

Valve in Valve tips and tricks

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☑ I have the following potential conflicts of interest to report:

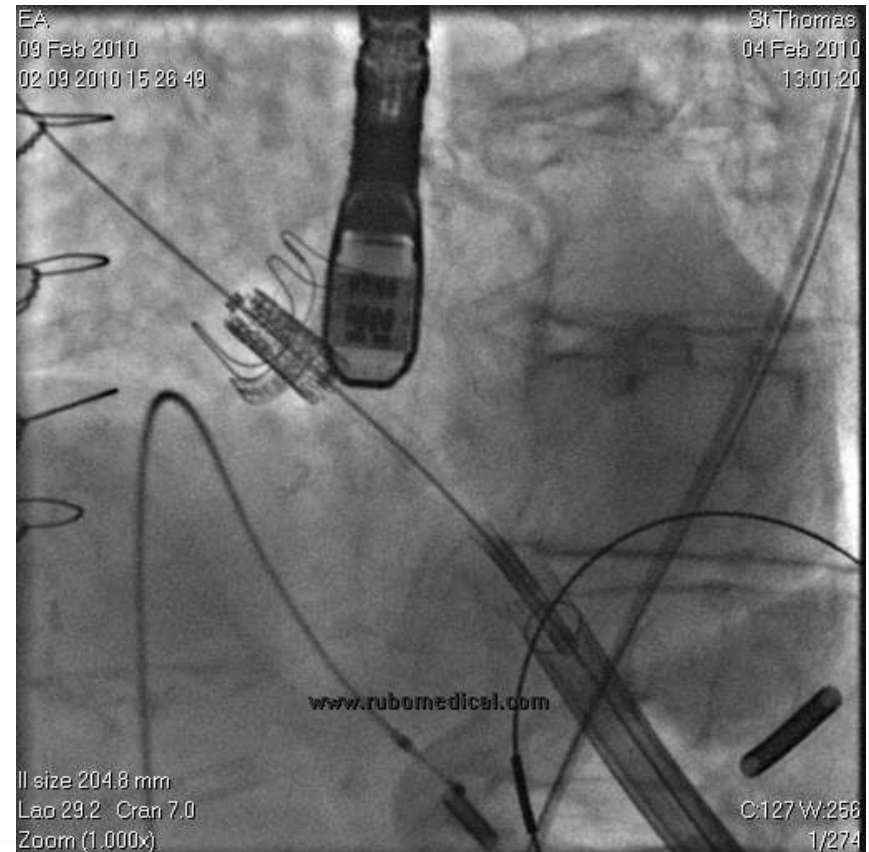
***: Consultant: Edwards Lifesciences
 Medtronic Inc
 Abbott
 4Tech
 4C
 Cephea***

Valve in Valve Aortic

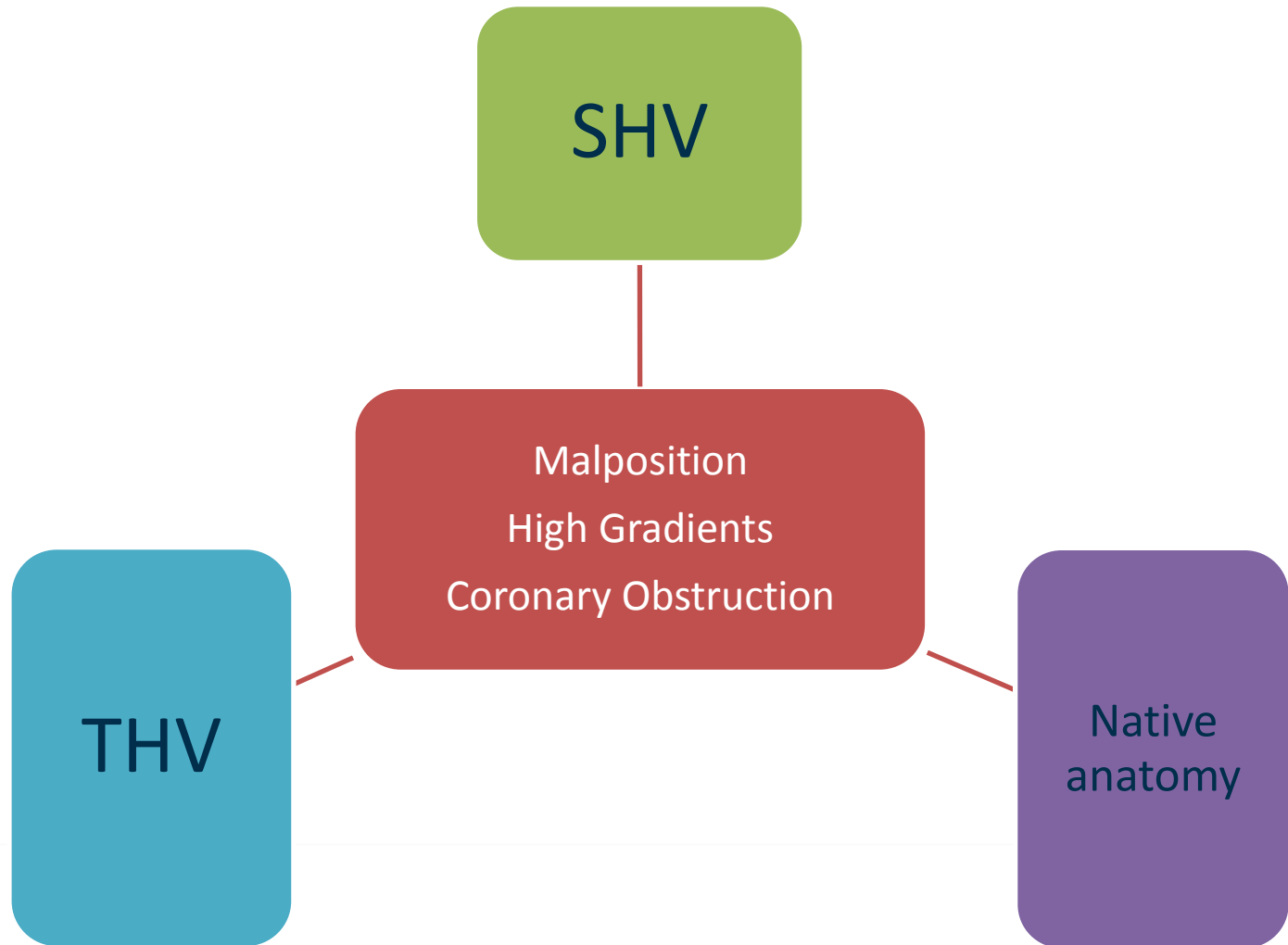
Attractive treatment option

Avoids redo operation
Less trauma
Faster recovery

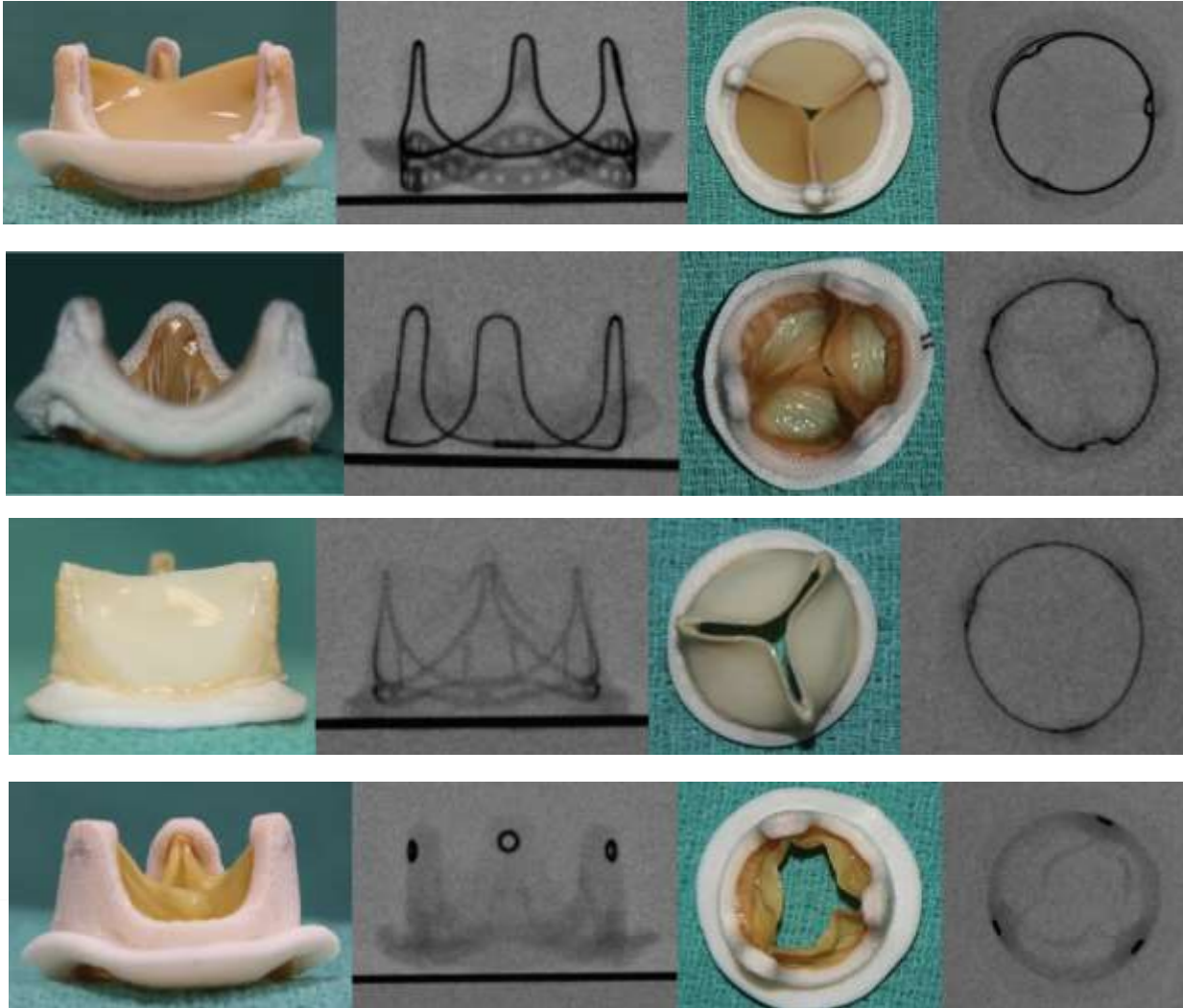
Easier Procedure
Less/no contrast
Near Perfect Implant zone



