STS/EACTS Latin America Cardiovascular Surgery Conference

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Degenerative Mitral Valve Regurgitation: Resect or Respect?

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The Society of Thoracic Surgeons

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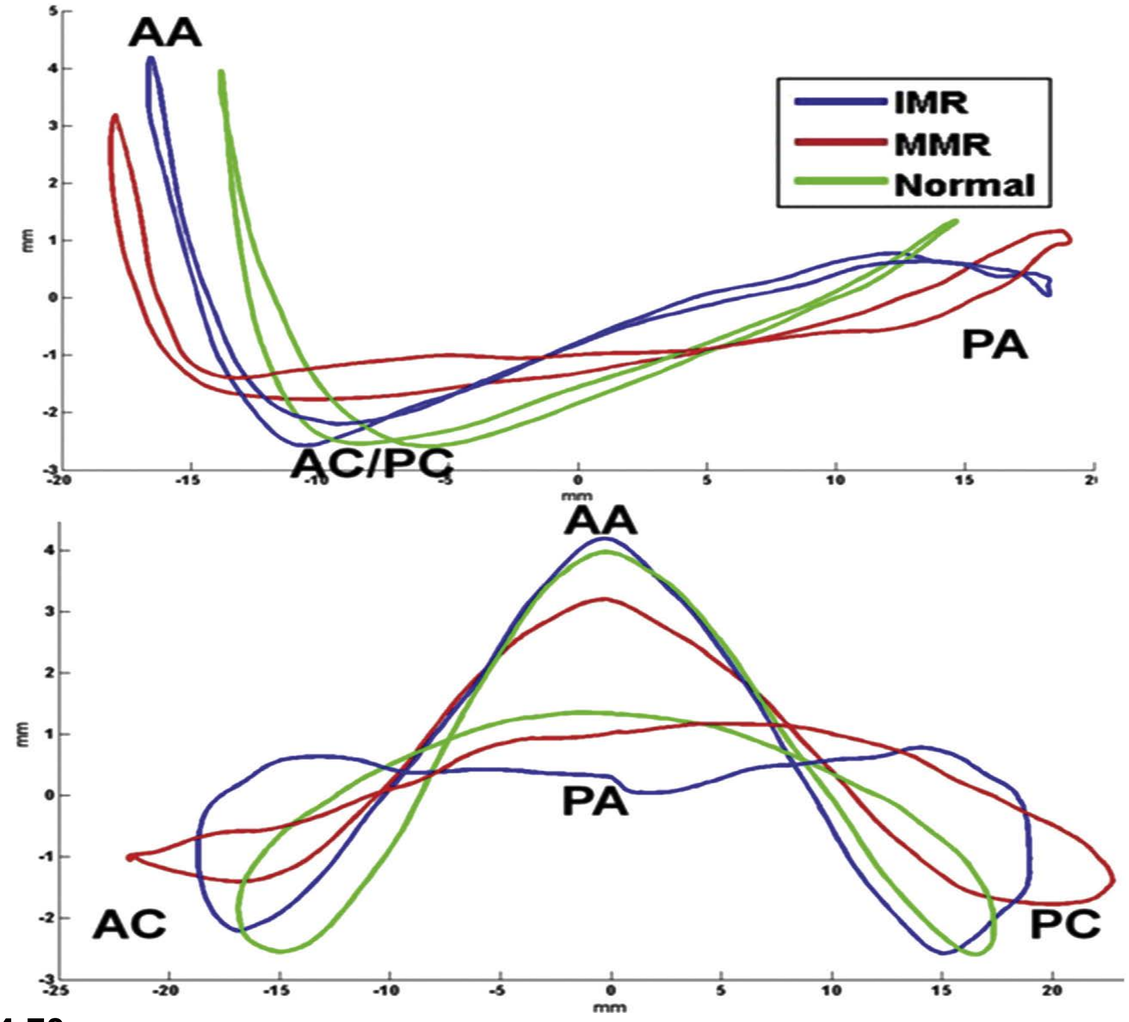
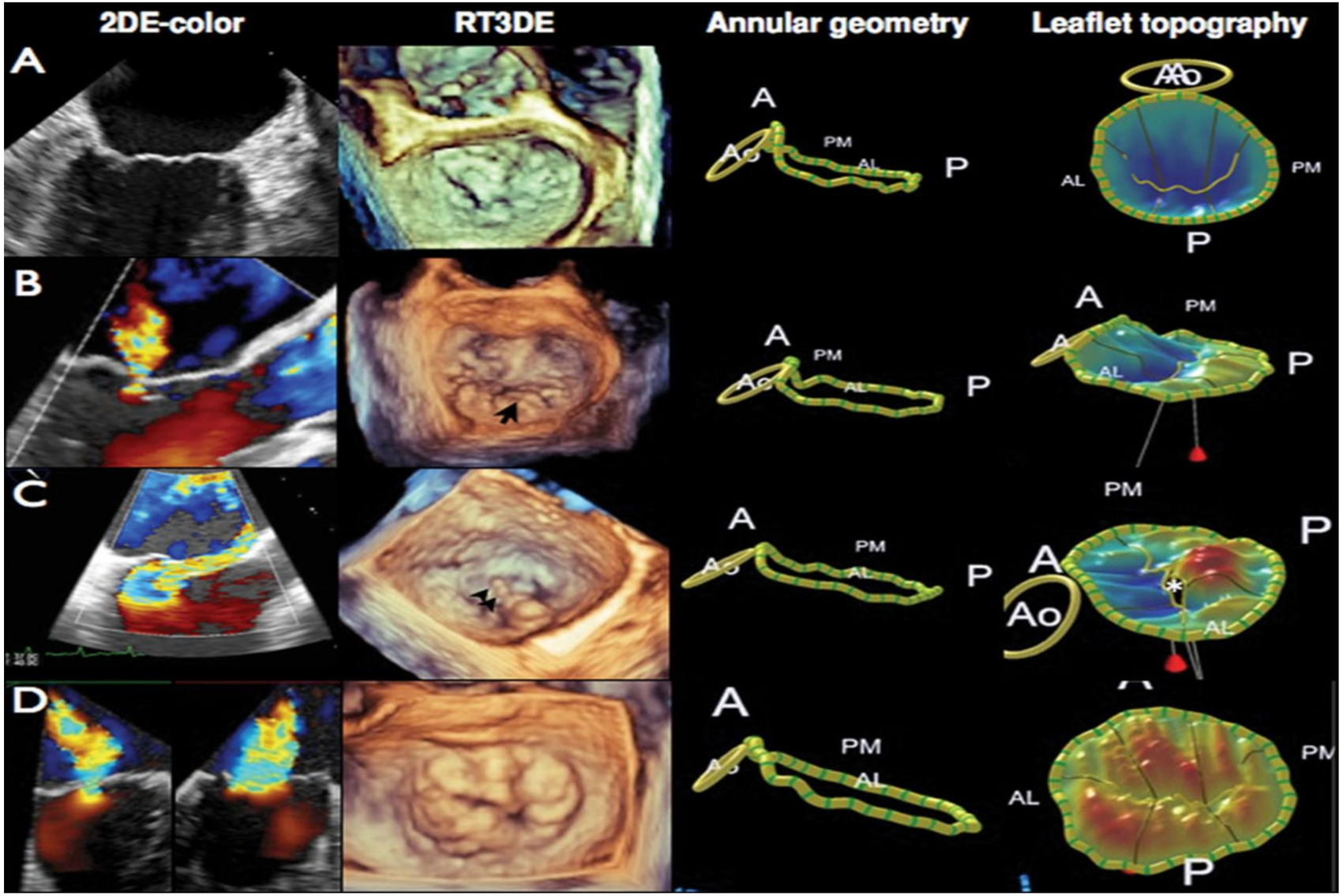
The Myxomatous Mitral Valve

- Annular enlargement and flattening before LV dilatation
- Flattening of the commissures
- Flattening of the P2-P3 junction
- Increased leaflet stress leading to myxomatous degeneration



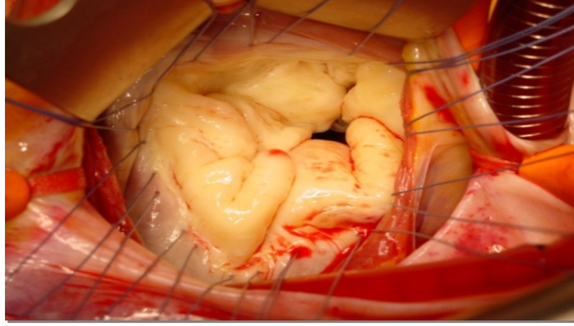
Jassar A et al. Ann Thorac Surg 2014;97:64-70

