

Utility of 3D Echocardiography in the Interventions for Structural Heart Disease

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1. Transcatheter Aortic Valve Replacement

1) Preprocedural Assessment

- Assessment of aortic annular size & shape
- Measurement of the distance between annulus & coronary ostia
- Assessment of aortic dimensions & atherosclerosis

2) Procedural Monitoring

- Prosthesis positioning during implantation

3) Postprocedural Assessment

- Assessment of degree of aortic regurgitation[1]
- Detection of complications

2. Device Closure of Atrial Septal Defect

1) Preprocedural Assessment

- Assessment of size & shape
- Evaluation of marginal rims
- Device size = $0.964 \times 3D_{max} - 2.622 \times \text{circular index} + 7.084$ [2]

2) Disadvantages of Balloon Sizing

- Overstretching defect
- Sometimes inaccurate
- Time & cost
- Bradycardia and hypotension
- Tearing of the septum primum
- Cardiac perforation

3. Device Closure of Paravalvular Leak

1) Preprocedural Assessment[3]

- Assessment of size & shape
ERO using color Doppler images[4]
- Evaluation of location

2) Postprocedural Assessment

- Assessment of degree of residual leak
- Detection of complications

References

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3. Ruiz CE, Jelnin V, Kronzon I, et al. Clinical outcomes in patients undergoing percutaneous closure of periprosthetic paravalvular leaks. *J Am Coll Cardiol* 2011;58:2210-7.
4. Franco E, Almeria C, de Agustin JA, et al. Three-dimensional color Doppler transesophageal echocardiography for mitral paravalvular leak quantification and evaluation of percutaneous closure success. *J Am Soc Echocardiogr* 2014;27:1153-63.