Main Concerns with VIV Aortic

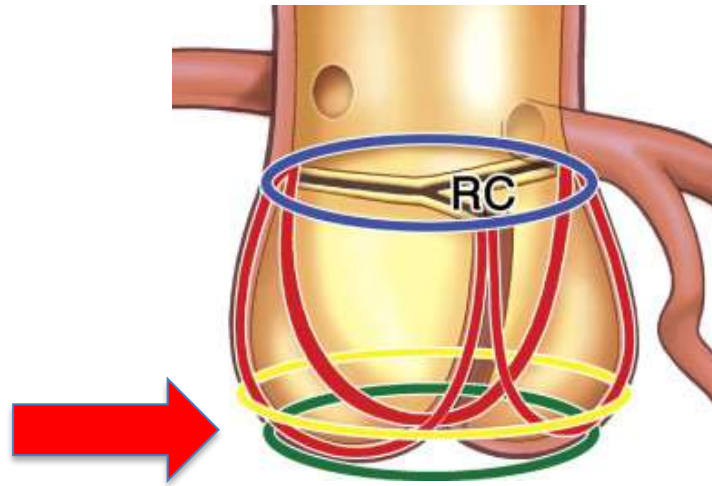


Each valve is unique - Surgical

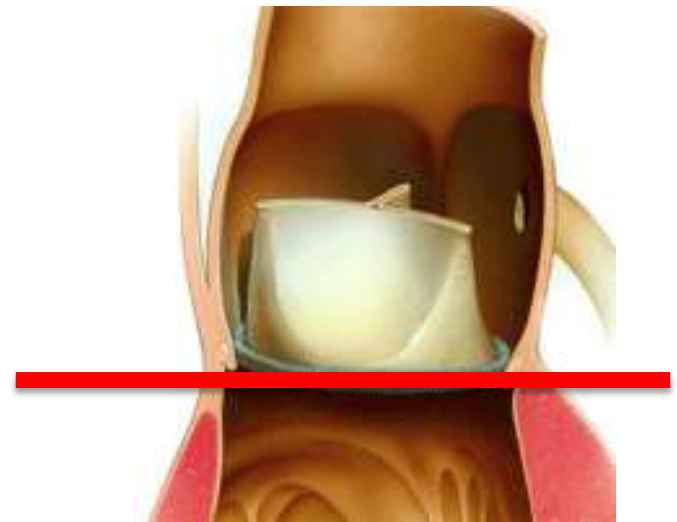


Malposition

Least flexible level



Native aortic valve

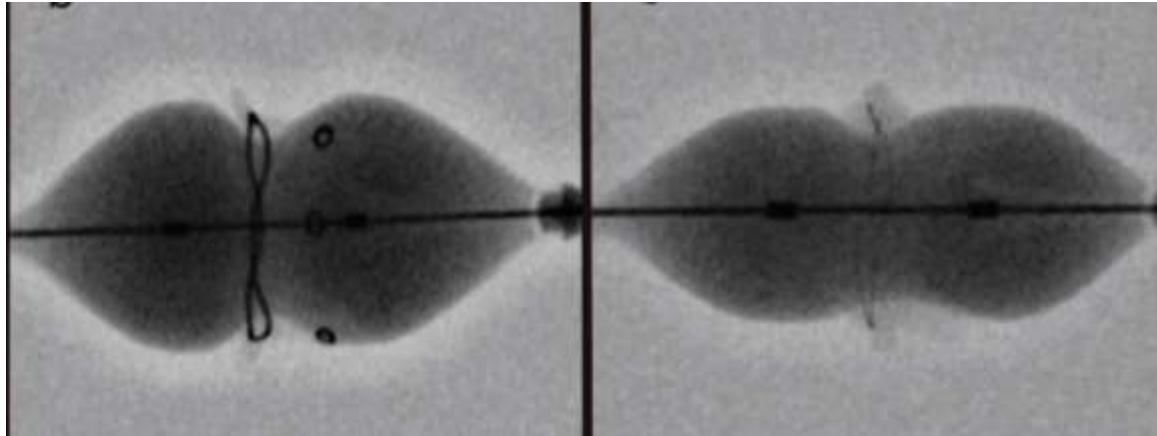


Surgical heart valve ??

Narrowest Portion - Sizing
Narrowest portion - Fixation

Neo-annulus is at Sewing ring

Least flexible level



Hancock 2

Biocor/Epic

Ideal Position

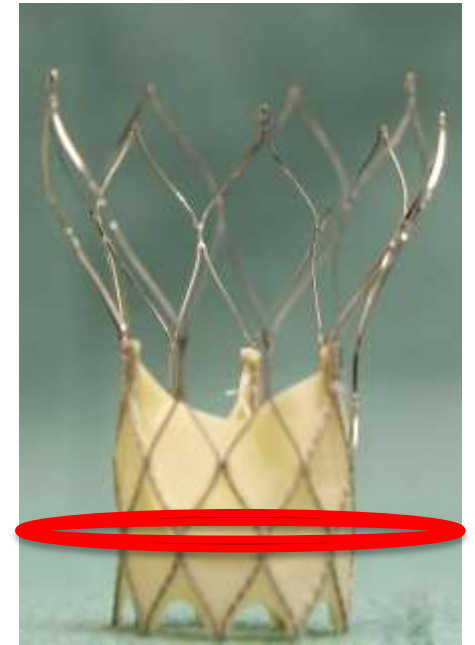
- With Reference to the Neo-annulus = **Sewing ring**



Sapien
15%



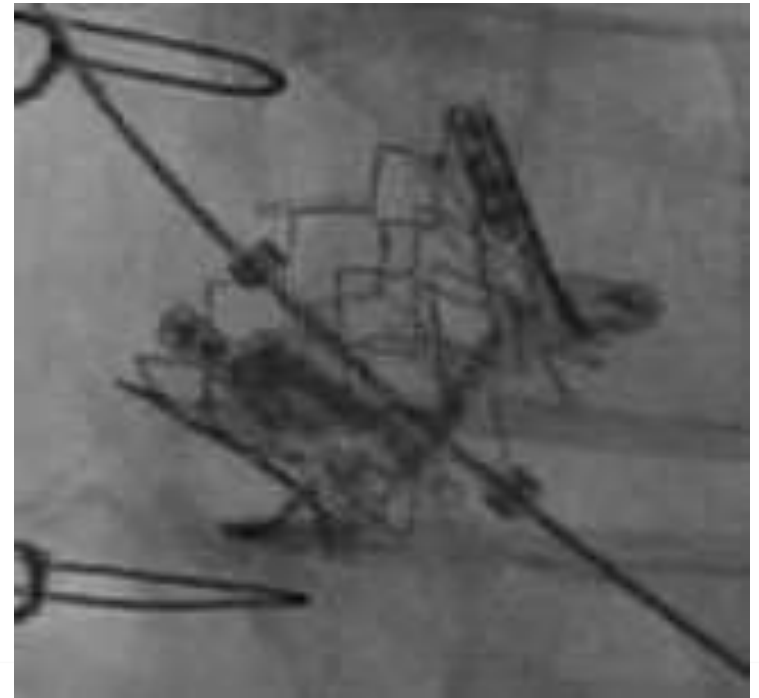
CoreValve
4mm



Portico
4mm

High Gradients

- Etiology
 - Incomplete expansion
 - Uneven expansion
 - Russian Doll effect



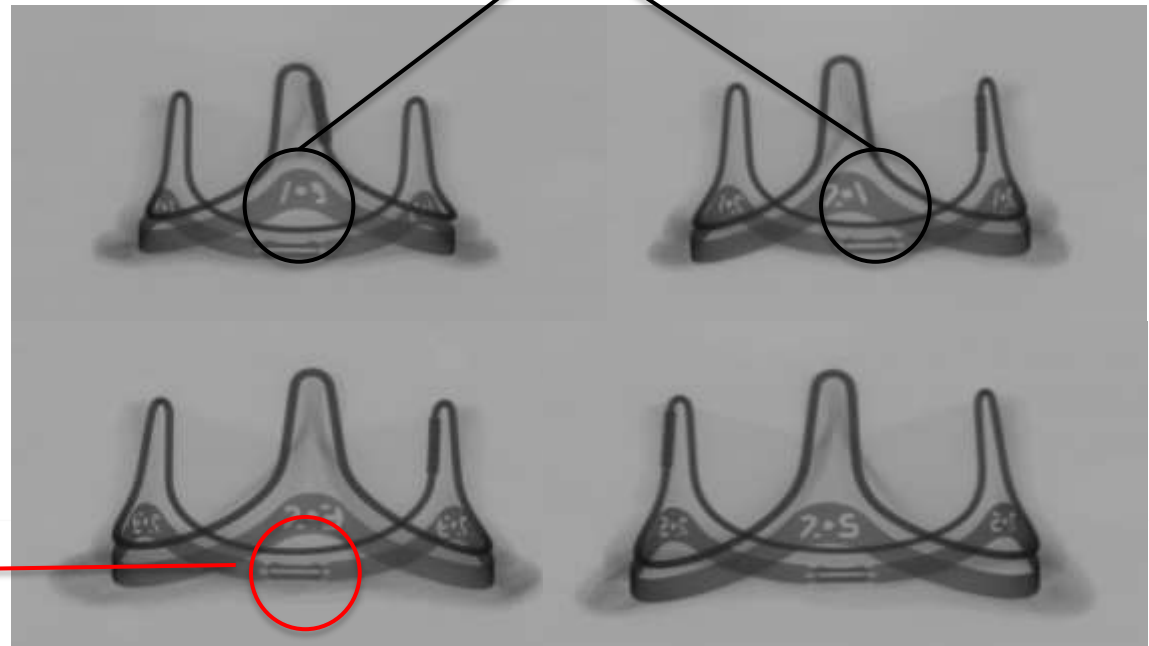
High gradients

- True ID less than 18 – Evolut R, Breaking valves
- True ID 18- 20 – Evolut R
- True ID >20 – S3/Evolut R

Inspiris

The first stented surgical bioprosthesis specifically designed to enable optimal valve-in-valve, if needed.

