**MHIF FEATURED STUDY:**

# ATTR CM

**OPEN and ENROLLING:**

**EPIC message to *Research MHIF Patient Referral***

| CONDITION: | PI: | RESEARCH CONTACTS: | SPONSOR: |
|---|---|---|---|
| Transthyretin-Mediated Amyloid Cardiomyopathy | Mosi Bennett, MD | **Sarah Schwager**<br>Sarah.Schwager@allina.com \| 612-863-6257<br>**Jane Fox**<br>Jane.Fox@allina.com \| 612-863-6289 | Ionis Pharmaceuticals |

**DESCRIPTION:** A Phase 3 Global, Double-Blind, Randomized, Placebo-Controlled Study to Evaluate the Efficacy and Safety of ION-682884 in Patients with Transthyretin-Mediated Amyloid Cardiomyopathy

ION-682884 vs. placebo administered by subcutaneous injection once every 4 weeks in patients with ATTR-CM receiving available background therapy. ION-682884 is a ligand-conjugated antisense drug designed to reduce the production of transthyretin to treat all types of TTR amyloidosis.

## CRITERIA LIST/ QUALIFICATIONS:

Inclusion

- Amyloid deposits in cardiac or non-cardiac tissue
- Medical history of HF secondary to hereditary or wild-type ATTR-CM

Exclusion

- Cardiomyopathy not primarily caused by ATTR-CM
- Significant co-morbidities
- Current treatment with inotersen, patisiran, diflunisal, doxycycline, non-dihydropyridine calcium-channel blocker

HOPE DISCOVERED HERE™

Minneapolis Heart Institute Foundation®
Creating a world without heart and vascular disease


1

## CASE PRESENTATION - 2015

- 77 year old lady – severe AS
- PMH
  - peripheral arterial disease with stents in the iliofemoral vessels,
  - COPD
  - Parkinson's
  - CHB s/p PPM
  - HTN
  - HL
  - CAD s/p RCA-BMS in 8/2013
  - Atrial fibrillation

2

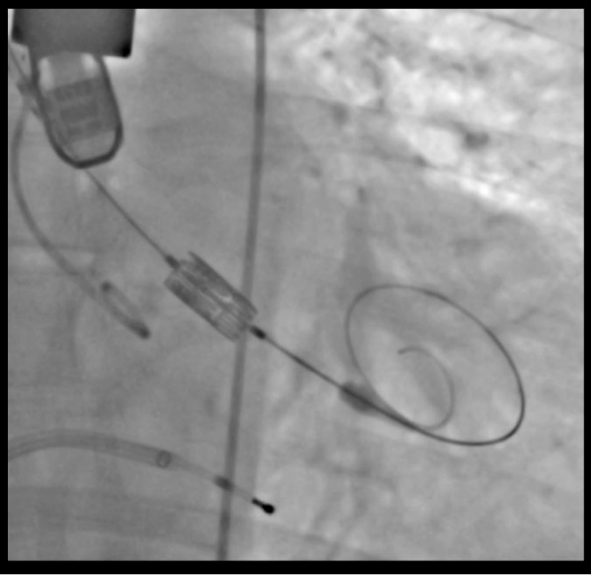
## ECHO CARDIOGRAM 2015

- The aortic valve is tricuspid- calcified and sclerotic, moderate to severe stenosis and mild regurgitation.
- Peak velocity is 3.4 m/second, mean gradient is 28 mm Hg, valve area is 0.84 cm squared, and dimensionless index is 0.23

- **Dobutamine Stress Echo 2015**
- The aortic valve is calcified, severe aortic stenosis. AVA is 0.7cm2 at rest. With dobutamine, Vmax increases to 4.2-4.3 m/sec.

3

## 2015 TAVR – TRANSAORTIC



4

# POST PROCEDURE ECHO

- 23 mm SapienXT bioprosthesis in the aortic position with mean gradient of 11.6 mmHg, dimensionless index of 0.54, EOA of 1.5 cm2, and mild anteromedial paravalvular regurgitation.

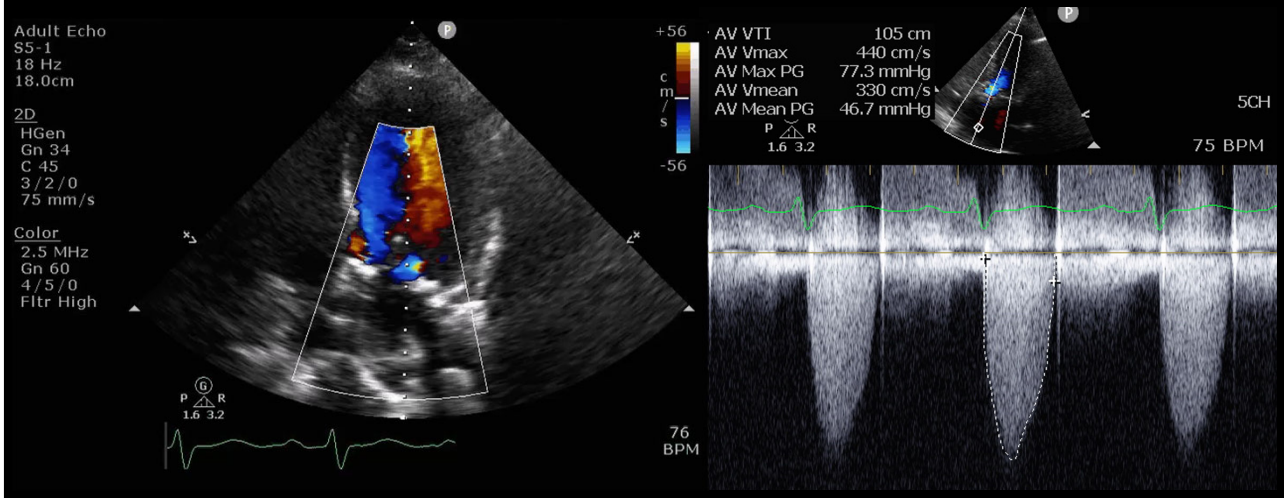
5

# CASE PRESENTATION - 2020

- Developed symptoms of HF


6

# CASE PRESENTATION - 2020




7

# WHAT TO DO NOW?!

8

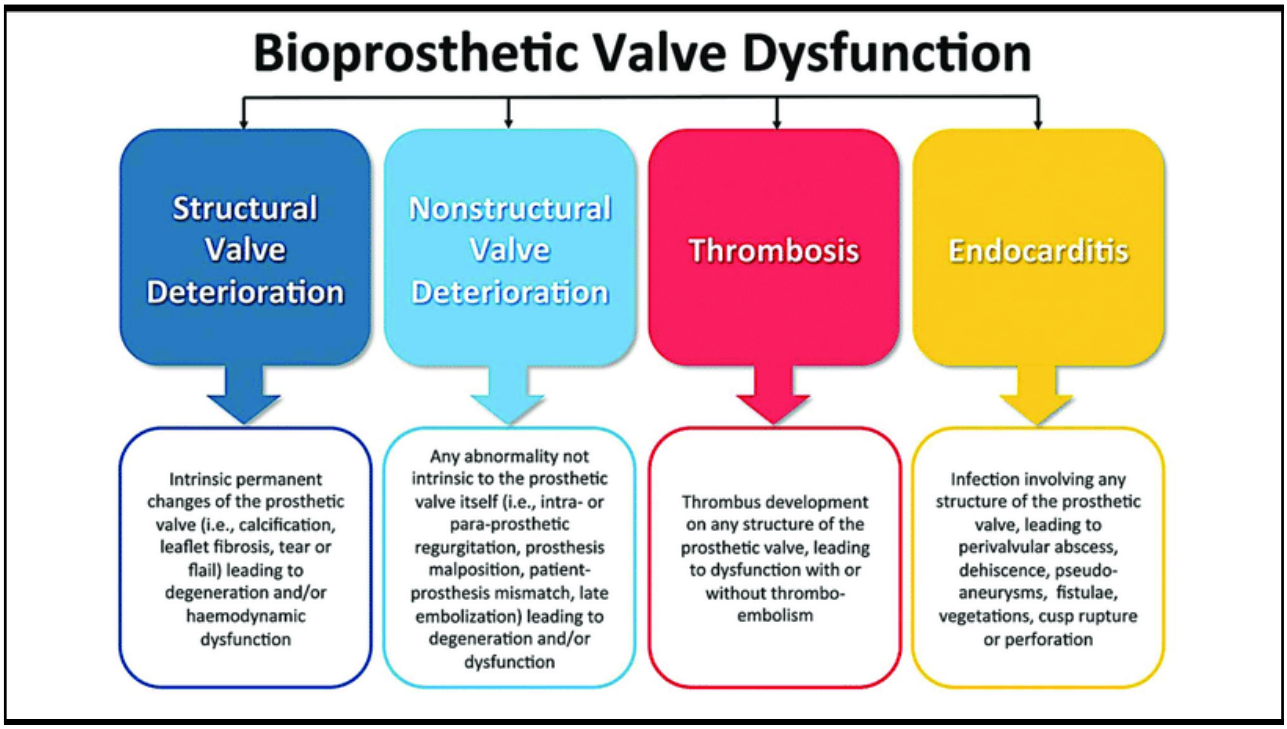
## OBJECTIVE

- Background on longevity of these valves and mechanism of deterioration
- Management of TAVR failure – Surgery vs Redo TAVR
- Limitation of TAVR in TAVR
- Bench testing
- Coronary protection: Chimney stent and Basilica

9

## MECHANISM OF TAVR FAILURE

10

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# LONGEVITY OF TAVR VALVES

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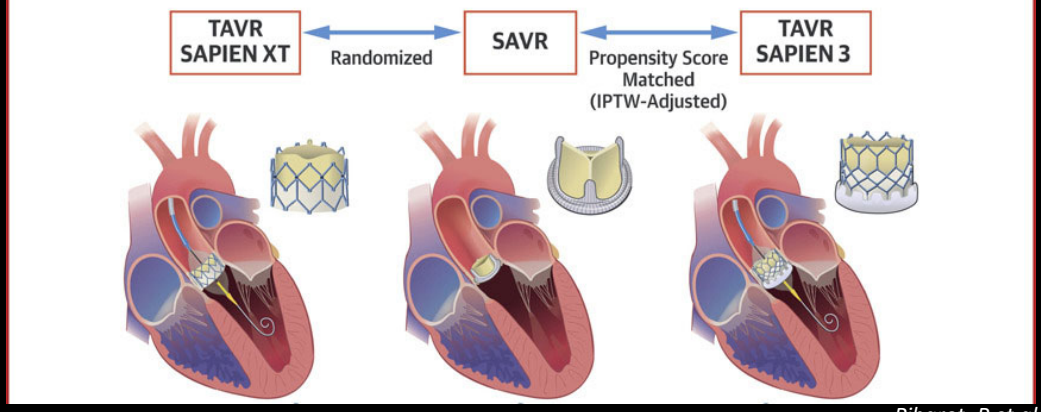
# VALVE DETERIORATION – TAVR VS SAVR

**CENTRAL ILLUSTRATION: Structural Valve Deterioration in Transcatheter Aortic Valve Replacement With Second and Third Valve Generations Versus Surgical Aortic Valve Replacement**




*Pibarot, P et al, JACC 2020*

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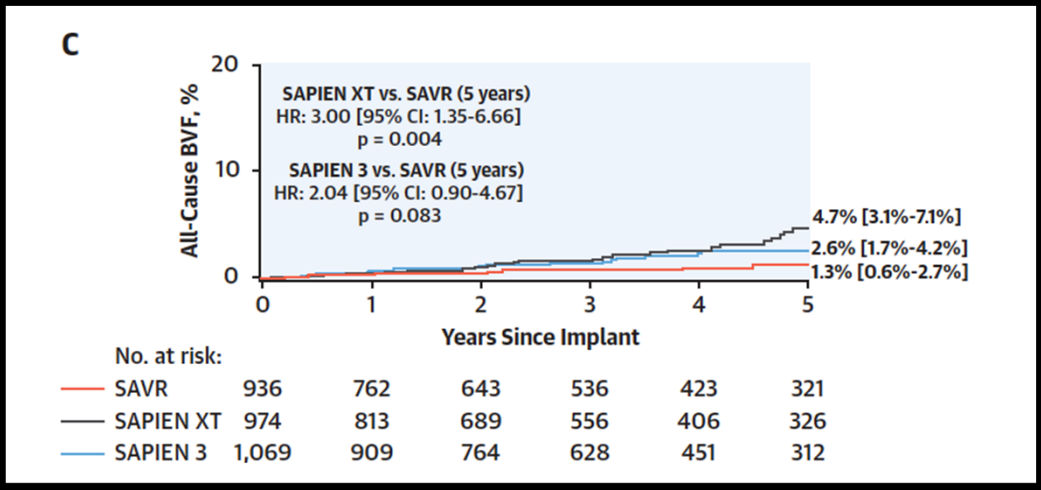


**Bioprosthetic Valve Failure:**

1) Valve dysfunction with clinically expressive criteria or irreversible stage 3 (severe) hemodynamic valve deterioration;
2) Valve reintervention
3) Valve-related death

*Pibarot, P et al, JACC 2020*

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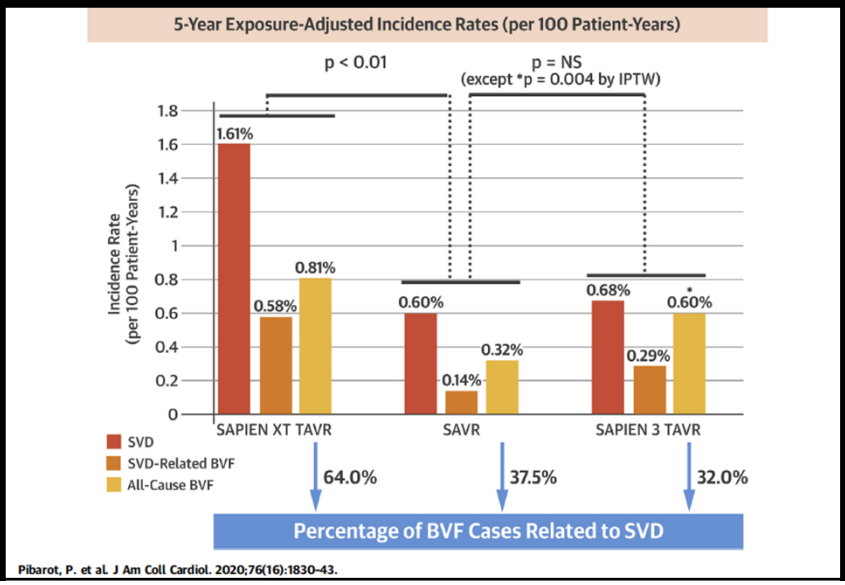
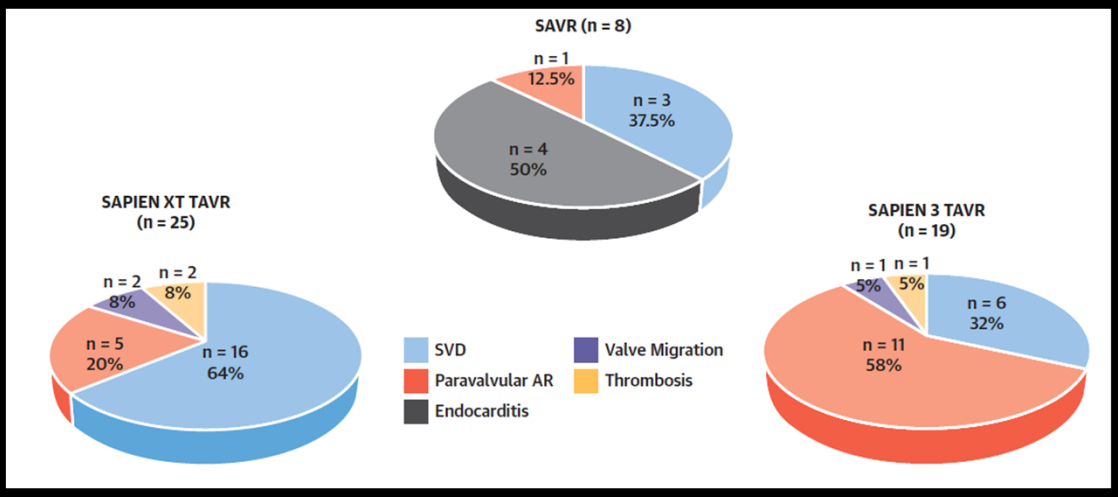
# VALVE DETERIORATION – TAVR VS SAVR




Pibarot, P. et al. J Am Coll Cardiol. 2020;76(16):1830–43.

