Incremental value of transesophageal echocardiography in the evaluation of patients before percutaneous closure of atrial septal defects

To the Editor,

We have recently read with great interest the article by Chen et al. (1) entitled "Transcatheter device closure of atrial septal defects guided completely by transthoracic echocardiography: A single cardiac center experience with 152 cases" published in Anatol J Cardiol 2018; 20: 330-5. We recognize authors' effort in the report describing the transcatheter device closure of atrial septal defects (ASDs) fully guided by transthoracic echocardiography (TTE), which was a single-cardiac-center experience including 152 cases. On the other hand, we believe that there are some major drawbacks that need to be addressed here.

ASDs are one of the most common forms of congenital heart disease in adults. Although percutaneous closure of ASDs has gained more popularity in recent years as a repair technique, a morphological evaluation of the defect is necessary for an appropriate patient election due to a considerable variation in the size, morphology, and location of the defects (2). Traditional balloon sizing and/or two-dimensional (2D) transesophageal echocardiography (TEE) have been used for defect sizing and procedure monitoring. The evaluation of patients for percutaneous transcatheter closure of secundum ASDs requires accurate information regarding the anatomy of the defect, such as its maximal diameter and the length of the circumferential tissue rims (3). TTE has a limited ability in this regard. The use of TEE, on the other hand, provides useful information about the exact morphology of the ASD, such as the size, position in the interatrial septum, and adequacy of septal rims. Inadequate visualization may result in suboptimal device delivery and unfavorable outcomes. Various defects may cross multiple imaging planes, complicating and sometimes precluding accurate visualization by conventional 2D TEE. In such cases, real-time three-dimensional TEE allows an accurate assessment of the cardiac anatomy and an excellent spatial orientation, yielding detailed information about the shape and location of the defects (4, 5).

Device embolization is a potential complication of the percutaneous transcatheter closure of ASDs. Most embolizations occurred because of inadequate rims or undersized devices (6). The incidence of device embolization in TEE-guided percutaneous ASD closures has been reported to be 0.5% (7). In the study by Chen et al. (1), it was reported that all patients were diagnosed and evaluated by TTE preoperatively before the percutaneous ASD closures. TTE may be used as the guidance during the procedure, but all patients should be evaluated previously by TEE, because TTE has a limited ability when it comes to indicating a defect size, adequacy of the rims, and the complexity of the defects. In addition, other accompanying congenital anomalies that may be counter indicated to the closure can only be visualized by a preoperative TEE examination.

In conclusion, a successful transcatheter closure of secundum ASDs is dependent on an accurate assessment of defect size, rim architecture and length, and relationship between the defect and adjacent cardiac structures. These features are of an incremental value in determining the appropriateness of transcatheter closure, device selection, and guidance of device deployment. The lack of evaluation of the patients by a TEE study before the transcatheter closure of ASDs may increase the number of procedure-related complications and decrease the success rates.

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DOI:10.14744/AnatolJCardiol.2018.80707

Author`s Reply

To the Editor,

First of all, we agree with the author's opinion. We also think that the accuracy of transesophageal echocardiography (TEE) is greater than the accuracy of transthoracic echocardiography (TTE) in assessing the anatomical structure of an atrial septal defect (ASD). The most important reason is that the TEE probe was adjacent to the left atrium, which may allow us to get a better view of ASD. As the author emphasized and other papers reported, TEE provides more information regarding the exact morphology of the ASD, such as the size, position in the interatrial septum, and adequacy of septal rims (1, 2).

However, it does not mean that TEE is to be used as the only guiding tool for the device closure of ASD. Perhaps because of the lean physique of southern Chinese people, we found that TTE can achieve satisfactory imaging and be used as a guiding device in the ASD closure. With the help of an experienced sonologist, the TTE guidance can also provide an accurate measurement of many parameters from the apical four-chamber view, the parasternal long-axis view, and the subxiphoid acoustic window, which can determine the maximum diameter of the defect and complete the procedure.

In the early stage, we mainly carried out transthoracic device closure of ASD, and we also reported the experience with regard to such cases with deficient rims, which were completed by the TTE guidance (3, 4). With the accumulation of experience, we gradually developed a transtheter device ASD closure guided by complete TTE. We have also found that some other scholars also support our opinion, using TTE as a guiding tool for device closure of ASD (5, 6). Our ultimate idea was to "one-stop shop" complete all kinds of ASD treatments.

It must be pointed out that we are not advocating TTE as a complete TEE replacement. For most cases in our center, the two methods are interchangeable. For a few complex cases, we still use TEE as a guiding tool. All of this also depended on the experience level of operators and sonologists. We think that this may be the reason why some scholars do not accept our method.

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Echogenicity and echocardiographic guidance

To the Editor,

We have read with great interest the article entitled "Transcatheter device closure of atrial septal defects guided completely by transthoracic echocardiography: A single cardiac center experience with 152 cases" published in Anatol J Cardiol 2018; 20: 330-5 by Chen et al. (1). In their study, they reported that lone echocardiographic guidance with transcatheter device closure of atrial septal defects is safe and effective as fluoroscopic and echocardiographic guidance together. I have made the following comments and concerns.

When we compare the groups, the ages ranged from 3 to 75 years for group I and from 4 to 60 years for group II. Echogenicity is the major concern in both echocardiographic assessment and guidance especially in the older patient population. We