



INSTITUT  
CARDIOVASCULAIRE  
PARIS  
SUD

# Valve in Valve: Things that you need to know

Bernard Chevalier  
ICPS Massy  
France



In the last five years , I received research grants or speaker fees or I am/was consultant for: Abbott Vascular, Asahi, Astra Zeneca, AVI, Boston Scientific, Biotronik, Colibri, Cook, Cordis, Daichi-Sankyo, Eli-Lilly, Iroko, Medtronic, Terumo. I am currently minor shareholder & general director of CERC (CRO)

# Isolated aortic valve replacement in North America comprising 108,687 outcome

James M. Brown  
James S. Gamm

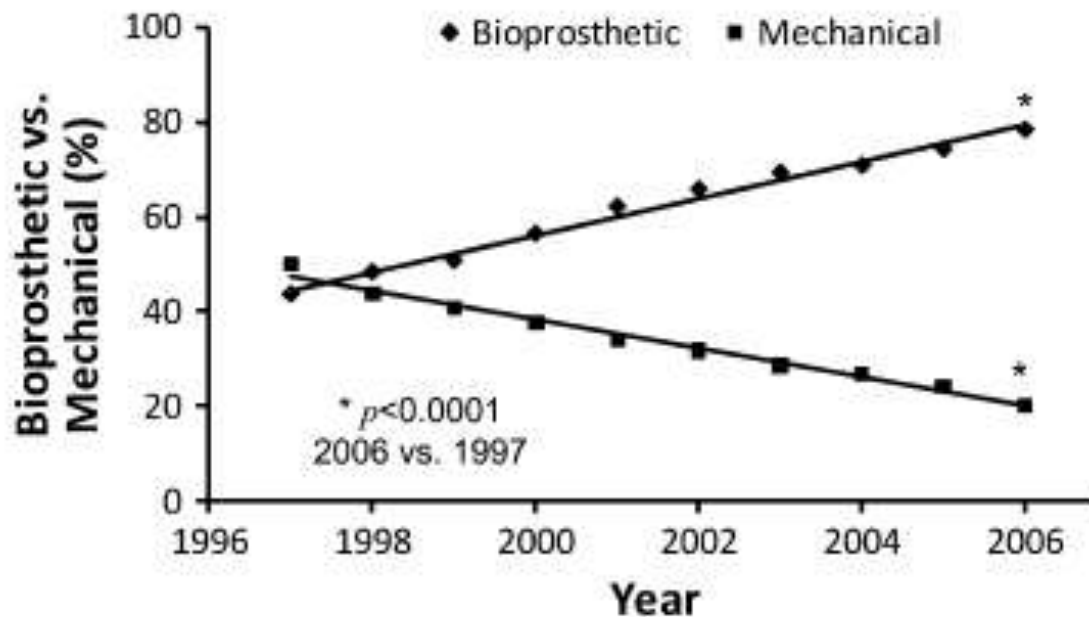
Objective  
changes

Methods  
baseline data, 10%  
distributed  
marized  
subgroup

Results:  
2006 we  
vs 3.25,  
Female s  
stroke ra

Conclus

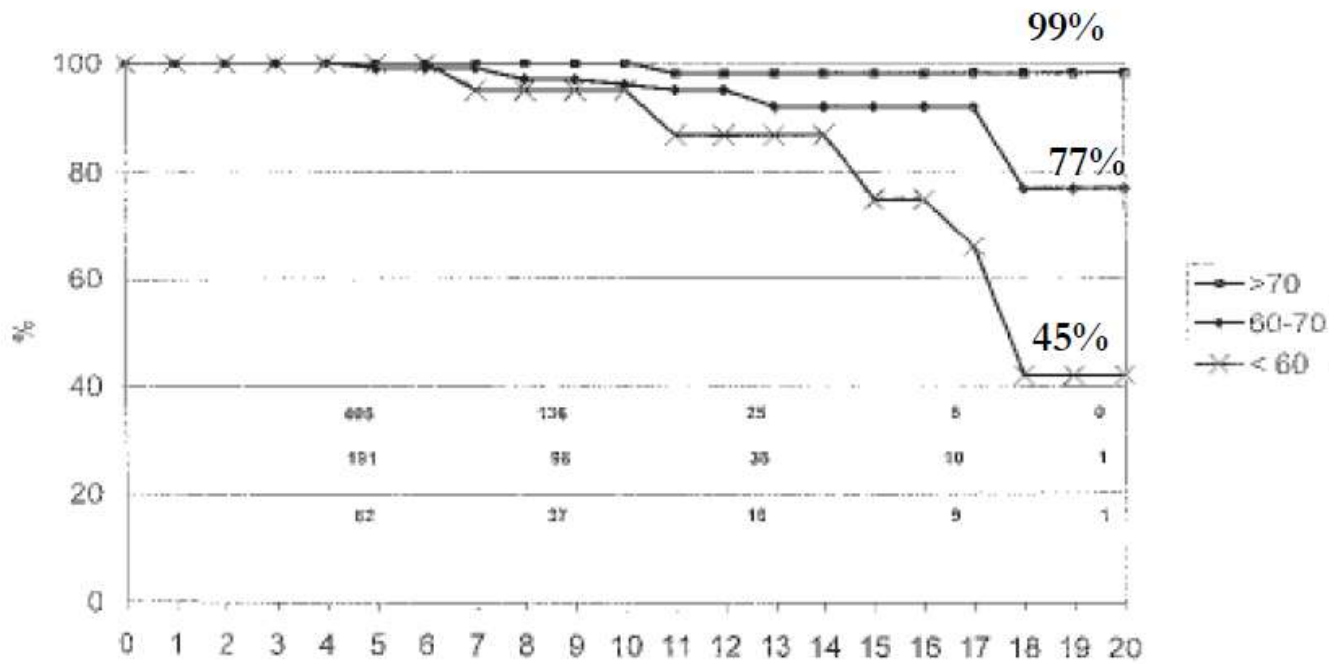
in patient age and overall risk profile. There has been a shift toward bioprostheses. Women, patients older than 70 years, and patients with ejection fraction less than 30% have worse outcomes for mortality, stroke, and postoperative stay.



**FIGURE 1.** Percentage use of bioprosthetic valves relative to mechanical valves from 1997 through 2006. Bioprosthetic valve use increased progressively during 10 years. Asterisk indicates  $P < .000001$ .

# Structural Bioprosthesis Failure

1133 Pts (1984-2003), mean age 72.6 yrs, Perimount valve



Actuarial freedom from structural valve failure

## Reoperation of

Thomas Eitz, MD, Dirk  
Armin Zittermann, PhD

Departments of Cardiothoracic Sur  
University Bochum, Bad Oeynhaus

**Background.** Because of incre  
patients with heart valve rep  
durability of heart valve biopr  
tion becomes necessary in a  
patients. Reliable data on mor  
octogenarians after replacemen  
ses are scanty, however.

**Methods.** We retrospectively  
80 years and older who underw  
the aortic valve (69 bioprothes  
ses) between 1991 and 2004 at  
rate of the study cohort was  
group of octogenarians matche  
aortic valve replacement. To as  
survival and 3-year survival,  
and multivariate analyses.