Progressive Dilatation and Flattening

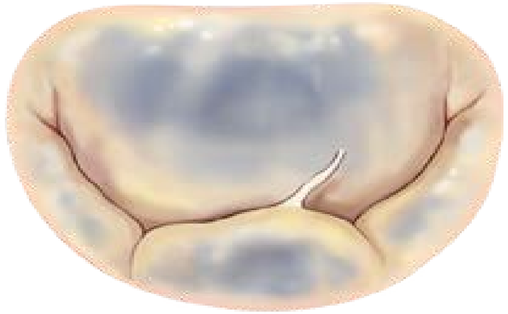


Lee A et al. Circulation 2013;127:832-841

Excess of Tissue

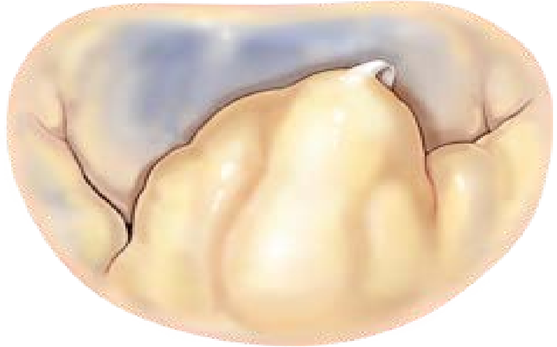


FED

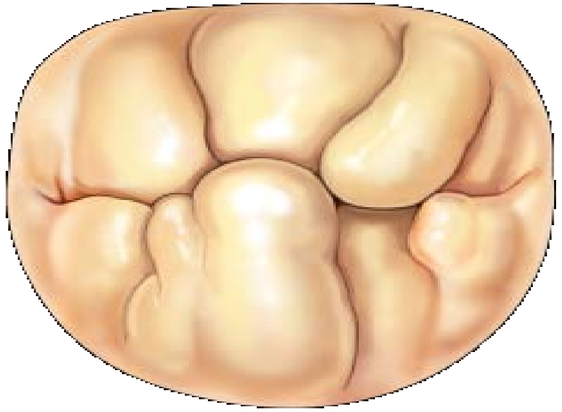


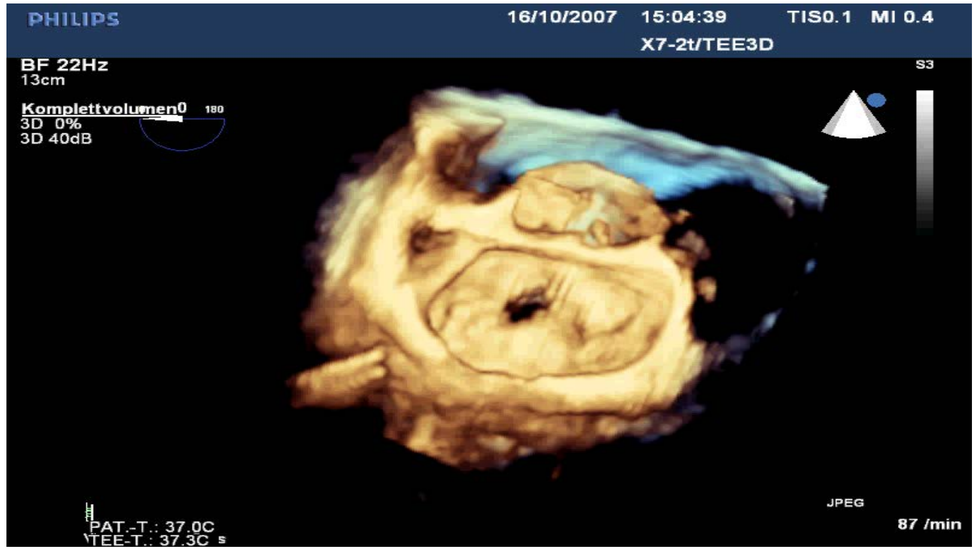
FED+

Form Fruste

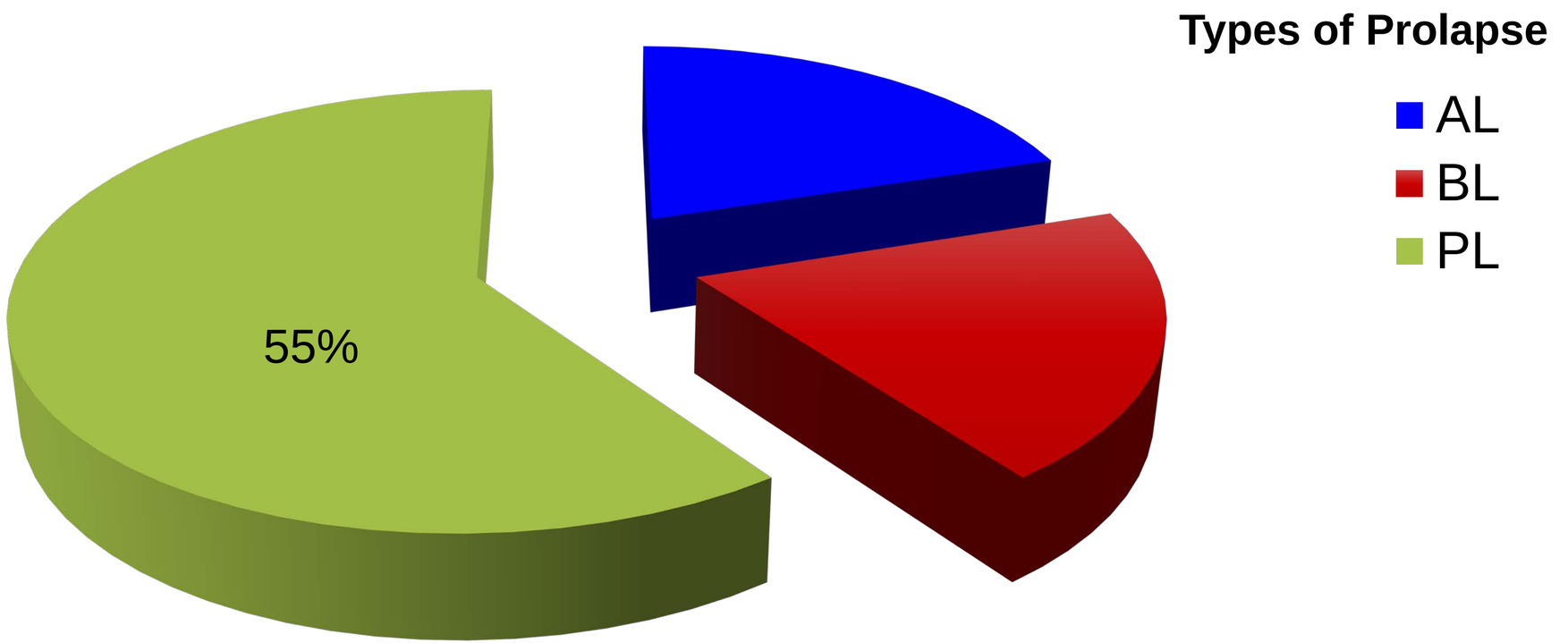


Barlow's



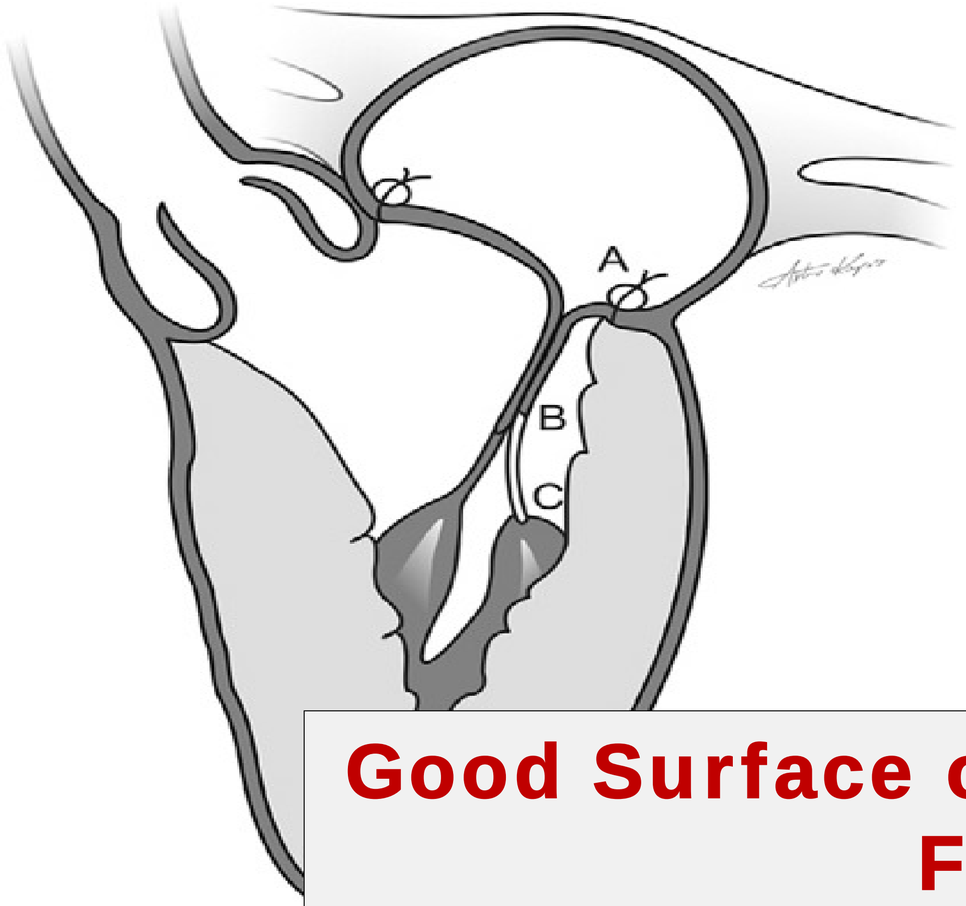


Most Frequent Dysfunction



Posterior leaflet prolapse is the most frequent dysfunction

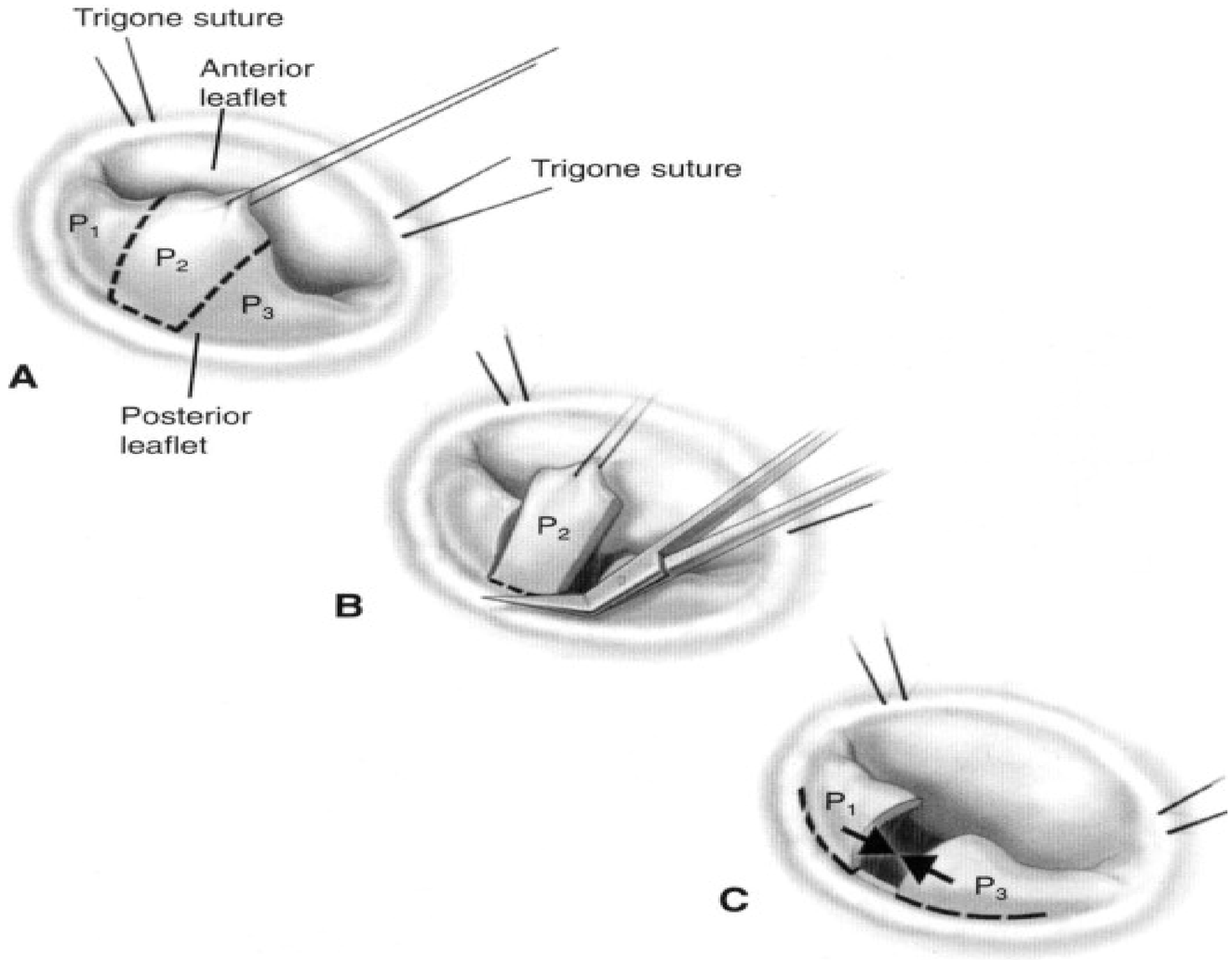
Goal of Repair



- Smooth and regular surface
- >8 mm height of coaptation
- Posterior leaflet positioned in the LV inflow

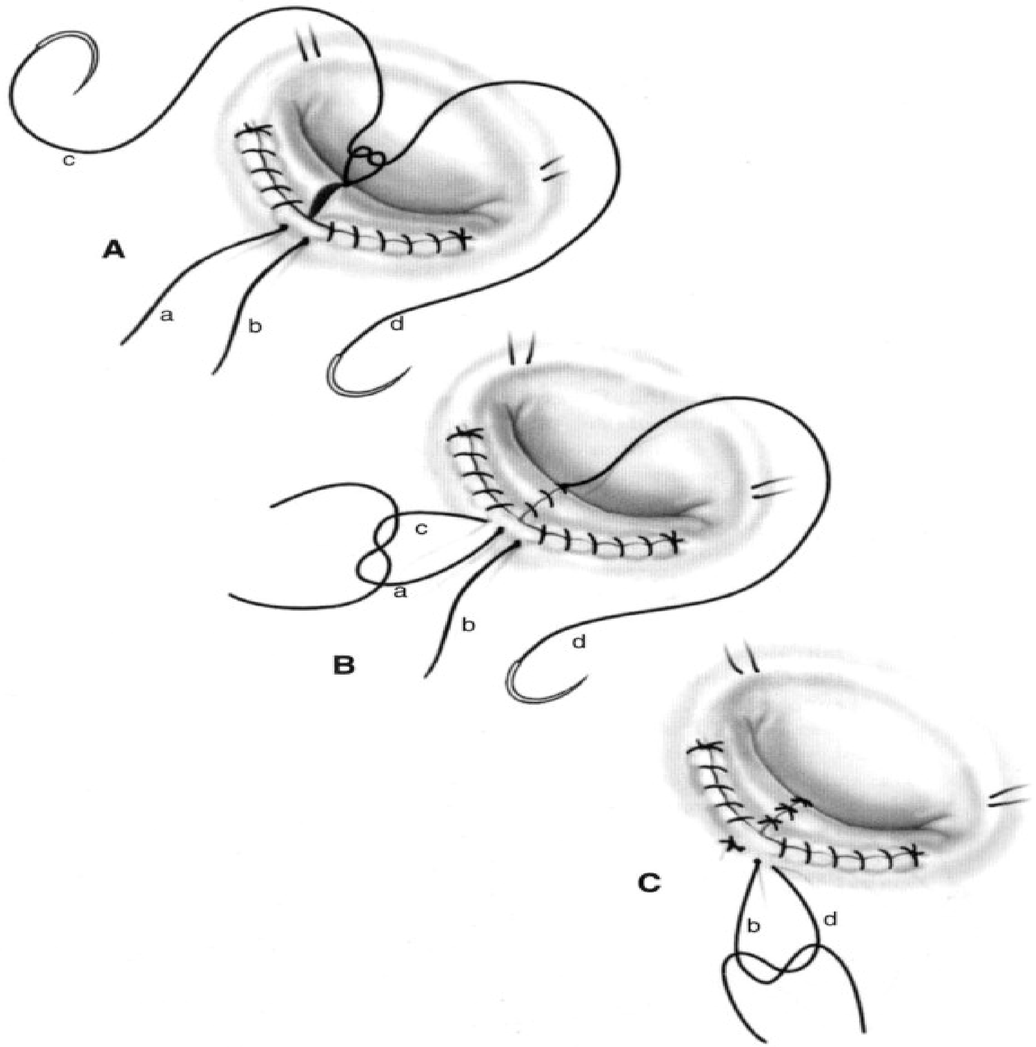
Good Surface of Coaptation = Good Function
(> 8 mm or 1/3 of ant leaflet)