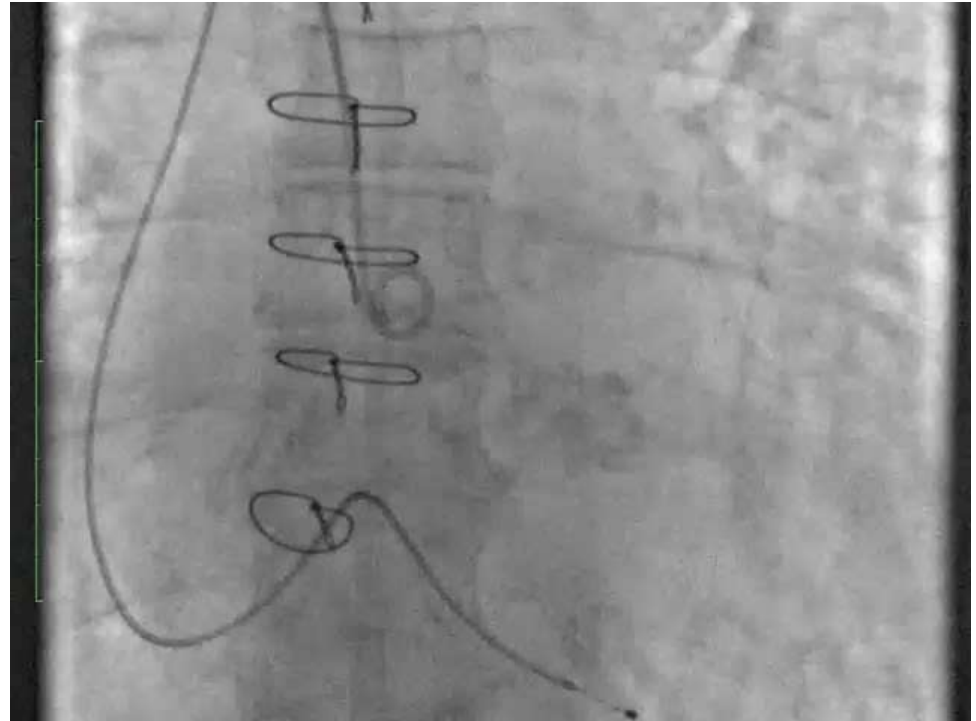
size identifier



Unique expansion mechanism

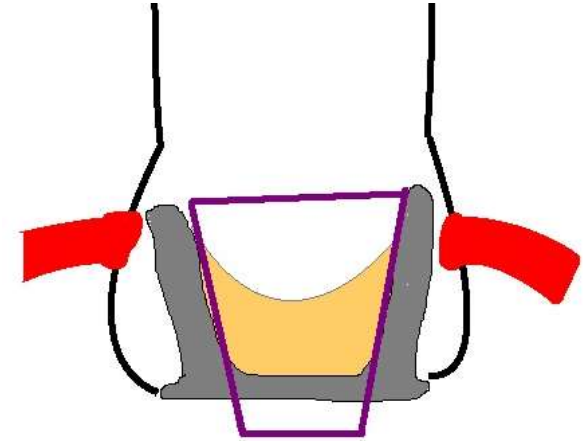
Coronary Obstruction

- *Function of*
Smaller anatomy
Narrow sinuses
Oversizing



Risk of Coronary obstruction

- *Function of*
 - Smaller anatomy*
 - Narrow sinuses*
 - Oversizing- Stent post deflection*
 - Valves with leaflet outside the stent*



Low



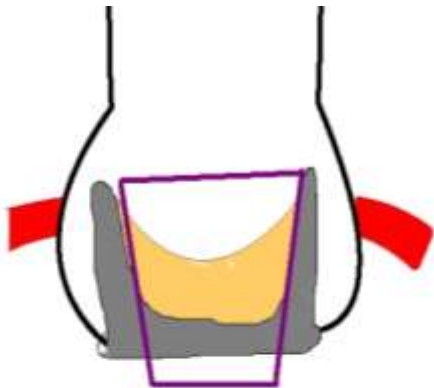
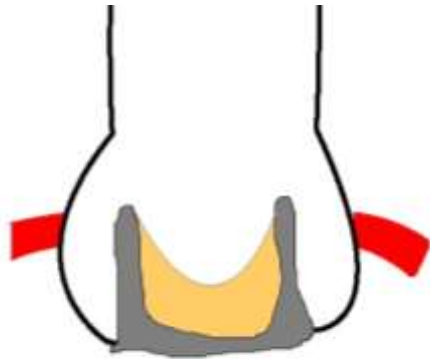
High



Coronary obstruction

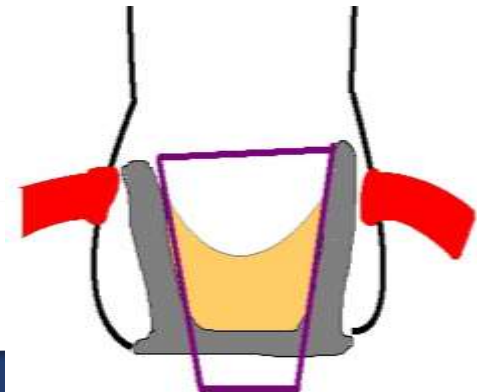
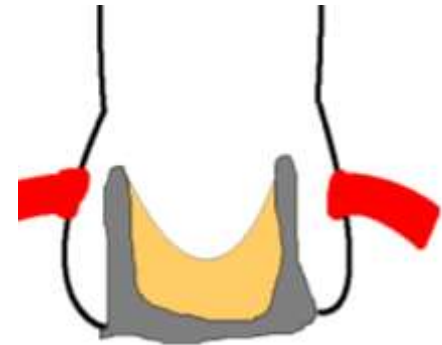
Wide sinuses

No or low risk



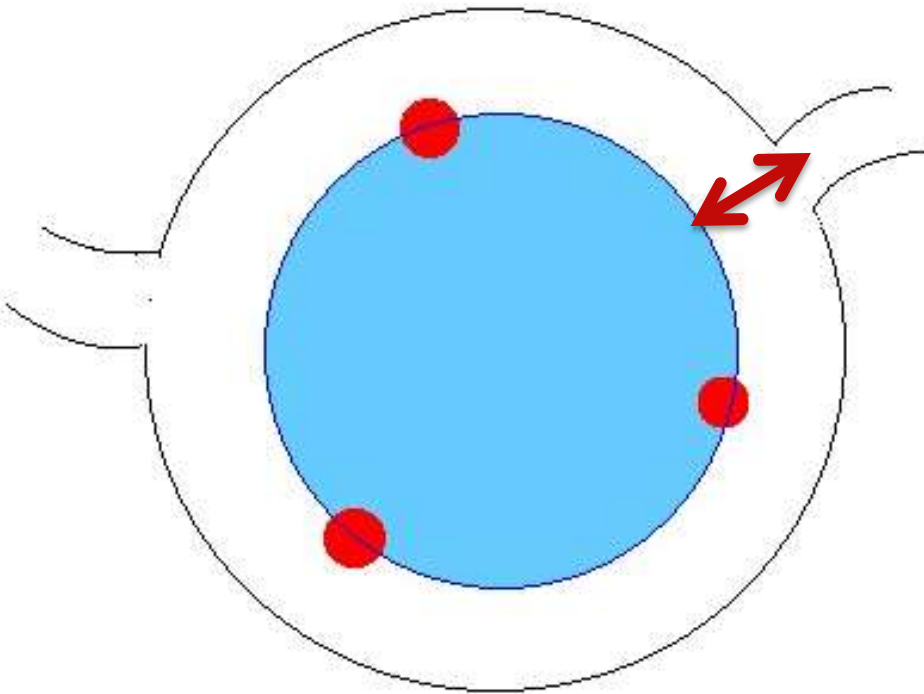
Narrow Sinuses

Higher risk

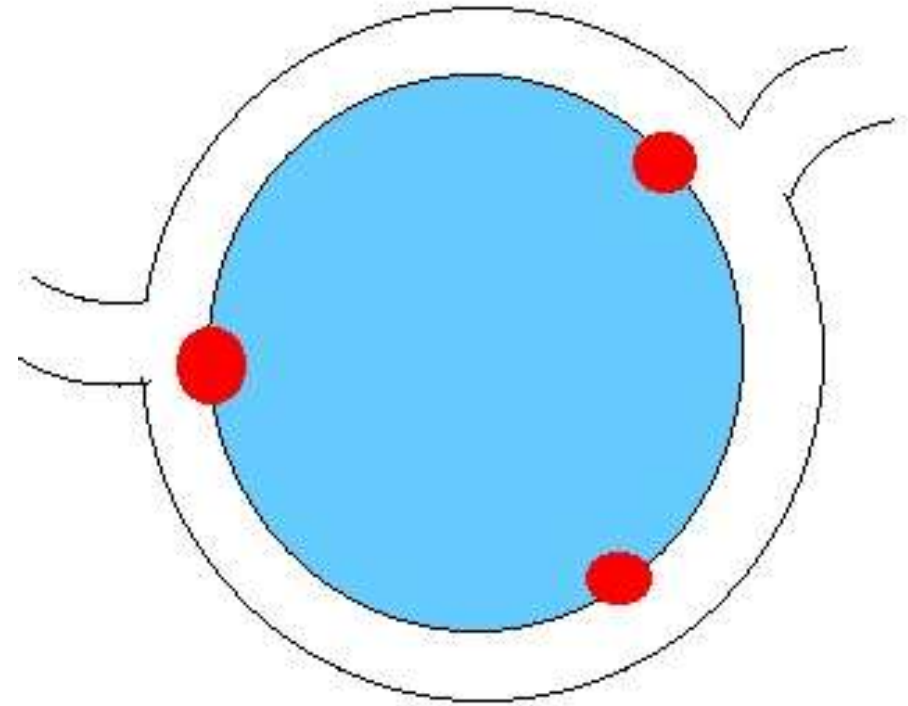


CT Analysis

VTC Distance



Strut Orientation



Avalus Valve (Medtronic Inc)

