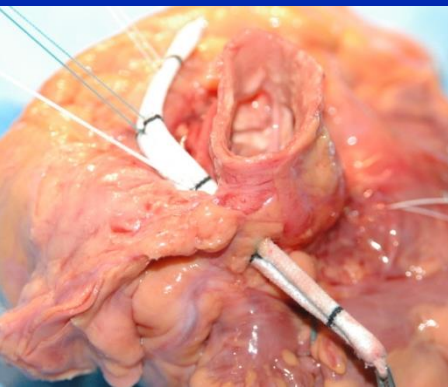


The aorto-ventricular junction in aortic repair

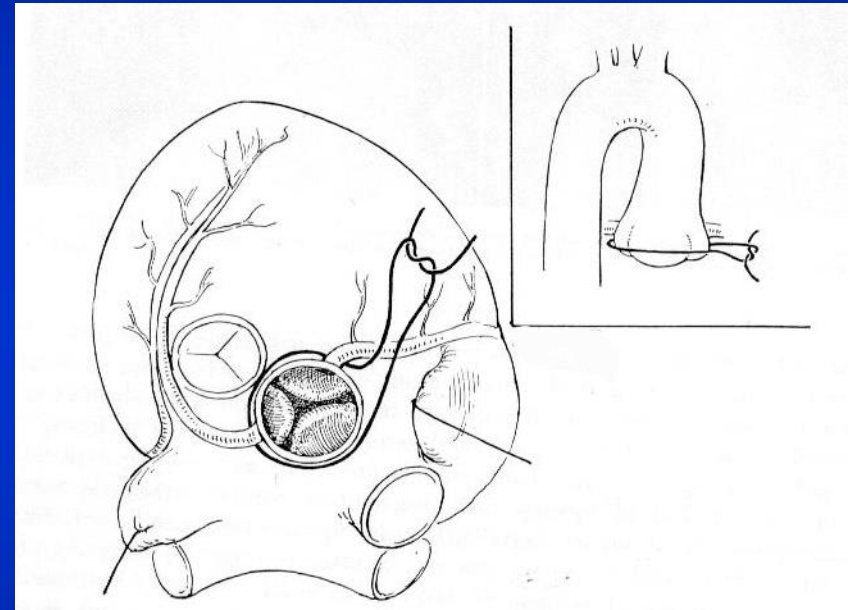
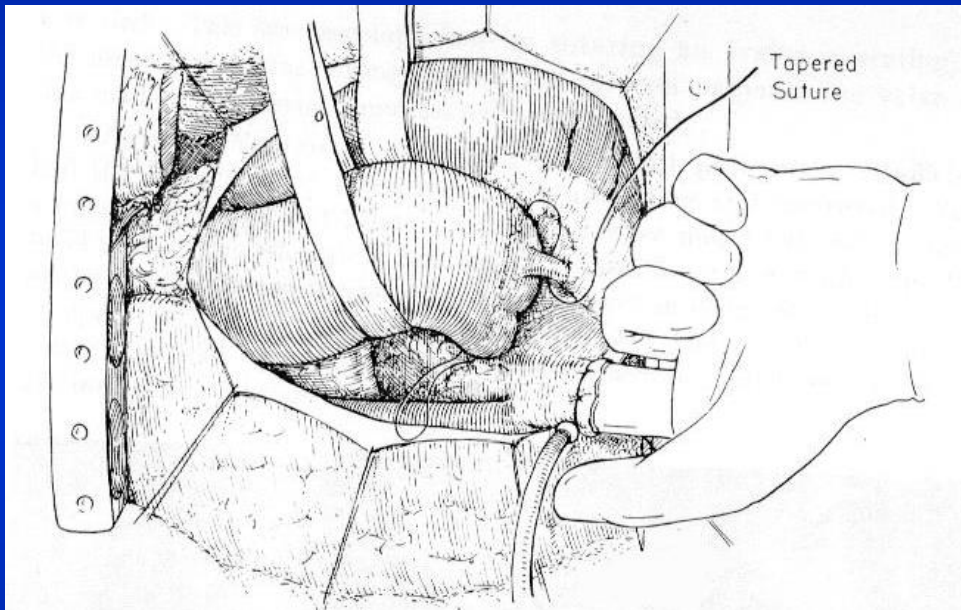
Emmanuel Lansac,
Isabelle Di Centa

Cardiac Surgery
Institut Mutualiste Montsouris,
Paris, France



The surgical correction of aortic insufficiency by circumclulsion

Taylor WJ, et al. JTCVS 1958;35:192-231



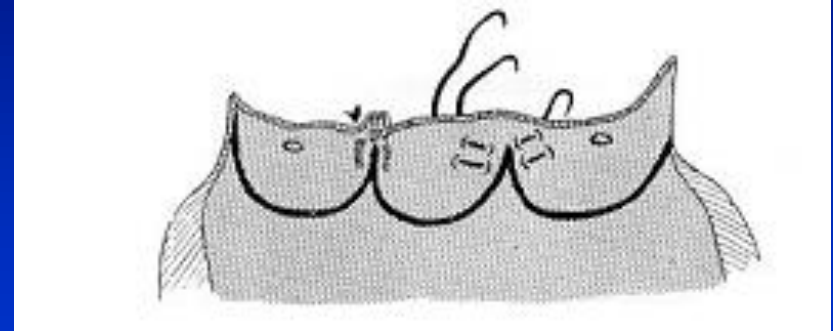
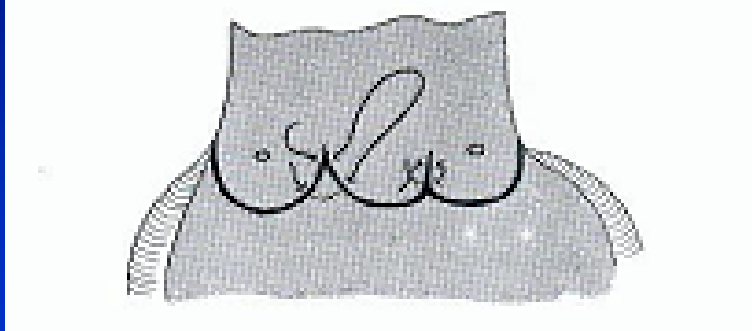
First subvalvular aortic annuloplasty

Beating Heart Right thoracotomy

11 patients, rheumatic disease (8/11)

Subcommissural plication stitches

(Cabrol stitches 1966)



Plicating U stitches at the base
of the interleaflet triangles

Plicating U stitches at the
commissures

= partial subvalvular annuloplasty

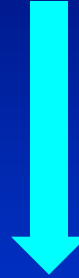
= partial supra-annular annuloplasty

Plication of the interleaflet triangles impairing valve dynamics
especially for bicuspid valves \Rightarrow significant gradient
minimal reduction in aortic annular base diameter