Quadrangular Resection
Posterior Leaflet Prolapse



Cohn L, Op Tech Thorac Cardiovasc Surg, 1998:95

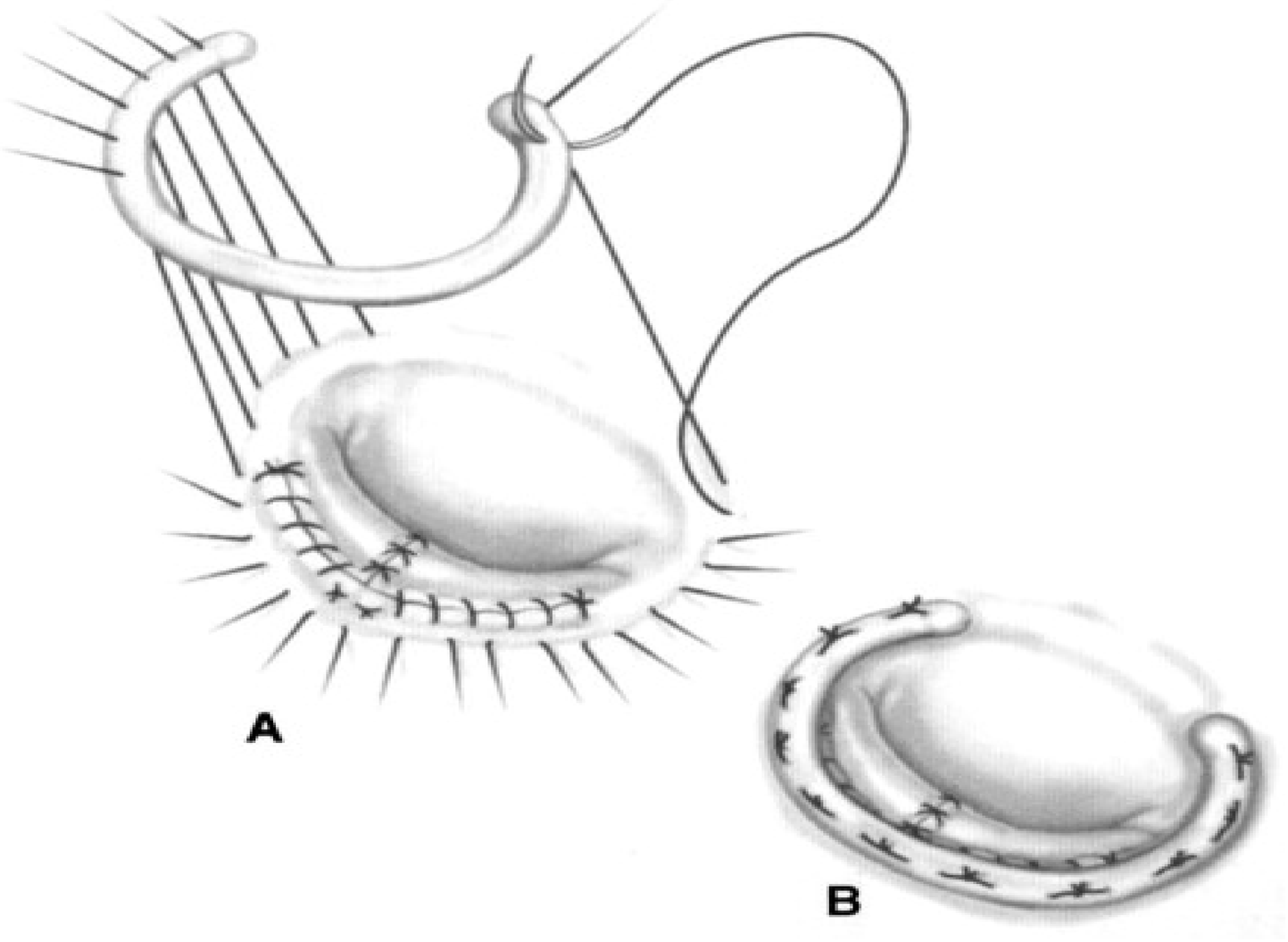
Quadrangular Resection
Posterior Leaflet Prolapse



Cohn L, Op Tech Thorac Cardiovasc Surg, 1998:95

Quadrangular Resection

Posterior Leaflet Prolapse

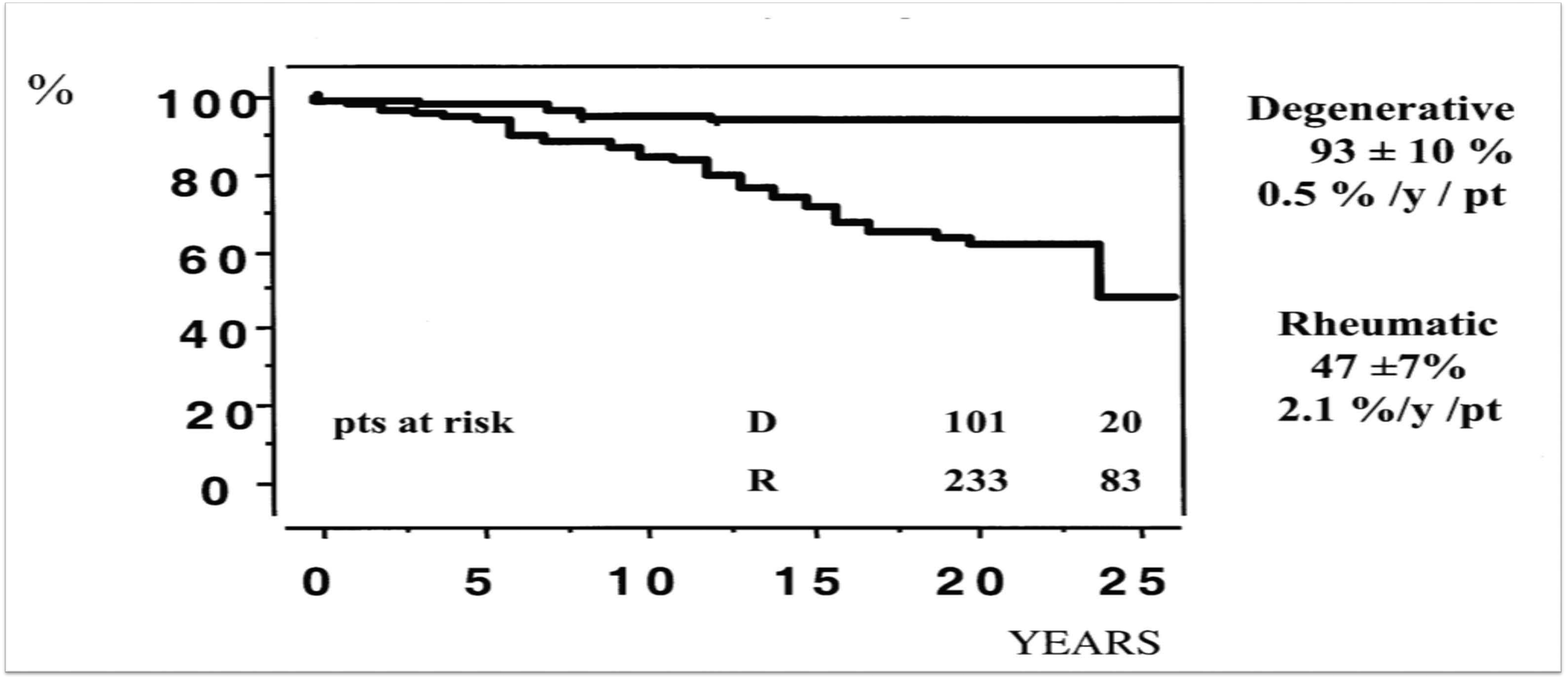


Cohn L, Op Tech Thorac Cardiovasc Surg, 1998:95

Quadrangular Resection
“The Gold Standard”

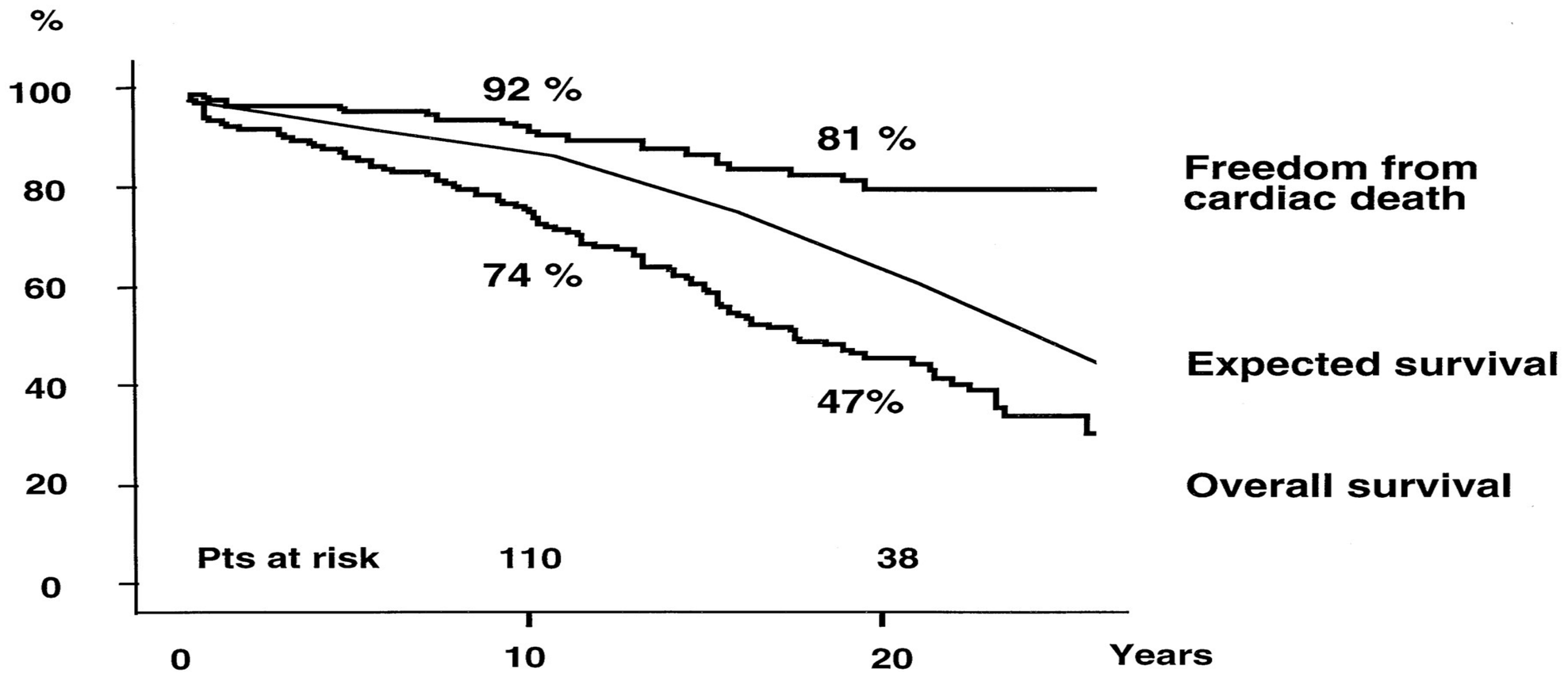
- Effective technique
- Excellent functional results
- Stable over time

Three Decades of Carpentier's Techniques
Freedom from Reoperation



Braunberger E et al. Circulation 2001;104:I-8-I-11

Three Decades of Carpentier's Techniques
Survival



Braunberger E et al. Circulation 2001;104:I-8-I-11

Limitations

- Immobilization of the posterior leaflet
- Risk of kinking of the circumflex artery
- Anterior displacement of the annulus
- Technically demanding, low applicability

