

Evolving Technologies to Improve Outcomes of T-AVR

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Washington, D.C.**

Conflict of Interest

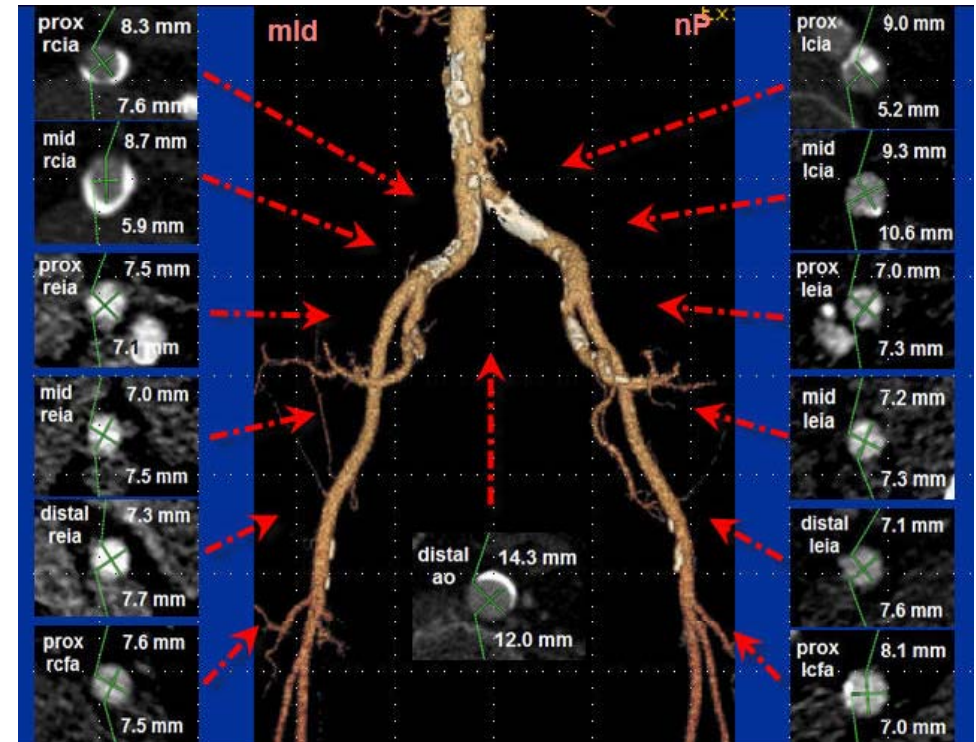
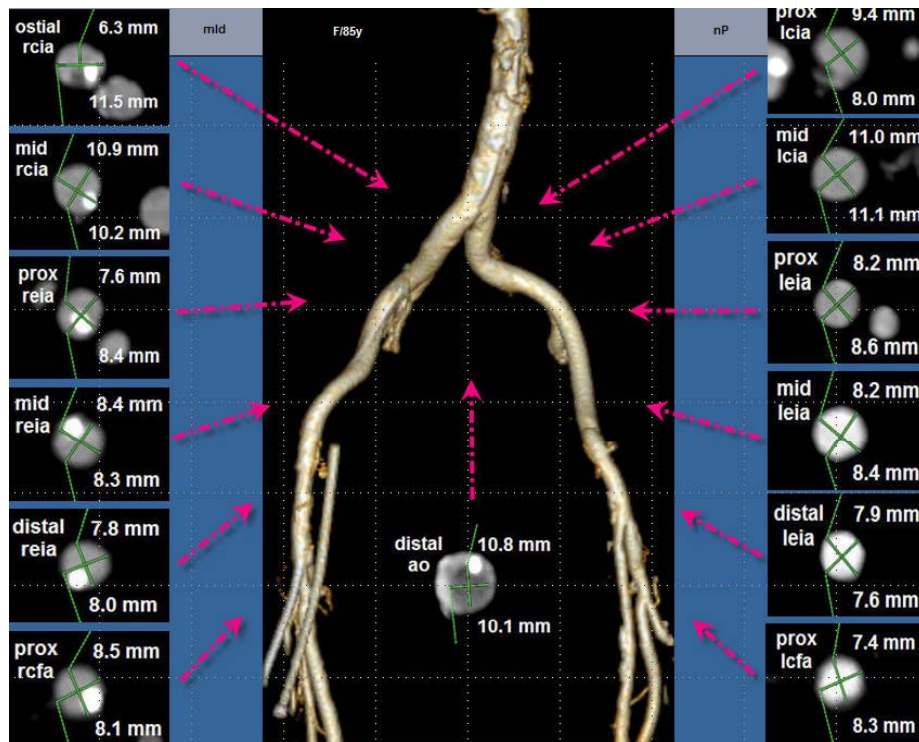
Proctor for Edwards Lifesciences

Speaker Bureau St Jude Medical

Evolving Technologies to Improve Outcomes of T-AVR

- **Access:**
 - **expandable sheaths**
 - TA percutaneous options
- Carotid protection
- Lower profile valves
- Accurate Valve Positioning
- Better patient selection
 - Heart team
 - MRI for fibrosis
 - TAVR Risk Score

Vascular Access is the Achilles Tendon of TAVR



Balloon Expandable Sheath



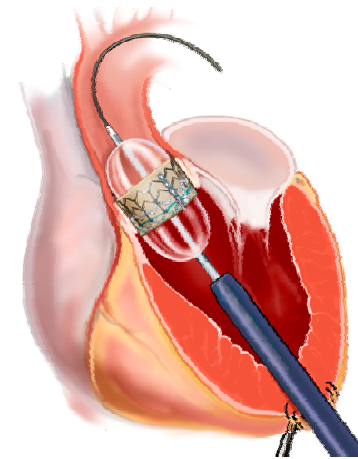
Expandable 16F Sheath.

