

Tricuspid Regurgitation

TTV Repair vs TTV Replacement

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Disclosure Statement of Financial Interest

Within the past 12 months, I or my spouse/partner have had a financial interest, arrangement or affiliation with the organization(s) listed below.

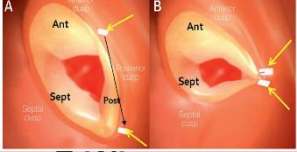



Financial Relationship

- Consulting Activities

Company

Abbott, Boston Scientific, Edwards Lifesciences, Medtronic

New Tricuspid Therapies

Mechanism	New Technologies
Annuloplasty (Direct and Indirect)	    <p>TriAlign Millepede CardioBand 4i ech</p>
Leaflet Devices	   <p>Forma MitraClip PASCAL</p>
Stented Valves in IVC/SVC	   <p>Trinity /Sapien NVT</p>
Valve Replacement	

Comparison

Mitral Regurgitation

TEER – works well

Annuloplasty – has not worked well

TMVR – works well but slow progress

Etiology

Primary – Good surgical options

Secondary – LV dysfunction
Atrial FMR

Tricuspid Regurgitation

TEER

Annuloplasty

TTVR

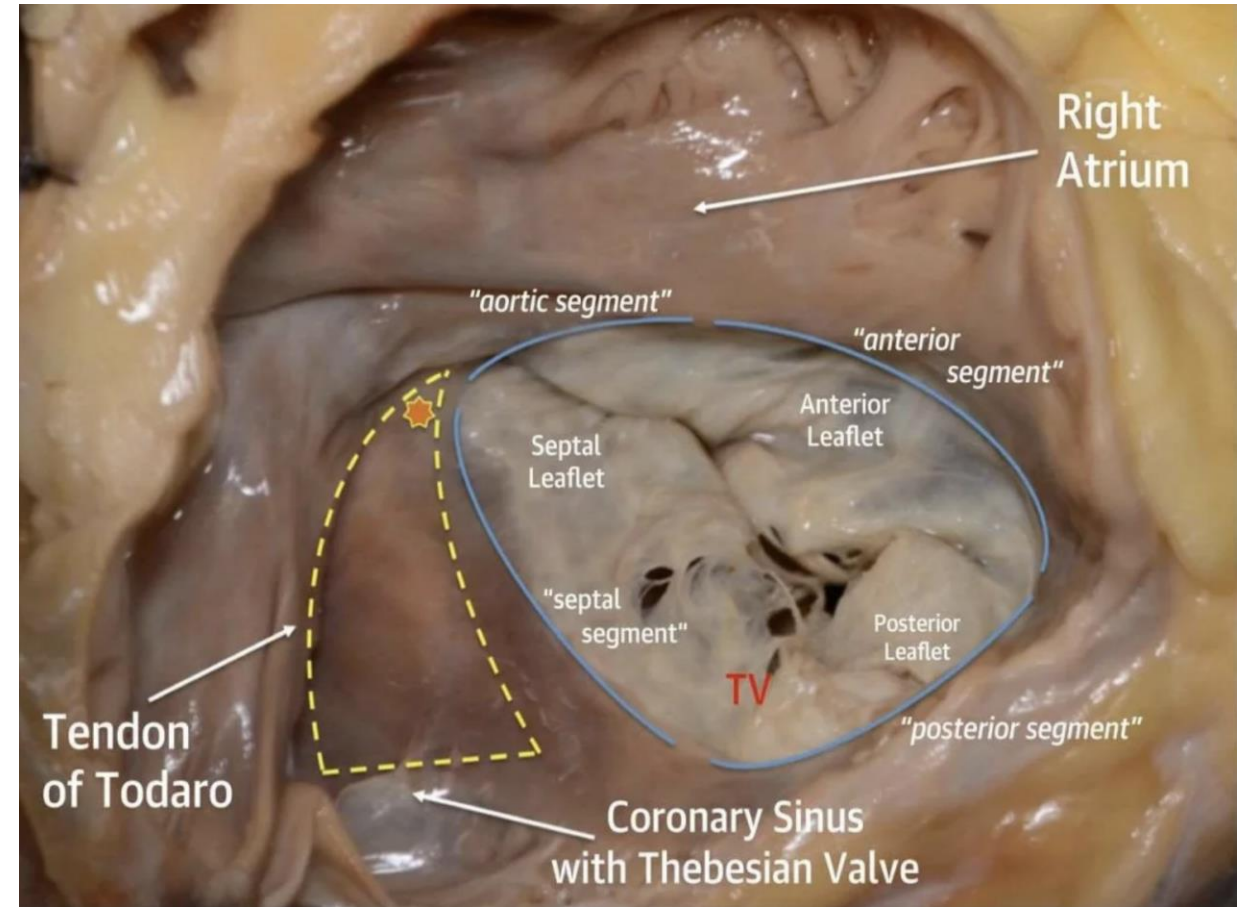
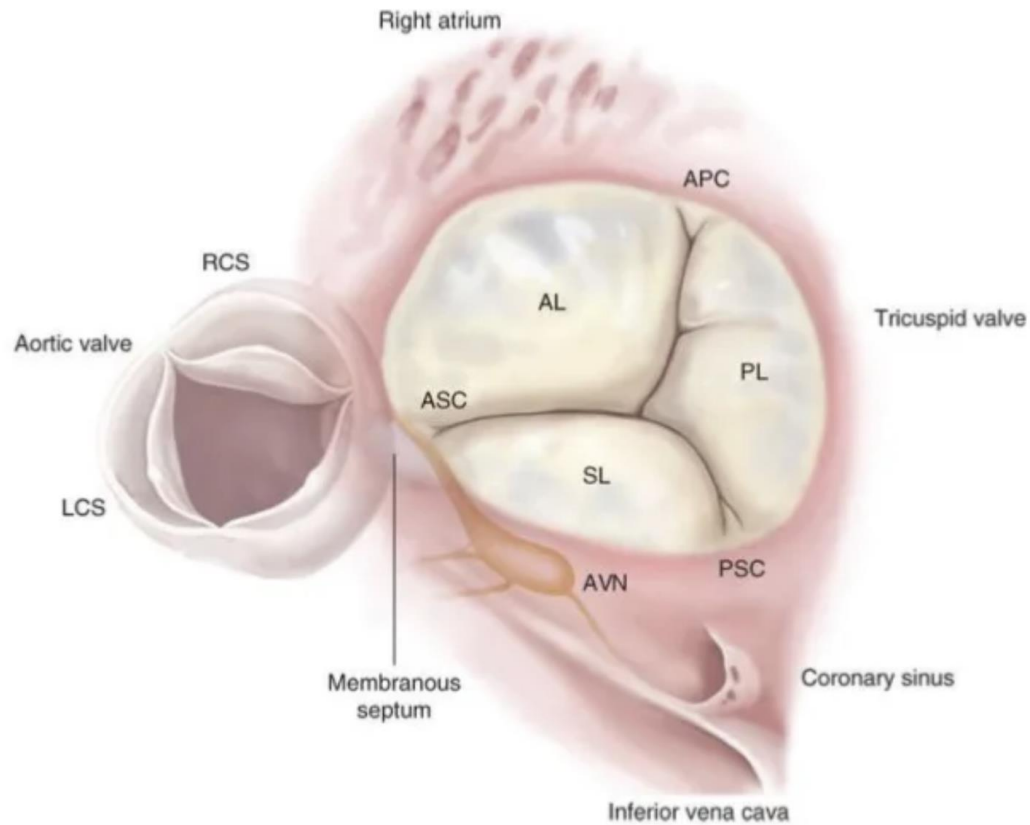
Other Novel options

