

Complex Indications

**Valve-in-Valve, Bicuspid, Combined CAD,
LV Dysfunction**

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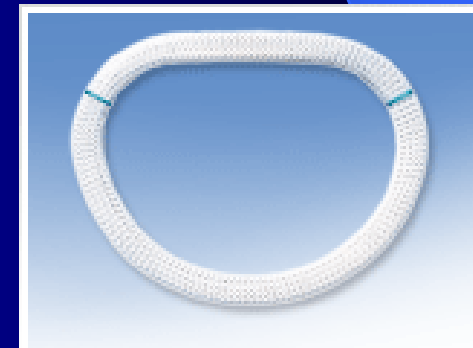
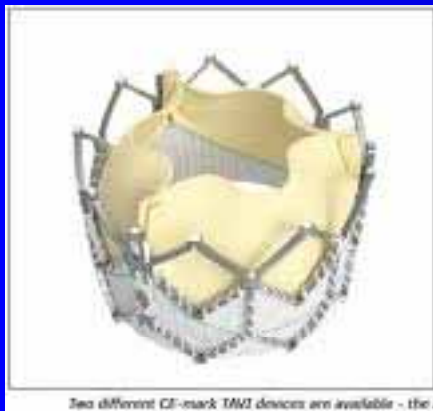
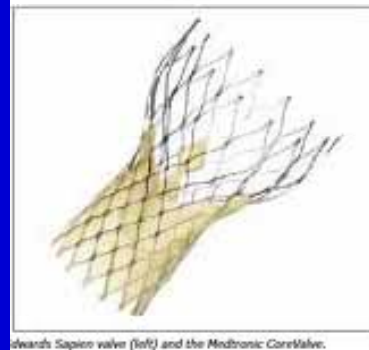
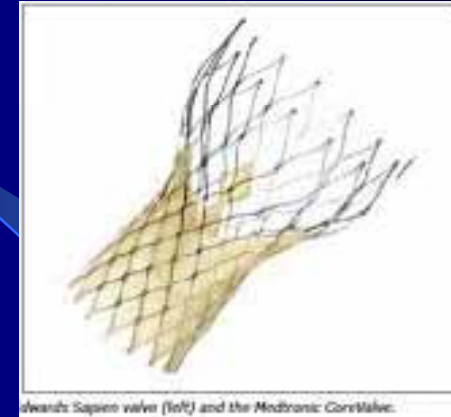
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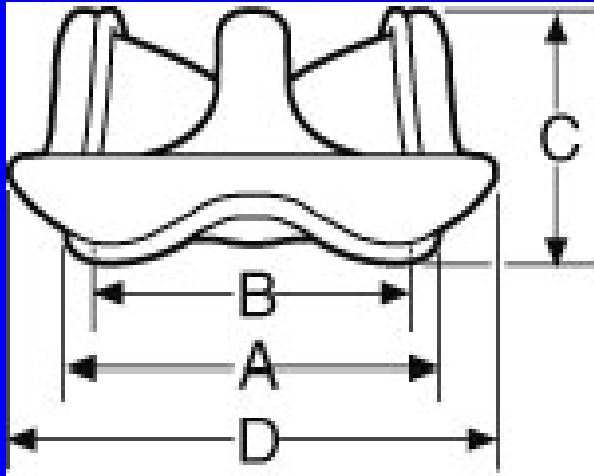


Valve-In-Valve



Size of Surgical Valve

Aortic Pericardial Tissue Valve



A. Mounting Diameter (Annulus)

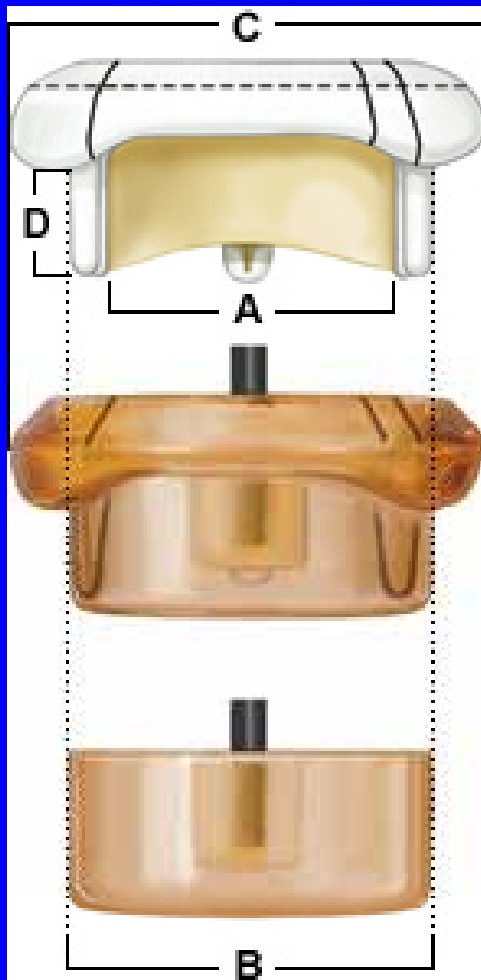
B. Internal Diameter (Stent I.D.)