15

# CAUSES OF VALVE FAILURE




*Pibarot, P et al, JACC 2020*

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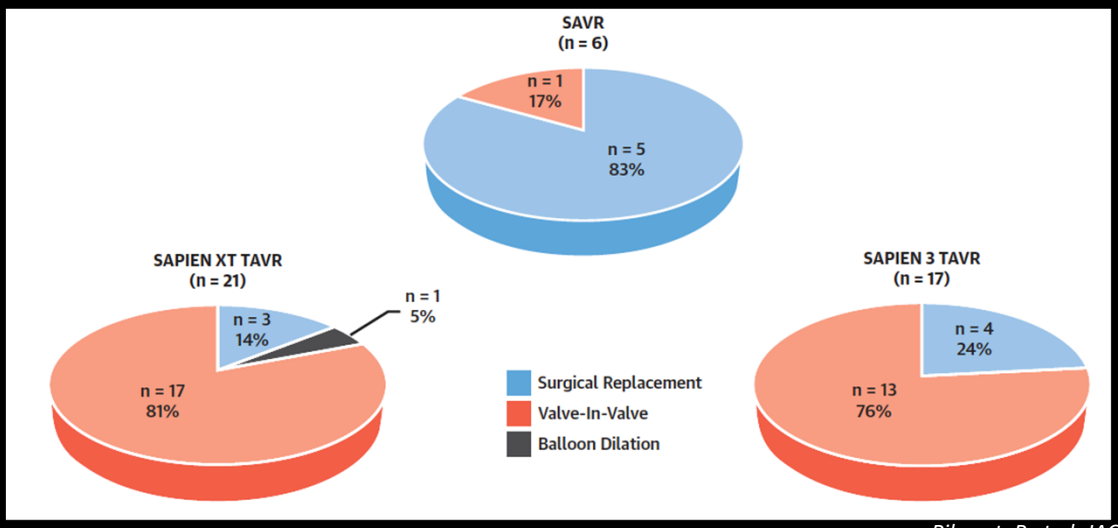
# TYPE OF VALVE REINTERVENTION



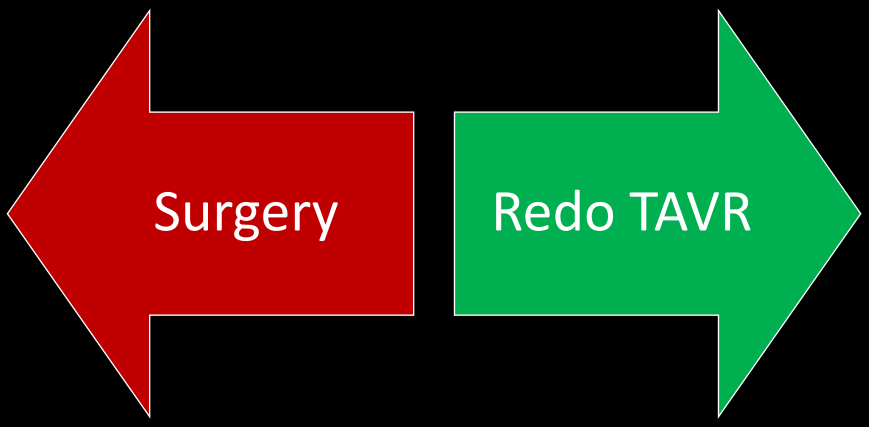

*Pibarot, P et al, JACC 2020*

17

# MANAGEMENT OF FAILING TAVRS

18

## MANAGEMENT OF FAILING TAVRS

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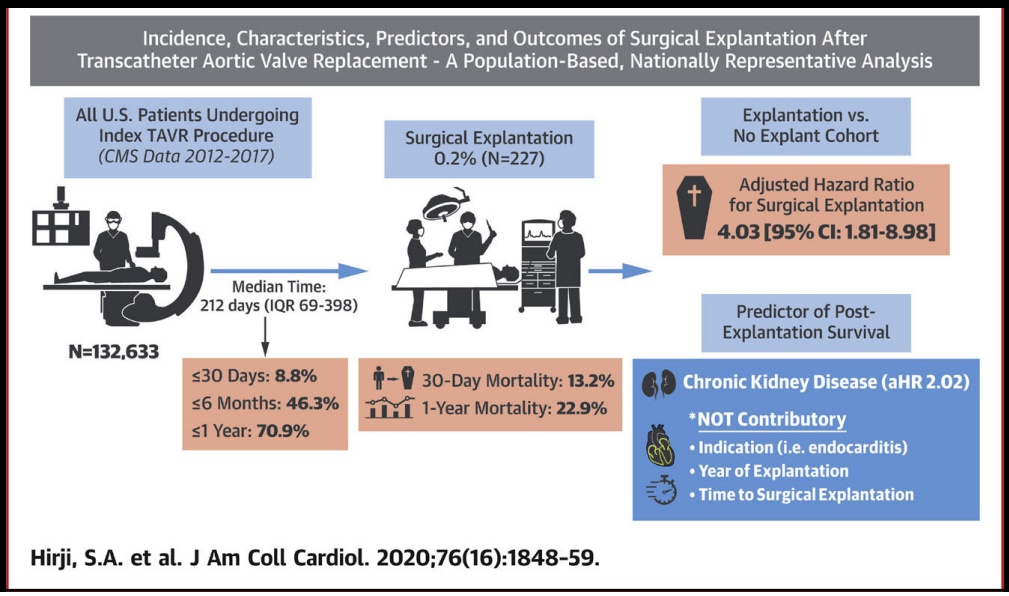
## TAVR EXPLANT CONSIDERATION

- Overall mortality of SAVR after TAVR remains ~10%
- Meticulous surgical technique is required in these commonly intermediate to high-risk surgical patients
- May need root replacement if the valve was implanted> 1 year (Thorani) , particularly in Evulot

20

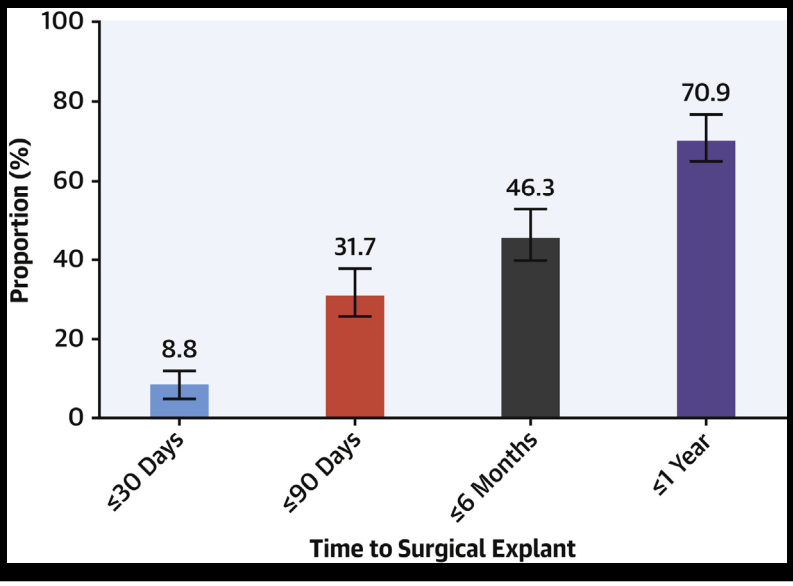
# TAVR EXPLANT REGISTRY




21

# TAVR EXPLANT REGISTRY

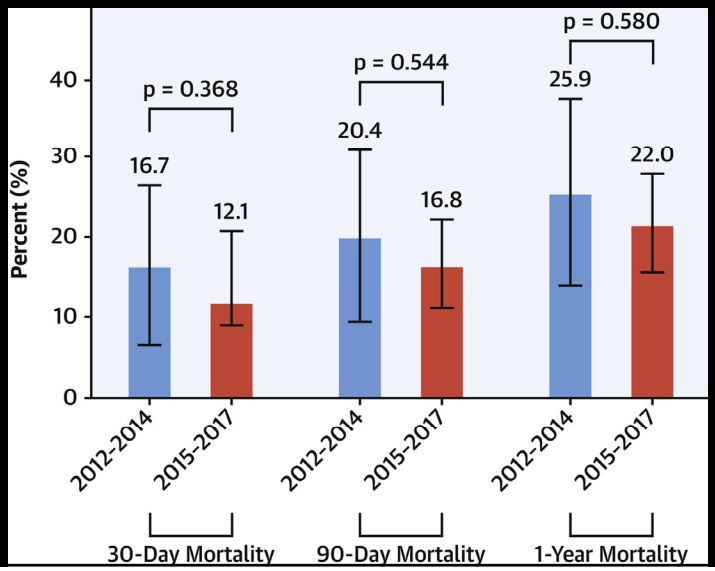
**Indication for the explant:**
- **Endocarditis 20.7%**
- **Bioprosthetic failure 79.3%**




*Hirji et l, JACC 2020*

22

## TAVR EXPLANT REGISTRY




*Hirji et l, JACC 2020*

23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## CONCERNS ABOUT REDO TAVR

- Unknown Safety / Mortality
- Challenging Coronary Access
- Coronary Obstruction
- Patient Prosthesis Mismatch
- Uncertainty Valve choice / sizing / positioning

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## OUTCOMES OF TAVR IN TAVR

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# REDO TAVR REGISTRY

- The Redo-TAVR registry collected data on consecutive patients who underwent redo-TAVR at 37 centers

- Patients were classified as:
  - Probable TAVR failure (procedure related; <1 year of index TAVR)
  - Probable THV failure (Prosthesis related; >1 year of index TAVR)

*Landes U, JACC 2020*

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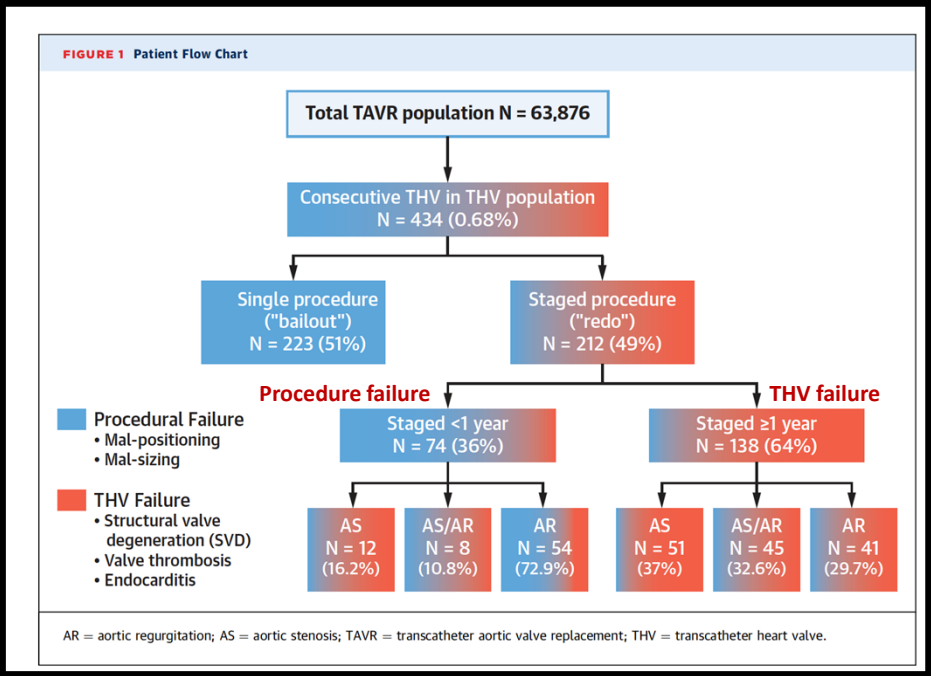


**(0.22% of all population)**

*Landes U, JACC 2020*

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## REDO TAVR REGISTRY

- Median follow-up (post redo-TAVR) was 15 (3 to 36) months
- Similar model was used in 60% of the patients
  - Corevalve (37%)
  - Sapien XT (24%)