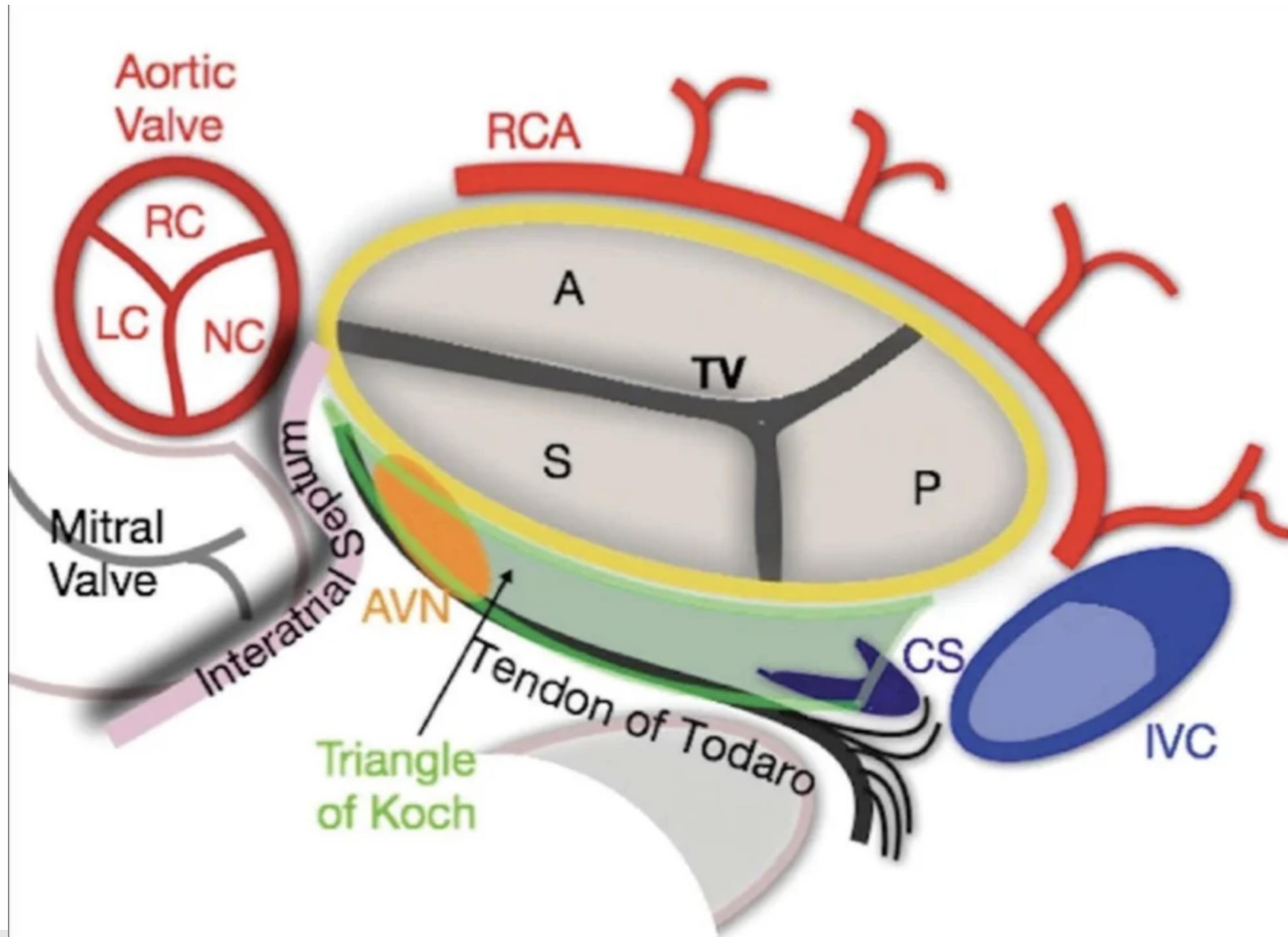
Etiology

Primary – Uncommon

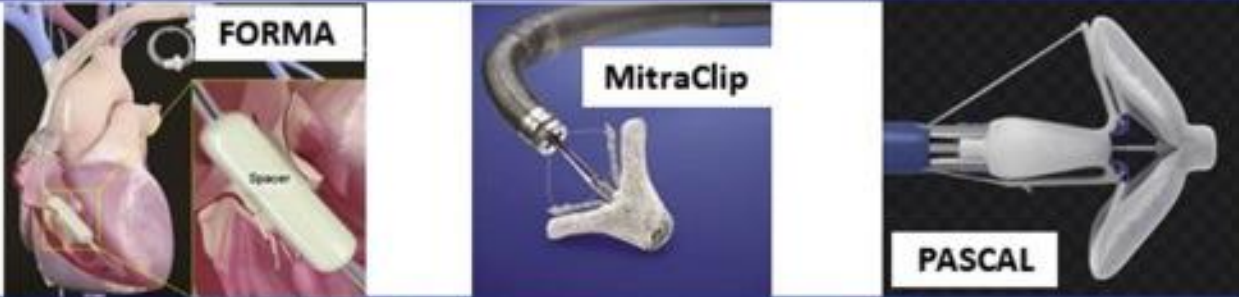
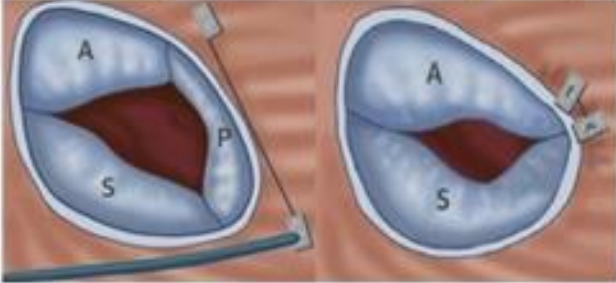

