

Surgical Approach to Aortic Insufficiency

JENNIFER CHUNG MD MSC FRCSC

CARDIOVASCULAR SURGEON/TORONTO GENERAL HOSPITAL

NOVEMBER 3, 2019

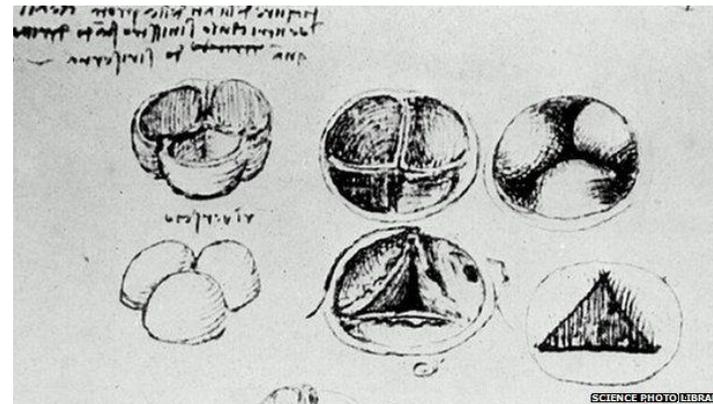
Outline

Surgical Anatomy

Classification of AI

Common Surgical Strategies

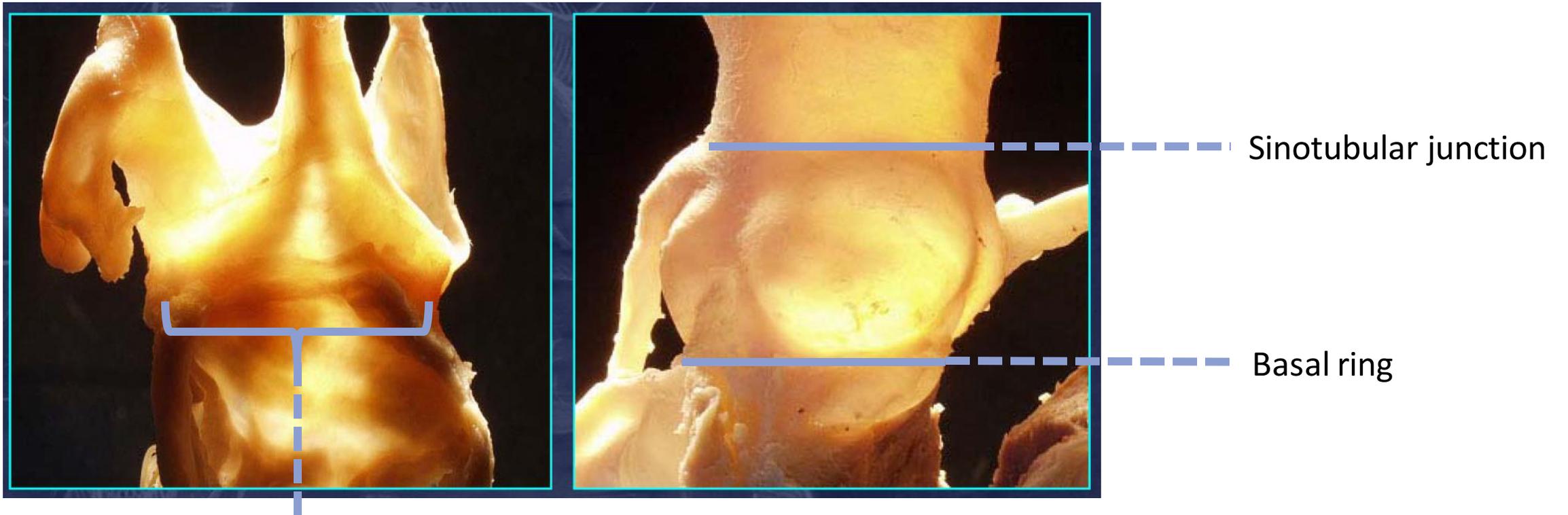
Evidence for Aortic Valve Repair



Surgical Anatomy

LET'S SPEAK THE SAME LANGUAGE

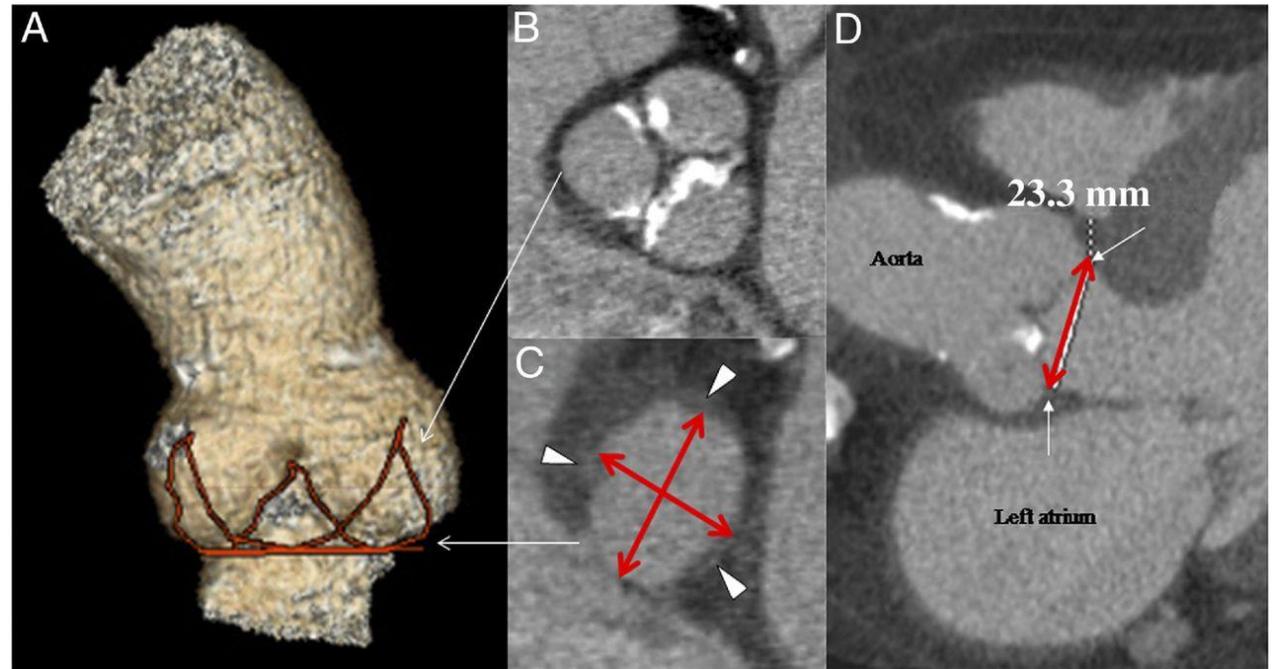
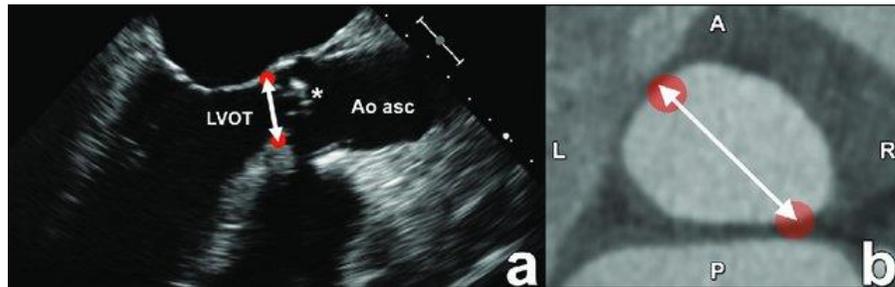
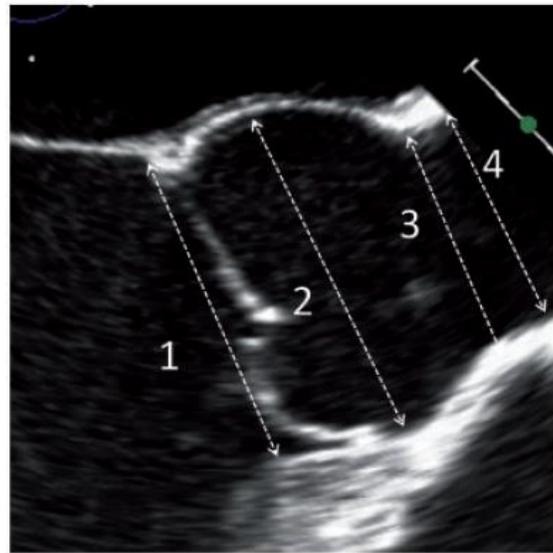
The Functional Aortic Annulus