C. Profile Height

D. External Sewing Ring Diameter

Size	19mm	21mm	23mm	25mm	27mm	29mm
A	19	21	23	25	27	29
B	18	20	22	24	26	28
C	13	14	15	16	17	18
D	28	31	33	35	38	40

Mitral Pericardial Tissue Valve (Model 7300TFX)

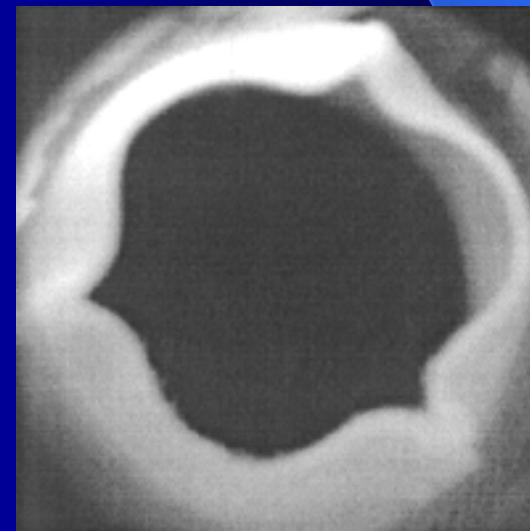


- A** Stent diameter (wireform)
- B** Tissue annulus diameter
- C** External sewing ring diameter
- D** Anterior effective profile

Size	25 mm	27 mm	29 mm	31 mm	33 mm
A	25	27	29	31	33
B	28	29.5	31.5	33.5	33.5
C	36	38	40	42	44
D	7	7.5	8	8.5	8.5

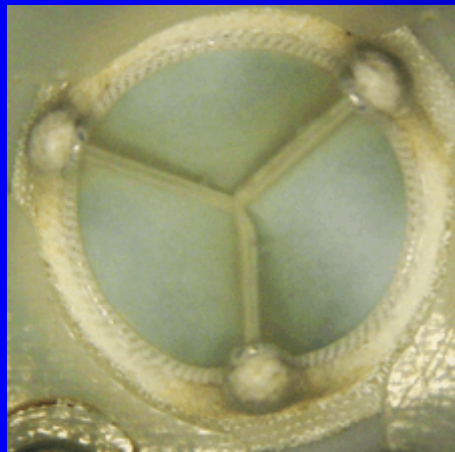
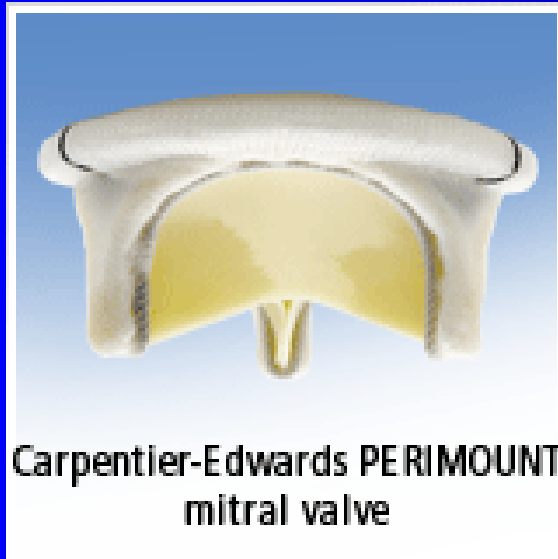
Design of Surgical Valve

