

# Transapical Aortic Valve Implantation *Techniques and Tips*



**Jian Ye, MD, FRCSC**

**Clinical Professor**

**Division of Cardiac Surgery, St. Paul's Hospital  
University of British Columbia, Vancouver, Canada**



PROVIDENCE  
HEART + LUNG INSTITUTE  
AT ST. PAUL'S HOSPITAL



# Disclosure Statement of Financial Interest

## Affiliation/Financial Relationship

Grant/ Research Support:

Consulting Fees/Honoraria:

Major Stock Shareholder/Equity Interest:

Royalty Income:

Ownership/Founder:

Salary:

Intellectual Property Rights:

Other Financial Benefit:

## Company

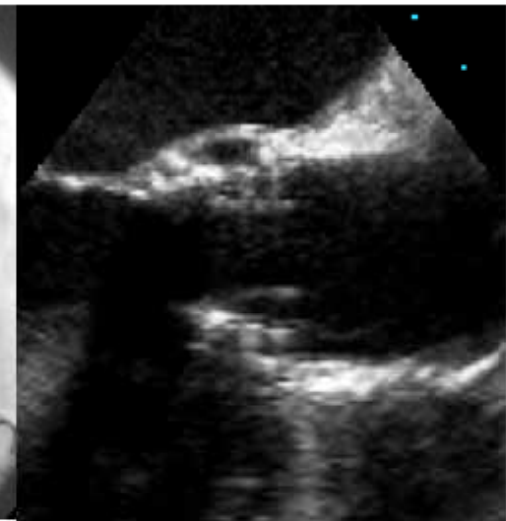
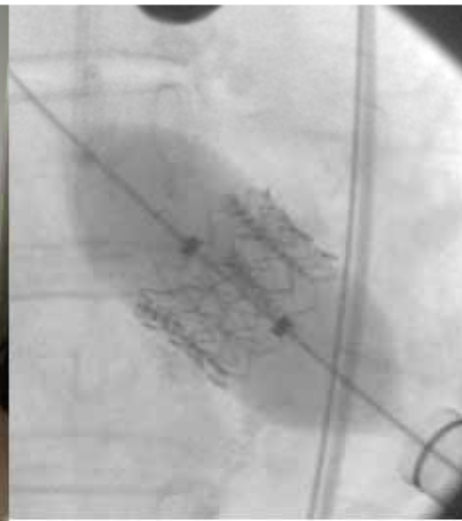
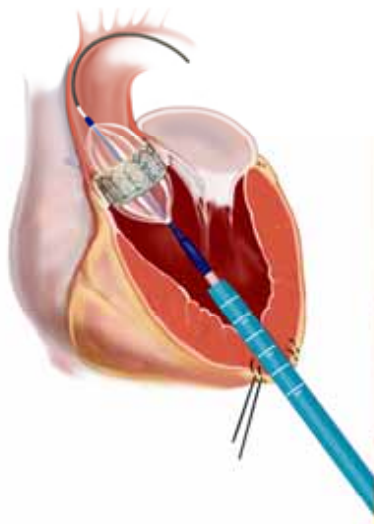
Edwards Lifesciences