*Landes U, JACC 2020*

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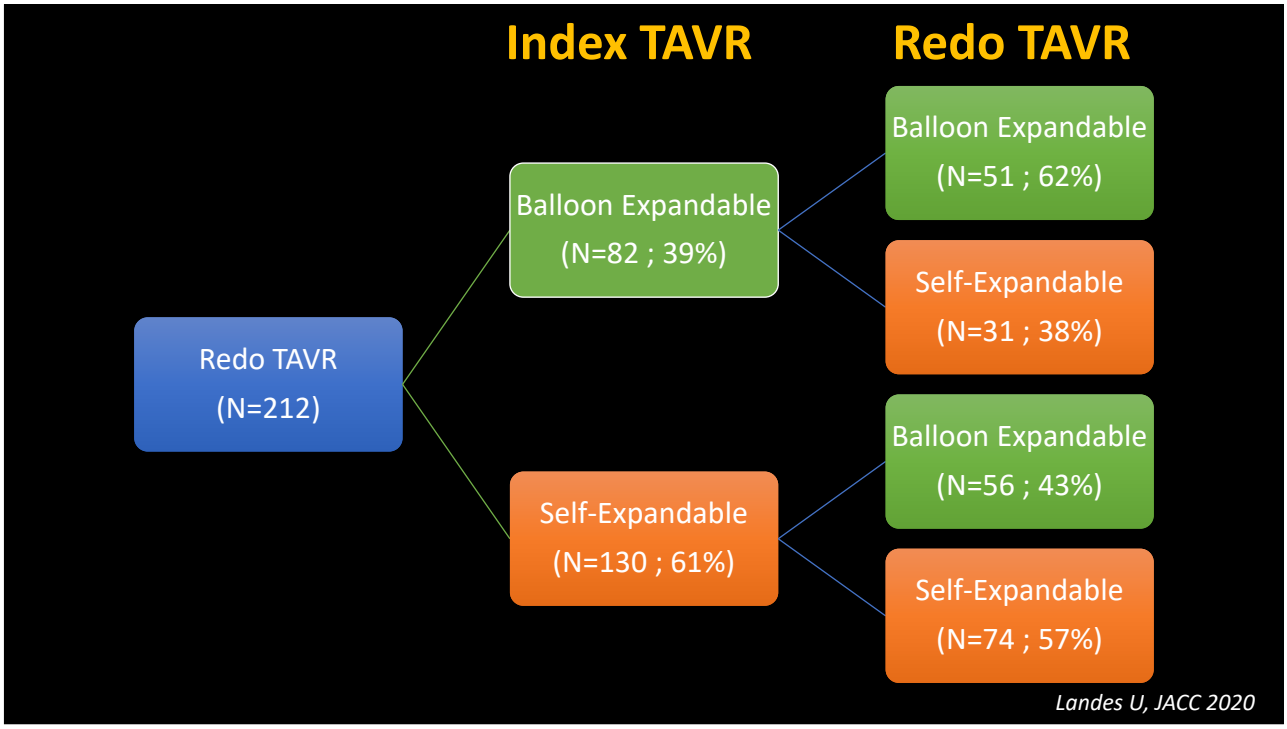


*Landes U, JACC 2020*

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# SIZING FOR REDO TAVR

| 1st THV (mm) | 2nd THV (mm) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 20 | 23 | 25 | 26 | 27 | 29 | 31 |
| 20 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 23 | 0 | 36 | 0 | 11 | 0 | 0 | 0 |
| 24 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |
| 25 | 0 | 4 | 0 | 3 | 0 | 0 | 0 |
| 26 | 0 | 5 | 1 | 46 | 2 | 8 | 0 |
| 27 | 1 | 1 | 0 | 6 | 0 | 3 | 1 |
| 29 | 0 | 1 | 1 | 13 | 0 | 35 | 2 |
| 31 | 0 | 0 | 0 | 1 | 0 | 9 | 6 |
| 34 | 0 | 0 | 0 | 2 | 0 | 6 | 0 |

*Landes U, JACC 2020*

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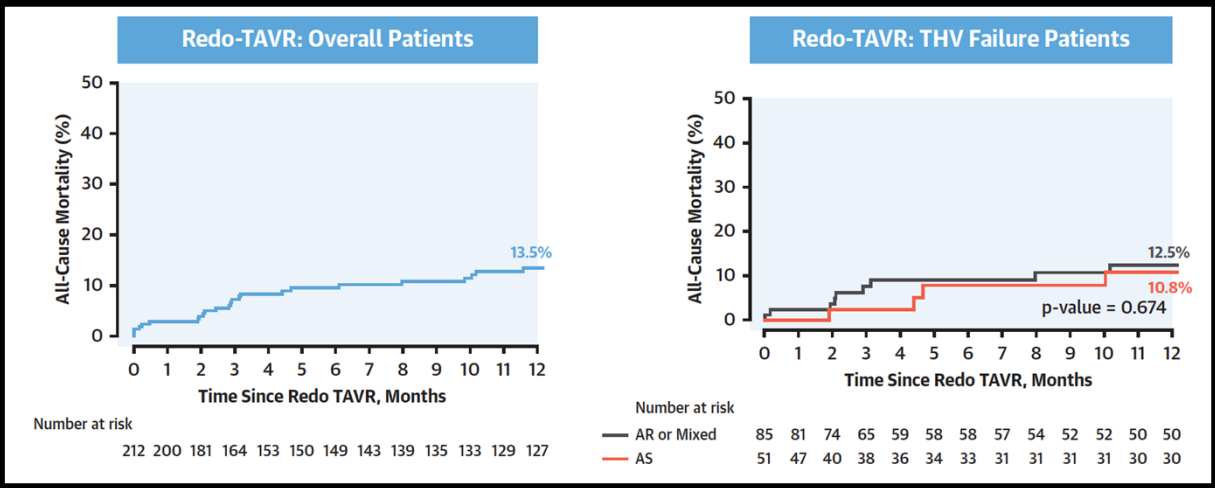
# REDO TAVR OUTCOMES




Median follow-up time was 447 (95 to 1,091) days

*Landes U, JACC 2020*

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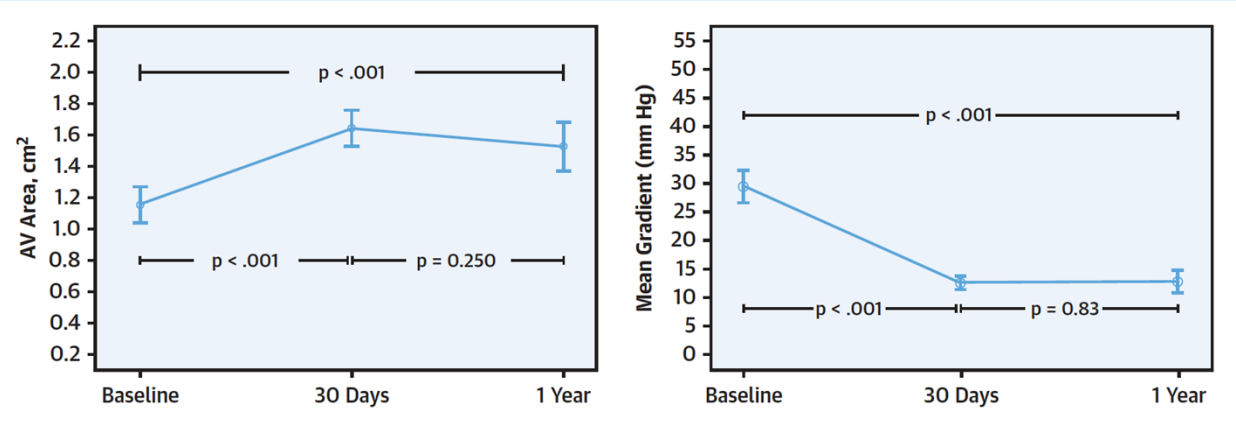
# REDO TAVR VALVE PERFORMANCE




- Transvalvular gradients decreased markedly with a mean of 12.6 +/- 7.5 mm Hg
- Index TAVR residual gradient was 11.1 mmHg

*Landes U, JACC 2020*

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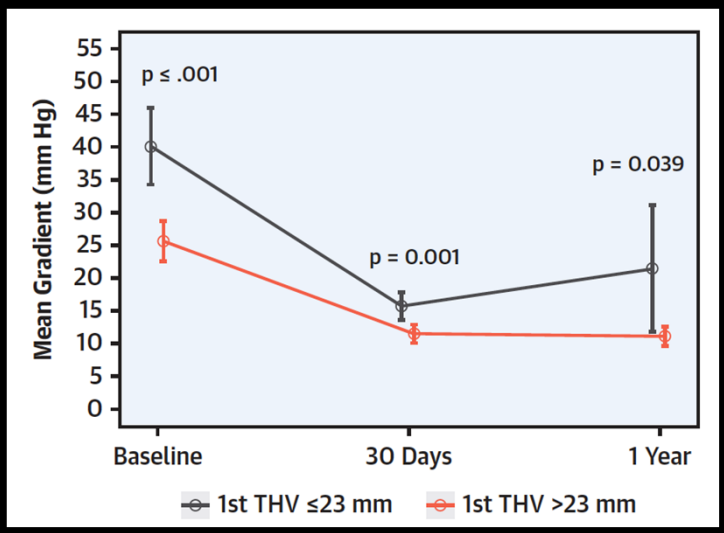
# REDO TAVR VALVE PERFORMANCE




*Landes U, JACC 2020*

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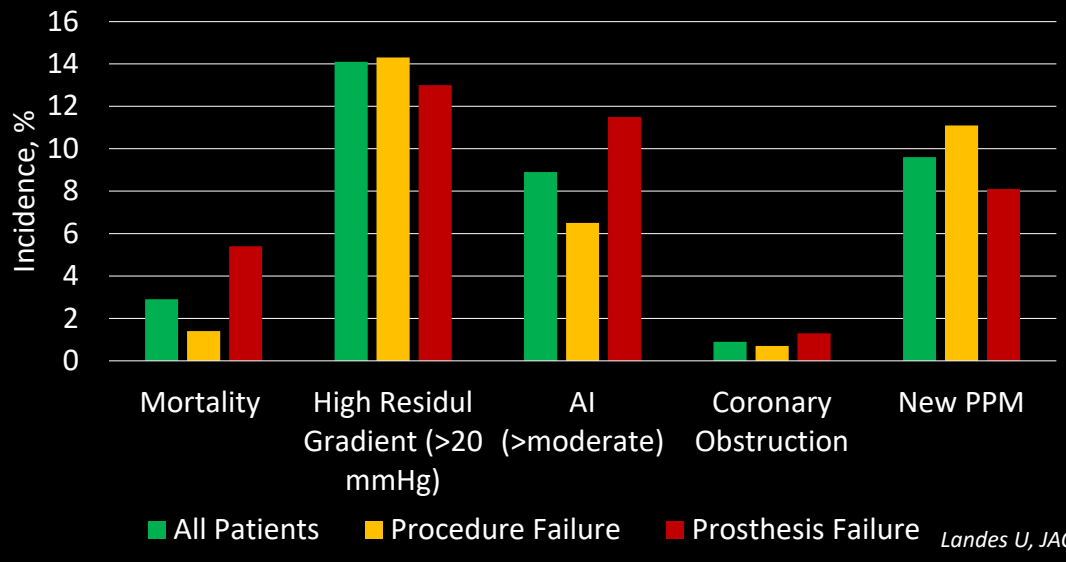
# REDO TAVR OUTCOMES




*Landes U, JACC 2020*

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# REDO TAVR VALVE PERFORMANCE

| | Incidence | Residual Gradient | Coronary Flow Obstruction | Mortality at 30 days |
|---|---|---|---|---|
| Redo-TAVR For: | | | | |
| Failed TAVR Valve | 0.22% | 13 mm Hg | 0.7% | 1.4% |
| Failed TAVR Procedure | 0.11% | 11.5 mm Hg | 1.3% | 5.4% |

*Landes U, JACC 2020*

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# HOW DOES THAT COMPARE TO TAVR IN SAVR?

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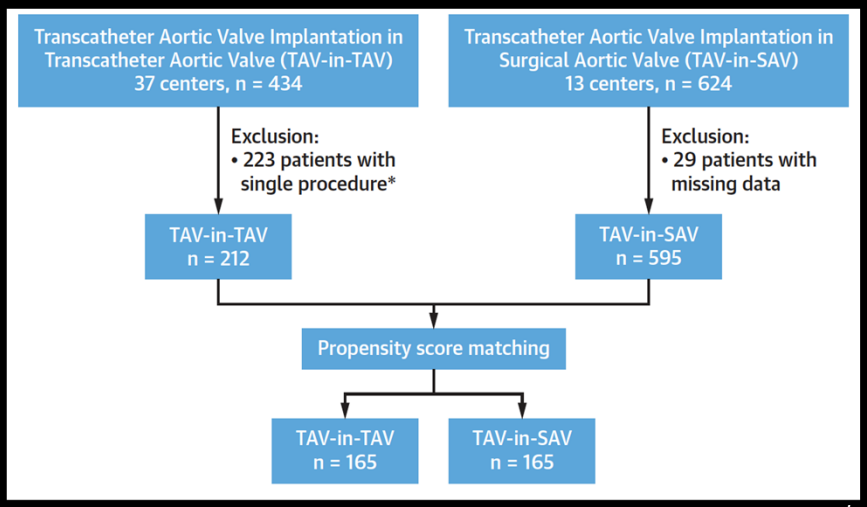
# REDO TAVR VS TAVR IN SAVR




*Landes U, JACC 2021*

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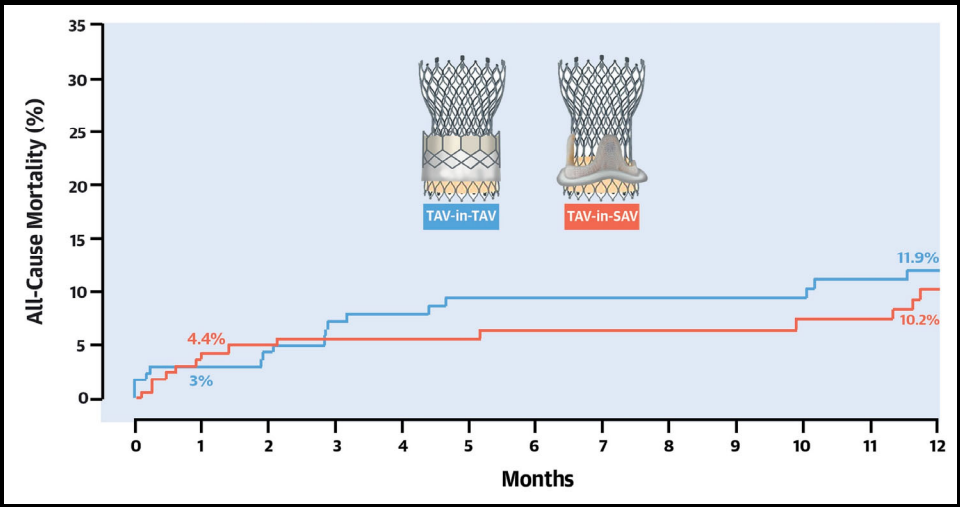
# REDO TAVR VS TAVR IN SAVR




*Landes U, JACC 2021*

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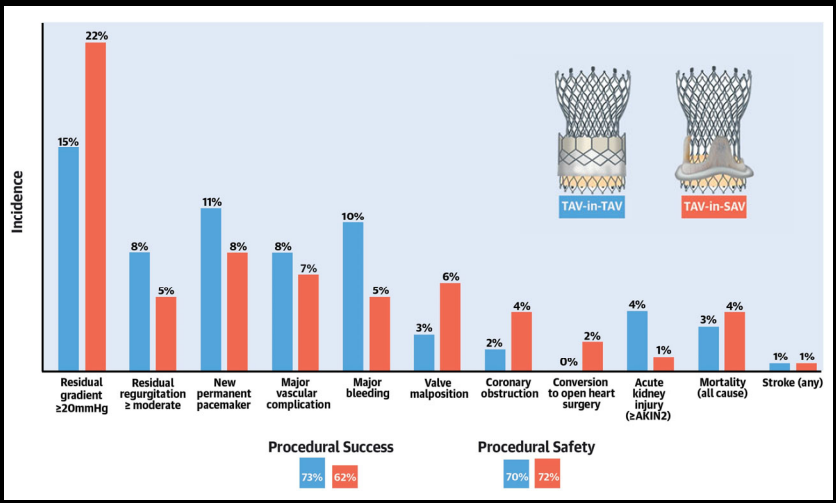
# REDO TAVR VS TAVR IN SAVR




*Landes U, JACC 2021*

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# CONCLUSION: TAVR IN TAVR APPEARS TO BE SAFE!