Leaflets Mounted Outside Struts



Design of Surgical Valve

Leaflets Mounted Inside Struts

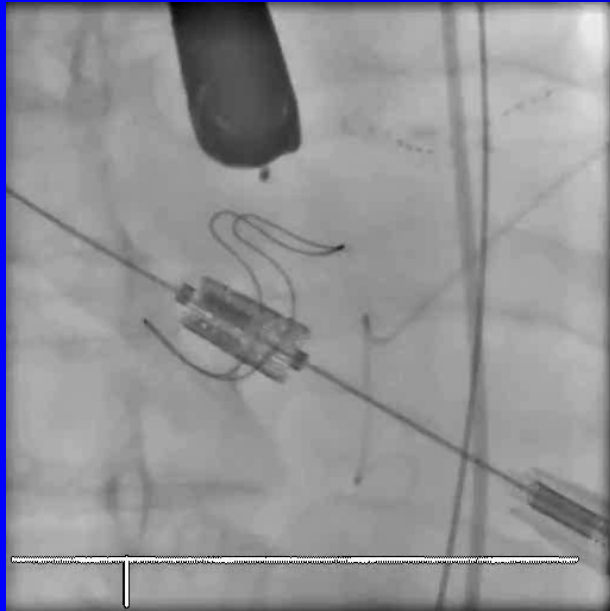


Design of Surgical Valve

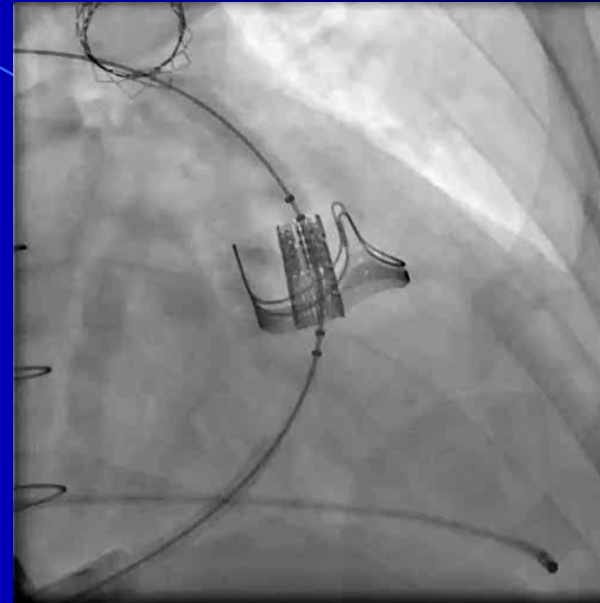
Stentless and Homograft Aortic Valves



Location of Surgical Valve



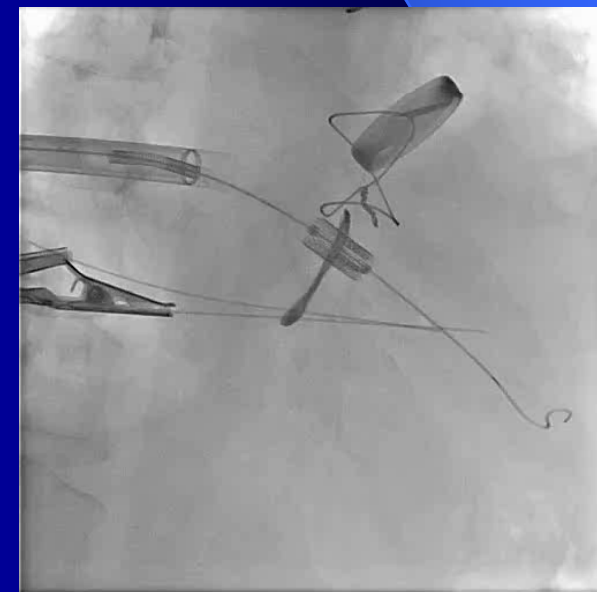
AV



PV



MV



TV

Aortic Valve-in-Valve Echo Results

Size of Surgical valve (mm)	Number of Patient	Size of Sapien THV (mm)	AI/Paravalvular leak	Mean Gradient (mm Hg)
21	5	23	no/trivial	27.8 (11-48)
23	6	23	no/trivial	23.2 (20-27)
25	2	23 or 26	no	6.0 (1-11)

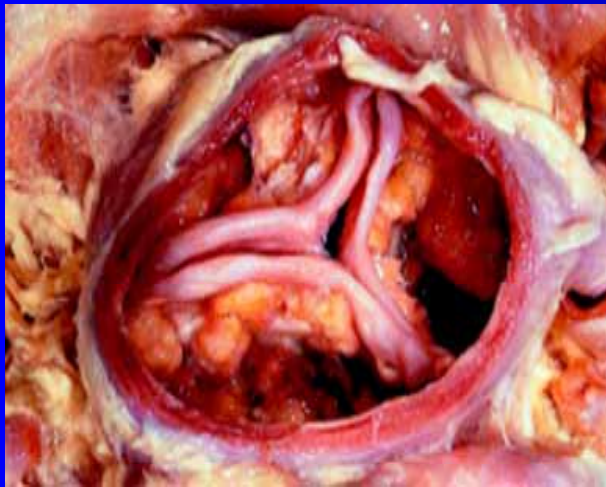
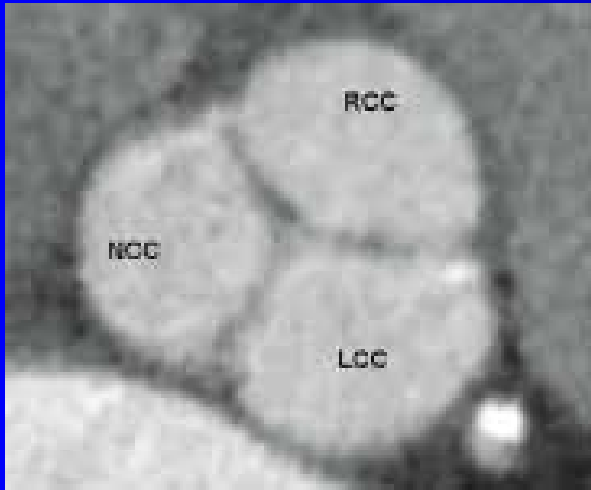
Mitral Valve-In-Valve Echo Results

Size of Surgical valve (mm)	Number of Patient	Size of Sapien THV (mm)	AI/paravalvular leak	Mean Gradient (mm Hg)
23	1	23	Trivial	6
25	3	23 or 26	No	6.5 (6-8)
27	5	23 or 26	No/trivial	7.6 (5-9)
29	2	26	No/trivial	5.0 (3-7)

