INSUFFICIENZA MITRALICA DEGENERATIVA 1
DIAGNOSI e RIMEDI a CUORE APERTO

Anche la plastica tradizionale della insufficienza mitralica è evoluta
I criteri della chirurgia sono cambiati? Cenni di tecnica

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ESC GL 2017

Indications for intervention in severe primary mitral regurgitation

Recommendations	Class[a]	Level[b]
Mitral valve repair should be the preferred technique when the results are expected to be durable.	I	C
Surgery is indicated in symptomatic patients with LVEF >30%.[121,131,132]	I	B
Surgery is indicated in asymptomatic patients with LV dysfunction (LVESD ≥45 mm[c] and/or LVEF ≤60%).[122,131]	I	B
Surgery should be considered in asymptomatic patients with preserved LV function (LVESD <45 mm and LVEF >60%) and atrial fibrillation secondary to mitral regurgitation or pulmonary hypertension[d] (systolic pulmonary pressure at rest >50 mmHg).[123,124]	IIa	B
Surgery should be considered in asymptomatic patients with preserved LVEF (>60%) and LVESD 40–44 mm[c] when a durable repair is likely, surgical risk is low, the repair is performed in a heart valve centre and at least one of the following findings is present: • flail leaflet or • presence of significant LA dilatation (volume index ≥60 mL/m² BSA) in sinus rhythm.	IIa	C
Mitral valve repair should be considered in symptomatic patients with severe LV dysfunction (LVEF <30% and/or LVESD >55 mm) refractory to medical therapy when the likelihood of successful repair is high and comorbidity low.	IIa	C
Mitral valve replacement may be considered in symptomatic patients with severe LV dysfunction (LVEF <30% and/or LVESD >55 mm) refractory to medical therapy when the likelihood of successful repair is low and comorbidity low.	IIb	C
Percutaneous edge-to-edge procedure may be considered in patients with symptomatic severe primary mitral regurgitation who fulfil the echocardiographic criteria of eligibility and are judged inoperable or at high surgical risk by the Heart Team, avoiding futility.	IIb	C

ESC GL 2012

Table 12 Indications for surgery in severe primary mitral regurgitation

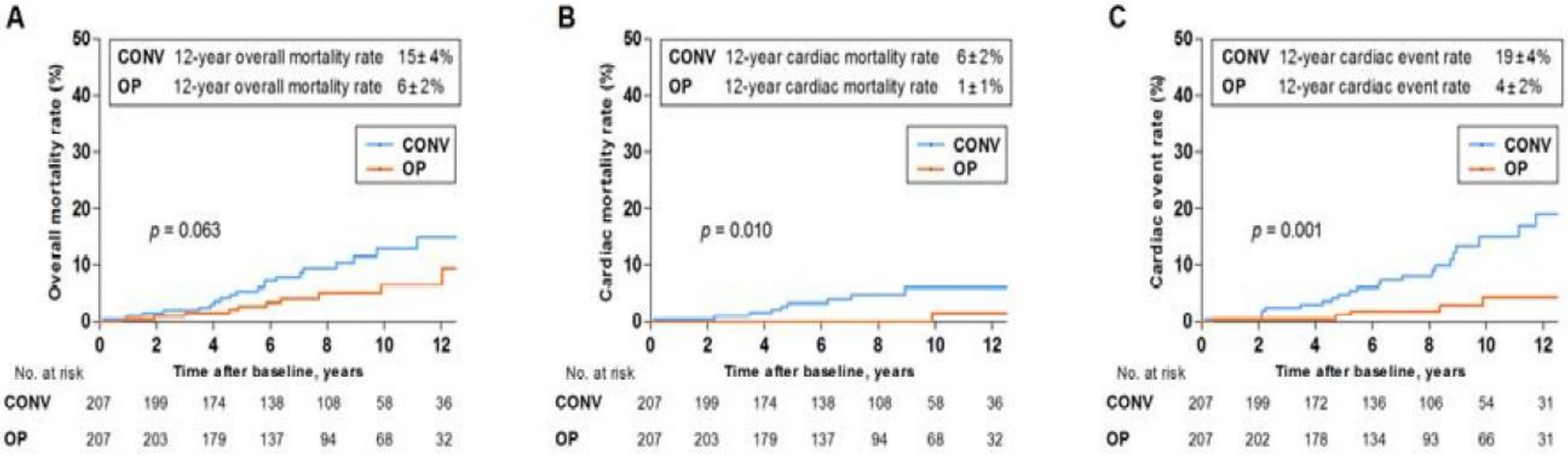
	Class[a]	Level[b]	Ref[c]
Mitral valve repair should be the preferred technique when it is expected to be durable.	I	C	
Surgery is indicated in symptomatic patients with LVEF >30% and LVESD <55 mm.	I	B	127, 128
Surgery is indicated in asymptomatic patients with LV dysfunction (LVESD ≥45 mm and/or LVEF ≤60%).	I	C	
Surgery should be considered in asymptomatic patients with preserved LV function and new onset of atrial fibrillation or pulmonary hypertension (systolic pulmonary pressure at rest >50 mmHg).	IIa	C	
Surgery should be considered in asymptomatic patients with preserved LV function, high likelihood of durable repair, low surgical risk and flail leaflet and LVESD ≥40 mm.	IIa	C	
Surgery should be considered in patients with severe LV dysfunction (LVEF <30% and/or LVESD >55 mm) refractory to medical therapy with high likelihood of durable repair and low comorbidity.	IIa	C	
Surgery may be considered in patients with severe LV dysfunction (LVEF <30% and/or LVESD >55 mm) refractory to medical therapy with low likelihood of durable repair and low comorbidity.	IIb	C	
Surgery may be considered in asymptomatic patients with preserved LV function, high likelihood of durable repair, low surgical risk, and: • left atrial dilatation (volume index ≥60 ml/m² BSA) and sinus rhythm, or • pulmonary hypertension on exercise (SPAP ≥60 mmHg at exercise).	IIb	C	

610 patients , severe MR, normal ventricular function, no symptoms (prospective study)

- **235 early surgery**
- **375 conventional treatment**

- **207 propensity matched pairs**

Comparison of end points in a propensity-matched cohort



Kang JACC 2014

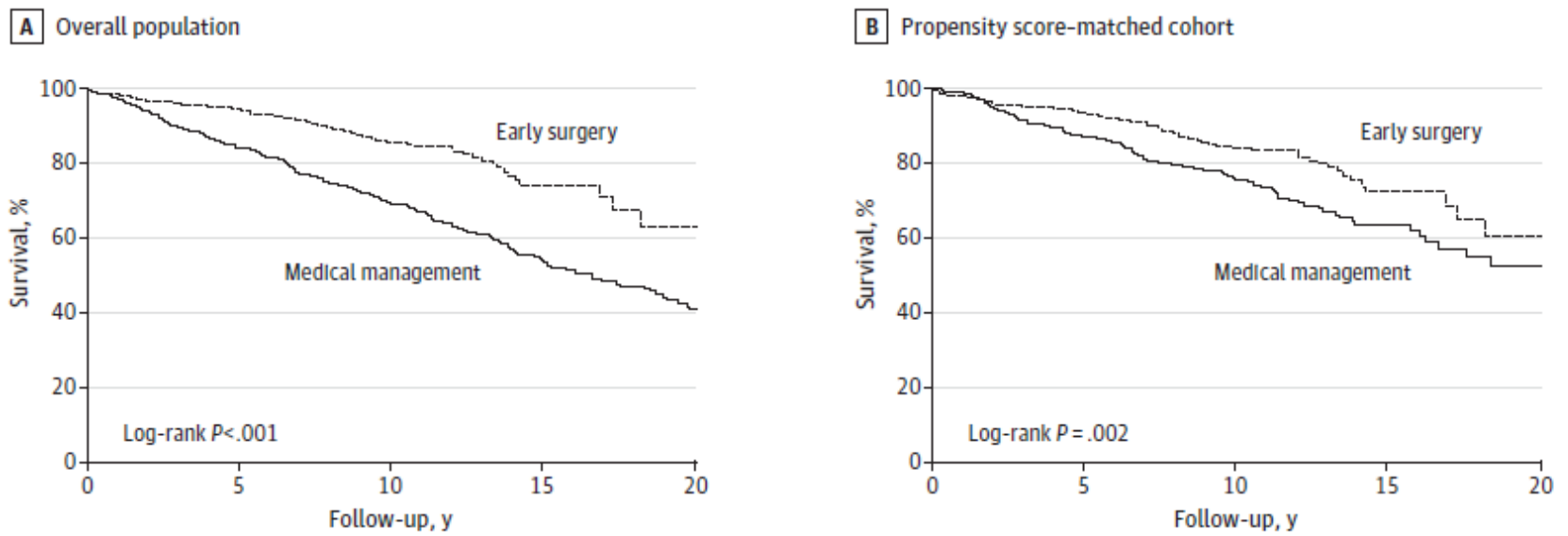
Association Between Early Surgical Intervention vs Watchful Waiting and Outcomes for Mitral Regurgitation Due to Flail Mitral Valve Leaflets

Rakesh M. Suri, MD, DPhil; Jean-Louis Vanoverschelde, MD; Francesco Grigioni, MD, PhD; Hartzell V. Schaff, MD; Christophe Tribouilloy, MD; Jean-Francois Avierinos, MD; Andrea Barbieri, MD; Agnes Pasquet, MD; Marianne Huebner, PhD; Dan Rusinaru, MD; Antonio Russo, MD; Hector I. Michelena, MD; Maurice Enriquez-Sarano, MD