# IS THAT THE FULL STORY?!

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## LIMITATIONS OF REDO TAVR REGISTRY

- The denominator is missing
- Only low risk patients are offered TAVR in TAVR
- What about patients who have TAVR dysfunction and were not candidate for redo TAVR?

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# TAVR IN TAVR PLANNING

43

## TAVR IN TAVR IS AN ART

MAINTAIN CORONARY PERFUSION

MAINTAIN CORONARY ACCESS

CHOOSING/POSITIONING THE SECOND VALVE

AVOID PATIENT PROSTHESIS MISMATCH

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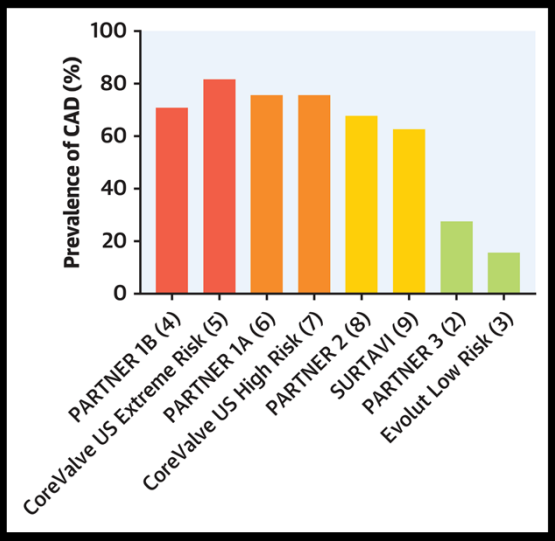
# CAD IN TAVR PATIENTS IN CLINICAL TRAILS

- About 50% of TAVR patients have CAD
- 11% have LM disease
- 50% have LAD disease
- About 10% will present with ACS within 2 years
- Success rate of PCI is only 90% in those with Corevalve




*Kleinman NS, et al CRT 2019.* *Vilalta V, et al , JACCl Intv 2018;11:2523–33*

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## Screening and Procedural Considerations

| Original THV Design | Original THC Characteristics | Anatomy | Failure Mode |
|---|---|---|---|
| Type | THV position in native anatomy | Coronary Access | PVL – malposition / calcification / size |
| Size | Expansion shape and ID/OD | Calcifications | Denegation – stenosis vs regurgitation |
| Frame design | Commissure Alignment | Sinus / VTC | Leaflet thrombosis |
| Leaflet Attachment | | STJ diameter and Sinus Heights | |
| | | Room to expand original THV | |

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# KEY TERMINOLOGY

- **Commissure** – Leaflet outflow attachment
- **Valve To Coronary:** distance measured from the valve to coronary ostia
- **Risk Plane**
- **Valve To Aorta (VTA) or Valve To STJ:** Distance between the valve stent frame to the aorta or STJ

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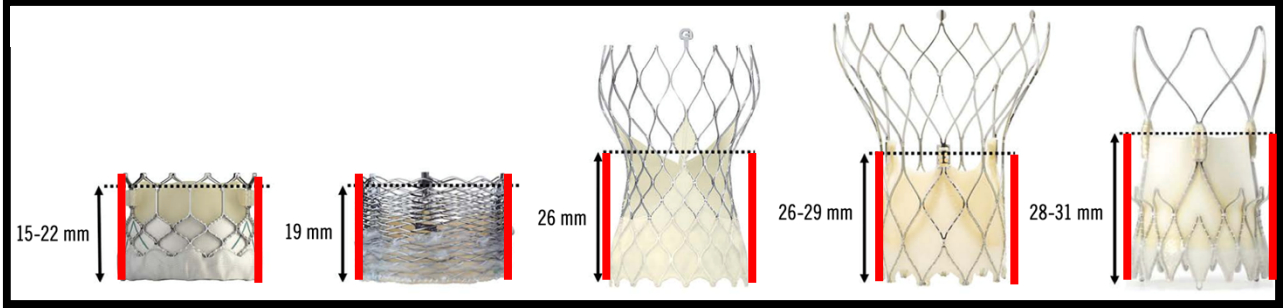
# RISK PLANE

- Level at which the stent frame of the first THV will be covered after the leaflets are displaced vertically with the implantation of the second THV




**THV in THV → Large covered stent!**

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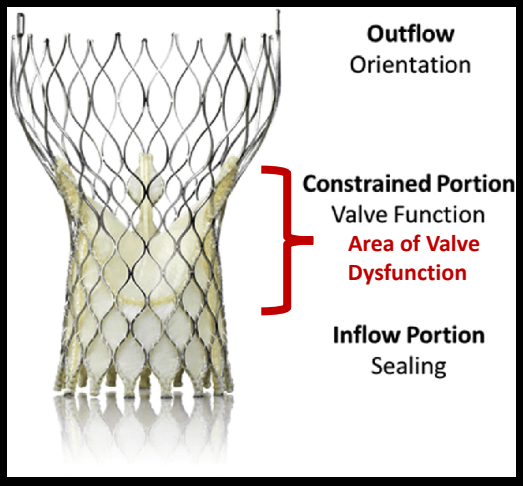
## SAPIEN IN EVOLUT

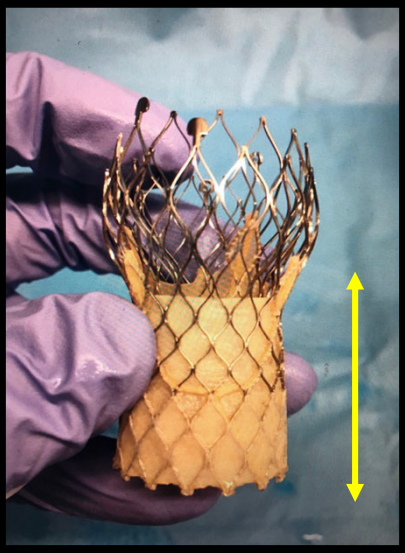


**Outflow**
Orientation

**Constrained Portion**
Valve Function
**Area of Valve Dysfunction**

**Inflow Portion**
Sealing

**Need to be covered by the new valve**

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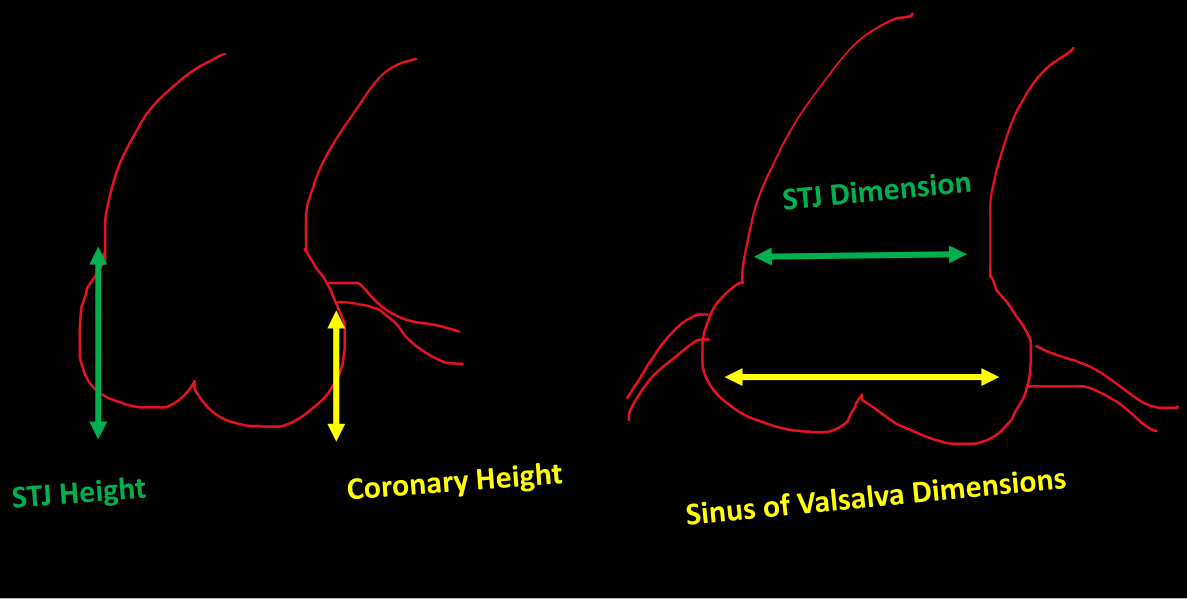
## PATIENT RELATED FACTORS

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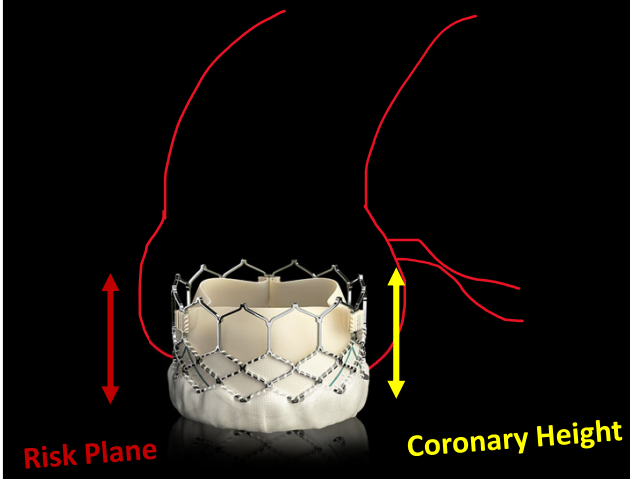
# VALVE – PATIENT INTERPLAY

Possible scenarios

51

## VALVE PATIENT INTERPLAY – SCENARIO #1




Coronary Artery **ABOVE** Risk Plane

THV in THV is likely feasible

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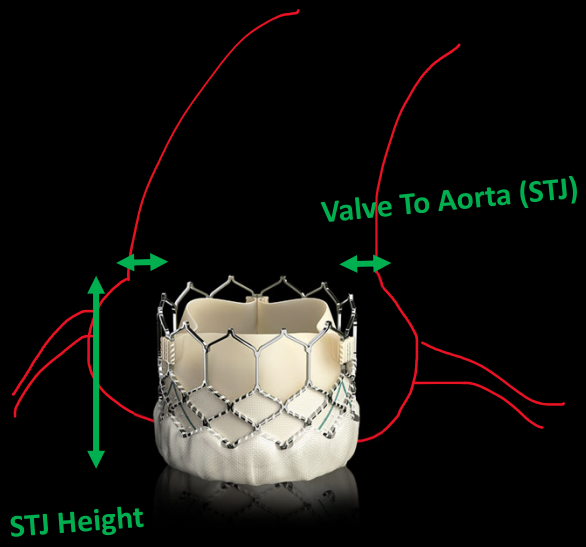
# VALVE PATIENT INTERPLAY – SCENARIO #2




Coronary Artery **BELLOW** Risk Plane

↓

Large VTA distance / Valve Bellow STJ

↓

THV in THV is likely feasible

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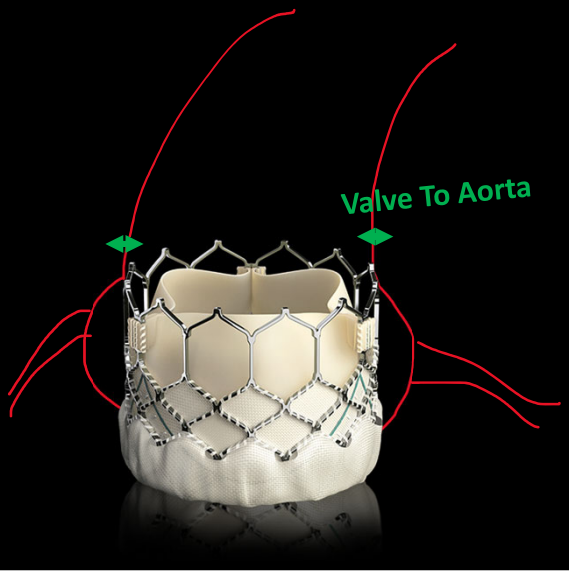
# VALVE PATIENT INTERPLAY – SCENARIO #3




Coronary Artery **BELLOW** Risk Plane

↓

Small VTA distance

↓

Sinus Sequestration!