Potential Candidates for Valve-in-Valve

- **Failed surgical or transcatheter valves**
- **High risk for conventional re-do valve replacement**
- **Age >70-75 y/o, particularly with prior CABG and patent grafts**
- **Optimal sizes of surgical valves >21mm**
- **No risk for LM obstruction**
- **Very limited experience in transcatheter valve into surgical rings and homografts**

Bicuspid Aortic Valve

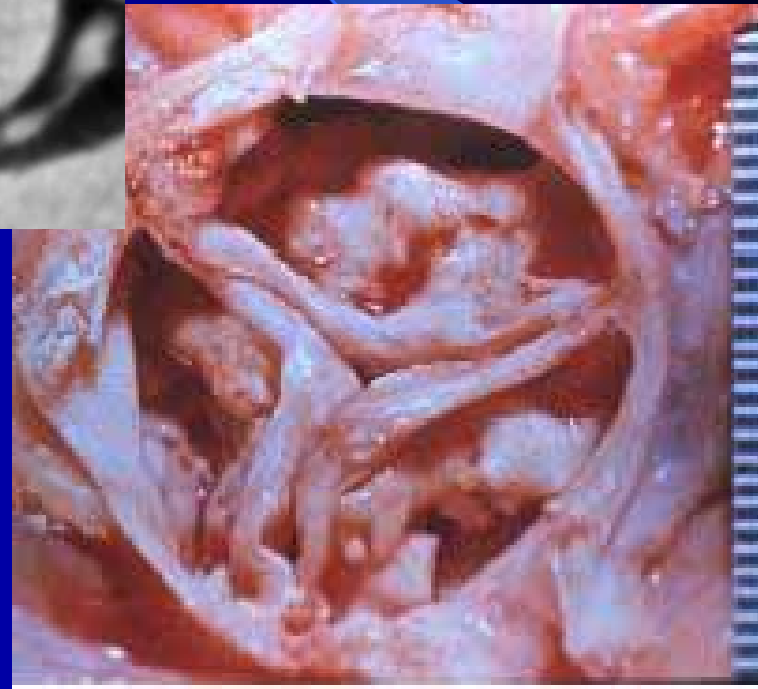
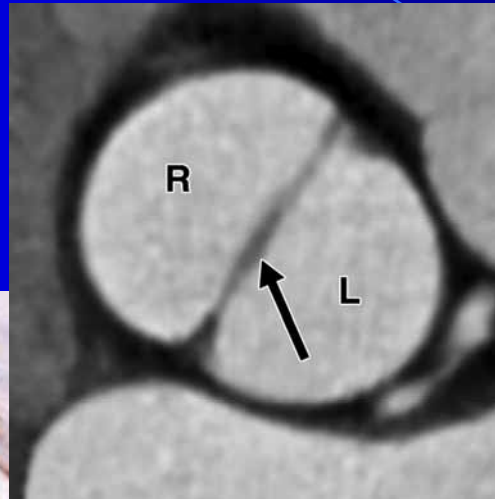
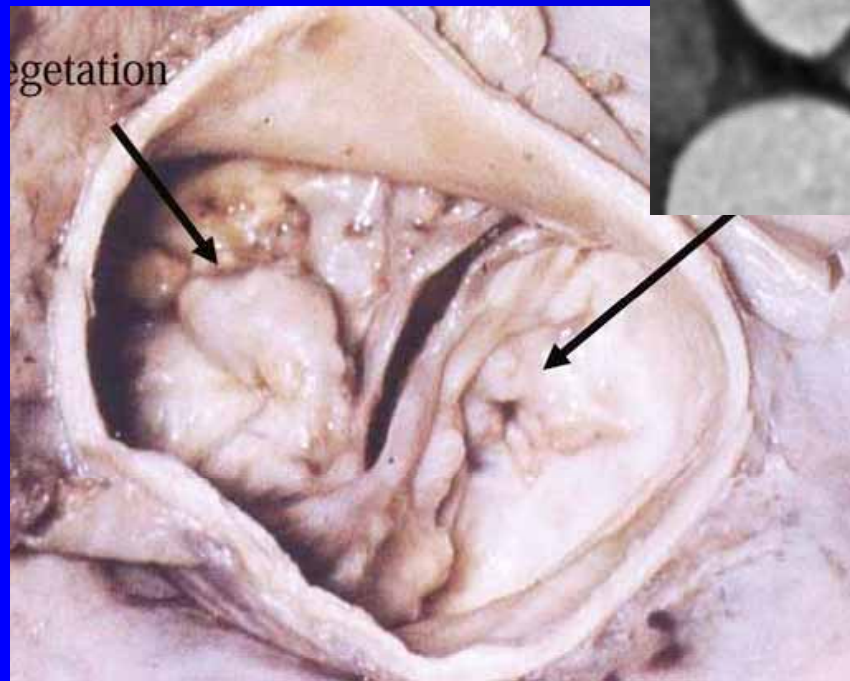


