Tandem transcatheter approach to double aortic and mitral valvulopaties

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TAVI & Mitral Regurgitation
Background

- Clinically significant MR is often found in conjunction with severe AS (5 - 20%)
- Co-existent moderate MR may increase both early and late mortality following SAVR
- Double valve replacement is associated with a significantly higher operative risk with a postoperative mortality at 11-12%
Mitral Regurgitation worsening after TAVR

- The long frame of the THV may physically interfere with the anterior leaflet of the mitral apparatus¹

- Post-TAVR significant paravalvular aortic regurgitation may maintain volume overload and contribute to MR worsening²

- LBBB and the need for PPM, which may lead to left ventricular asynchrony and a negative effect on left ventricular remodeling and MR³

- In subjects with small LV cavity and severe IVS hypertrophy, afterload reduction may cause SAM with LVOT obstruction and MR⁴

TAVR & Mitral Regurgitation

SOURCE XT subanalysis 2615 patients

All-Cause Mortality

Cardiac Mortality

Log-Rank $p = 0.0004$

Log-Rank $p < 0.0001$

Residual MR $3^{+}/4^{+}$
No Residual MR

Baumgartner H, EuroPCR 2013
Impact of Preoperative Moderate/Severe Mitral Regurgitation on 2-Year Outcome After Transcatheter and Surgical Aortic Valve Replacement

Insight From the Placement of Aortic Transcatheter Valve (PARTNER) Trial Cohort A

Marco Barbanti, MD; John G. Webb, MD; Rebecca T. Hahn, MD; Ted Feldman, MD; Robert H. Boone, MD; Craig R. Smith, MD; Susheel Kodali, MD; Alan Zajarias, MD; Christopher R. Thompson, MD; Philip Green, MD; Vasilis Babaliaros, MD; Raj R. Makkar, MD; Wilson Y. Szeto, MD; Pamela S. Douglas, MD; Tom McAndrew, MS; Irene Hueter, PhD; D. Craig Miller, MD; Martin B. Leon, MD;
on behalf of the Placement of Aortic Transcatheter Valve (PARTNER) Trial Investigators

Barbanti M et al. Circulation 2014
In contrast to the increased risk associated with mitral surgery performed for MR following prior isolated aortic valve surgery, prior TAVR does not seem to increase the risk of a subsequent procedure on the mitral valve.

A TAVR-first staging strategy might allow for the possibility of a spontaneous reduction in MR after isolated treatment of AS, and the potential to avoid an unnecessary additional procedure on the mitral valve.
Clinical Data

• 71 year-old female
• Hypertension
• Obesity, BMI 38
• NYHA class IV
• Hospital admission due to CHF 1 month ago
• HCV-related hepatopathy with pancytopenia
• EuroScore II 5.08 %, STS Score Mortality 2.02 %
Echocardiographic assessment

- LVEF 30%
- Severe low-flow low gradient aortic stenosis (mean transvalvular gradient 19 mmHg, AVAi 0.6 cm²/m², annulus size 22 mm)
- Severe mitral regurgitation (double regurgitation jet due to FMR)

HEART TEAM ASSESSMENT

appropriate candidate for TF-TAVI with Portico device

and reassessment for mitral valve repair with Mitraclip system

Tamburino C.
MDCT and CAD assessment

Annulus assessment

- Area 4.7 cm$^2$
- Perimeter 8 cm

CAD assessment

- No coronary stenosis

Tamburino C.
TF-TAVI  Portico 29 mm
Post-op course

- Transferred to Coronary Intensive Care Unit and after two days in the cardiology ward
- Optimization of medical therapy and re-assessment of mitral regurgitation

Echocardiogram after TAVI

- Mean aortic gradient 5 mmHg (max 11 mmHg) with mild peri-prosthetic regurgitation
  - Moderate-to-severe mitral regurgitation with double jet and mild tricuspid regurgitation
  - sPAP 45 mmHg

Tamburino C.
Staged MitraClip procedure at 10 days

First grasping with residual lateral MR

Mean gradient 1 mmHg

Tamburino C.
Second clip laterally implanted

After second grasping still residual lateral MR
Third grasping and final residual mitral regurgitation

Tamburino C.
Final result

- Mean mitral gradient 5 mmHg
- Residual mild mitral regurgitation
- sPAP 35 mmHg

The procedure ended without any complications.

At the end of the procedure, after awakening from sedation and extubation, the patient was transferred to CICU for a detailed monitoring of clinical and vital signs.

5 days Later, NYHA Class II
Conclusions I

- Significant MR is frequent in TAVR patients
- The real impact on mid- and long-term outcomes and the correct management are still controversial
- Significant MR can be pre-existent before TAVR, or it can appear afterwards, as a mechanical impairment of the THV with the mitral valve apparatus or as an anomalous cardiac pathophysiological response
- MitraClip procedure is a feasible and effective approach either as a planned staged treatment or as a bailout therapy
A TAVR-first staging strategy might allow for the possibility of a spontaneous reduction in MR after isolated treatment of AS, and the potential to avoid an unnecessary additional procedure on the mitral valve.

In contrast to the increased risk associated with mitral surgery performed for MR following prior isolated aortic valve surgery, prior TAVR does not seem to increase the risk of a subsequent procedure on the mitral valve.

Tamburino C.