Edwards LifeSciences



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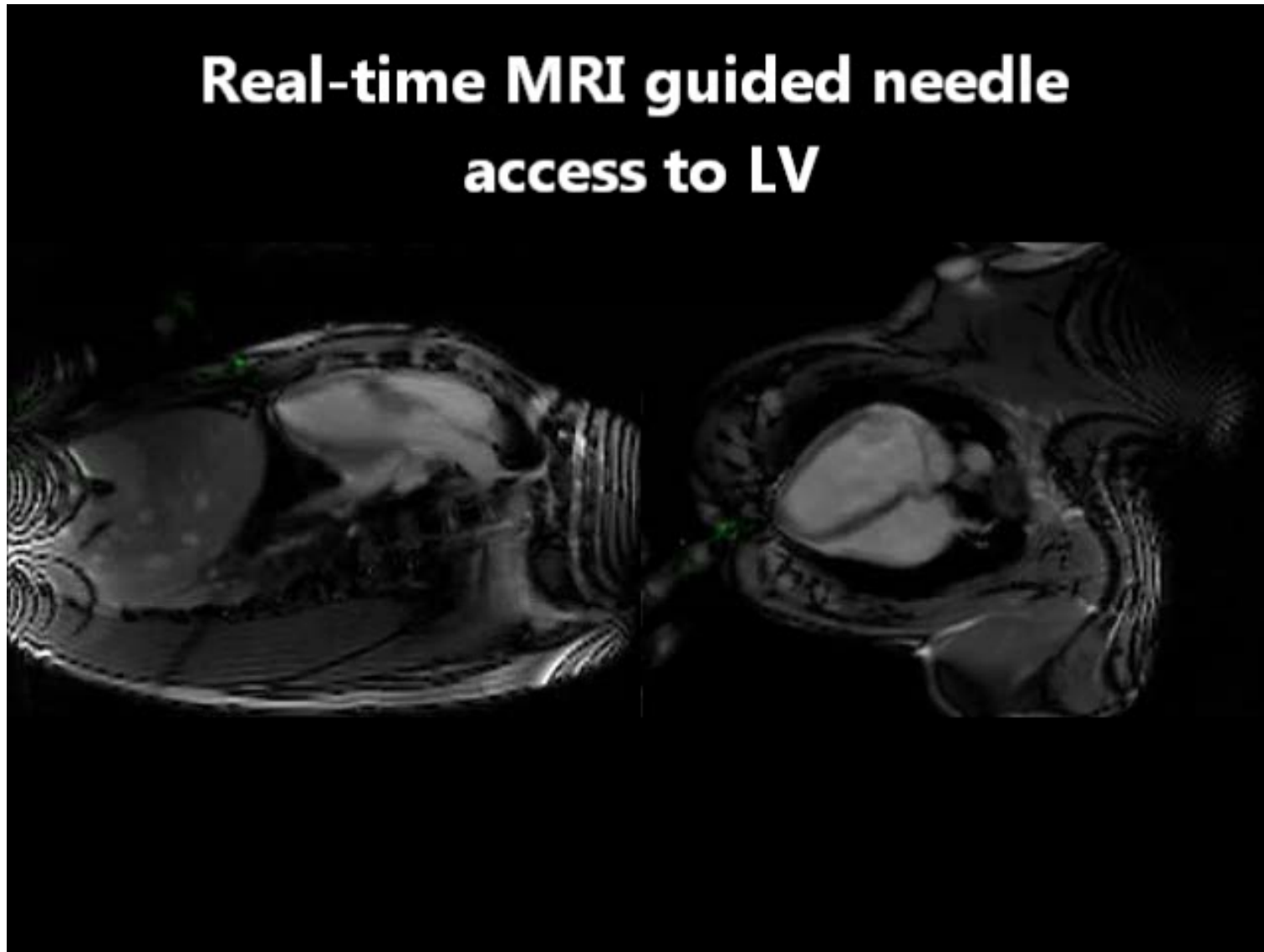
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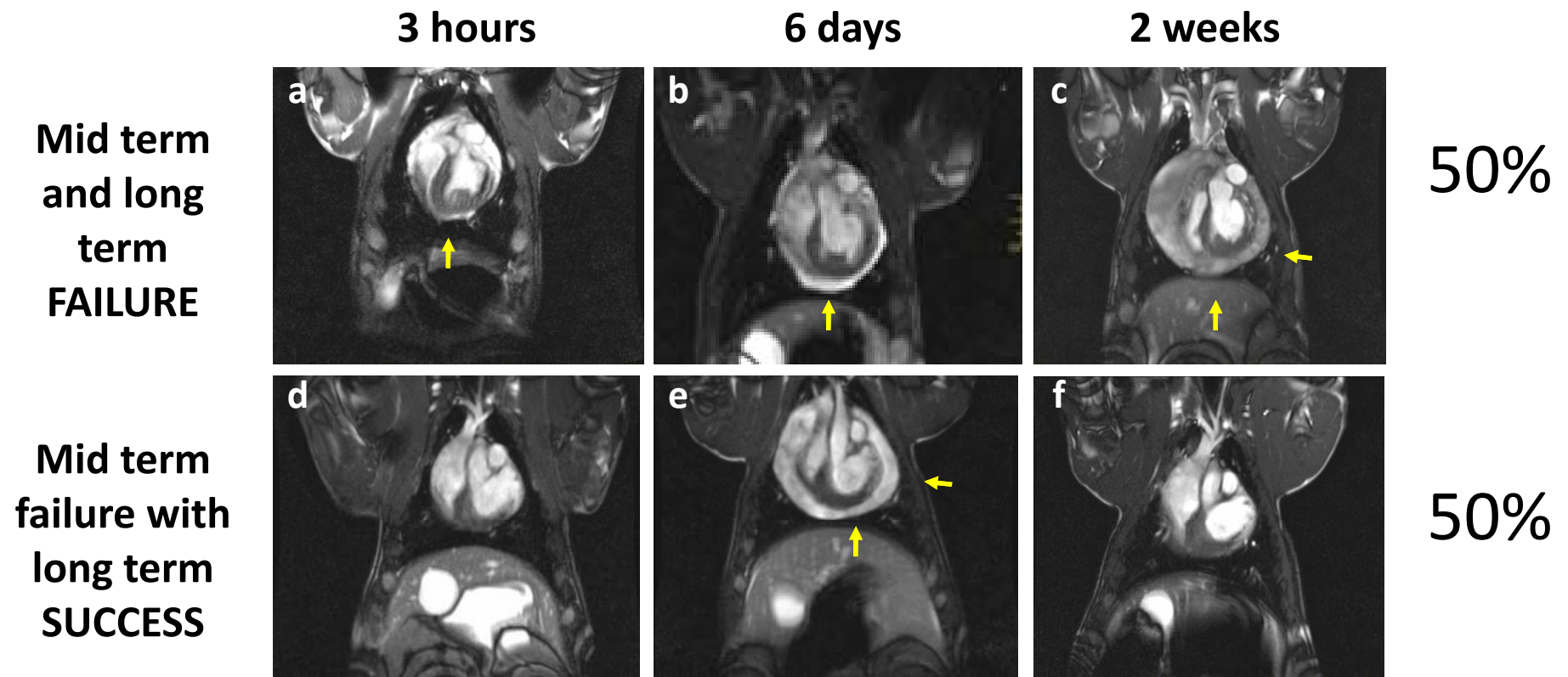
Devices for Percutaneous TA Access

- Numerous devices are been developed to access the apex:
 - without thoracotomy
 - with safe closure (no bleeding, no pseudoaneurysm, etc.).
- These devices could expand the indications for TA access.

“Hybrid” periventricular procedure

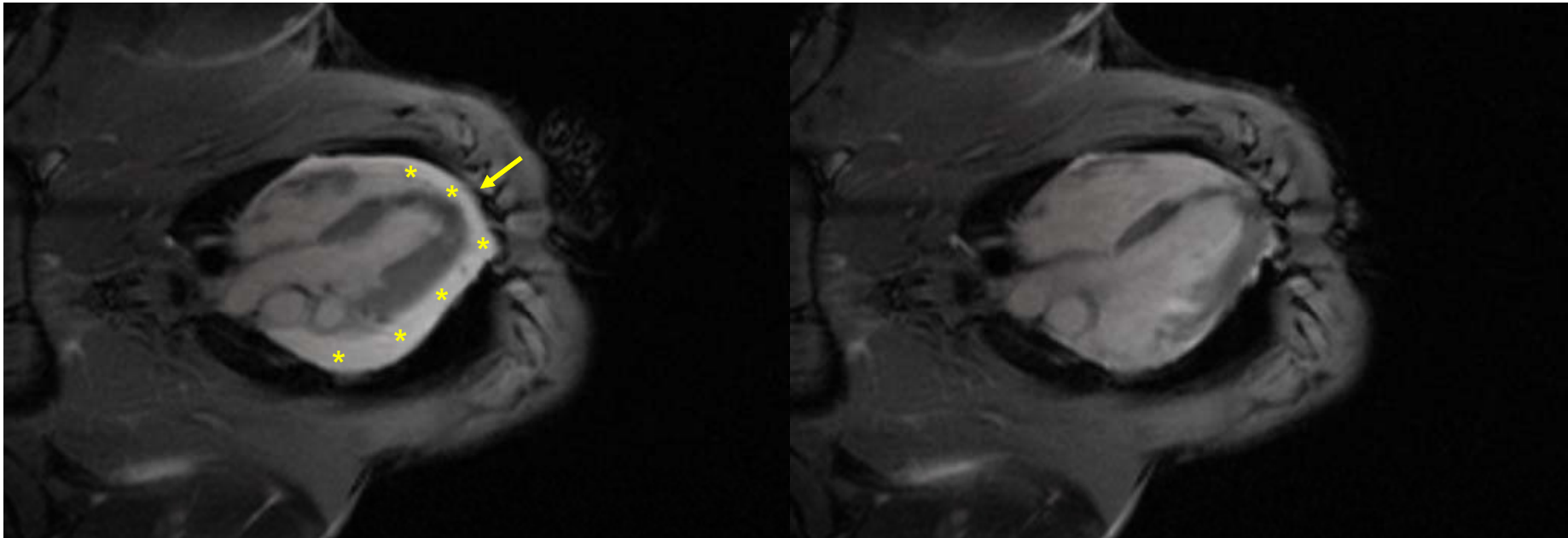


Collagen vascular closure device (*Angio-Seal*): Early hemostasis; Late failure



“Permissive pericardial tamponade”