Useful to protect a commissural repair or as a bailout technique

Dilated aortic annulus > 25 - 28 mm

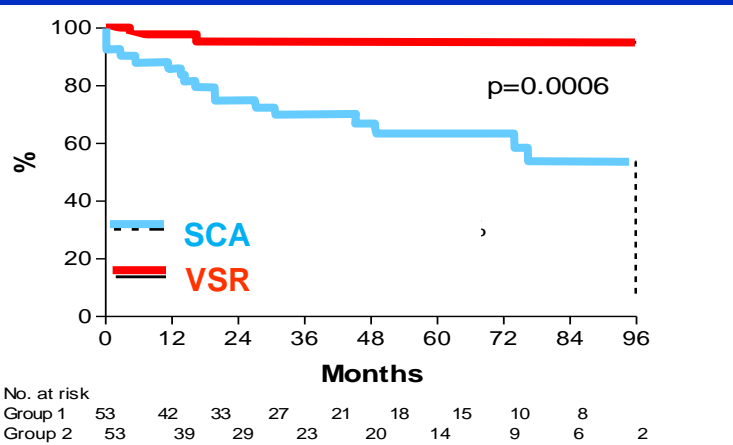
Risk factor for failure



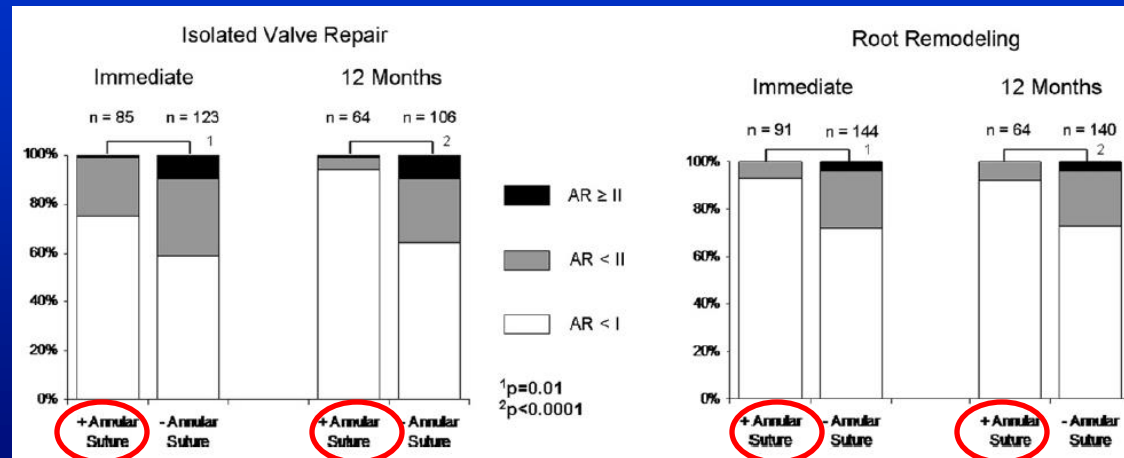
Luciani ATS 1999, Lansac ATS 2005, Hanke JTCVS 2008, de Kerchove JTCVS 2010, Schäfers JTCVS 2013, Navarra EJTCVS 2013, Aicher JTCVS 2013, Vallabhajosyula ATS 2014

Circumferential aortic annuloplasty improves the results
 (proximal suture reimplantation, External ring, Annular stitch)

Lansac EJTCVS 2006



De Kerchove JTCVS 2011



Aicher JTCVS 2013

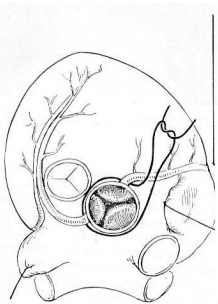
Goals for aortic valve repair

treat dilated aortic annulus and STJ \emptyset

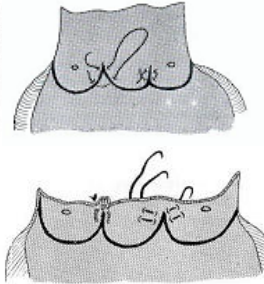
preserve root dynamics (neosinuses of Valsalva)

preserve expansibility (interleaflet triangles)

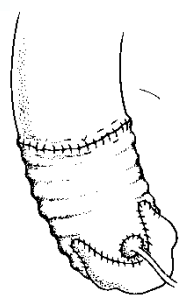
restore coaptation and effective height



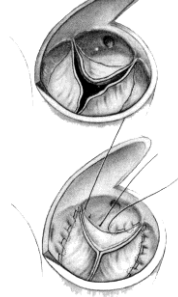
Taylor
1958



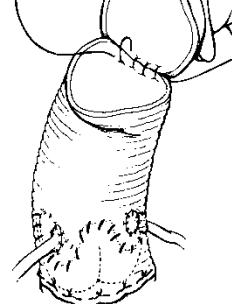
Cabrol
1966



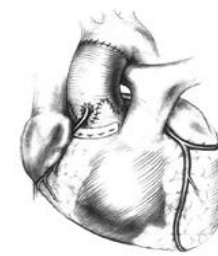
Yacoub
1983



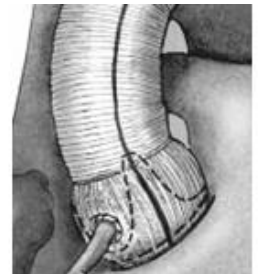
Carpentier
1983



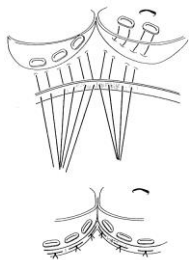
David
1992



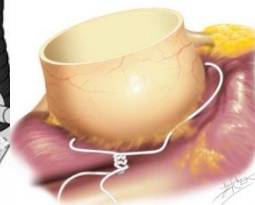
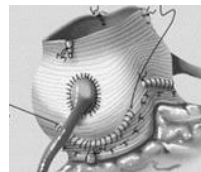
David III
1996



De Paulis
2001-2002



Izumoto
2002

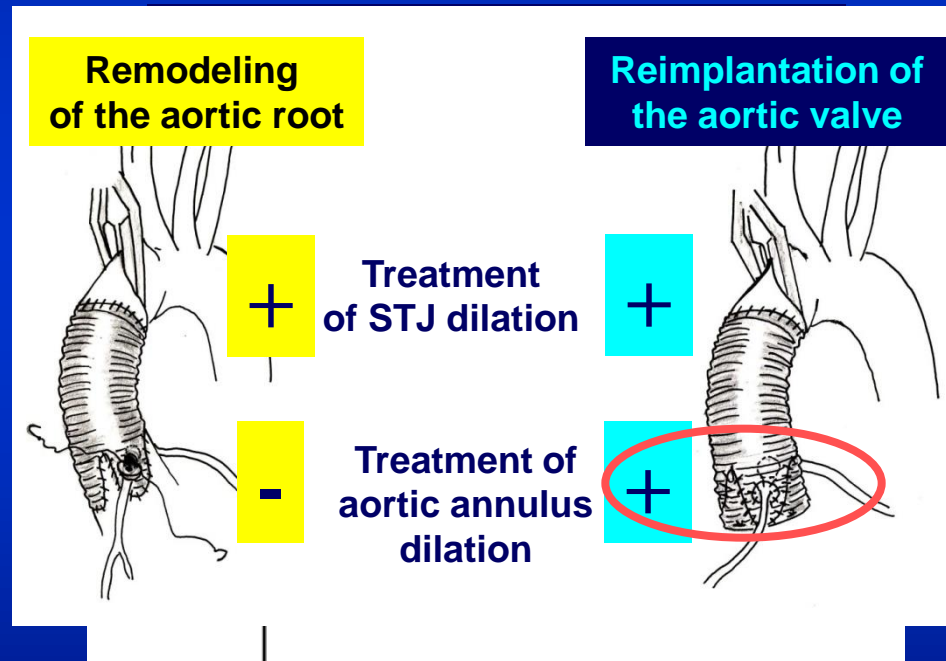


Rankin
2011

Need for standardization

Aortic annuloplasty and valve sparing root replacement ?