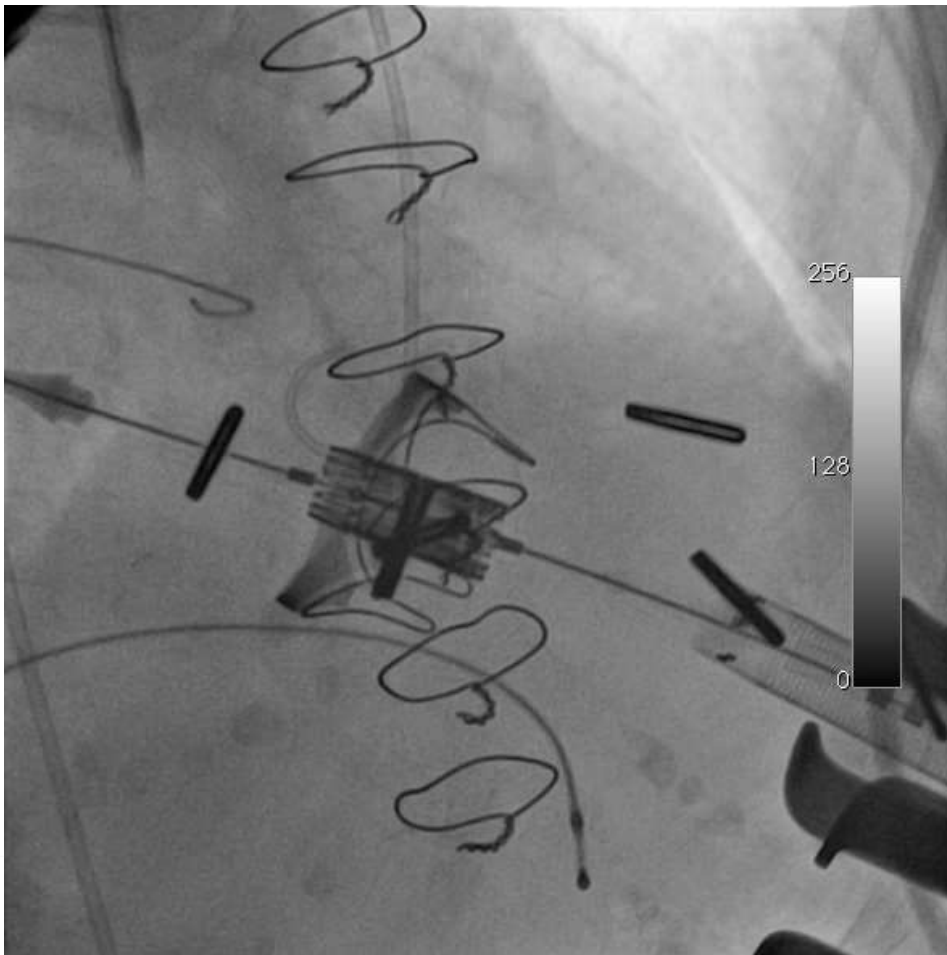


Laser Cut leaflets

Shorter leaflet height – reduce risk of coronary obstruction

Mitral VIV

Mitral VIV



**Large valves
Only Stented valves**



**Less chance of PPM
Ease of positioning**

Trans-septal approach

- Preferred approach
- Procedure is well defined now

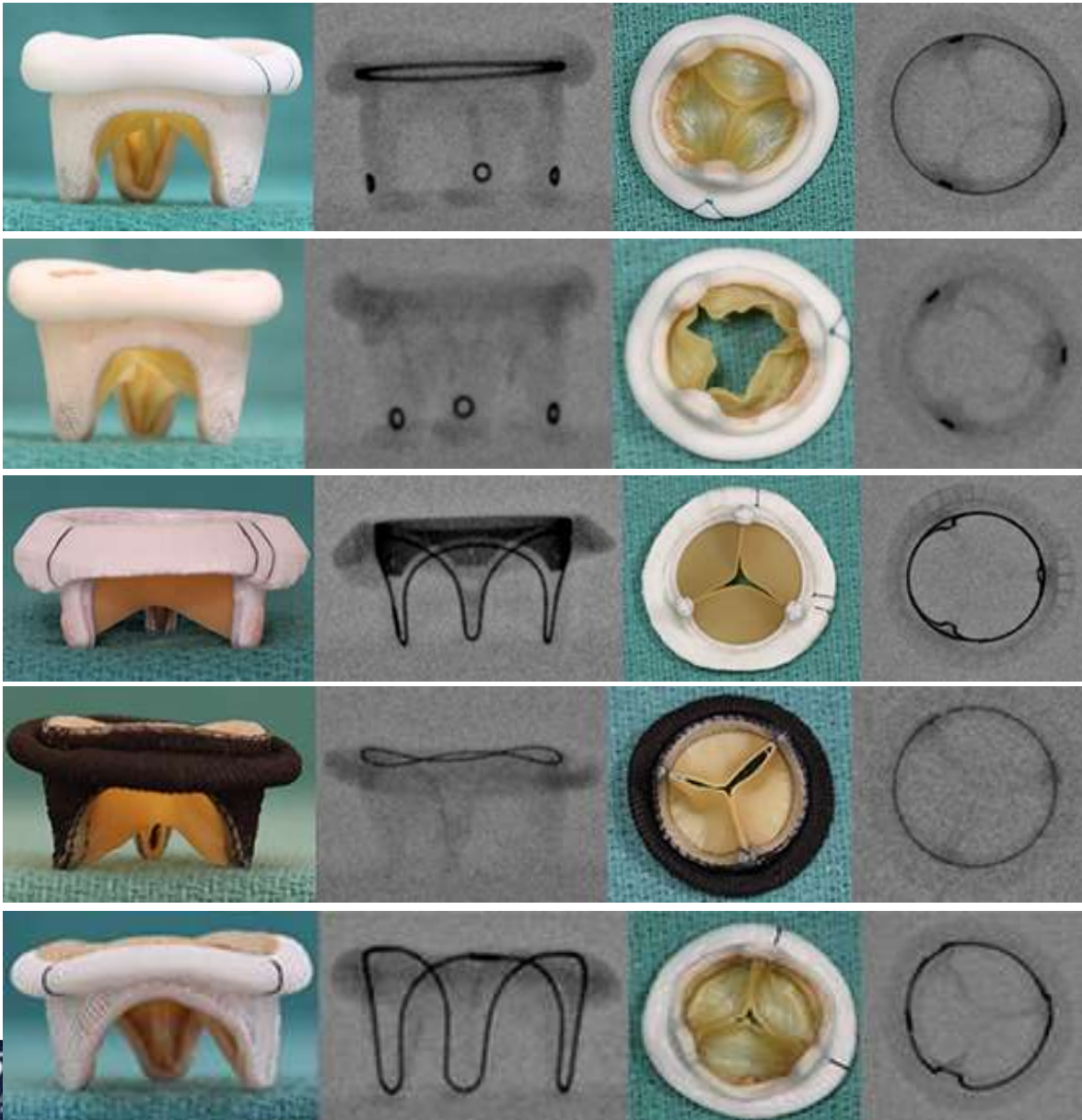
**Important to confirm ORIENTATION
of the SAPIEN 3**



Challenges and issues

- Malposition and embolisation: 6%
- LVOT obstruction: 2-6%
- Thrombosis
- Leaflet malfunction

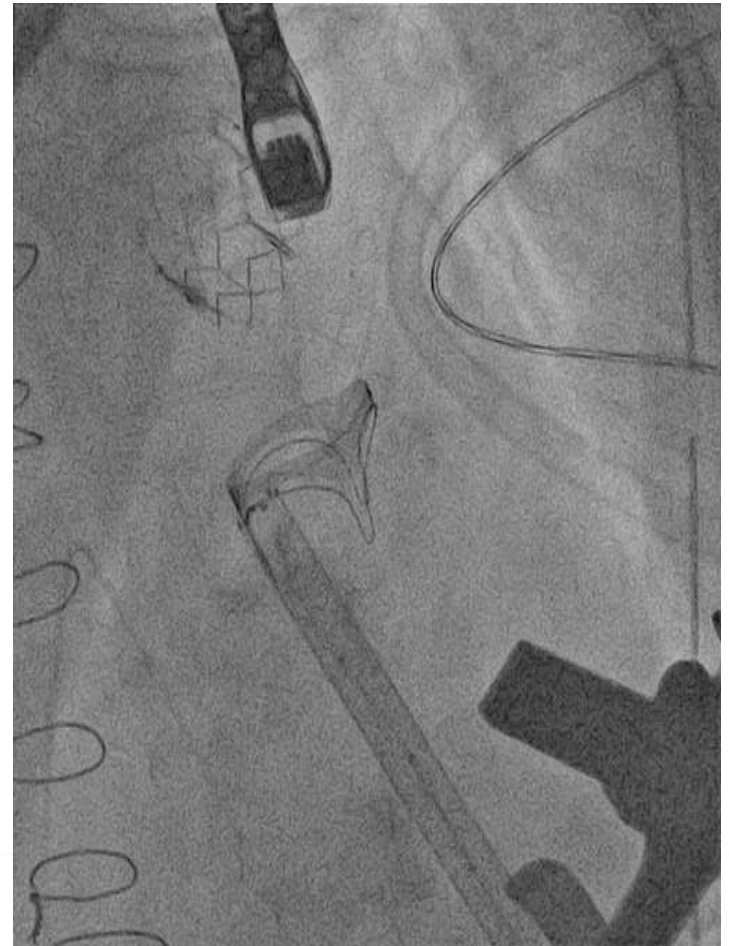
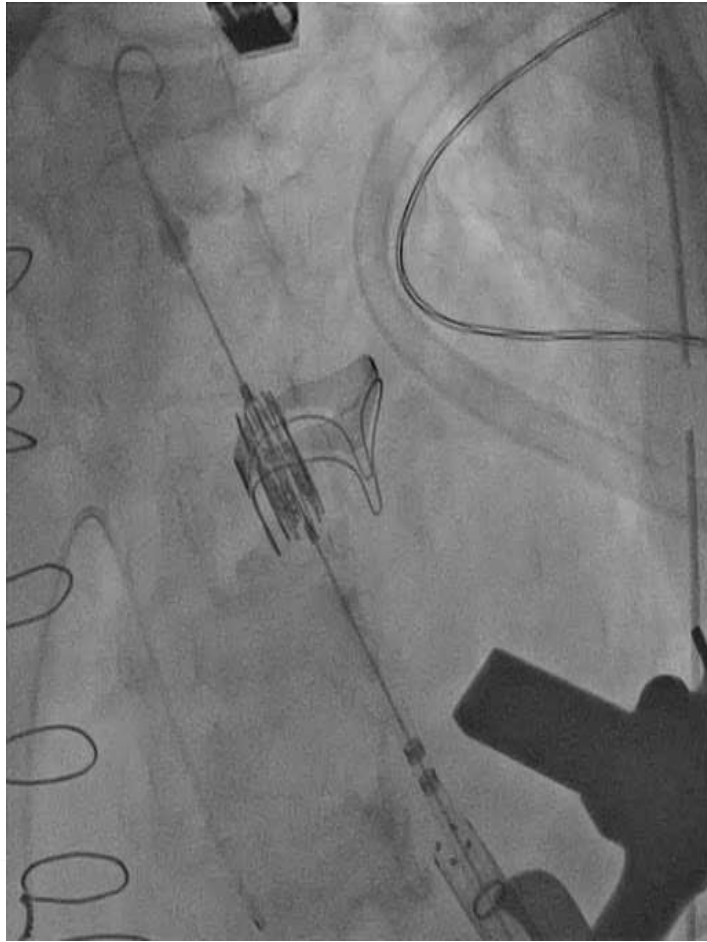
Each valve is Unique



