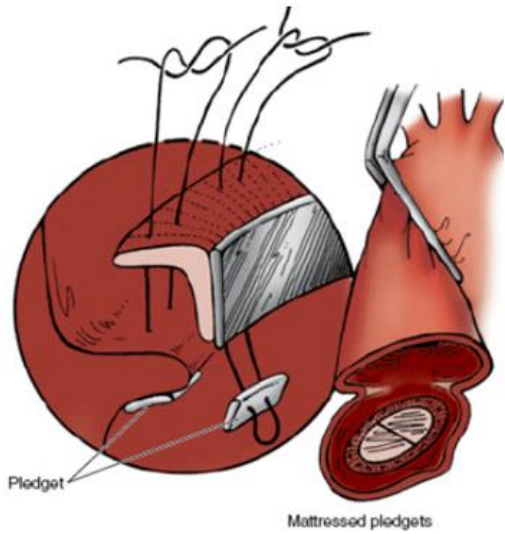


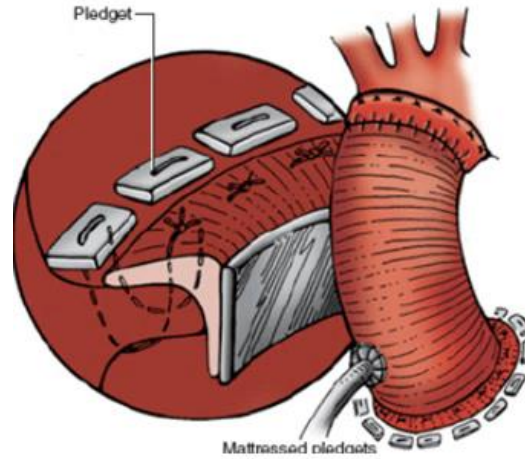
# **Indication and Techniques of Aortic Valve Surgery**

