

# Valve-in-Valve-in-Valve TAVR With Bilateral UNICORN Modification

*A High-Risk Solution for Coronary Obstruction Prevention in Severe Aortic Insufficiency*

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TRANSCATHETER  
CARDIOVASCULAR  
THERAPEUTICS®

# Disclosure of Relevant Financial Relationships

- I, Billal Mohmand, DO NOT have any financial relationships to disclose
- Marvin Eng, Within the prior 24 months, I have had a financial relationship with a company producing, marketing, selling, re-selling or distributing healthcare products used by or on patients
  - Clinical Proctor – Edwards Lifesciences, Medtronic

# Case Presentation

65-Year-Old Male with **Severe Prosthetic Aortic Insufficiency** presenting  
with **Acute Decompensated Heart Failure**

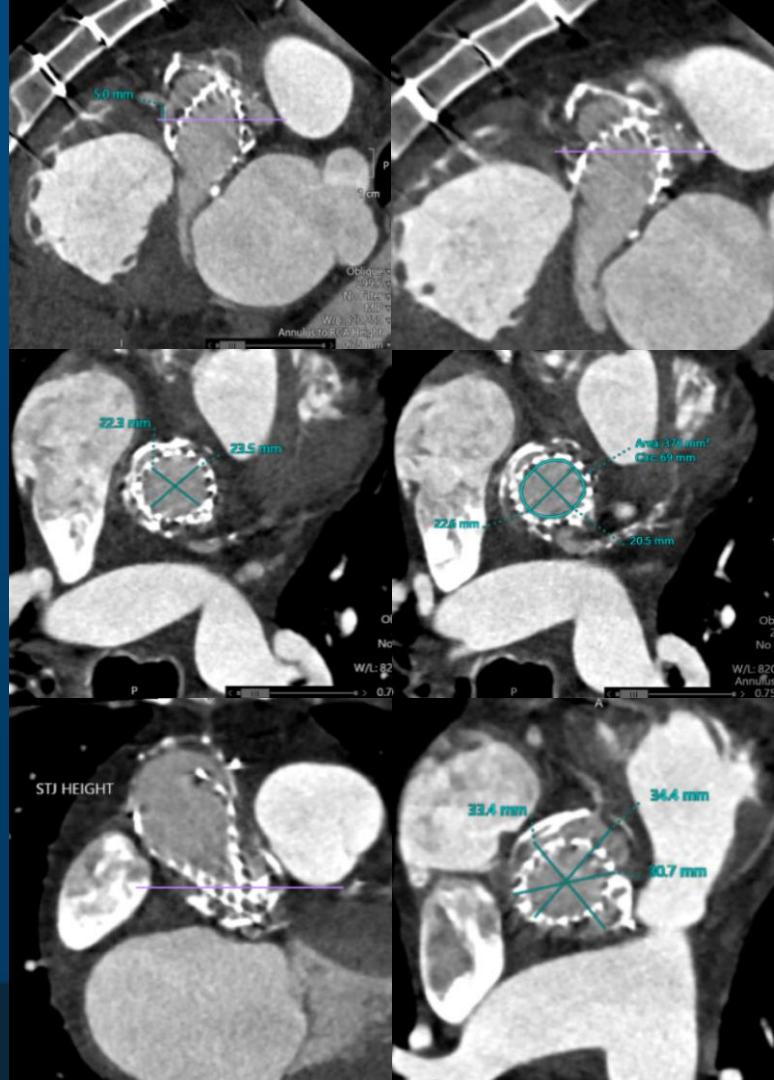
Evaluation for Valve-in-Valve-in-Valve

# CT TAVR

## High-Risk Findings for Coronary Obstruction

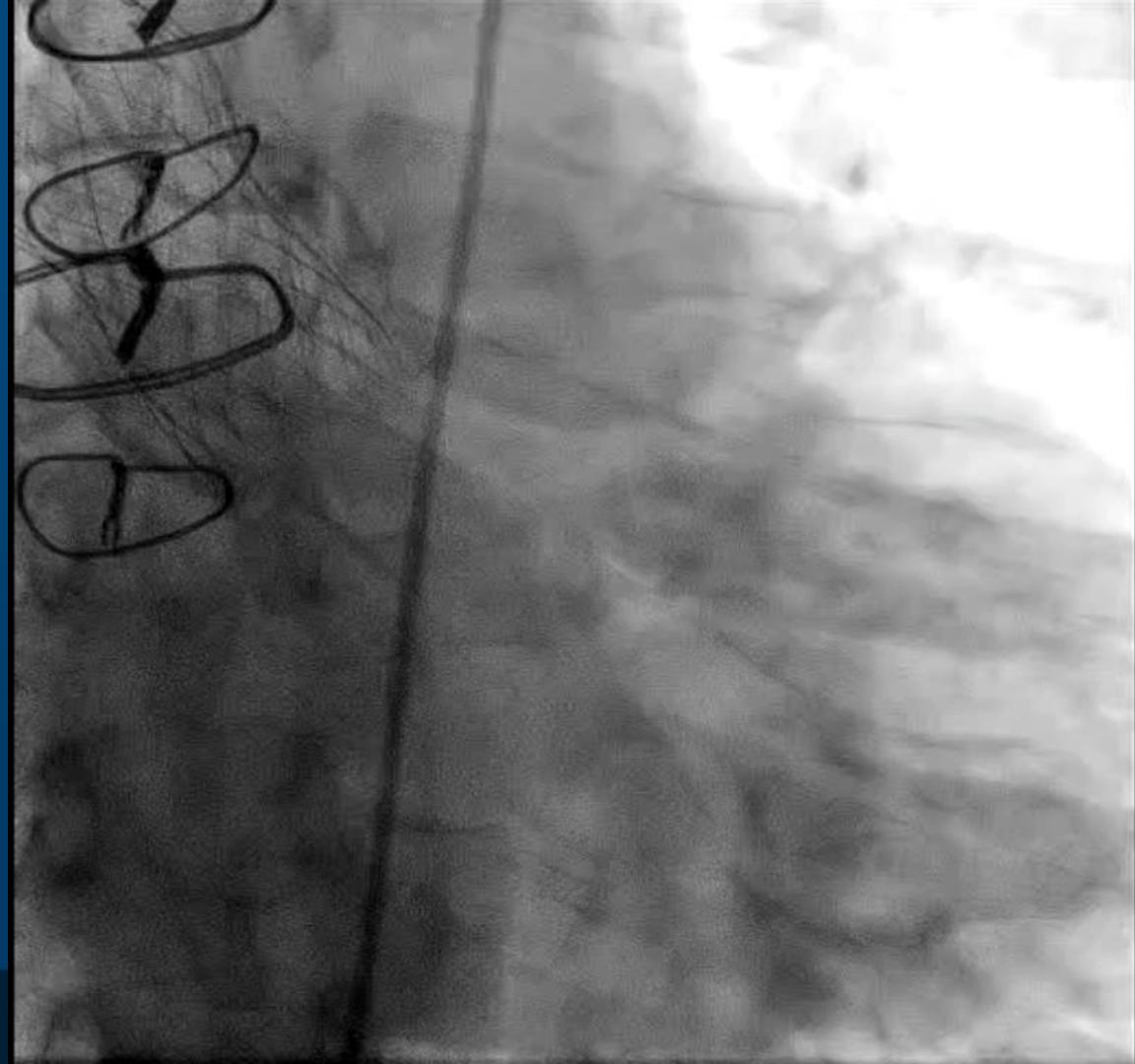
- **Aortic annulus to Left Main: 5.0 mm**
  - High risk: Ostial height <10 mm
- **Aortic annulus to RCA: 5.0 mm**
  - High risk: Ostial height <10 mm
- **Annulus to Sino-tubular Junction: 1.0 mm**
  - High Risk: Very narrow
  - Risk of Leaflet Displacement and Coronary Obstruction
- **Sino-tubular Junction Diameter: 28.1 x 28.5 mm**
  - High risk: Narrow, Increased Risk of Obstruction
- **Sinus of Valsalva Diameter: 33.4 x 34.4 x 30.0 mm**
  - Borderline/High risk

