

Assessment of Atrial Septal Defects through Advanced Three-Dimensional Transesophageal Echocardiography Imaging

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Abstract :

This article presents a study on the use of three-dimensional transesophageal echocardiography (3D TEE) in the evaluation of atrial septal defects (ASD) in adults. With 3D TEE, a more accurate anatomical assessment of the atrial septum is achieved, allowing precise measurement of size, shape, and border characteristics of the ASD. In a series of 27 cases, the 3D evaluation showed a strong correlation between measured parameters and the size of the closure device required. 3D TEE appears to be a significant advancement in cardiovascular imaging, enhancing pre-interventional assessment and the success of interventions for ostium secundum ASD.

Keywords: Three-Dimensional Transesophageal Echocardiography, Ostium Secundum ASD, Pre-Interventional Evaluation, Cardiovascular Imaging.

Introduction : Real-time three-dimensional transesophageal echocardiography (3D TEE) represents a revolutionary advancement in cardiovascular imaging, enabling improved anatomical evaluation of atrial septal defects (ASD), such as ostium secundum ASD. This technique provides additional value due to the complex anatomy of the atrial septum, enhancing the accuracy of assessment and choice of closure device (1, 2).

Description : A retrospective observational study was conducted to assess the utility of 3D TEE in the pre-interventional evaluation of ostium secundum ASD in adults. Thirty-six patients with ostium secundum ASD were included in this study. Clinical evaluation, transthoracic echocardiography, and electrocardiography (ECG) were performed for each case. All patients underwent diagnostic and complementary 3D TEE, with a preference for the 3D mode in complex cases, to assess the size, shape, and quality of the ASD borders.

Discussion : The results confirmed that 3D TEE is superior to 2D TEE. This modality offers comprehensive and precise analysis of ASD anatomy, allowing determination of the type of septal defect, exact size, single or multiple character, and any associated anomalies. This technique improves intervention outcomes, whether percutaneous or surgical, by facilitating planning and selection of closure devices (1, 2, 3).

Conclusion : Three-dimensional transesophageal echocardiography is an essential tool in the evaluation of ostium secundum ASD in adults. It contributes to enhancing the accuracy of initial diagnosis and reduces complications during interventions, leading to safer and successful outcomes for patients. 3D TEE represents a major advancement in cardiovascular imaging for complex structural heart malformations.

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