**Results.** Survival rates at 30 c  
years were 83.6%, 76.1%, 70.8%

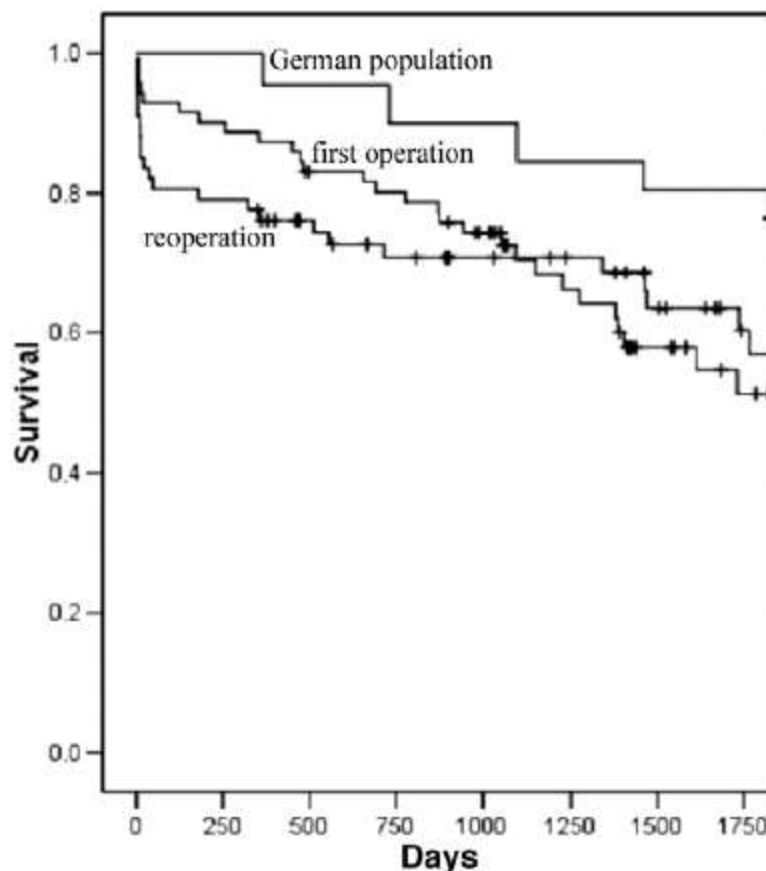


Fig 1. Kaplan Meier survival estimates for octogenarians with a reoperation of their aortic valve prosthesis (bottom line) compared with octogenarians who had their first aortic valve replacement (middle line) and an age-matched and gender-matched cohort from the German population (top line). Results did not differ between patients with reoperation and the control group ( $p = 0.646$ ).

## ogenarians

PhD,  
rörfer, MD, PhD

hine Westfalia, Ruhr

ificantly between the study  
ents with reoperation had an  
of 5.6 years. Postoperative  
ardiac output syndrome and  
only independent predictors  
and  $p = 0.015$ , respectively).  
al failure, and diabetes mel  
ctors of 3-year survival ( $p =$

onstrate that it is possible to  
ome in octogenarians who  
c valve prosthesis. Early and  
nificantly influenced by unex  
cations and not by preoper  
ception of diabetes mellitus.

Thorac Surg 2006;82:1385–91)  
ociety of Thoracic Surgeons

# Redo SVAR: Impact on risk

Patient related factors			Cardiac related factors		
Age <sup>1</sup> (years)	<input type="text" value="83"/>	<input type="text" value="0.68"/>	NYHA	<input type="text" value="select"/>	<input type="text" value="0"/>
Gender	<input type="text" value="male"/>	<input type="text" value="0"/>	CCS class 4 angina <sup>8</sup>	<input type="text" value="no"/>	<input type="text" value="0"/>
Renal impairment <sup>2</sup> <small>See calculator below for creatinine clearance</small>	<input type="text" value="moderate (CC &gt;50 &amp; &lt;85)"/>	<input type="text" value=".303553"/>	LV function	<input type="text" value="moderate (LVEF 31%-50%)"/>	<input type="text" value=".3150652"/>
Extracardiac arteriopathy <sup>3</sup>	<input type="text" value="no"/>	<input type="text" value="0"/>	Recent MI <sup>9</sup>	<input type="text" value="no"/>	<input type="text" value="0"/>
Poor mobility <sup>4</sup>	<input type="text" value="no"/>	<input type="text" value="0"/>	Pulmonary hypertension <sup>10</sup>	<input type="text" value="no"/>	<input type="text" value="0"/>
Previous cardiac surgery	<input type="text" value="no"/>	<input type="text" value="0"/>	Operation related factors		
Chronic lung disease <sup>5</sup>	<input type="text" value="no"/>	<input type="text" value="0"/>	Urgency <sup>11</sup>	<input type="text" value="elective"/>	<input type="text" value="0"/>
Active endocarditis <sup>6</sup>	<input type="text" value="no"/>	<input type="text" value="0"/>	Weight of the intervention <sup>12</sup>	<input type="text" value="single non CABG"/>	<input type="text" value=".0062118"/>
Critical preoperative state <sup>7</sup>	<input type="text" value="no"/>	<input type="text" value="0"/>	Surgery on thoracic aorta	<input type="text" value="no"/>	<input type="text" value="0"/>
Diabetes on insulin	<input type="text" value="no"/>	<input type="text" value="0"/>			
EuroSCORE II	<input type="text" value="EuroSCORE II 5.23 %"/>				
<small>Note: This is the 2011 EuroSCORE II</small> <input type="button" value="Calculate"/> <input type="button" value="Clear"/>					



# Transapical aortic valve implantation in patients requiring redo surgery<sup>☆</sup>



Thomas Walther<sup>a,\*</sup>, Volkmar Falk<sup>a</sup>, Michael A. Borger<sup>a</sup>, Jörg Kempfert<sup>a</sup>, Jörg Ender<sup>b</sup>, Axel Linke<sup>c</sup>, Gerhard Schuler<sup>c</sup> and Friedrich W. Mohr<sup>a</sup>

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1. ✉<sup>☆</sup> Presented at the 22nd Annual Meeting of the European Association for Cardio-thoracic Surgery, Lisbon, Portugal, September 14-17, 2008.

Received September 7, 2008.

Revision received January 31, 2009.

Accepted February 4, 2009.

## Case Reports

### Human Minimally Invasive Off-Pump Valve-in-a-Valve Implan

Thomas Walther, MD, PhD<sup>a,\*</sup>, Jörg Kempfert, MD<sup>a</sup>, Michael A. Borger, MD, PhD<sup>a</sup>, Jens Fassl, M Johannes Blumenstein, MS<sup>a</sup>, Mark Dehdashtian, PhD<sup>d</sup>, Gerhard Schuler, MD, PhD<sup>c</sup>, Friedrich W.

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<sup>c</sup> Department of Cardiology, Universität Leipzig, Herzzentrum, Leipzig.  
<sup>d</sup> Edwards Laboratories, Irvine, California

Accepted for publication December 13, 2007.

## Brief Technique Report

### Transcatheter valve-in-

Josep Rodés-Cabau, MD, FESC\*,

## Transapical off-pump aortic valve-in-a-valve implantation in two elderly patients with a degenerated porcine bioprosthesis

### Which available transapical transcatheter valve fits into degenerated aortic bioprostheses?

Enrico Ferrari<sup>a,\*</sup>, Carlo Marcucci<sup>b</sup>, Christopher Sulzer<sup>b</sup> and

Ludwig Karl von Segesser<sup>a</sup>

+ Author Affiliations

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## Brief Technique Report

### Minimally invasive transapical aortic valve-in-a-valve implantation for severe aortic regurgitation in a degenerated stentless bioprosthesis

Timotheos G. Kelpis, MD\*, Nikolaos E. Mezilis, MD, FESC, Vlasis N. Ninios, MD, MRCP, Antonis A. Pitsis, MD, FETCS, FESC

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Received for publication March 21, 2009; accepted for publication May 17, 2009.

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July 31, 2009.

Journal of the American College of Cardiology  
 © 2010 by the American College of Cardiology Foundation.  
 Published by Elsevier Inc.

