoid missing these types of defects. Intraoperative TEE should be considered to assess the result of surgical repair. In our current practice preoperative TEE is routinely performed in all patients with ASD, but intraoperative TEE is reserved for those with unusual or multiple ASDs.

### References

1. Young D. Later results of closure of secundum atrial septal defect in children. *Am J Cardiol* 1973; 31: 14-22.
2. Lueker RD, Vogel JHK, Blount SG. Cardiovascular abnormalities following surgery for left-to-right shunts: observations in atrial septal defects, ventricular septal defects and patent ductus arteriosus. *Circulation* 1969; 40: 785-801.
3. Santoso T, Meltzer RS, Castellanos S, Serruys PW, Roelandt J. Contrast echocardiographic shunts may persist after atrial septal defect repair. *Eur Heart J* 1983; 4: 129-36.
4. Valdes-Cruz LM, Pieroni DR, Roland JMA, Shemateck JP. Recognition of residual postoperative shunts by contrast echocardiographic techniques. *Circulation* 1977; 55: 148-52.
5. Hausmann D, Werner G, Mugge A, Ziemer G, Pearlman AS. Value of transesophageal color Doppler echocardiography for detection of different types of atrial septal defect in adults. *J Am Soc Echocardiogr* 1992; 5: 481-8.
6. Kronzon I, Tunick PA, Freedberg RS, Trehan N, Rosenzweig BP, Schwinger ME. Transesophageal echocardiography is superior to transthoracic echocardiography in the diagnosis of sinus venosus atrial septal defect. *J Am Coll Cardiol* 1991; 17: 537-42.
7. Pascoe RD, Oh JK, Warnes CA, Danielson GK, Tajik AJ, Seward JB. Diagnosis of sinus venosus atrial septal defect with transesophageal echocardiography. *Circulation* 1996; 94: 1049-55.