***Each Valve
Looks
different***

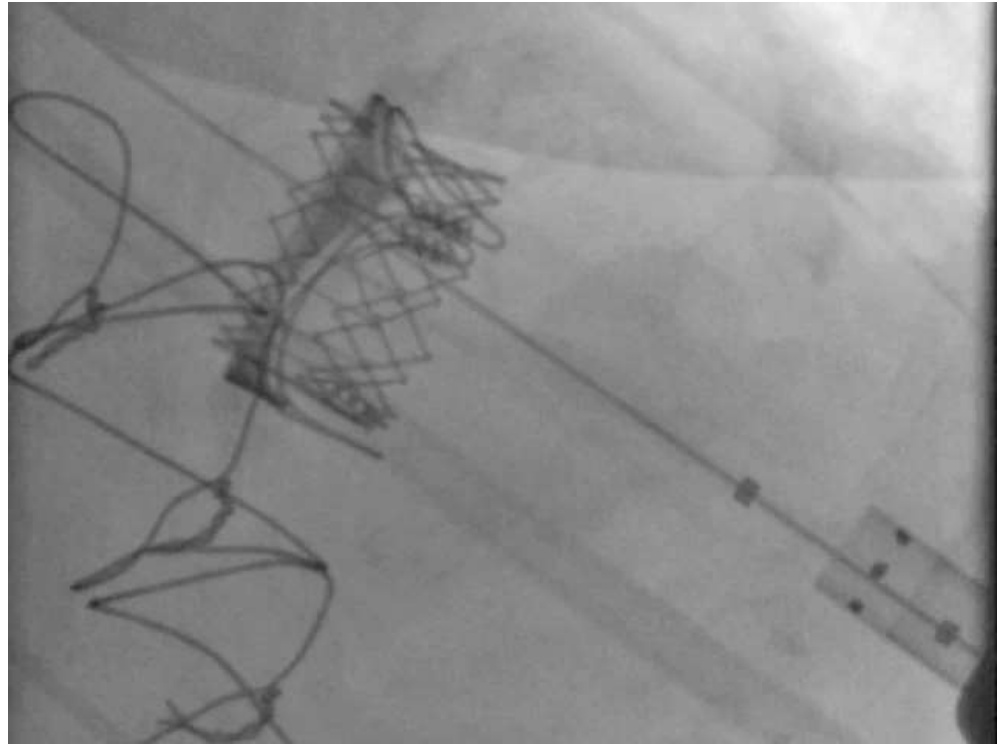
Sizing and risk of Embolisation

Unique problem !



Very unique indeed!

a



Why did this happen

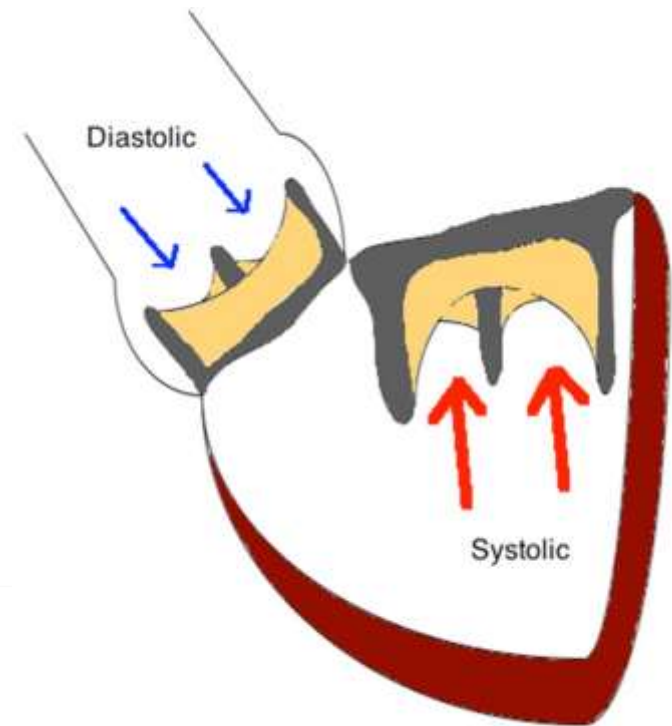
- Wrong oversize?
 - Difference between aortic and mitral VIV

Closing pressures

Aortic - 1mm Oversize may be good enough

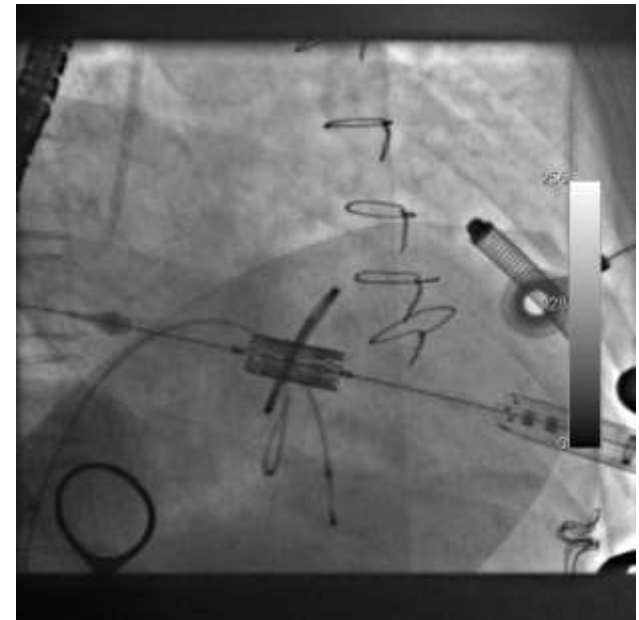
Mitral – 2 or 3mm oversize may be required

Conical Shape



Mitral VIR

- Shape - Complete/Incomplete/Bands
- Rigidity - Rigid/Semirigid/Flexible
- Radio opacity- good/Intermediate/none
- Edwards – 5 rings
- Medtronic – 6 rings
- St Jude – 4 rings
- Sorin – 6 rings
- Sizes – 24 to 40



Four properties

- Ability to adapt a **circular** shape
- Provide a good **anchor**
- Radio- **opacity**
- Suitability for current TAVR devices - **Size**

Misconception that VIR results are bad

Circularity

Semi-Rigid Rings



Semirigid rings – can become circular

Ideal for VIR

Sorin Memo 3D

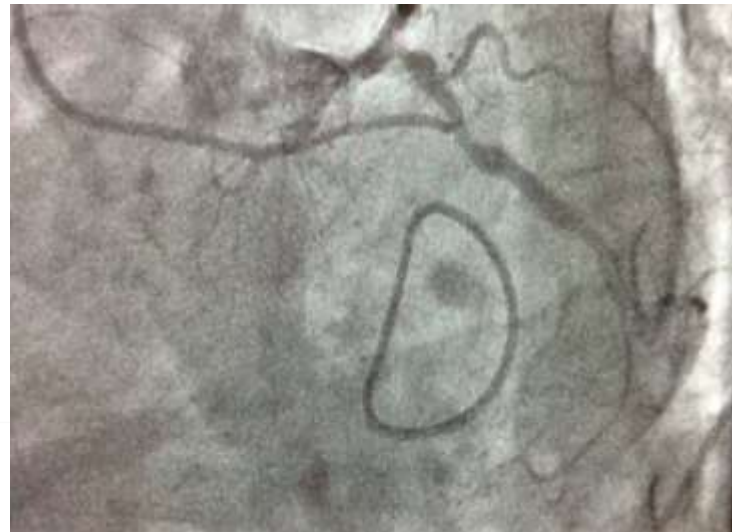
Rigid ring example

St. Jude Rigid Saddle Ring



Rigid rings – cannot become circular

Rigid rings may deform the valve
Intravalvular regurgitation
Paravalvular regurgitation

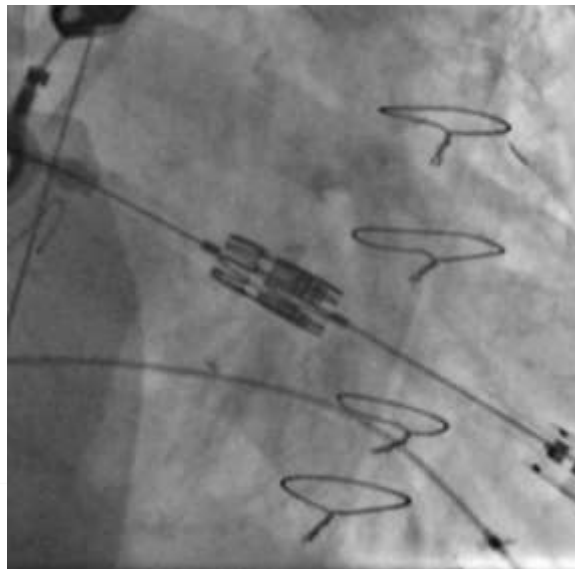
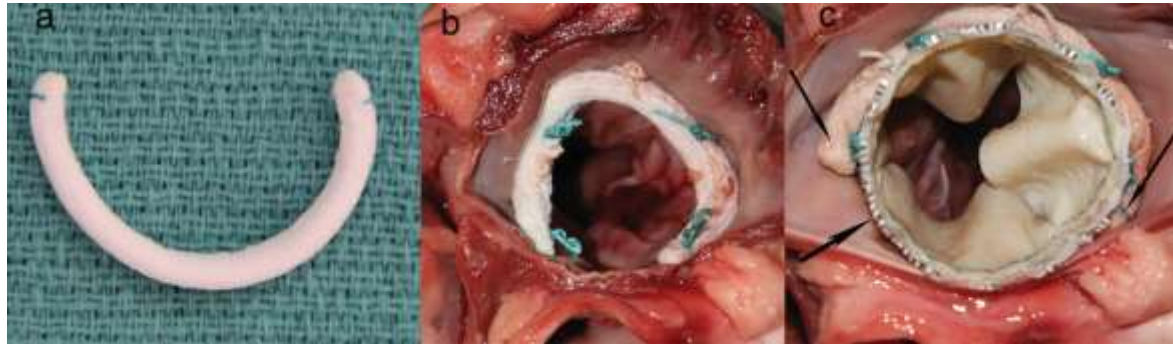


Anchor

Implications

- Rigid: Good Anchor
- Semirigid rings: Good anchor
- Flexible bands complete: Borderline
- Incomplete: Insecure anchor