Secondary – RV, Pacing leads, PHT,
Atrial FTR

Related structures



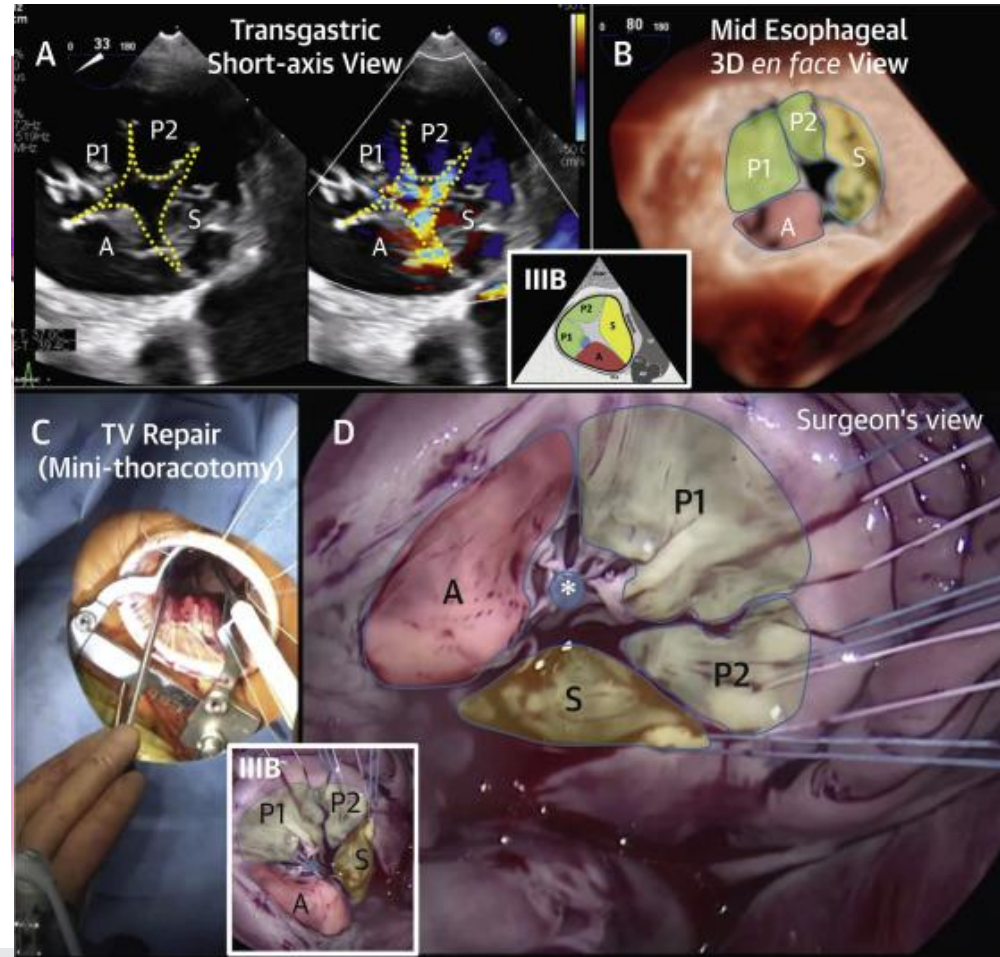


Repair Technologies

Leaflet Coaptation Devices	 <p>FORMA</p> <p>MitraClip</p> <p>PASCAL</p>
Direct Suture Annuloplasty	 <p>Trialign</p>
Ring Annuloplasty	 <p>Cardioband</p> <p>TriCinch</p> <p>Millipede IRIS</p>

TEER devices

- Leaflets are thinner
- Morphology varies
- Imaging can be harder
- Difficult to assess outcome