(through a separate catheter)

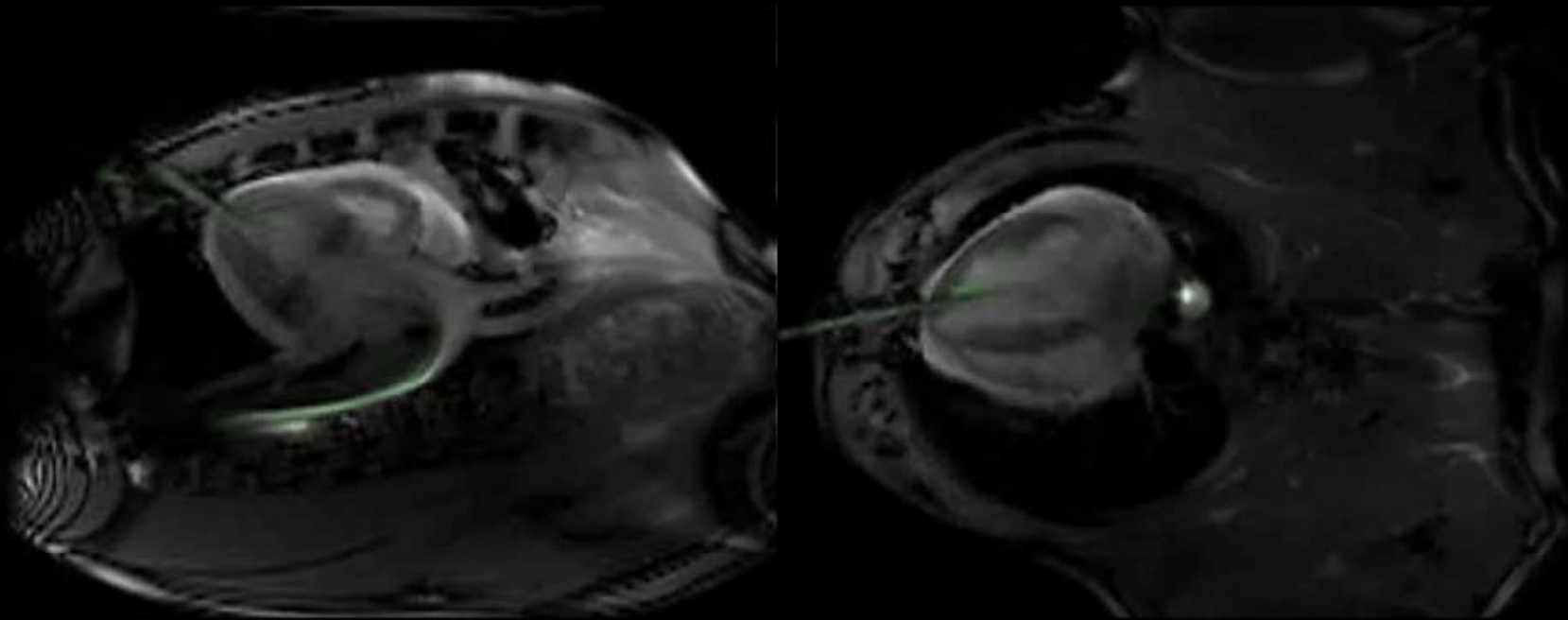


**Separate the pericardial layers with
injection of fluid**

**Empty the pericardium after
device is deployed**

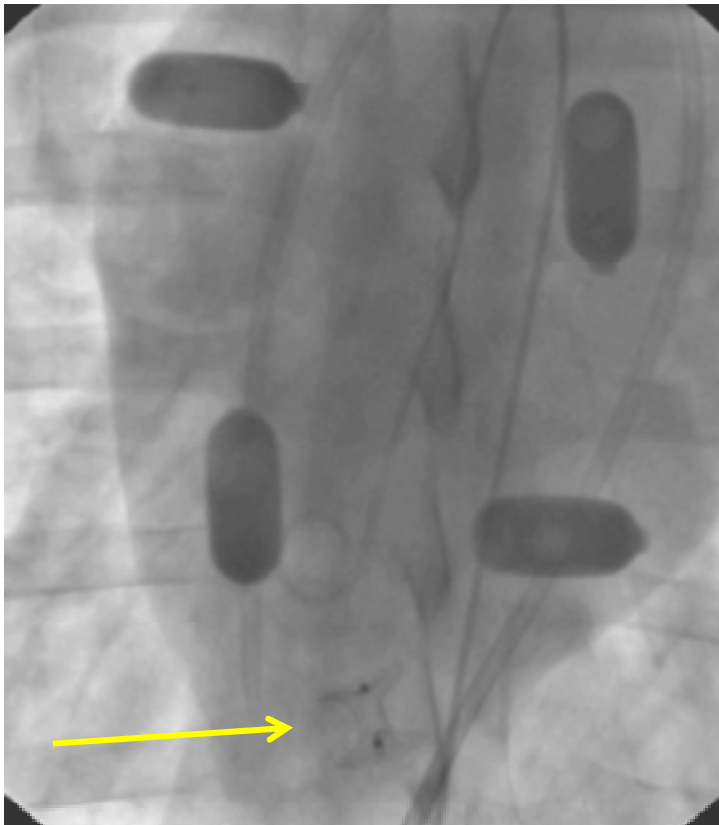
Nitinol Implant: Amplatzer Device

**Real-time MRI guided closure of LV
access site**



Amplatzer Device in Apex

Left ventriculogram indicate no significant leakage at access site

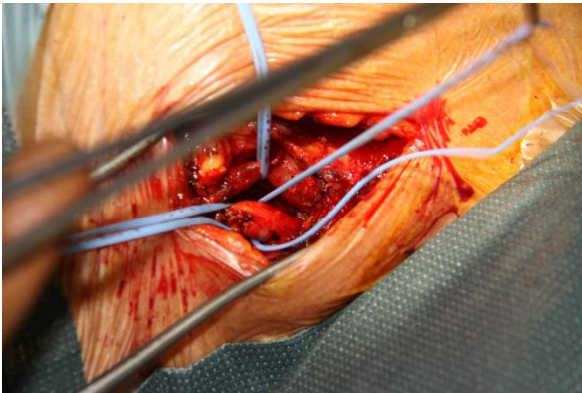


Dark blood sequence to identify occluder position



Other Access Options.

1. Subclavian (Axillary)



2. Ascending Aorta

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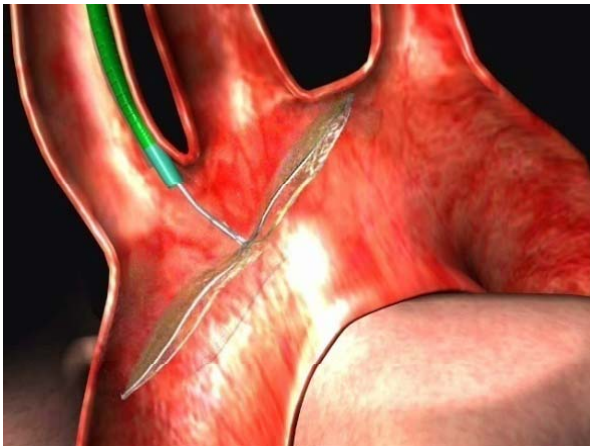
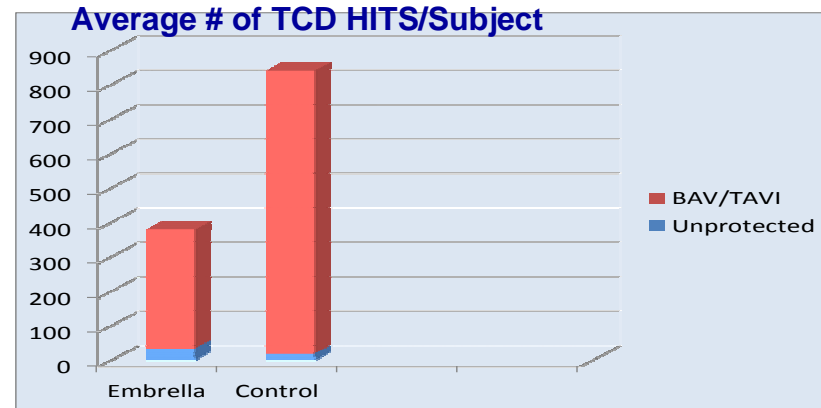
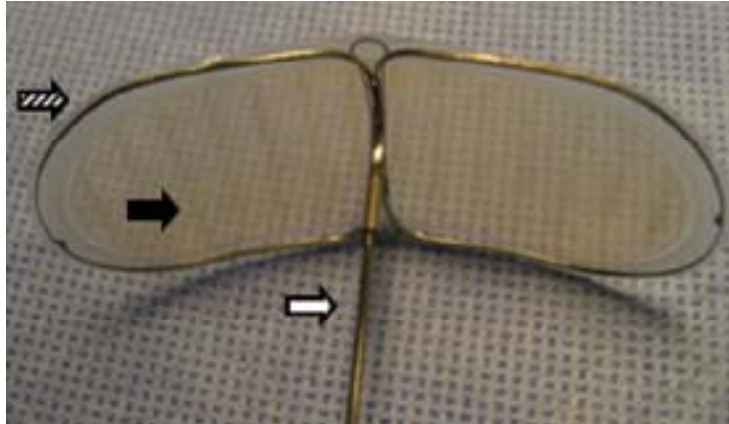
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CVA/TIA in first 30 days: 2-5%