THV in THV is likely NOT feasible

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# PLANNING SECOND VALVE

## VIRTUAL CT ANALYSIS

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**Feasibility of Coronary Access and Aortic Valve Reintervention in Low-Risk TAVR Patients**

Toby Rogers, MD, PhD,[a,b] Benjamin C. Gre
Paige Craig, MPH,[a] Christian Shults, MD,[d]
John Goncalves, MD,[h] Robert Levitt, MD,[i]
David Butzel, MD,[m] Scott Buchanan, MD,[n]
Federico Asch, MD,[q] Hector M. Garcia-Garc
Ron Waksman, MD[a]

**Risk of Coronary Obstruction and Feasibility of Coronary Access After Repeat Transcatheter Aortic Valve Replacement With the Self-Expanding Evolut Valve**

A Computed Tomography Simulation Study

Brian J. Forrestal, MBBS; Brian C. Case, MD; Charan Yerasi, MD; Corey Shea, MS; Rebecca Torguson, MPH; ed Ali, MBBS; Lowell F. Satler, MD; ; Jaffar M. Khan, BM BCh, PhD;

JACC: CARDIOVASCULAR INTERVENTIONS
VOL. 13, NO. 22, 2020

PUBLISHED BY ELSEVIER

**Risk of Coronary Obstruction Due to Sinus Sequestration in Redo Transcatheter Aortic Valve Replacement**

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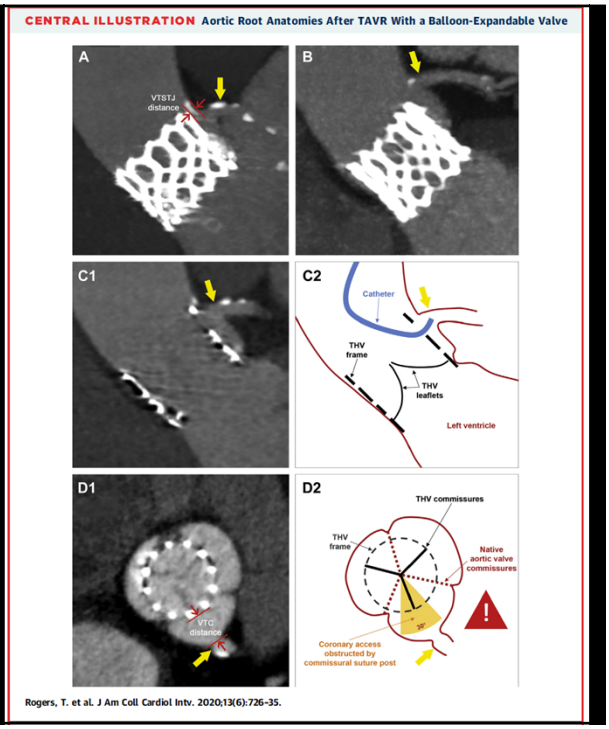
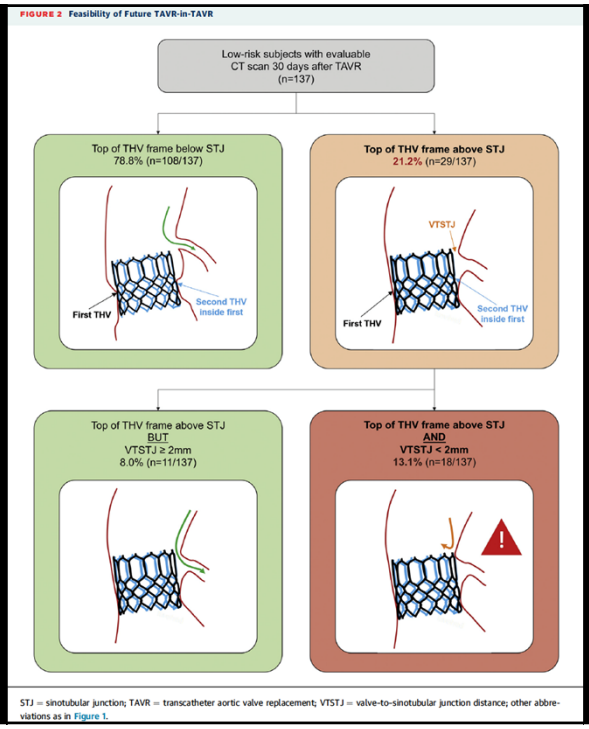
# LOW RISK TRIAL

- Sapien valve
- Enrolled 200 subjects
- 137 subjects had 30-day CTA + adequate image quality for analysis
- Age: mean 74 years
- Comprehensive CTA assessment

*Rogers, T, et al, JACC Intv 2020*




57




**13% of the patient will NOT be a candidate for TAVR in TAVR**

*Rogers, T, et al, JACC Intv 2020*

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# THE COREVALVE EVOLUT PRO PROSPECTIVE REGISTRY (EPROMPT; NCT03423459)

- 81 patients had Evolut/ Corevalve
- CTA was performed 30 days after TAVR

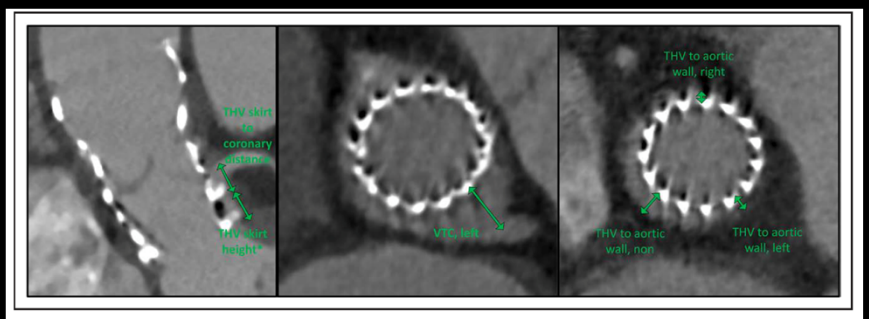


**Figure 2. Computed tomographic images with measurements used to calculate the risk of obstruction and feasibility of coronary access.**

*Forrestal, et al, CIRC Intv 2020*

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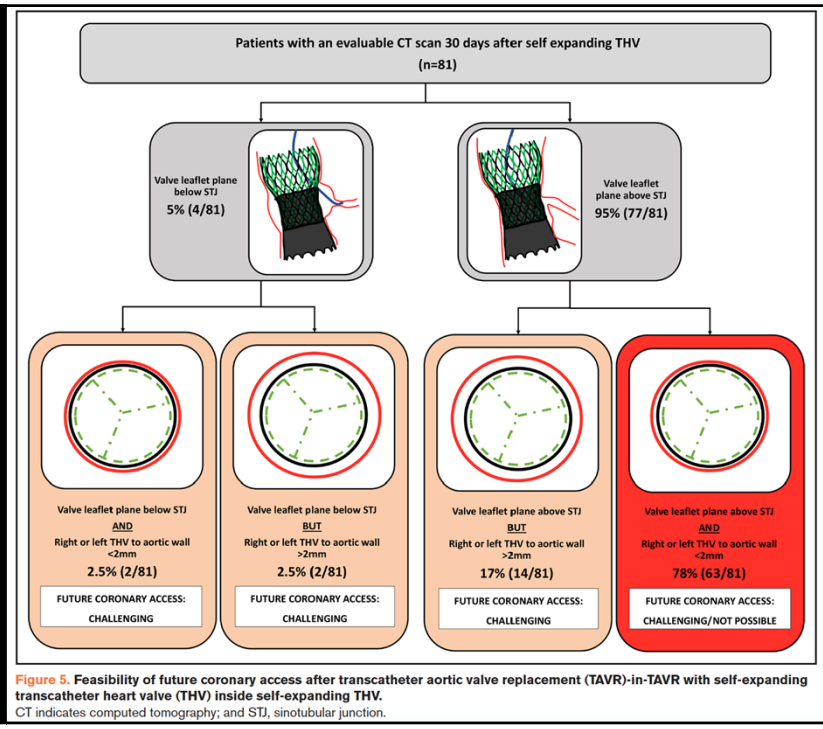


**Figure 5. Feasibility of future coronary access after transcatheter aortic valve replacement (TAVR)-in-TAVR with self-expanding transcatheter heart valve (THV) inside self-expanding THV.**
CT indicates computed tomography; and STJ, sinotubular junction.

*Forrestal, et al, 2020*

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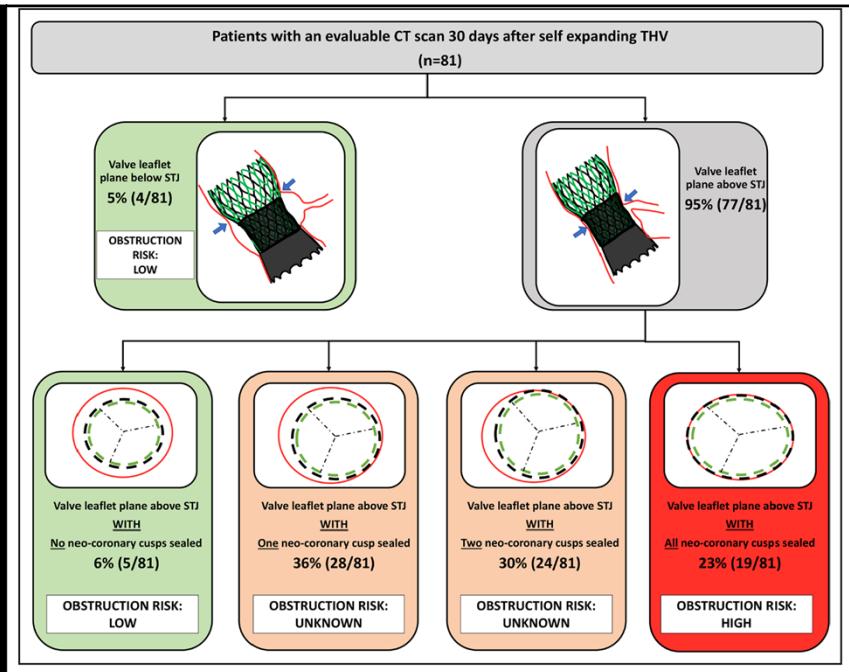


**Figure 4. Risk of coronary artery obstruction due to sinus sequestration during transcatheter aortic valve replacement (TAVR)-in-TAVR with self-expanding transcatheter heart valve (THV) inside self-expanding THV.**
Blue arrows represent the sinotubular junction (STJ). CT indicates computed tomography.

*Forrestal, et al, 2020*

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# EVOLUT IN EVOLUT EXAMPLE

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## THE COREVALVE EVOLUT PRO PROSPECTIVE REGISTRY (EPROMPT; NCT03423459)

### WHAT THE STUDY ADDS

Our computed tomography–based simulation predicts the following:

- There is a risk of coronary obstruction due to sinus sequestration after TAVR-in-TAVR with an Evolut PRO or Evolut PRO+ transcatheter heart valve in up to 1 in 4 patients.
- Future coronary access is likely to be not possible, or exceedingly challenging, in up to 4 of 5 patients after TAVR-in-TAVR.

*Forrestal, et al, CIRC Intv 2020*

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## THE RESOLVE REGISTRY (CEDARS-SINAI)

- Virtual analysis of Post-TAVR CT
  - 66 patients ➔ Evolut R or Evolut PRO
  - 345 patients ➔ Sapien S3
- Sinus Sequestration:
  - Prior TAV commissure level was above sinotubular junction (STJ)
  - The distance between TAV and STJ was <2.0 mm in each coronary sinus

*Makkar, et al, JACC Intv 2020*

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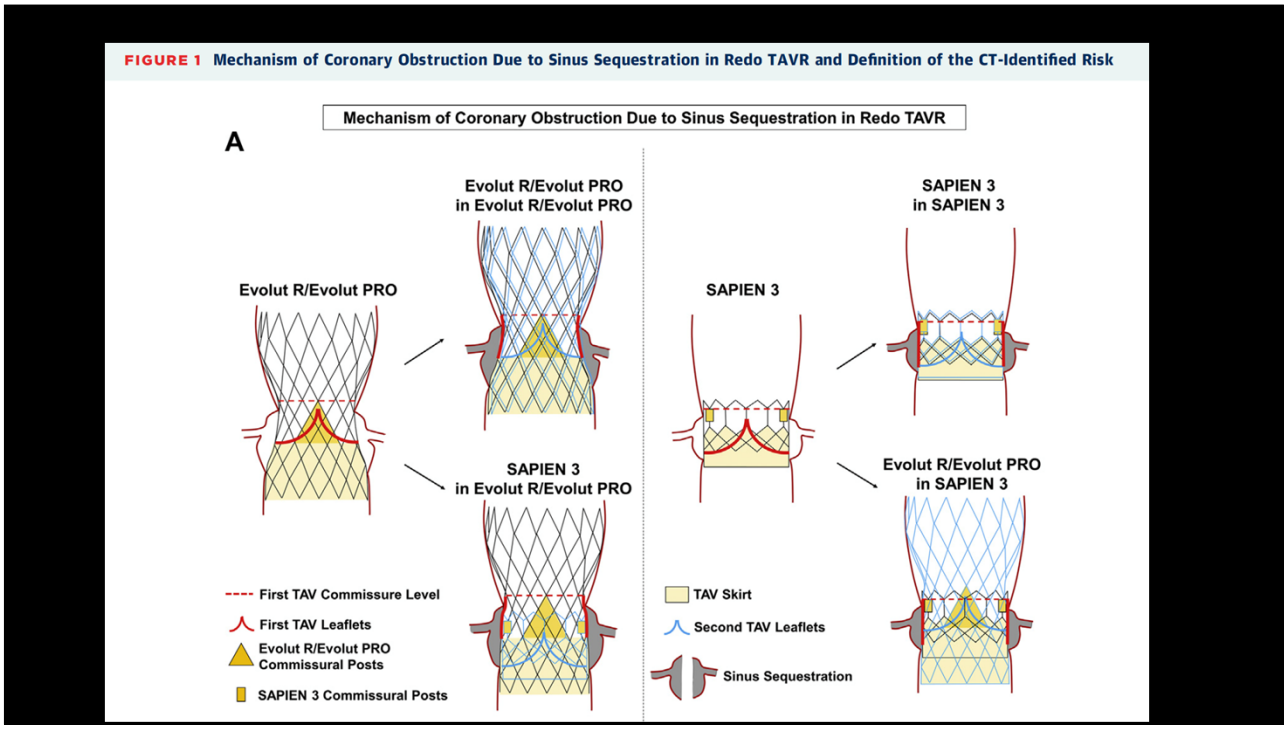
FIGURE 1 Mechanism of Coronary Obstruction Due to Sinus Sequestration in Redo TAVR and Definition of the CT-Identified Risk
Mechanism of Coronary Obstruction Due to Sinus Sequestration in Redo TAVR
A
Evolut R/Evolut PRO
Evolut R/Evolut PRO in Evolut R/Evolut PRO
SAPIEN 3 in Evolut R/Evolut PRO
SAPIEN 3
SAPIEN 3 in SAPIEN 3
Evolut R/Evolut PRO in SAPIEN 3
First TAV Commissure Level
First TAV Leaflets
Evolut R/Evolut PRO Commissural Posts
SAPIEN 3 Commissural Posts
TAV Skirt
Second TAV Leaflets
Sinus Sequestration