Registro internazionale

- **1021 pazienti**
- **648 propensity matched**
- **Follow-up 5 anni**

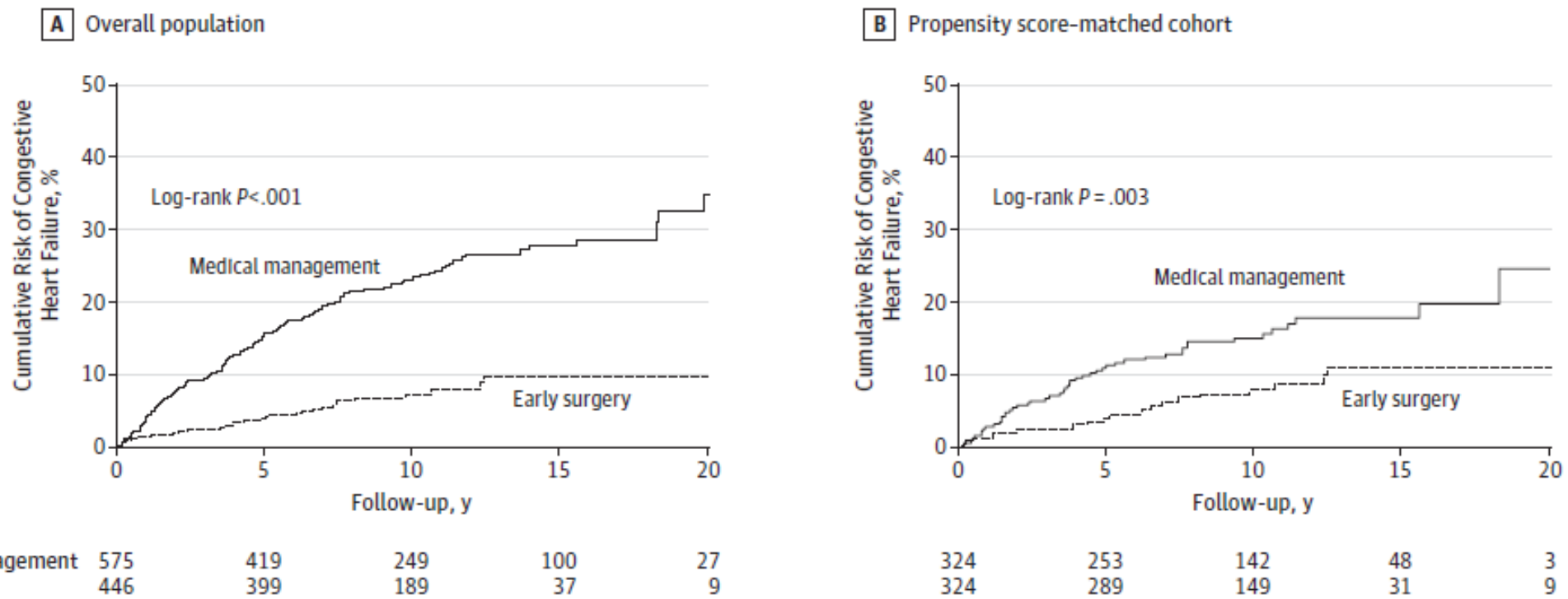
Figure 1. Survival After Diagnosis of Mitral Regurgitation Due to Flail Mitral Leaflet According to Initial Treatment Strategy



Long-term survival following early surgery vs initial medical management overall population (A) and in the propensity score–matched cohort (B).

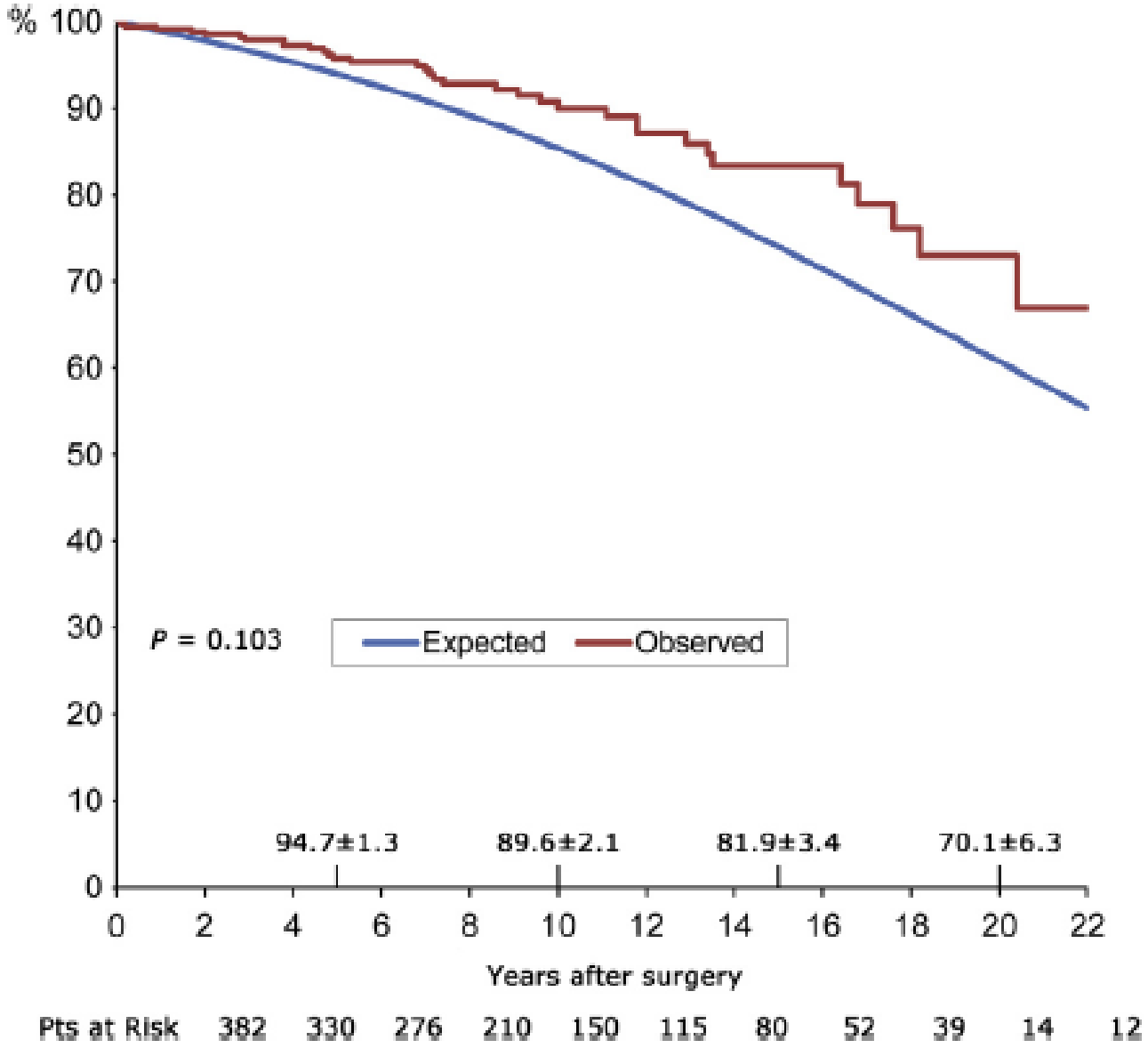
JAMA 2013

Figure 2. Heart Failure Incidence After Diagnosis of Mitral Regurgitation Due to Flail Mitral Leaflet According to Initial Treatment Strategy



Long-term heart failure risk following early surgery vs initial medical management overall (A) and in the propensity score–matched cohort (B).

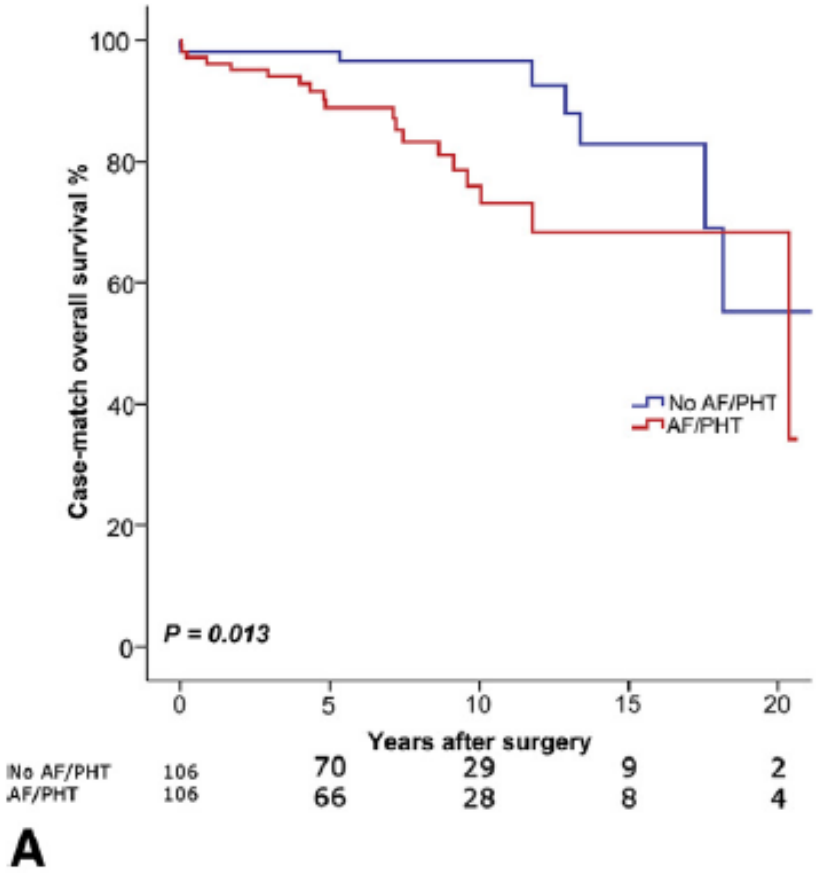
Suri JAMA 2013



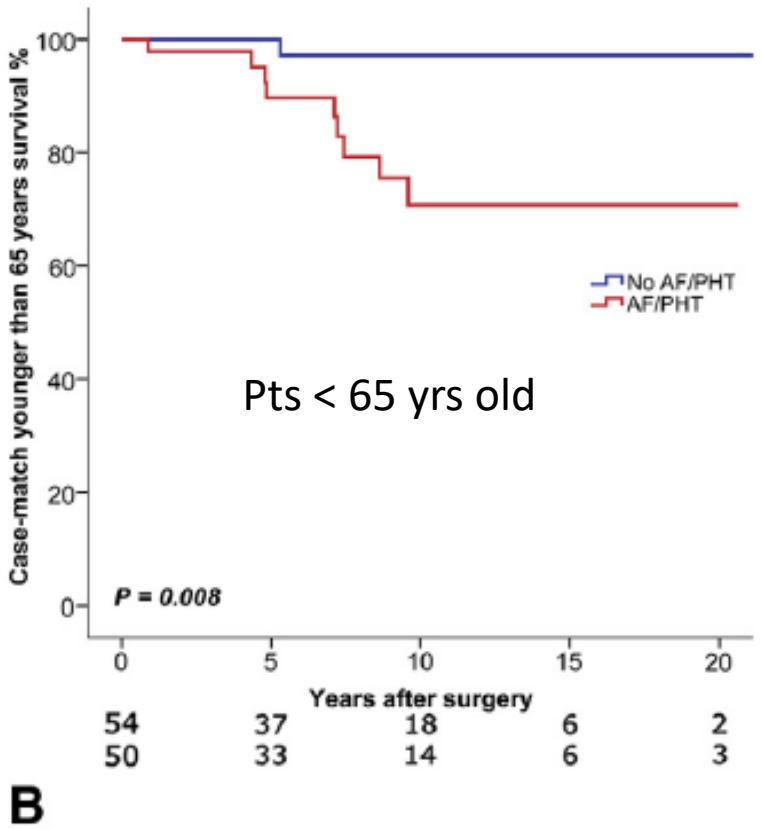
Long-term follow-up of asymptomatic or mildly symptomatic patients with severe degenerative mitral regurgitation and preserved left ventricular function