Joon Bum Kim, MD, PhD

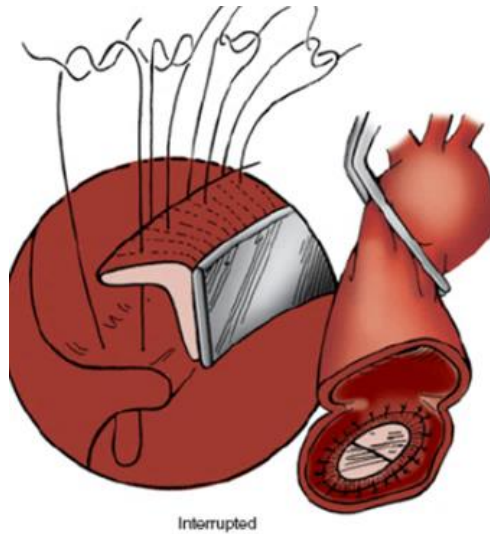
# AVR suture methods



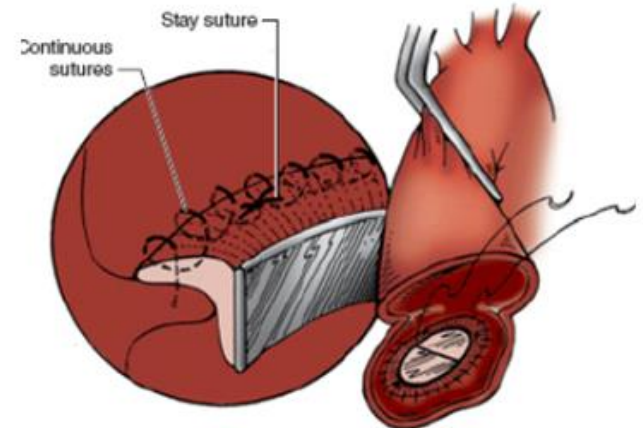
**Non-everting mattress**



**Everting mattress**

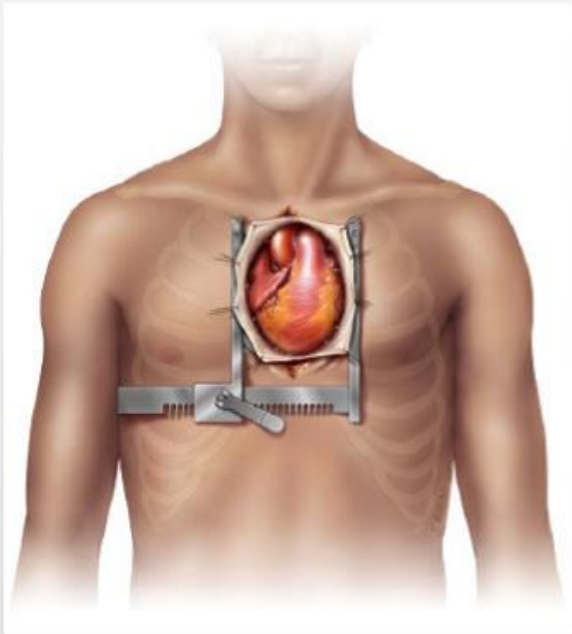


**Simple interrupted**



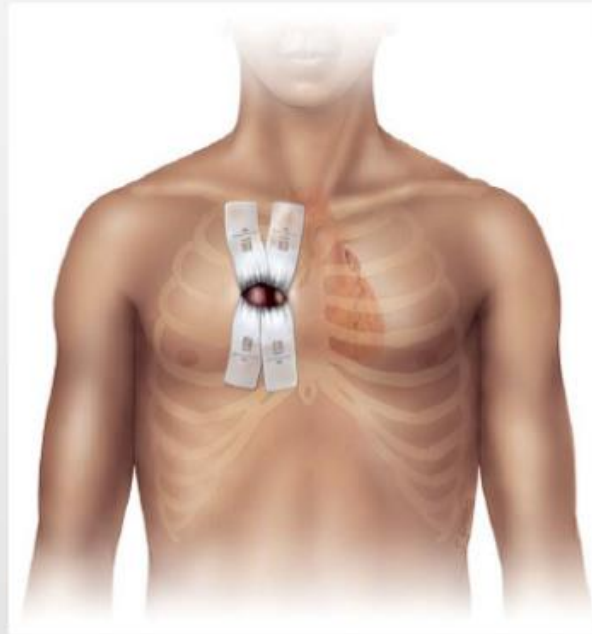
**Continuous**

## Conventional

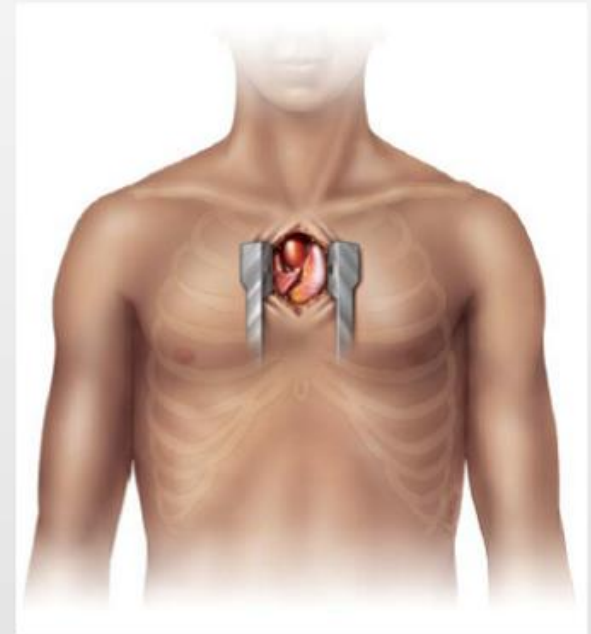


Open-chest or Sternotomy

## Minimal Incision



Right Anterior  
Thoracotomy



Mini-sternotomy

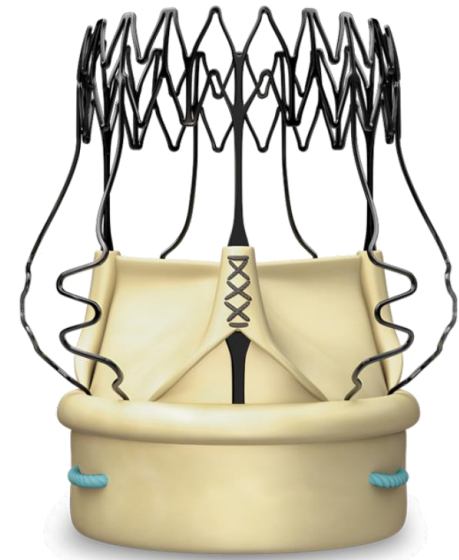
Rapid Deployment / Sutureless AVR

# Rapid Deployment / Sutureless AVR

## Intuity



## Perceval



## Phenotypes of the ascending aorta



Aortic root aneurysm  
Valsalva  $\geq 45$  mm



Supra-coronary aneurysm  
Valsalva  $< 40$  mm  
Supracoronary Aorta  $> 45$



Isolated AI  
Valsalva  $< 40$  mm  
Supracoronary Aorta  $< 40$

## Standardized and physiological approach to aortic valve repair

### Root reconstruction



Remodeling  
+ sub-valvular  
annuloplasty



Supra-coronary  
graft + sub-valvular  
annuloplasty  
(annulus  $\geq 25$  mm)



Sub-valvular  
annuloplasty  
(annulus  $\geq 25$  mm)

