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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References

1. Chen Q, Cao H, Zhang GC, Chen LW, Lu H, Yu LL. Transcatheter device closure of atrial septal defects guided completely by transthoracic echocardiography: A single cardiac center experience with 152 cases. Anatol J Cardiol 2018; 20: 330-5.
2. Stout KK, Daniels CJ, Aboulhosn JA, Bozkurt B, Broberg CS, Colman JM, et al. 2018 AHA/ACC Guideline for the Management of Adults With Congenital Heart Disease: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. J Am Coll Cardiol 2018; pii: S0735-1097(18)36845-1.
3. Silvestry FE, Cohen MS, Armsby LB, Burkule NJ, Fleishman CE, Hijazi ZM, et al.; American Society of Echocardiography; Society for Cardiac Angiography and Interventions. Guidelines for the echocardiographic assessment of atrial septal defect and patent foramen ovale: from the American Society of Echocardiography and Society for Cardiac Angiography and Interventions. J Am Soc Echocardiogr 2015; 28: 910-58.
4. Kalçık M, Gürsoy MO, Yesin M, Yıldız M, Özkan M. The Role of Real-time Three-dimensional Transesophageal Echocardiography in Patient Selection before Percutaneous Closure of Complex Atrial Septal Defects. Koşuyolu Heart Journal 2015; 18: 118-9.
5. Faletra FF, Pedrazzini G, Pasotti E, Muzzarelli S, Dequarti MC, Murzilli R, et al. 3D TEE during catheter-based interventions. JACC Cardiovasc Imaging 2014; 7: 292-308.
6. Agca M, Naser A, Guner A, Kılıcgedik A, Celik M, Akgun T, et al. Spontaneous embolization of an atrial septal defect occluder device into the left ventricular outflow tract in a patient with pulmonary stenosis. Echocardiography 2017; 34: 1714-6.
7. Levi DS, Moore JW. Embolization and retrieval of the Amplatzer septal occluder. Catheter Cardiovasc Interv 2004; 61: 543-7.

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