Coutinho GF JTCVS 2014

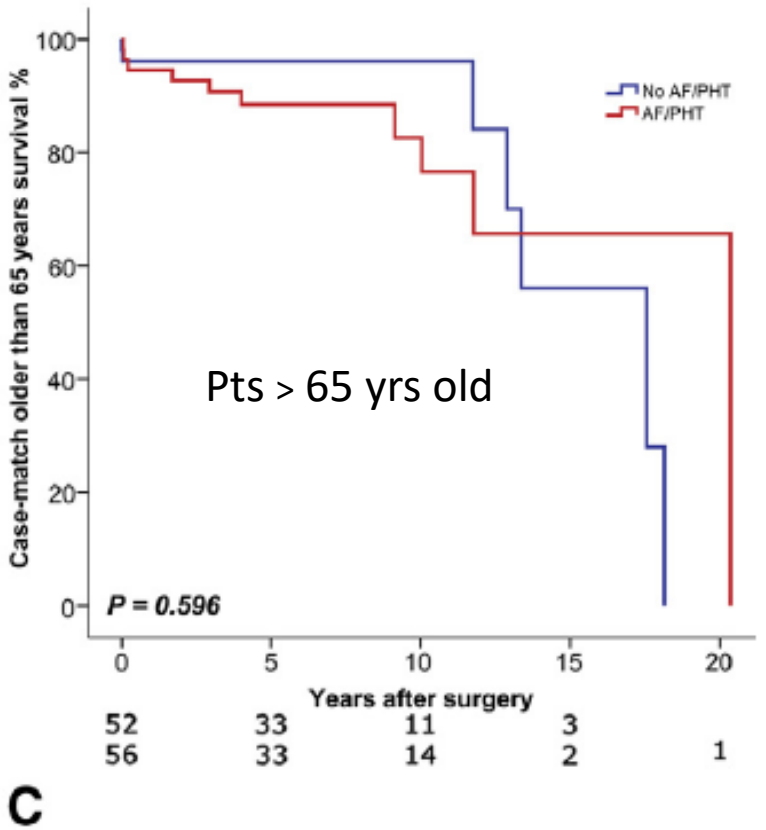
Afib and Pulmonary Artery Pressure and Outcome