# First Successful Transcatheter Transapical AVI

## Transapical aortic valve implantation in humans

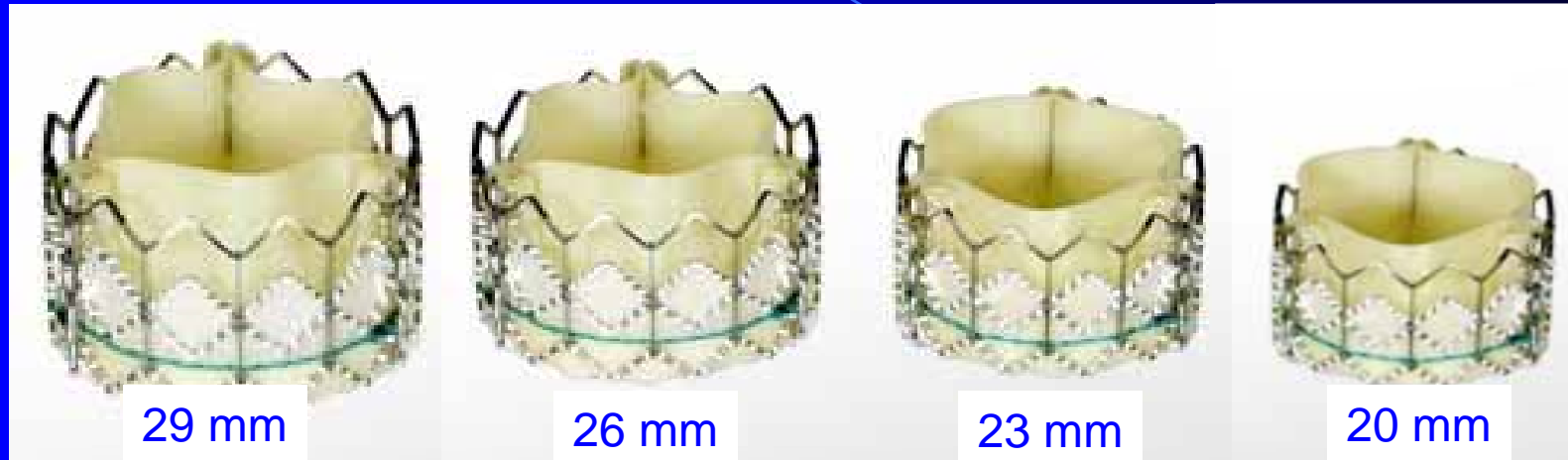
Jian Ye, MD, Anson Cheung, MD, Samuel V. Lichtenstein, MD, PhD, Ronald G. Carere, MD,  
Christopher R. Thompson, MD, Sanjeevan Pasupati, MD, and John G. Webb, MD, Vancouver, BC, Canada