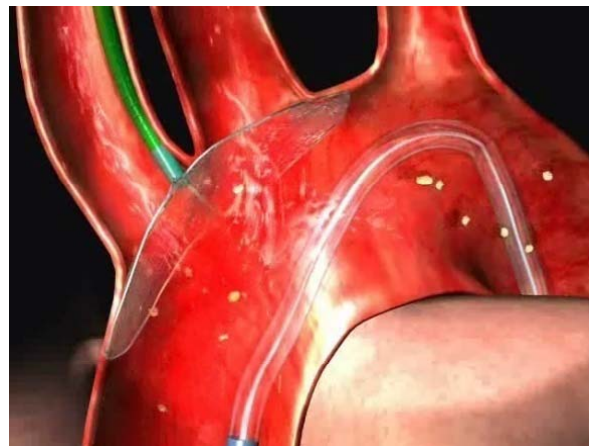
The etiology is not well understood:

- **Aortic arch atheroma embolized during or after the procedure?**
- **Calcific debris from the valve embolized during the procedure?**
- **Platelet/Fibrin emboli originating on the valve assembly?**
- **Peri-procedural AF?**
- **Thrombi forming between the valve assembly and the aortic sinuses?**

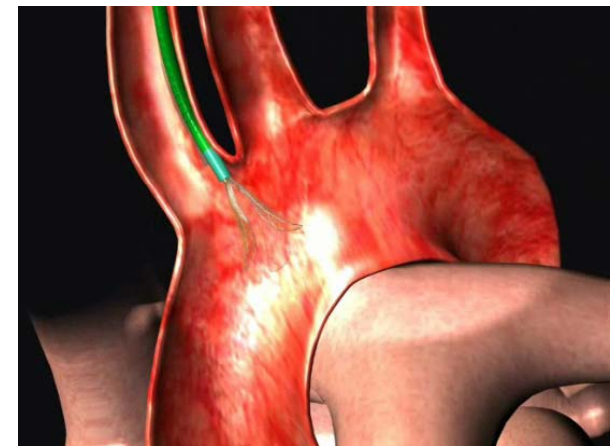
EMBRELLA deflector



Insert



Protect

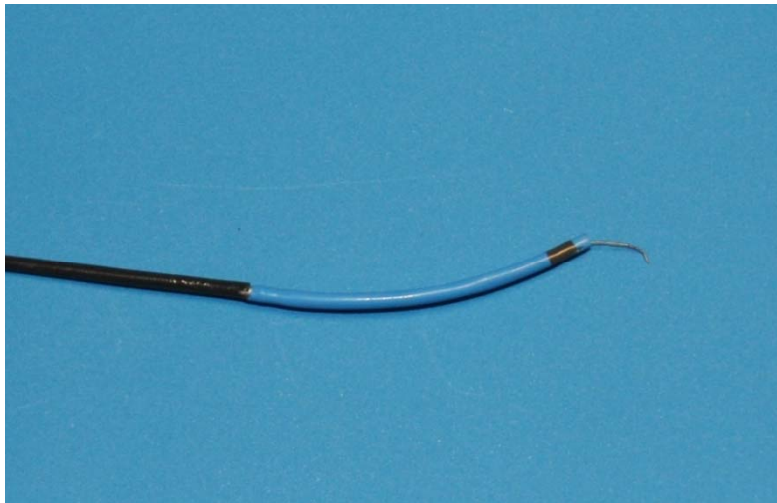


Retrieve

Claret Dual Filter Device



Handle



Filters Sheathed



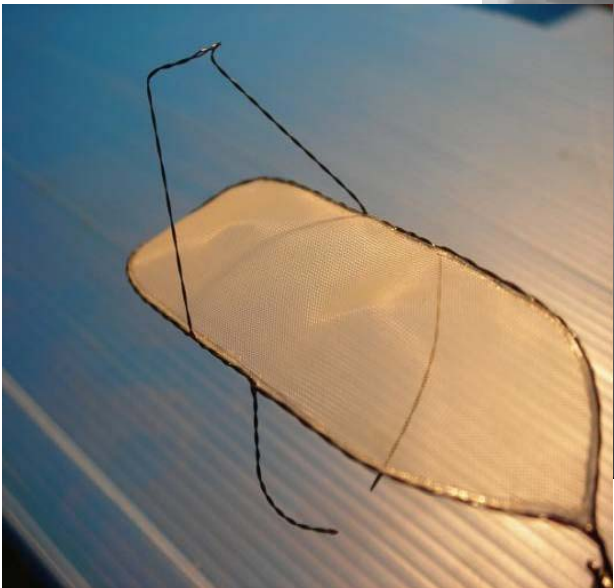
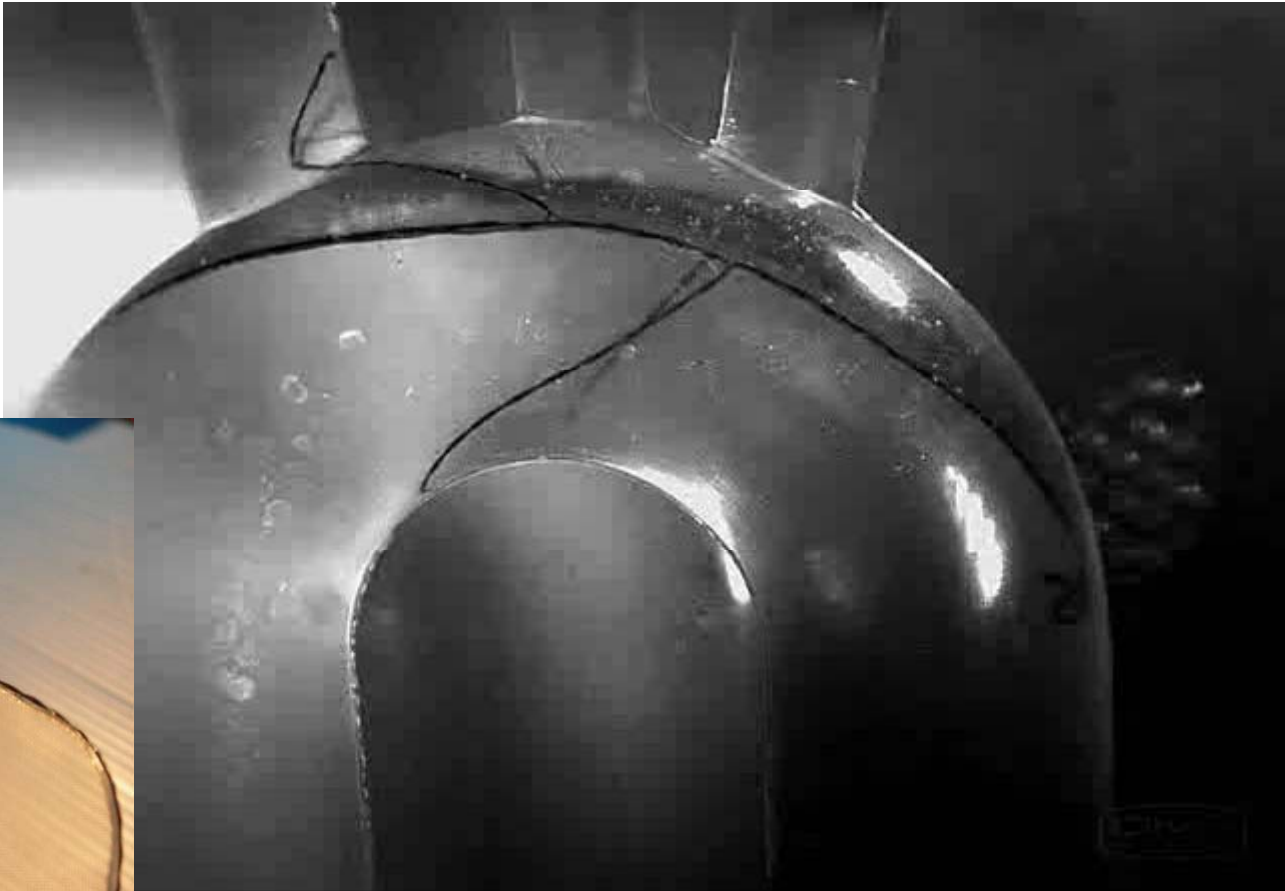
Filters Deployed