**Leaflet Modification Necessary**



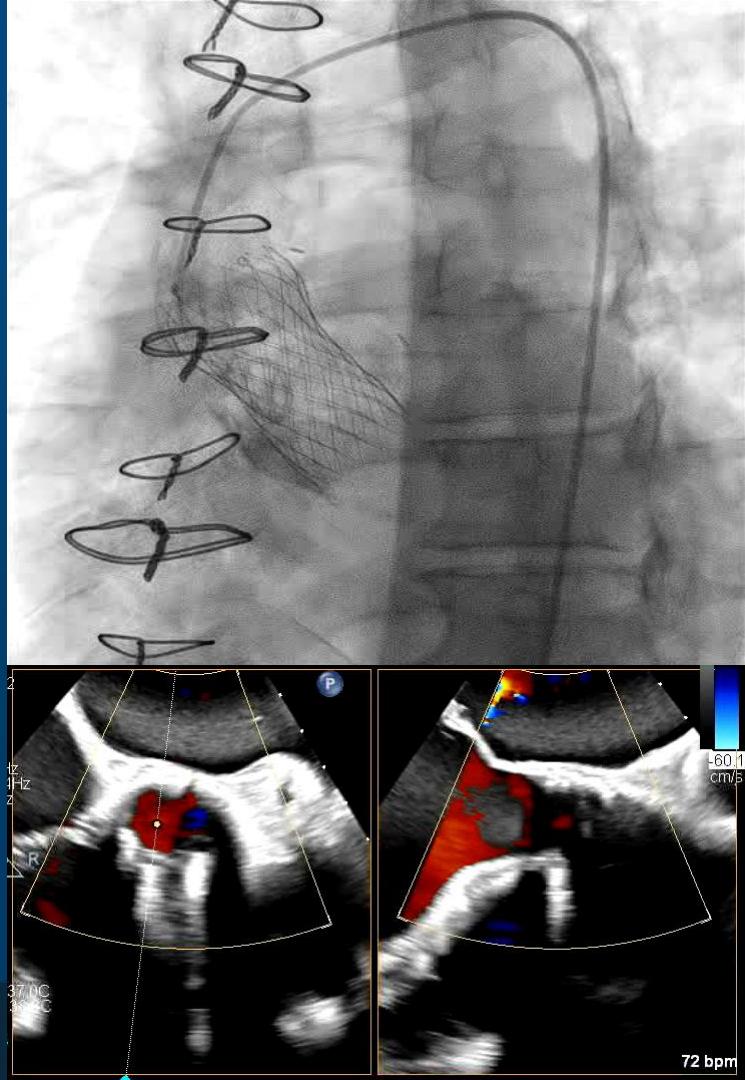
# Diagnostic Evaluation

- **Left Main Coronary Artery**
  - Patent, Anomalous origin reimplemented prior surgery
- **Left Anterior Descending Artery**
  - Patent, No high-grade lesions
- **Left Circumflex Artery**
  - Patent, No high-grade lesions
- **Right Coronary Artery**
  - Patent, Dominant
  - Reimplanted
  - No high-grade lesions
- **Patent Abdominal Aorta,  
Common Iliac, External iliac,  
Common Femoral arteries**