Tricuspid AV



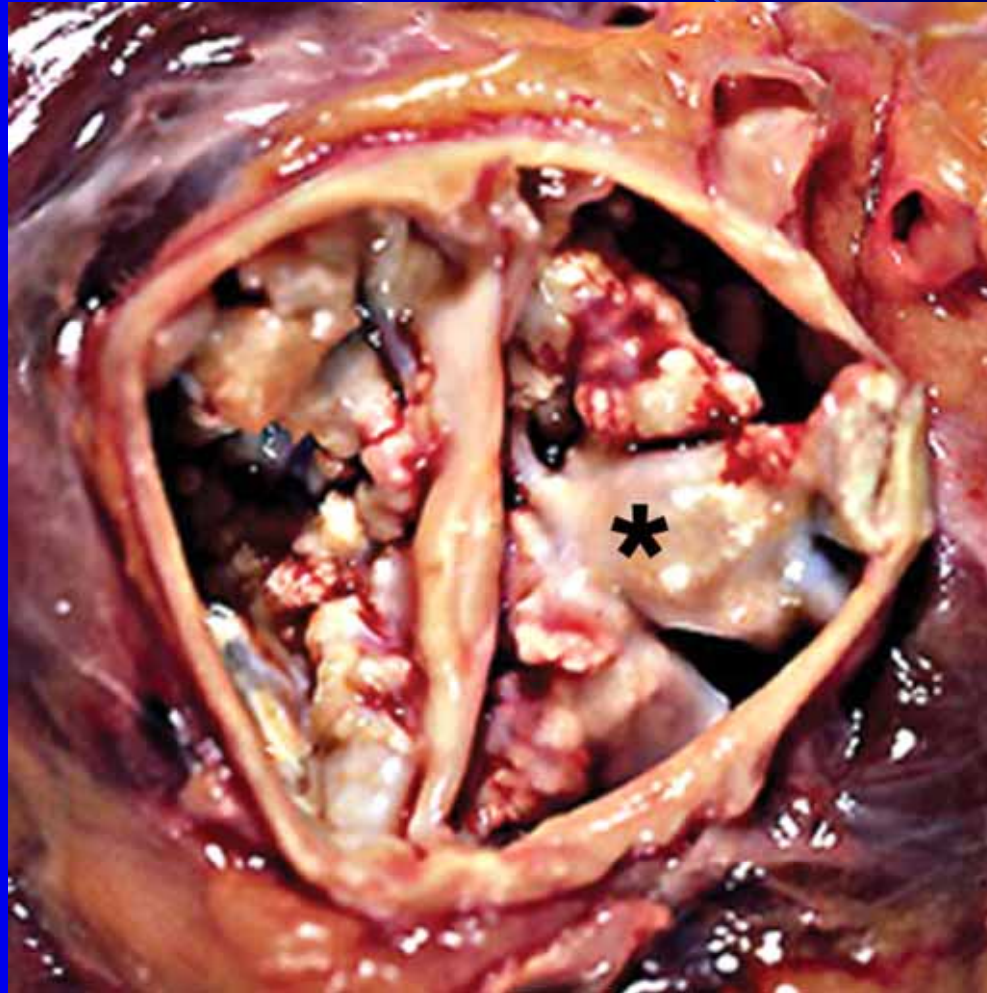
Bicuspid AV

Challenges *Annulus Sizing*



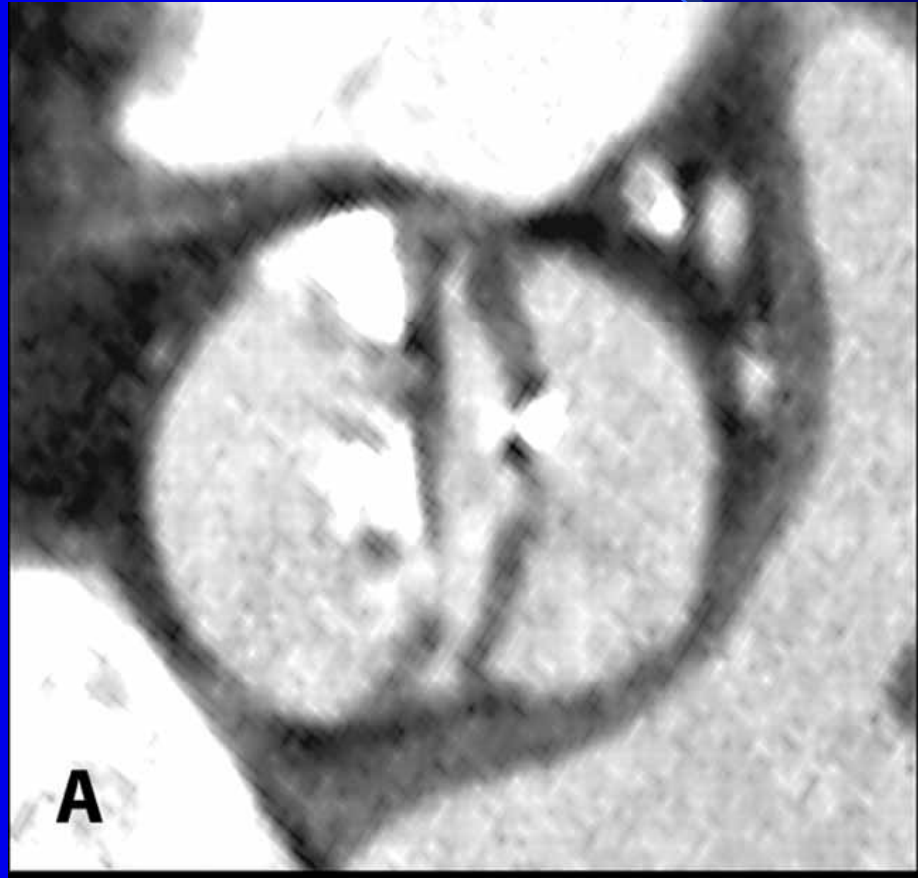
Challenges

Paravalvular leak



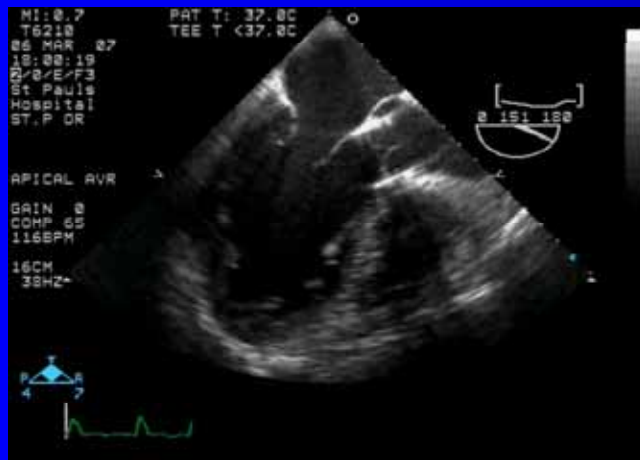
Challenges

Valve Migration or Embolization



Challenges

Valve Migration or Embolization



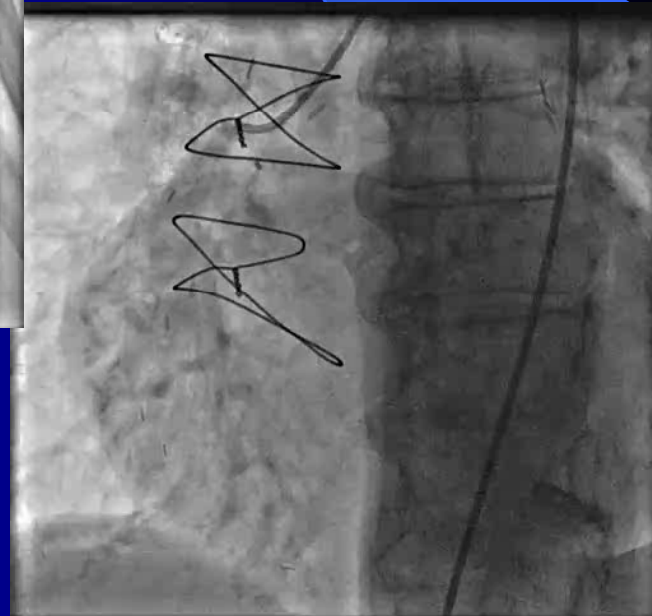
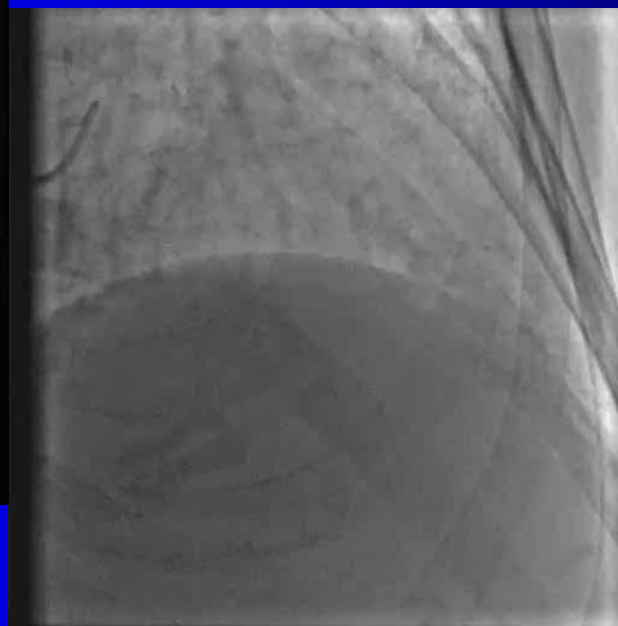
Key Points for Success

- **Careful assessment of amount and distribution of calcification**
- **Accurate measurement of aortic annulus:
CT + TEE ± balloon valvuloplasty**
- **Ascending aortic dilatation/aneurysm:
transapical approach may be better**
- **Careful evaluation of risk for LM obstruction**
- **Consideration of re-dilatation**
- **Relative contraindication for new centers**