A

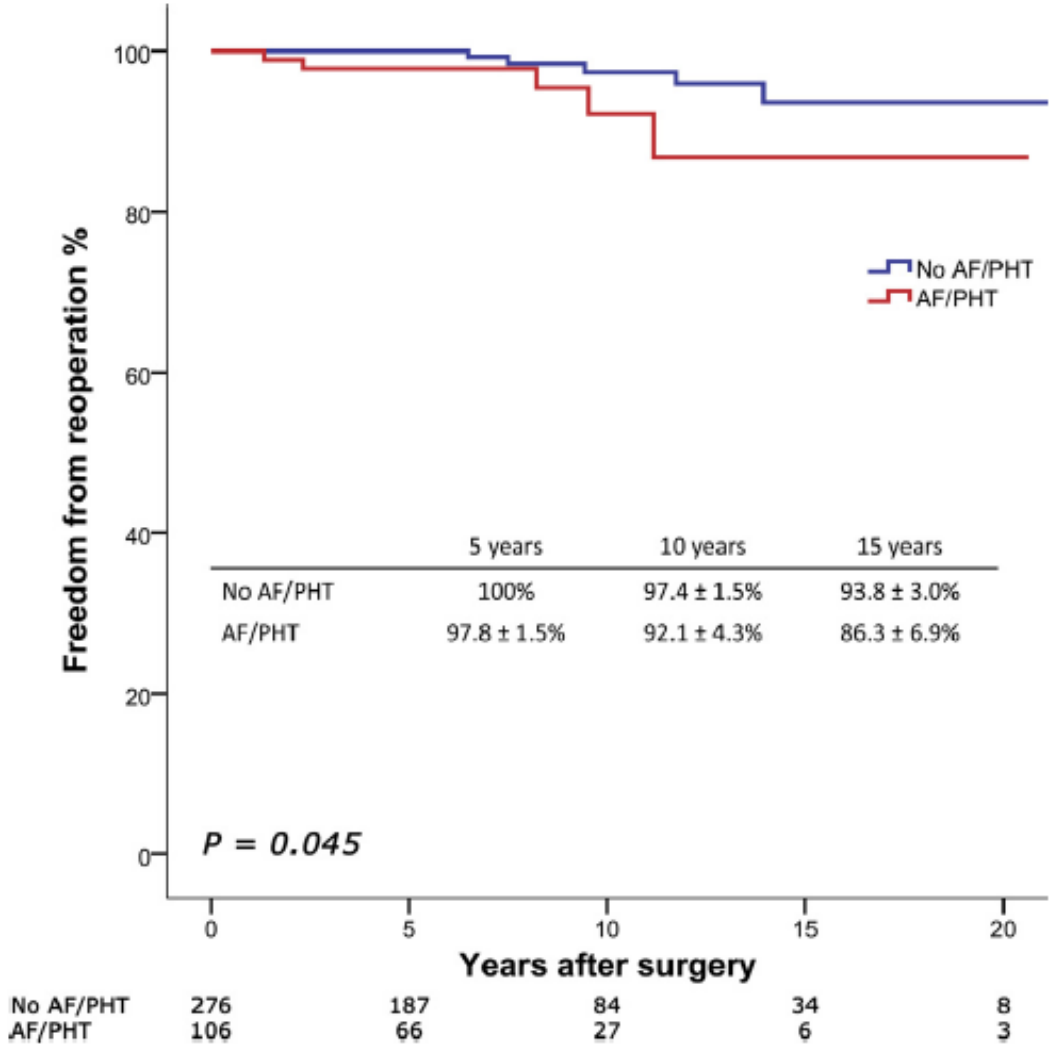


B



C

Coutinho GF JTCVS 2014



Afib, Pulmonary pressure and repair durability

Coutinho GF JTCVS 2014

Impact of Left Atrial Volume on Clinical Outcome in Organic Mitral Regurgitation

Le Tourneau JACC 2010

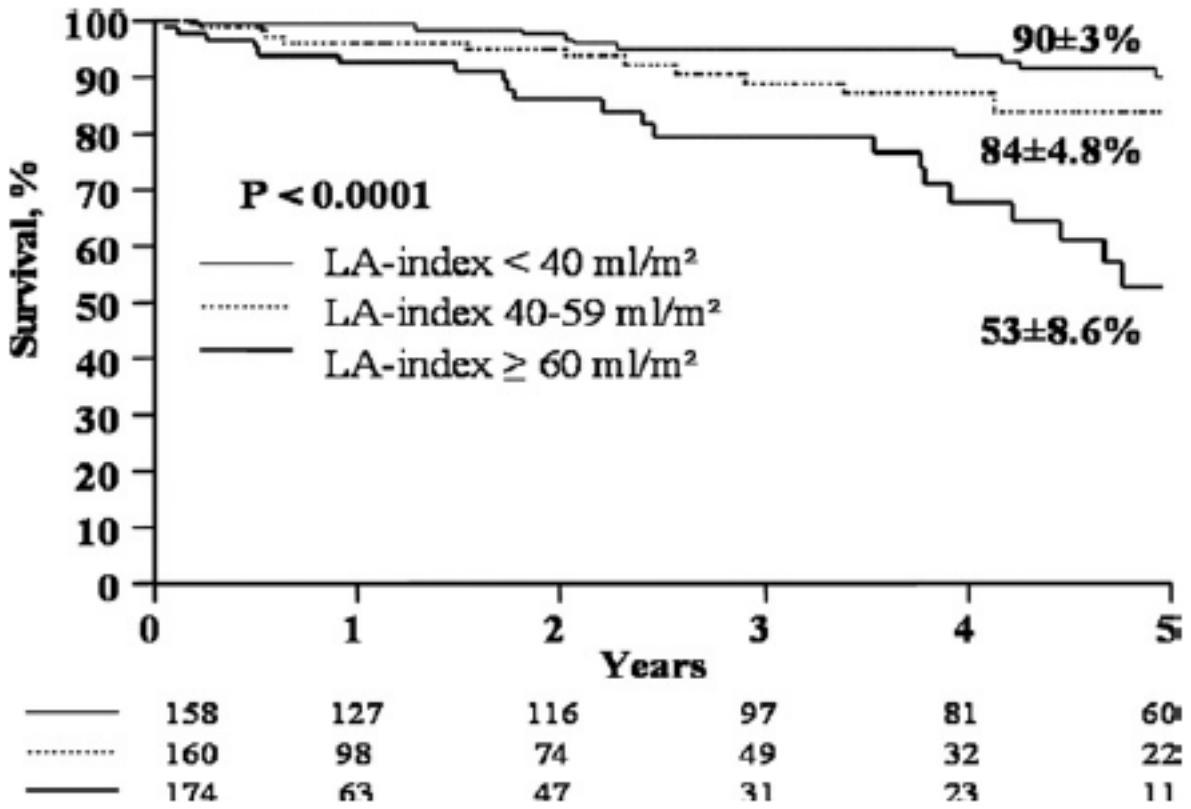


Figure 1 Survival After Diagnosis According to LA Volume

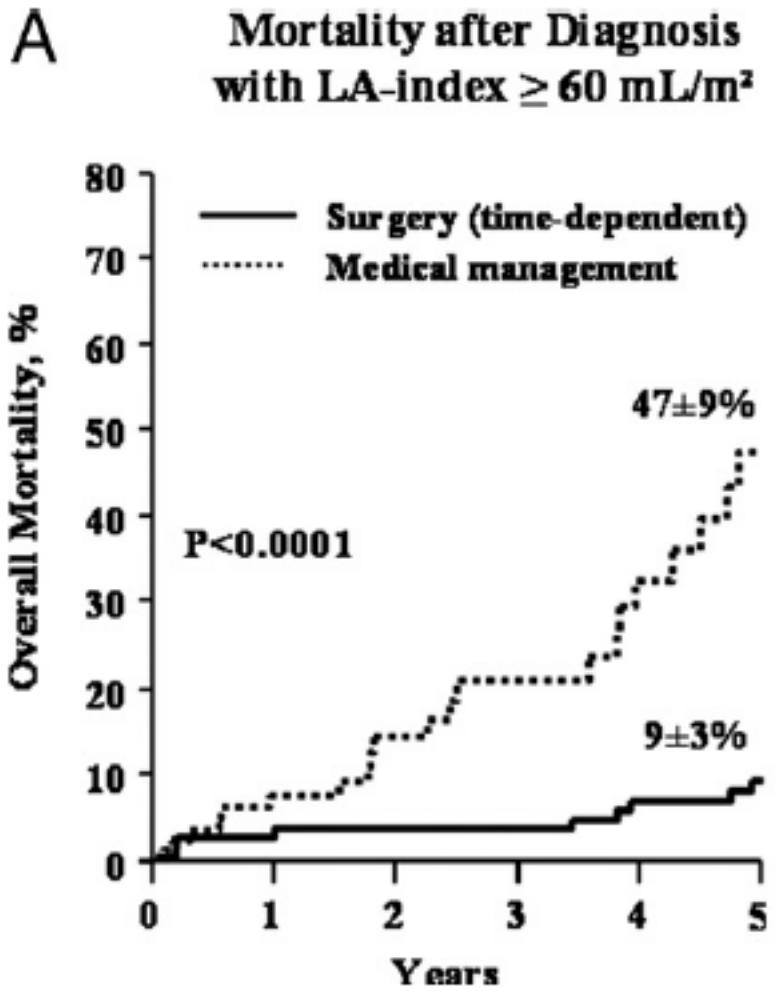
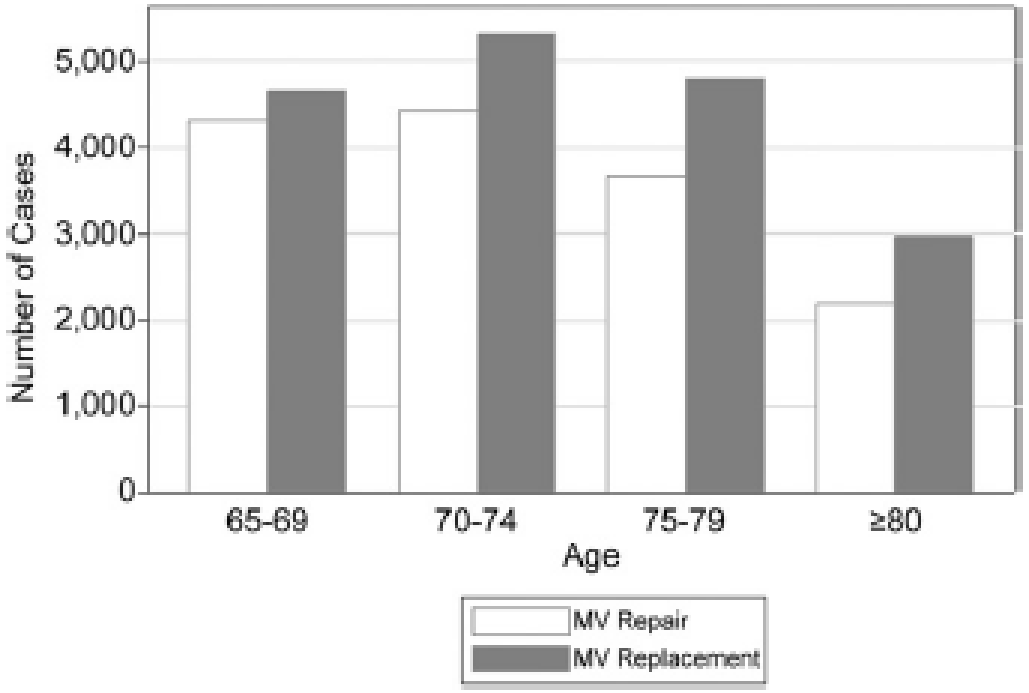
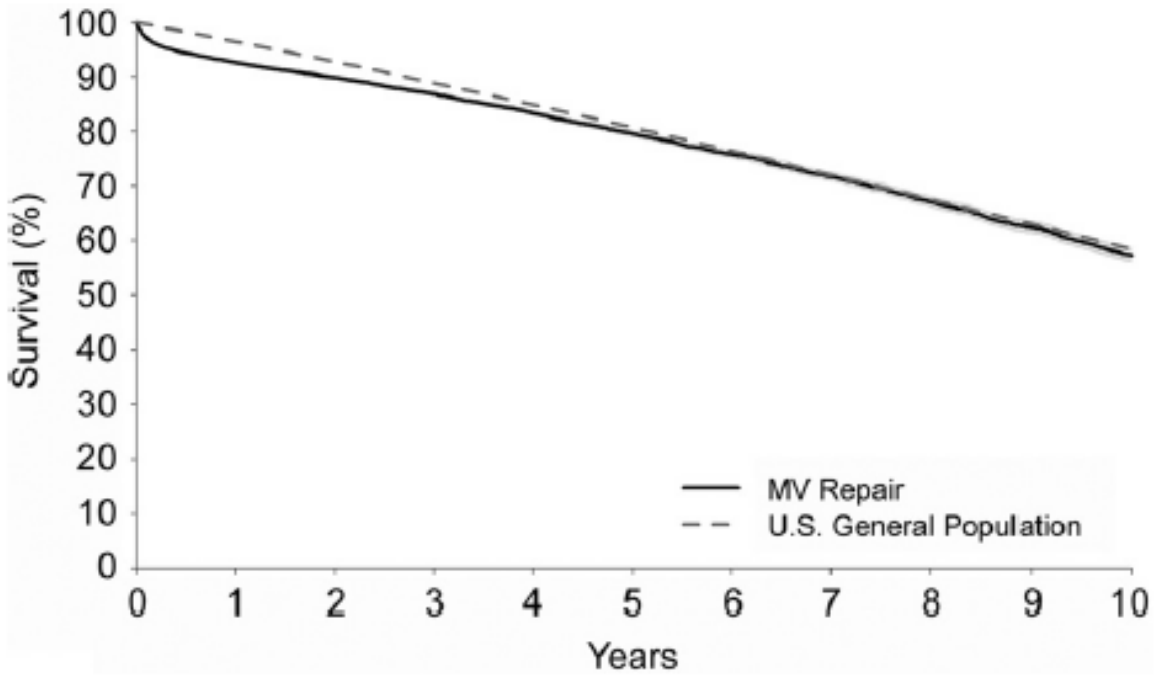


Figure 5 Outcome in Patients With Markedly Enlarged LA Compared Between Surgical and Medical Management

Longitudinal Outcome of Isolated Mitral Repair in Older Patients: Results From 14,604 Procedures Performed From 1991 to 2007



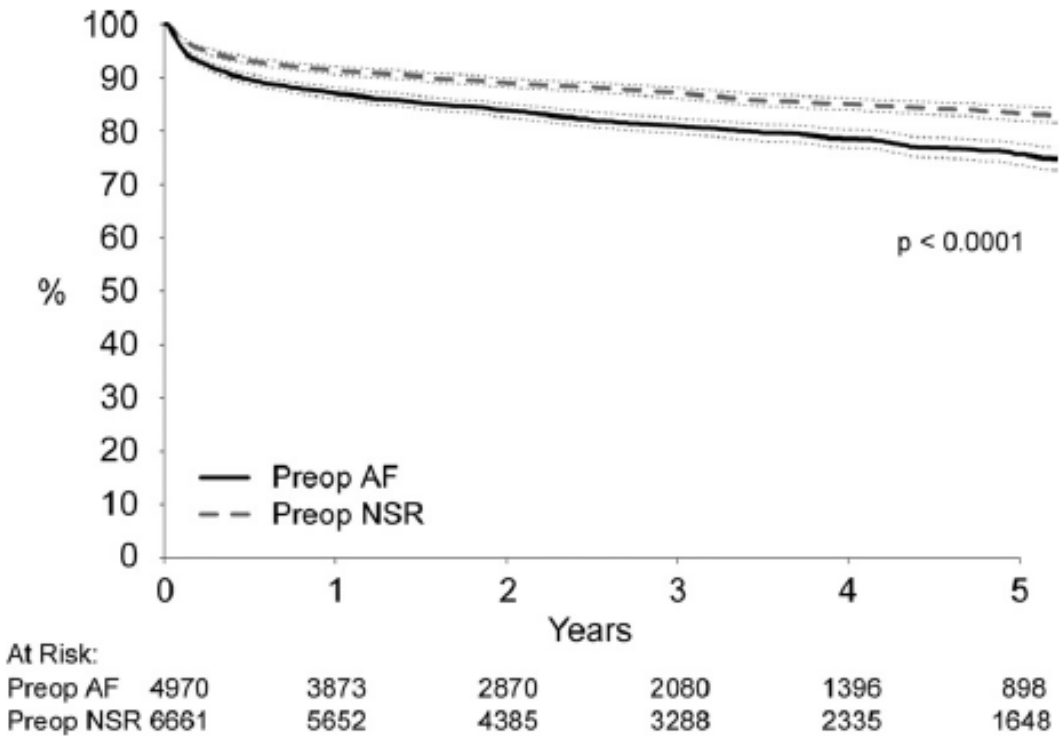


Badhwar Ann Thorac Surg 2012

Table 3. Impact of Preoperative New York Heart Association Class on Operative Mortality After Isolated Primary Mitral Valve Repair in Patients Aged 65 Years or More

Age Group	Total Cohort	NYHA I–II	NYHA III–IV	*p* Value
Overall	2.6%	1.5%	3.3%	<0.0001
65 to 70 years	1.7%	0.8%	2.4%	<0.0001
70 to 75 years	1.9%	1.2%	2.3%	0.0047
75 to 80 years	3.4%	2.5%	4.0%	0.0165
More than 80 years	4.3%	2.7%	5.3%	0.0060

NYHA = New York Heart Association.