Crown-shaped aortic annulus

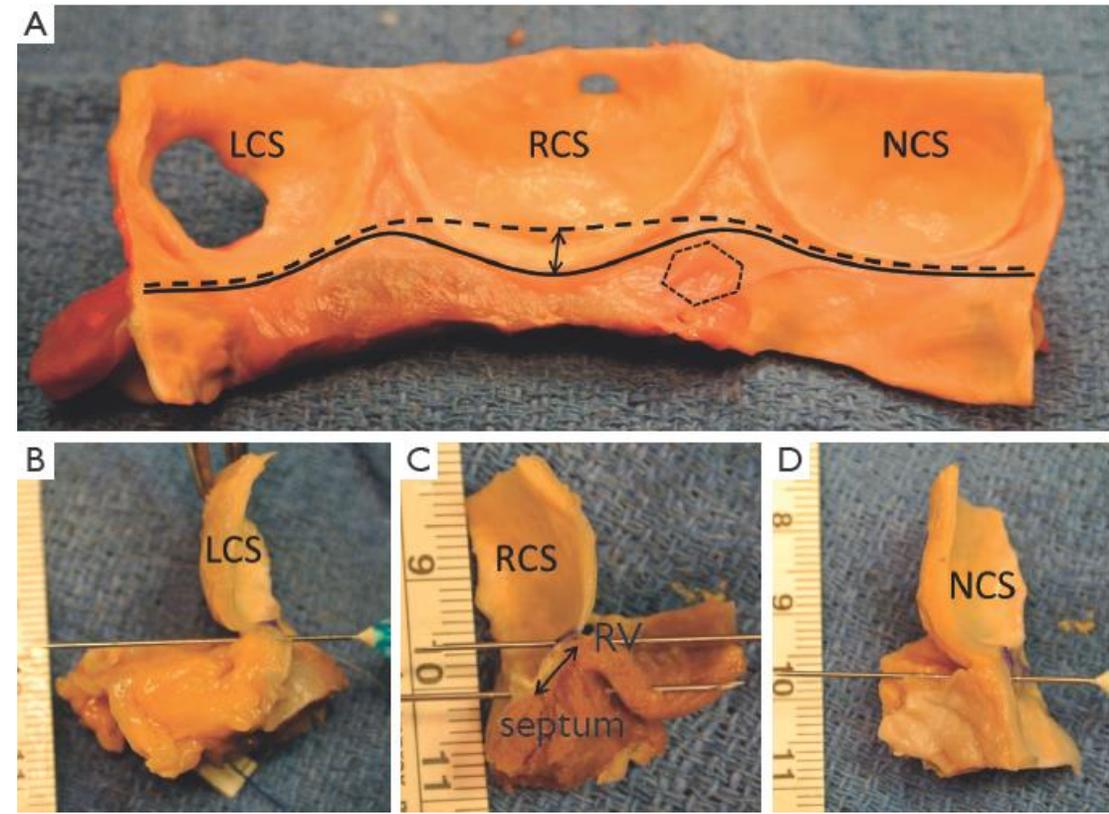
The Functional Aortic Annulus

Aortic Annulus
The Virtual Basal Ring



The Functional Aortic Annulus

Ventricular-aortic junction
the VAJ



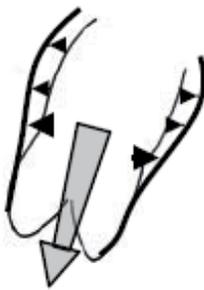
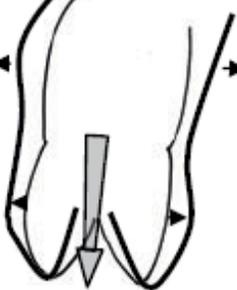
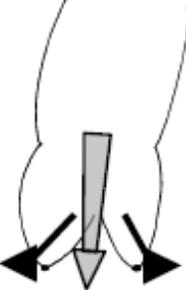
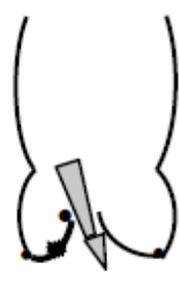
The Myth of the Aortic Annulus: The Anatomy of the Subaortic Outflow Tract

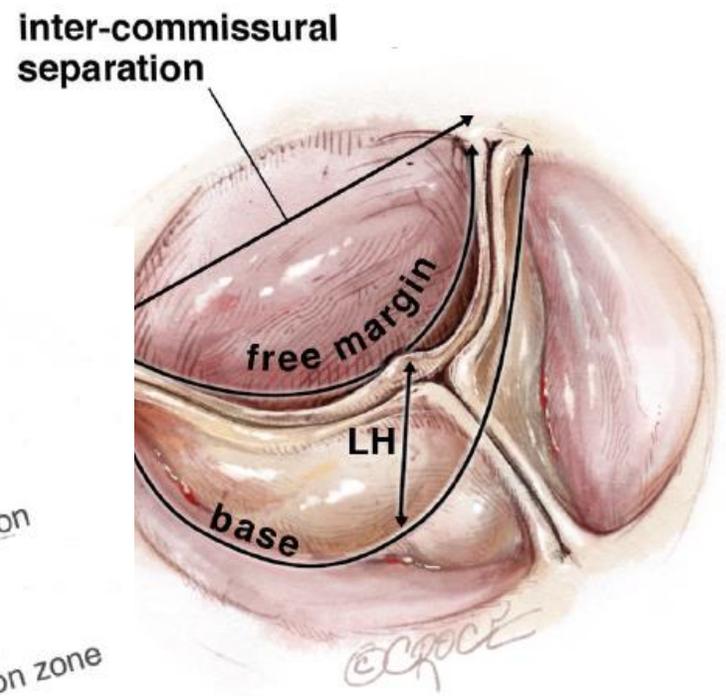
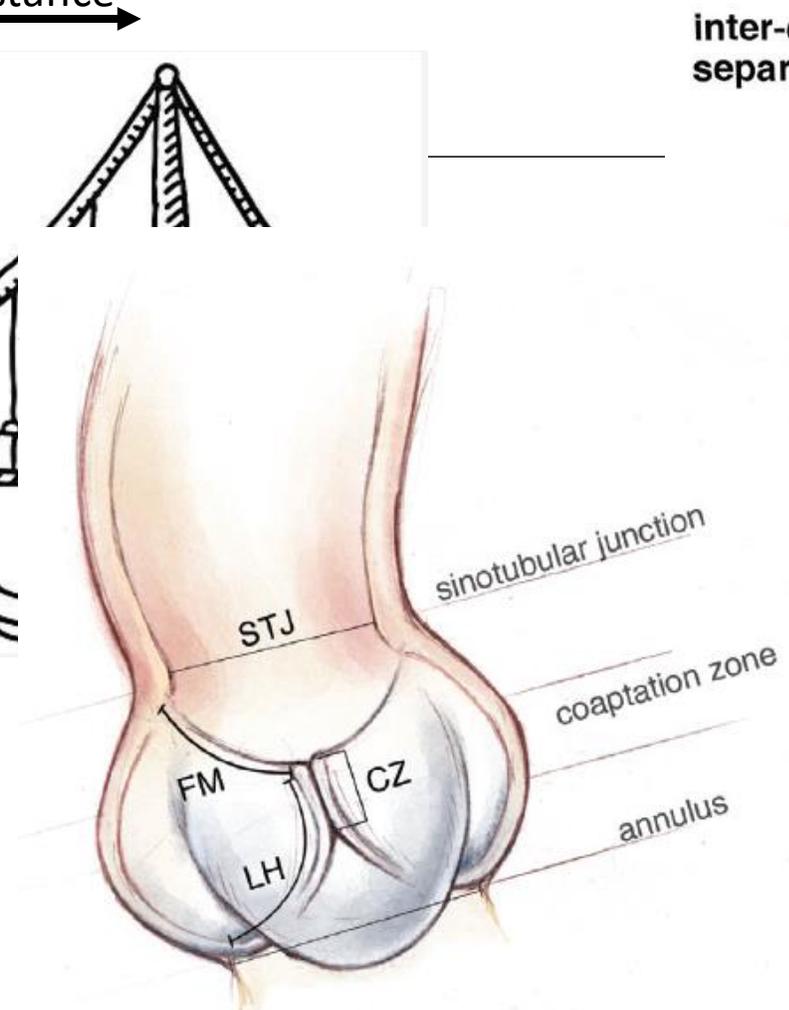
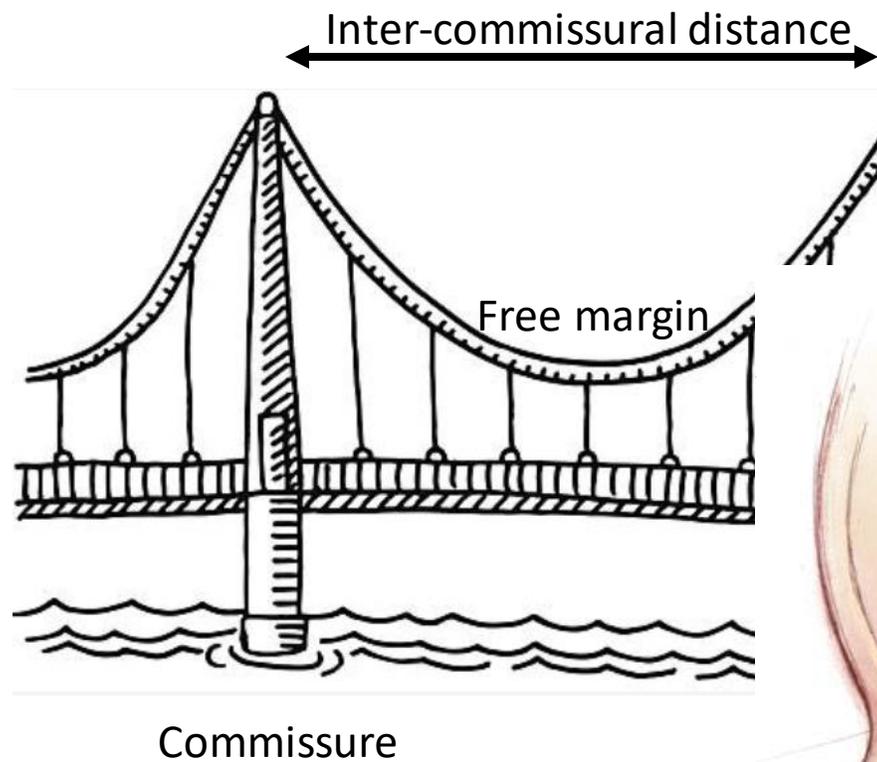
Robert H. Anderson, MD, FRCPath, William A. Devine, BS, Siew Yen Ho, PhD, Audrey Smith, PhD, and Roxane McKay, MD, FRCS