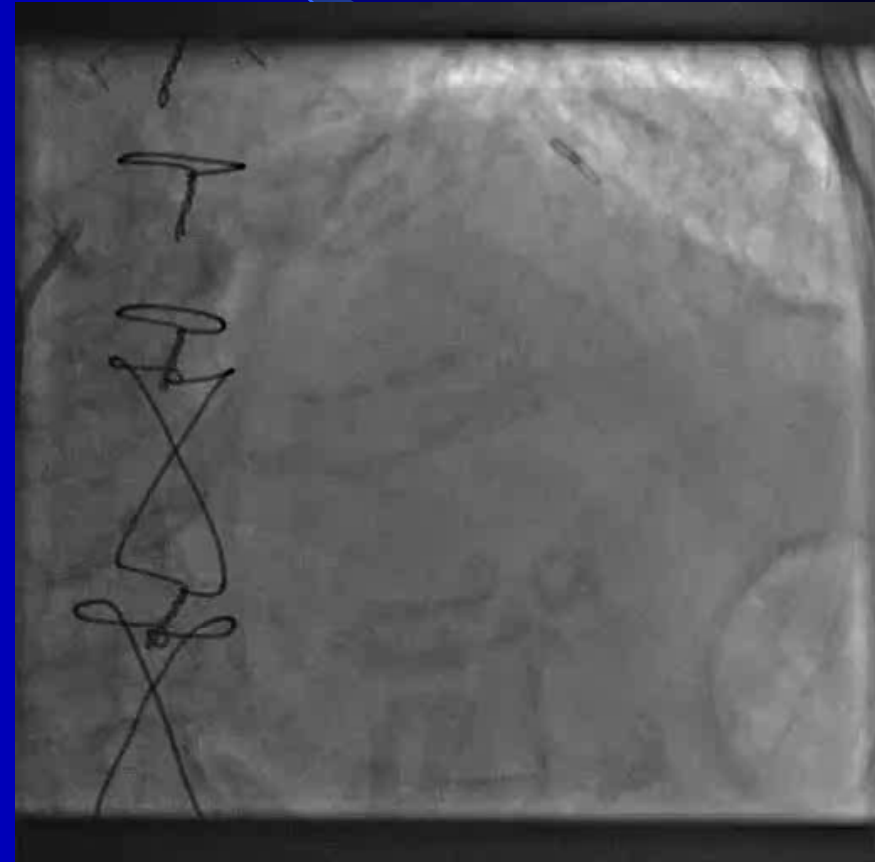
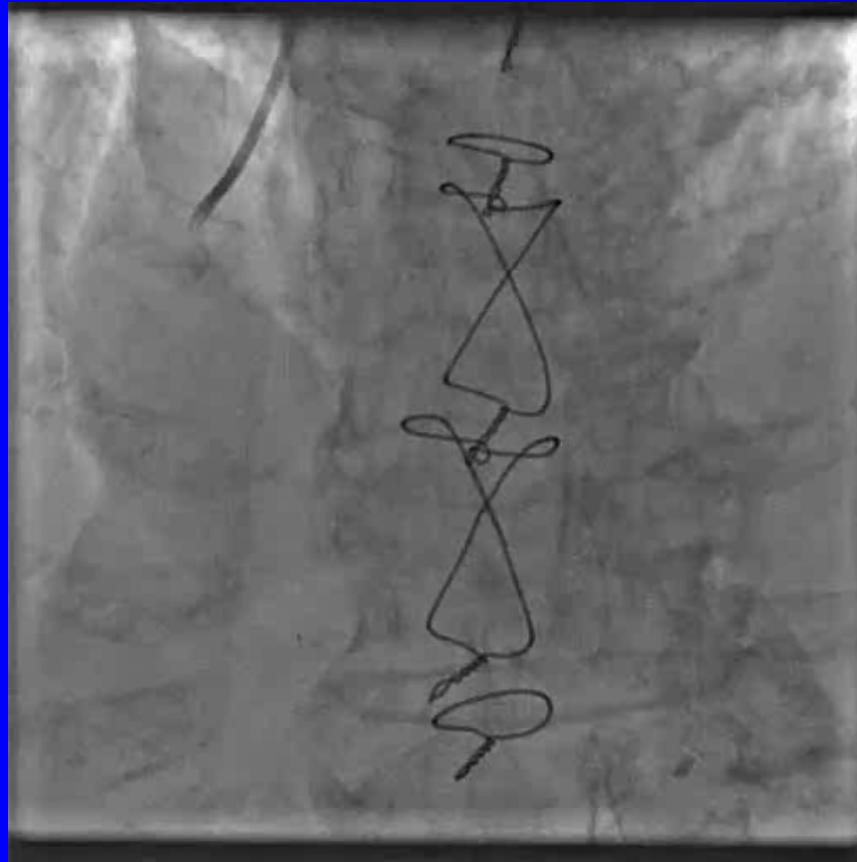
Combined CAD

- **Common in the elderly**
- **High risk patients:**
 - Hybrid (staged or combined) procedure (PCI + TAVI)**
- **Low-mod risk patients**
 - Conventional CABG + AVR**
- **Perioperative MI is rare**
- **Feasibility of PCI after TAVI**
- **Poor revascularization, poor mid-term survival**