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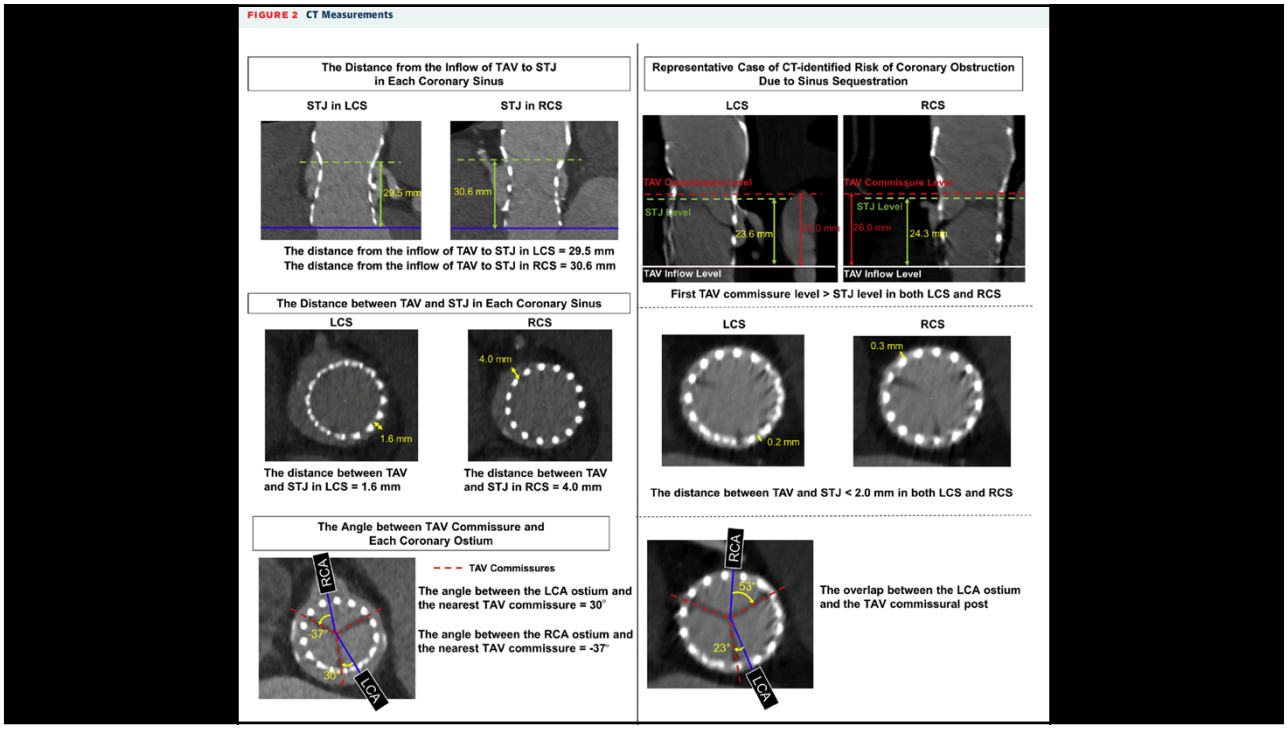
FIGURE 2 CT Measurements
The Distance from the Inflow of TAV to STJ in Each Coronary Sinus
STJ in LCS
STJ in RCS
29.5 mm
30.6 mm
The distance from the inflow of TAV to STJ in LCS = 29.5 mm
The distance from the inflow of TAV to STJ in RCS = 30.6 mm
The Distance between TAV and STJ in Each Coronary Sinus
LCS
RCS
1.6 mm
4.0 mm
The distance between TAV and STJ in LCS = 1.6 mm
The distance between TAV and STJ in RCS = 4.0 mm
The Angle between TAV Commissure and Each Coronary Ostium
TAV Commissures
RCA
LCA
-37°
38°
The angle between the LCA ostium and the nearest TAV commissure = 30°
The angle between the RCA ostium and the nearest TAV commissure = -37°
Representative Case of CT-identified Risk of Coronary Obstruction Due to Sinus Sequestration
LCS
RCS
TAV Commissure Level
STJ Level
23.6 mm
29.0 mm
26.0 mm
24.3 mm
TAV Inflow Level
First TAV commissure level > STJ level in both LCS and RCS
0.2 mm
0.3 mm
The distance between TAV and STJ < 2.0 mm in both LCS and RCS
53°
23°
The overlap between the LCA ostium and the TAV commissural post

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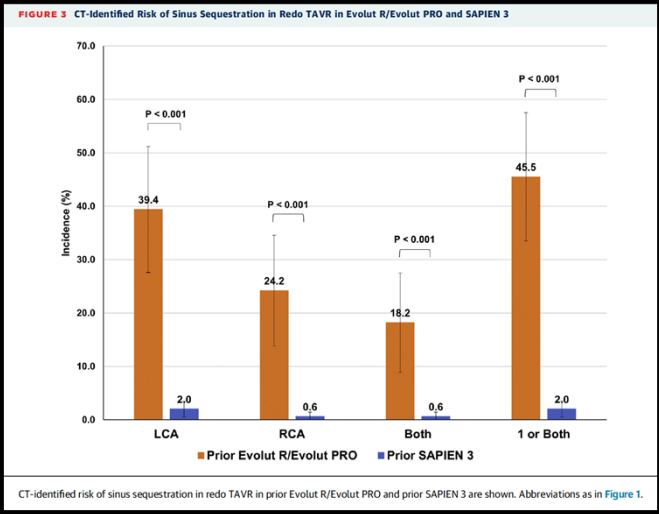
# The RESOLVE Registry (Cedars-Sinai)

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# PLANNING FEASIBLE PATIENTS

## REMAINS A CHALLENGE

68

## VALVE SIZING – MANY UNKNOWNS

- Same index valve size if using the same brand?
  - 1st valve expansion
- Should we size based on native anulus?
- Should we use ViV APP?


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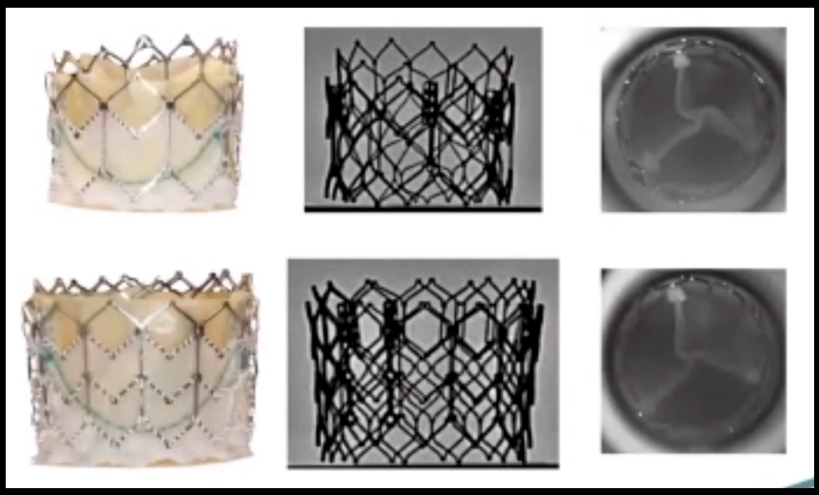
## VALVE SIZING – AVOID PINWHEELING



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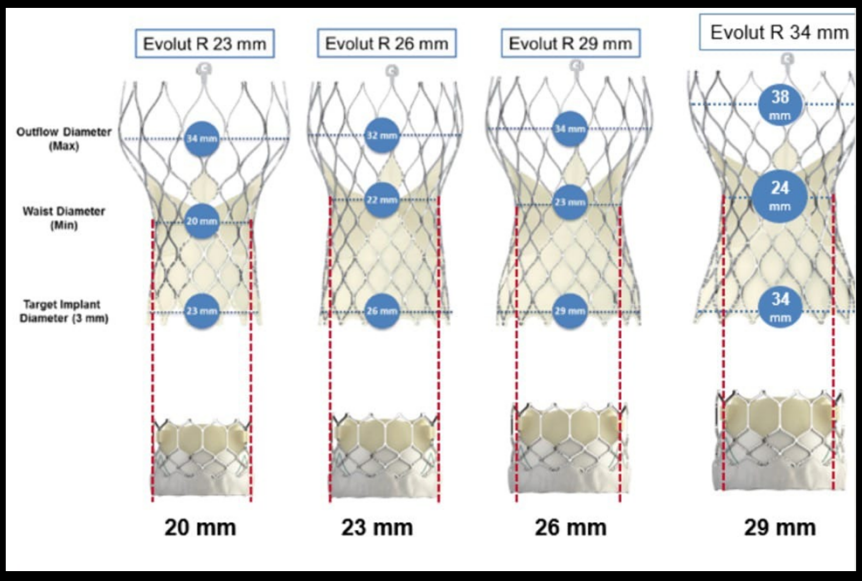
# VALVE SIZING

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# VALVE SIZING

- No data available for valve sizing for Accurate Neo, Medtronic, or Portico valve

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## Valve Positioning

- Very limited data
- More straight forward when using same brand
- More challenging when then index valve is self expandable

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## REPEAT TAVR AND IMPLICATIONS FOR THV PERFORMANCE: INSIGHTS FROM BENCH TESTING

**Index Valve**

**2nd Valve** Sapien 3, Evolut Pro, Acurate neo, Allegra, and Portico

**Outcome** Hydrodynamic function was evaluated using a pulse duplicator
Multimodality imaging was performed

*Sathananthan, et al, Eurointervention 2021*

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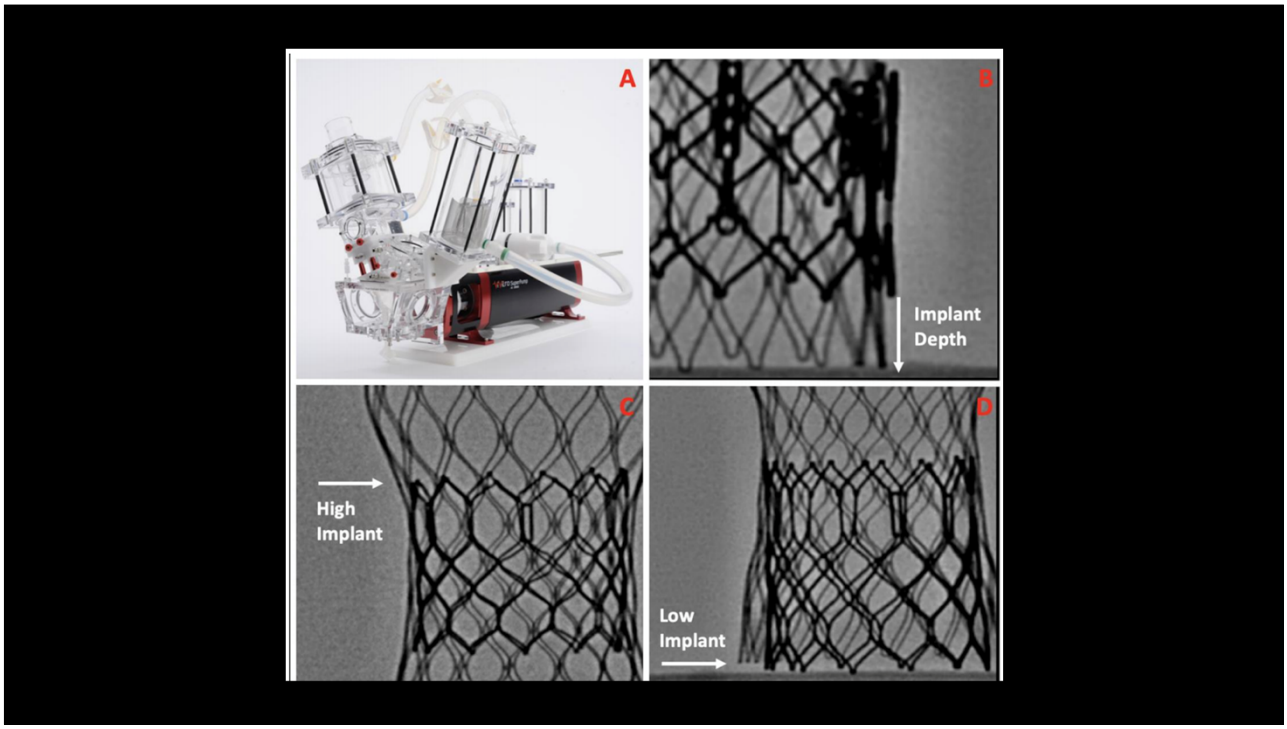
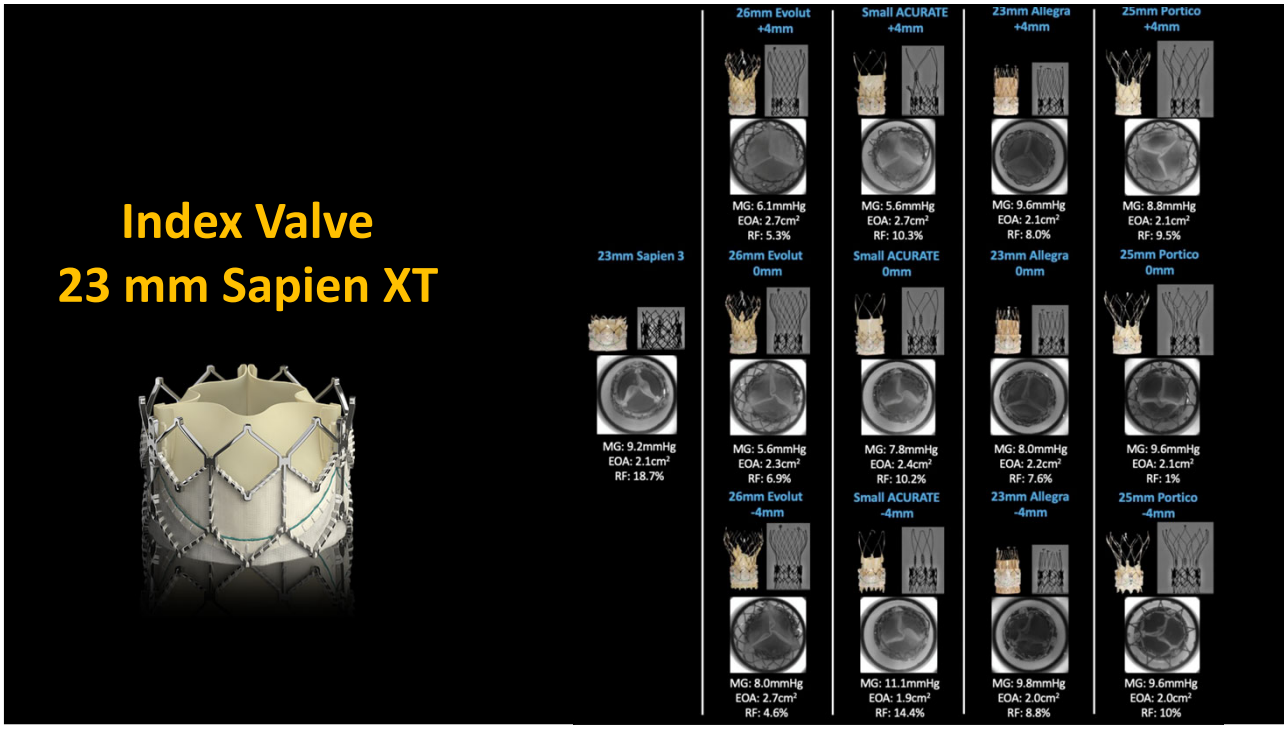