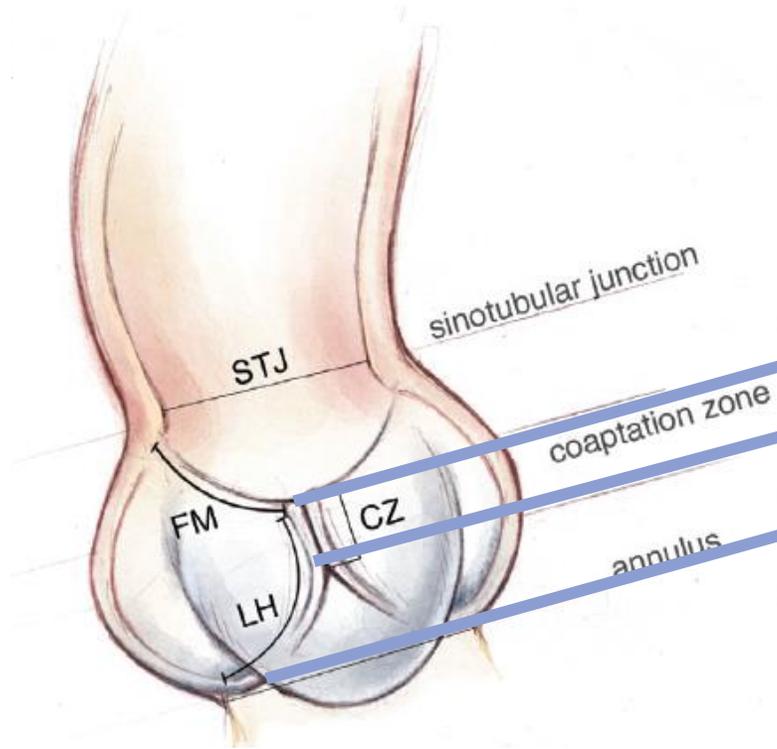
Department of Paediatrics, National Heart and Lung Institute, London, United Kingdom; Department of Pathology, Children's Hospital of Pittsburgh, Pittsburgh, Pennsylvania; and Department of Surgery, Institute of Child Health, University of Liverpool, Liverpool, United Kingdom

Classification of Aortic Insufficiency

INFORMS SURGICAL REPAIR CHOICES

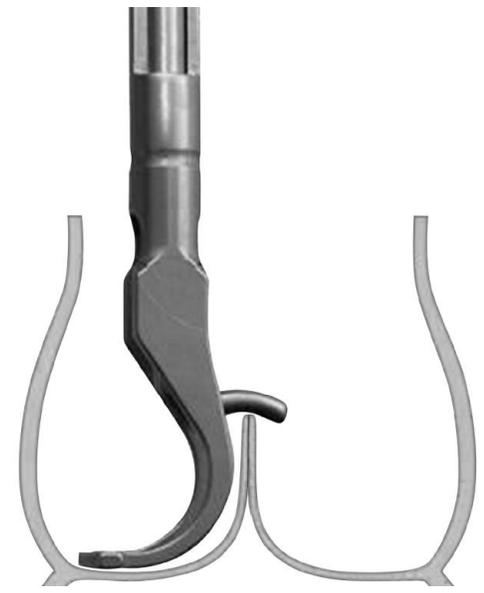
AI Class	Type I Normal cusp motion with FAA dilatation or cusp perforation				Type II Cusp Prolapse	Type III Cusp Restriction
	Ia	Ib	Ic	Id		
Mechanism						
Repair Techniques (Primary)	STJ remodeling <i>Ascending aortic graft</i>	Aortic Valve sparing: <i>Reimplantation or Remodeling with SCA</i>	SCA	Patch Repair <i>Autologous or bovine pericardium</i>	Prolapse Repair <i>Plication Triangular resection Free margin Resuspension Patch</i>	Leaflet Repair <i>Shaving Decalcification Patch</i>
(Secondary)	SCA		STJ Annuloplasty	SCA	SCA	SCA



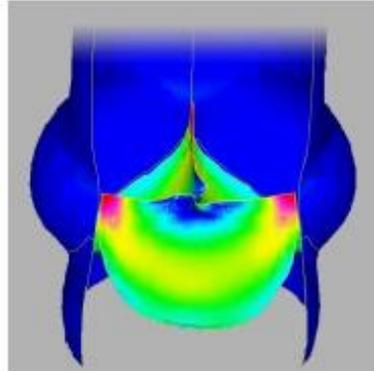


COAPTATION LENGTH

EFFECTIVE HEIGHT



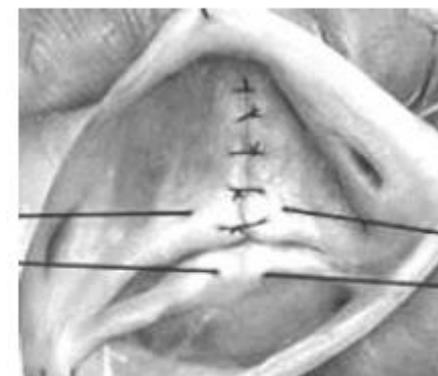
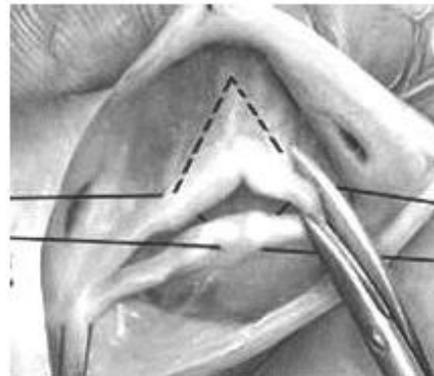
Q1: What is the condition of the leaflets



Thin and pliable

Small fenestrations

Long and prolapsing



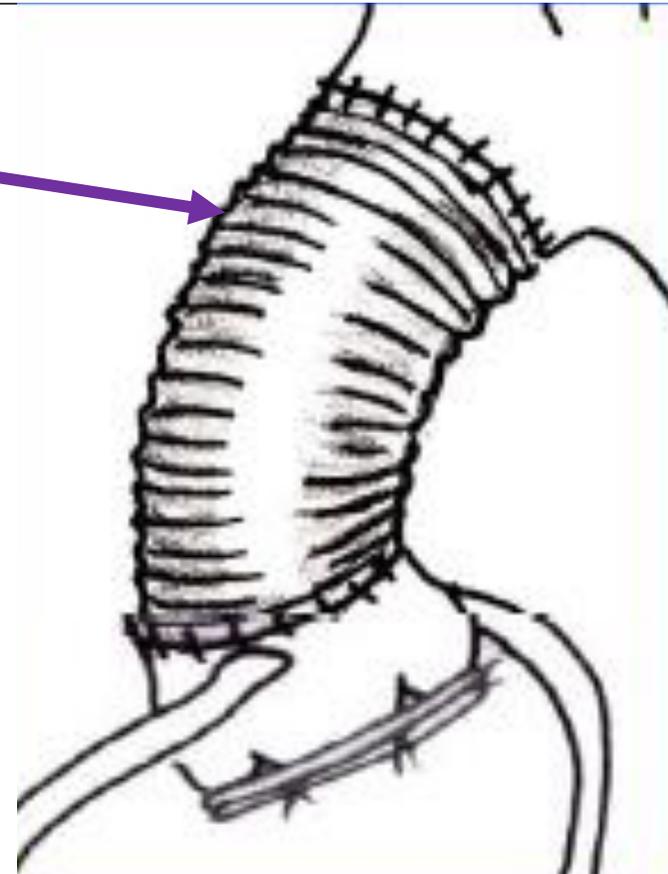
let

Schafers, Homburg, Germany

Q2: What is the condition of the FAA?