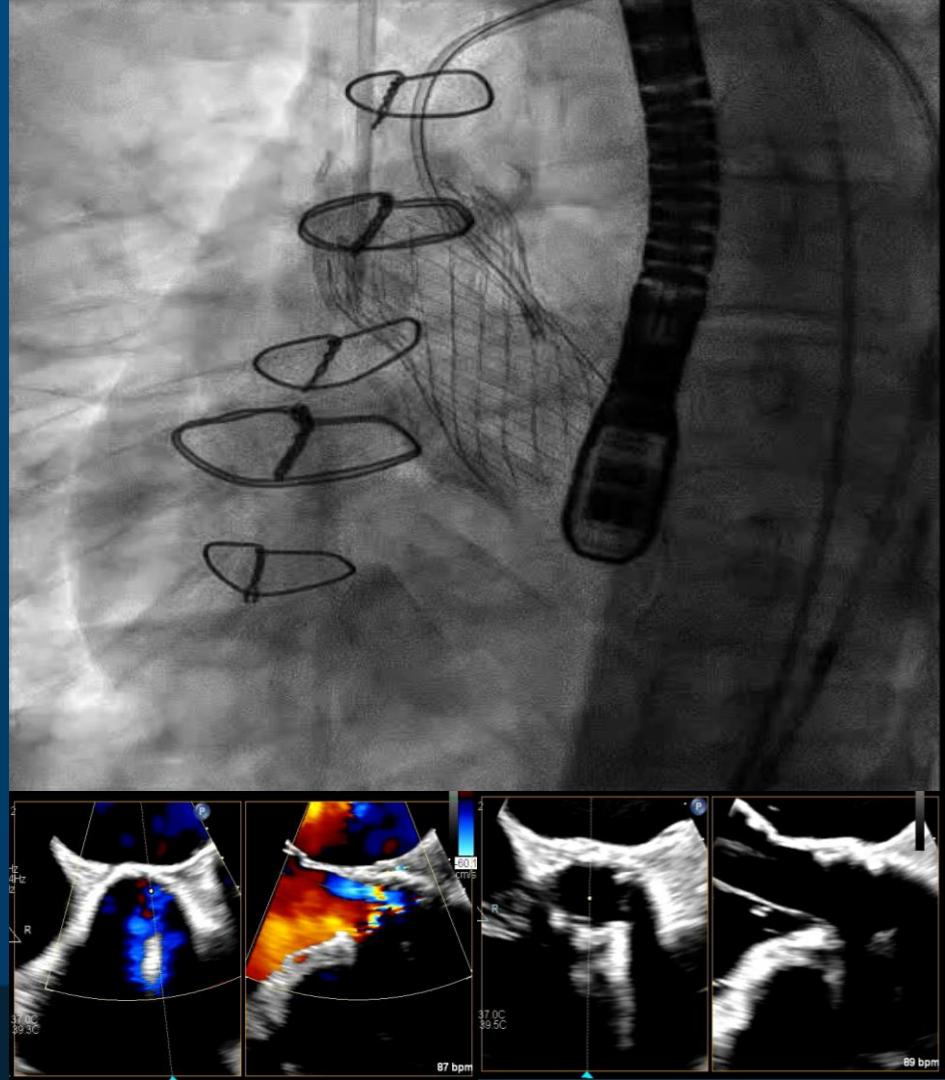
# Diagnostic Evaluation

- **Aortogram**
  - Severe Prosthetic Aortic Insufficiency
- **Hemodynamics**
  - Normal aortic opening/closing pressures
  - **Wide pulse pressure**
    - Consistent with Severe AI
- **Echocardiogram**
  - Prosthetic Aortic Valve well seated
  - Leaflets thick
  - Peak Velocity 2.5 m/s, Mean PG 15 mmHg
  - Severe Prosthetic Valve Regurgitation