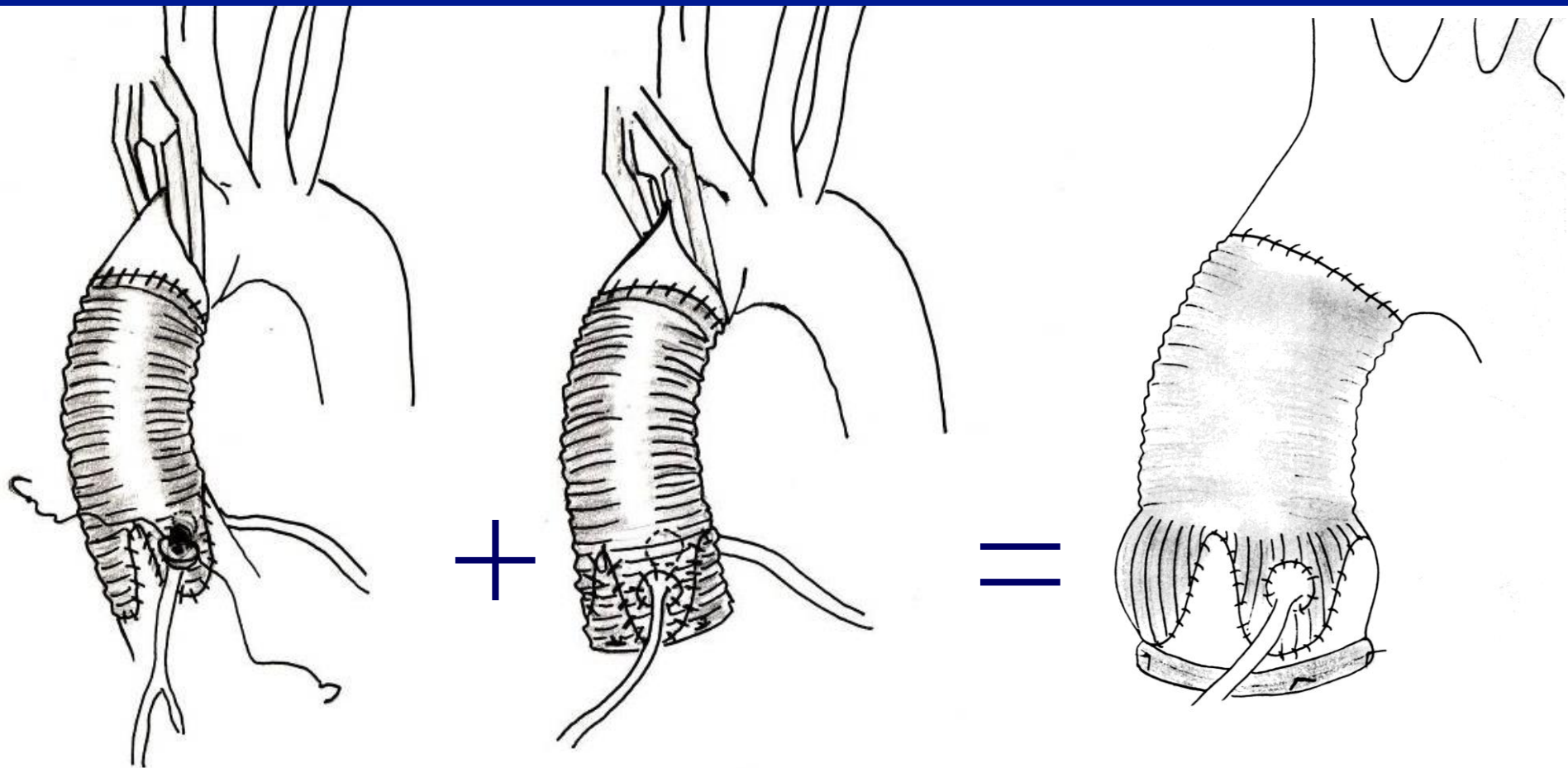
**Risk factor for failure of the Remodeling :
Annulus dilation >25-28 mm**



Reimplantation performs a subvalvular annuloplasty

Remodeling alone is a contraindication if annulus >25 mm

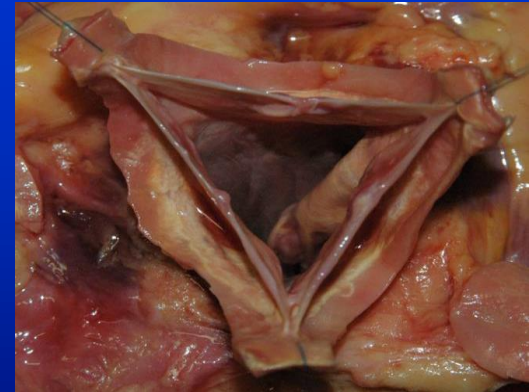
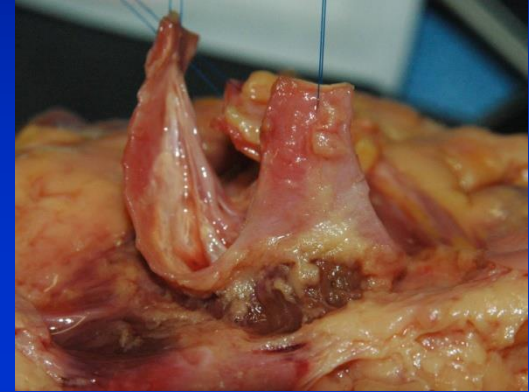
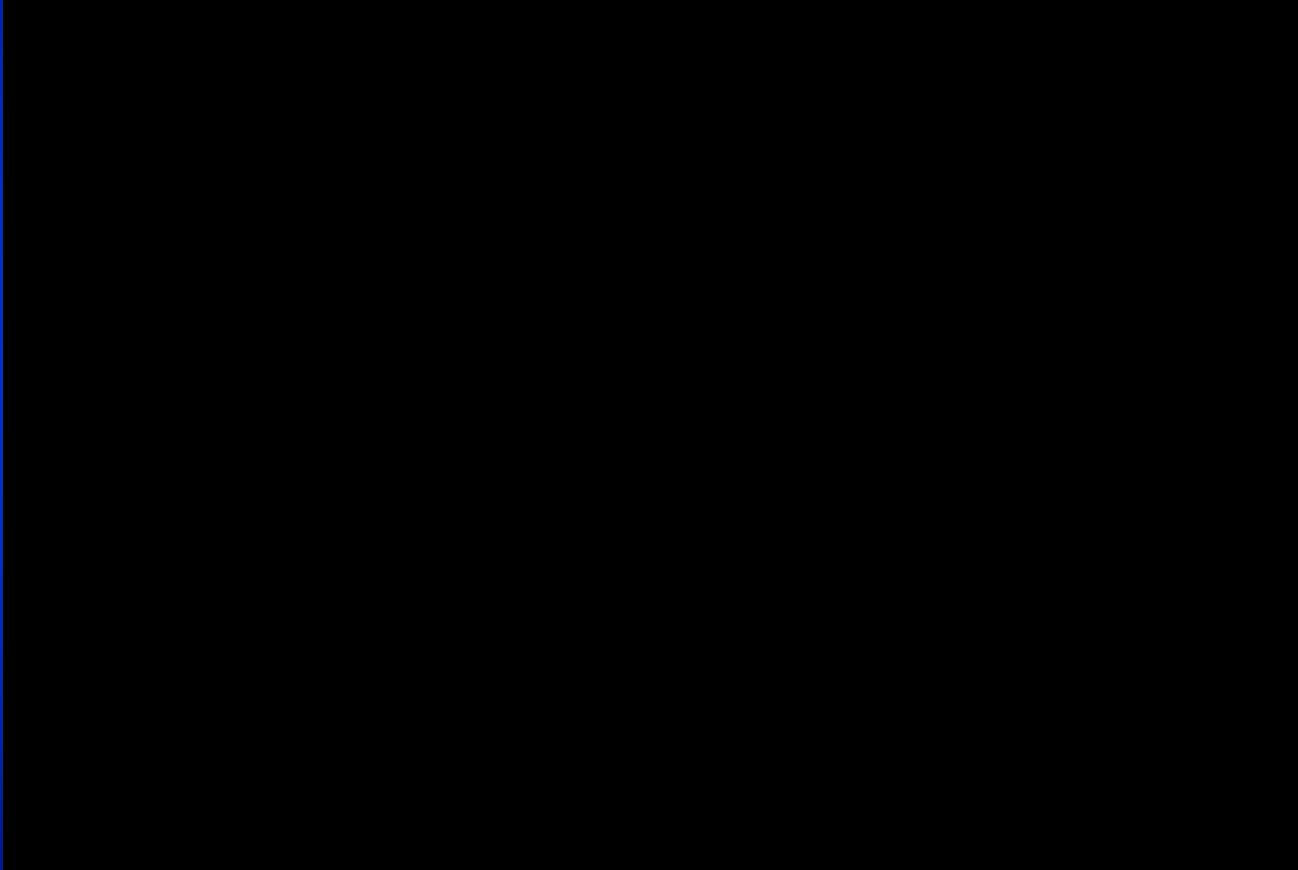
Physiological and standardized approach to Valve Sparing Root Replacement