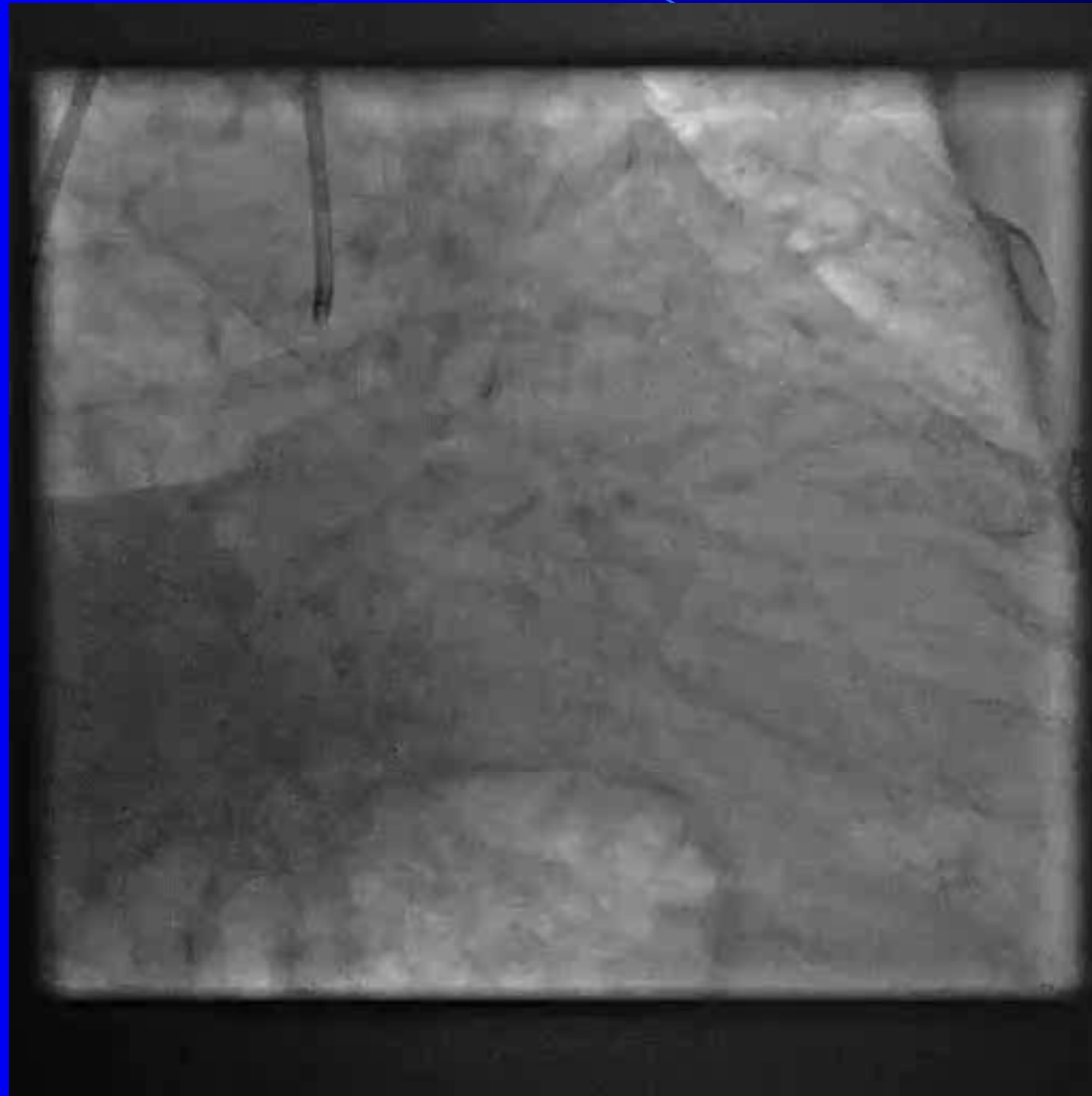
Significant Stenosis



Multiple Vessel CAD



Multiple Vessel CAD



Combined CAD

- **Pre-TAVI stenting:**
 - **Severe stenosis (>75-80%) in a major artery**
 - **Unstable angina or ACS**
 - **Large area of reversible ischemia**
 - **Significant LV dysfunction**
 - **Relatively low risk PCI**

LV Dysfunction

- **Increased operative risk and poor outcome:**
 - **LVEF <20%**
 - **Dilated LV with thin wall**
 - **Severe pulmonary hypertension**
 - **Severe MR**
 - **Ischemic cardiomyopathy without viability**
 - **Uncorrectable severe CAD**
 - **No contractility reserve (AVB or Stress Echo)**

Summary

- **Valve-in-valve:**
 - Feasible for all stented bioprosthetic valves
 - Excellent early outcomes
 - Potential high pressure gradient if surgical valve is 21mm or less
- **Bicuspid AV:**
 - Challenges in annulus sizing and valve positioning
 - Potentially increased paravalvular leak and need of re-dilatation
- **Coronary artery disease:**
 - Common in the elderly, but low incidence of periop MI
 - No hesitation to perform PCI before TAVI
- **LV dysfunction:**
 - BAV or Stress Echo if LVEF <20%
 - Increased operative risk and poor outcome if there is no contractility reserve