➤ STJ dilated?

Then STJ remodeling



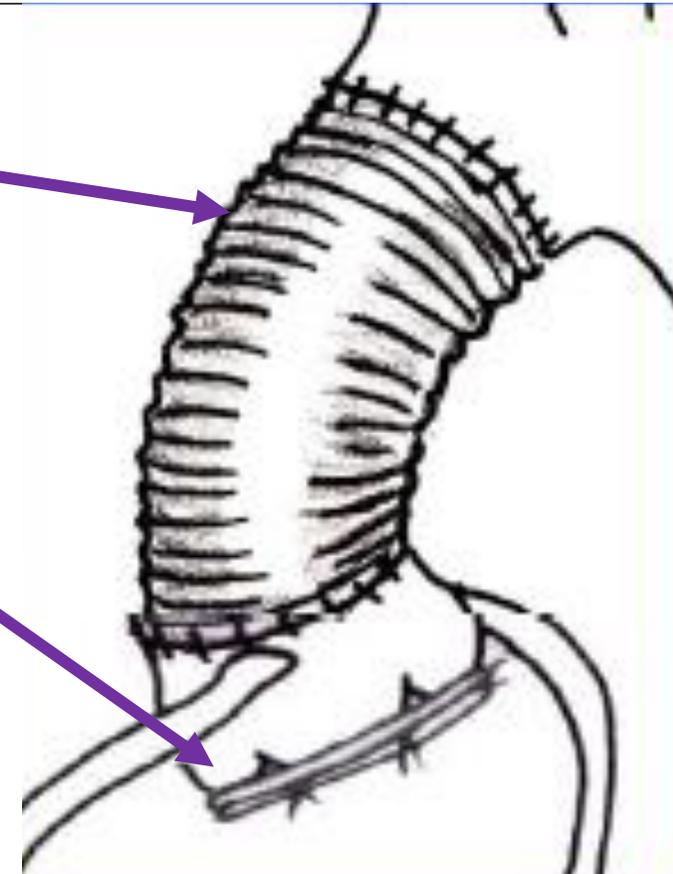
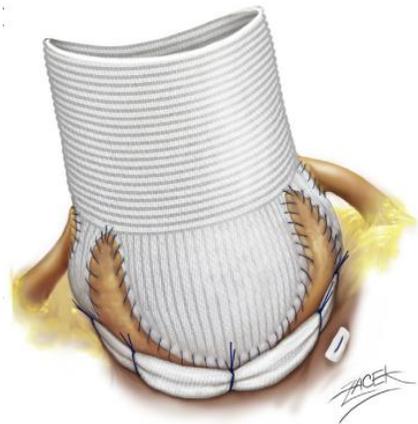
Q2: What is the condition of the FAA?

➤ STJ dilated?

Then STJ remodeling

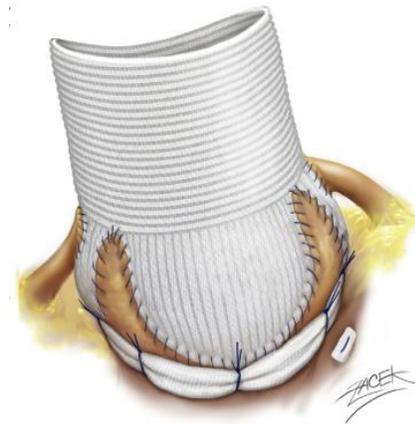
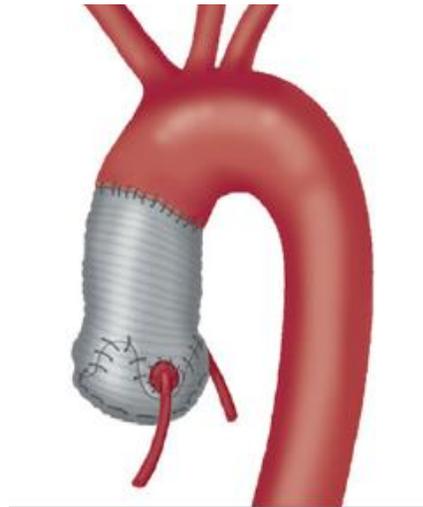
➤ Annuloaortic ectasia?