J Thorac Cardiovasc Surg 2006;131:1194-6



October 2005

# Edwards SAPIEN™ Transcatheter Heart Valve

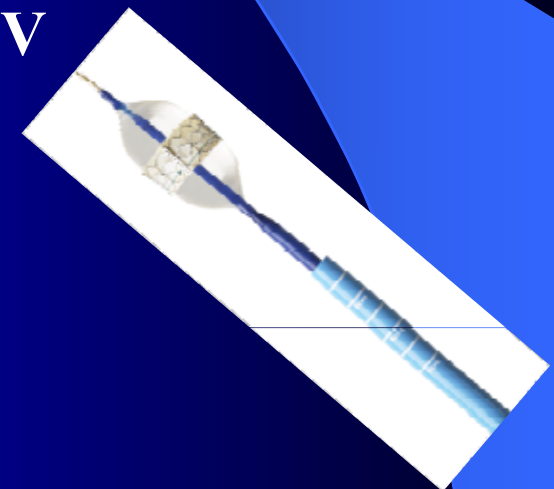


## Edwards SAPIEN™ THV

3 delivery options



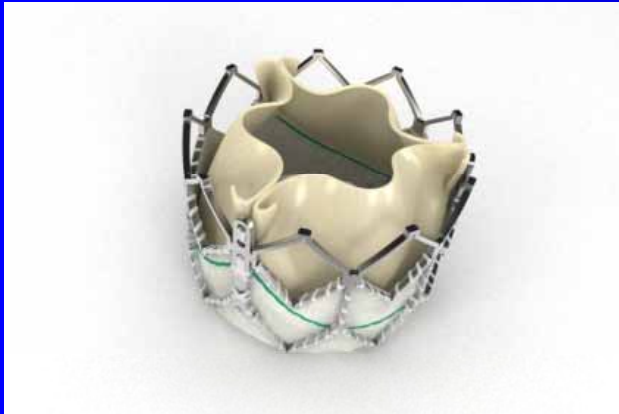
**Transfemoral**



**Transapical**

**Transaortic**

# Edwards Ascendra 2™ Delivery System



SAPIEN XT™ THV



Delivery System



Introducer Sheath Set



Crimper



Balloon Catheter