Impact of preoperative Afib on 5 years readmission for HF

Badhwar Ann Thorac Surg 2012

Mitral repair: early surgery

- Probabily of repair > 95%
- Low mortality < 1%
- **DURABLE REPAIR**

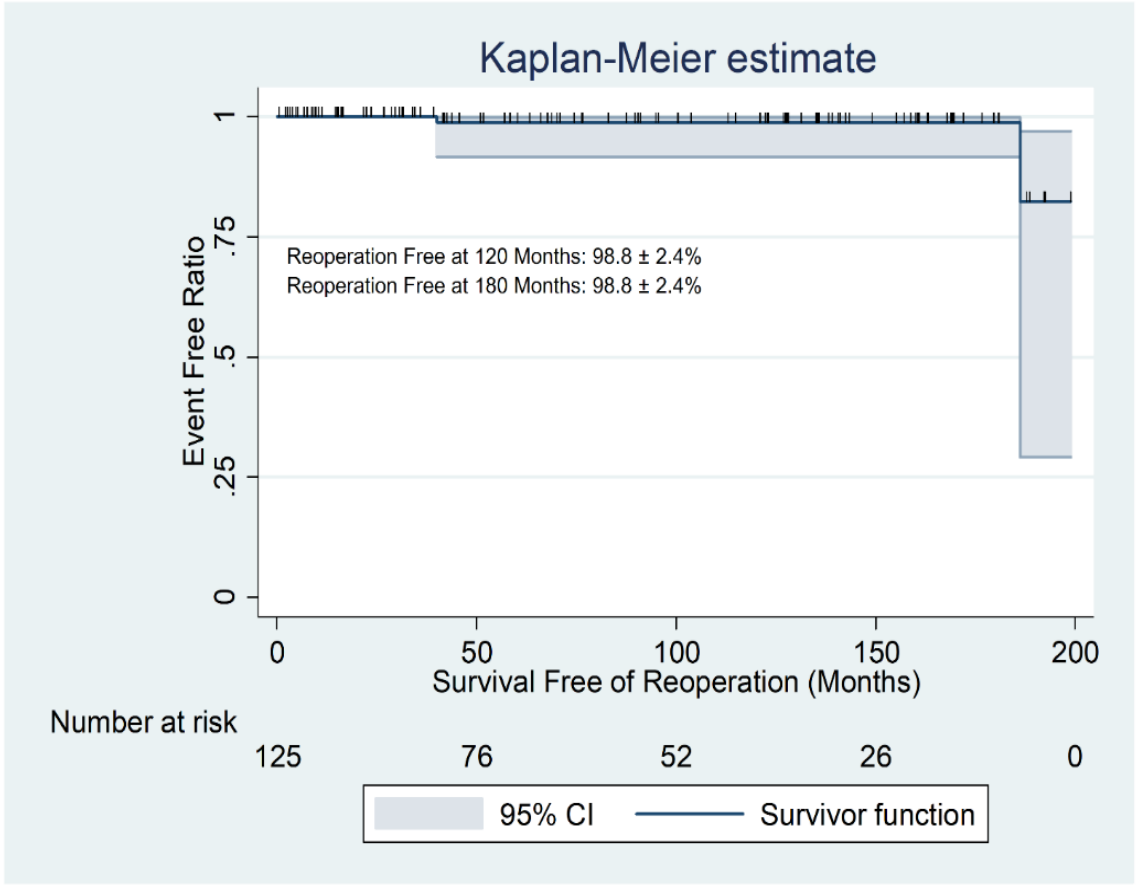
Il concetto di «repair rate»

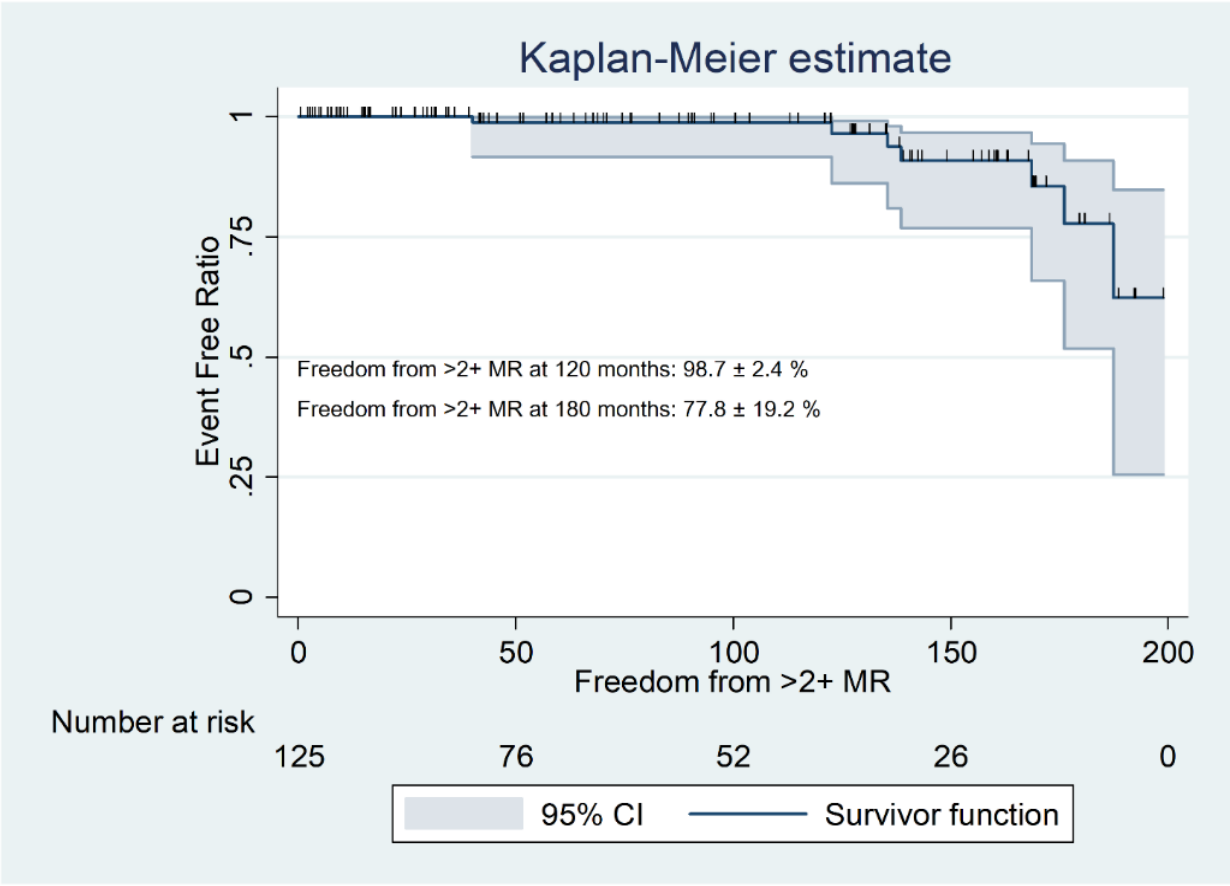
- Monitoraggio della percentuale di valvole riparate con successo rispetto al numero totale di pazienti operati per insufficienza mitralica degenerativa
- Valutazione ecocardiografica della eziologia e del meccanismo del vizio valvolare
- Controllo ecocardiografico postoperatorio del risultato della riparazione

La nostra esperienza

- AA 2016-2017
- Chirurgia della valvola mitrale: 386
- Malattia degenerativa della valvola mitrale: 234
- Riparazione valvolare 227
- «repair rate» 97%
- Mortalità 0.5%

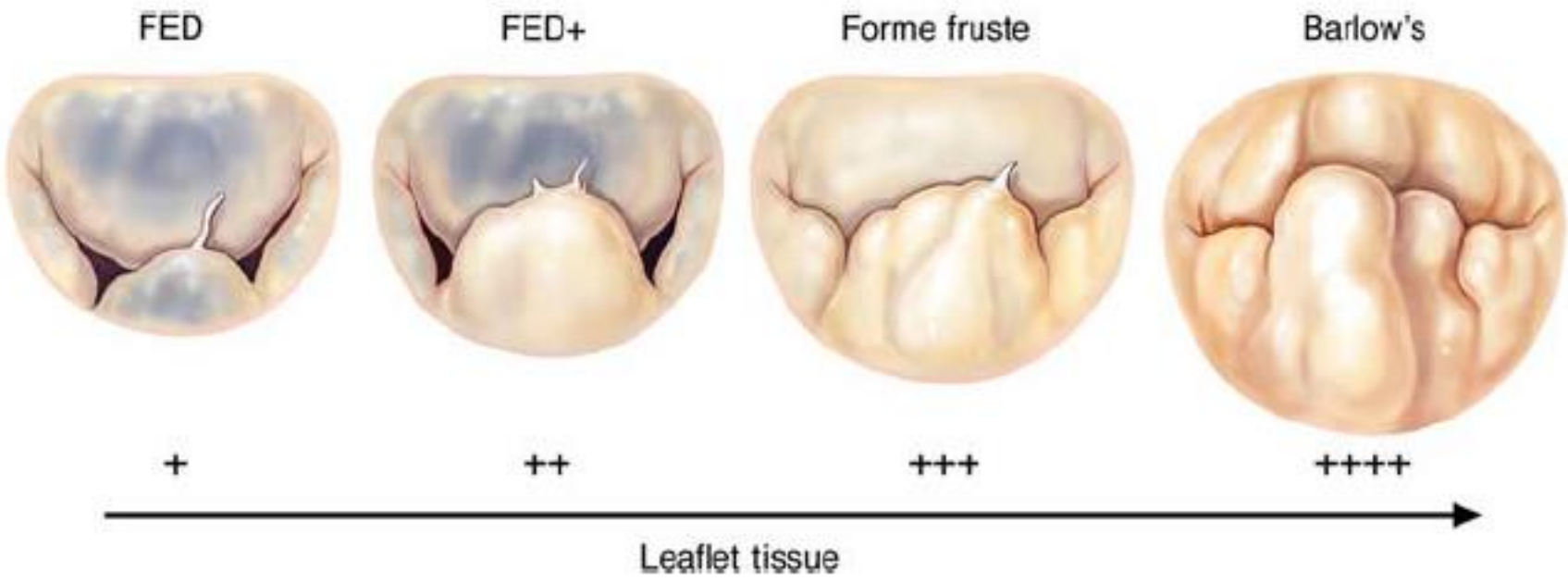
Late results of Minimally Invasive Mitral Repair in Barlow disease





presented at EACTS 2017

Quale tecnica chirurgica?



Surgical techniques:

- **Posterior leaflet** prolaspse/flail: resection, neocordae implantation
- **Anterior leaflet** prolapse/flail: neocordae implantation
- **Bileaflet** prolapse/flail: resection,neocordae implantation/ edge-to-edge

How does the use of polytetrafluoroethylene neochordae for posterior mitral valve prolapse (loop technique) compare with leaflet resection? A prospective randomized trial

TABLE 5. Echocardiographic follow-up

6-mo follow-up	Loops (n = 42)	Resection (n = 34)
LVEF	60.4 ± 7.9	57.3 ± 7.9
MR grade	0.21 ± 0.4	0.32 ± 0.42
P mean (mm Hg)	2.36 ± 0.97	2.44 ± 1.23
Mitral orifice area (cm^2)	3.27 ± 1.32	2.96 ± 1.01
1-y follow-up	**Loops (n = 30)**	**Resection (n = 20)**
LVEF	62.9 ± 8.3	59 ± 12.3
MR grade	0.28 ± 0.45	0.44 ± 0.54
P mean (mm Hg)	2.34 ± 0.96	2.58 ± 1.39
Mitral orifice area (cm^2)	3.21 ± 1.39	3.62 ± 1.35

LVEF, Left ventricular ejection fraction; *MR*, mitral regurgitation. All values are expressed as mean ± standard deviation.