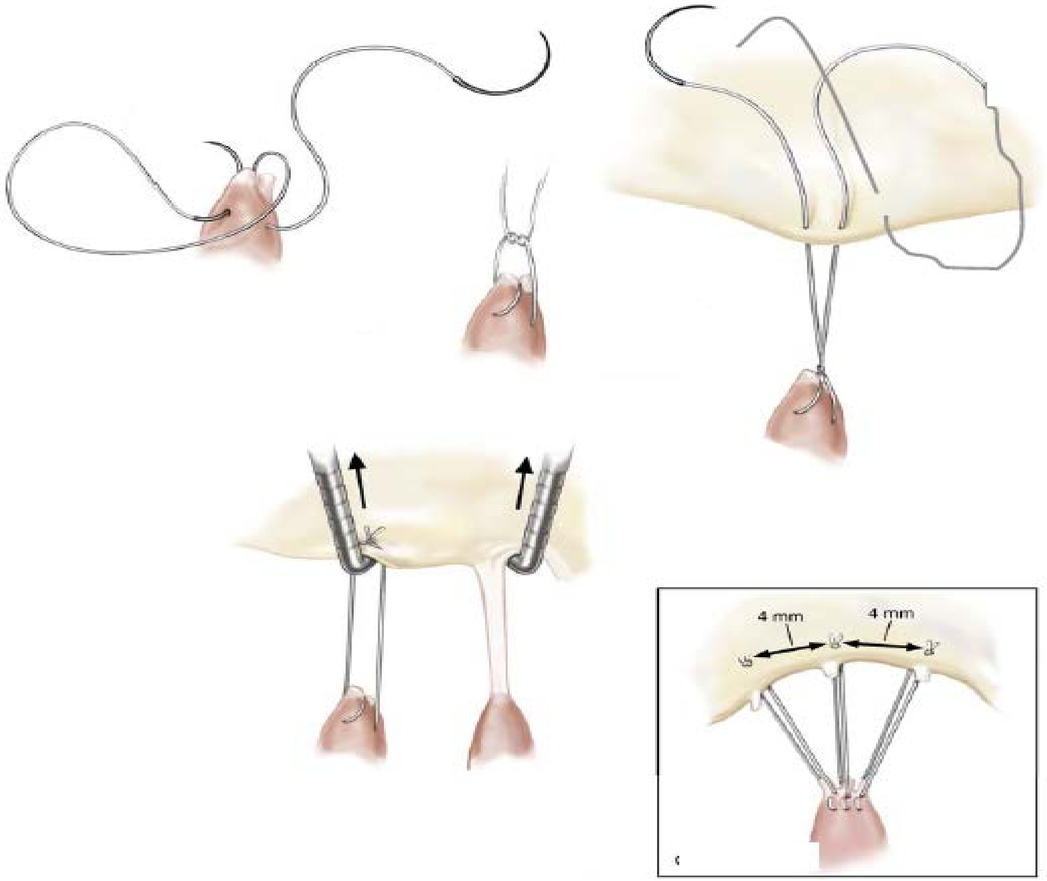
Should You Always Resect?

- If the goal of MV repair is to restore *Optimal Surface of Coaptation*

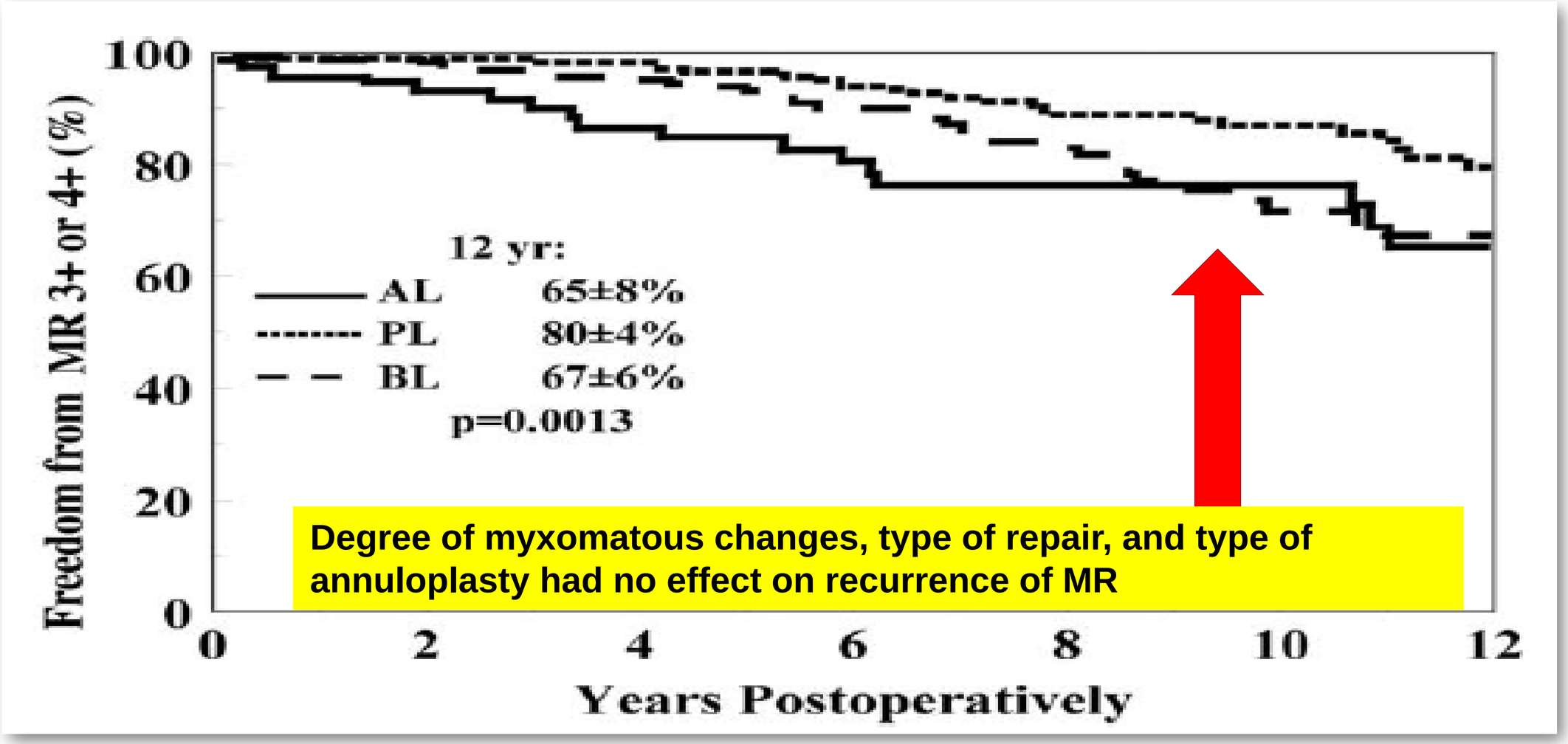
- Is tissue resection the most logical approach?

Chordal Replacement

- First introduced by T. David in 1985
- Currently the “Gold Standard” for anterior leaflet (AL) repair
- Chordal transfer and AL resection rarely indicated
- Initially indicated in PL prolapse secondary to FED



Mitral Valve Repair
Neochordae



David T et al. J Thorac Cardiovasc Surg 2005: 1242

The “Respect Rather Than Resect” Concept

- Correct excessive leaflet motion of the free edge with artificial chordae

- Transform the posterior leaflet into a smooth, regular, vertical buttress

Respect Rather Than Resect

No Excess of Tissue

Bring the free edge of PL to the level of the annular plane

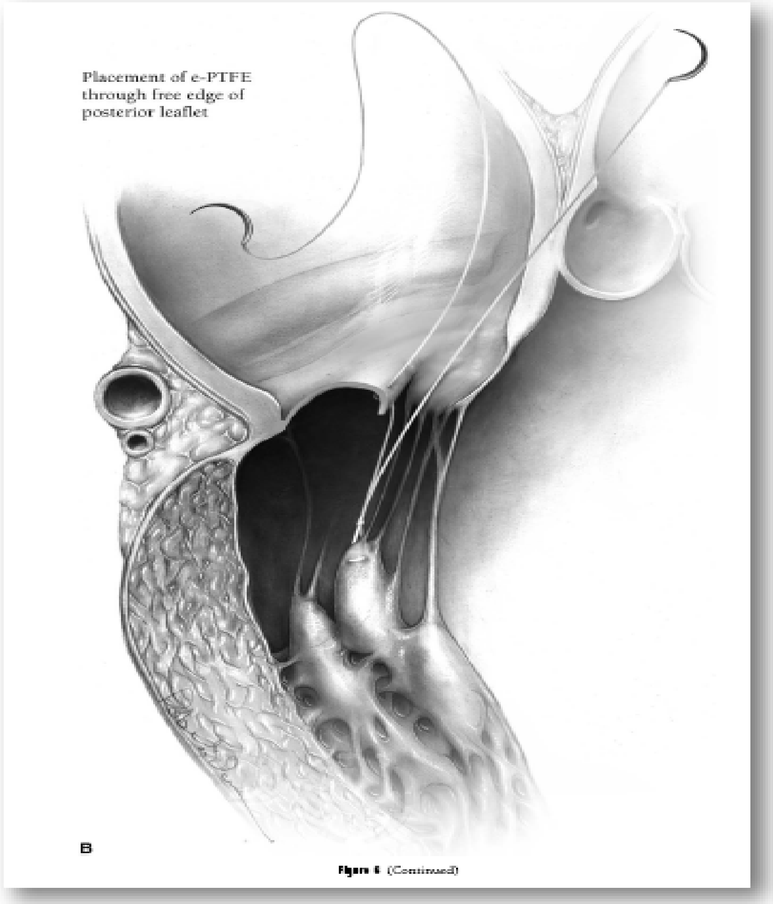


Figure 6 (Continued)

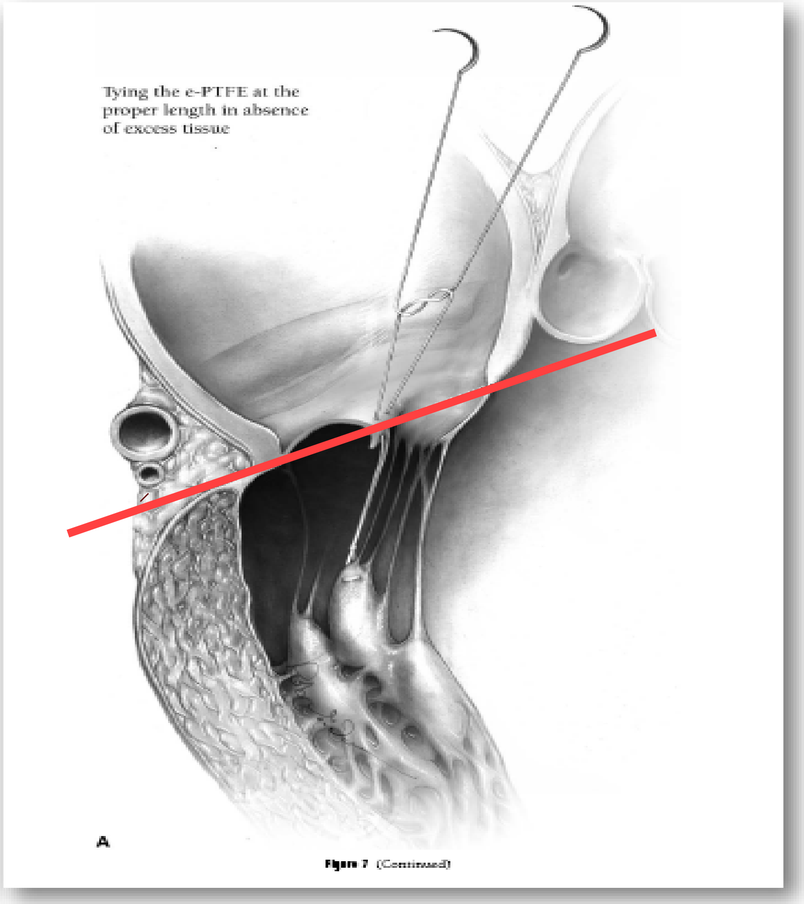


Figure 7 (Continued)