Inflation Device

# Selection of Balloon-Expandable Valve Sizes

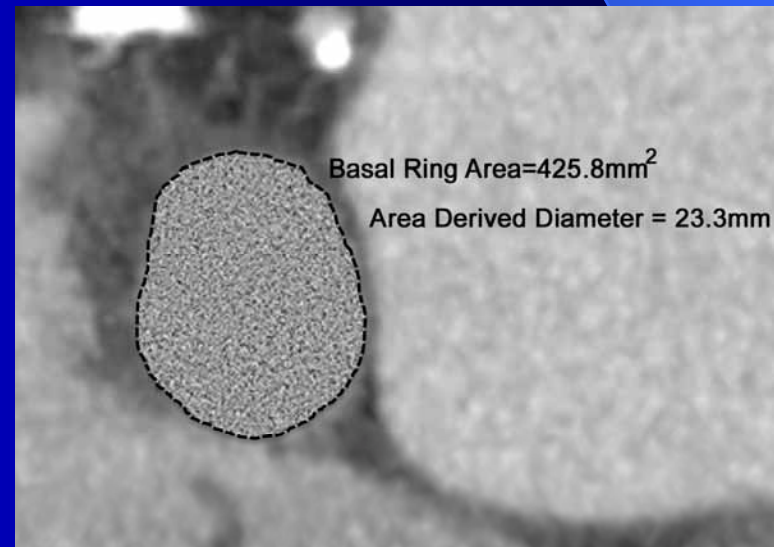
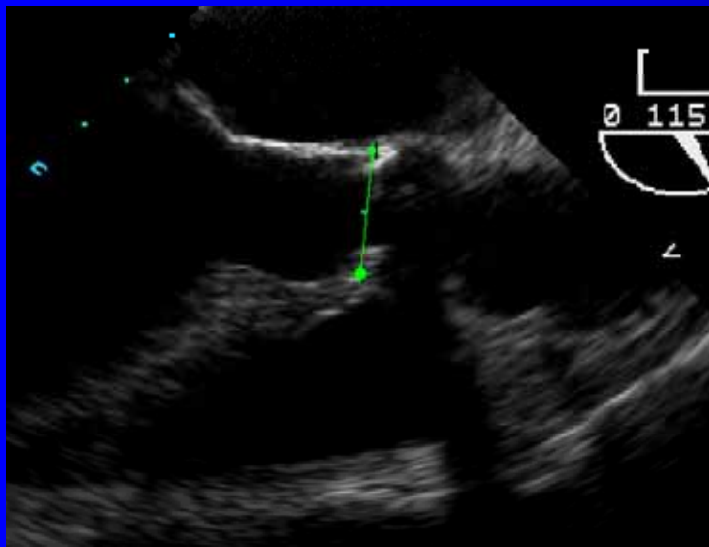
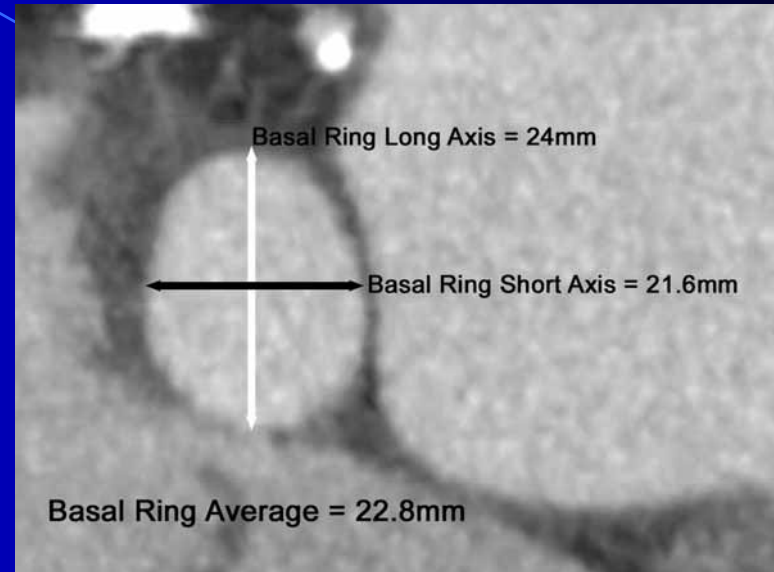
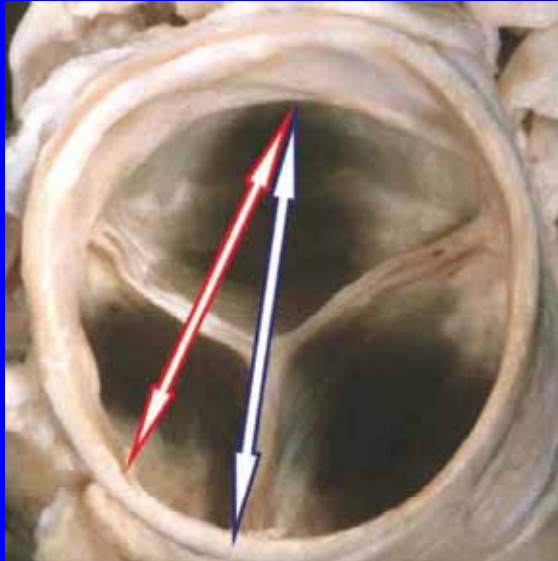
- 20 mm valve for an annulus diameter of  $\leq 18$  mm
- 23 mm valve for an annulus diameter of 18-22 mm
- 26 mm valve for an annulus diameter of 22-25 mm
- 29 mm valve for an annulus diameter of 25-28 mm