### Cusp repair



Alignment of cusp free edges



Resuspension of cusp effective height

+

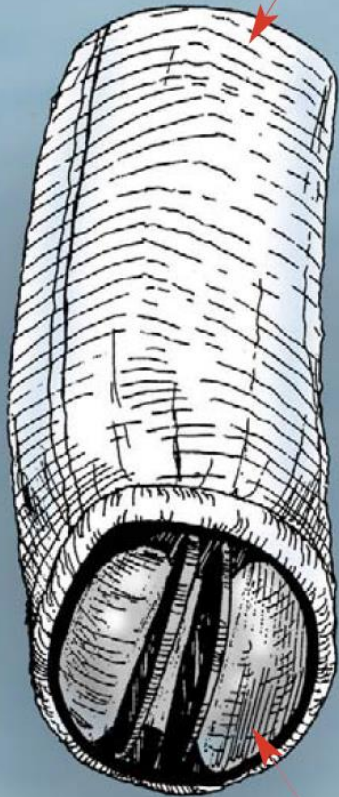


Subvalvular external aortic annuloplasty



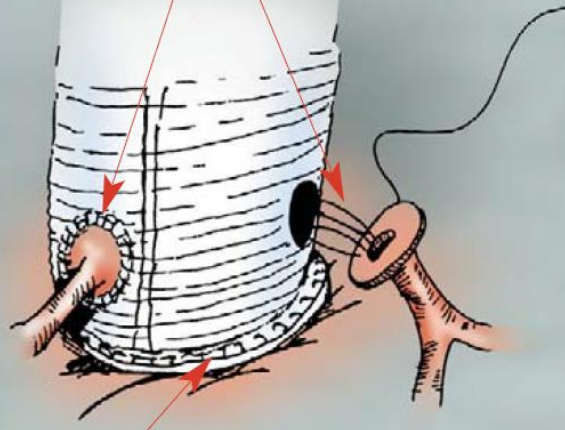
# Bentall Procedure

*woven tube vascular graft*



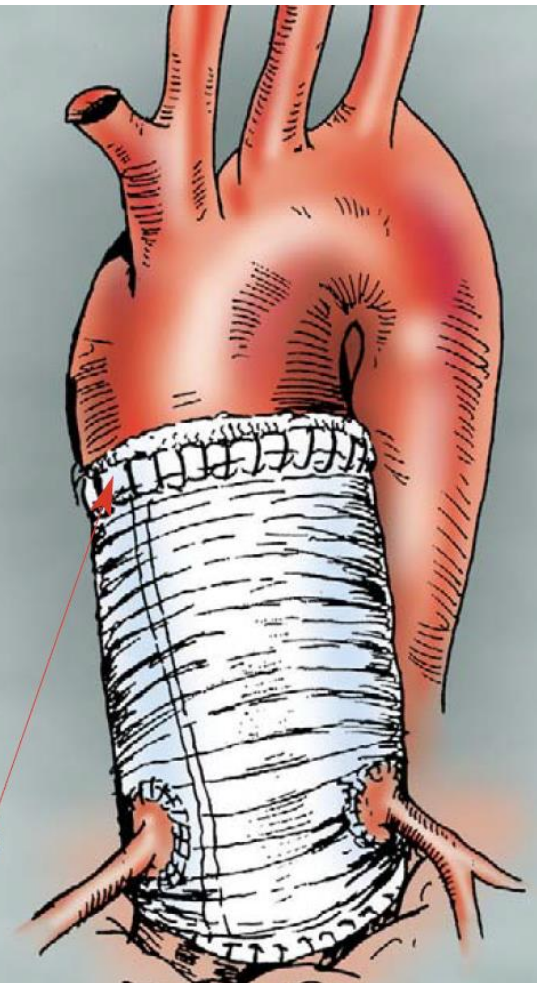
*mechanical prosthesis*

*coronary buttons  
sewn into holes  
punched in graft*

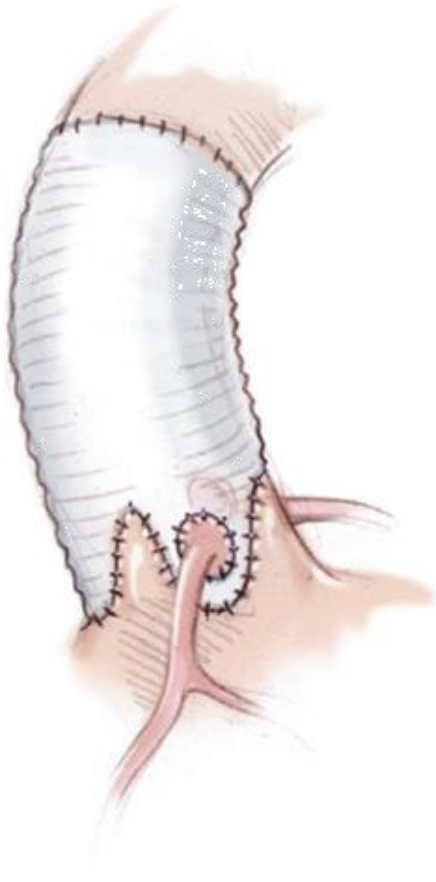


*aortic valve  
sewn in place*

*completed  
anastomosis*