No difference

Line of coaptation (mm)	Loops	Resection	
After surgery	7.6 ± 3.6 mm	5.9 ± 2.6 mm	$P = .03$

Table 4. Echocardiographic Outcomes Before and Immediately After Surgery

	Baseline	After Surgery	*p* Value
MR grade			
Loop	3.3 ± 0.7	0.2 ± 0.5	< 0.001
Resection	3.3 ± 0.6	0.4 ± 0.6	< 0.001
p value	0.5	0.007	
LVEF, %			
Loop	63.9 ± 10.5	58.2 ± 9.3	< 0.001
Resection	60.9 ± 12.6	56.6 ± 11.1	< 0.001
p value	0.19	0.08	
Mitral orifice area, cm^2			
Loop		3.3 ± 0.8	
Resection		3.0 ± 0.8	
p value		< 0.001	
P mean, mm Hg			
Loop		2.7 ± 1.7	
Resection		3.1 ± 1.7	
p value		0.03	

All data are presented as mean ± standard deviation.

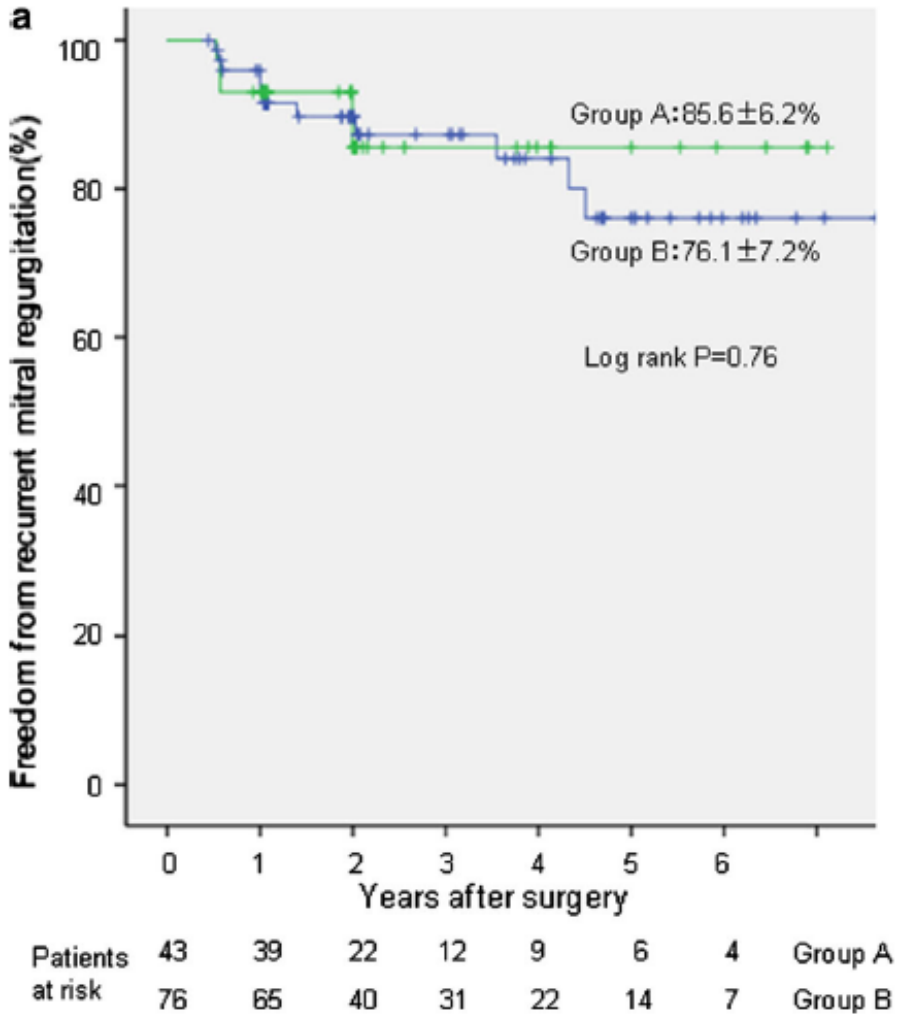
LVEF = left ventricular ejection fraction; MR = mitral regurgitation; P mean = mean pressure gradient.

Leaflet resection versus cordal replacement in posterior leaflet prolapse

1708 MIMVR pts

- **353 Leaflet resection**
- **317 cordal replacement**

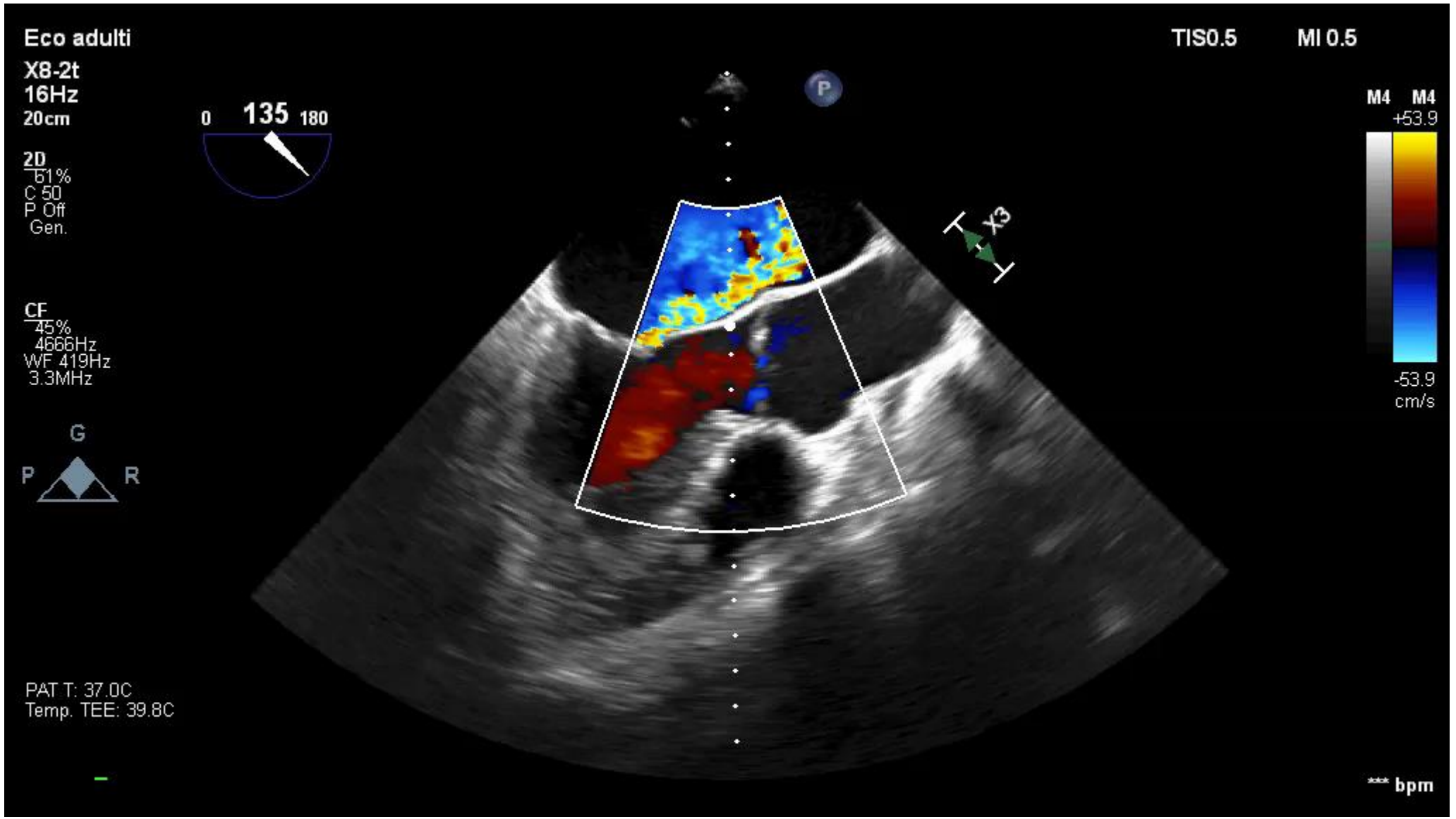
Post-repair coaptation length and durability of mitral valve repair for posterior mitral valve prolapse