Remodeling more physiologic
RF failure annulus > 25 mm

Remodeling +
subvalvular annuloplasty

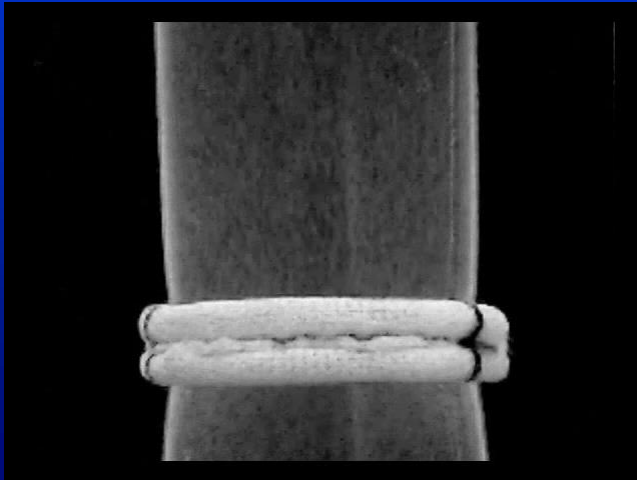
1. Dissection of the subvalvular plane



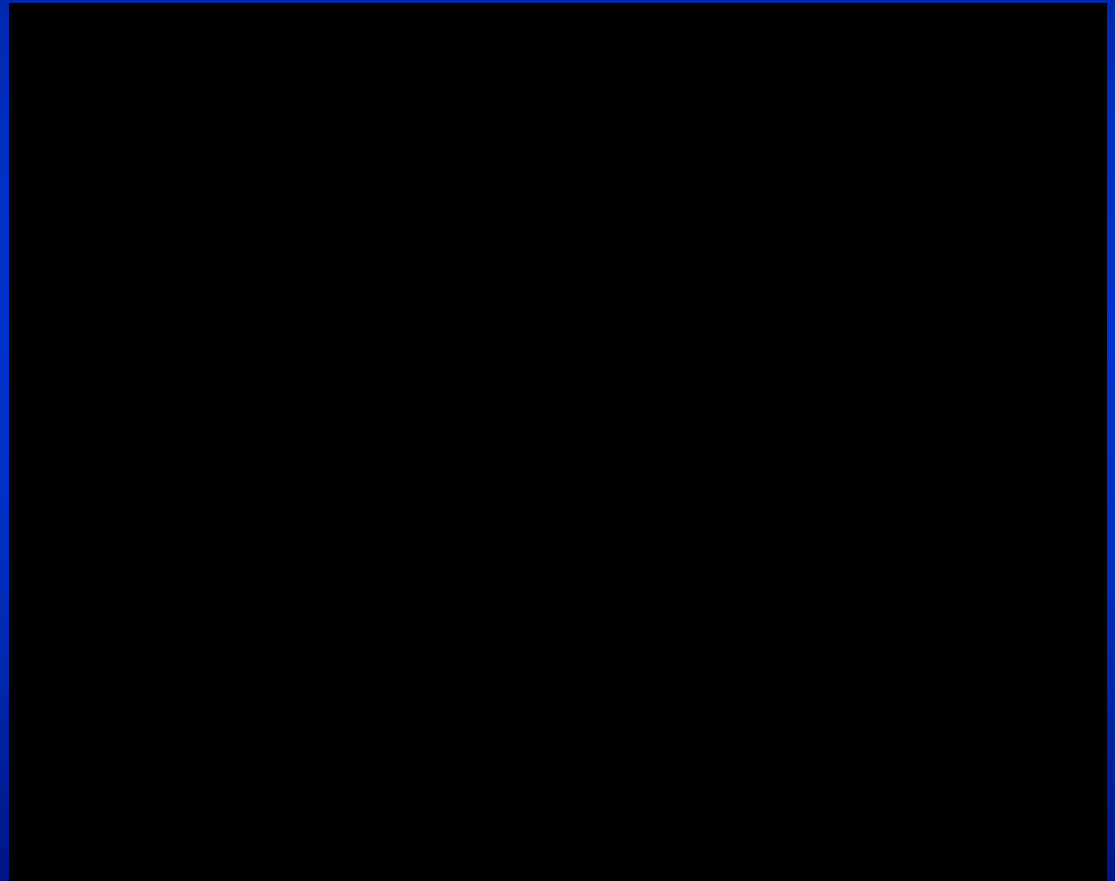
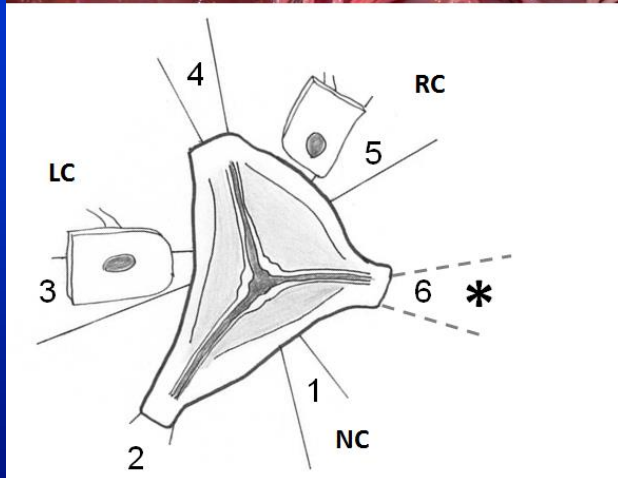
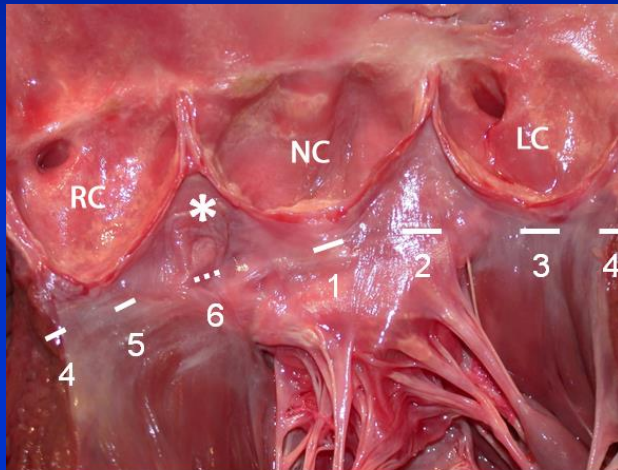
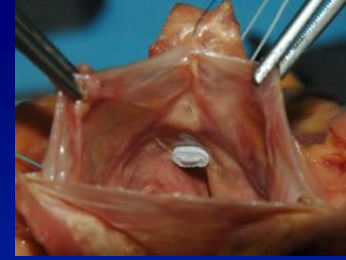
Standardization based on aortic annulus Ø

 	Aortic annular base Ø (Hegar dilators, mm)				
	25-27	28-30	31-35	36-40	> 40
Valsalva graft® Ø (mm)	26	28	30	32	34
Extra aortic ring® Ø (mm)	25	27	29	31	33