A
B
Implant
Depth
C
High
Implant
D
Low
Implant

75


Index Valve
23 mm Sapien XT
23mm Sapien 3
MG: 9.2mmHg
EOA: 2.1cm²
RF: 18.7%
26mm Evolut +4mm
MG: 6.1mmHg
EOA: 2.7cm²
RF: 5.3%
Small ACURATE +4mm
MG: 5.6mmHg
EOA: 2.7cm²
RF: 10.3%
23mm Allegra +4mm
MG: 9.6mmHg
EOA: 2.1cm²
RF: 8.0%
25mm Portico +4mm
MG: 8.8mmHg
EOA: 2.1cm²
RF: 9.5%
26mm Evolut 0mm
MG: 5.6mmHg
EOA: 2.3cm²
RF: 6.9%
Small ACURATE 0mm
MG: 7.8mmHg
EOA: 2.4cm²
RF: 10.2%
23mm Allegra 0mm
MG: 8.0mmHg
EOA: 2.2cm²
RF: 7.6%
25mm Portico 0mm
MG: 9.6mmHg
EOA: 2.1cm²
RF: 1%
26mm Evolut -4mm
MG: 8.0mmHg
EOA: 2.7cm²
RF: 4.6%
Small ACURATE -4mm
MG: 11.1mmHg
EOA: 1.9cm²
RF: 14.4%
23mm Allegra -4mm
MG: 9.8mmHg
EOA: 2.0cm²
RF: 8.8%
25mm Portico -4mm
MG: 9.6mmHg
EOA: 2.0cm²
RF: 10%

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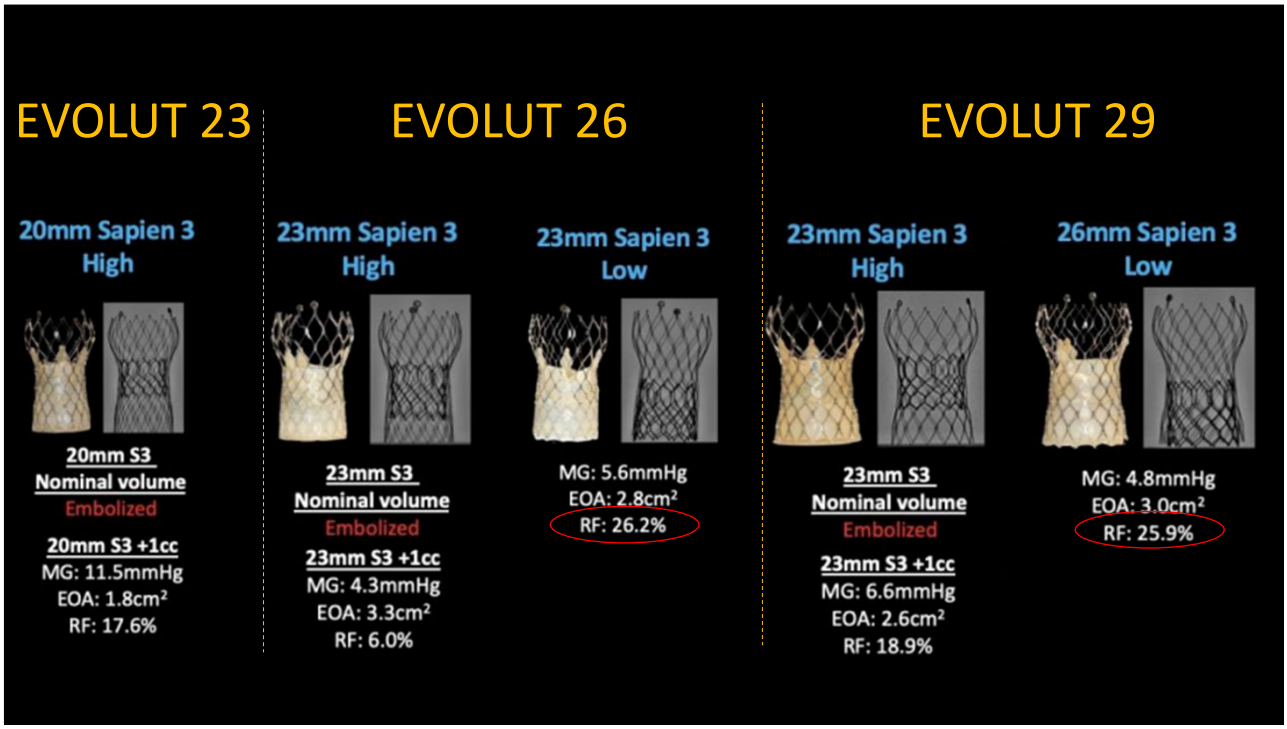
EVOLUT 23
EVOLUT 26
EVOLUT 29
20mm Sapien 3
High
20mm S3
Nominal volume
Embolized
20mm S3 +1cc
MG: 11.5mmHg
EOA: 1.8cm²
RF: 17.6%
23mm Sapien 3
High
23mm S3
Nominal volume
Embolized
23mm S3 +1cc
MG: 4.3mmHg
EOA: 3.3cm²
RF: 6.0%
23mm Sapien 3
Low
MG: 5.6mmHg
EOA: 2.8cm²
RF: 26.2%
23mm Sapien 3
High
23mm S3
Nominal volume
Embolized
23mm S3 +1cc
MG: 6.6mmHg
EOA: 2.6cm²
RF: 18.9%
26mm Sapien 3
Low
MG: 4.8mmHg
EOA: 3.0cm²
RF: 25.9%

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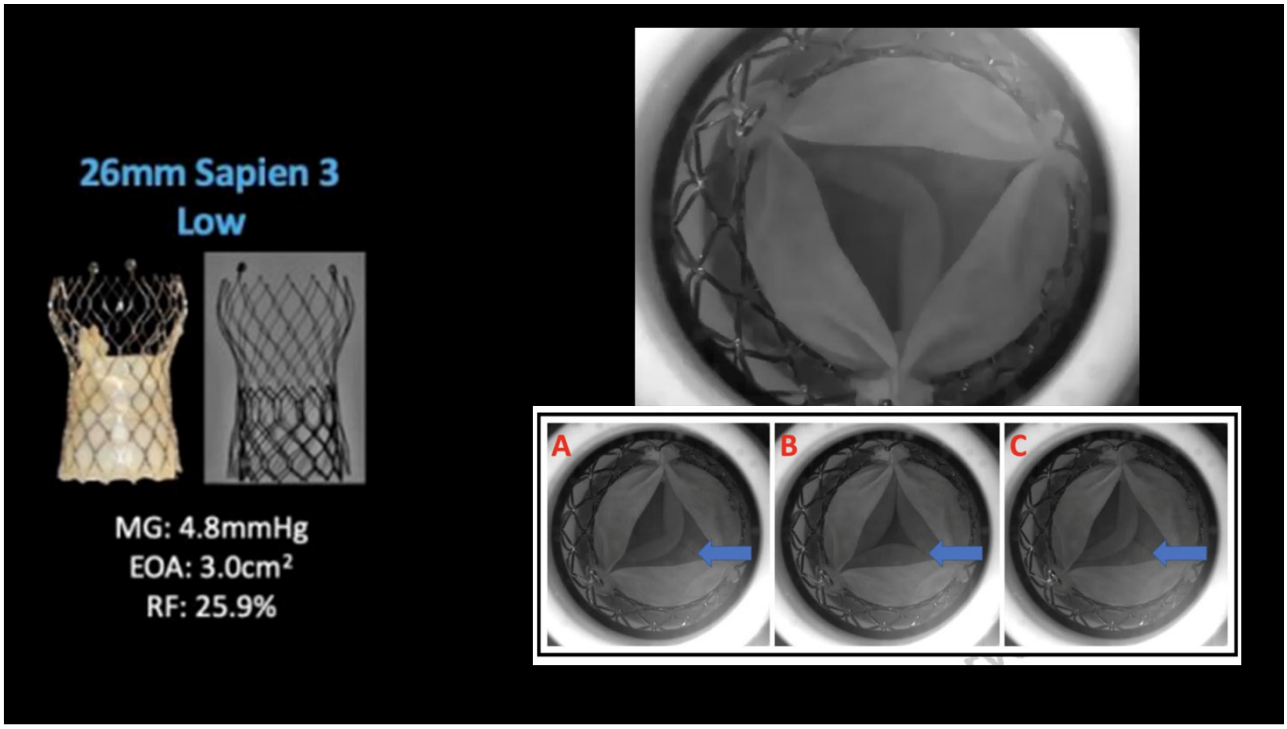
26mm Sapien 3
Low
MG: 4.8mmHg
EOA: 3.0cm²
RF: 25.9%
A
B
C

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# WHAT ABOUT HIGH RISK PATIENTS?

## ROLE OF CORONARY PROTECTION!

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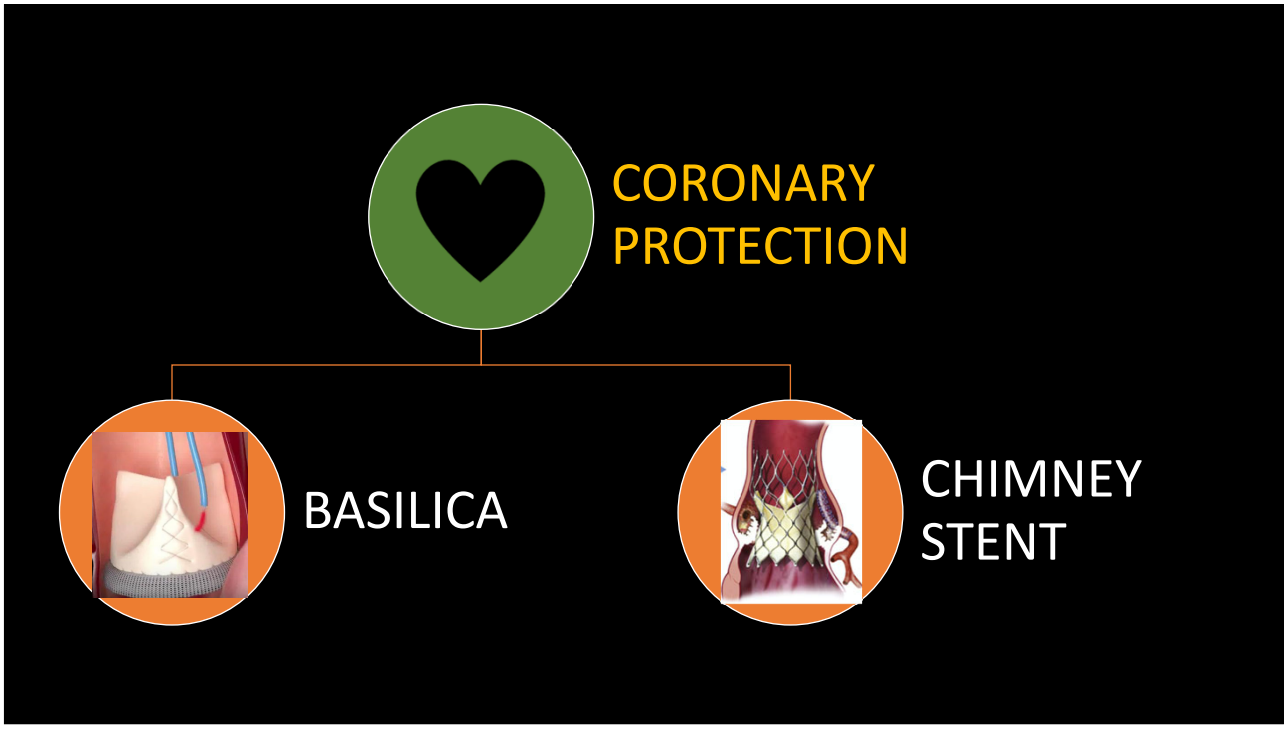


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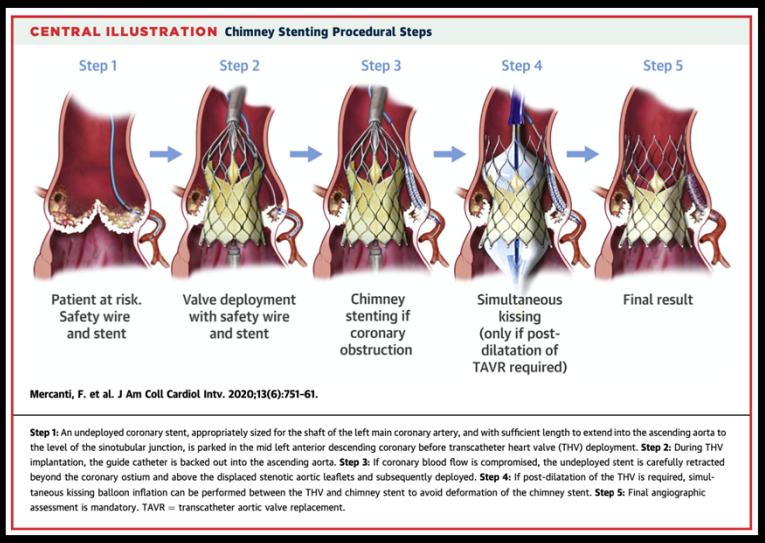
# CHIMNEY STENTING

**TABLE 5** 30-Day Clinical Outcomes (N = 60)

| | Total (N = 60) | CAO | | | Coronary Protection | | |
|---|---|---|---|---|---|---|---|
| | | iCAO (n = 35) | eCAO (n = 25) | p Value | Present (n = 44) | Absent (n = 16) | p Value |
| Procedural death | 3 (5.0) | 0 (0.0) | 3 (12.0) | 0.07 | 0 (0.0) | 3 (18.75) | 0.02 |
| 30-day death | 3 (5.0) | 0 (0.0) | 3 (12.0) | 0.07 | 0 (0.0) | 3 (18.75) | 0.02 |
| MI | 13 (21.6) | 0 (0.0) | 13 (52.0) | <0.01 | 6 (13.6) | 7 (43.8) | 0.03 |
| Cardiogenic shock | 14 (23.3) | 1 (2.9) | 13 (52.0) | <0.01 | 4 (9.1) | 10 (62.5) | <0.01 |
| Stroke | 1 (1.7) | 0 (0.0) | 1 (4.0) | – | 0 (0.0) | 1 (6.2) | – |
| Major vascular complication | 2 (3.4) | 1 (2.9) | 1 (4.0) | 0.7 | 2 (4.5) | 0 (0.0) | 0.5 |
| Life-threatening bleeding | 1 (1.7) | 0 (0.0) | 1 (4.0) | – | 0 (0.0) | 1 (6.2) | – |
| AKI grade 3 | 3 (5.0) | 1 (2.9) | 2 (8.0) | 0.4 | 1 (2.3) | 2 (12.5) | 0.15 |

Values are n (%).
AKI = acute kidney injury; eCAO = established coronary artery occlusion; iCAO = impending coronary artery occlusion; MI = myocardial infarction.