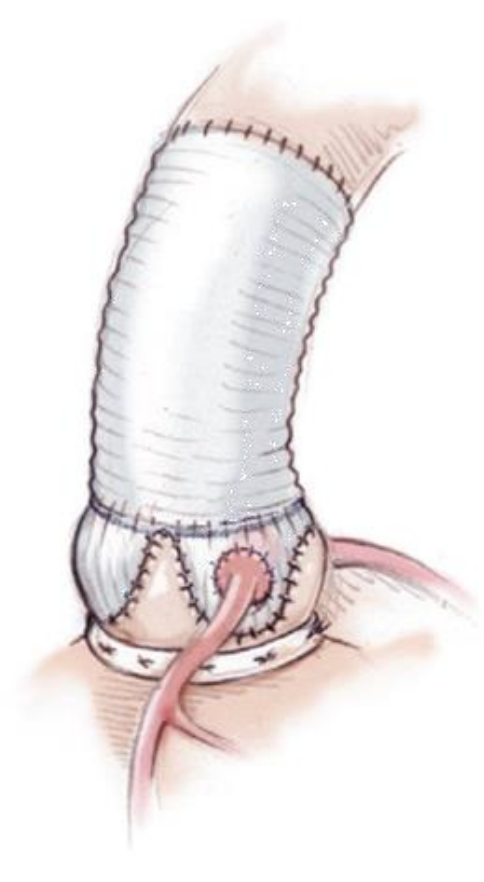
# Valve-Sparing Root Replacement



Remodeling  
Yacoub



Reimplantation  
David



Remodeling  
Lansac



# Remodeling vs. Reimplantation



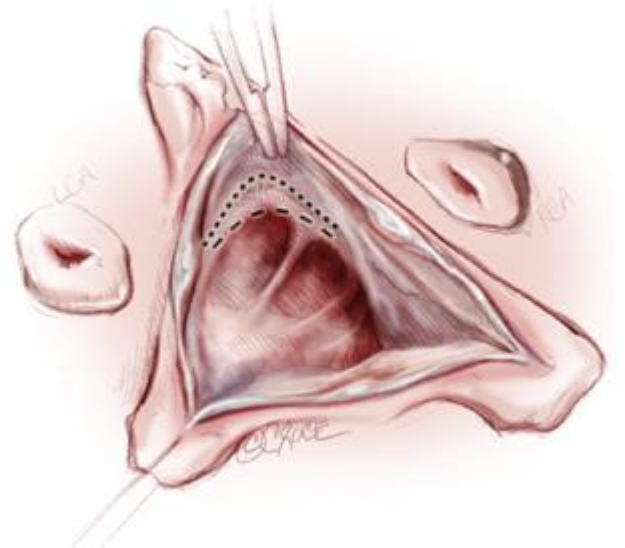
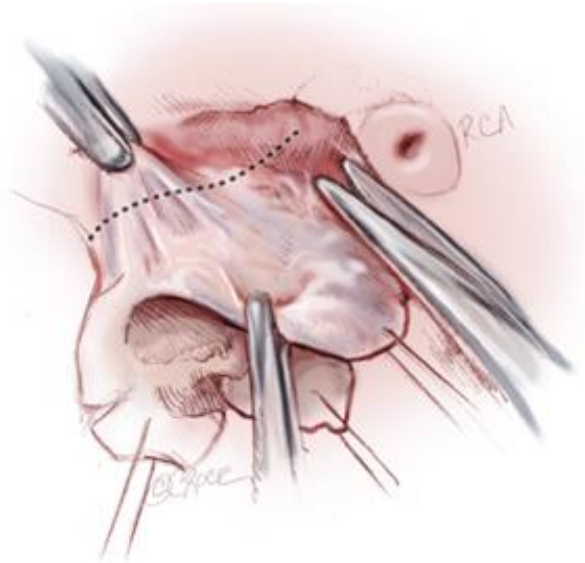
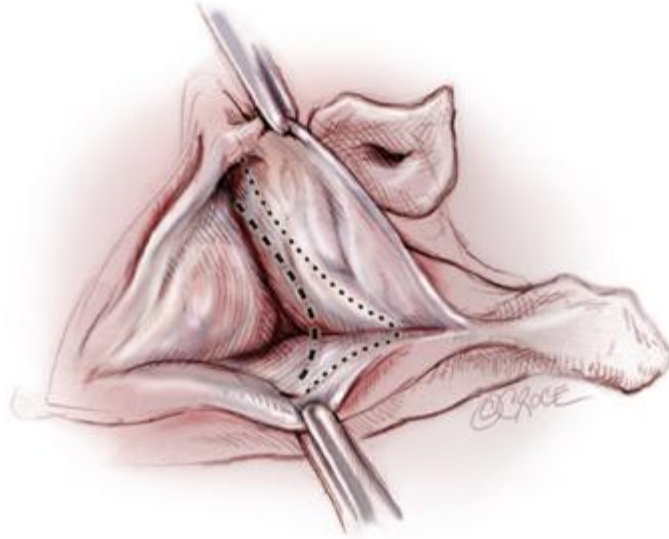
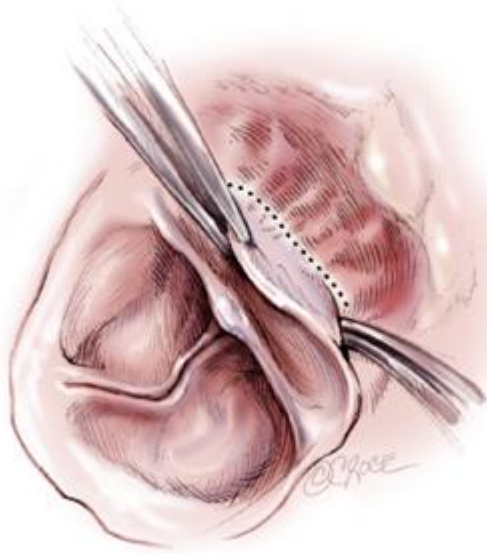
## Remodeling

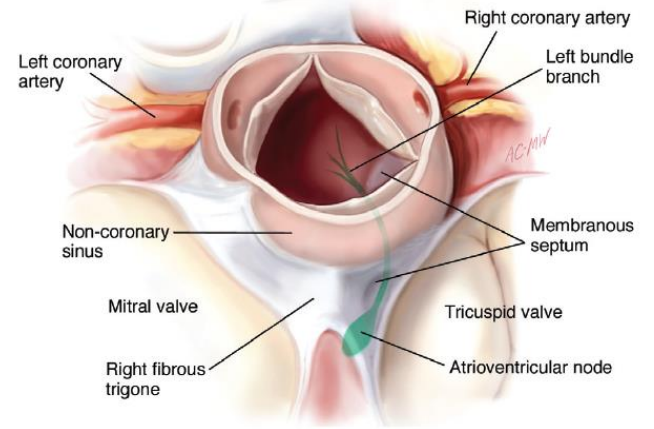
Easier stitches  
More bleeding  
Difficult to model  
Annulus is not addressed