Vol. 55, No. 2, 2010  
 ISSN 0735-1097/10/\$36.00  
 doi:10.1016/j.jacc.2009.06.060

## Transcatheter Aortic Valve Implantation for Stenosed and Regurgitant Aortic Valve Bioprostheses

CoreValve for Failed Bioprosthetic Aortic Valve Replacements

Muhammed Z. Khawaja, MBBS,\* Peter Haworth, MBBS,\* Azad Ghuran, MBChB, MD,\* Lorraine Lee, BSE,\* Adam de Belder, MD,\* Neville Hutchinson, MD,\* Uday Trivedi, MBBS,\* Jean-Claude Laborde, MD,† David Hildick-Smith, MD\*

Brighton, United Kingdom; and Toulouse, France



# France TAVI registry

3707 patients in 2013



3,2% Valve in Valve TAVI

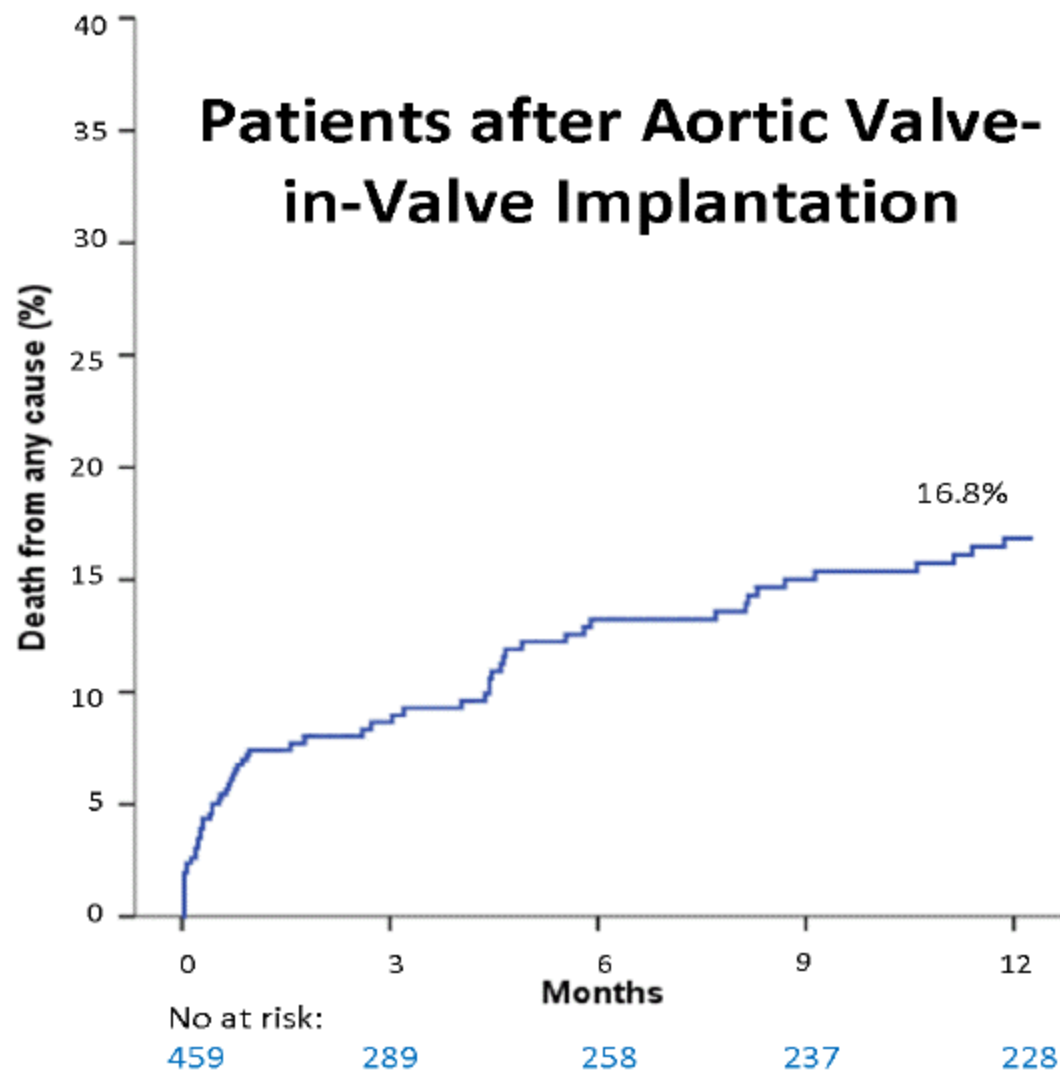
# What do we learn from global registry?

## **Transcatheter Aortic Valve Replacement for Degenerative Bioprosthetic Surgical Valves**

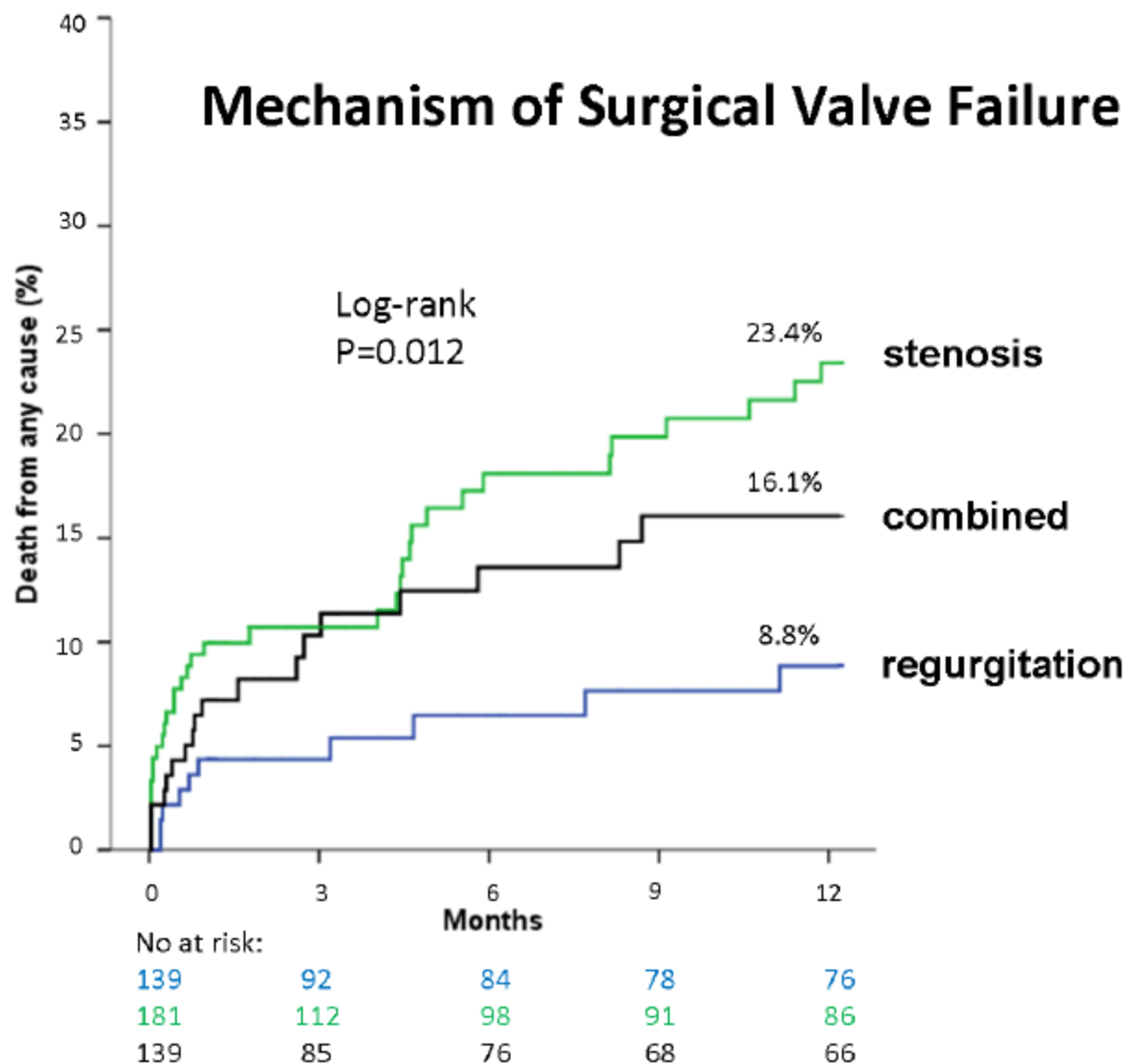
### **Results From the Global Valve-in-Valve Registry**