# Preparation

- **CPB or ECMO system**
- **Cell saver (option)**
- **Good IV access (central line)**
- **Smallest size of femoral artery cannula**
- **One perfusionist in OR**
- **Packed red blood cells checked and ready for emergent transfusion**
- **Surgical instruments for urgent sternotomy**
- **Two surgeons or one surgeon with an appropriate assistant**

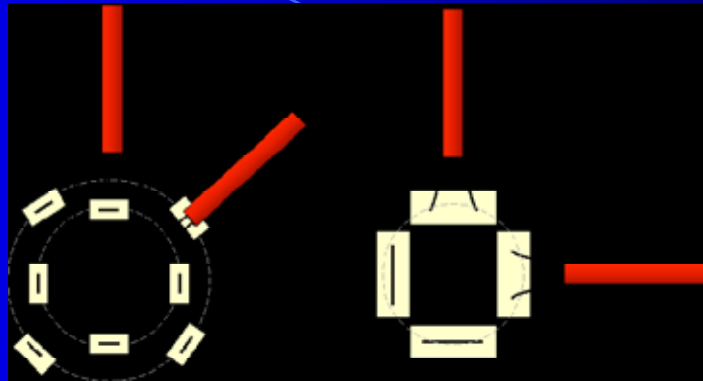


# Sizing of Aortic Annulus





# Apical Suture

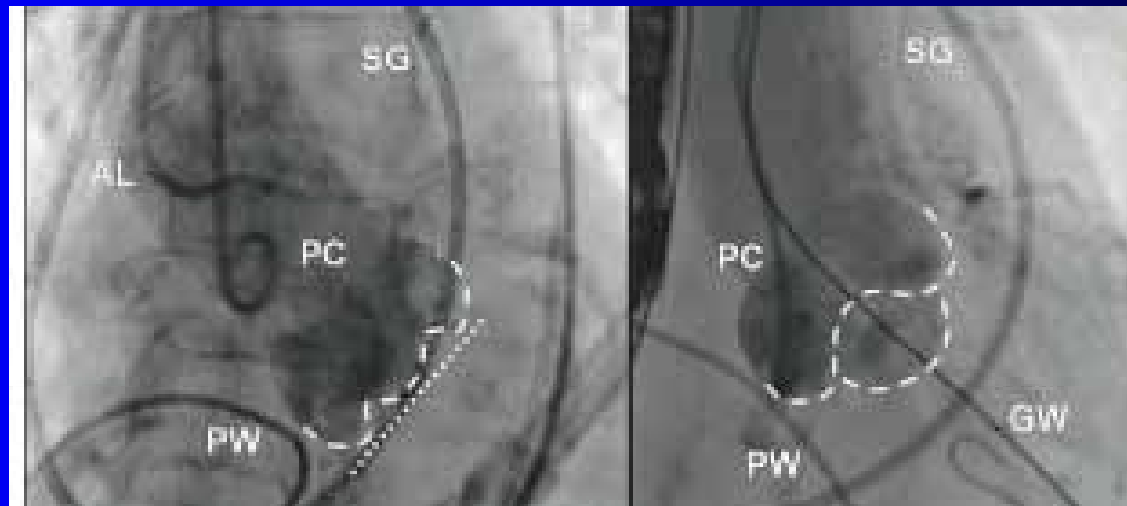
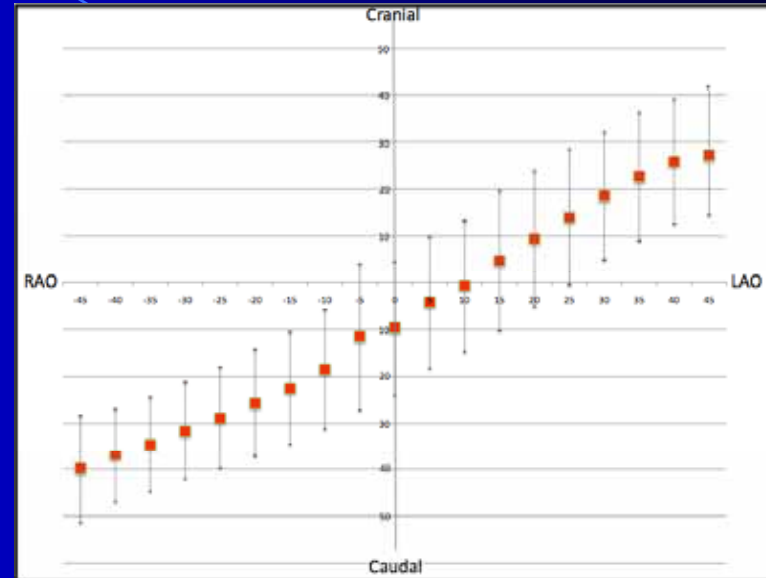
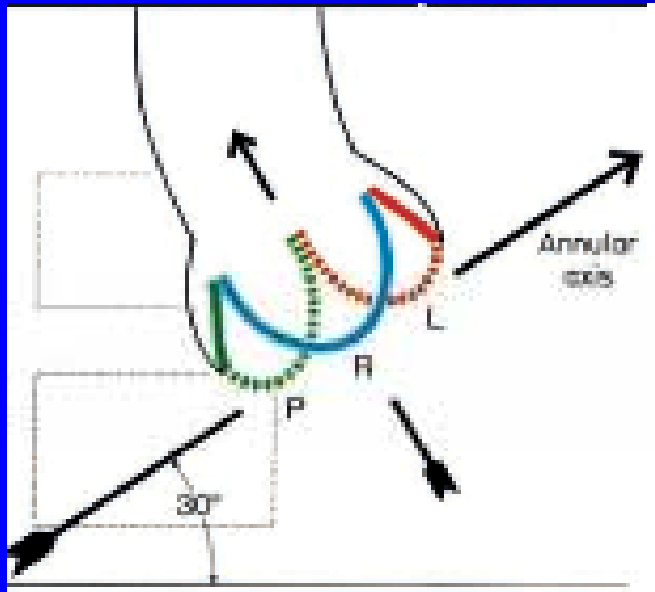


