Mitral Valve-in-Valve: Procedural Image Guidance with TEE, a “Must Have” or “Nice to Have”?

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Mitral ViV: why?

• Growing numbers of mitral biological prostheses are being implanted in clinical practice
• Incidence of failing mitral biological prostheses is increasing over time
• Transcatheter ViV implantation may be a lower risk alternative treatment for high-risk patients with MV degeneration
Goals of percutaneous replacement

- Complete elimination of MS and/or MR
- Minimize risk of LVOT obstruction
- Minimize risk of paravalvular leak
- Address wide range of patient sizes
- Durability
- Improve outcomes compared to surgical MVR

5-Year Experience With Transcatheter Transapical Mitral Valve-in-Valve Implantation for Bioprosthetic Valve Dysfunction

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- Series of 23 patients (MR, MS and mixed)
- Minimal morbidity and low operative mortality
- Clinical and hemodynamic outcomes were favorable at short- and midterm follow-up
- The transapical approach appeared particularly well suited to mitral TVIV

MV VIV: TEE is a “Must Have”

- Determine the mode of bioprosthetic failure and true internal dimension to confirm ViV size
- Assess risk of LVOT obstruction
- Evaluate access site (transseptal versus apical)
- Confirm ViV position and angulation prior to deployment
- Assess need for post-implant dilation to ensure flaired or conical shape
- Functional assessment & rule out complications (pericardial effusion, LVOT obstruction, leak)
Mitral paravalvular leak closure with concomitant transcatheter valve-in-valve implantation

- An 81 year old male patient presented with symptoms of increasing fatigue and dyspnea on exertion.
- Congestive heart failure treatment.
- S/P CABG, bioprosthetic aortic (25mm Hancock II Ultra®) and bioprosthetic mitral (27mm Carpentier Edwards®) valve replacements in 2007
- S/P AV nodal ablation therapy for chronic Afib with ICD implantation for recurrent VT
- TTE & TEE: mod-sec prosthetic MV stenosis and at least moderate paravalvular mitral regurgitation.
CASE: Mitral annular calcification, MS & MR

- This is a 71 year old male with history of CABG, mechanical AVR
- Atrial fibrillation, COPD
- Admitted with CHF and volume overload, progressive SOB
- AKI on CKD
- TTE with moderate mitral stenosis with a mean gradient of 7mmHg, moderate mitral regurgitation (MR)
- Severe pulmonary arterial hypertension (PASP 70-75mmHG)
- Severe mitral annular calcification (MAC)
Predicting LVOT Obstruction

Blanke P et al., JACC: CARDIOVASCULAR IMAGING 2016

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Summary

• Successful trans-apical MV replacement with a (aortic) Sapien XT valve, for the novel indication of mixed mitral stenosis and regurgitation
• Few case reports in North America
• Further multicenter research/registry work is necessary to evaluate effectiveness and comparative risk of this novel intervention.
CONCLUSION: TEE is essential to assess...

- true internal dimension to confirm ViV size
- risk of LVOT obstruction
- access site (transseptal versus apical) and guide approach
- ViV position and angulation prior to deployment
- need for post-implant dilation to ensure flared or conical shape
- function & possible complications