Embolic Material



Courtesy E. Grube

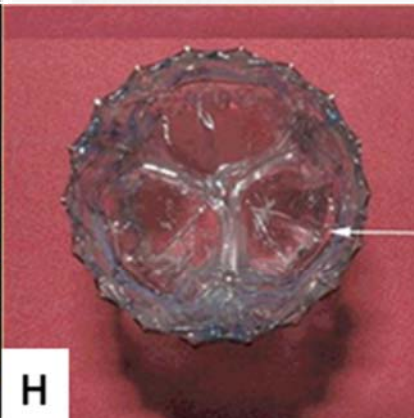
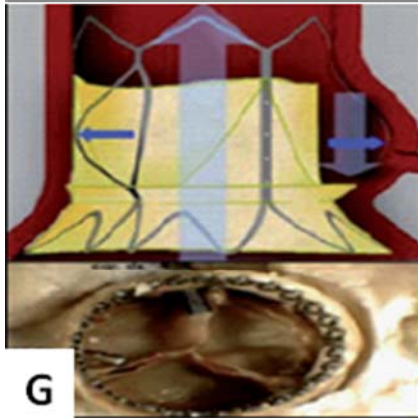
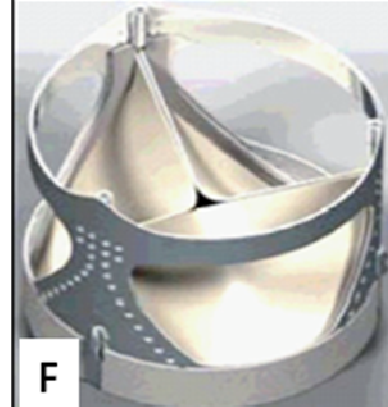
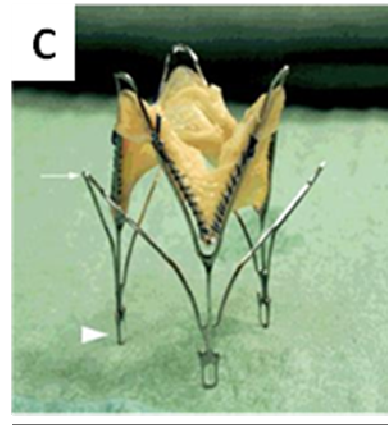
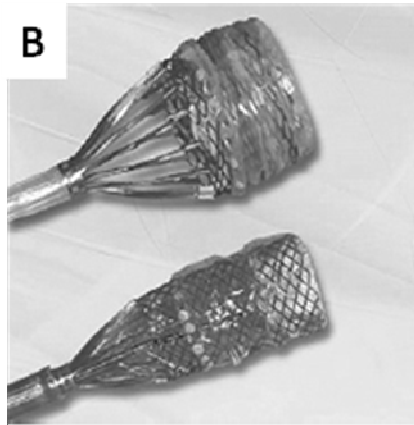
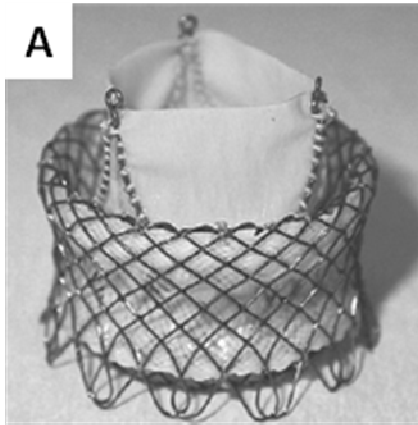
SMT Medical Technologies



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Valves in development

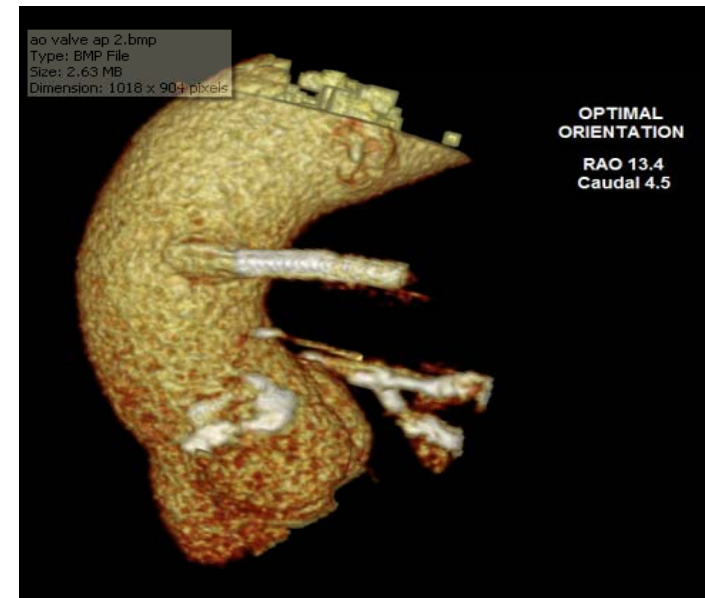
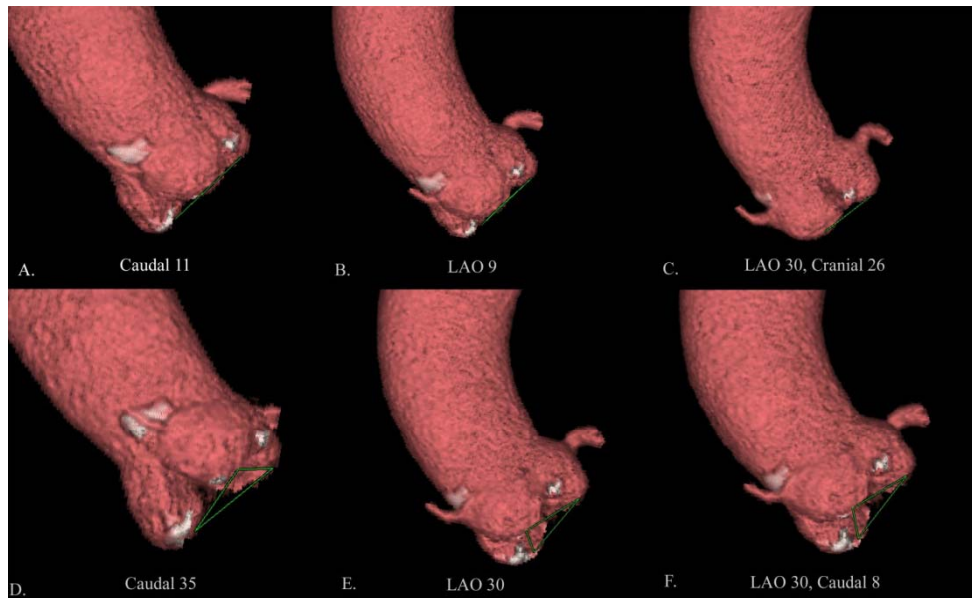


A: Heart Leaflet Technologies valve (Heart Leaflet Technologies Inc., USA); **B:** Lotus Valve System (Boston Scientific Inc., USA); **C:** JenaClip (JenaValve Technology GmbH, Munich, Germany); **D:** Direct Flow Medical Aortic Valve (Direct Flow Medical Inc., USA); **E:** ATS 3f Entrata valve (ATS Medical, Minneapolis, MN); **F:** AorTx Device (Hansen Medical Inc, Mountain View, CA); **G:** Perceval-Percutaneous (Sorin Group, Milan, Italy); **H:** Paniagua Heart Valve (Endoluminal Technology Research, Miami, FL); **I:** Engager valve (formerly Ventor) (Medtronic, Minneapolis, MN).