## Reimplantation

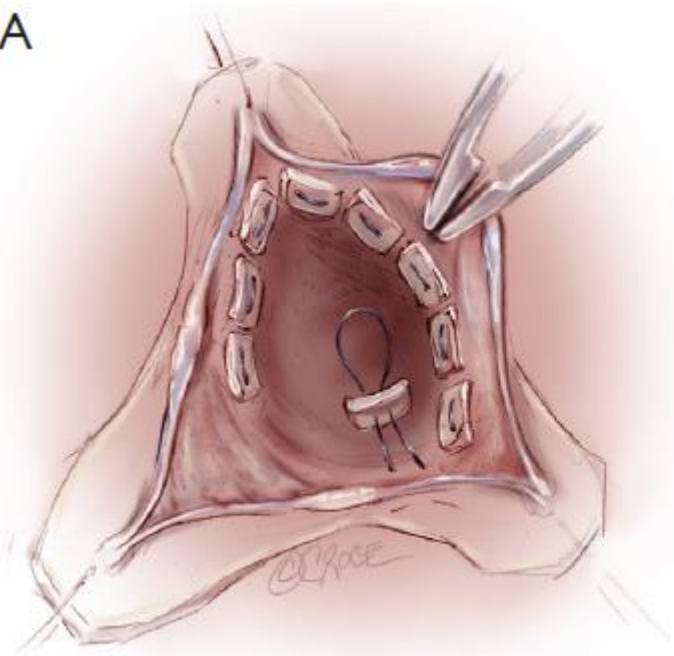
Difficult stitches  
Identifying bleeding focus?  
Annulus is addressed