Cosgrove band

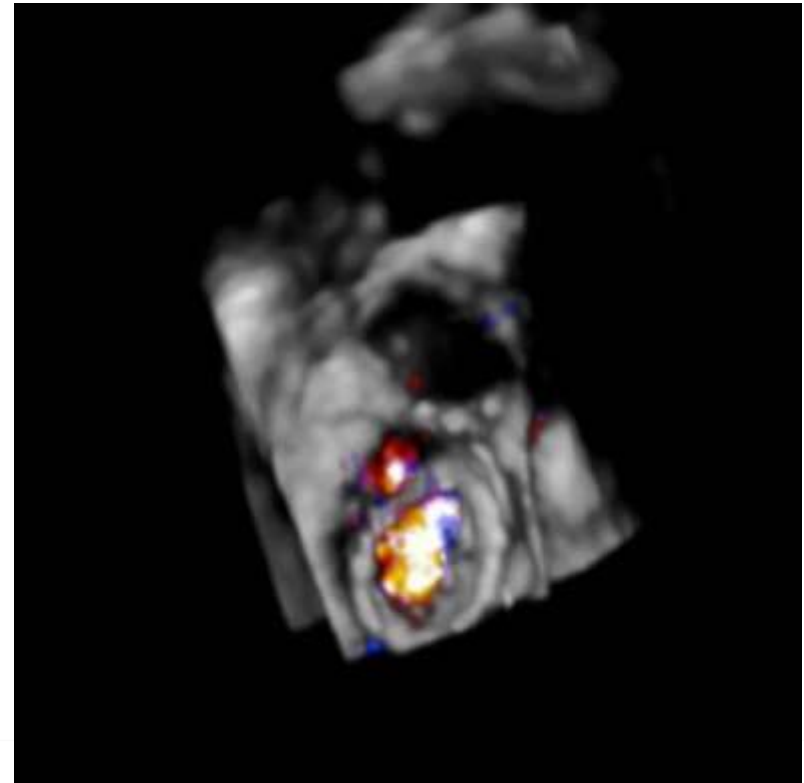


Sapien XT 26

Stayed on for 2 years

Mitral VIR

Incomplete Band – Sapien 29



Ideal Rings

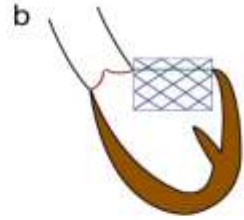
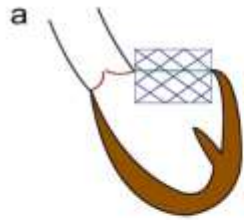
Sorin:	Memo 3D Annuloflex Sovering
Medtronic:	Duran CG Future Simulus
Edwards:	Physio 1 Physio 2
St Jude:	Tailor Ring

LVOTO

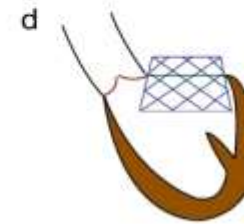
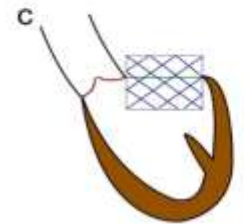
Is a possibility after Mitral

1. VIV
2. VIR
3. MAC
4. TMVR

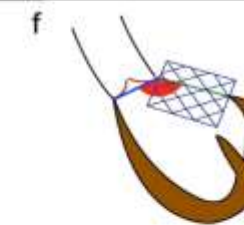
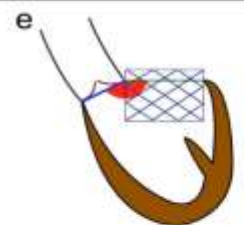
Factors Influencing LVOTO



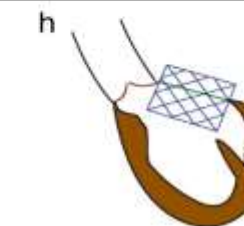
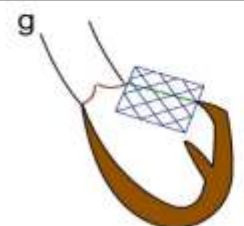
Deeper placement in LV



Flaring

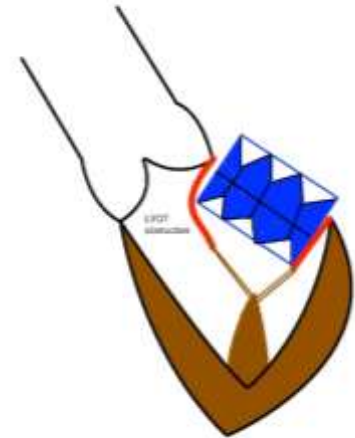
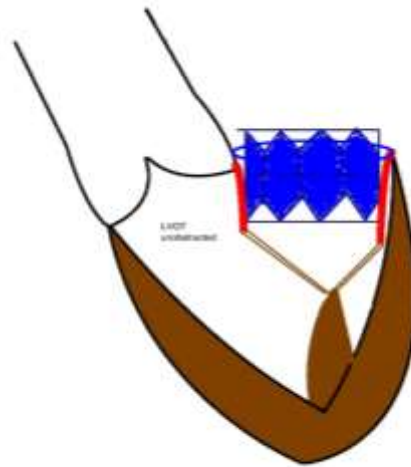
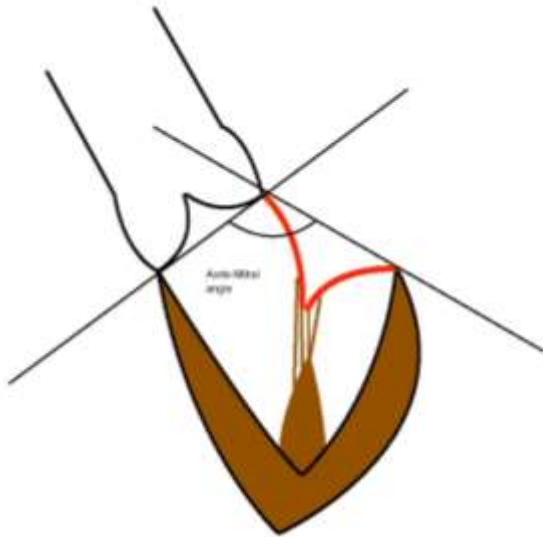


AMA angle



Septal bulge

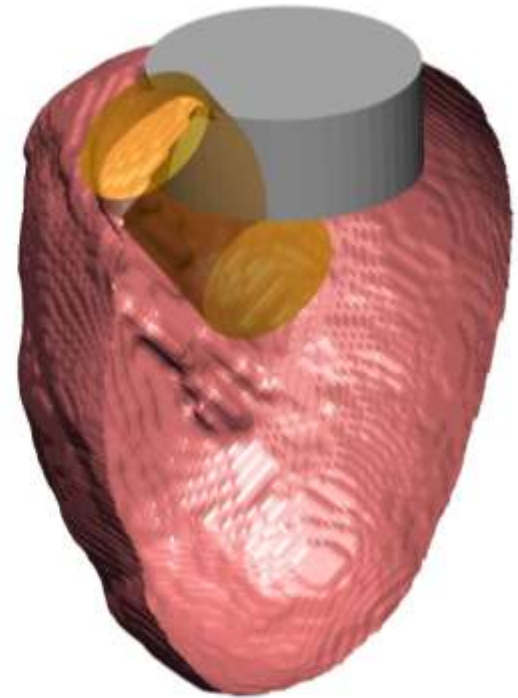
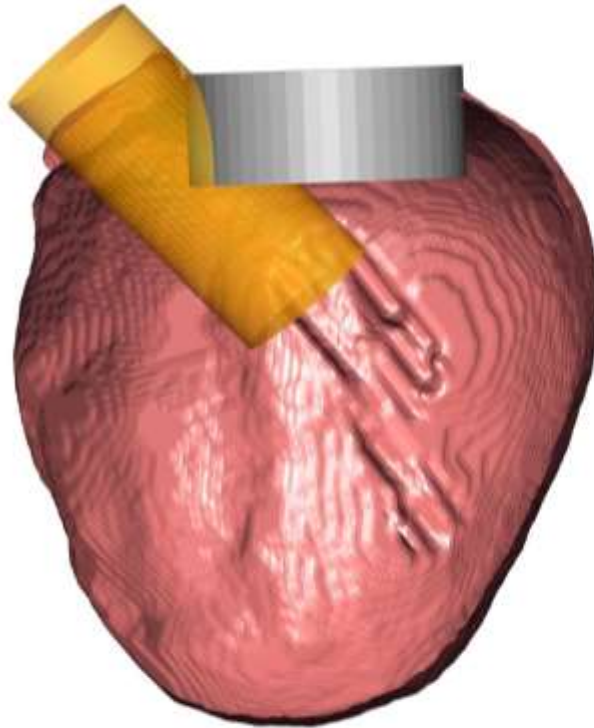
LVOTO Etiology



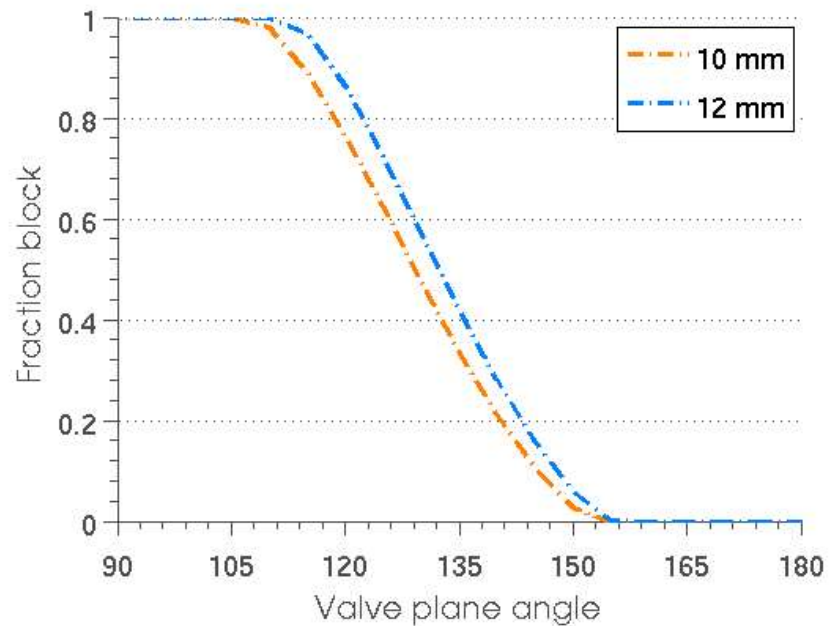
Less Chance if
AMA angle is obtuse

Greater Chance if
AMA angle is less obtuse

Can we predict it?