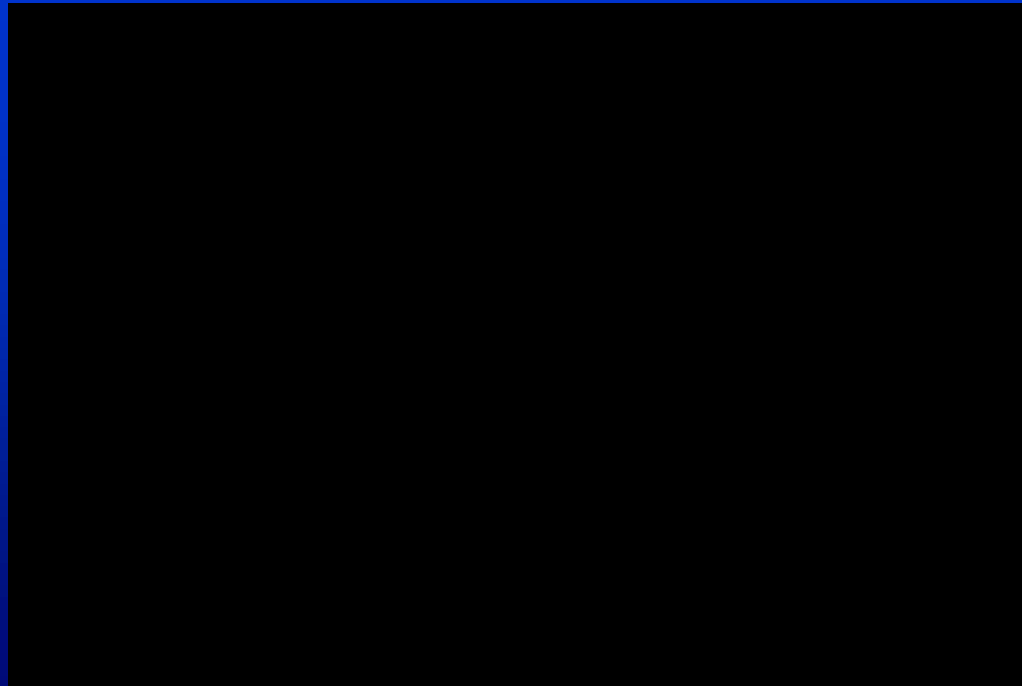
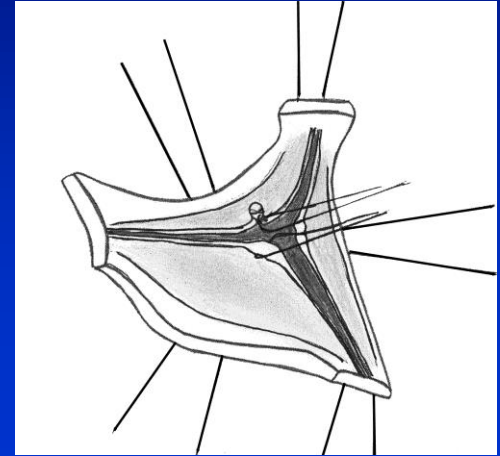
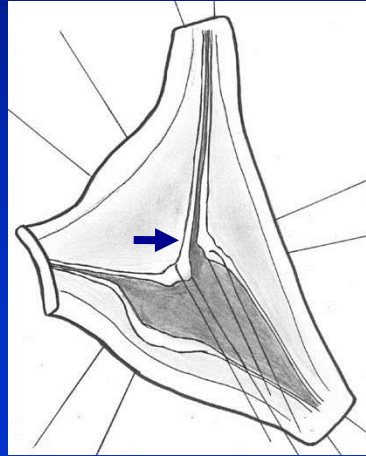
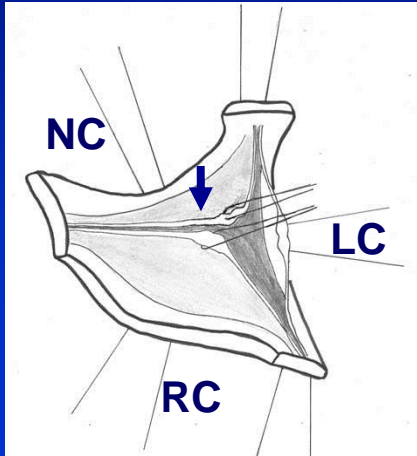
Subvalvular ring = down size from one size



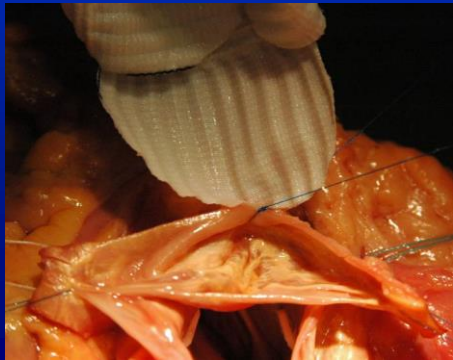
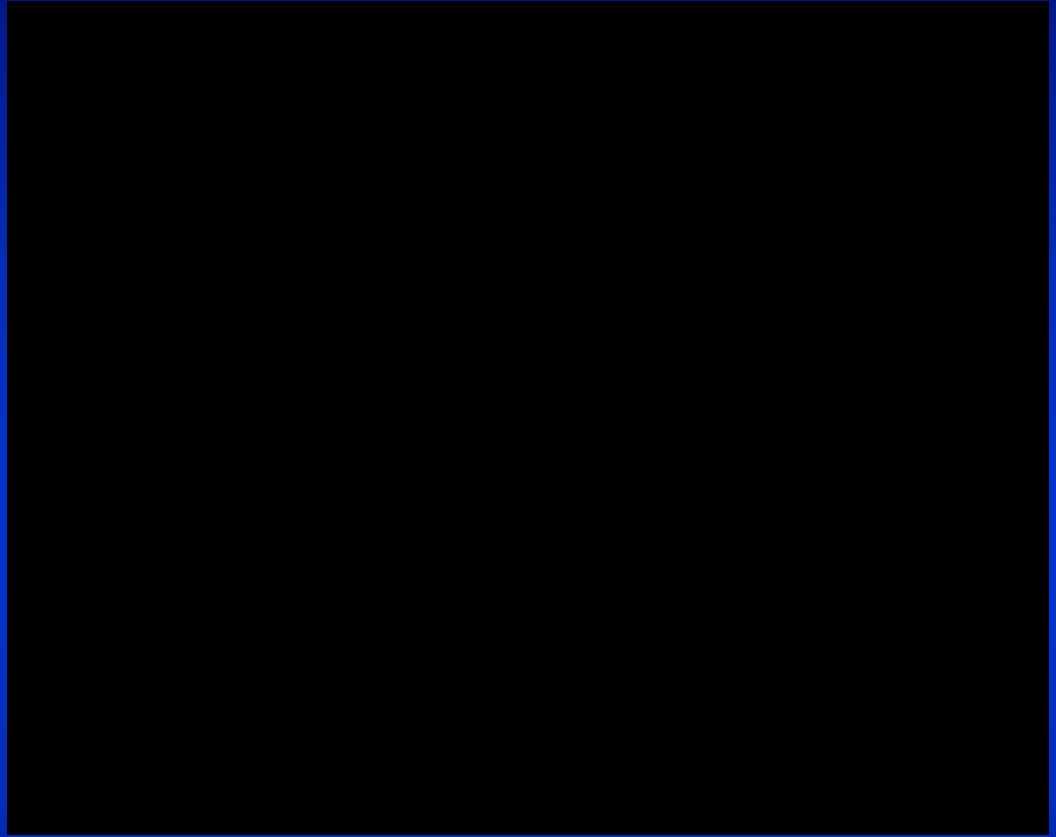
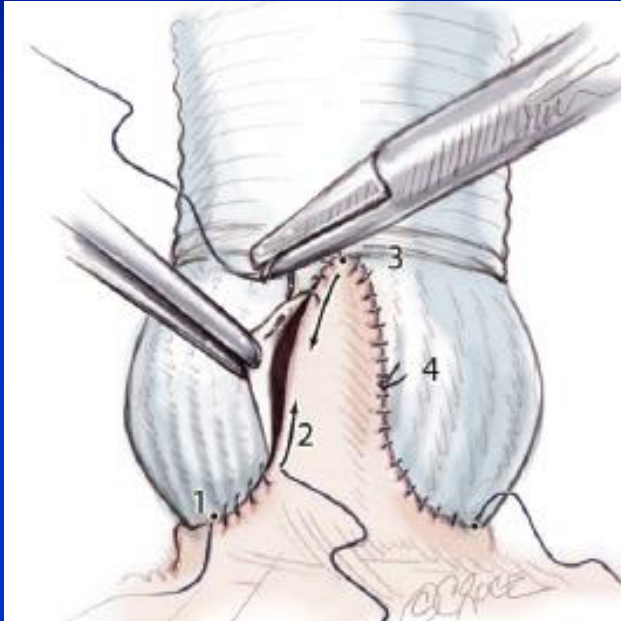
3. 6 subvalvular « U » stitches