Danny Dvir, MD; John Webb, MD; Stephen Brecker, MD; Sabine Bleiziffer, MD;  
David Hildick-Smith, MD; Antonio Colombo, MD; Fleur Descoutures, MD;  
Christian Hengstenberg, MD; Neil E. Moat, FRCS; Raffi Bekerredjian, MD; Massimo Napodano, MD;  
Luca Testa, MD, PhD; Thierry Lefevre, MD; Victor Guetta, MD; Henrik Nissen, MD, PhD;  
José-María Hernández, MD; David Roy, MD; Rui C. Teles, MD; Amit Segev, MD;  
Nicolas Dumonteil, MD; Claudia Fiorina, MD; Michael Gotzmann, MD; Didier Tchetché, MD;  
Mohamed Abdel-Wahab, MD; Federico De Marco, MD; Andreas Baumbach, MD;  
Jean-Claude Laborde, MD; Ran Kornowski, MD

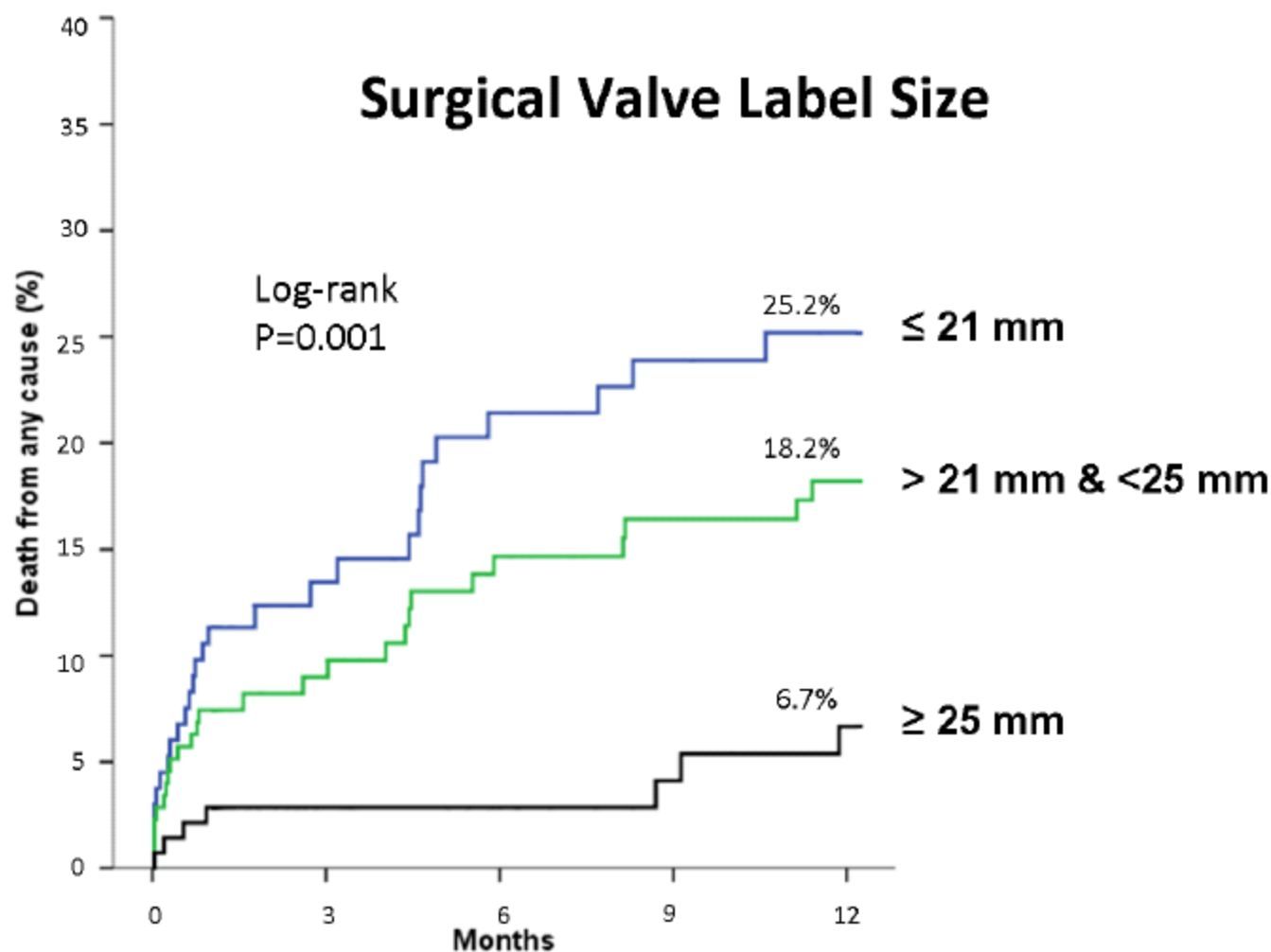
*Circulation* 2012; 126: 2335-2344



## Mechanism of Surgical Valve Failure

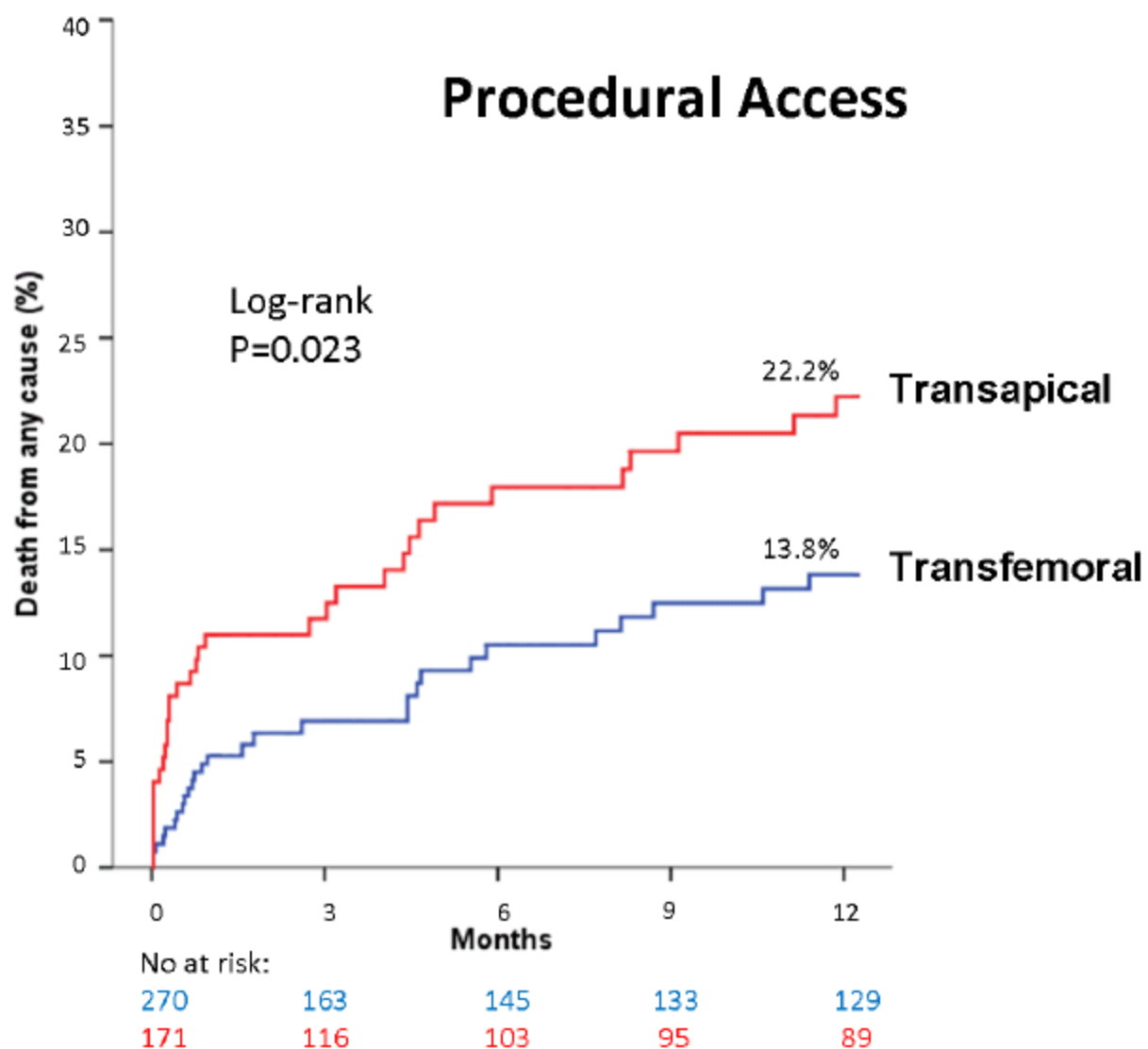


## Surgical Valve Label Size



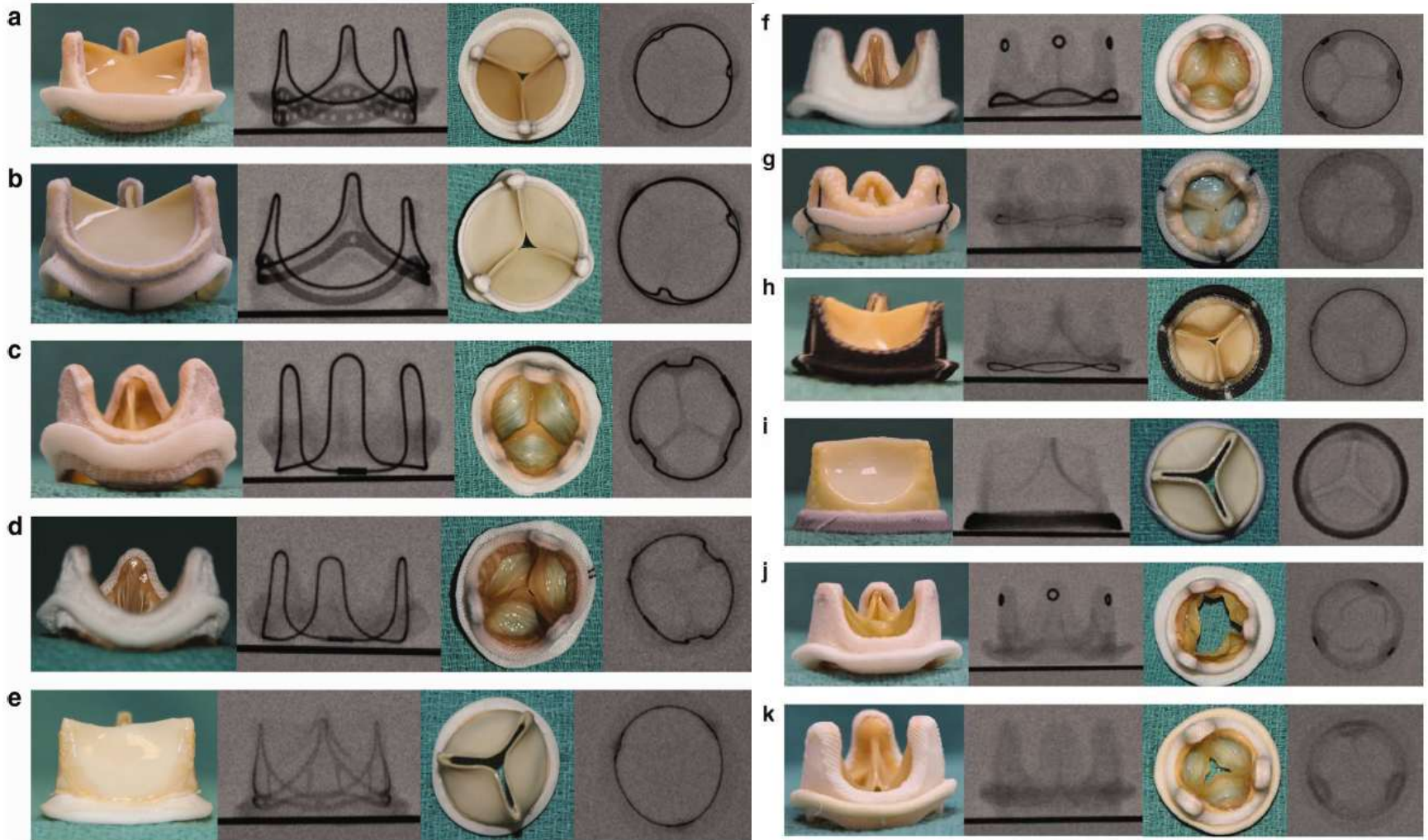
No at risk:

133	81	68	61	57
176	116	103	95	92
139	89	82	76	73



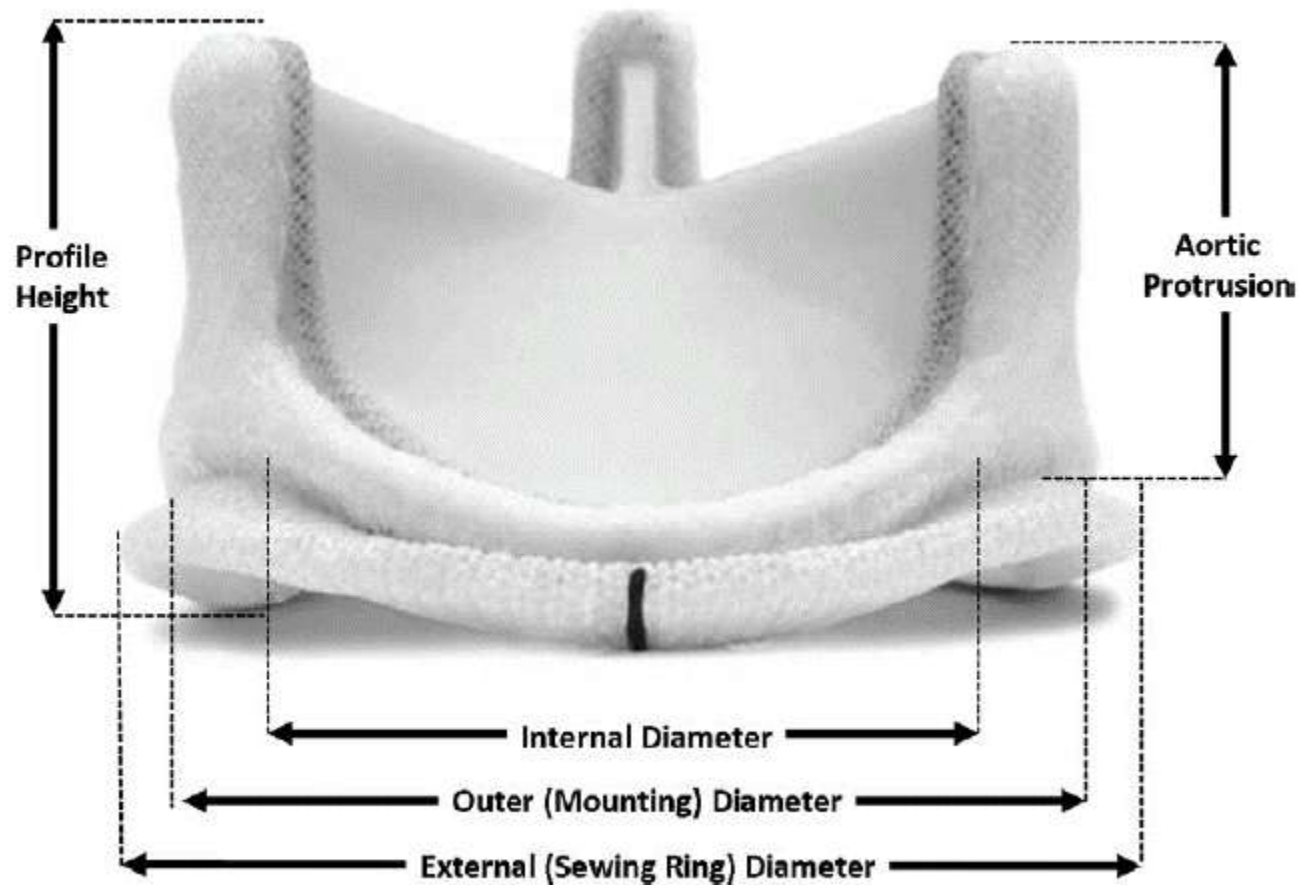
# Patient selection

# Design of Bioprosthetic Valves





# You need to know...



# Get the report of SVAR



Model	A Inside Diameter mm	B Outside Diameter mm	C Profile Height mm	D Sewing Cuff Width mm	EOA* cm <sup>2</sup>
LXA19	15.4	18.6	11	21	1.7
LXA21	17.3	20.7	13	23	2.1
LXA23	19	22.7	14	26	2.6
LXA25	21	25.1	15	29	3.2
LXA27	22.9	27.3	16	31	3.6

# We should...

- Understand mechanisms



vs

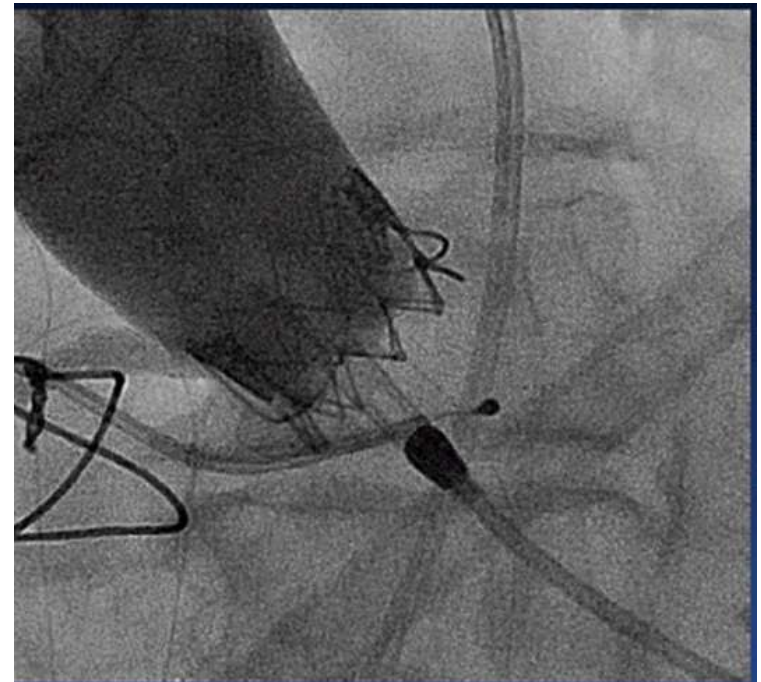
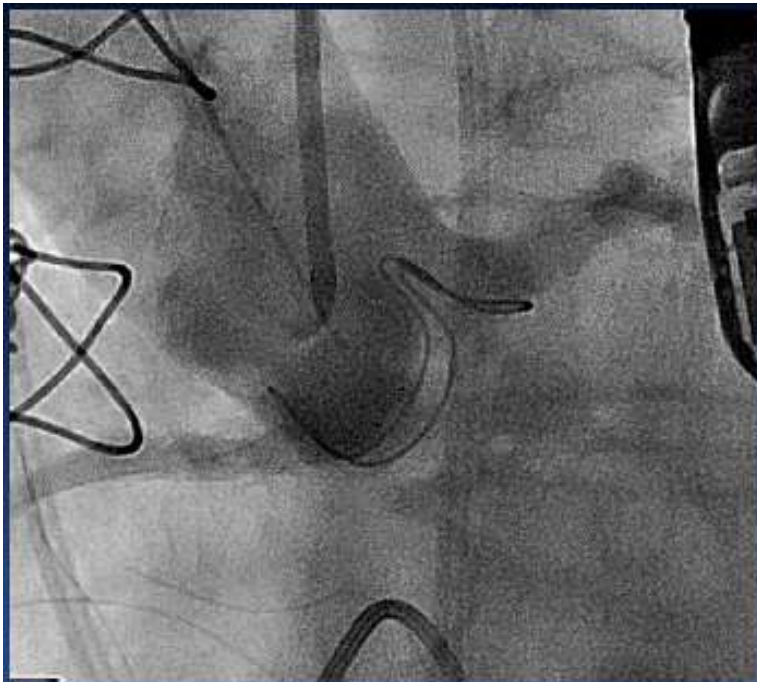


vs



- Eliminate thrombus / endocarditis
- Eliminate mismatch as mechanism of AS
- Eliminate PVL as mechanism of AR
- Assess the risk for coronary occlusion

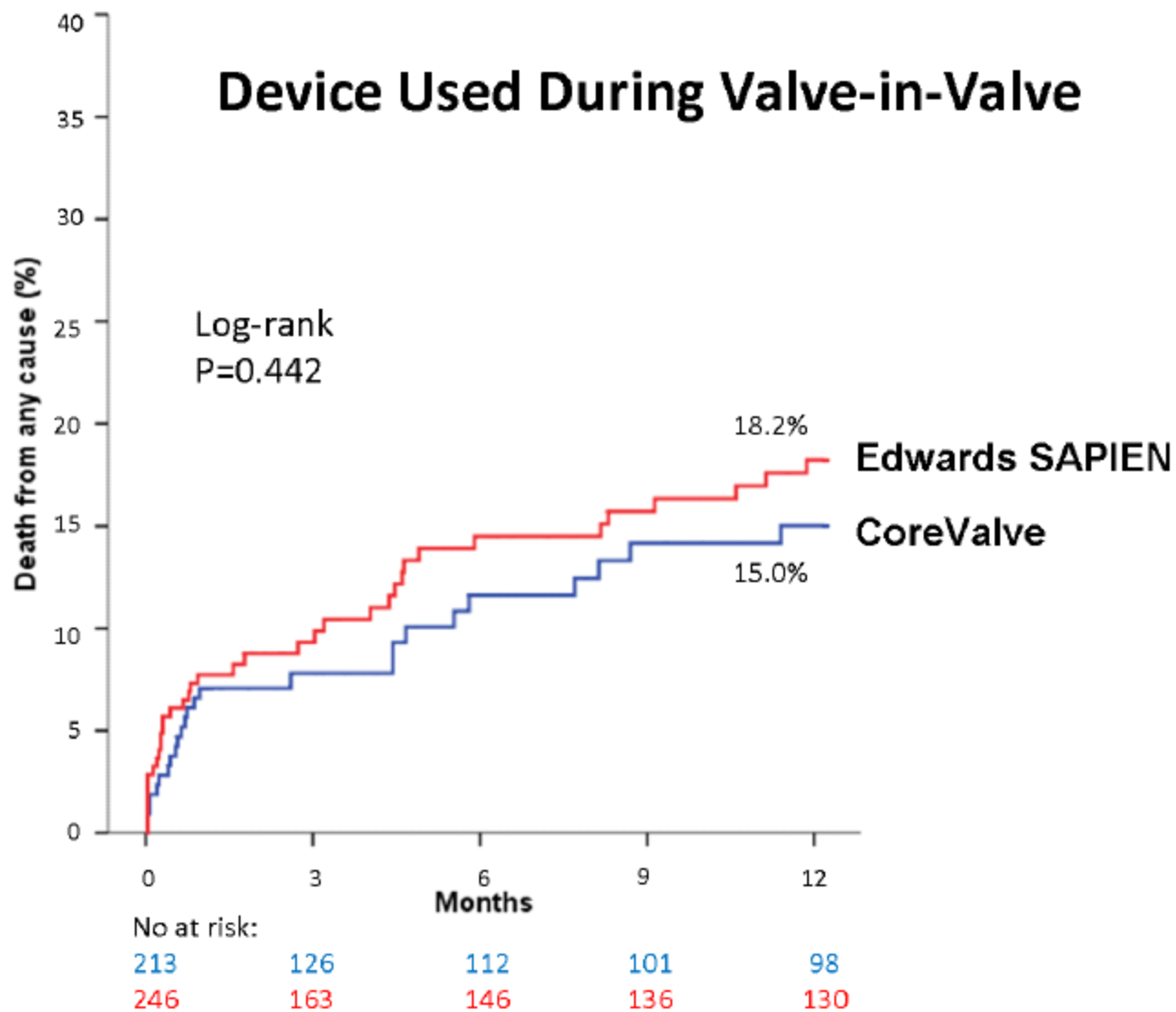
# Specific attention to sinus dimensions & distance to coronary ostia on MSCT