Then basal ring remodeling

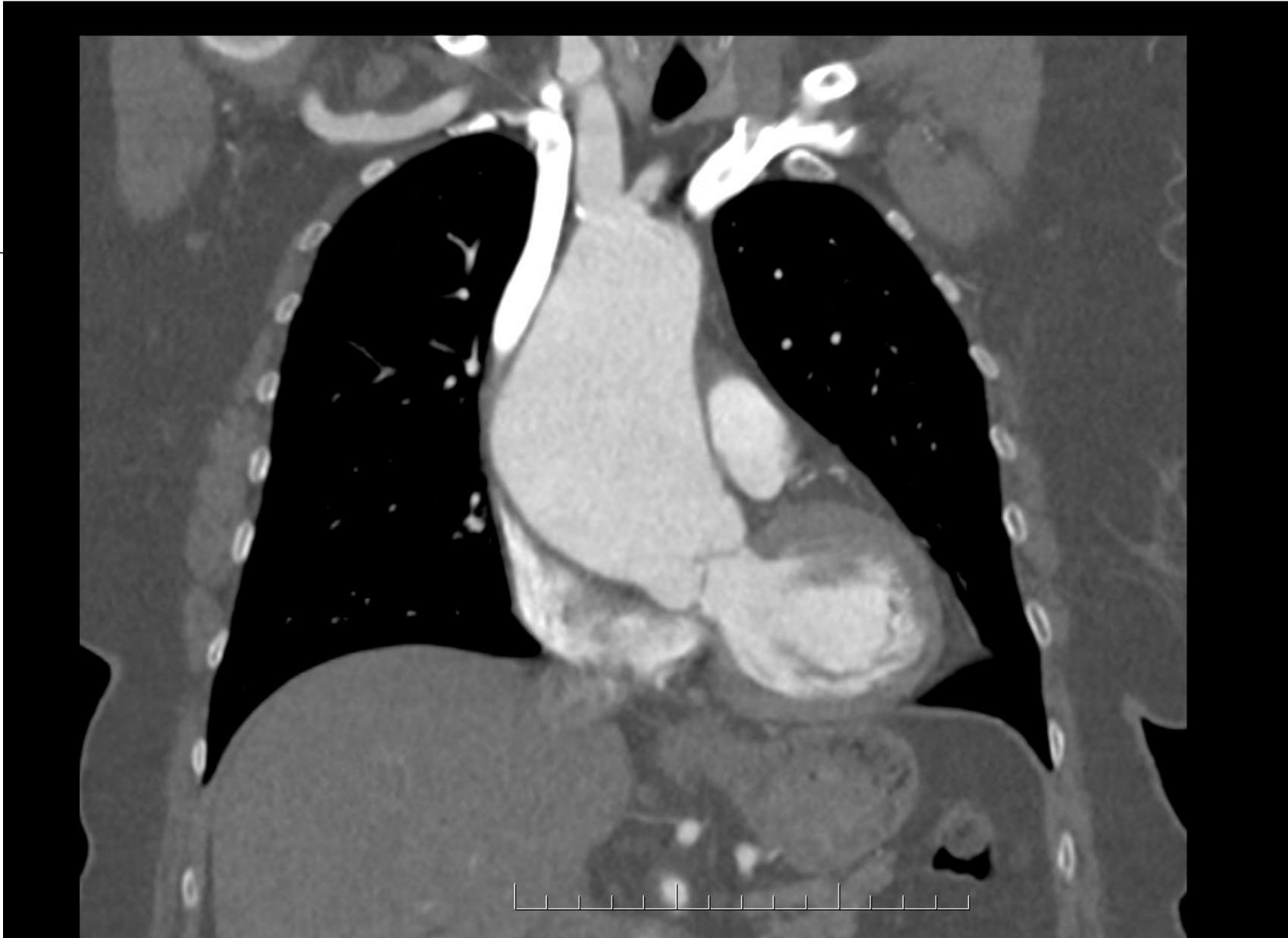


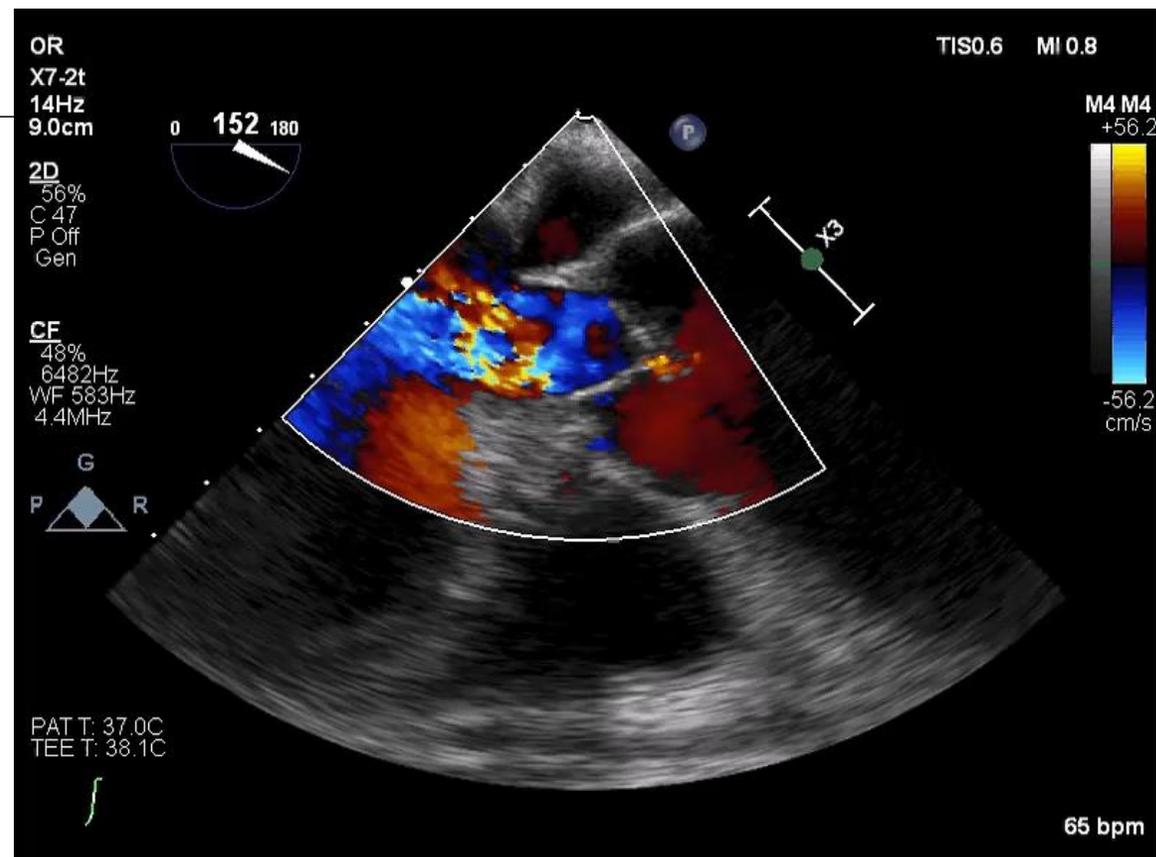
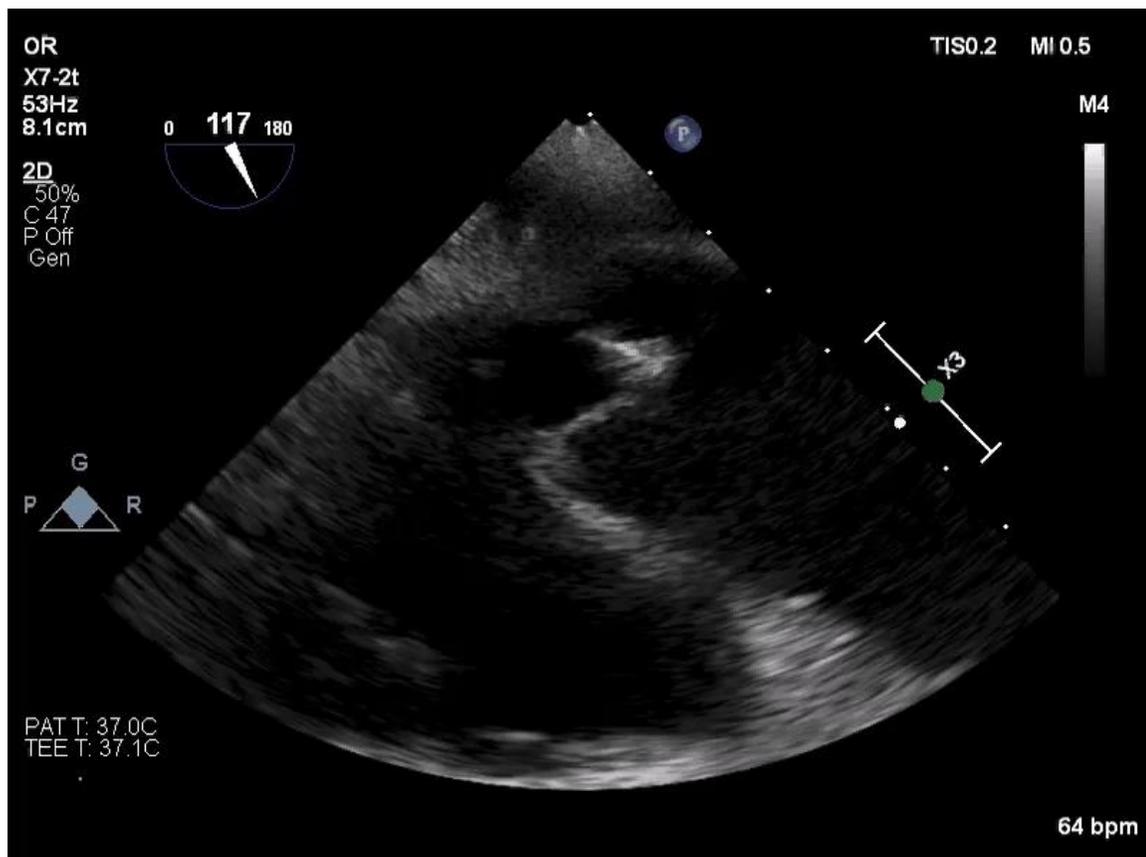
Q2: What is the condition of the FAA?

- STJ dilated? *Then STJ remodeling*
- Annuloaortic ectasia? *Then basal ring remodeling*
- Sinuses of Valsalva? *Then the root should be replaced (VSRR versus Bentall)*



Quick case example





Repair strategy

Aneurysm – needs replacement of the ascending aorta and hemiarch replacement

But what about the severe AI?

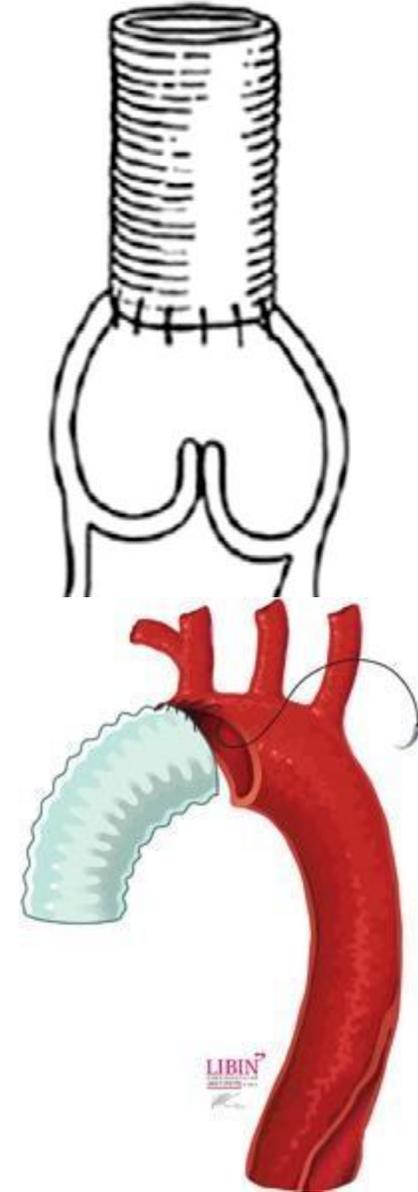
Q1: Leaflet quality: Thickened, Geometric height 17mm