Group A : postrepair CL ≥ 8mm

Group B : postrepair CL < 8mm

Uchimuro T Gen Thorac Cardiovasc Surg 2014


Eco adulti
X8-2t
16Hz
20cm
2D
61%
C 50
P Off
Gen.
CF
45%
4666Hz
WF 419Hz
3.3MHz
G
P
R
0
135
180
TIS0.5
MI 0.5
M4
M4
+53.9
-53.9
cm/s
X3
PAT T: 37.0C
Temp. TEE: 39.8C
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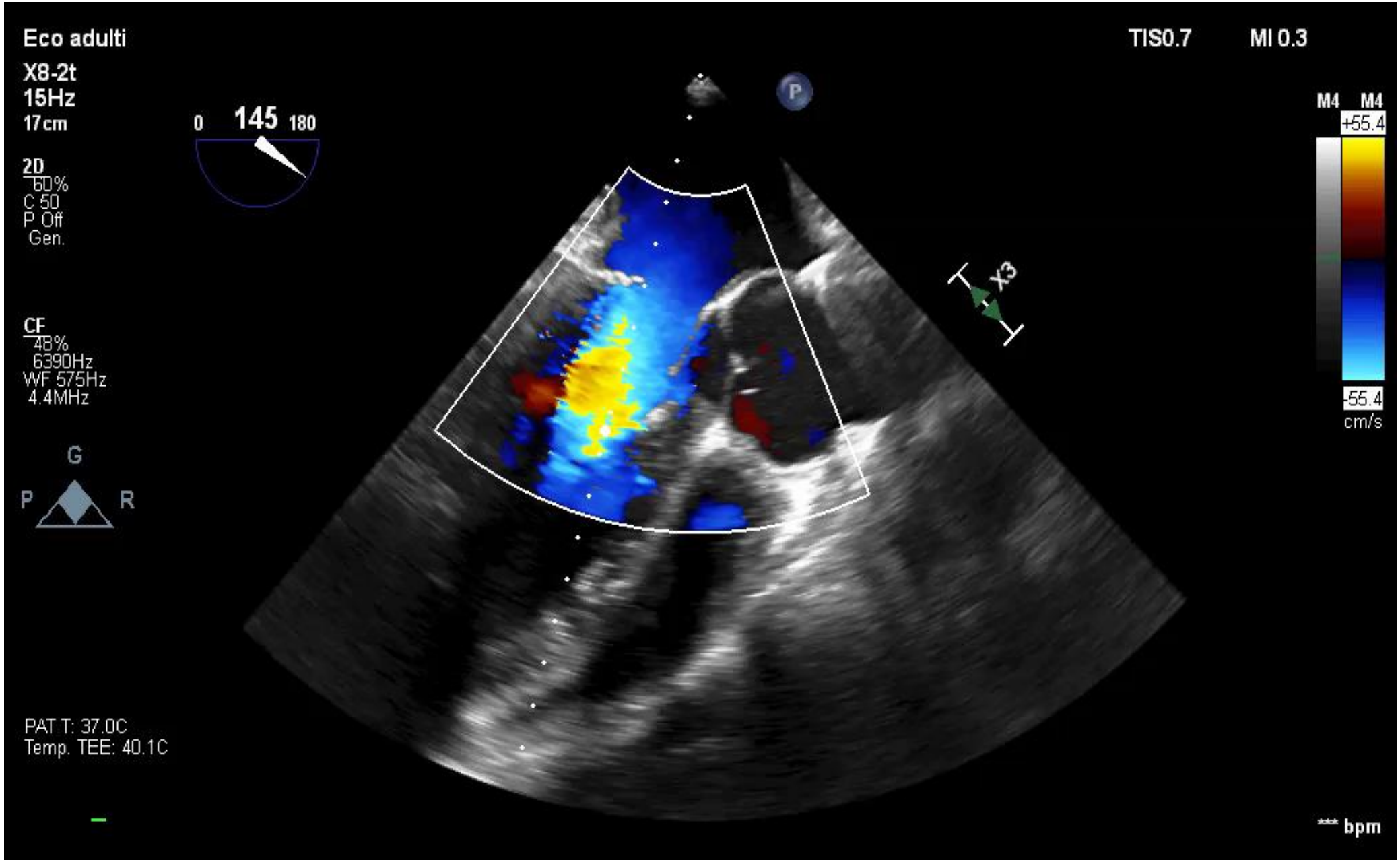
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X8-2t
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17cm
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60%
C 50
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4.4MHz
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P
R
0
145
180
TIS0.7
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M4
M4
+55.4
-55.4
cm/s
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PAT T: 37.0C
Temp. TEE: 40.1C
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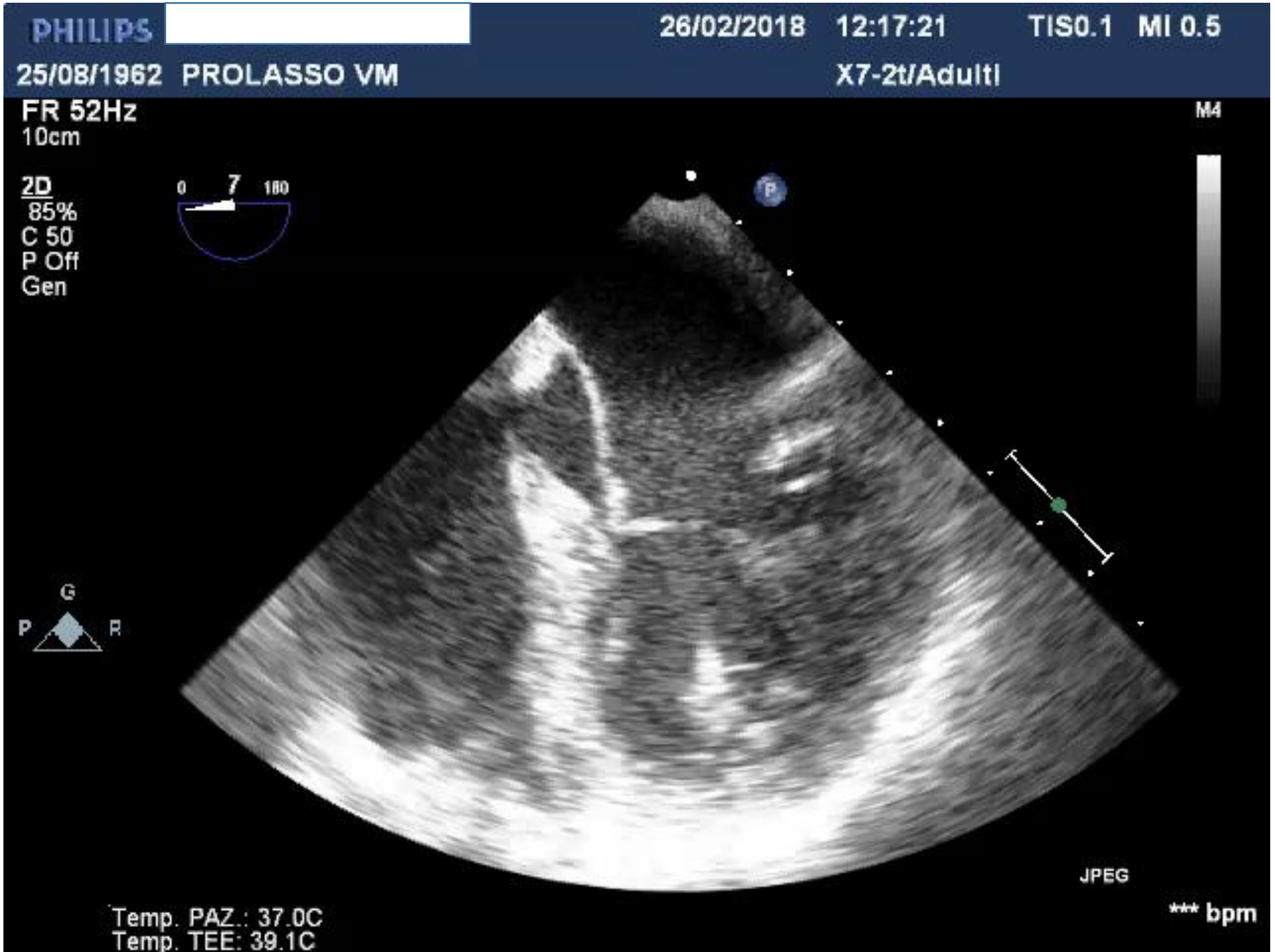
PHILIPS
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25/08/1962 PROLASSO VM
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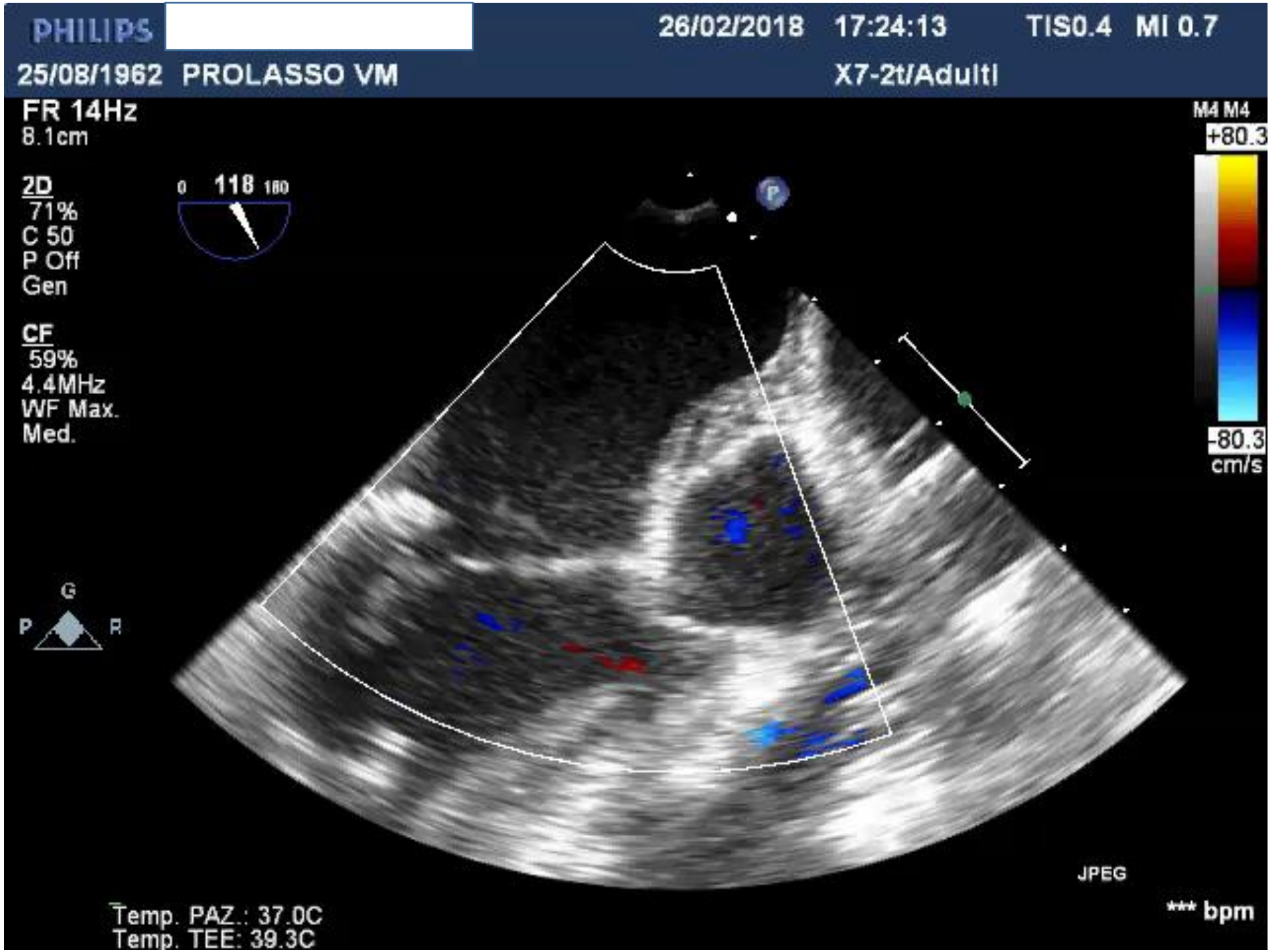
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X7-2t/Adulti
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71%
C 50
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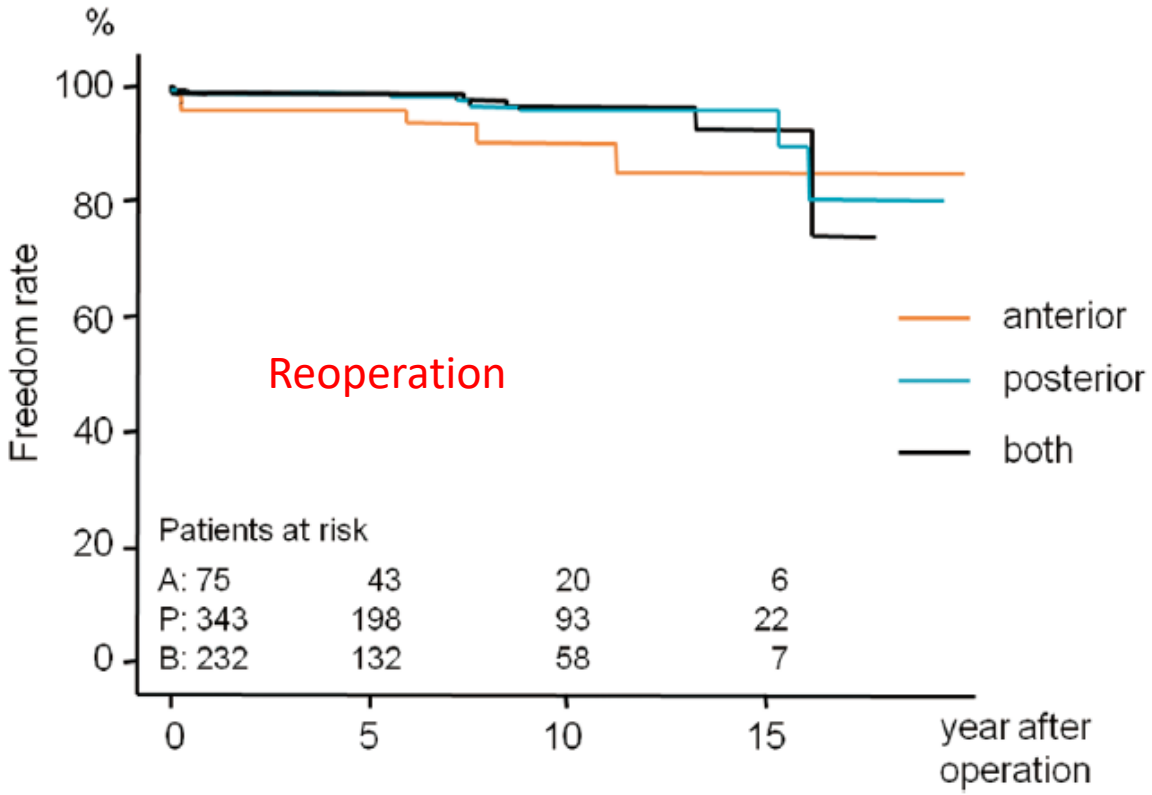
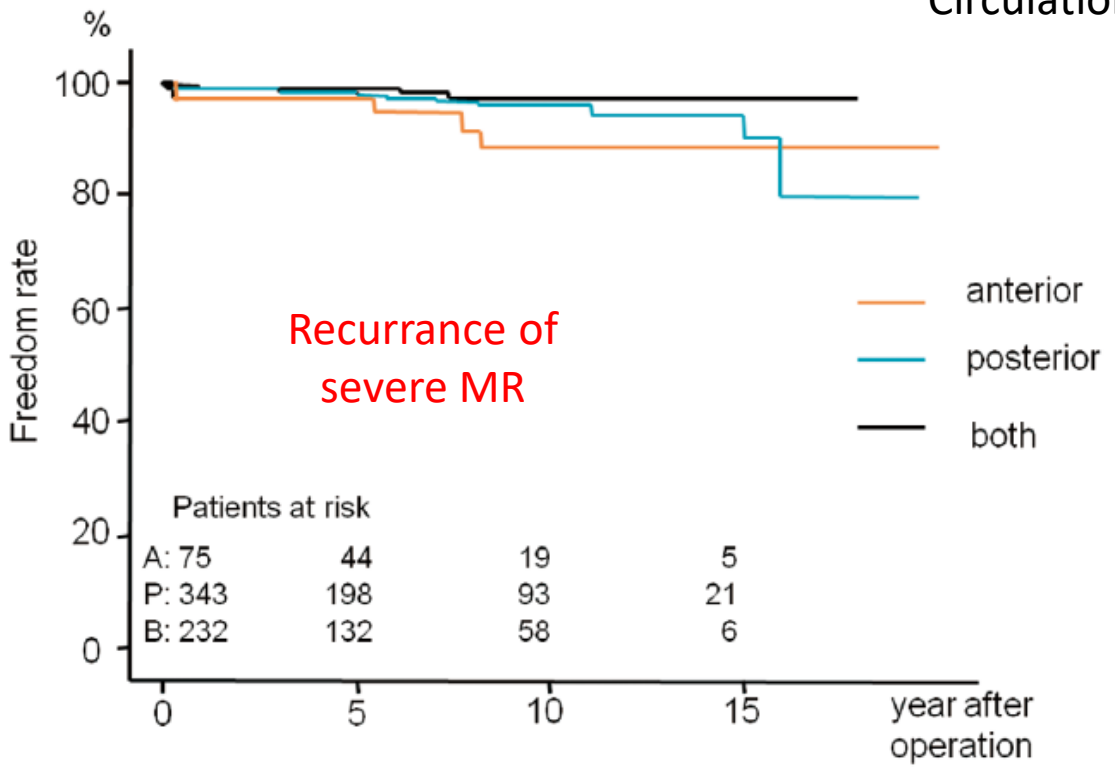
Temp. PAZ.: 37.0C
Temp. TEE: 39.3C