Operative Techniques in Thoracic and Cardiovascular Surgery

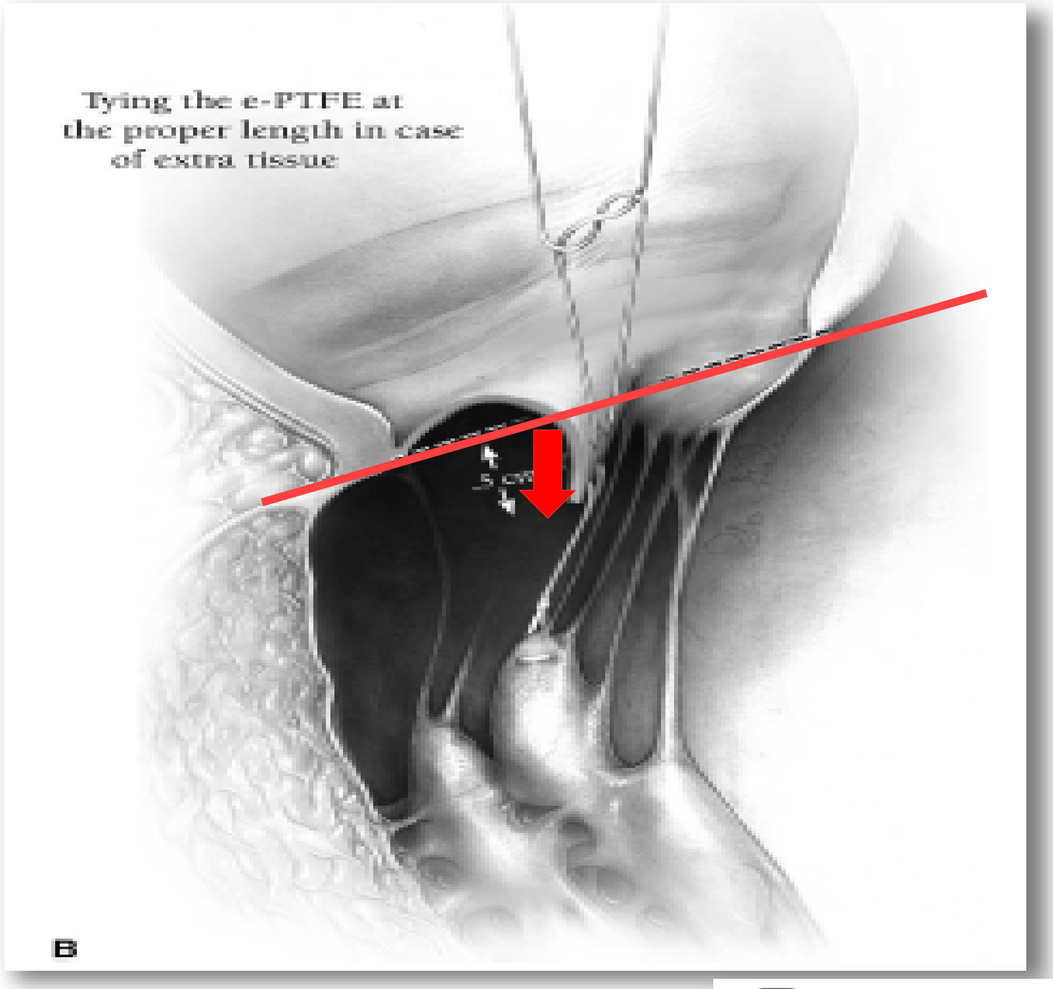
A New Paradigm for the Repair of Posterior Leaflet Prolapse: Respect Rather Than Resect

Patrick Perier, MD

Respect Rather Than Resect

Excess of Tissue

Bring the free edge of PL between 5 mm to 8 mm underneath the plane of the annulus,



Operative Techniques in Thoracic and Cardiovascular Surgery

A New Paradigm for the Repair of Posterior Leaflet Prolapse: Respect Rather Than Resect