Q2: Basal ring is small, Root not dilated, STJ is distracted

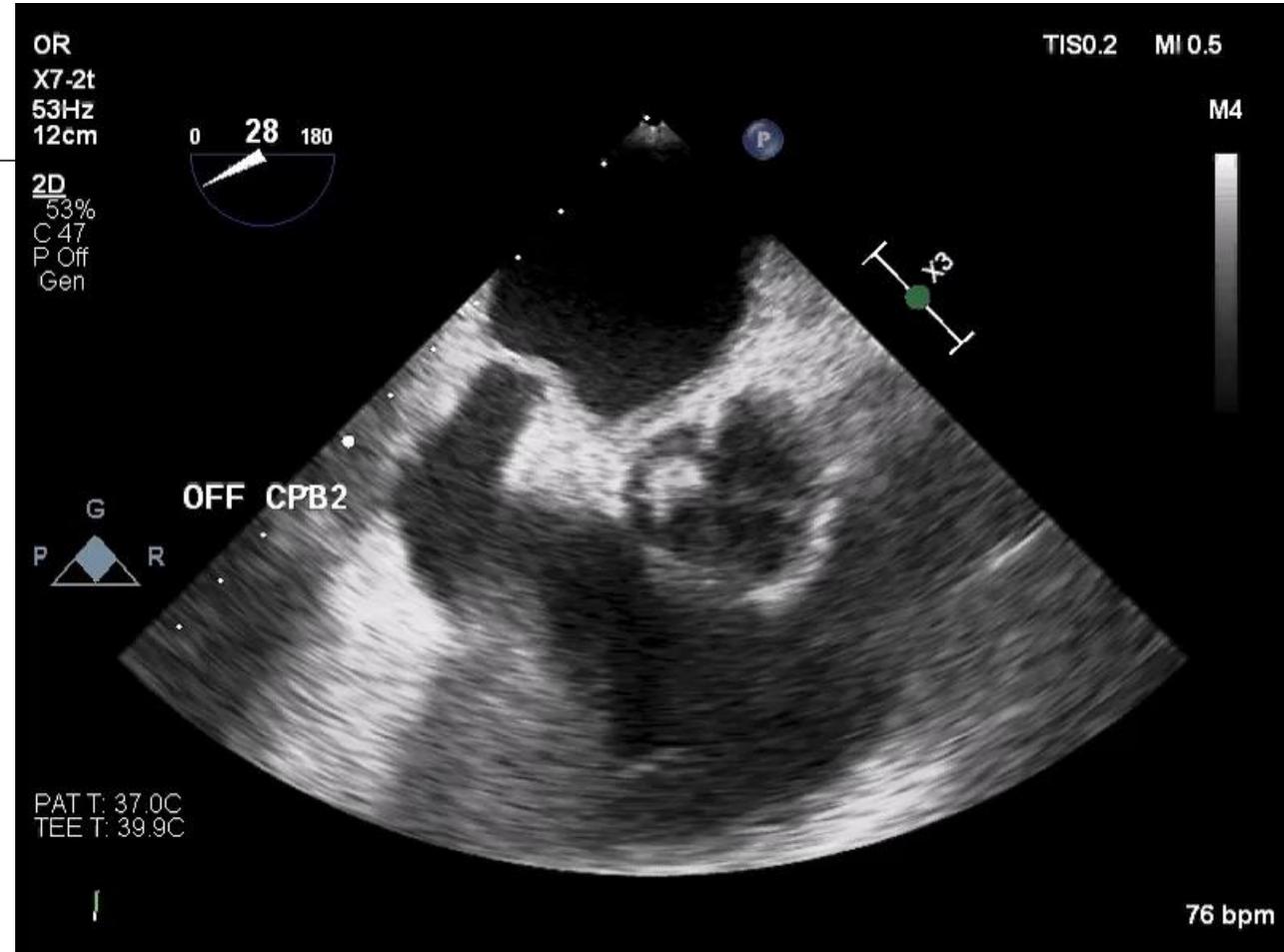
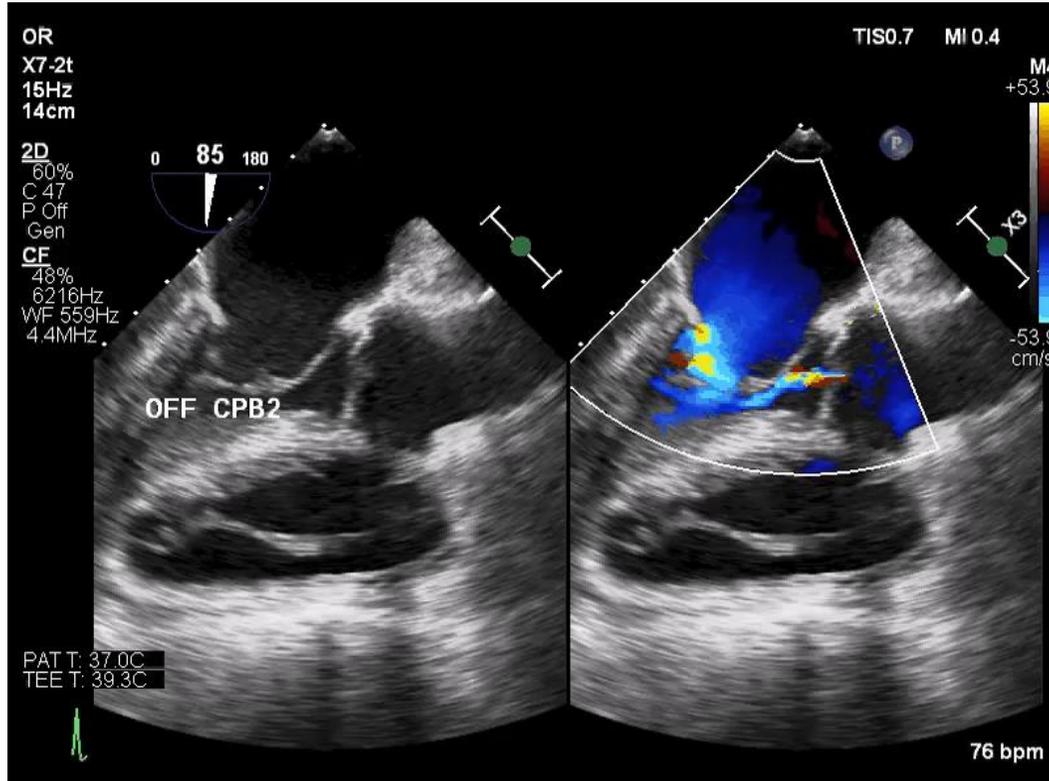
STJ remodeling!

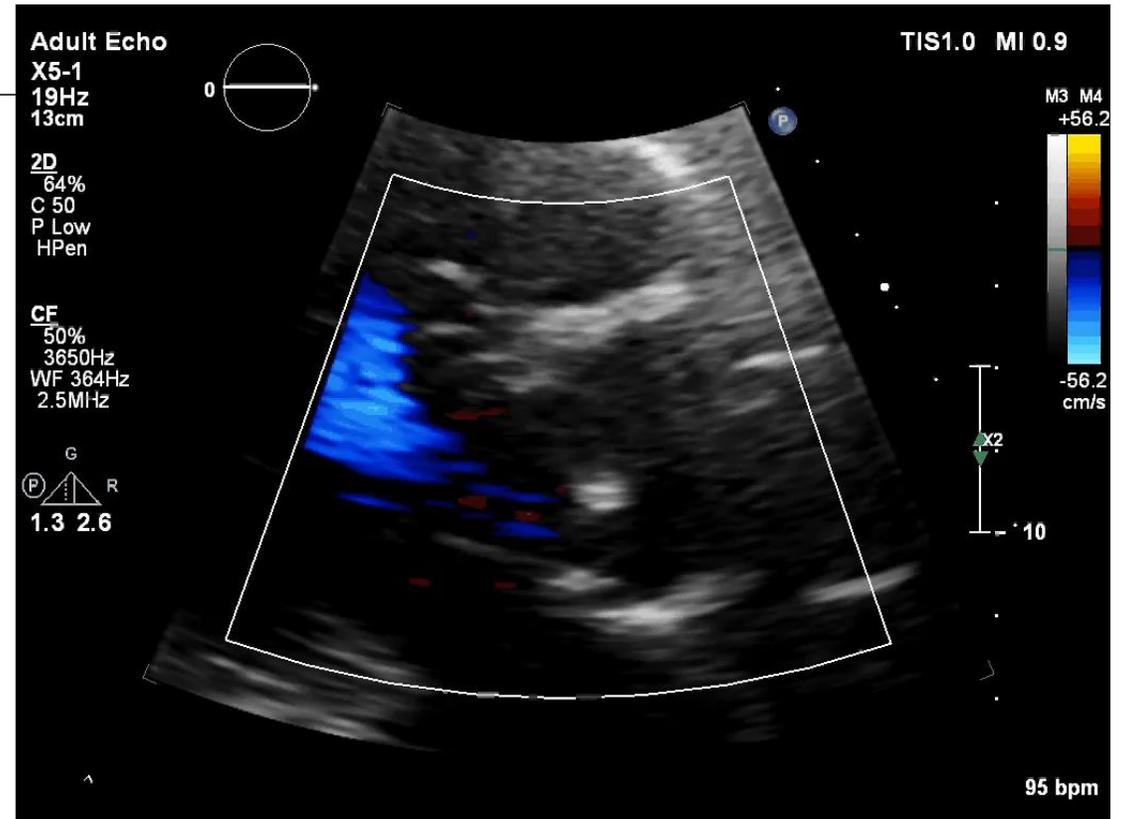
Finer points

- Small basal ring, short leaflets, 26 mm graft chosen
- Anticipate central jet given thickened leaflets
- Best practice to reinspect the valve after STJ remodeling
- Separate graft for hemiarch replacement, and then graft to graft