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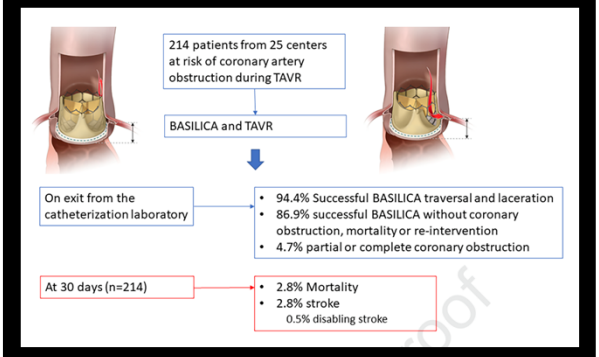
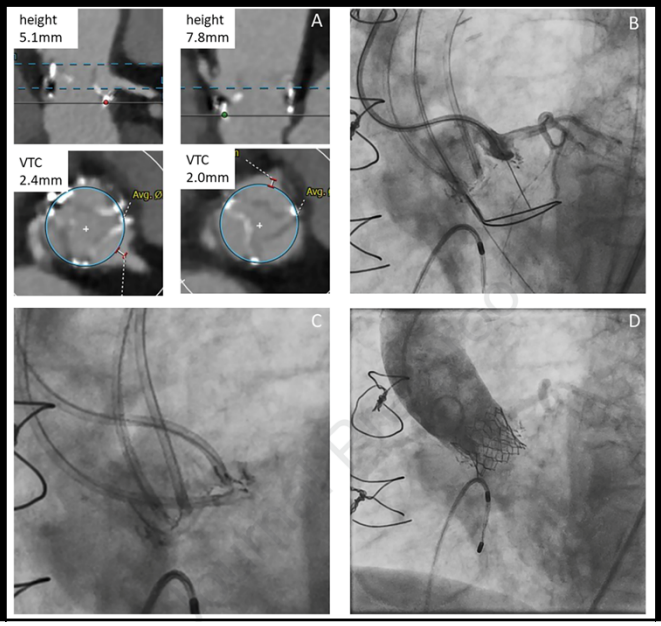
# BASILICA




*Khan, JACC-Interventional 3/2021*

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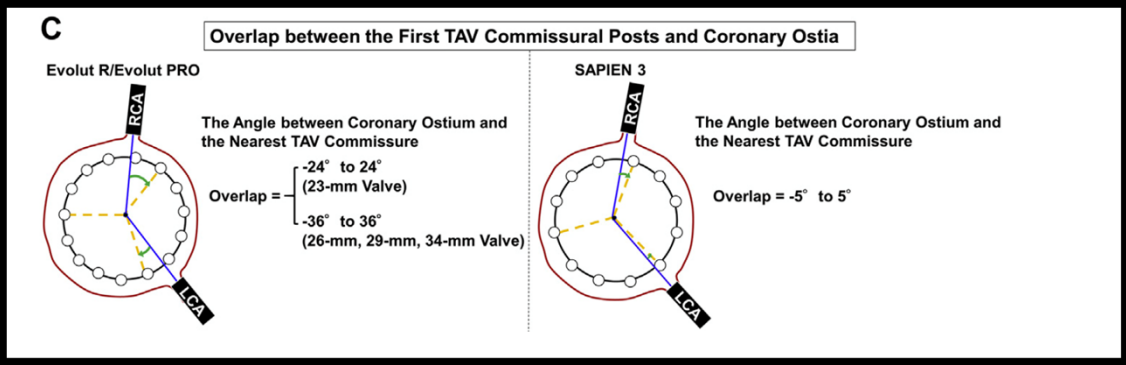
# COMMISSURES, SKIRTS AND BASILICA

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# BASILICA IN TAVR IN TAVR

- Splay Angles and slit width
  - Sapien XT & Lotus > Sapien 3 and Evolut R

We believe that BASILICA may NOT reliably prevent coronary obstruction for TAVR in-TAVR, especially when the predicted mechanism of obstruction is sinus of Valsalva effacement

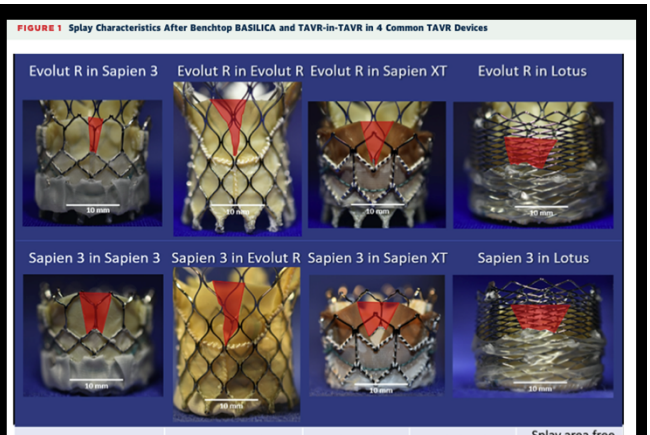


FIGURE 1 Splay Characteristics After Benchtop BASILICA and TAVR-in-TAVR in 4 Common TAVR Devices

| Degenerated Valve | Splay Angle (degrees, min/max) | Slit width maximum (mm) | Slit height (mm) | Splay area free of TAVR skirt ($mm^2$) |
|---|---|---|---|---|
| **Evolut R implanted in prior TAVR** | | | | |
| Sapien 3 23mm | 11 | 3 | 14 | 12 |
| Evolut R 23mm | 16 / 52 | 7 | 12 | 29 |
| Sapien XT 23mm | 34 | 6 | 9 | 26 |
| Lotus 25mm | 59 | 10 | 10 | 37 |
| **Sapien 3 implanted in prior TAVR** | | | | |
| Sapien 3 23mm | 22 | 6 | 14 | 32 |
| Evolut R 23mm | 19 / 34 | 6 | 12 | 33 |
| Sapien XT 23mm | 49 | 8 | 9 | 30 |
| Lotus 25mm | 56 | 11 | 11 | 41 |

The orifices created by BASILICA-splayed leaflets are depicted in **red**. TAVR = transcatheter aortic valve replacement.

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# BACK TO OUR CASE!

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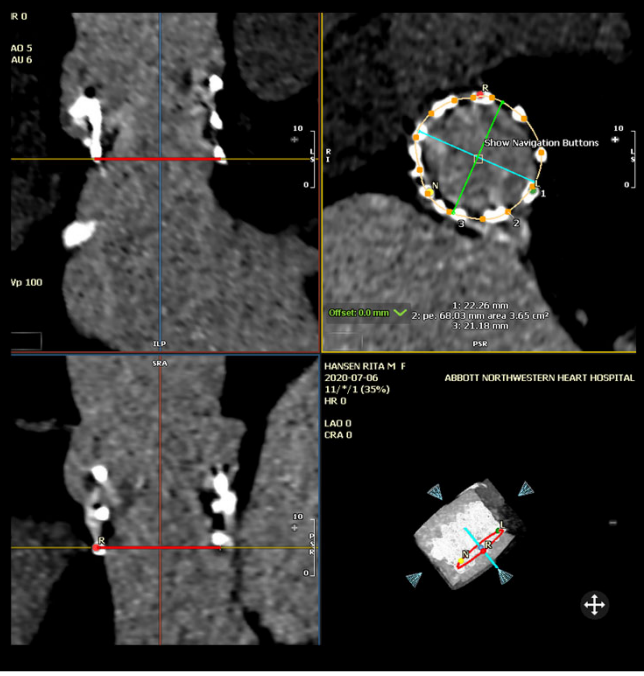
# CARDIAC CTA

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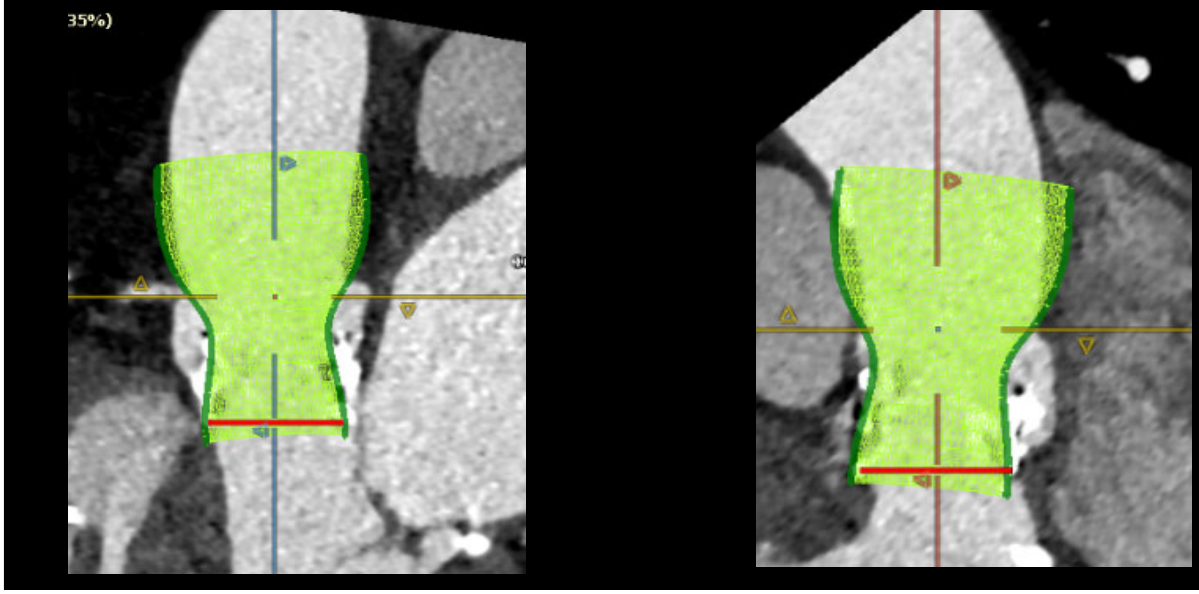
## CARDIAC CTA – VIRTUAL VALVE

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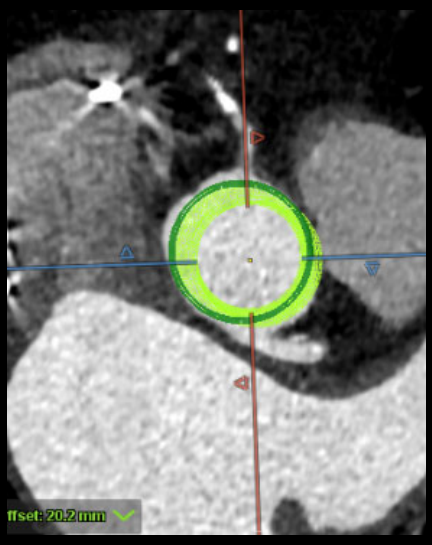
## CARDIAC CTA – VIRTUAL VALVE

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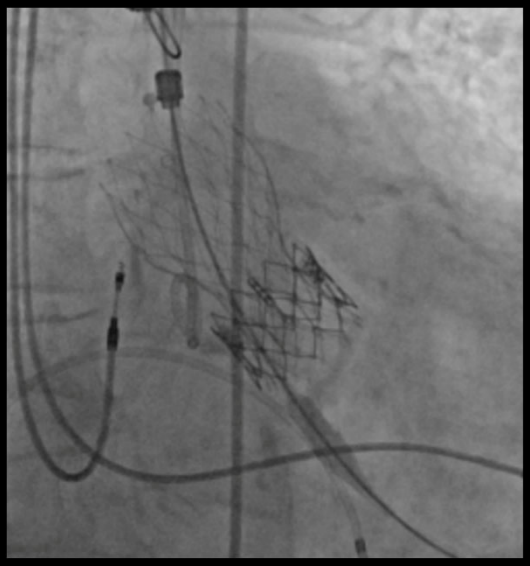
## TAVR 2020 – EVOLUT PRO 23 MM

- TTE next day:
  - Mean gradient 16-17 mmHg
  - Mild PVL



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## LETS GO TO THE FUTURE!

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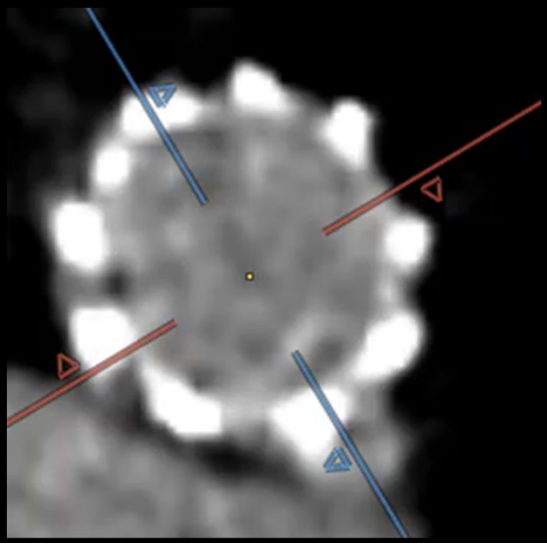
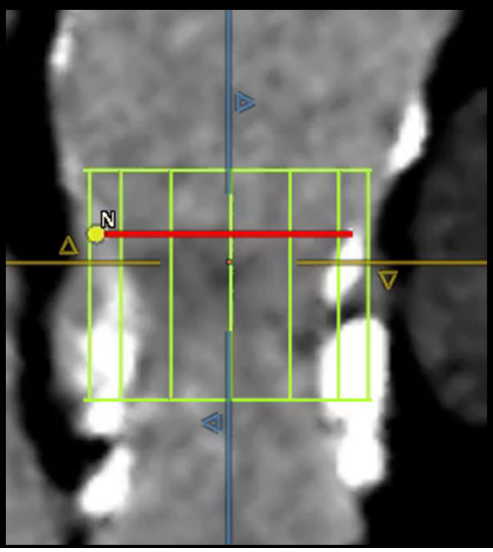
## PLANNING 3rd VALVE



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## CONCLUSION

- TAVR is TAVR is feasible in selected patients
- Specific consideration 1st THV selection and positioning is important in allowing future TAVR in TAVR
- Coronary protection techniques might be helpful, but still limited

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