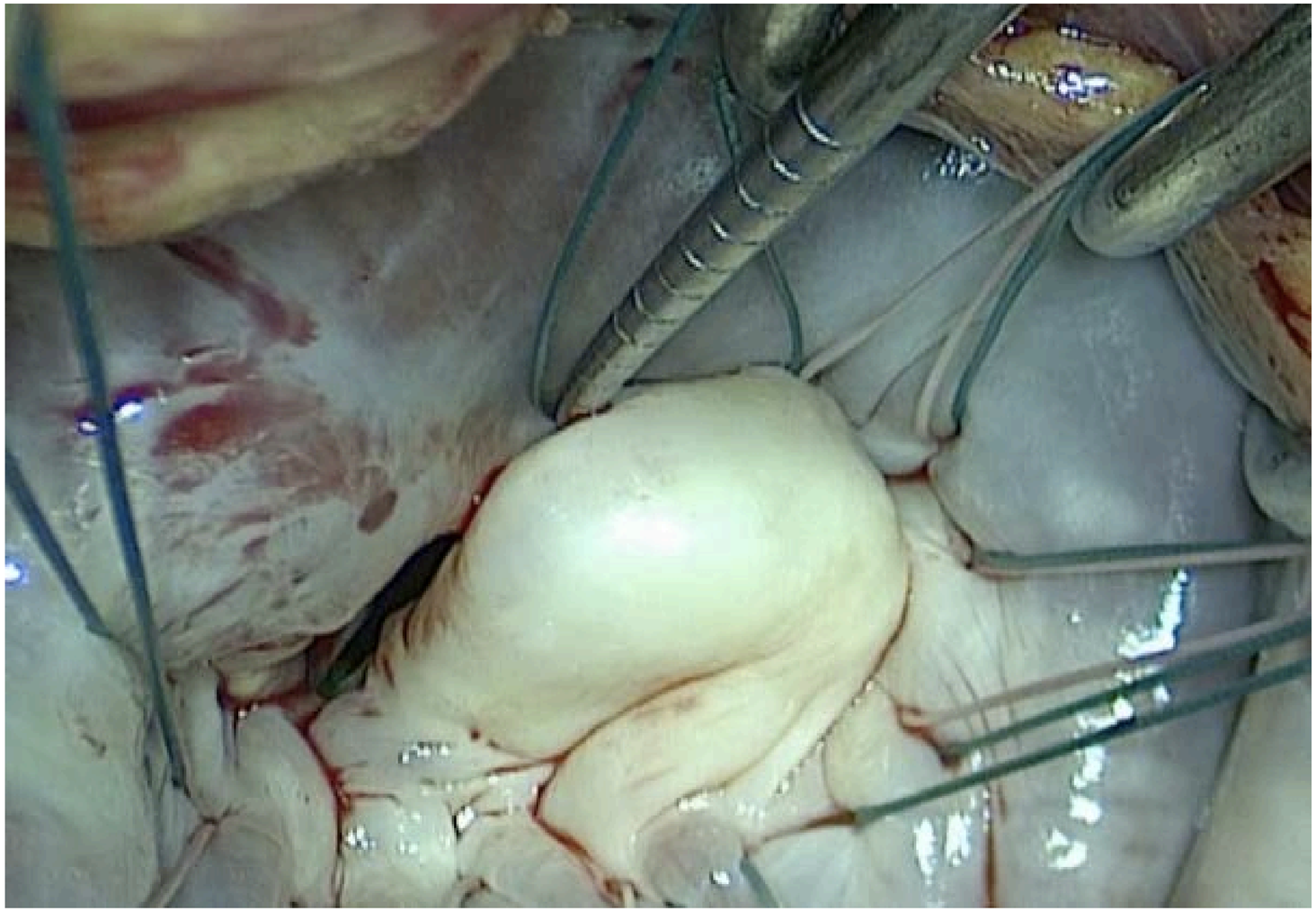
Patrick Perier, MD

The Respect Principle

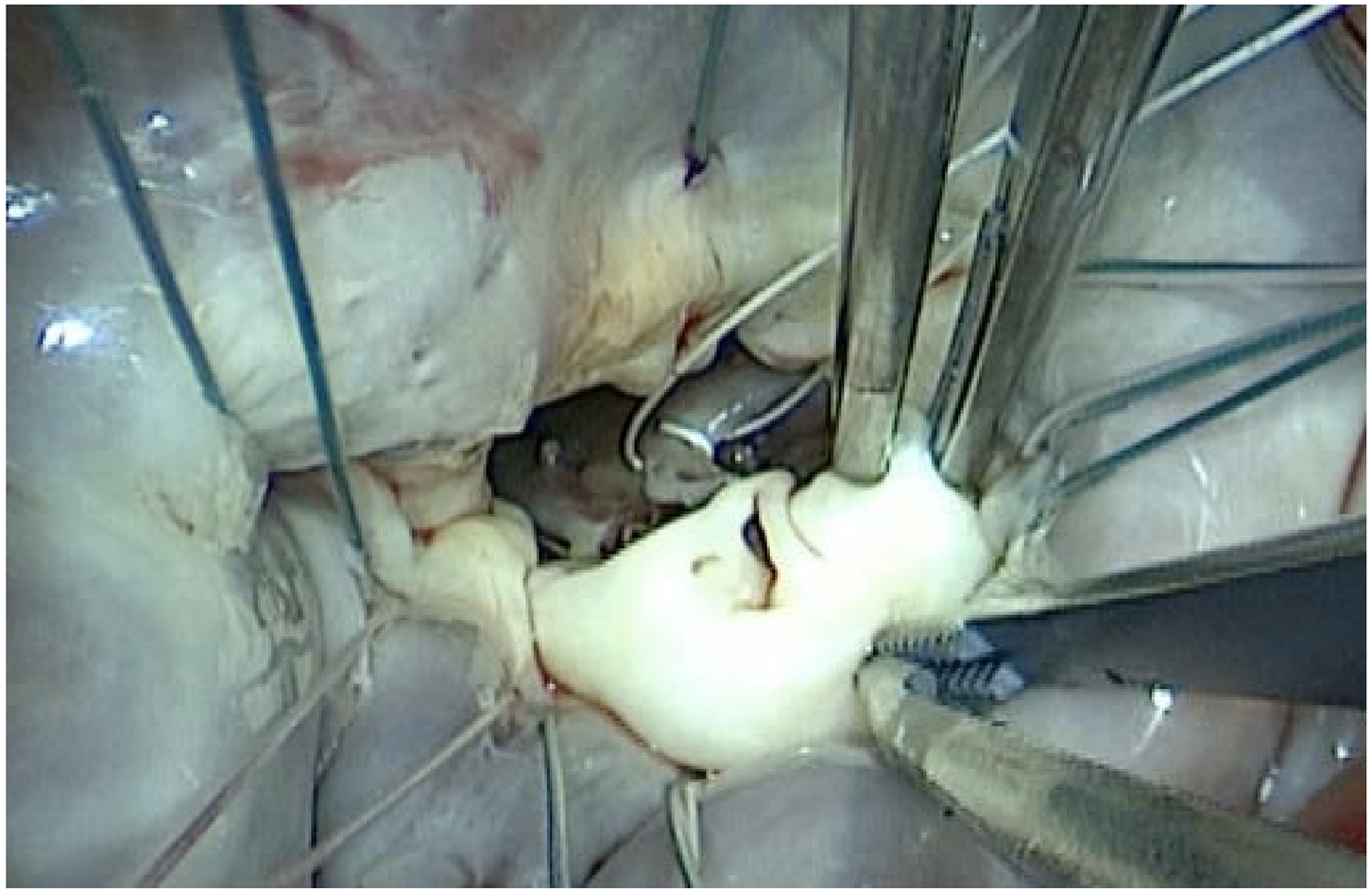
P2 Prolapse

Excess Tissue

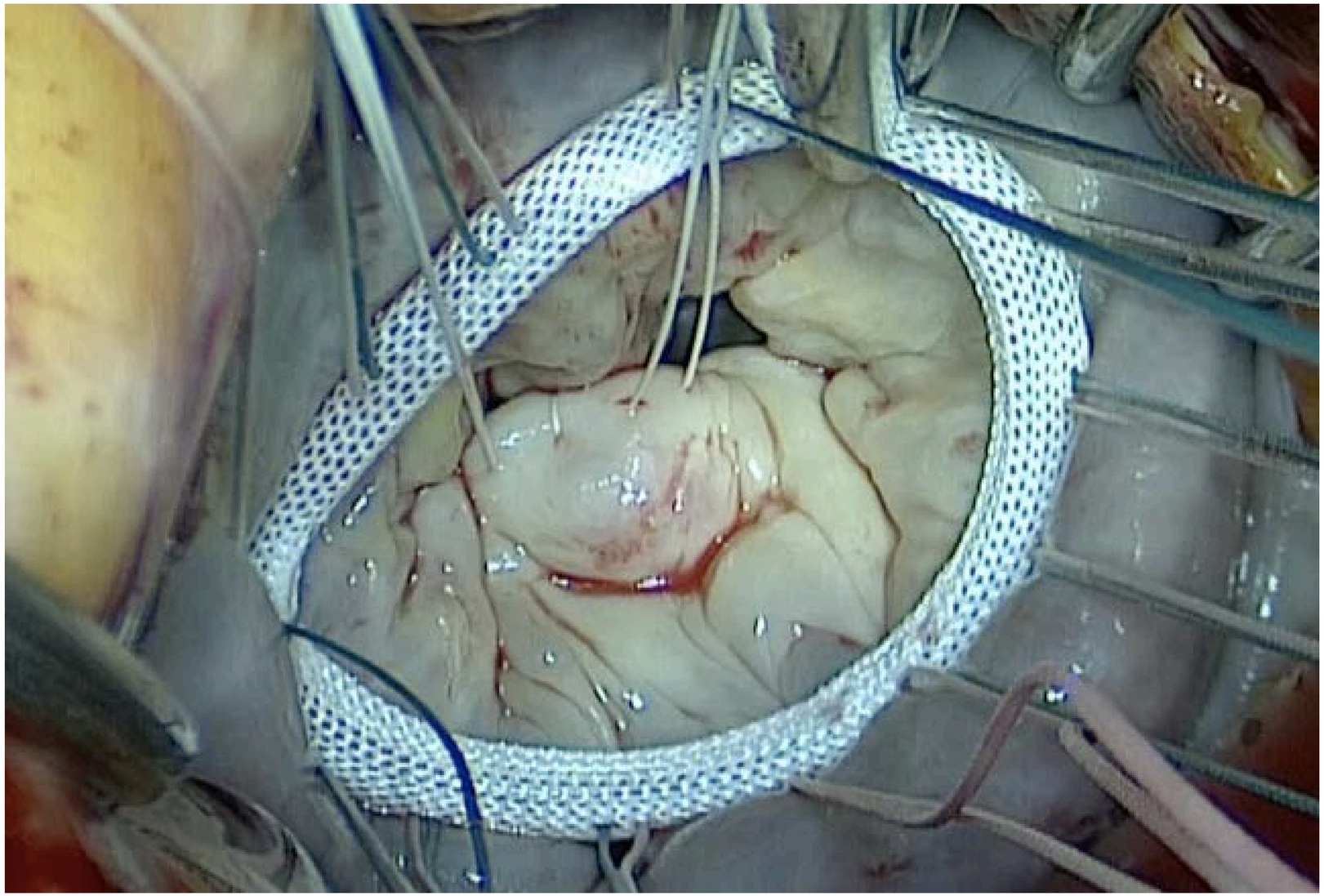
P2 Prolapse



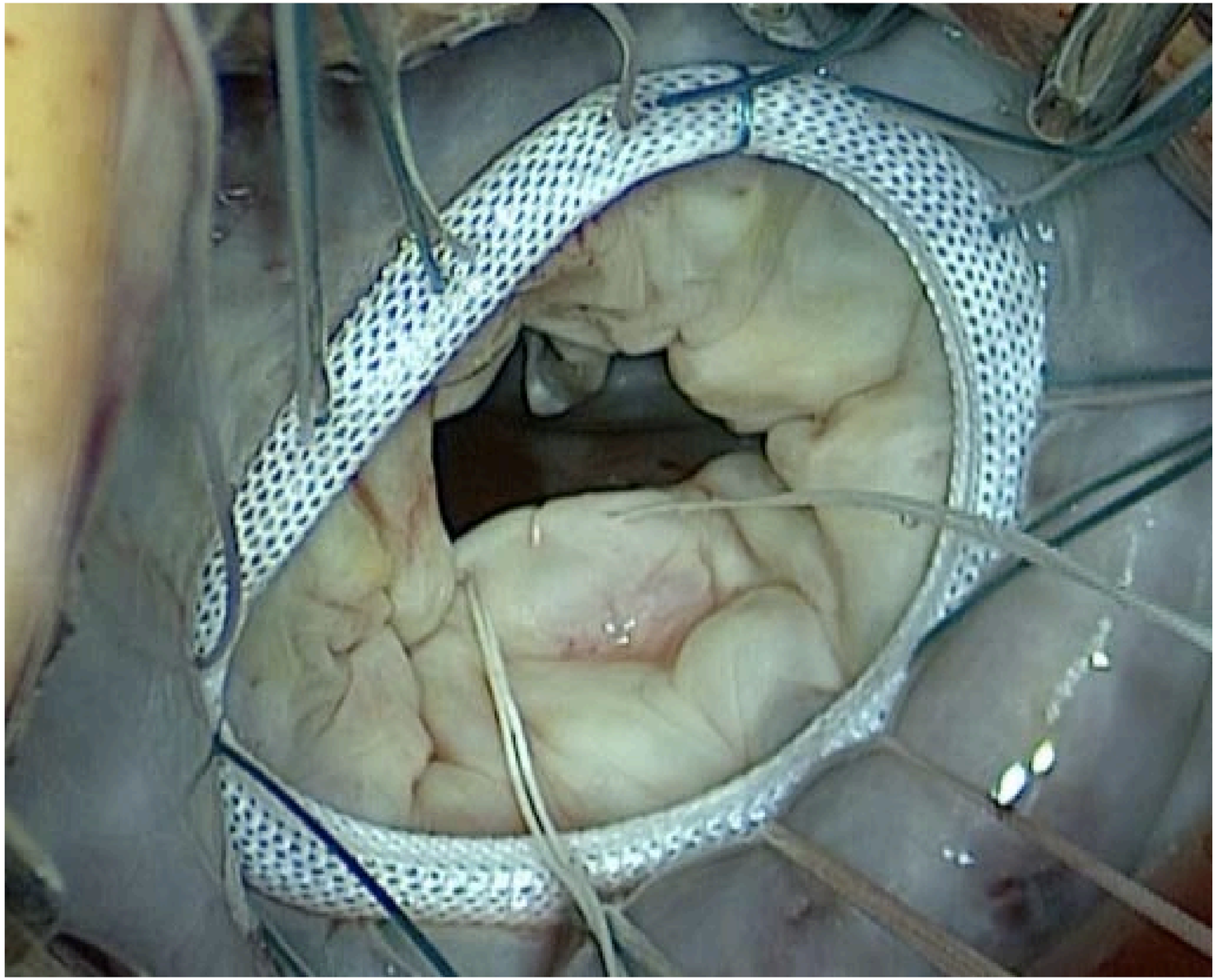
Artificial Chord on Tip of PPM



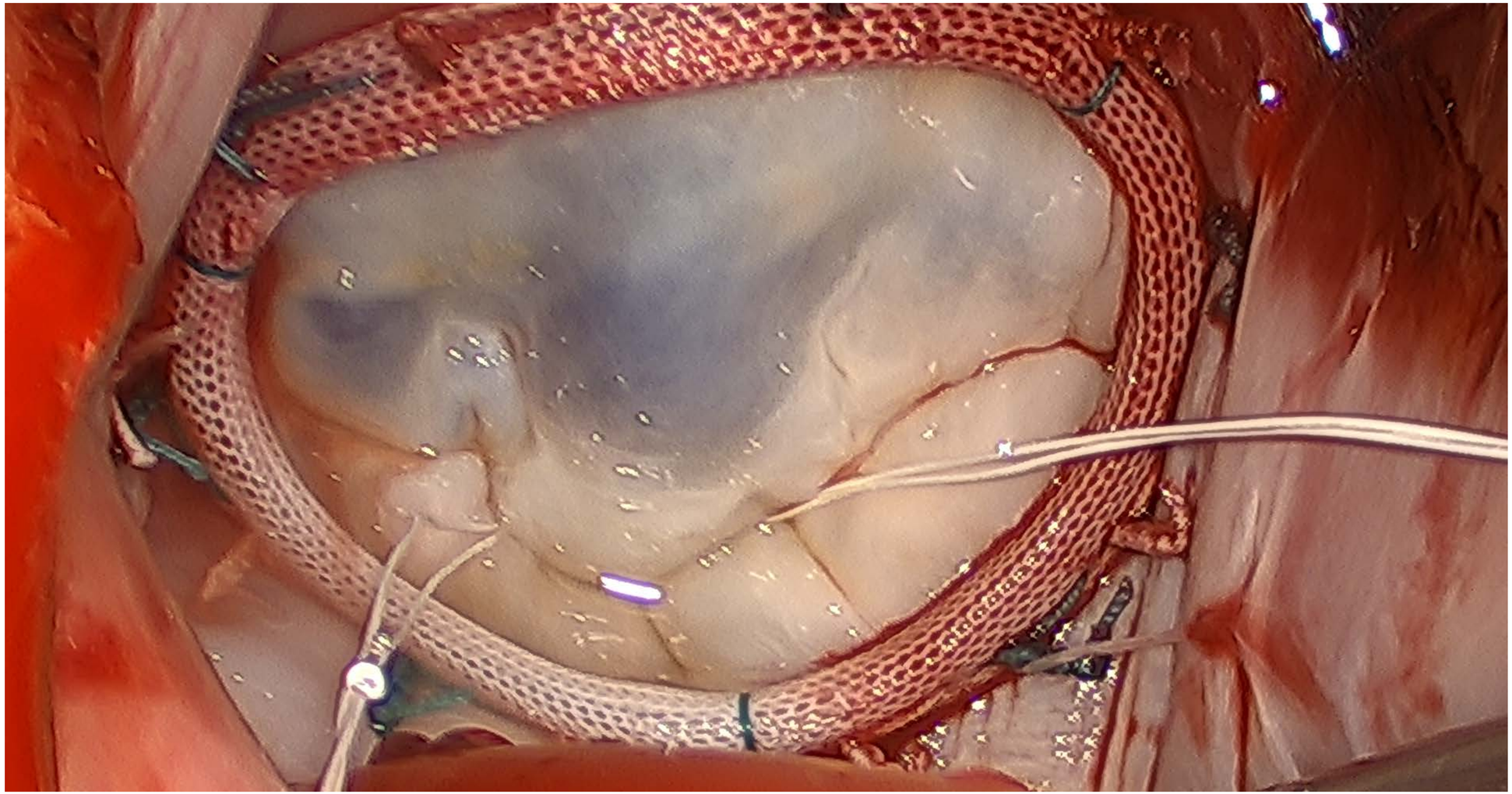
Correct Excessive Leaflet Motion



Smooth, Regular Buttress in LV Inflow



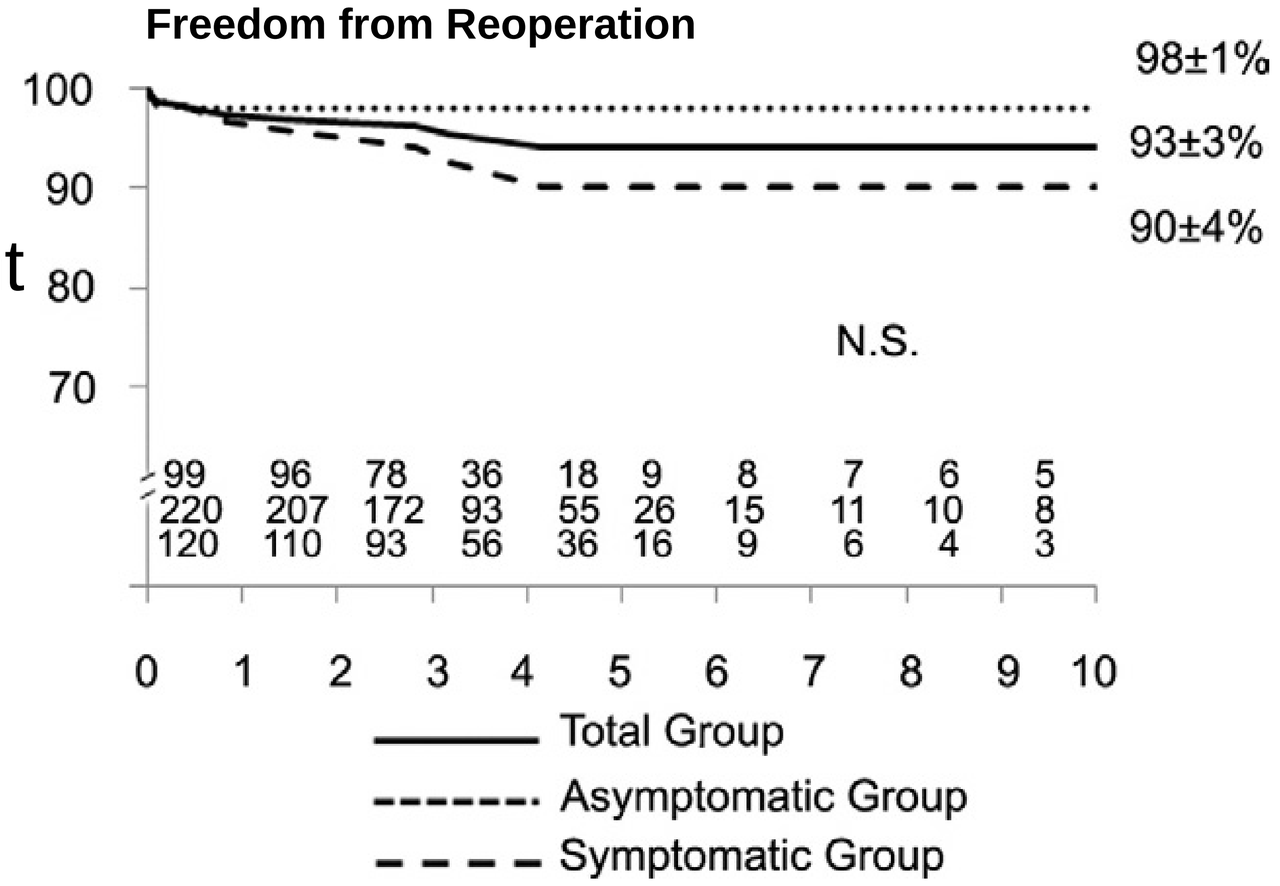
The “Respected” Valve



Height of Coaptation (>8mm)

Respect Rather Than Resect
Results.