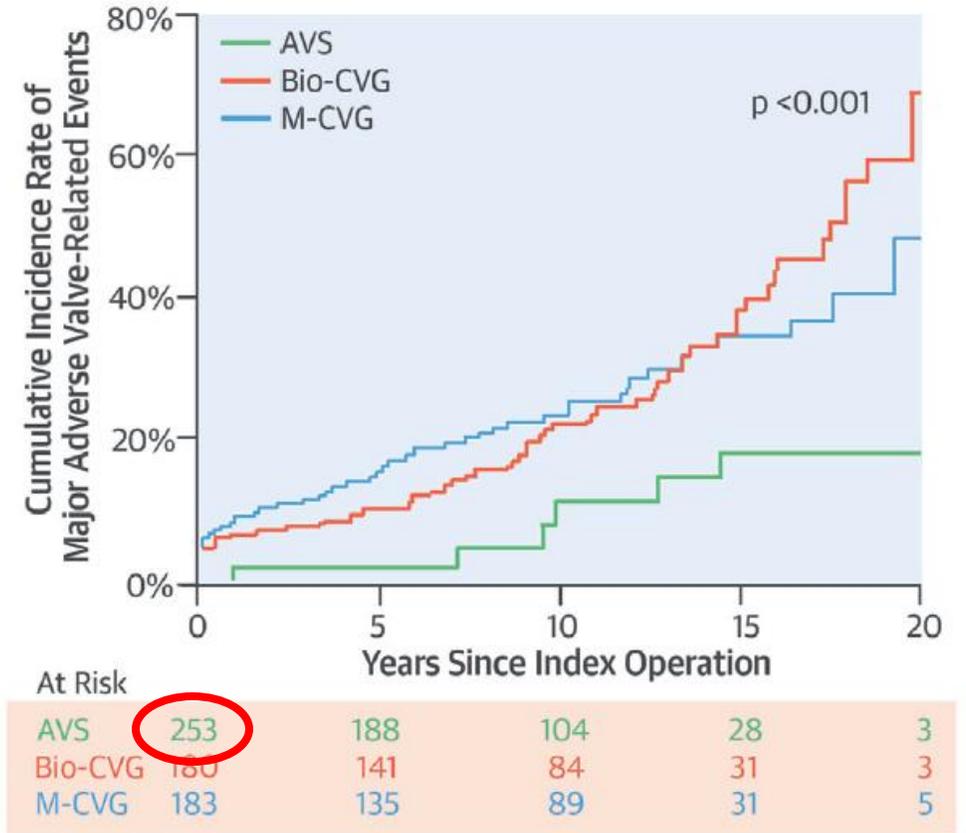
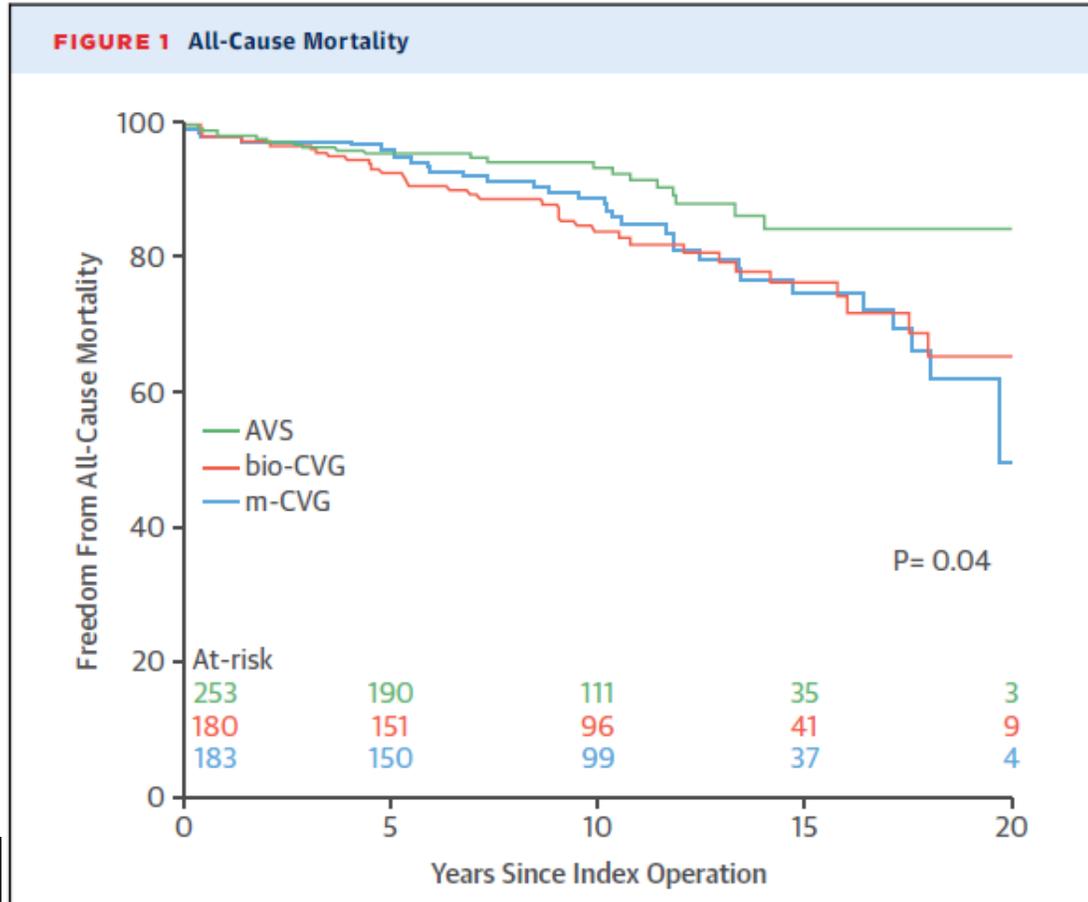
Evidence for Aortic Valve Repair

LONG-TERM OUTCOMES

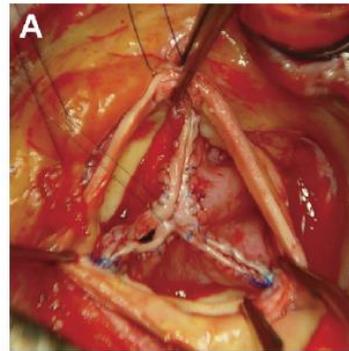
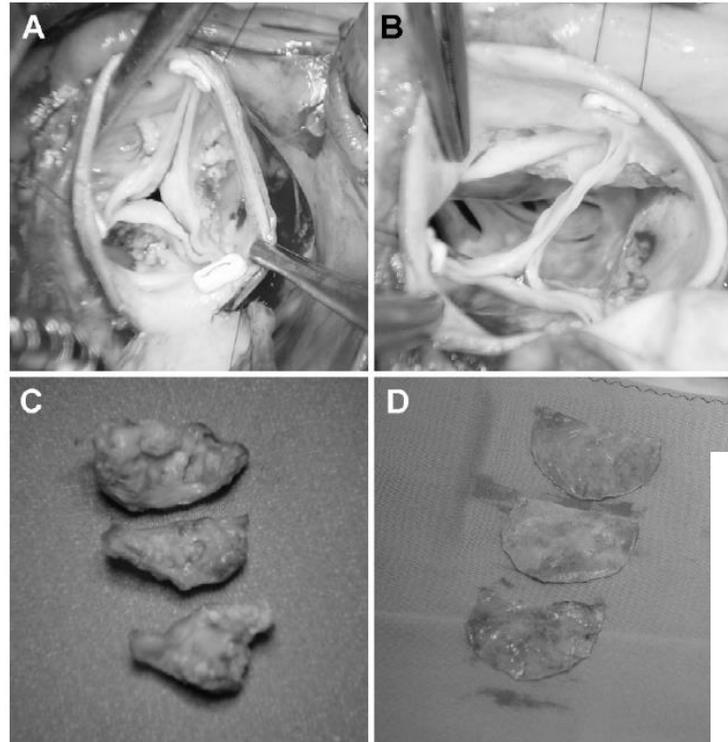