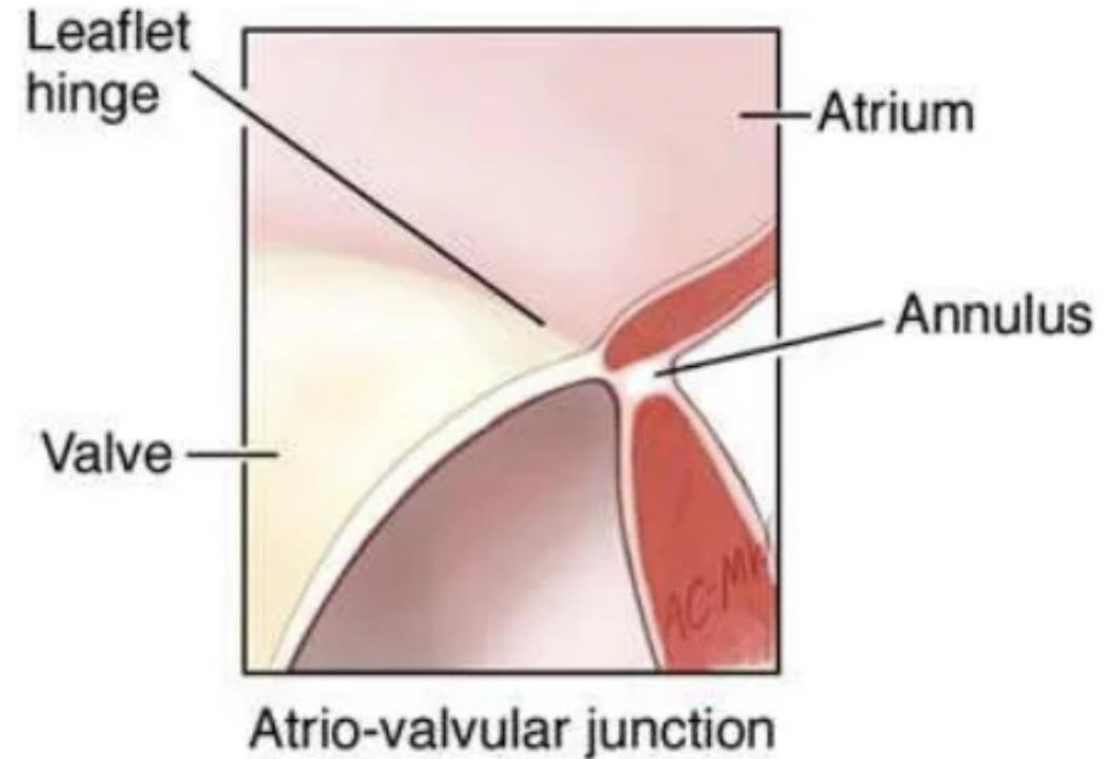
Annular devices

- Trialign
- Cardioband
- Millepide

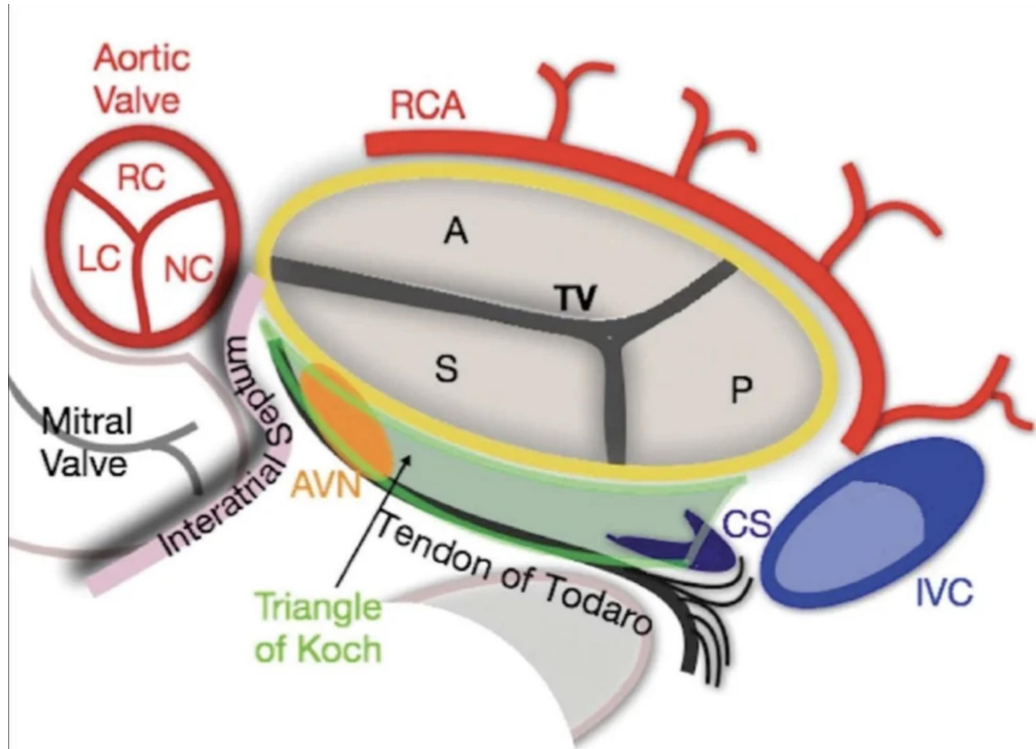
Issue

Delicate Annular tissue

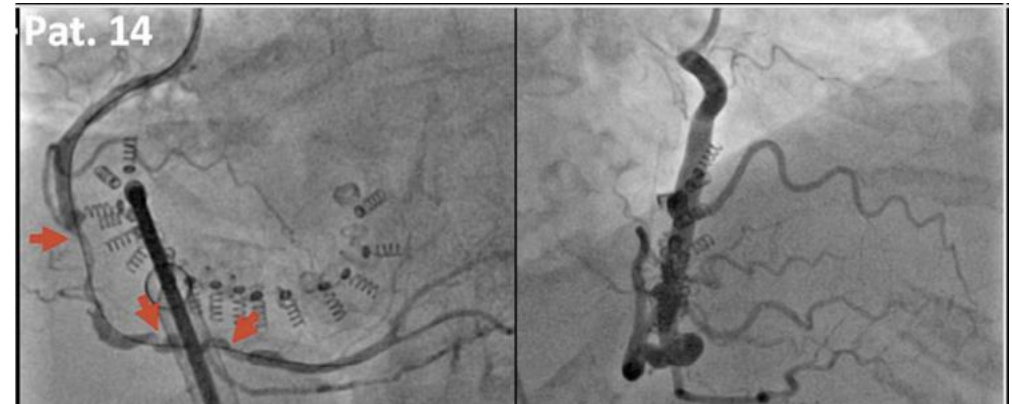
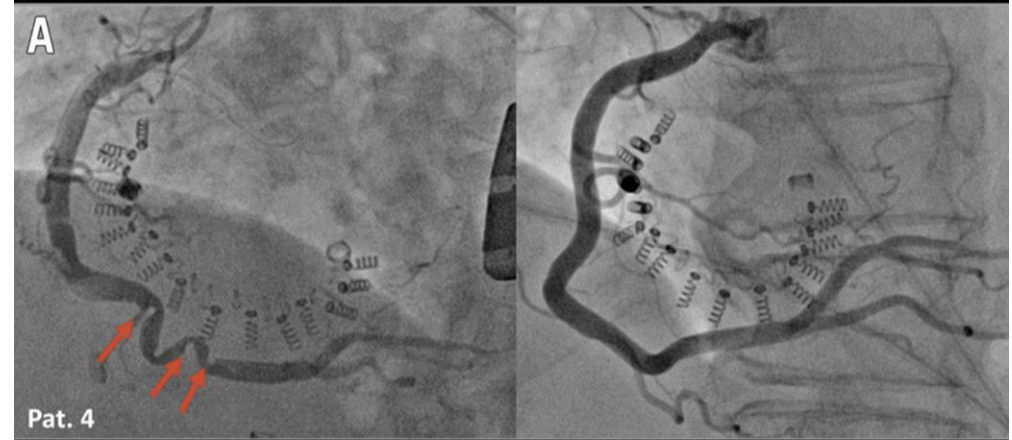
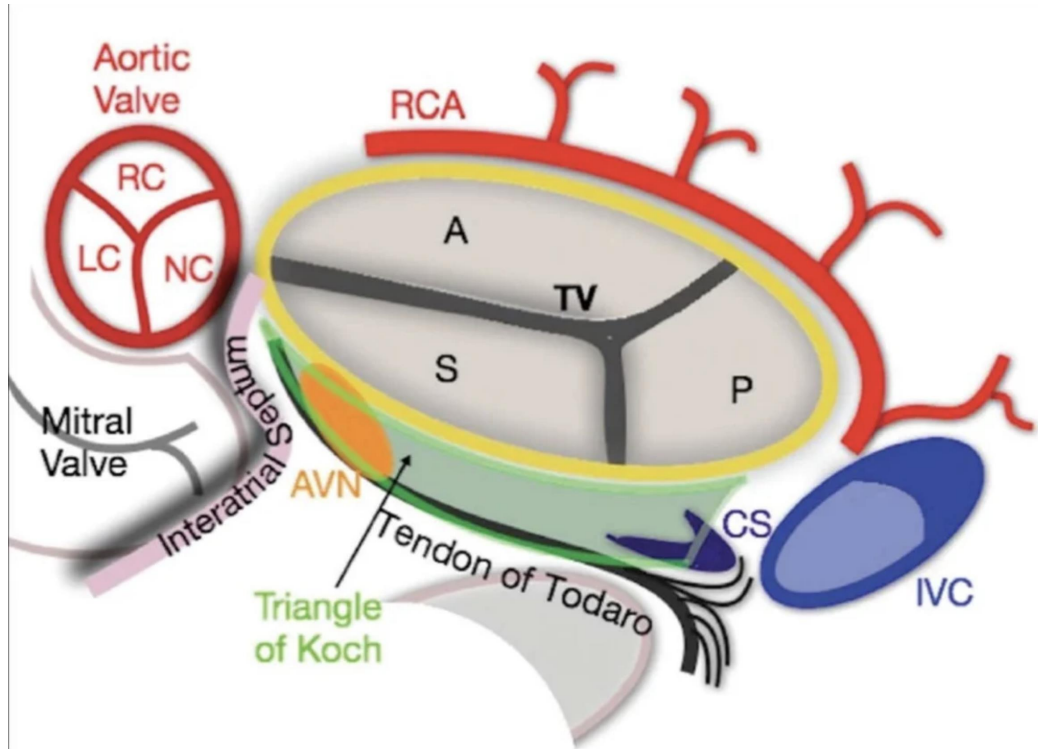
Unclear annular shelf



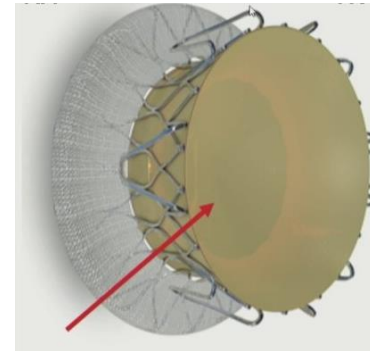
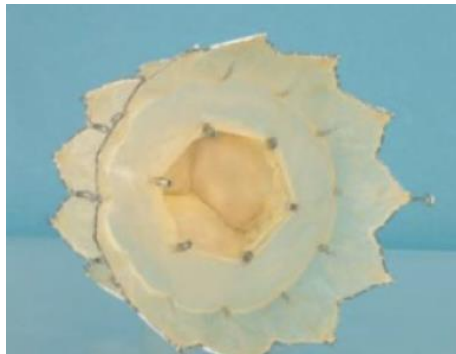
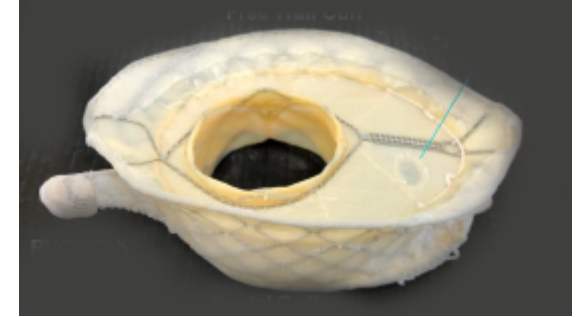
Risk of injury to surrounding structures



Risk of injury to surrounding structures



TTVR landscape

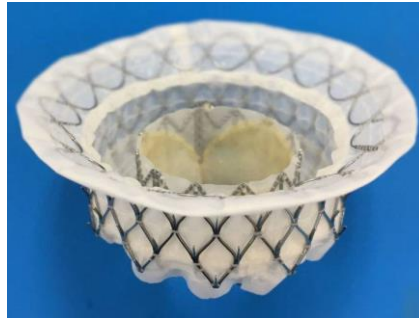


Anchoring and sealing - examples

- RV systolic pressures lower than LV systolic pressures
- Anchoring: annular, Leaflets, Chords