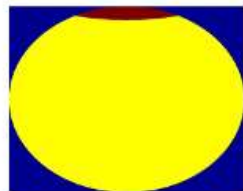
Fraction of Aorta blocked by 10mm and 12 mm valve as a function of valve plane angle



10mm



180



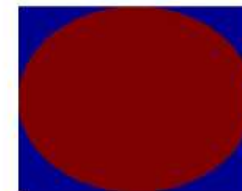
150



135

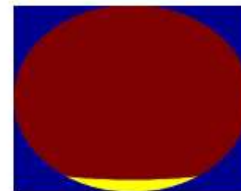


115

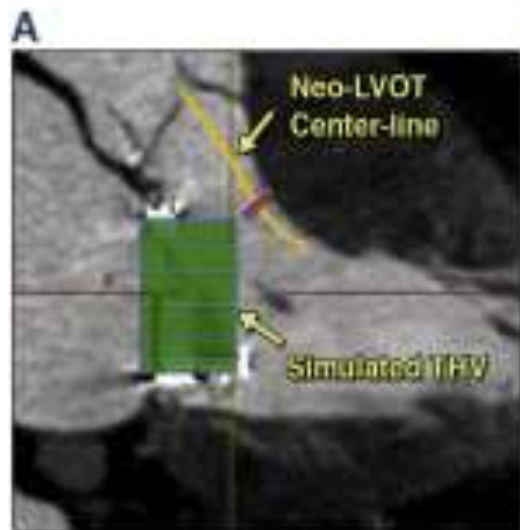


90

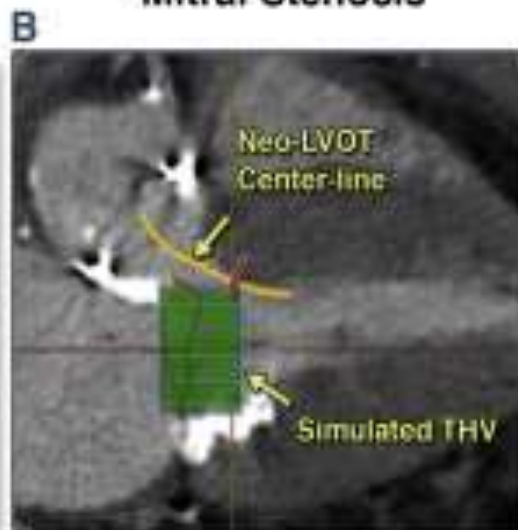
12mm



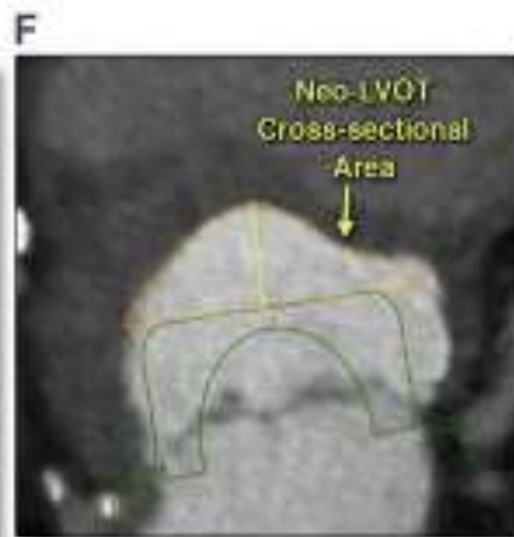
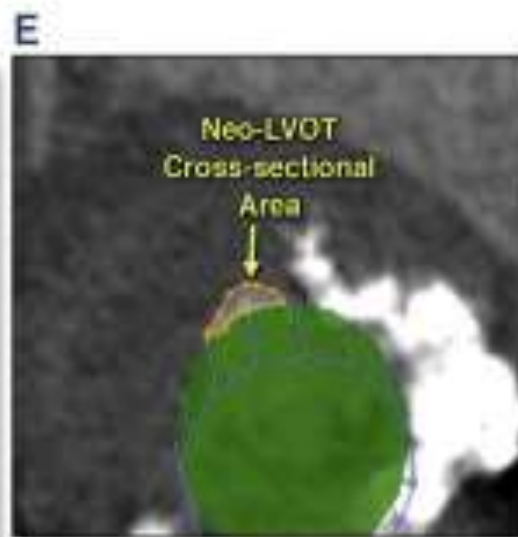
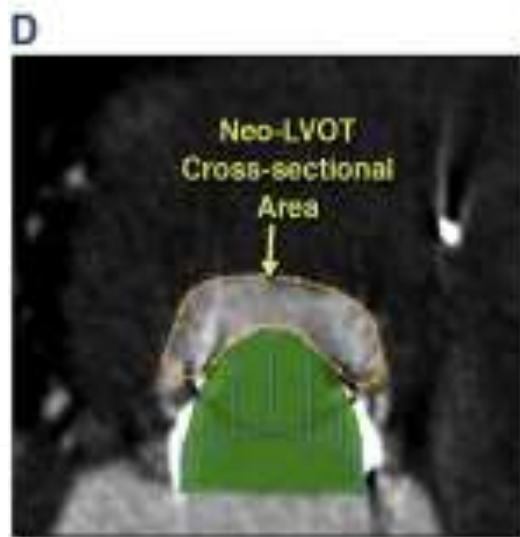
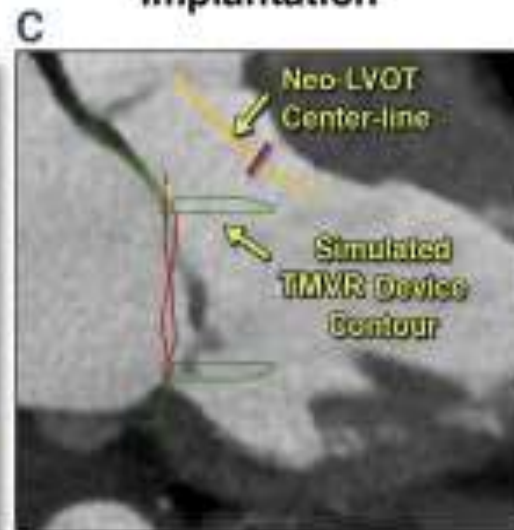
Valve-in-Valve