**Two apical purse-string sutures using 2-0 Prolene with 8-10 interrupted pledgets**



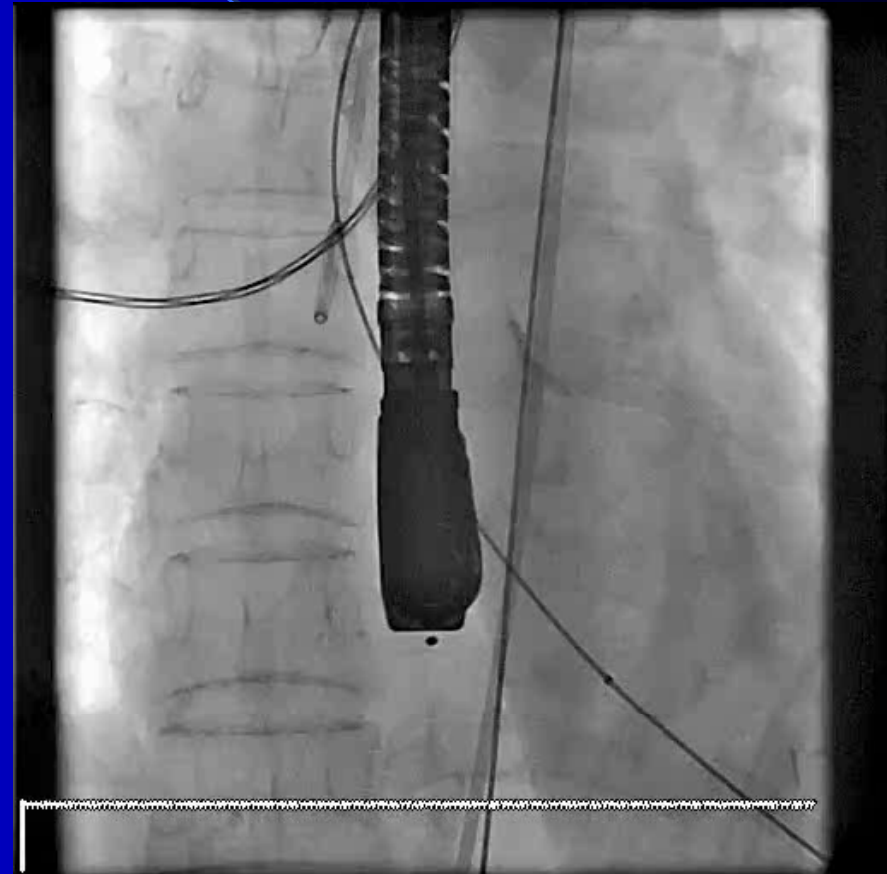
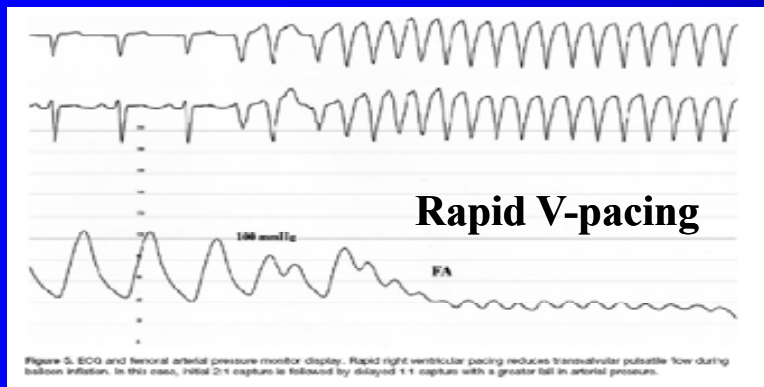
**Two perpendicular mattress sutures using either 2-0 or 3-0 Prolene with 4 large pledgets (1.5 – 2.0 cm in length)**