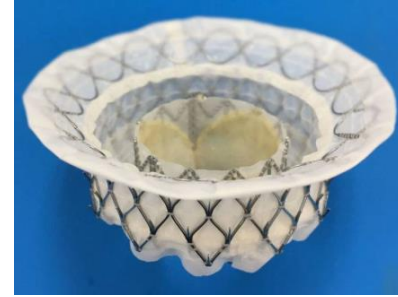
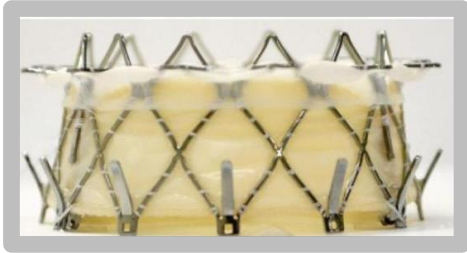
Anterior leaflet
RVOT



Leaflets
Annulus



Chords
Annulus



Evoque

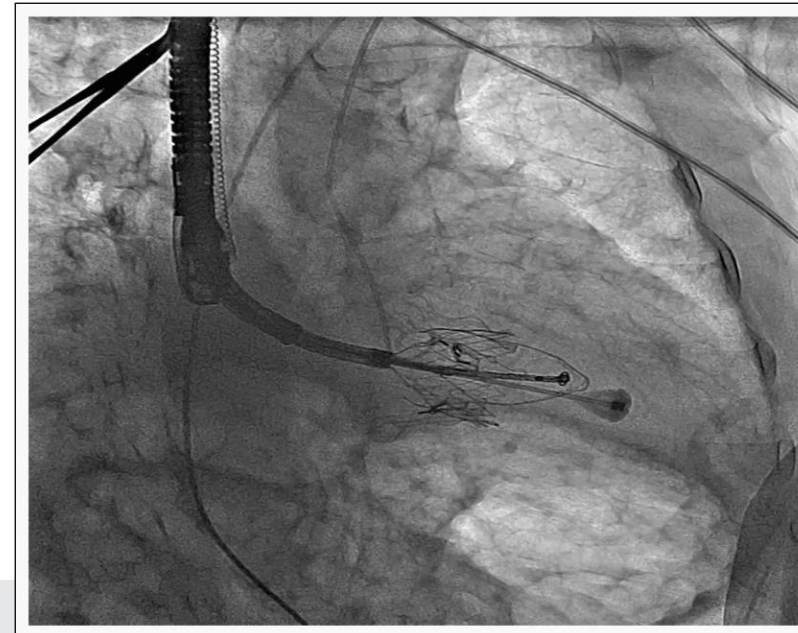
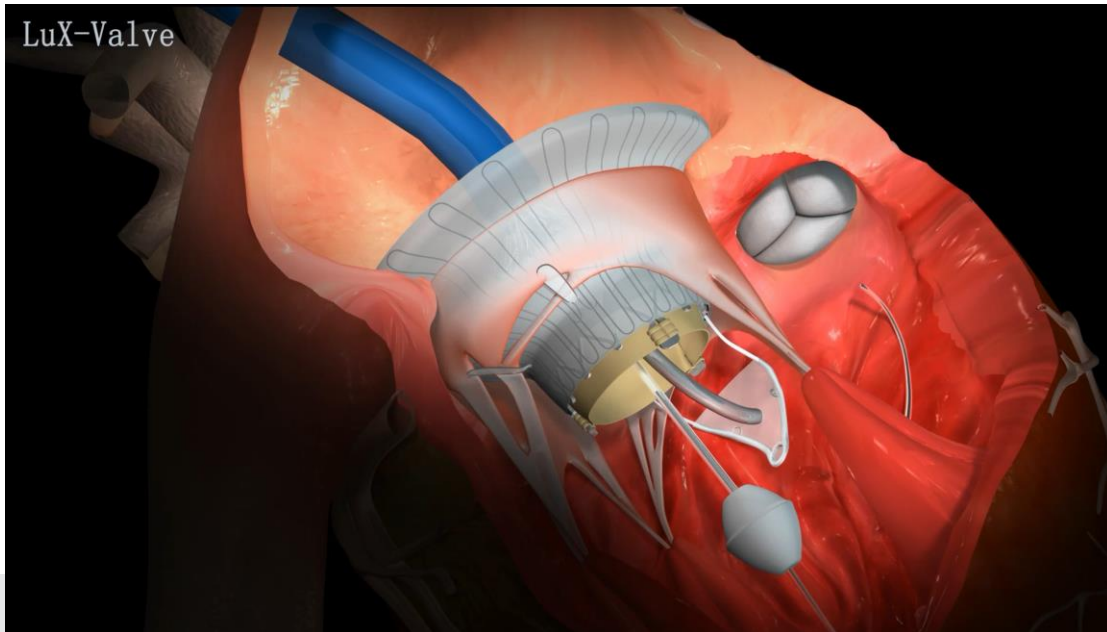


- Largest experience
- Dedicated delivery system
- Trans Femoral
- Smallest Caliber
- Double articulation
- PPM interaction?

Need to be coaxial for deployment

LuX-valve

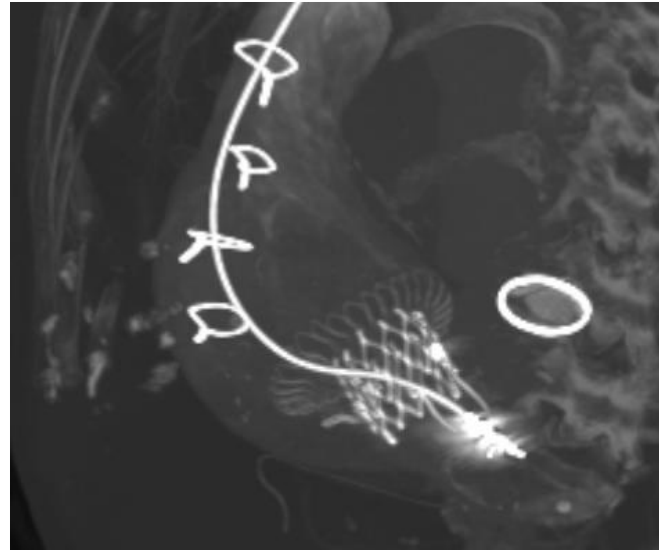
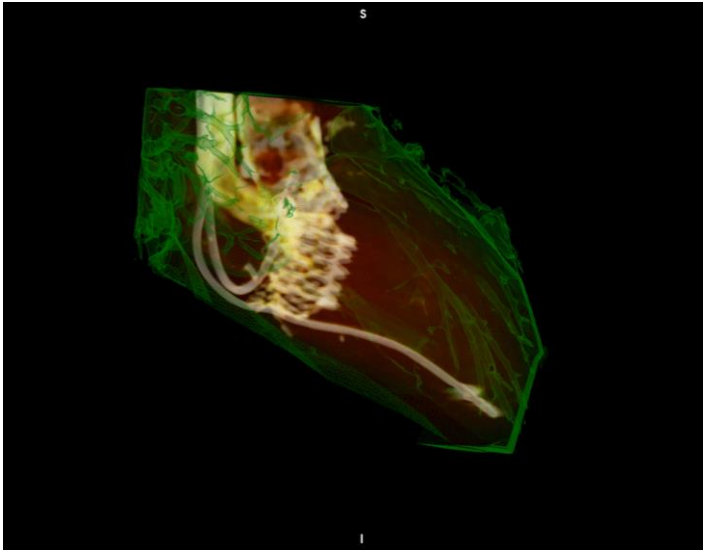
- Valve sizing is based on effective tricuspid orifice area, not the size of annulus
- Fixation is depending on anterior cusp and interventricular septum, not the radial force
- Good paravalvular leakage solution