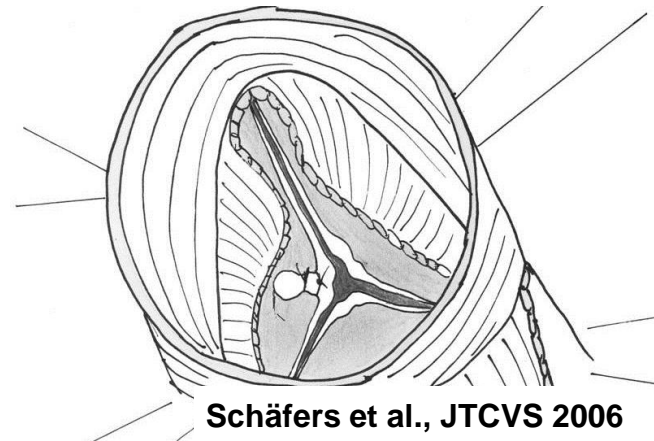
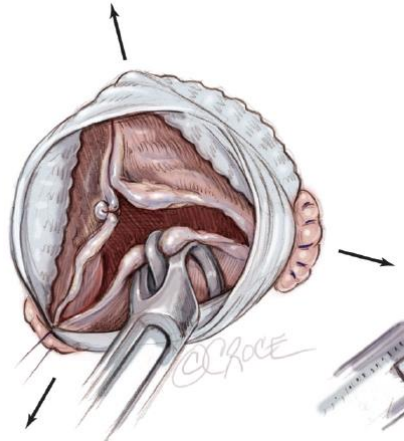
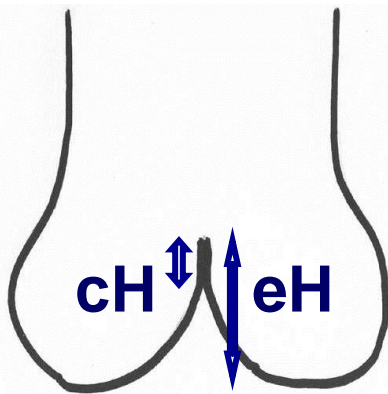
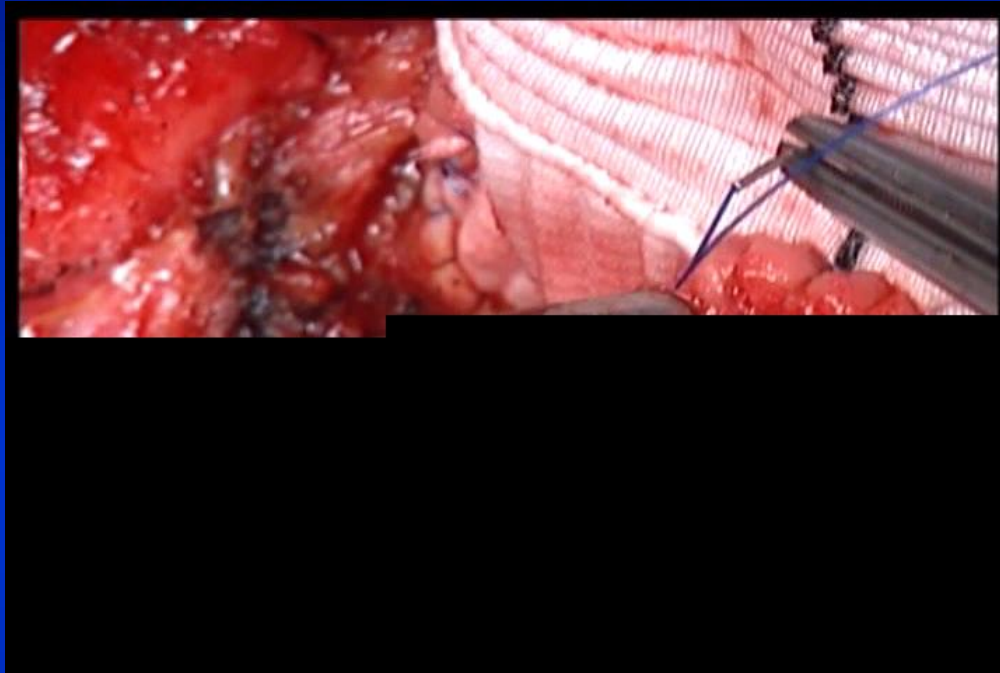
4. Alignment of cusp free edges prior Remodeling



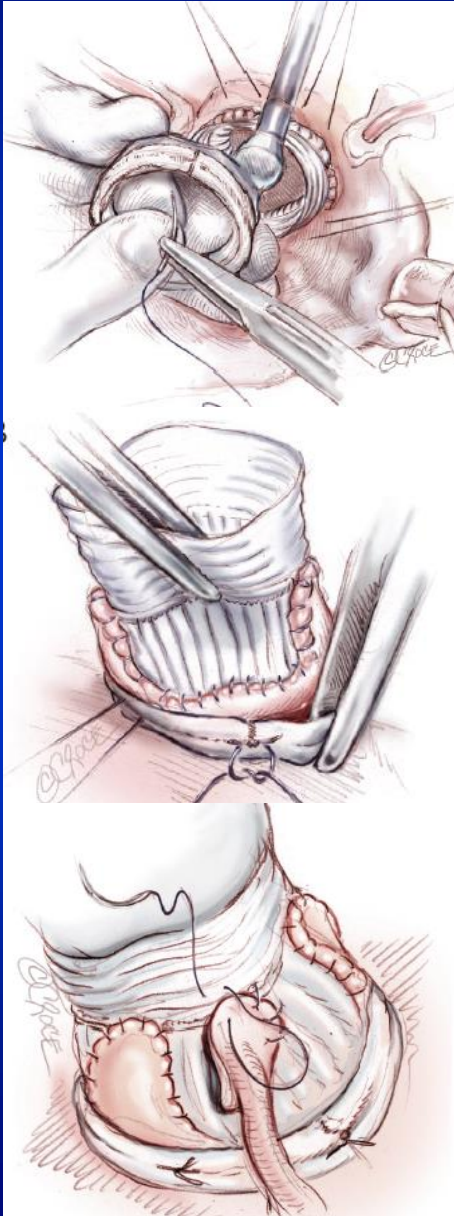
5. Suture of the Remodeling



6. Cusp resuspension after the Remodeling (effective height 9 mm)



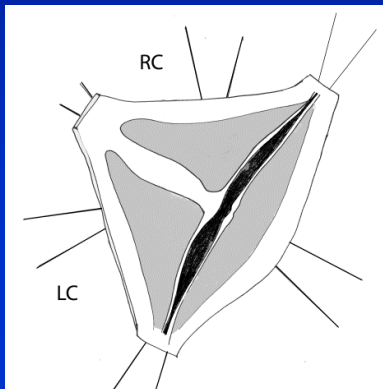
7. Subvalvular ring implantation



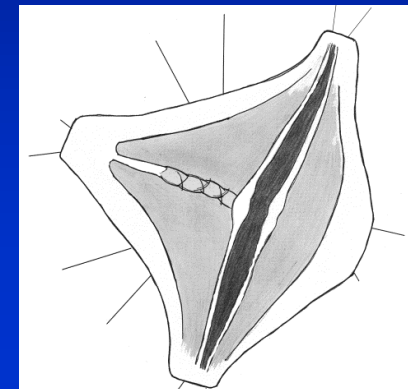
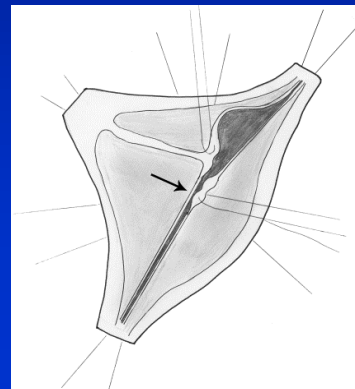
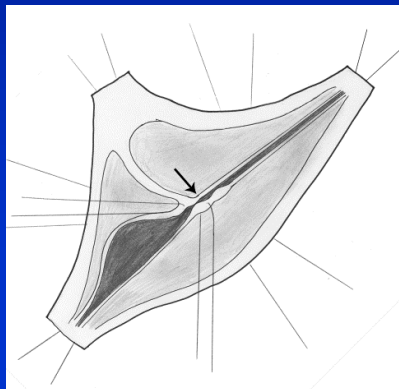
Root aneurysms: Bicuspid valves

(Sinus Valsalva $\text{\O} \geq 45 \text{ mm}$)

6 subvalvular
« U » stitches



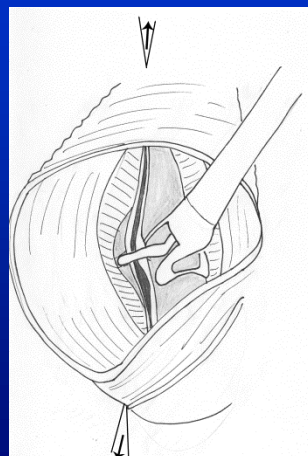
Alignment of cusp free edges



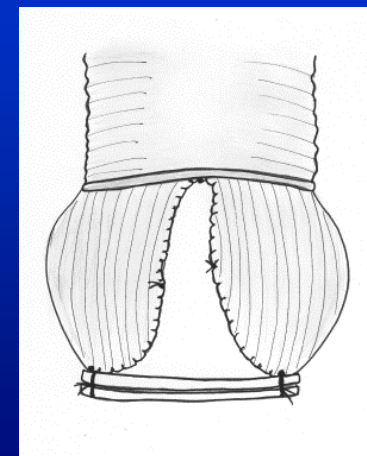
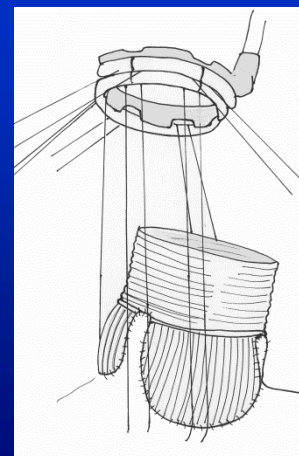
Commissures
at 180°