Valve-Sparing Root Replacement Compared With Composite Valve Graft Procedures in Patients With Aortic Root Dilatation

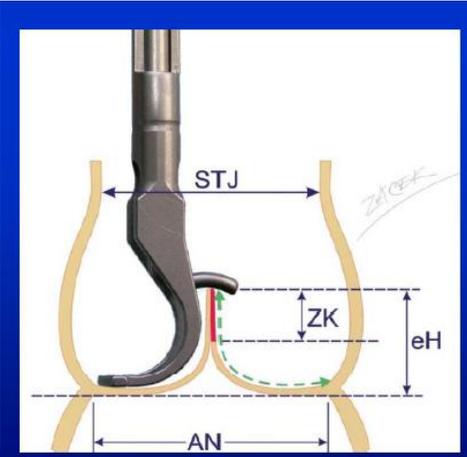
Maral Ouzounian, MD, PhD, Vivek Rao, MD, PhD, Cedric Manlhiot, PhD, Nachum Abraham, MSc, Carolyn David, RN, Christopher M. Feindel, MD, MSc, Tirone E. David, MD



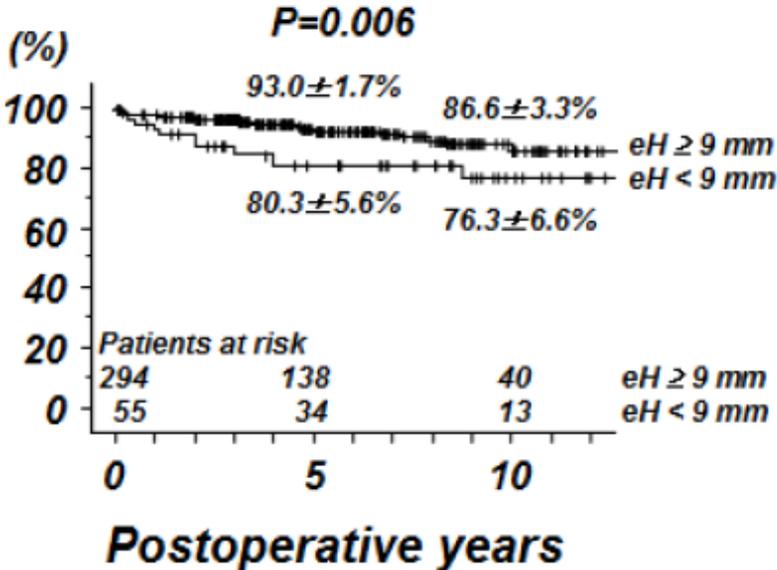
Beware patients who require **significant de-calcification** or **extensive patch-work**



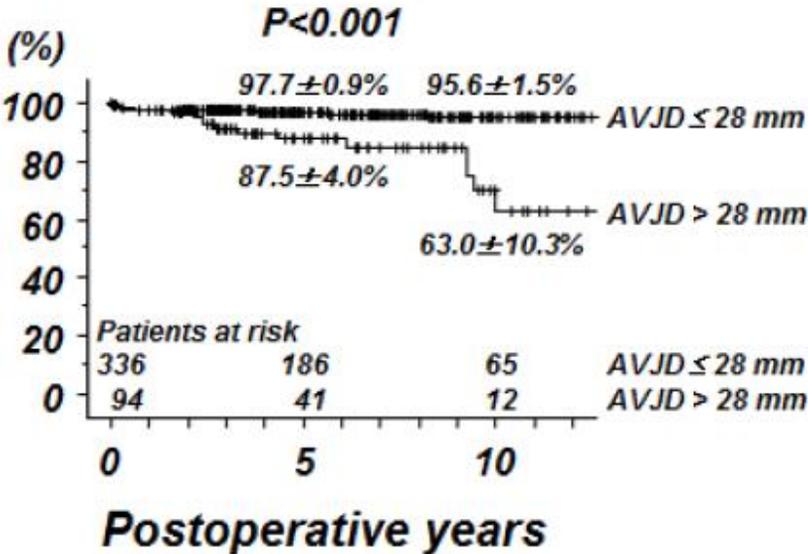
Technique optimizes long-term durability



Stratified by effective height



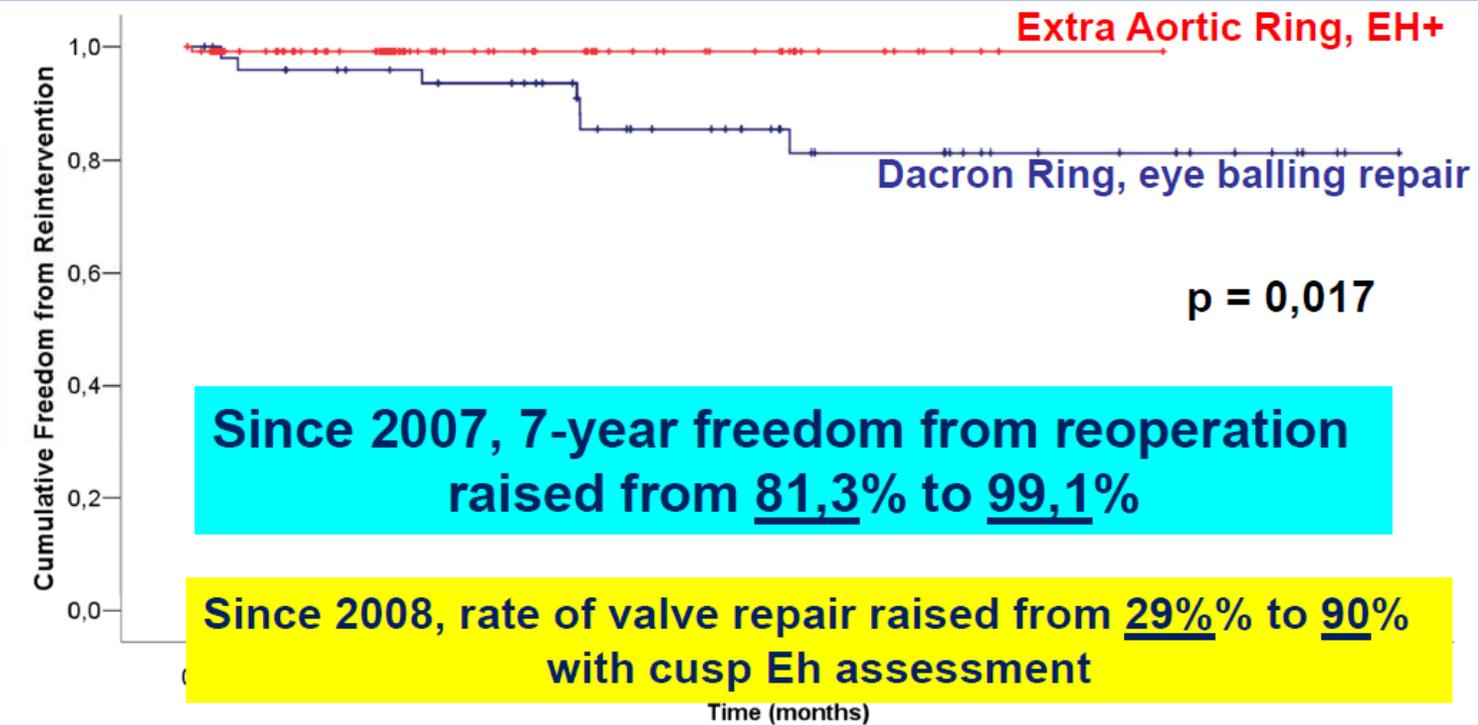
Stratified by AVJD



Technique optimizes long-term durability

2007 : calibrated expansible Extra-Aortic™ ring annuloplasty

2008 : cusp effective Height caliper assessment (Fehling)



Take-Home Messages

UNDERSTANDING THE FUNCTIONAL AORTIC ANNULUS INFORMS
SURGICAL REPAIR STRATEGIES

EXCELLENT LONG-TERM RESULTS FOR AORTIC VALVE REPAIR FOR
AORTIC INSUFFICIENCY IF CHOOSE THE RIGHT PATIENTS AND THE
RIGHT TECHNIQUES



@jenn_cy_chung



jennifer.chung@uhn.ca

THANK-YOU FOR YOUR ATTENTION