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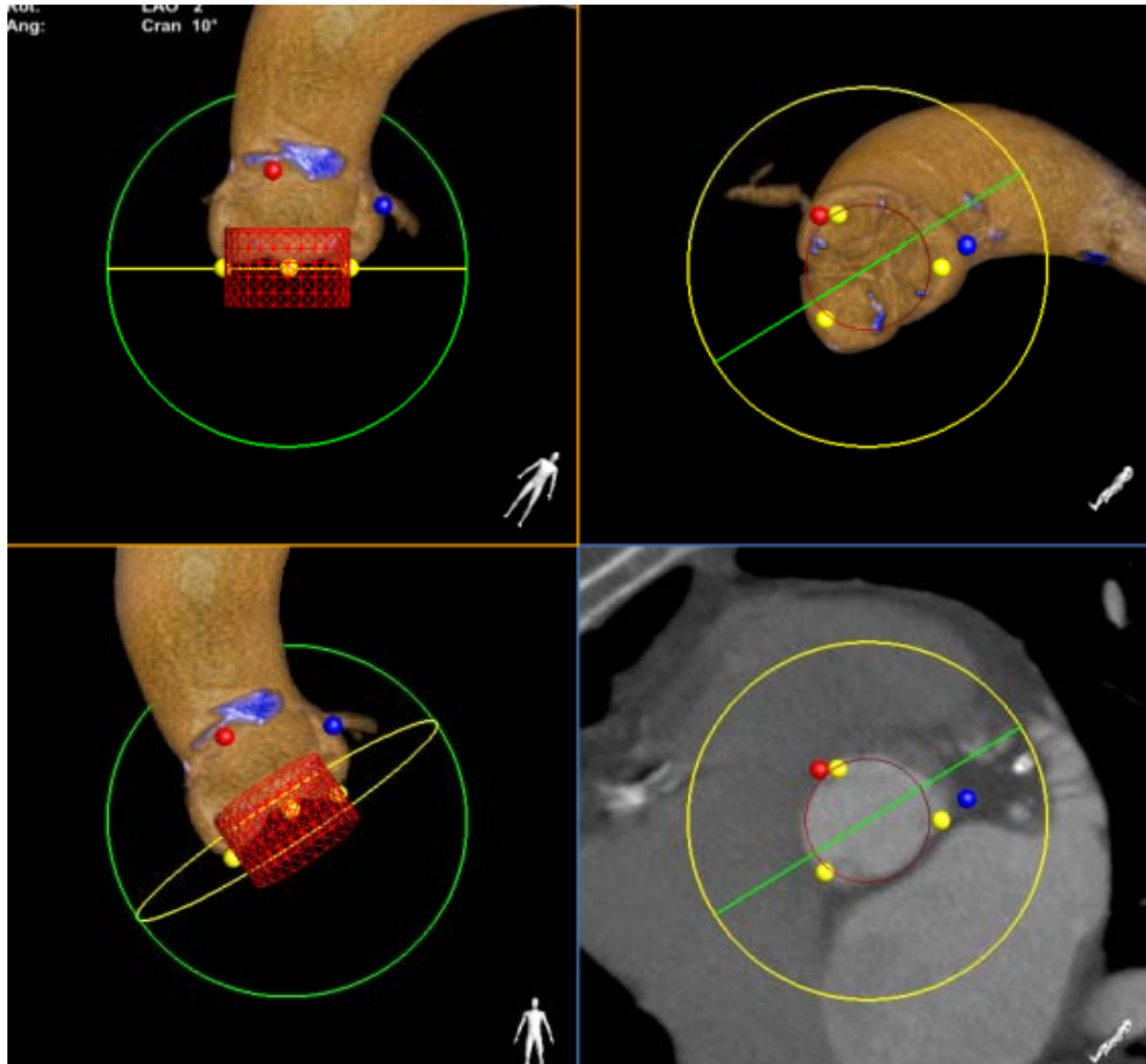
Dyna CT for optimal Ao Sinus Alignment. Wood et al. Vancouver (TVT 2010)