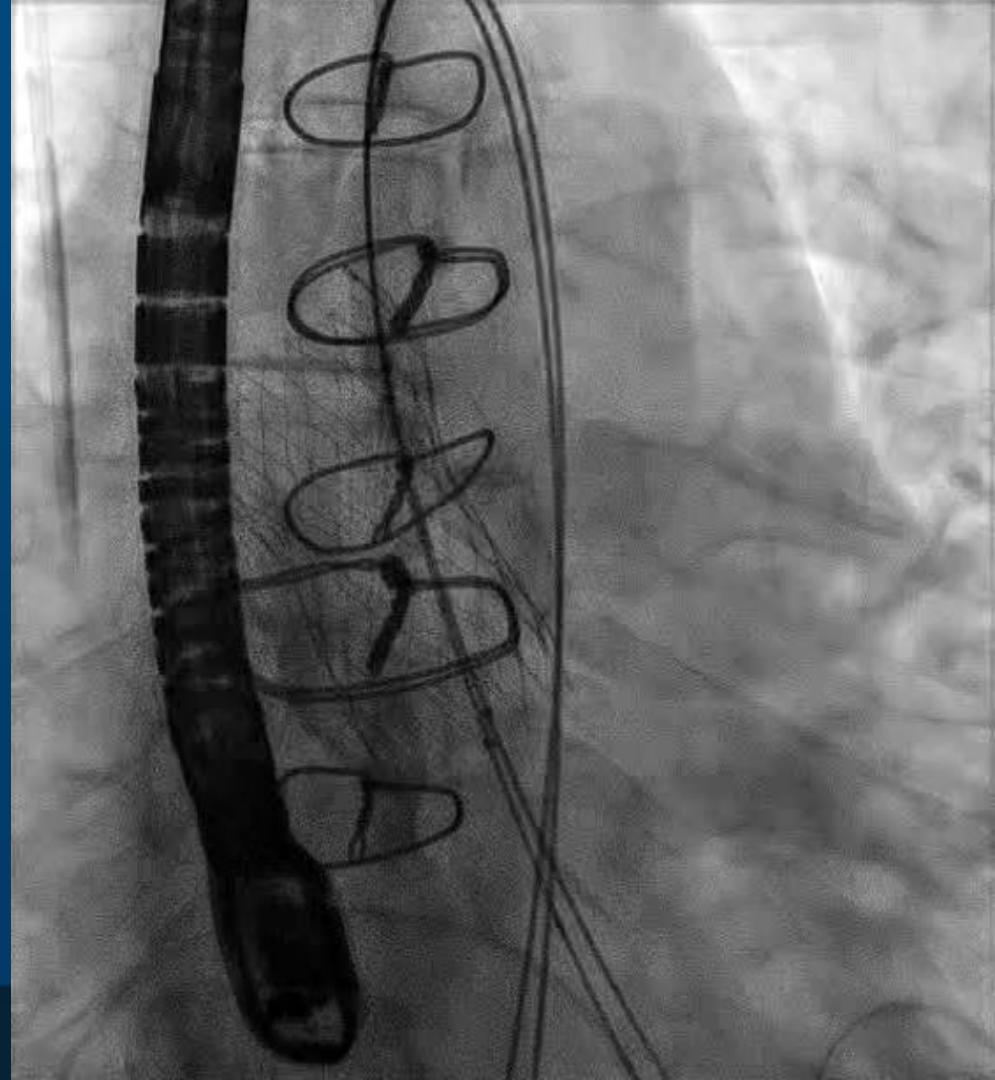
# Leaflet Modification – UNICORN

- **Left Coronary Cusp**
  - AL2 guide, Astatot wire connected to electrocautery (50W)
  - Perforation and aortotomy of LCC
  - Balloon angioplasty
  - 2.5 x 12 mm balloon
- **Right Coronary Cusp**
  - Multipurpose guide, Astatot wire, electrocautery (50W)
  - Perforation and aortotomy of right coronary cusp
  - Balloon angioplasty
  - 2.5 x 12 mm and 4 x 20 mm balloons



# Simultaneous Double UNICORN Balloon Angioplasty

- 12 x 40 mm Armada balloon across *Left Coronary Cusp aortotomy*
- 14 x 40 mm Armada balloon across *Right Coronary Cusp aortotomy*
- **Simultaneous Inflation to ensure Complete Leaflet Modification**
- Hemodynamic stability maintained throughout procedure
  - Anesthesia and CTS Support
  - ECMO Standby