# Optimal Fluoroscopic View

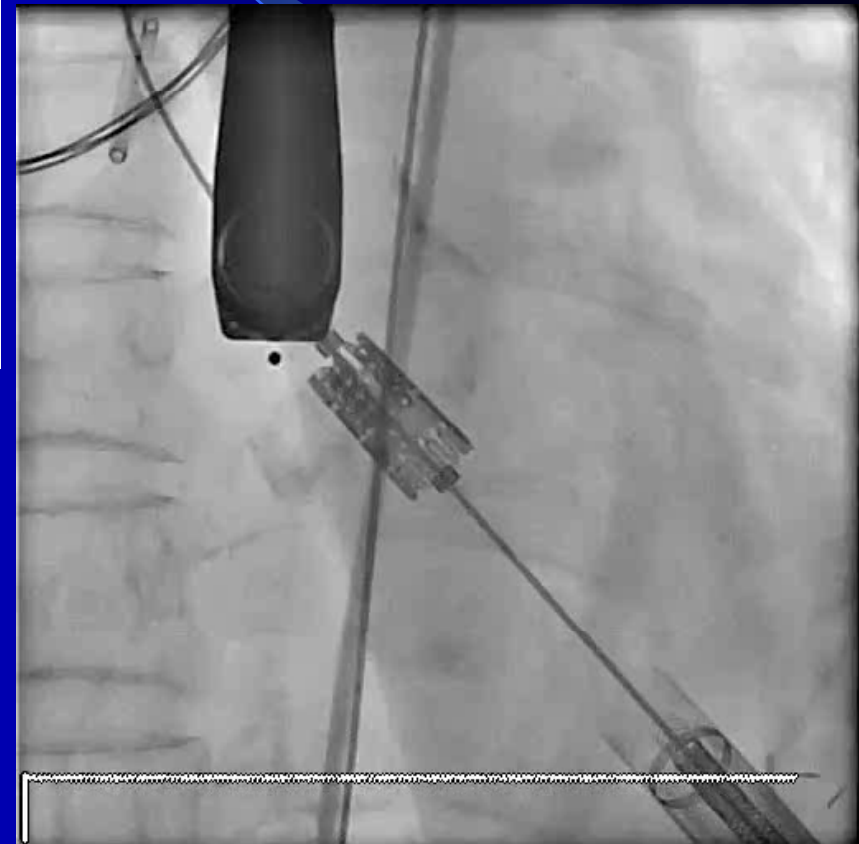
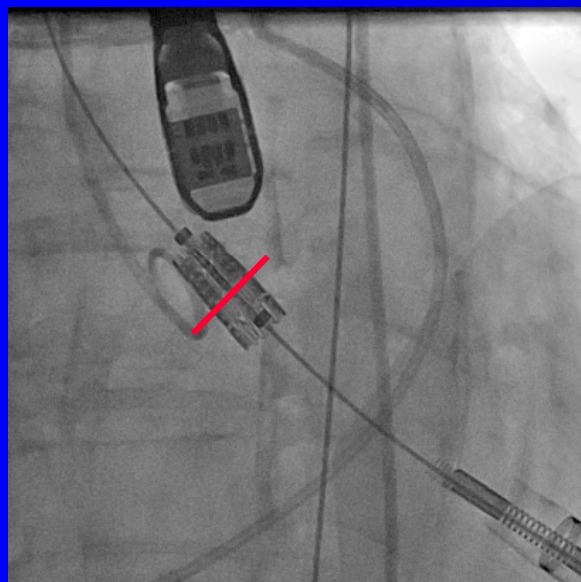
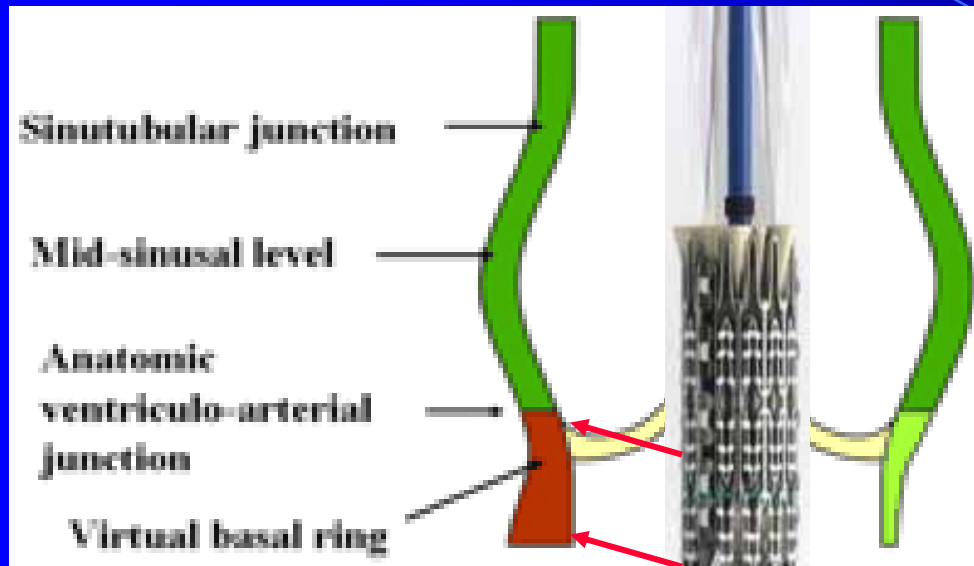


# Balloon Aortic Valvuloplasty

- 20 mm balloon
- ? necessary



# Valve Positioning



# Transapical Approach

- **Major advantages:**
  - (1) no limitations on valve and delivery sheath sizes
  - (2) less intra-aortic manipulation
  - (3) a short straight route
  - (4) better coaxial alignment /stabilization
  - (5) most suitable way for valve-in-valve implantation
  - (6) Antegrade approach to aortic valve
  - (7) less fluoroscopic time and amount of IV contrast
- **Disadvantages:**
  - (1) general anesthesia
  - (2) mini-thoracotomy
  - (3) relatively longer learning curve