Unique issues – Unique Solutions

- Presence of Pacing leads
- Large Annulus
- Reduce Pop-off effect
- Thrombosis

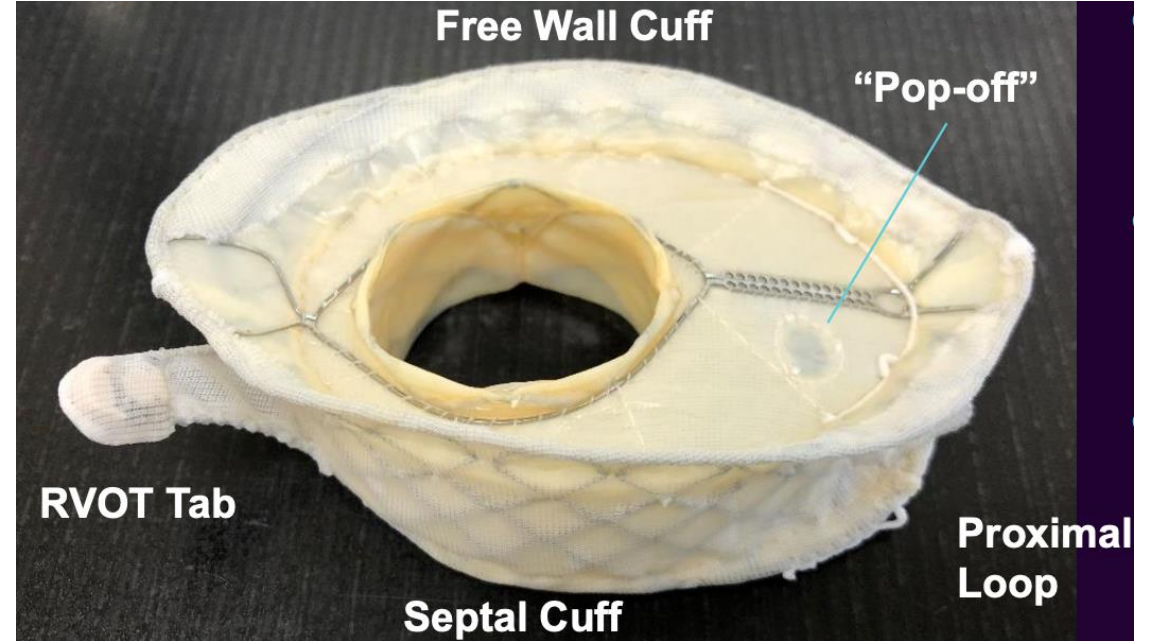
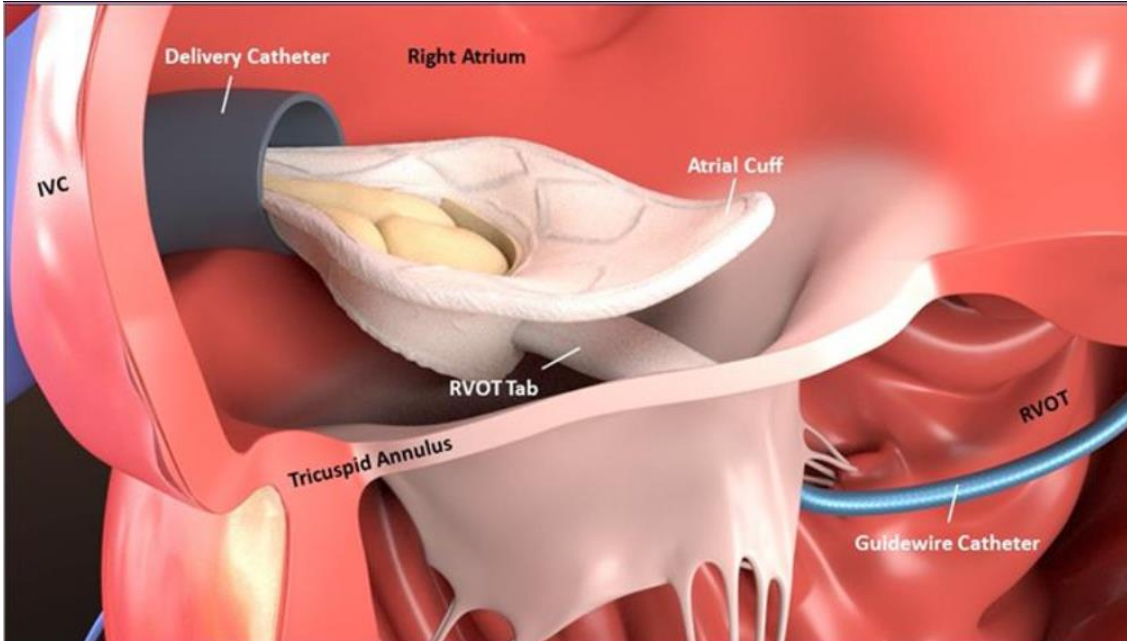
Presence of Pacing lead- planning, Inclusion and exclusion



