TEE guided TAVR using BASILICA technique in patient with stenotic Freestyle aortic bioprosthesis

Zuyue Wang MD
Associate professor, Georgetown University School of Medicine
MedStar Heart and Vascular Institute
MedStar Washington Hospital Center
Potential conflicts of interest

Speaker's name:

- I do not have any potential conflict of interest
Introduction

- Coronary artery obstruction is a rare but fatal complication of transcatheter aortic valve replacement (TAVR).

- Transcatheter laceration of aortic leaflets (BASILICA-- Bioprosthetic Aortic Scallop Intentional Laceration to prevent Iatrogenic Coronary Artery obstruction) can be used to prevent coronary obstruction during TAVR.

- TEE plays an essential role in guiding BASILICA procedure and successful valve implantation in patient with bioprosthesis that is no radio-opaque.

- We present a case of successful valve-in-valve TAVR using TEE guided BASILICA technique in a patient with stenotic Freestyle bioprosthesis and low left main coronary artery height.
Clinical History

**Relevant history:**
68 year-old woman presented with multiple heart failure admissions

**Past medical history:**
CAD status post CABG X3 
(mLAD-70%, Om-1 80%, RCA 50% 
Patent grafts: LIMA to LAD, SVG to Diag) 
Ischemic cardiomyopathy with EF <20% 
Severe aortic stenosis s/p aortic root repair and 
AVR with #27 Freestyle bioprosthesis) 
Status post ICD placement 
Severe restrictive lung disease 
AAA repair 
Iatrogenic right iliac injury 
Hypertension 
Hyperlipidemia 
Ht=162.6cm, Wt=96.1kg, BMI=36.3, BSA=, 
Cr=0.8 

STS score=8.1% 
Surgeon: Extreme risk
**Echo Variable (TTE)**  
**Measure**  
<table>
<thead>
<tr>
<th>Trileaflet valve</th>
<th>Bioprosthetic valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Velocity</td>
<td>4.3 m/sec</td>
</tr>
<tr>
<td>Mean Gradient</td>
<td>46 mmHg</td>
</tr>
<tr>
<td>Calculated AVA</td>
<td>0.6 cm²</td>
</tr>
<tr>
<td>Calculated AVA index</td>
<td></td>
</tr>
<tr>
<td>Severity of AR</td>
<td>none</td>
</tr>
<tr>
<td>Severity of MR</td>
<td>moderate</td>
</tr>
<tr>
<td>Ejection Fraction</td>
<td>&lt;20% %</td>
</tr>
<tr>
<td>TTE/TEE annulus diameter</td>
<td></td>
</tr>
<tr>
<td>RV Pressures</td>
<td>70(RHC) mmHg</td>
</tr>
</tbody>
</table>

**Comment**  
Severe Pulm HTN  
PA 71/40mmHg, PCWP=40mmHg  
CI=2.4l/min/m²  
PA sat=47%
### CT Analysis

#### S3

<table>
<thead>
<tr>
<th>Annulus by CT</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short Annulus Diameter</td>
<td>21.6 mm</td>
</tr>
<tr>
<td>Long Annulus Diameter</td>
<td>23.7 mm</td>
</tr>
<tr>
<td>Annular Perimeter</td>
<td>74.8 mm</td>
</tr>
<tr>
<td>Annular Area</td>
<td>442 mm²</td>
</tr>
</tbody>
</table>

#### Oversizing

<table>
<thead>
<tr>
<th>Oversizing</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15-18 %</td>
</tr>
</tbody>
</table>
# Aortic Root by CT

## Measure

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sinus of Valsalva Diameter</td>
<td>(33)x(33.5)x(35.2)mm</td>
</tr>
<tr>
<td>Sinotubular Junction Diameter</td>
<td>32.3x34.2mm</td>
</tr>
<tr>
<td>Sinus Height</td>
<td>Not measured</td>
</tr>
<tr>
<td>Left Coronary Height</td>
<td>9.8mm</td>
</tr>
<tr>
<td>Right Coronary Height</td>
<td>13.1mm</td>
</tr>
<tr>
<td>Aorta</td>
<td>39.2x39.6mm</td>
</tr>
<tr>
<td>Angle</td>
<td>41.6°</td>
</tr>
</tbody>
</table>

CT Analysis:

LMCA height=10mm
3D TEE analysis

LMCA height=9.8mm
CT analysis
A single leaflet tear could prevent coronary obstruction

BASILICA Technique

- Leaflet wire traversal and snaring
- Leaflet slicing
- Valve in Valve

Conventional vs With BASILICA
Freestyle valve is not radio-opaque
TEE is a **MUST** for BASILICA and V-in-V TAVR
Positioning wire in the left coronary cusp
Crossing LC Leaflet with Astato wire activated with Bovie
Leaflet wire snaring and slicing
After left coronary cusp slicing
Severe aortic regurgitation after leaflet slicing
Deployment of 26mm Sapien 3
Post BASILICA and TAVR with 26mm S3 in 27mm Freestyle bioprosthesis
Post BASILICA and TAVR with 26mm S3 in 27mm Freestyle bioprosthesis

Normal flow in LM
Conclusion

BASILICA offers a solution to the problem of coronary obstruction during TAVR

Cardiac imaging has an essential role in the planning and provision of TAVR for high risk patients with severe aortic stenosis

Intraprocedural TEE is a must-have imaging tool in patient with low coronary artery height and aortic bioprosthesis that is not radio-opaque requiring BASILICA procedure.
Yes we can, but can’t do intervention for structural heart diseases without images