THV in Calcific Mitral Stenosis

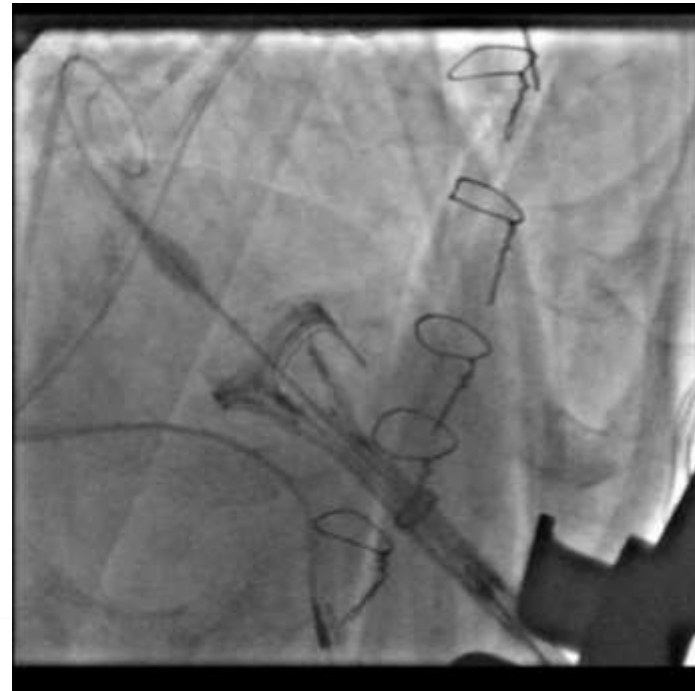


Transcatheter MV Implantation



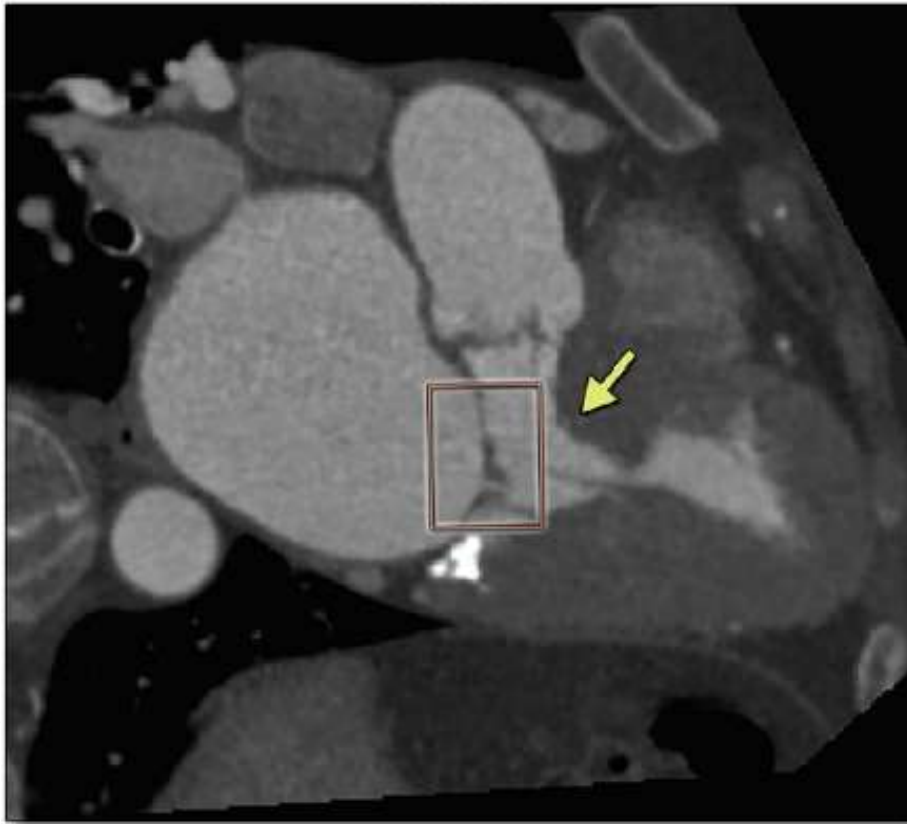
One Solution

Use a repositionable and recapturable device

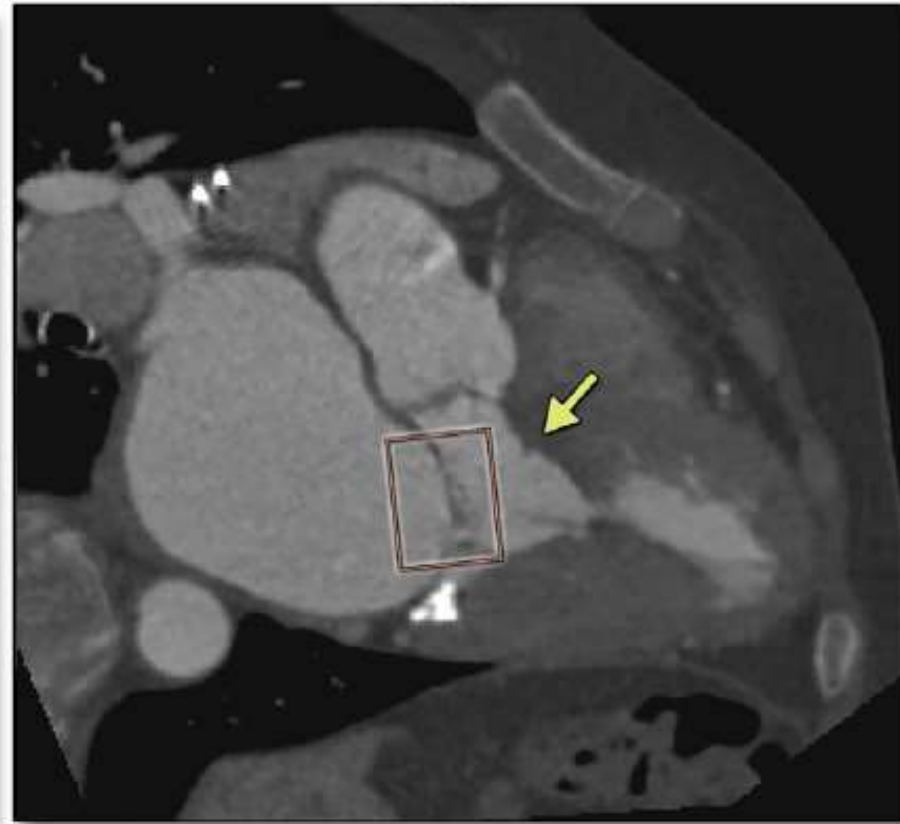


Alcohol Septal ablation

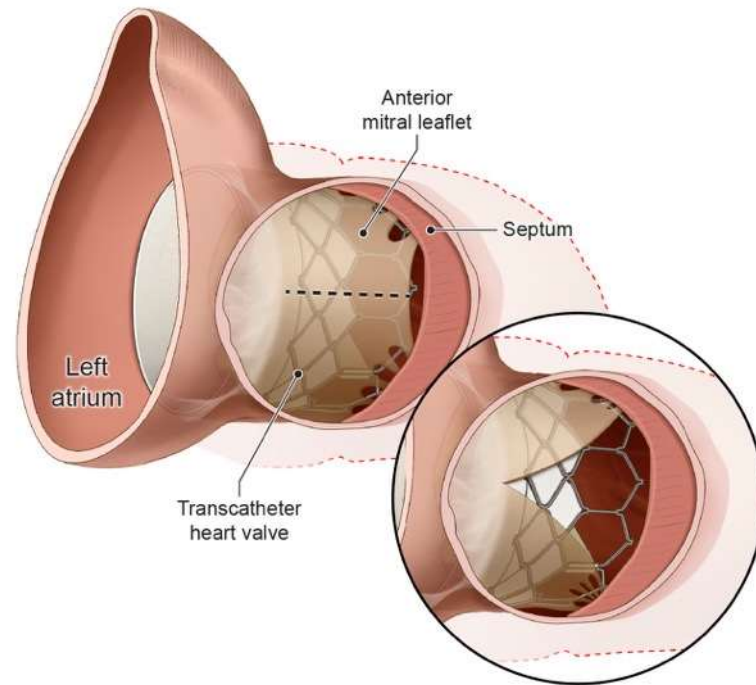
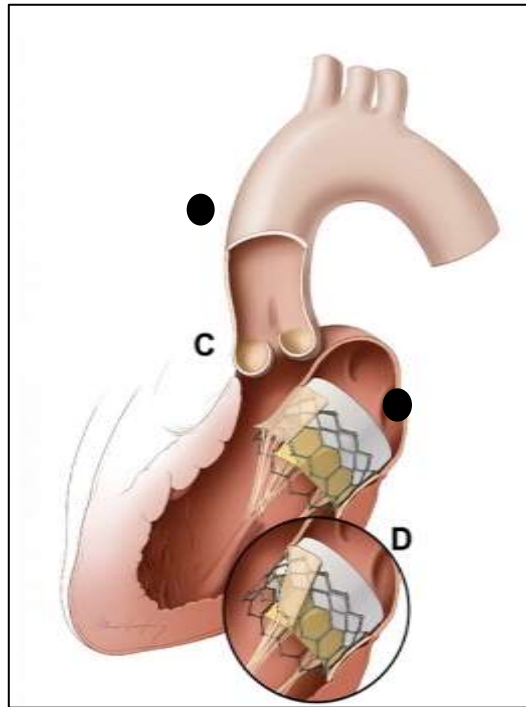
Pre



Post



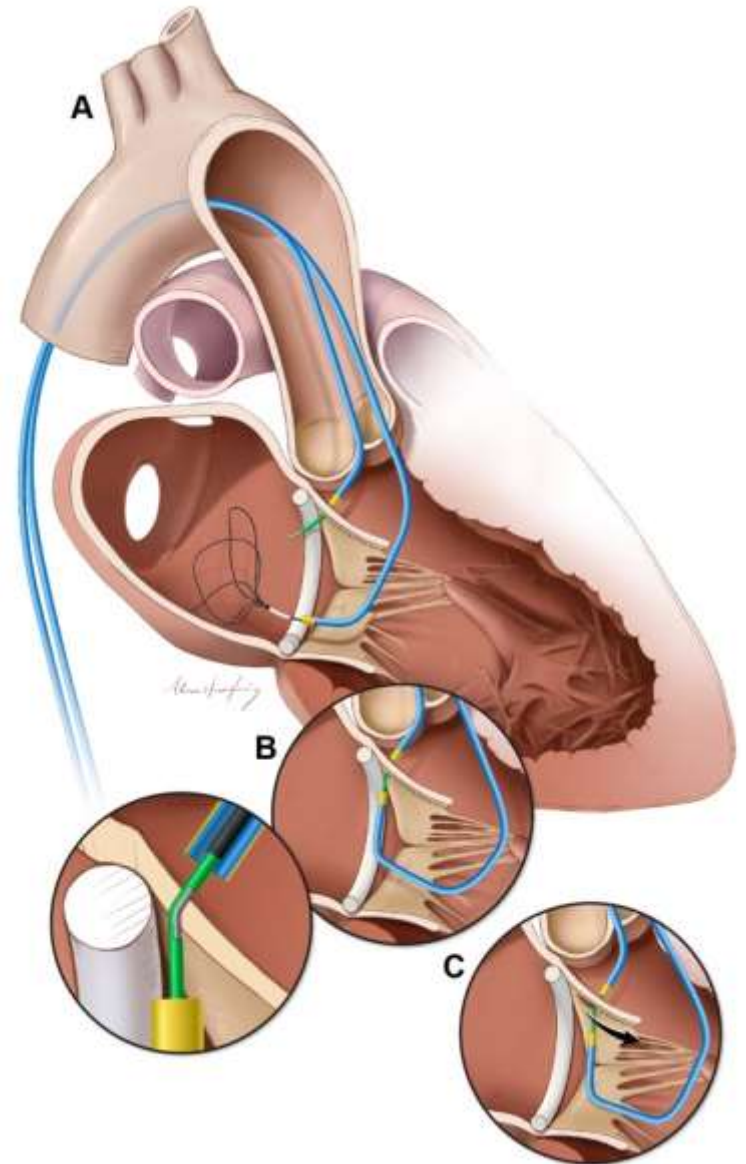
Transcatheter Mitral Valve Implantation risks LVOT Obstruction



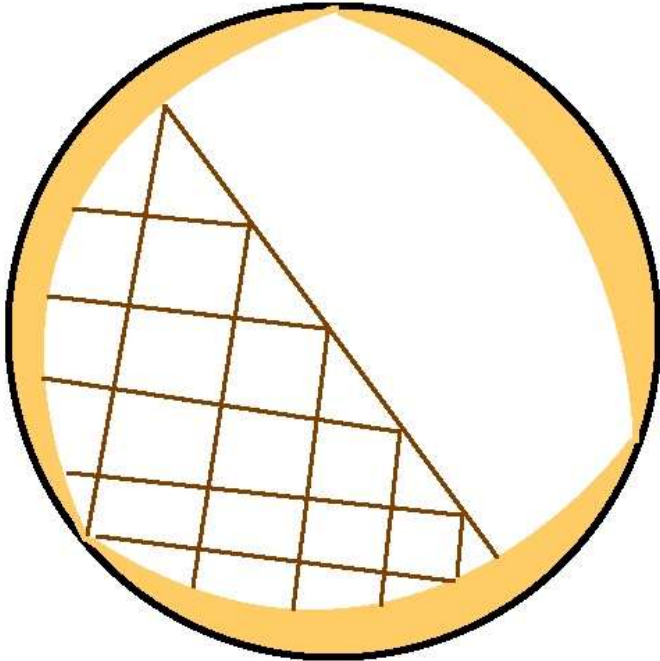
JM Khan, JACC Cardiovasc Interv. 2016; Sep 12, 9(17):1835

LAMPOON

- A. Electrified wire traverses A2 base from LVOT to LA
- B. Wire loop through both retrograde catheters
- C. Leaflet lacerated by pulling and electrifying wire loop



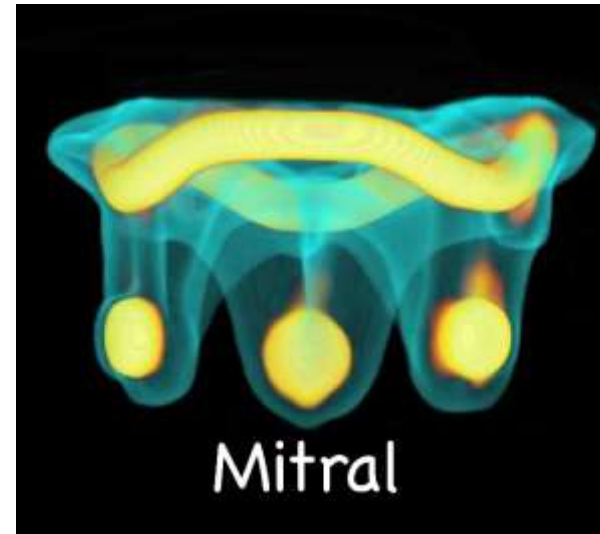
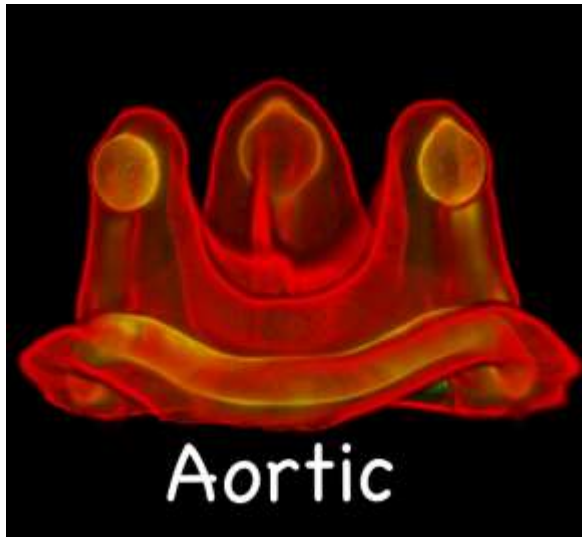
Open Surgery



Results

- Mitral VIV : Encouraging results after Trans-septal procedures
- Mitral VIR: Due to differences in the ring properties, results are mix
- Anticoagulation: minimum 3 months is important

Valve in Valve Apps



Free to download