# Reimplantation



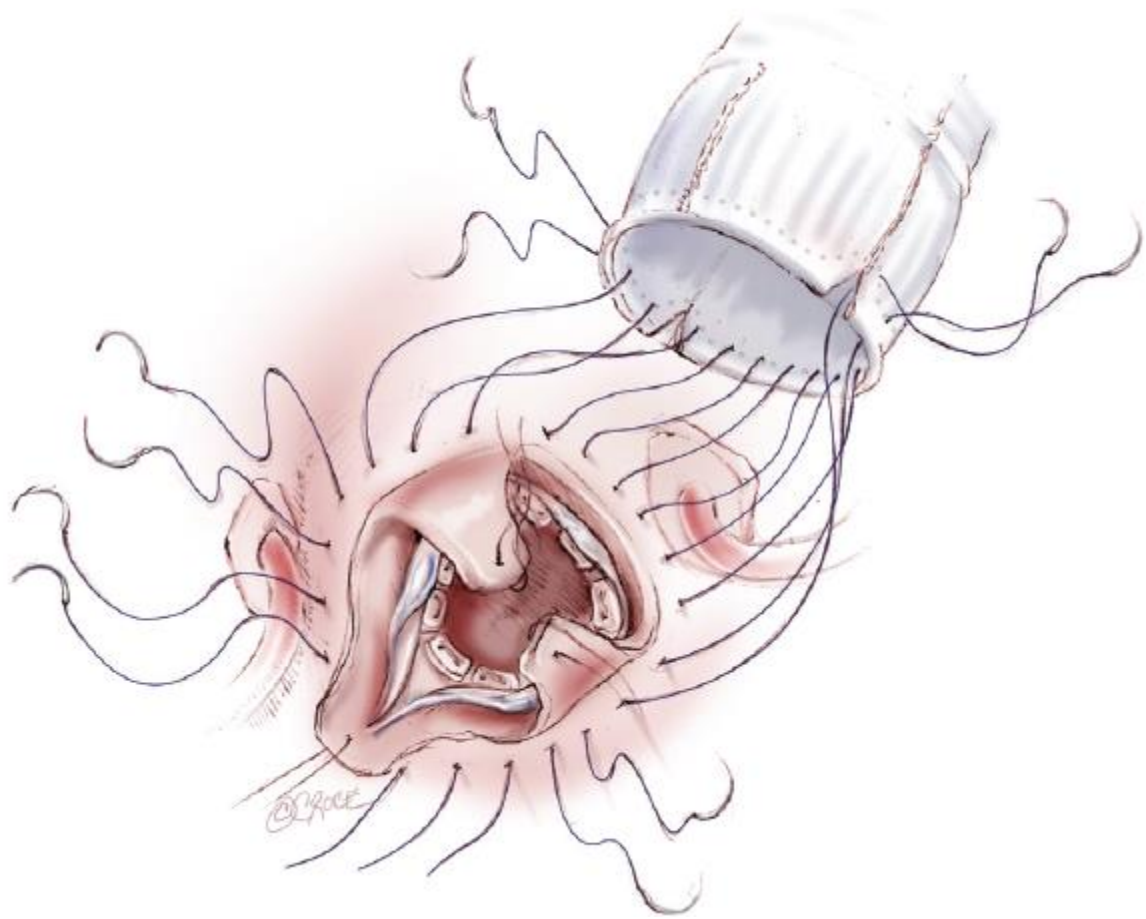


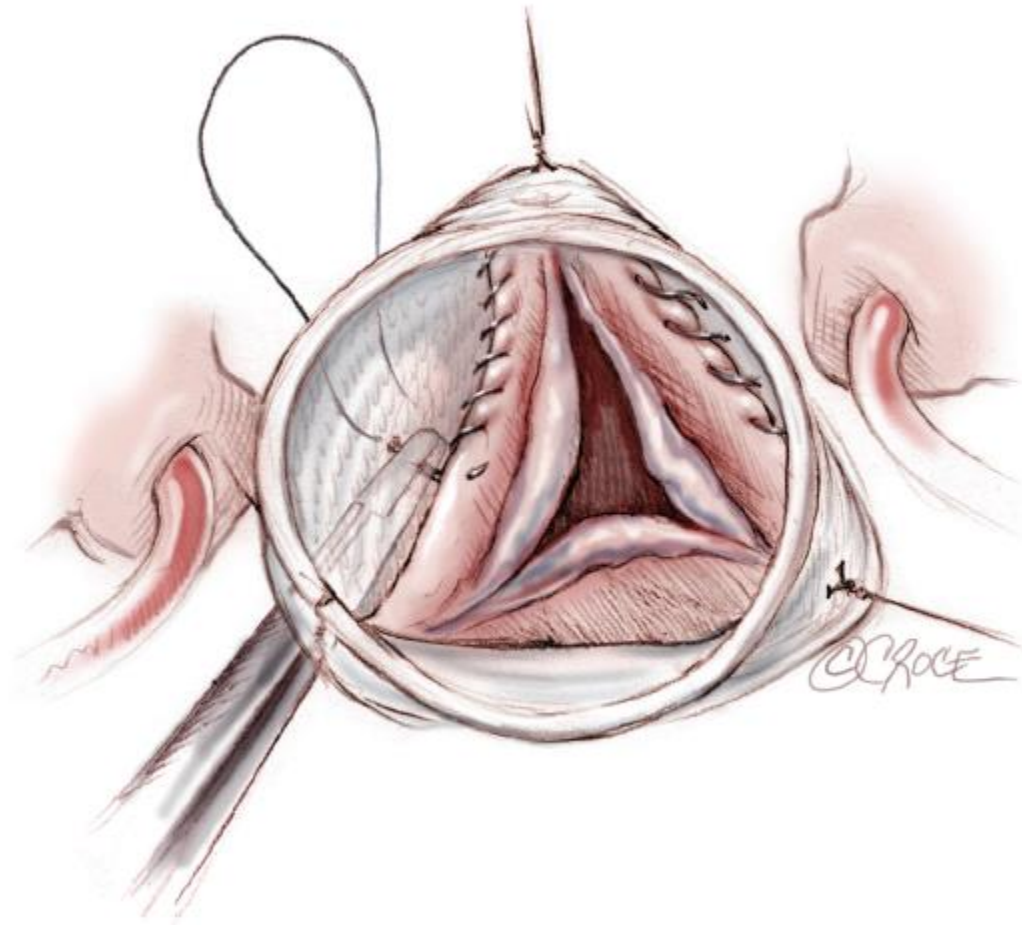
A



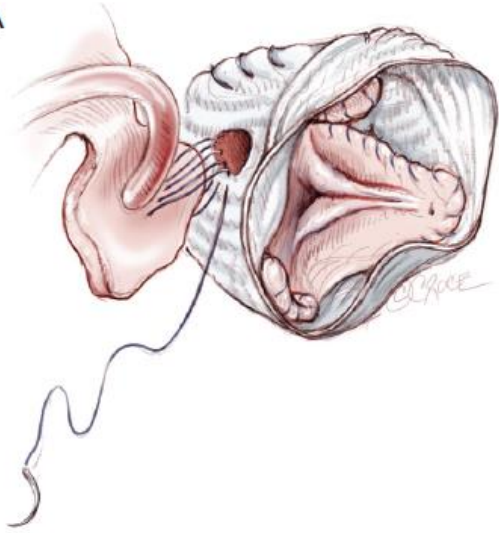
B



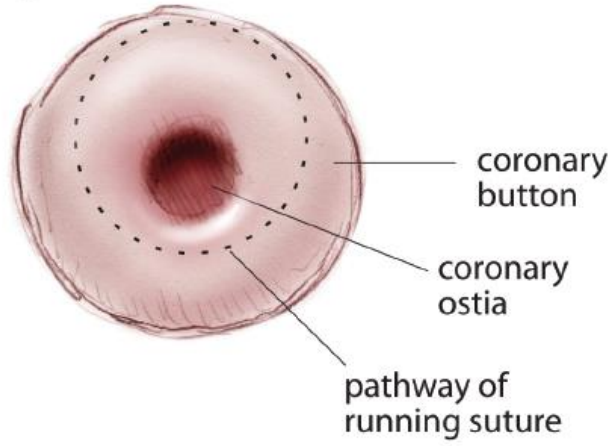