Mechanism of and Risk Factors for Reoperation After Mitral Valve Repair for Degenerative Mitral Regurgitation

Circulation J 2013





No difference in reoperation or recurrance rate depending on location of the prolapse

Mitral repair failure: risk factors and mechanism

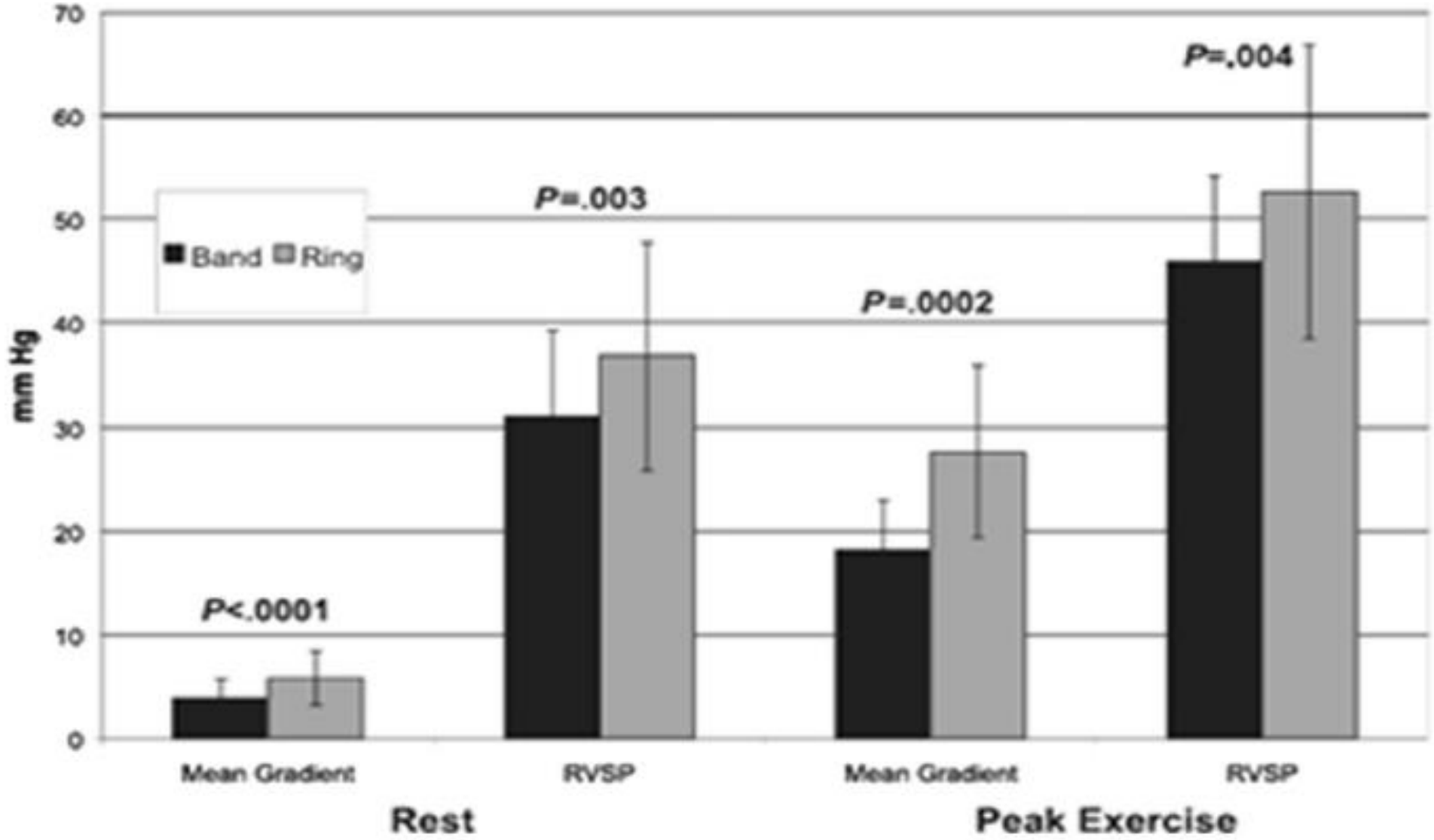
Table 4. Risk Factors for Reoperation			
Multivariate			
Moderate MR at discharge	3.246	1.297–8.117	0.012
LVDd	3.009	1.441–6.278	0.003

- Procedure-related: ring dehiscence, neo cordae rupture, tear of suture (EARLY)
- Valve related: new prolapse, leaflet thickening (IM,SM), endocarditis

Il ruolo dell'anuloplastica

	All (n=110)	Group1 Mean MV Grade ≤3 mm Hg (n=35)	Group 2 Mean MV Grade >3 mm Hg (n=75)	*P* Value
Resting measures				
MV peak gradient, mm Hg	10.0±4.4	6.5±1.2	11.7±4.5	<0.0001
MV mean gradient, mm Hg	4.5±2.4	2.5±0.3	5.5±2.4	…
MV area, cm^2	2.1±0.6	2.4±0.5	1.9±0.6	0.0005
PASP, mm Hg	33.3±9.6	28.6±5.7	35.5±10.2	.0003
Peak exercise measures				
MV peak gradient, mm Hg	21.9±10.1	15.6±6.4	24.8±10.2	<0.0001
MV mean gradient, mm Hg	12.5±6.7	8.9±3.8	14.2±7.1	<0.0001
MV annuloplasty	107 (97)	33 (94)	74 (99)	
Band	65 (59)	32 (91)	33 (44)	<0.0001
Ring	42 (38)	1 (3)	41 (55)	<0.0001

Chan KL Circ Cardiovasc Imaging 2013



Chan V JTCVS 2015

Conclusioni

- La riparazione valvolare mitralica è il trattamento di scelta della insufficienza mitralica degenerativa

- Un centro di riferimento per il trattamento riparativo della patologia mitralica non può prescindere dal conoscere il proprio «repair rate» e l'outcome a distanza dei pazienti trattati

- La stabilità nel tempo della riparazione valvolare mitralica in relazione alla tecnica utilizzata e al risultato postoperatorio precoce meritano ulteriore approfondimento