Computerized Assistance for Valve Positioning. C-THV Paieon System

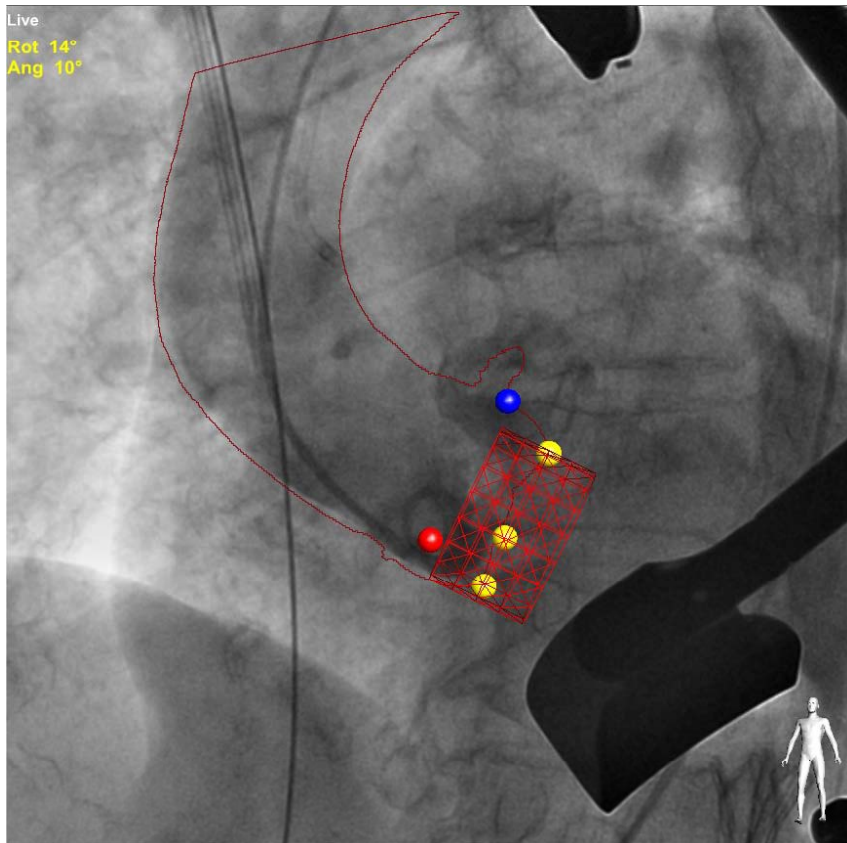


Philips Navigator

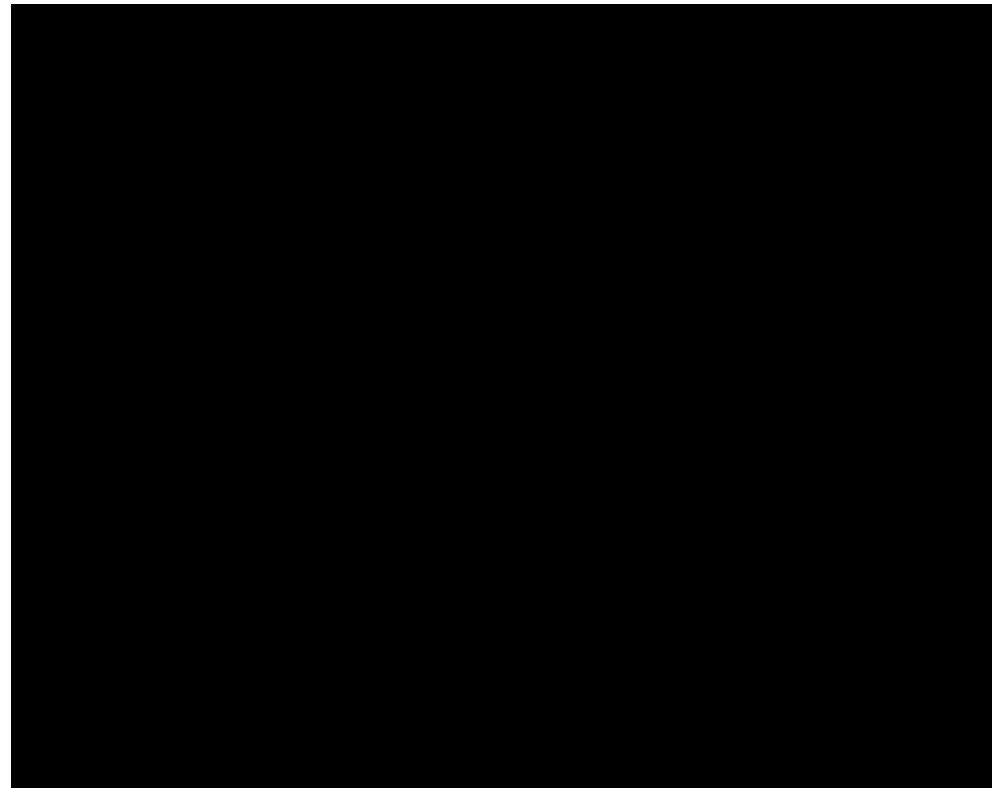


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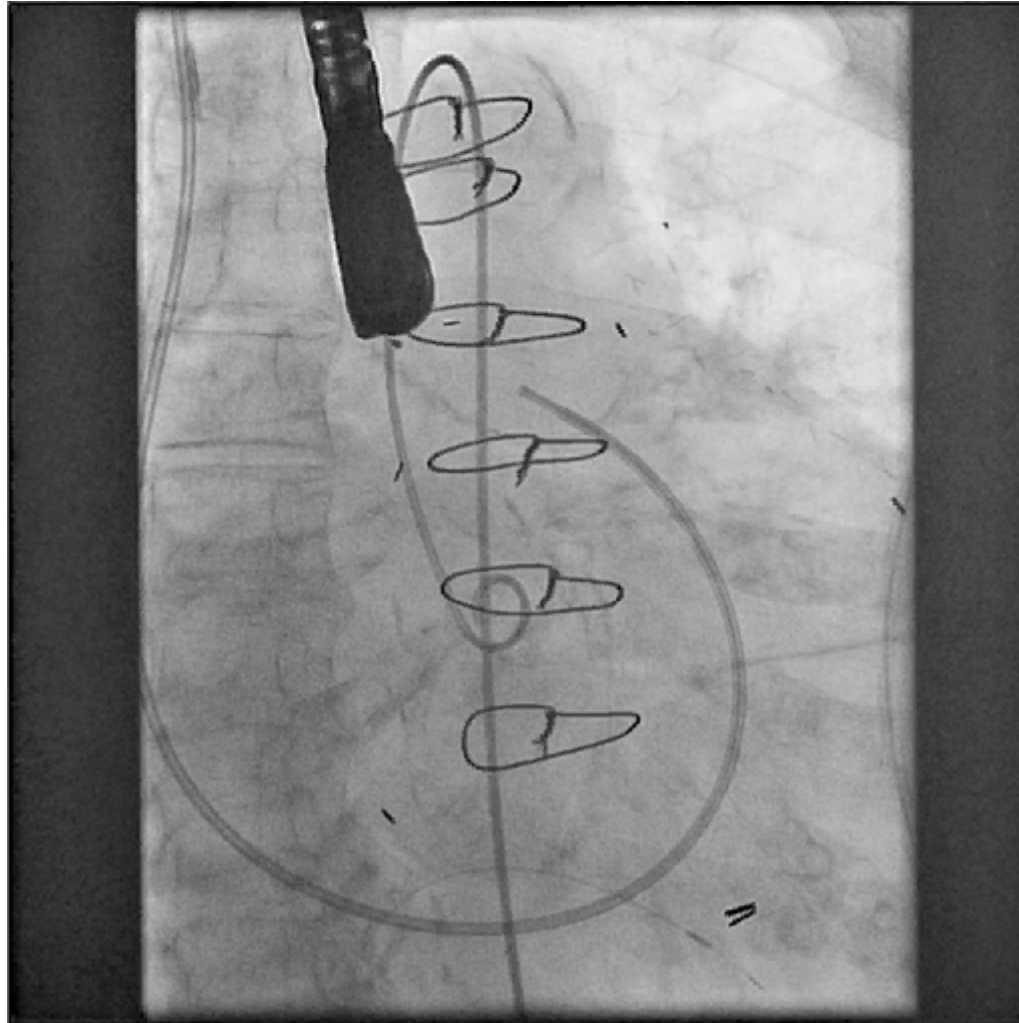
Pre planning



Live Guidance



Alignment of Aortic Sinuses. Rotating Aortogram

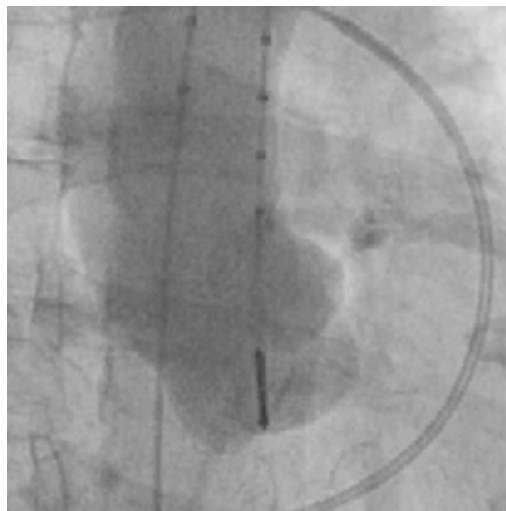
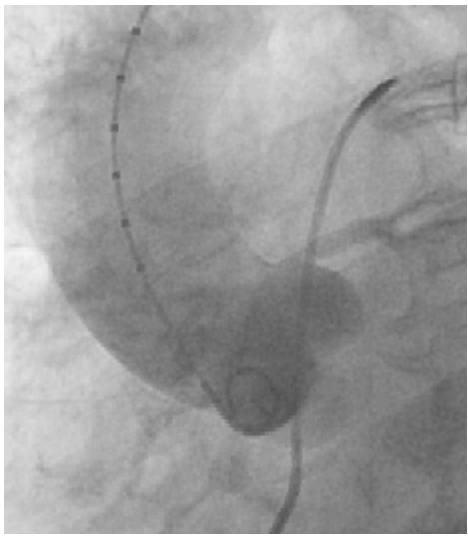


25 cc of diluted contrast at 15 cc/sec, 600 PSI. RV Pacing.

Rotating Aortogram.

12° Caudal, RAO to LAO.