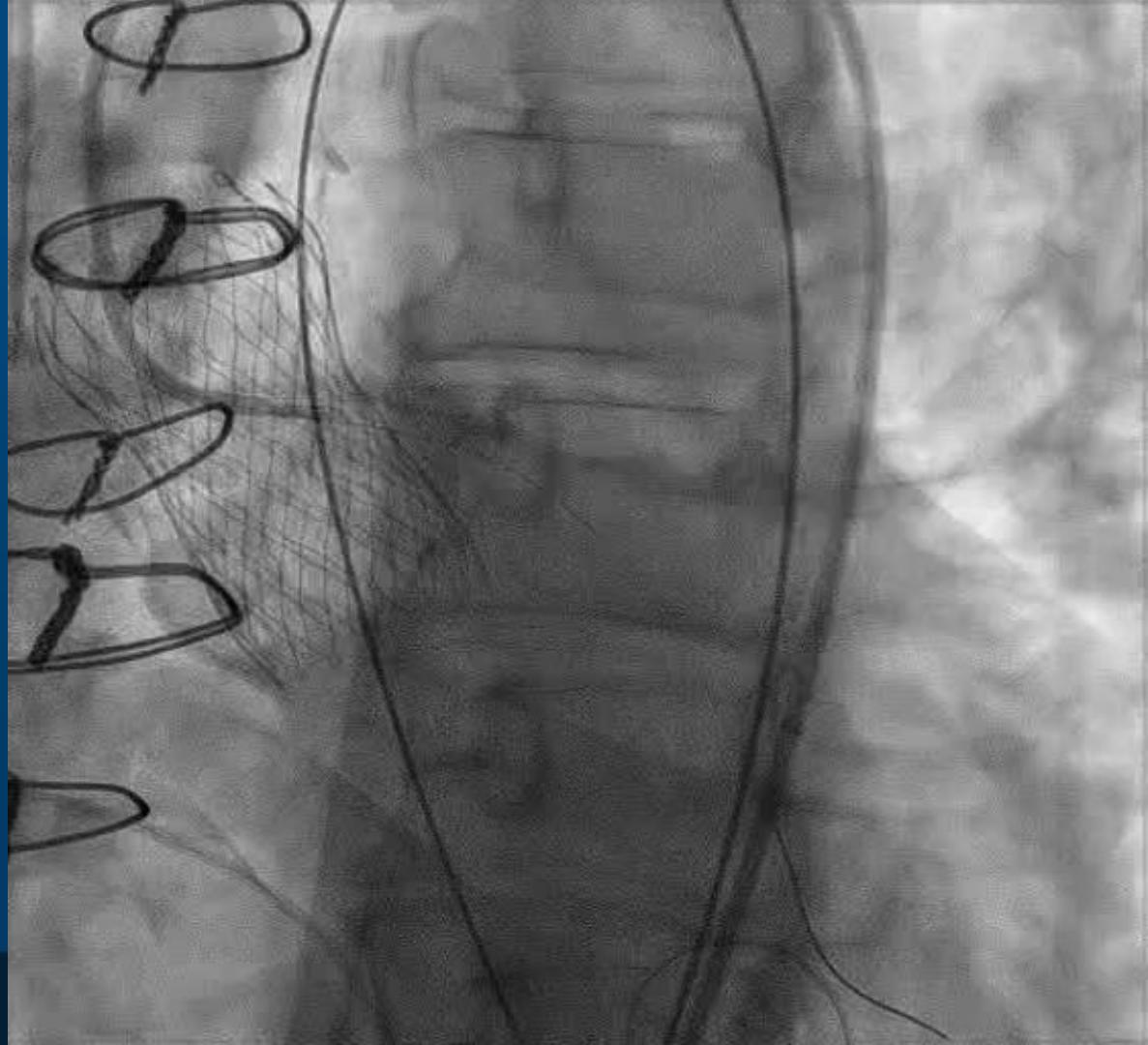


# Simultaneous Double UNICORN Balloon Angioplasty



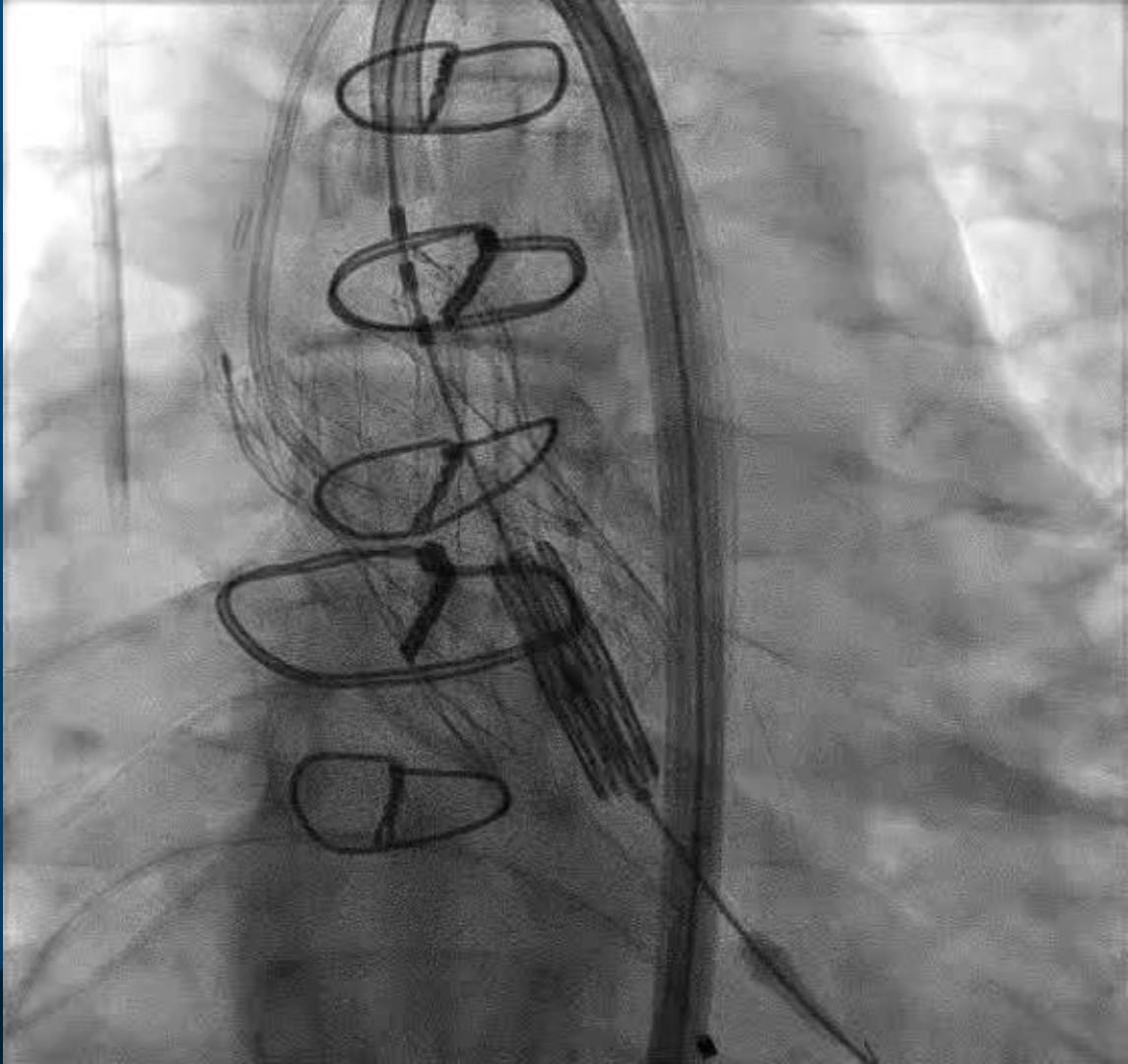
# Coronary Protection *Snorkel* Technique

- JL4 guide advanced to ascending aorta and LM
- Runthrough wire into LCX
- 3 x 15 mm Trek balloon positioned across CoreValve struts into LM
- Balloon inflation during TAVR deployment for LM protection



