

Editorial



Percutaneous Device Closure of Atrial Septal Defect: Neglected Long-Term Effects on the Left Atrium

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Conflict of Interest

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Atrial septal defect (ASD) is a common congenital heart disease in adulthood that can be isolated or associated with other abnormalities. It is generally recommended to close this defect if it is associated with significant left-to-right shunt with right heart enlargement or paradoxical embolism. While surgical repair of ASD is a low-risk procedure, it can be associated with morbidity related to cardiopulmonary bypass, thoracostomy and atriotomy. Since the initial cases of successful transcatheter ASD closure were reported in the mid-1970s,^{1,2)} percutaneous device closure has become widely accepted as an alternative for surgical closure of small- or moderate-size secundum ASDs if the morphologic characteristics are appropriate. Several devices are currently available for transcatheter closure, and the factors that affect successful device closure to achieve optimal outcomes include the patient's comorbidities, preprocedural criteria for selection, and postprocedural care. Prior observational studies have shown that, compared to surgical closure, percutaneous closure has a similar efficacy rate with shorter hospital stays and lower rates of early complications.^{3,4)} However, there have been concerns about potential long-term complications including arrhythmia, embolic events, residual shunt, erosion of cardiac structure by the device, and even sudden death.^{5,7)} Long-term clinical outcomes following transcatheter ASD closure remain less certain.

In this issue of The Journal of Cardiovascular Imaging, Seo et al.⁸⁾ investigated left atrial (LA) function 1–3 years after percutaneous device closure or surgical repair in patients with ASD using speckle tracking echocardiography. While baseline LA function before ASD closure was not available in this study, LA function decreased in patients with device closure as compared with controls. On the other hand, patients with surgical repair showed similar LA function to those with device closure or controls. Although it is hard to draw a conclusion from this data given that the study population was too small to compare LA function between the groups, this study suggests that device closure might adversely influence LA function. In a different study, however, worse LA function was observed in patients with surgical closure than those with percutaneous device closure.⁹⁾ Additionally, more data would be needed to be assured of long-term clinical outcomes following percutaneous ASD closure.

Numerous studies have shown the utility of LA function as a sensitive indicator for left ventricular diastolic dysfunction and as a good predictor for functional capacities and clinical outcomes in various cardiovascular diseases.^{10,11)} In one report, patients with decreased LA

function were more likely to develop atrial fibrillation.¹²⁾ While a meta-analysis showed that surgical or percutaneous ASD closure significantly reduces the risk of atrial tachyarrhythmia in the short-to-medium term,¹³⁾ closure does not eliminate this risk. The risk of atrial arrhythmia can be related to aging, other underlying comorbidities and incomplete atrial remodeling after ASD closure. Further studies are required to determine whether different ASD closure techniques differently affect long-term LA function and clinical outcomes, including atrial arrhythmia.

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