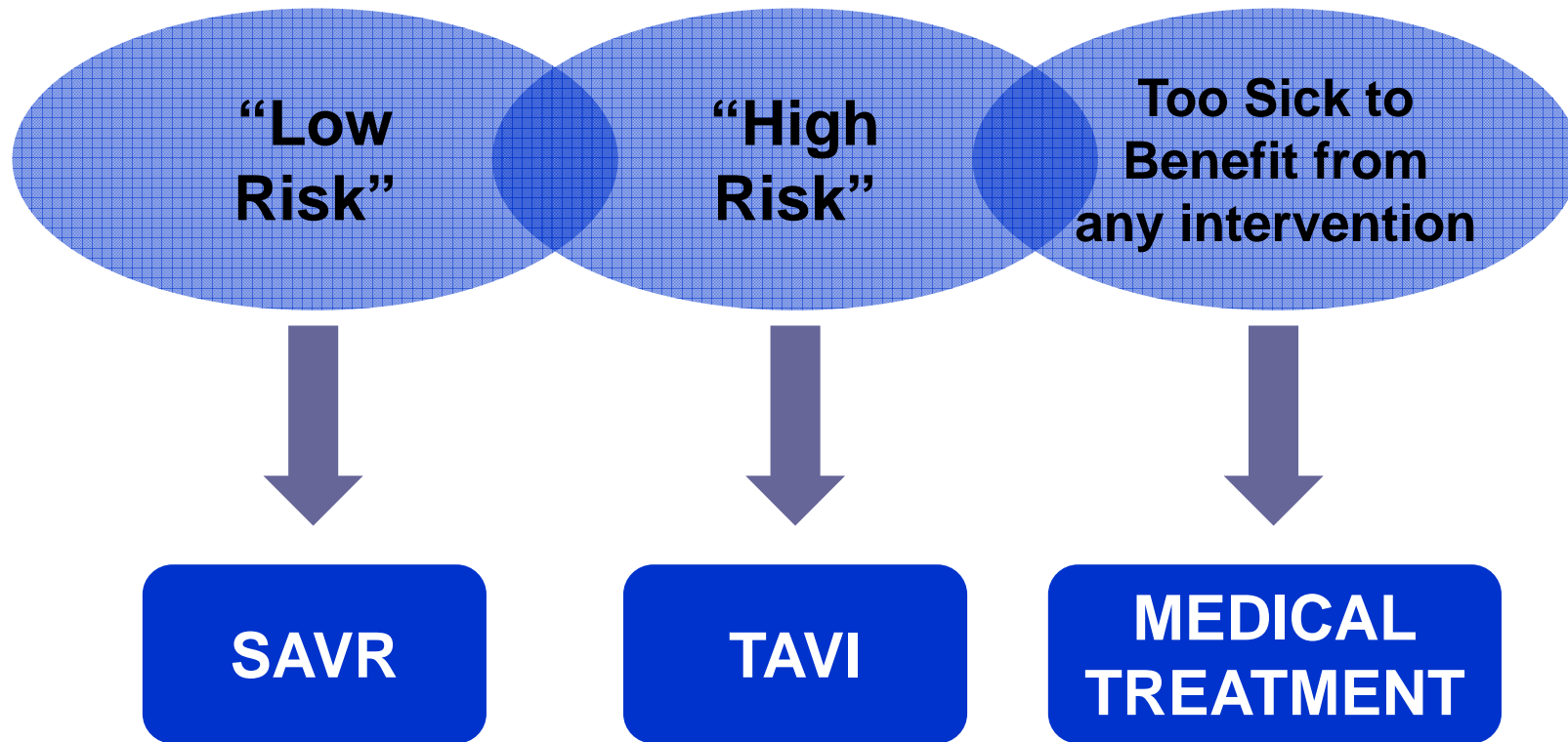
15 cc/sec, 20-25 cc diluted contrast. Rapid RV pacing



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« Heart Team » Assigns Patient to:



Too Sick for T-AVR?

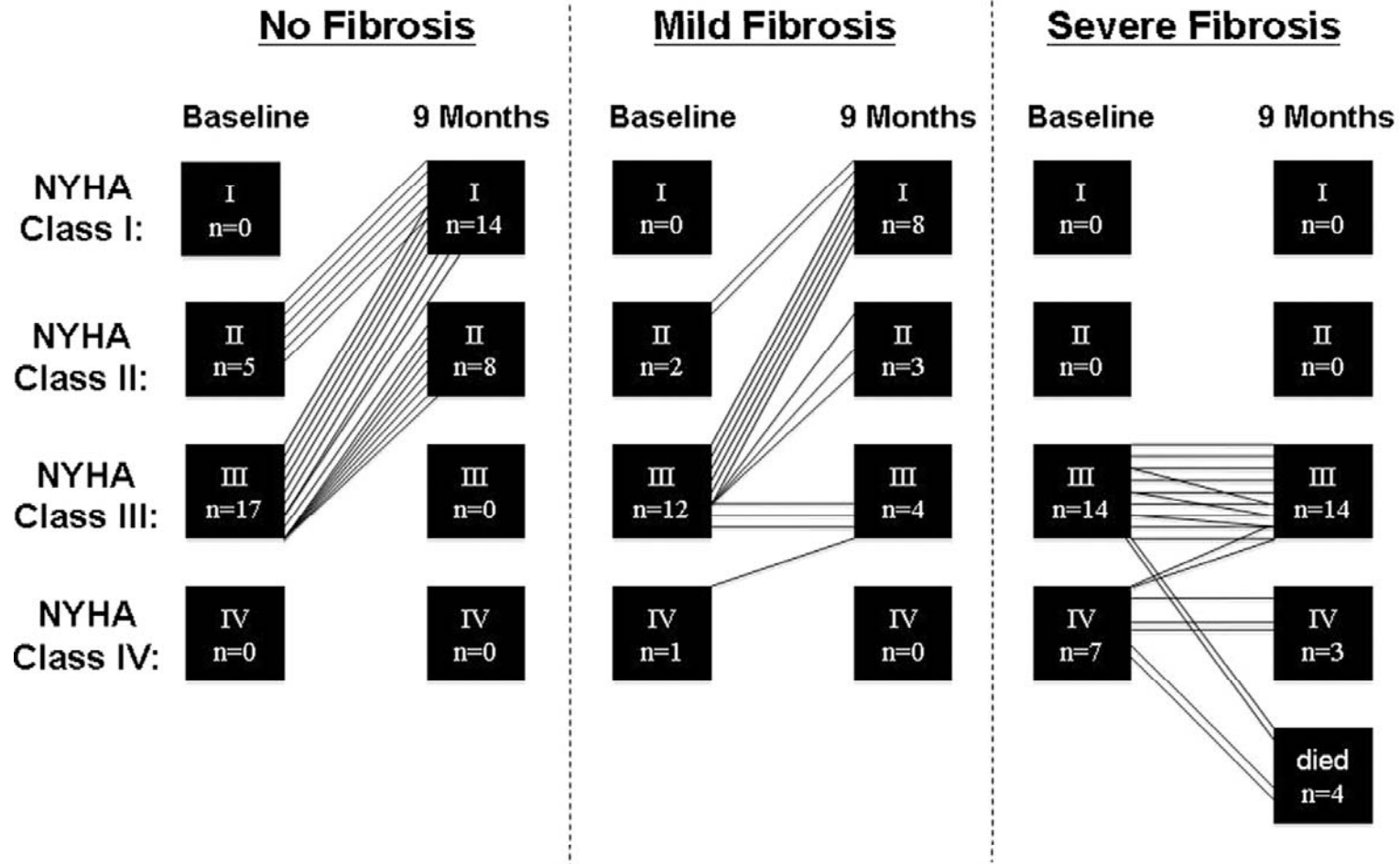
“The patient with multiple comorbidities and multisystem failure will not feel different with or without aortic stenosis”.

(STS, EuroScore, T-AVR Score)

Is Severe LV Dysfunction Irreversible?

Myocardial Fibrosis by MRI

Weideman et al. *Circulation*. 2009;120:577-584



Aortic Valvuloplasty to help Select T-AVR Candidate

1. Excellent tool to evaluate:

- Reversibility of severe LV dysfunction, severe MR, severe pulmonary hypertension.
- Improvement of symptoms.

2. It may improve Outcome of AVR (S or T), specially in the very sick patients:

- Data from Tissot et al (PCR 2010), WHC, and preliminary data from Partner.

Conclusions

- 1. The advent of T-AVR (TAVI) has initiated a revolution in the treatment of severe aortic stenosis and in Medicine in general.**
- 2. Major advances in technology will expand the indications and outcomes of T-AVR.**
- 3. Optimal patient selection remains most important.**

The end