- Same results as resection in their Institution
- 2/10 reoperations due to detachment of artificial chords
- No difference in thromboembolic complications



Perier et al. Ann Thorac Surg 2008;86:718–25

Neochordae For Posterior Leaflet Prolapse
A Randomized Trial

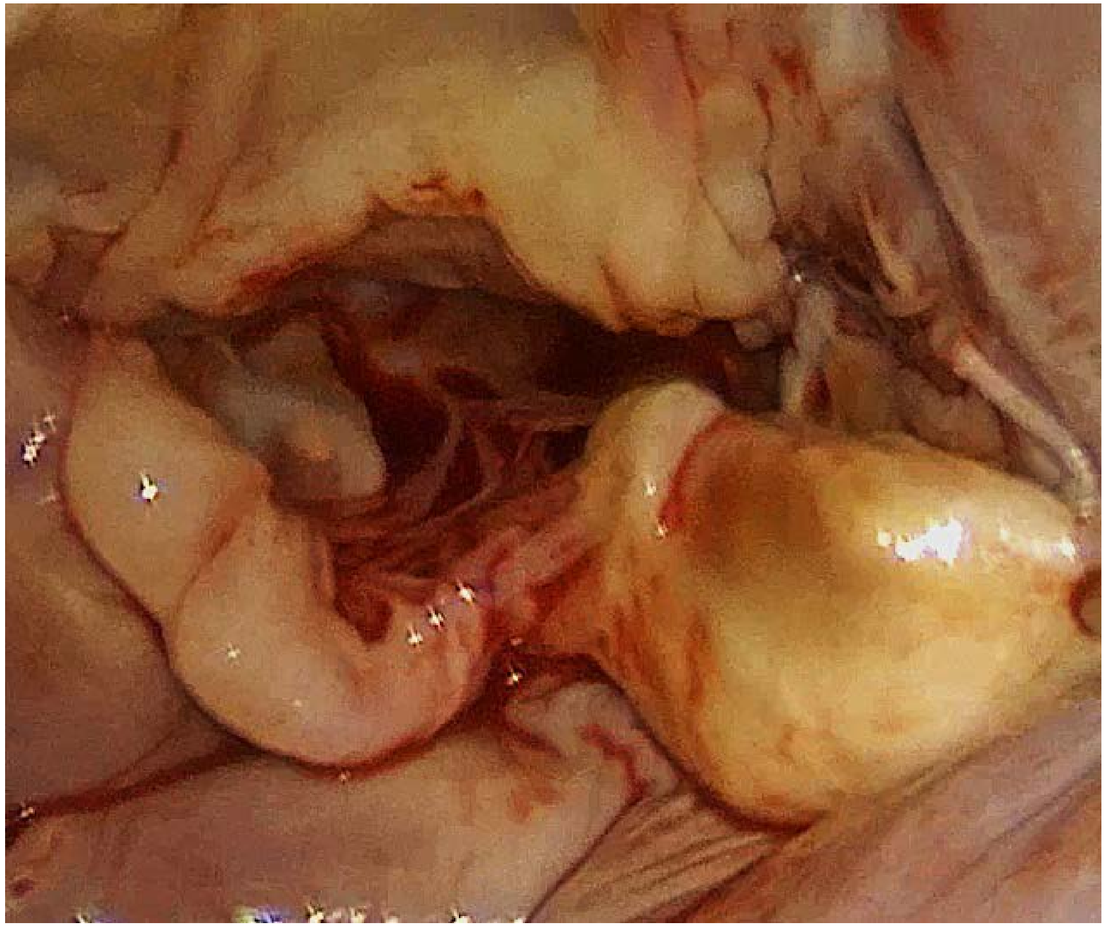
- 100% repair rate
- No difference in mortality or recurrence of MR
- Longer line of leaflet coaptation may result in better durability
- Longer follow-up is required

Falk *et al.* J Thorac Cardiovasc Surg 2008;136:1200-6

Apply To ALL Valves?

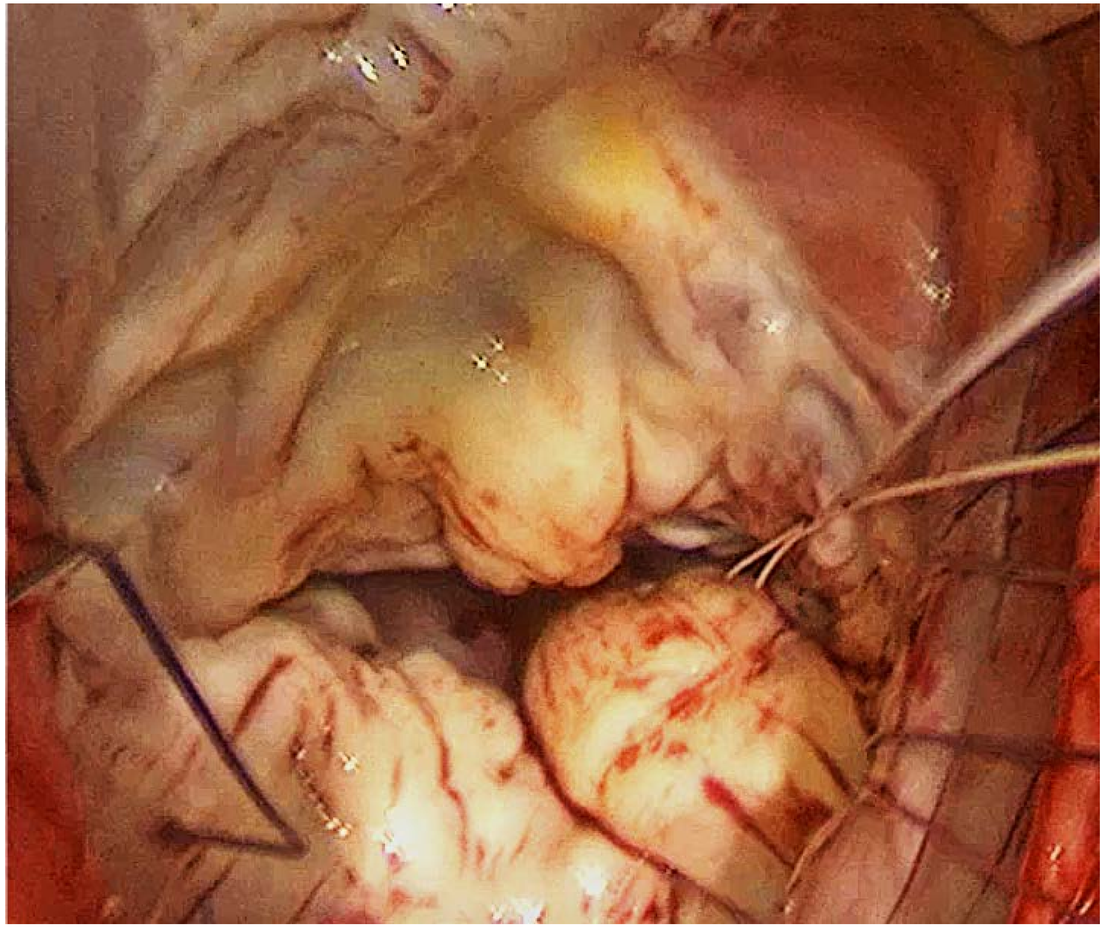
- Thorough analysis of the valve
- Excessive tissue –height and width may lead to irregular surface of coaptation after placement of the ring
- Accumulation of myxomatous tissue at leaflet base may displace it anteriorly - SAM
- Resection has to be tailored to anatomic considerations

Apply To ALL Valves?



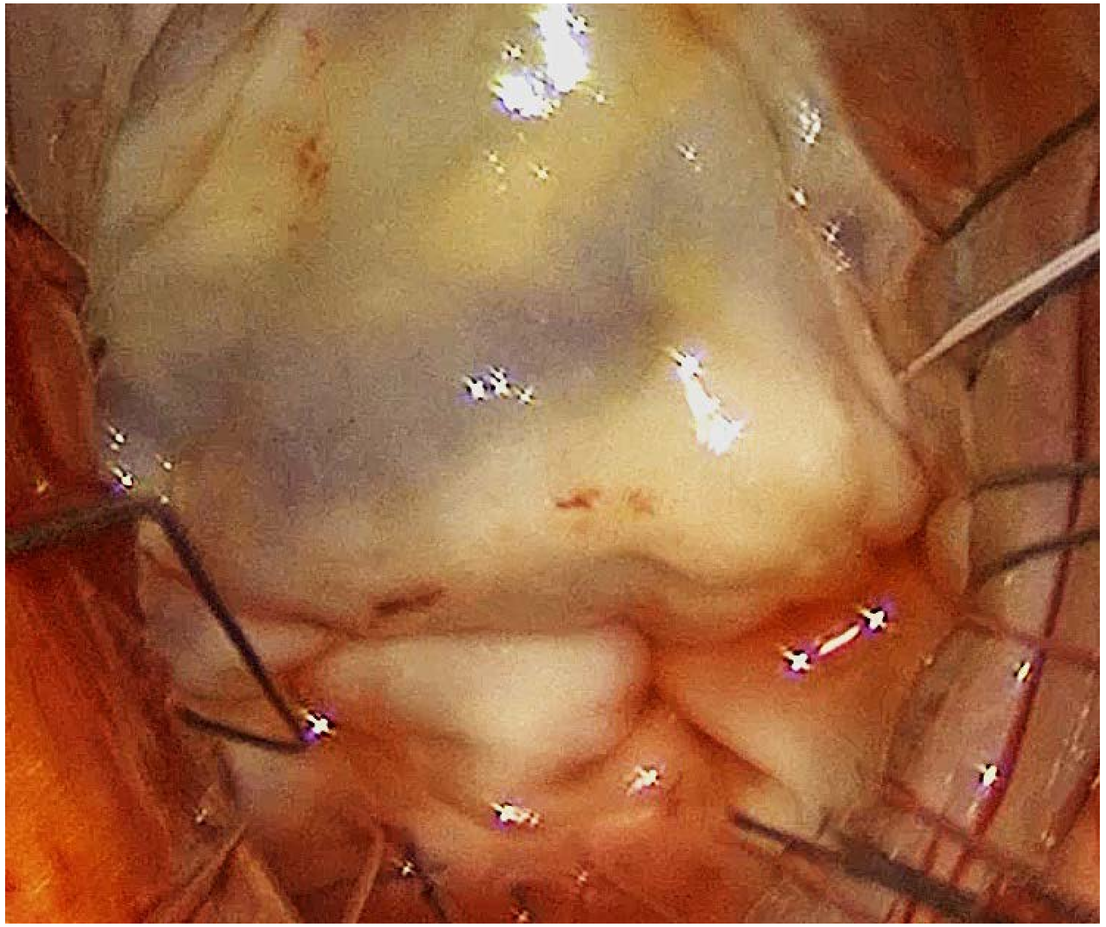
- Redundant, rigid P2-P3
- Trapezoidal configuration with excess height and width

Apply To ALL Valves?