Effective height
measurement



Subvalvular aortic annuloplasty

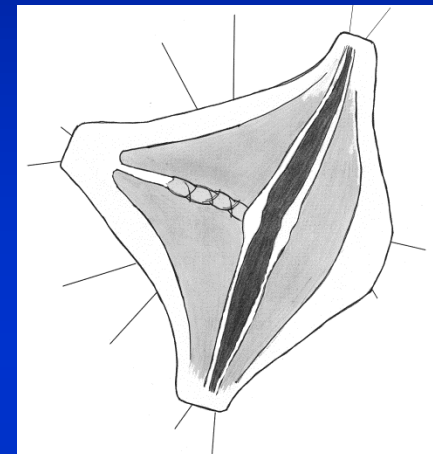
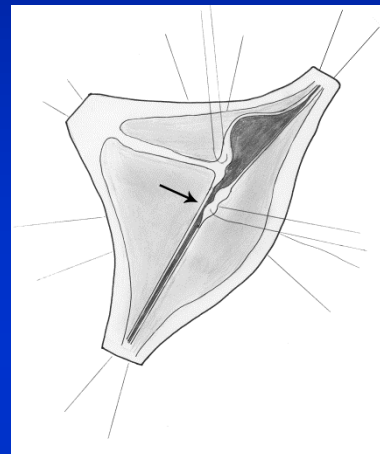
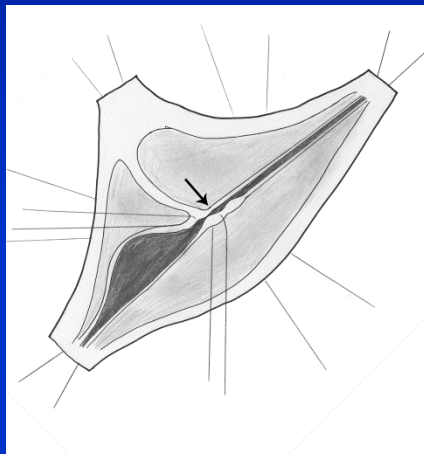
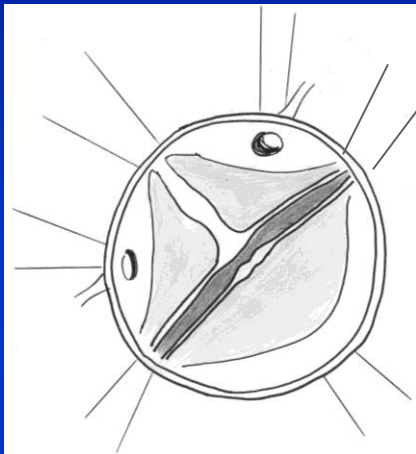


Supra-coronary aneurysms

Bicuspid R-L (sinus \varnothing 40 – 45 mm)

6 subvalvular
« U » stitches

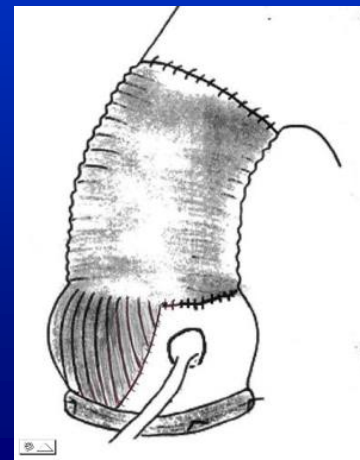
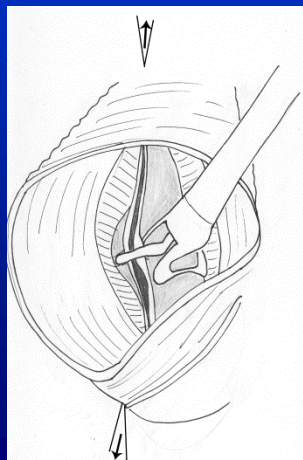
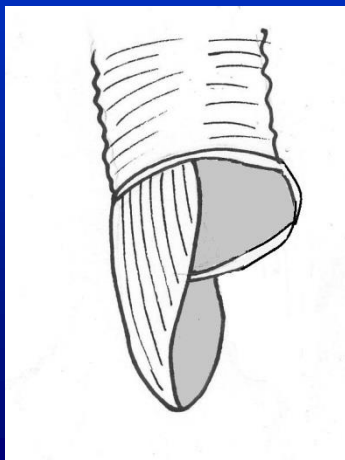
Alignment of cusp free edges



Commissures
at 180°

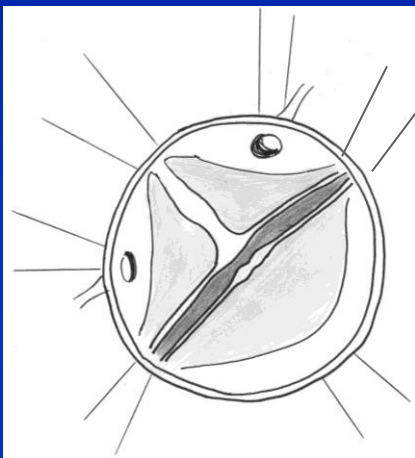
Effective height
measurement

Subvalvular aortic
annuloplasty

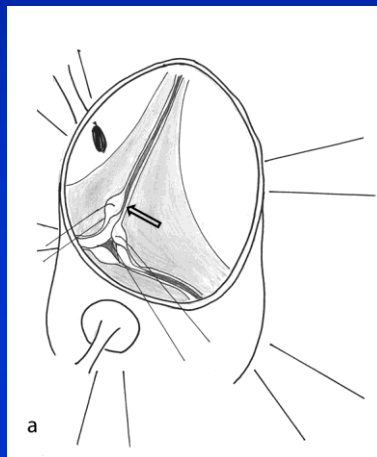


Isolated aortic insufficiency (all diameters ≤ 40 mm)

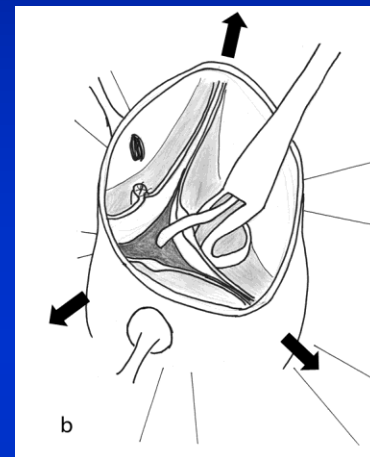
6 subvalvular « U »
stitches



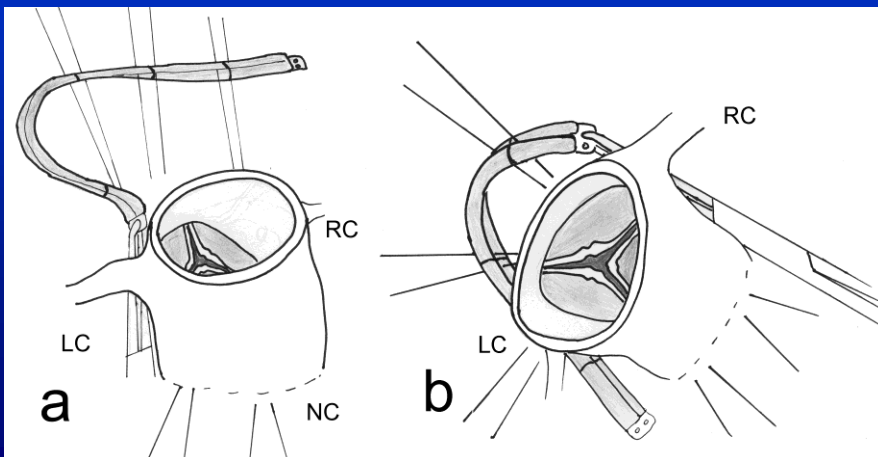
Alignment of cusp free edges



Cusp resuspension
(effective height ≥ 9 mm)