Leads should not interfere with

1. Delivery
2. Seating and sealing
3. Pacing

Vdyne

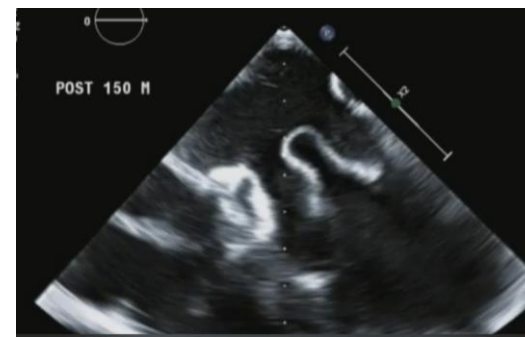
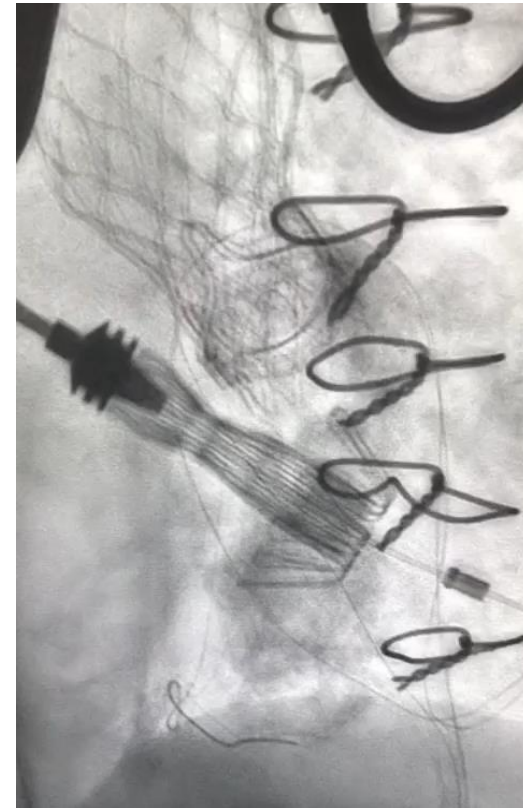
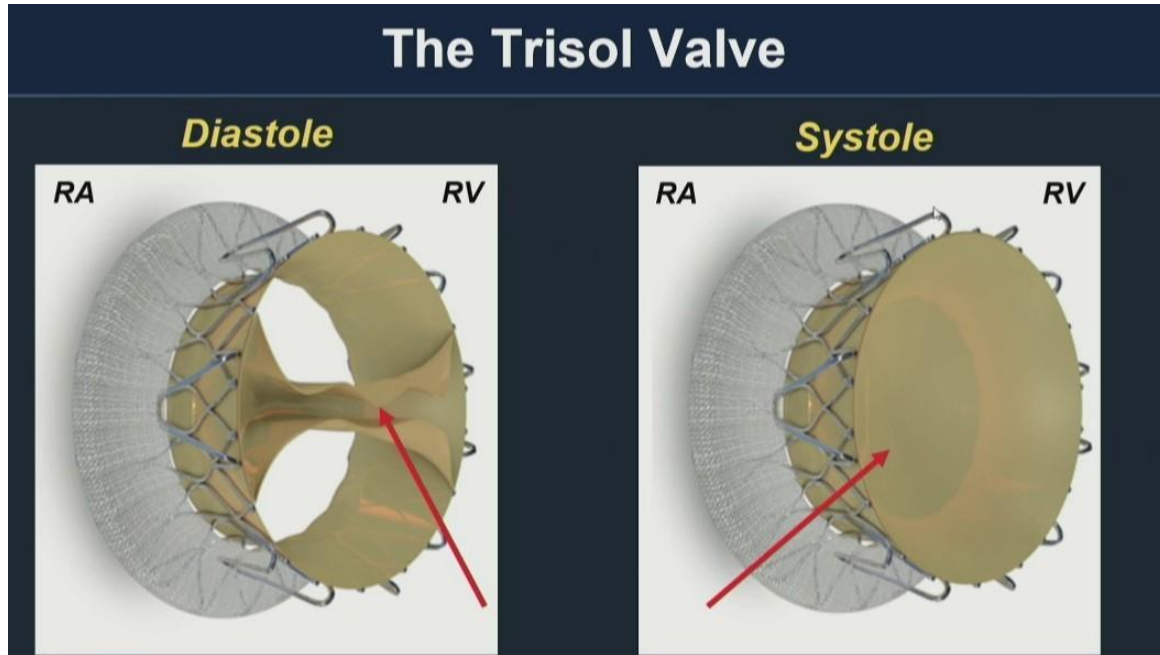


Inner valve: 30mm Porcine pericardial trileaflet valve
5 Sizes: Outer frame perimeter 140 to 180mm

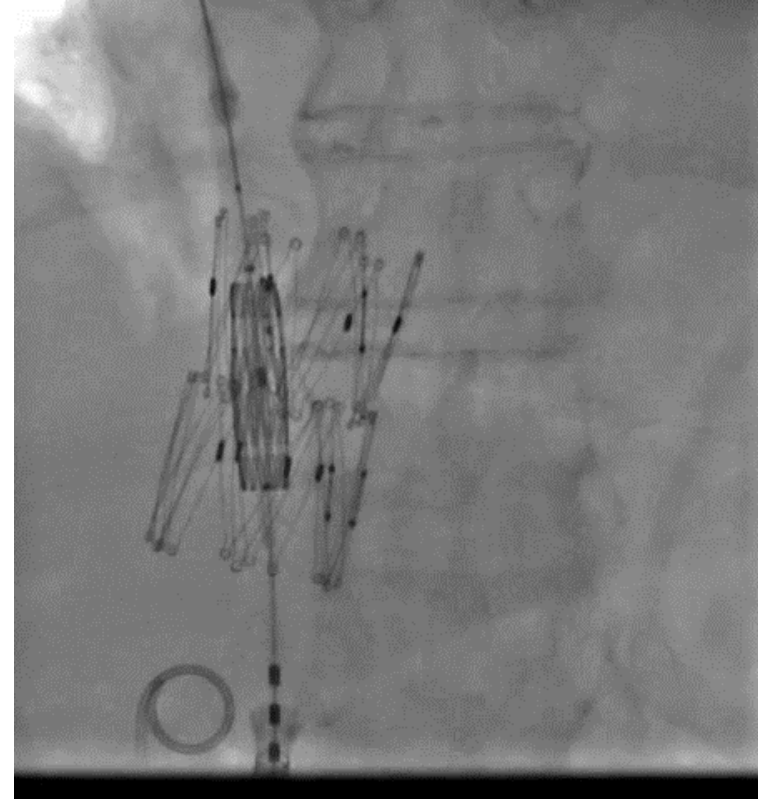
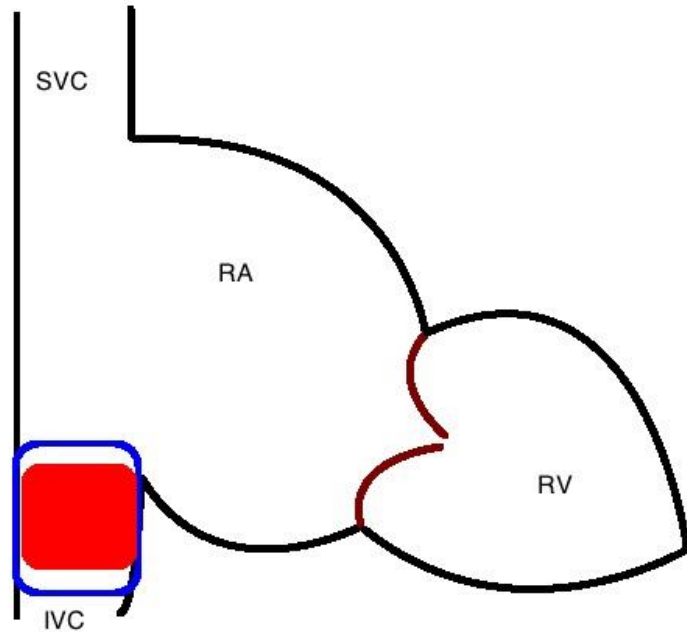
Pop-off tab: safety to manage RV dysfunctional

Trisol Valve

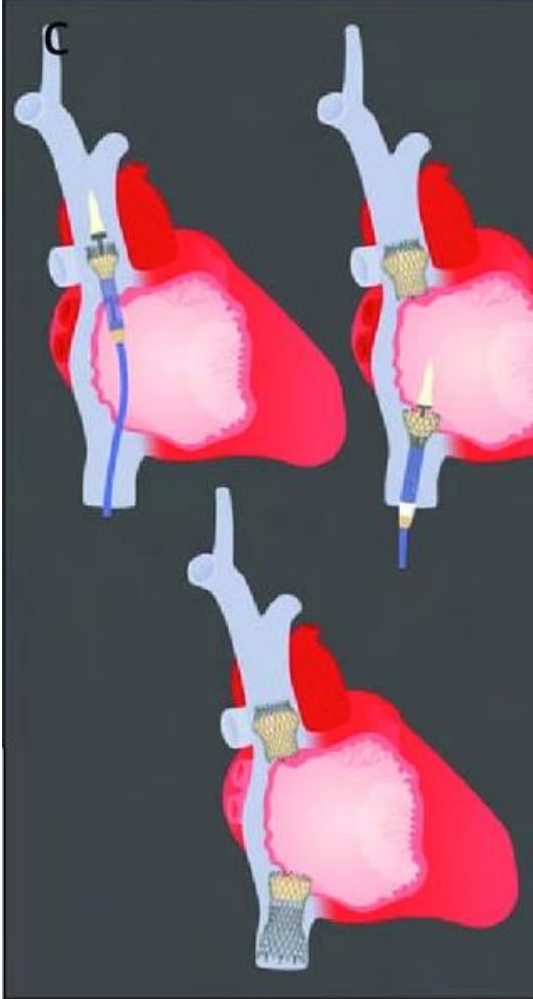
Unique design
Pericardial dome
Opens centrally