A



B



C



# Effective height

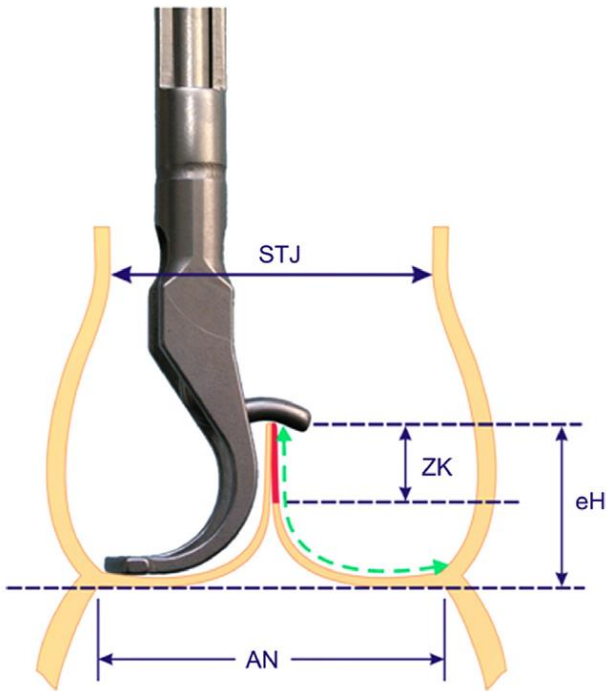
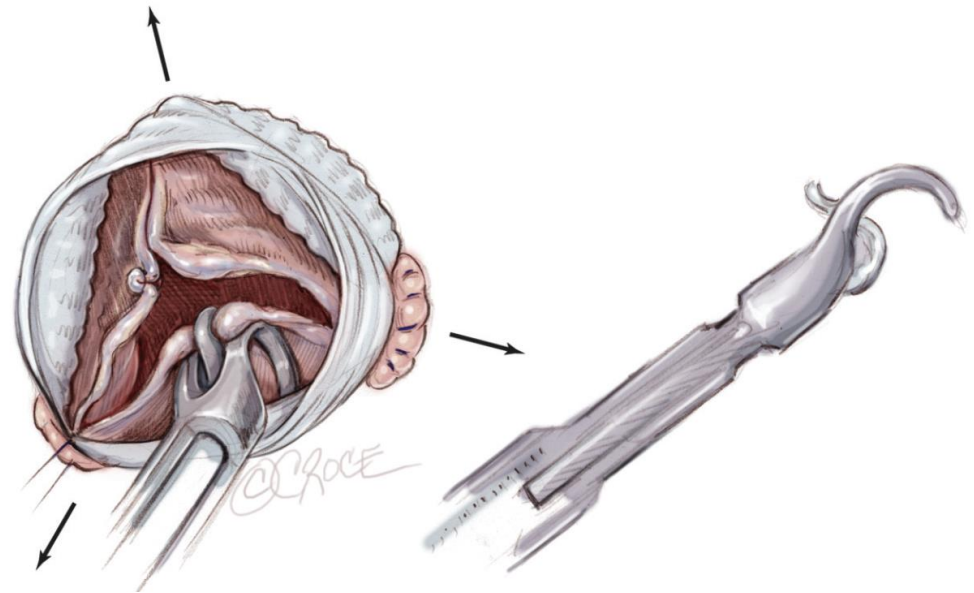
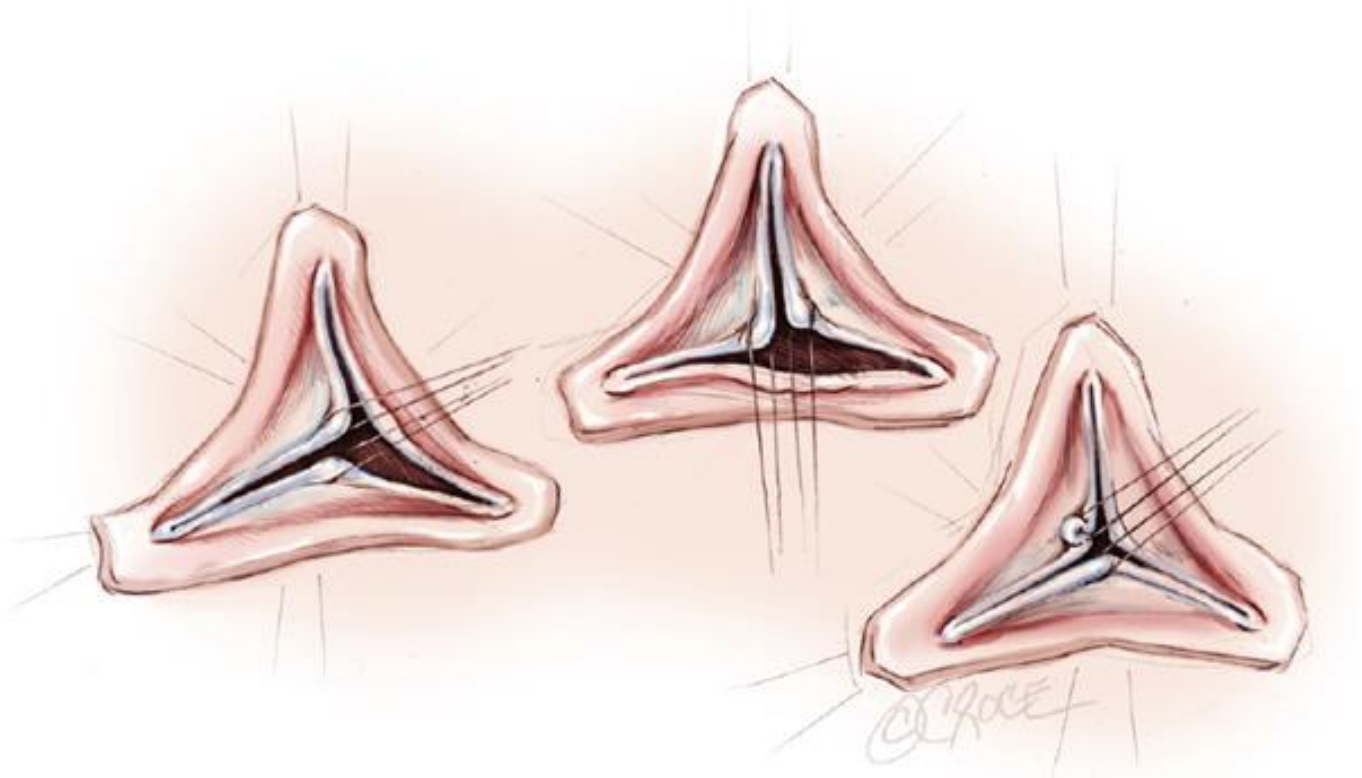