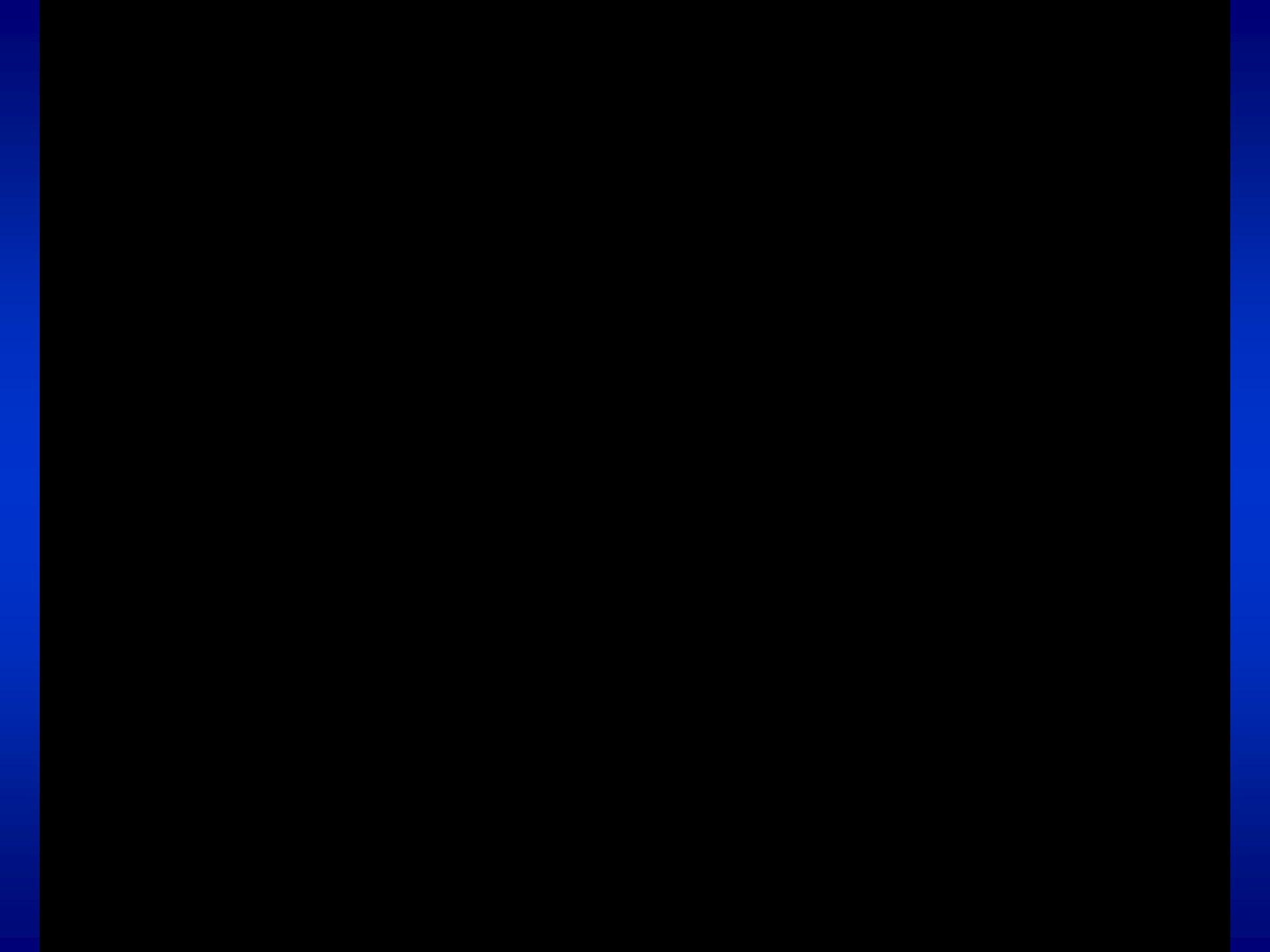


Placement of the open subvalvular ring
below the coronaries



Final aspect







Aortic valve repair using an external aortic ring

Operative mortality 1.2%

IMM series
238 patients
 (In process)

Survival 97%, freedom from reoperation 95% at 10y
80 % freedom from AI>1 and 95% from AI>2 à 10y

Bicuspid 40%, no differences with tricuspid or phenotype

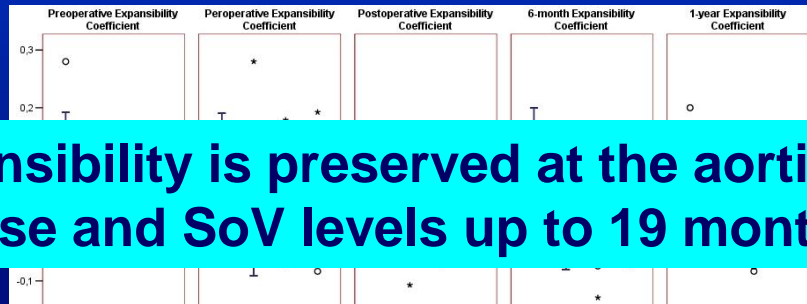
CAVIAAR Trial
 JTCVS 2015

130 valve repair versus 131 CVG

30 days mortality 3.8% in each group

Despite longer crossclamp times and a learning curve in the REPAIR group, there is no increase in post operative morbi-mortality compared to CVG group

At 30 days, REPAIR group showed a trend towards reduce Major Adverse Valve Related Events compared to CVG group (3.8% versus 9.2%, p<0.08)

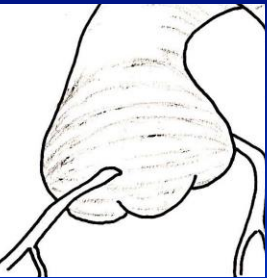


Root dynamics study (60 pts)
 EJTCVS 2015

Expansibility is preserved at the aortic annular base and SoV levels up to 19 months (1-64)

Independently of age and bicuspid valve

Pliable bicuspid and tricuspid valves



Aortic root aneurysm

Valsalva ≥ 45 mm



Supra-coronary aneurysm

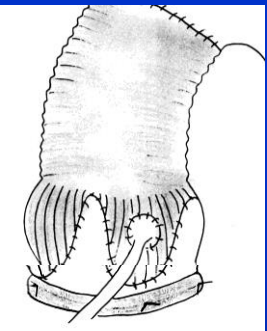
Valsalva < 40 mm



Isolated AI

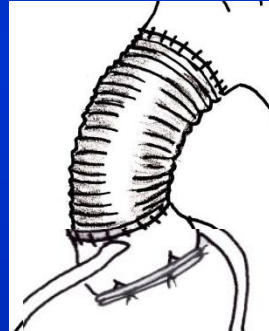
all $\emptyset < 40$ mm

Standardized approach according to phenotypes



Remodeling

+ subvalvular annuloplasty



Supra-coronary graft

+ subvalvular annuloplasty
(annulus > 25 mm)



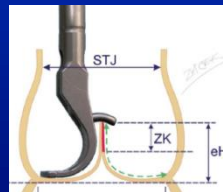
Supra-valvular annuloplasty
(STJ > 35 mm)

Subvalvular annuloplasty
(annulus > 25 mm)

Cusp repair



Alignment of the cusp free edges



Resuspension of cusp effective height

+



Subvalvular external aortic annuloplasty



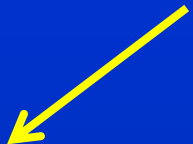


Open Prospective International Multicenter Registry

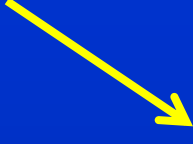
**Isolated AI and/or ascending aorta aneurysm
Candidates for Aortic valve repair / sparing**

Surgical indication

No



Yes



Medical Registry
(In process)

Surgical Registry
Aortic valve Repair / sparing and Replacement

Evaluation of the Guidelines

Evaluation of the results



Open to all center, Join us!
AVIATOR@HeartValveSociety.org