Heterotropic Valves



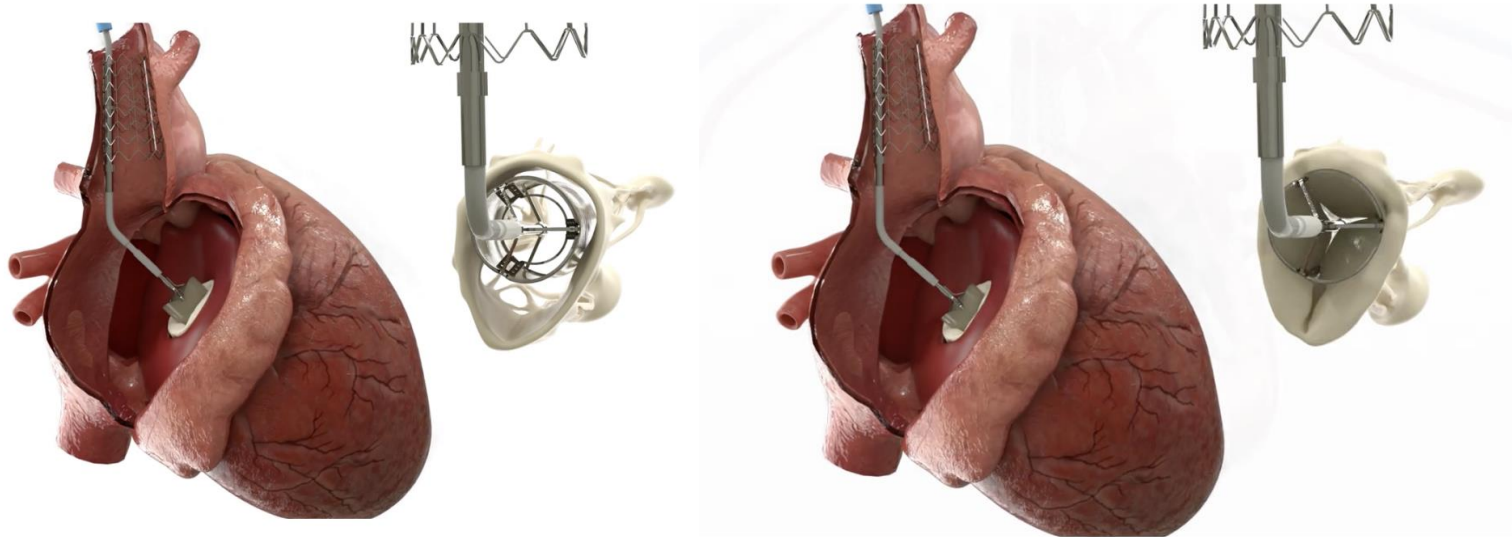
Tric Valve



Easy to Implant

- 300 cases
- Good outcomes

CroiValve



Stent in the SVC
Valve attached to the stent
Similar to Forma

TTV Repair

TEER: Thin leaflets

Multiple clefts/leaflets

Pacing leads

Annuloplasty: Ill defined Annulus

Inability to eliminate TR

Usually Achieve Reduction

TTV Replacement

POP off Effect

Pacemaker rates

Anticoagulation and thrombosis

Usually Achieve Elimination

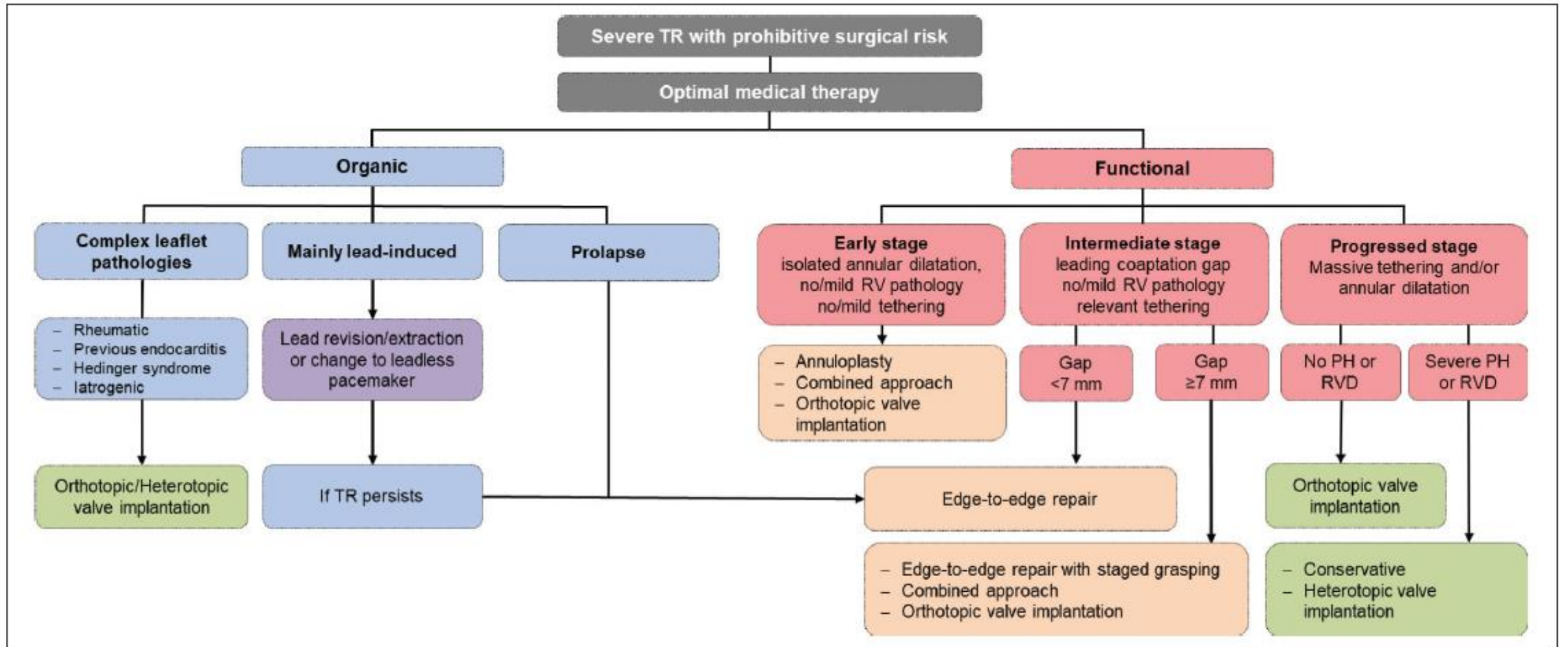
Elephant in the room

- Is reduction is better than Elimination???
- If Repair is done and fails – what next?
- Which Patients will tolerate Elimination i.e. TTVR
- If Replacement fails – what next?
- Role of Heterotrophic valves?

Imaging Considerations

Importance of Imaging Modalities for planning and Guiding Transcatheter TV Interventions

	Echocardiography	CT	Fluoroscopy
TEER	+++	-	+
Annuloplasty	++	++	++
TTVR	+++	+++	++
Heterotropic Valves	-	+++	+++



Jury is still out

- TEER: Elderly, higher risk, suitable leaflet morphology, poor RV
- TTVR: Reasonable RV, reasonable risk, pacing leads
- Heterotropic VR: Unsuitable for the above two

Sequencing??