Fig. 2 - Illustration depicting measurement of the cusp effective height using an aortic caliper. Effective height is the height difference between the central free margins and the aortic insertion lines. (STJ=sinotubular junction; ZK=zone of coaptation; eH=cusp effective height; AN=aortic annulus or aortoventricular junction). Adapted and modified from Schäfers et al. [13].

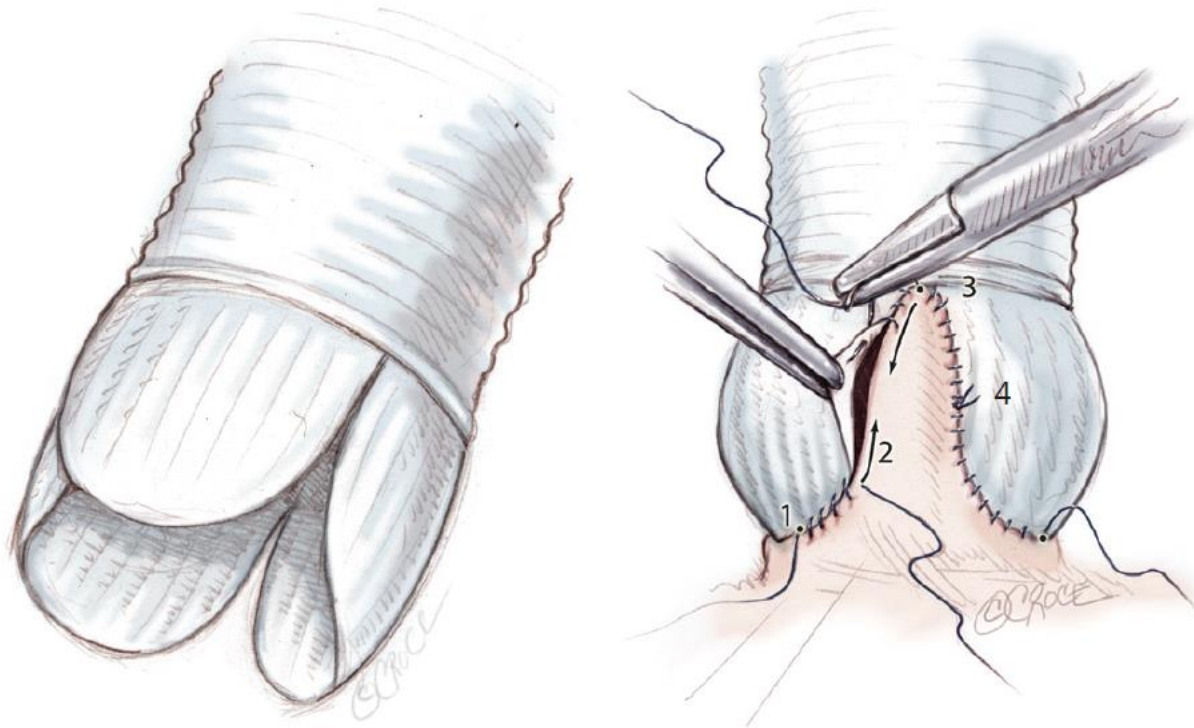






**Cusp plication**

# Remodeling



# Surgical Indication: AS

HF  
Angina  
Syncope /  
presyncope

**Severe AS**

**AND**

**Symptom (+)**

**OR**

**LVEF < 50%**

AVA  $\leq 1.0\text{cm}^2$   
Ao Vmax  $\geq 4\text{m/s}$   
Mean PG  $\geq 40\text{mmHg}$

# Surgical Indication: AS

**Severe AS**

**BUT**

**Symptom (-)**

**AND**

**LVEF  $\geq$  50%**

Maybe considered  
if low surgical risk + rapid progression  
(Class IIb)

# Surgical Indication: AS

**Severe AS**

**BUT**

**Symptom (-)**

**AND**

**LVEF  $\geq$  50%**

**Reasonable  
if (+) Exercise test results  
(Class IIa)**

# Surgical Indication: AR

HF  
Angina

**Severe AR**

**AND**

**Symptom (+)**

**OR**

**LVEF < 50%**

- Jet width  $\geq$  65% of LVOT
- Vena contracta  $>$  0.6cm
- ERO  $\geq$  0.3cm<sup>2</sup>
- Holo-diastolic flow reversal in proximal abdominal aorta

# Surgical Indication: AR

**Severe AS**

**BUT**

**Symptom (-)**

**AND**

**LVEF  $\geq$  50%**

**Reasonable  
if (+) LVESD > 50mm  
(Class IIa)**