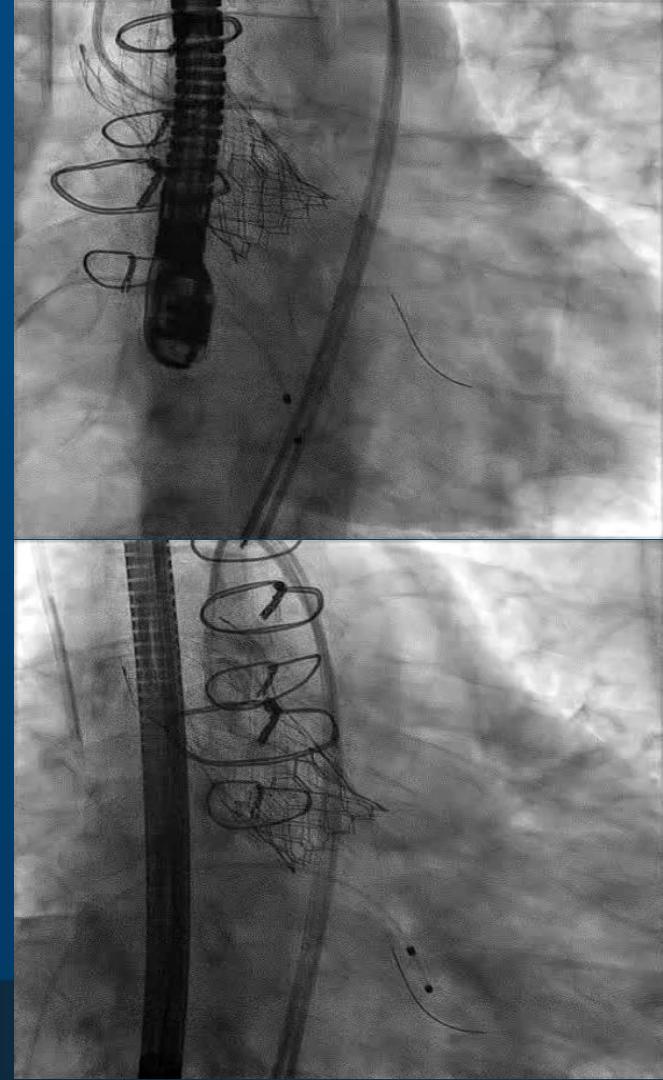
# TAVR Deployment

- Edwards Sapien S3 26 mm Ultra-Resilient Valve
  - Advanced over Safari wire
- Rapid pacing at 180–200 bpm for 21 seconds
- Valve deployed Successfully
  - Slightly low but stable position

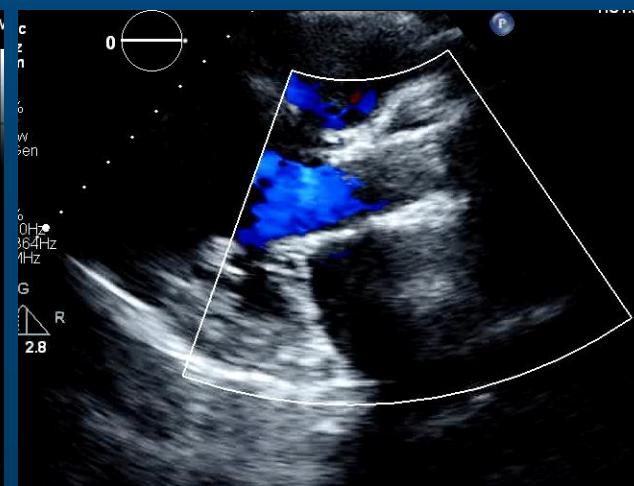


# Post Deployment Assessment

- **No immediate complications**
  - TIMI III flow in coronaries
    - No dissection, perforation, or embolization
  - No conduction abnormalities
  - No vascular or neurologic events
- **No significant PVL or AI on TEE and Aortogram**
- **Hemostasis achieved with Perclose devices**



# Post Deployment Assessment



# Double Unicorn Leaflet Modification

- **Successful Double UNICORN leaflet modification and ViViV TAVR**
  - Effective Left Main protection with Snorkel technique
- **Take-Home Points**
  - Double UNICORN leaflet modification is *feasible and effective* for high-risk ViViV TAVR
  - Simultaneous bilateral leaflet modification can *prevent coronary obstruction in challenging anatomy*
    - Snorkel technique provides *additional LM protection*
  - Careful pre-procedural planning, multimodal imaging and multidisciplinary approach are critical for success