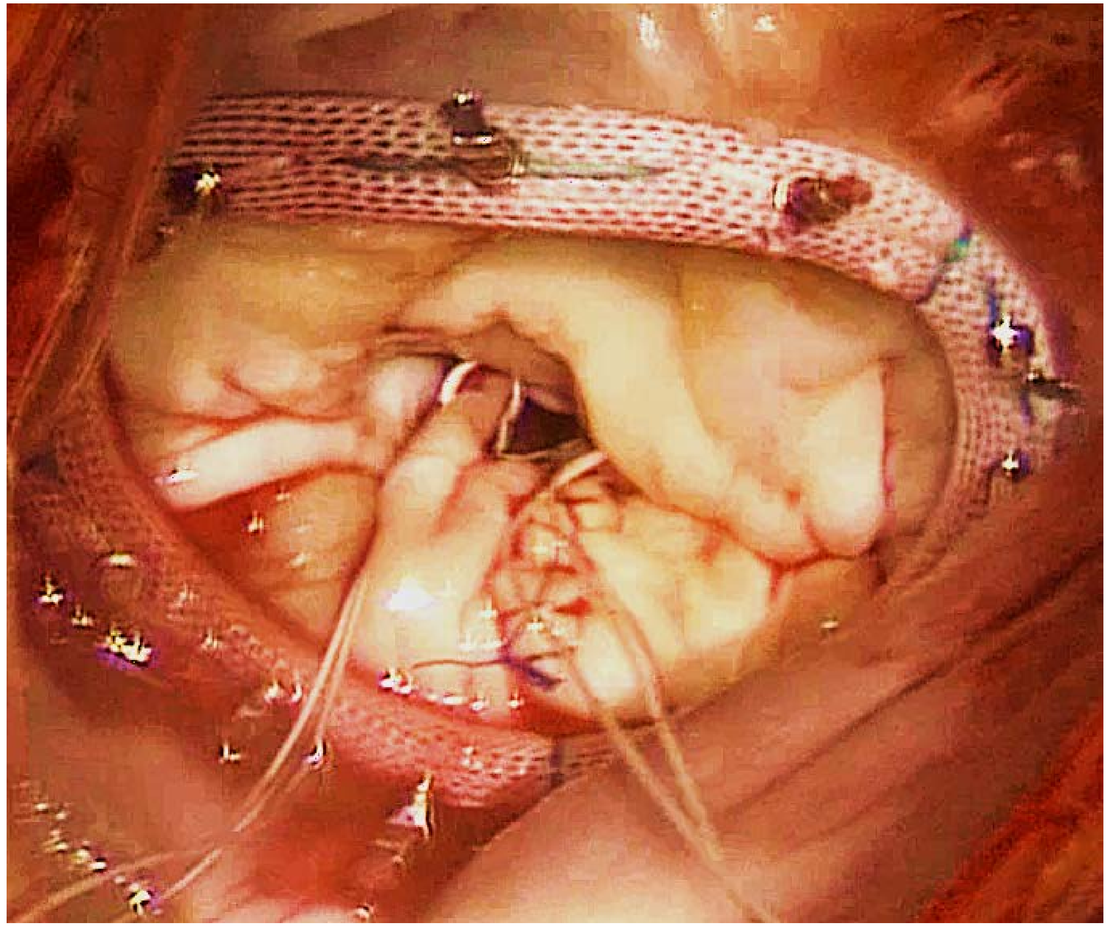
- Excessive tissue at the base of the P2-P3 with anterior displacement

Apply To ALL Valves?



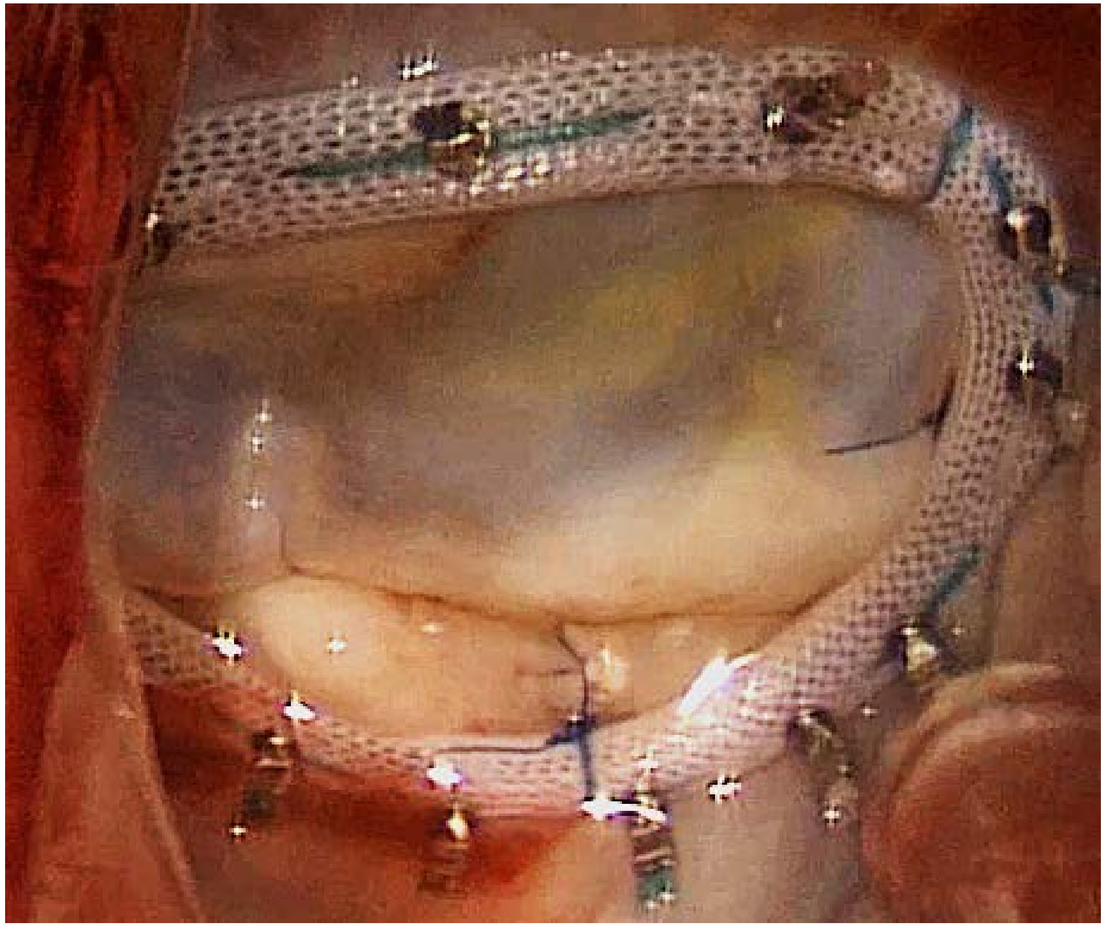
- Irregular surface of coaptation
- Likely to worse with placement of the annuloplasty ring

Apply To ALL Valves?



- Localized quadrangular resection
- “Flanking” artificial chords

Apply To ALL Valves?



- 3:4 ratio restored
- Posterior line of coaptation
- Absence of MR

FCI – IC Experience
Methods

- Historic cohort between January 2004 and June 2017 of patients undergoing isolated mitral valve repair by a single team

- Descriptive analysis of the data, differences between groups were analyzed using: chi – square test, Fisher´s exact test or wilcoxon-Mann-Whitney test. Follow-up were done by institutional registries.

FCI – IC Experience
Preoperative Variables

	NO RESECTION n=111	RESECTION n=34	P-value difference between groups
Male sex	71 (63.4)	26 (70.6)	0.539
Age years,	54.4 (41.9-63)	52.5 (41-59)	0.746
Diabetes	5 (4.5)	0	0.260
Dyslipidemia	12(10.7)	9 (26.5)	0.047
Dialysis	1 (0.9)	0	0.767
Hypertension	32(28.57)	11(32.3)	0.672
COPD	4 (3.6)	3(8.8)	0.132
NYHA functional class			0.947
I	12(10.7)	4 (11.8)	
II	81(72.3)	25(73.5)	
III	19(17)	5 (14.7)	
Arrhythmia	22 (19.6)	4 (11.8)	0.293
Ejection fraction	55 (50-60)	60 (53-65)	0.061
PAP (mmhg)	30 (30-45)	40(35-58)	0.04
MR grade			0.804
Mild	1 (0.9)	0	
Moderate	16(14.3)	3 (8.8)	
Severe	93(83)	31(91.2)	

FCI – IC Experience
Perioperative Outcomes

Perioperative data

	NO RESECTION n=111	RESECTION n=34	p -value difference between groups
Cardiopulmonary bypass time, minutes	114 (95-141)	110(102-135)	0.715
Cross -clamp time, minutes	90(73-105)	94(83-109)	0.262
ICU stay, days	1(1-3)	1(1-2)	0.167
Post ICU stay, days	3(2-4)	3(3-5)	0.504
Post operative variables			
Reoperation for bleeding	2 (1.8)	1 (2.9)	0.331
Arrhythmia	18 (16.1)	5(14.7)	0.848
In hospital stay	6 (5-11)	6.5 (5-11)	0.945

[a] Categorical data are expressed as number (%) and continuous data as median (Interquartile range)

FCI – IC Experience
Perioperative Outcomes

Follow-up data

	NO RESECTION n=84	RESECTION n=19
Follow-up months	14 (5-38)	65 (25-86)
NYHA functional class		
I	63 (74.7)	14 (73.7)
II	19(22.3)	4(21)
III	2(2.3)	1 (5.3)

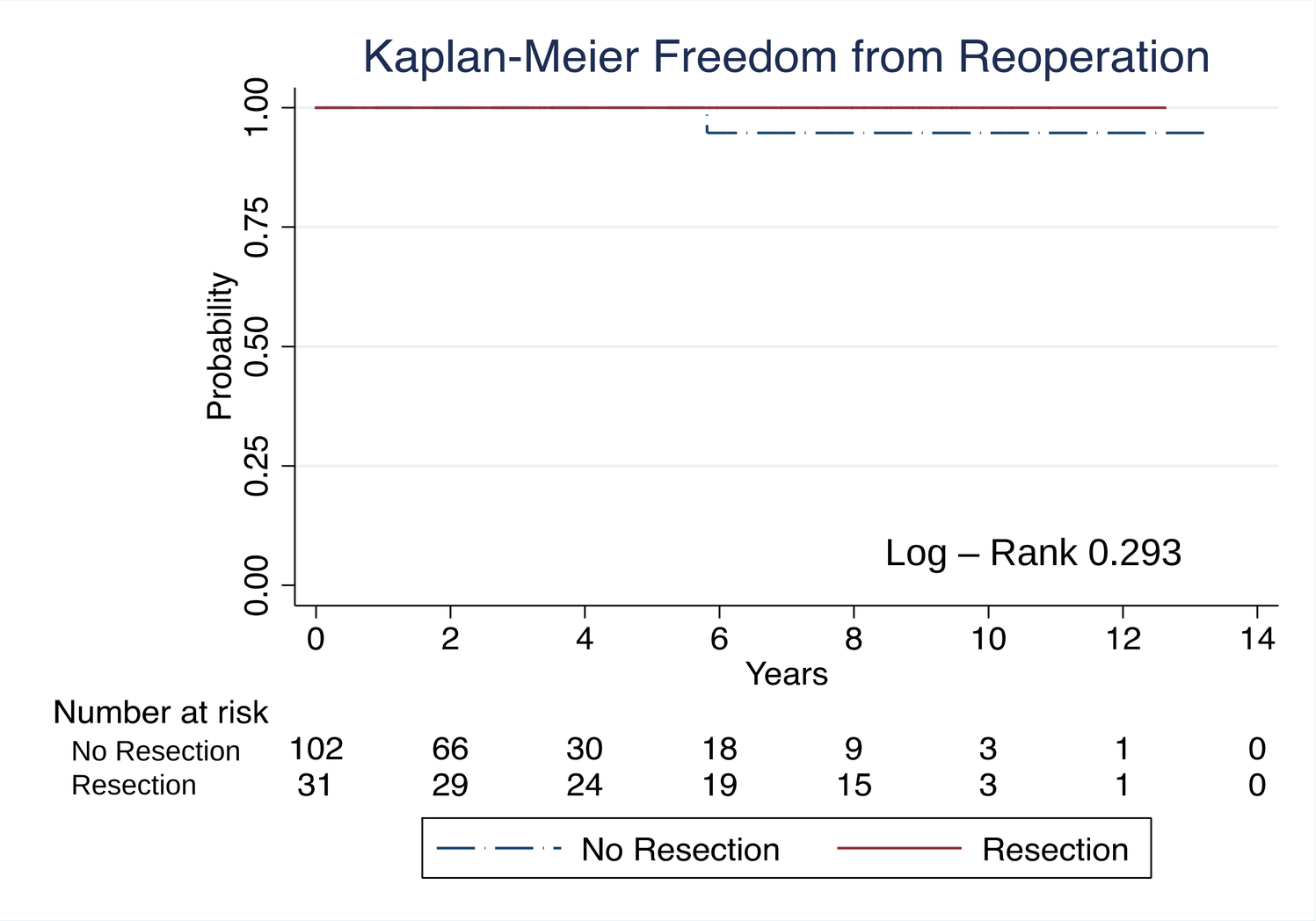
[a] Categorical data are expressed as number (%) and continuous data as median (Interquartile range)

FCI – IC Experience
Freedom from Reoperation

At 12 years, freedom from reoperation:

Resection 100%

Artificial Chordae 94.7%



Conclusions

- Prolapse of PL is NOT as straighforward
- Great variety of lesions imply adaptation of multiple surgical techniques
- Very often, a combination of techniques is needed
- Always start by *respecting* leaflet tissue
- Focus on the goal: Restoration of surface of coaptation

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Thank You

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