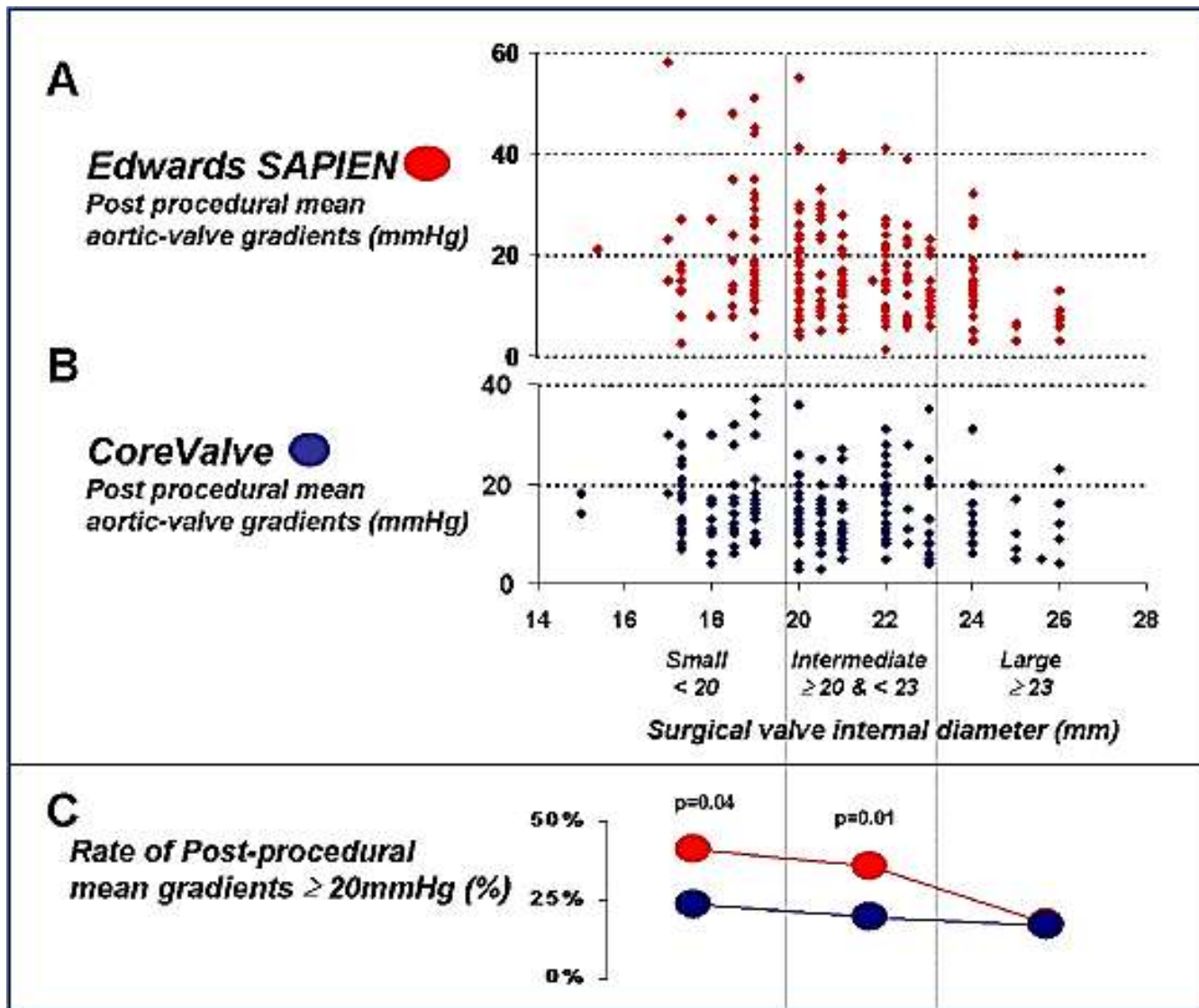


Higher risk in Mitroflow / Freedom


# Valve selection

## Device Used During Valve-in-Value



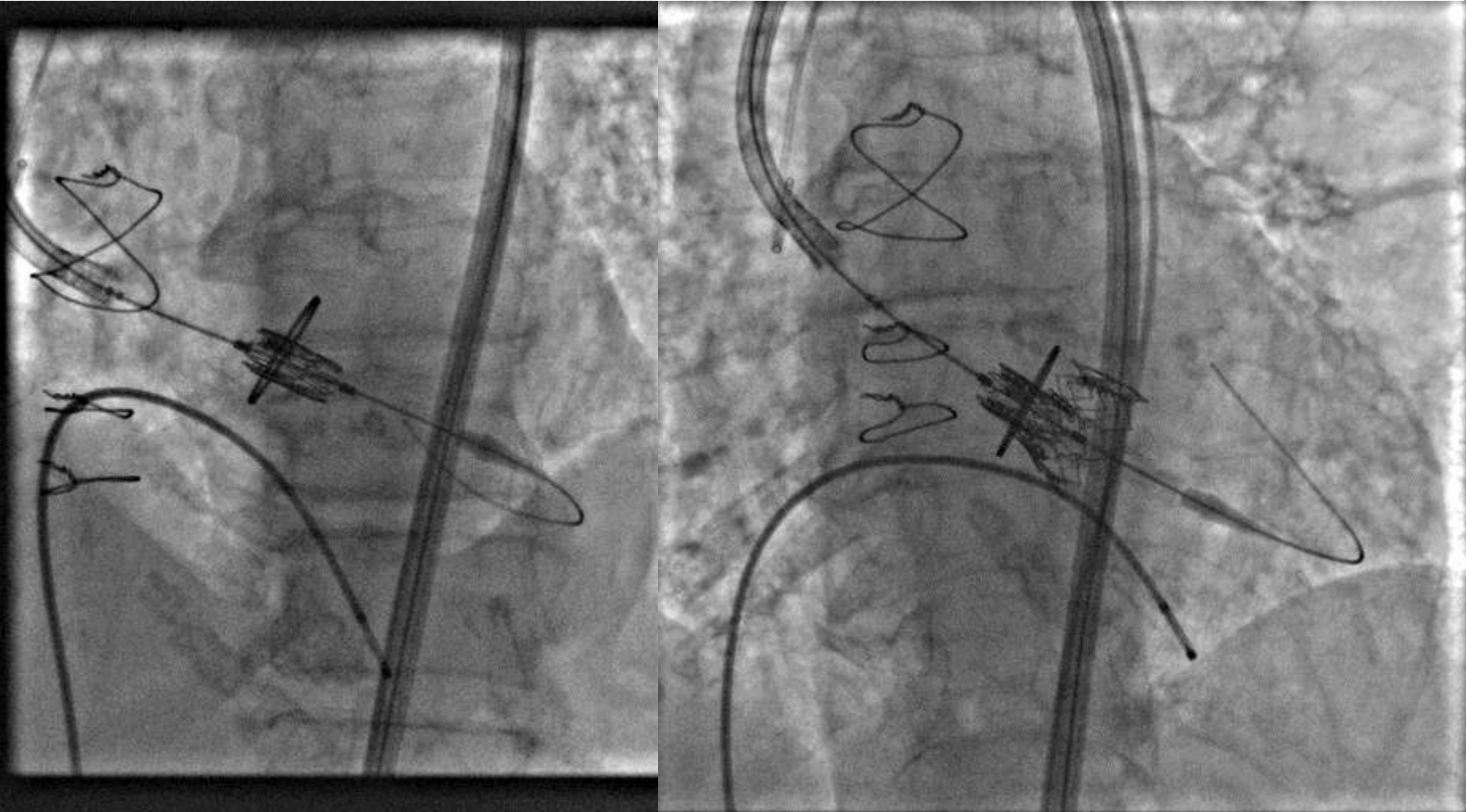


- Eliminate mismatch
- Precise look on surgical report
- No Sapien if ID < 20 mm
- Questionable benefit if ID < 18 mm

Perimount 2700 Valve Size	
Stent Internal Diameter	20
 True ID	19
Height	15
Suggested TAVI Valve Size	
Sapien Size	23
CoreValve Size	23
Portico Size	23



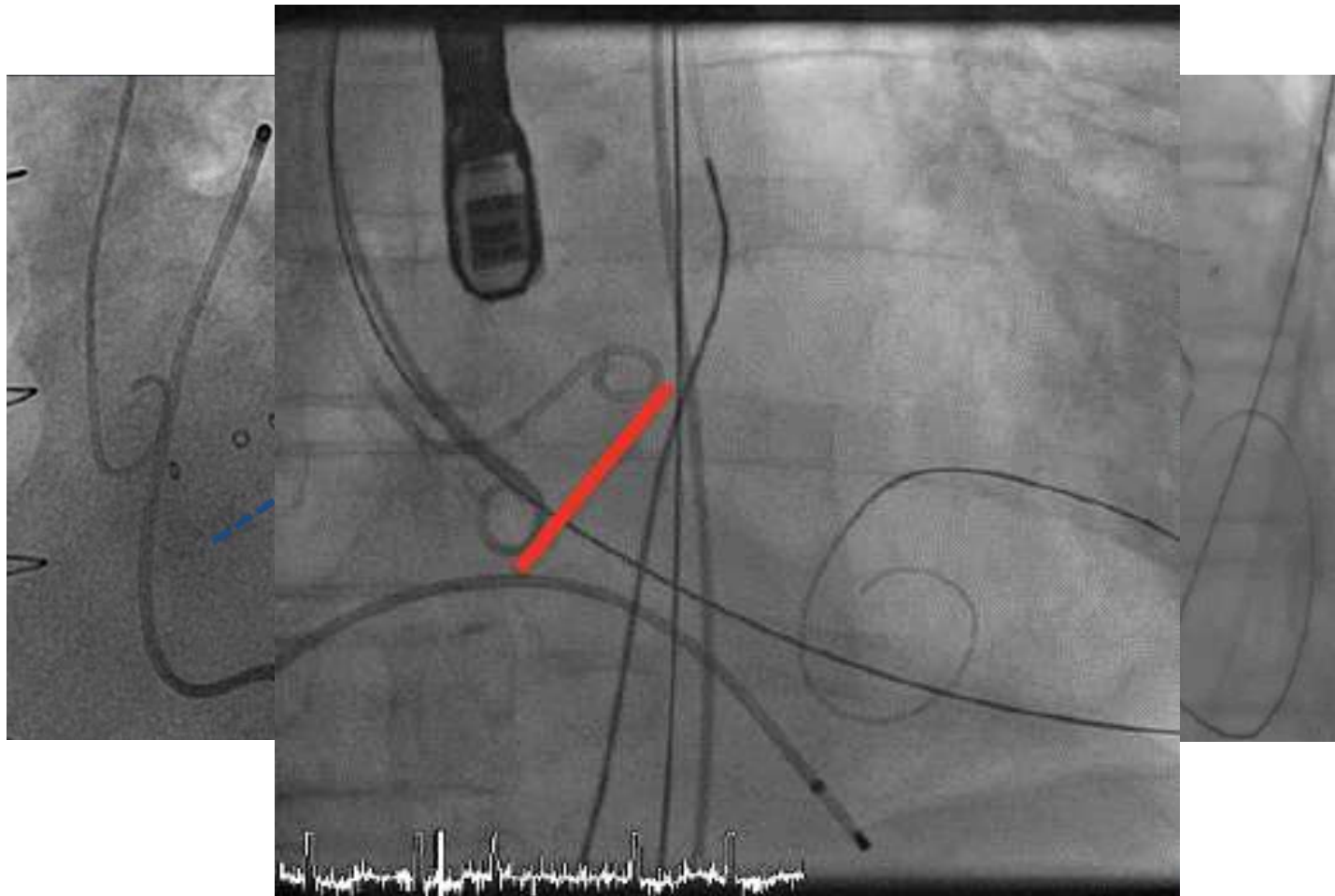
# Valve positioning



# 10,5% of valve malpositioning

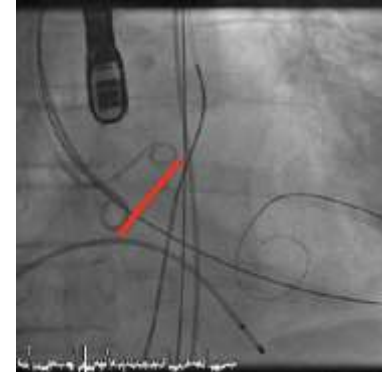
	<b>All (n=459)</b>	<b>CoreValve (n=213)</b>	<b>SAPIEN (n=246)</b>	<b>p Value*</b>
<b>Attempted device retrieval</b>	22 (10.3%)	22 (10.3%)	NA	NA
<b>Post-implantation valvuloplasty</b>	48 (10.5%)	40 (18.8%)	8 (3.3%)	<0.0001
<b>Second TAVR device implantation</b>	26 (5.7%)	16 (7.5%)	10 (4.1%)	0.052

# Absence of markers



# Tips & tricks

- No predil
- Valve larger than ID
- Maximal guidance / Appropriate view
- Identify the target
  - High enough for high effective orifice area
  - Low enough for fixation to surgical ring
- Moderate rapid pacing for Corevalve



# Messages for screening

- Risk evaluation
  - Redo surgery
  - TAVI
  - Heart Team
- Specific screening
  - Eliminate poor candidate (mechanism)
  - Precise look on surgical report
  - Evaluate risk of mismatch & coronary occlusion

# Messages for procedure

- Corevalve in small Ids
- Maximize guidance
  - Fusion MSCT, TEE, 2<sup>nd</sup> Pigtail
- Rapid pacing even if self expanding devices
- Ideal indication for repositionable / retrievable valve (Lotus for ex...)