AF in VHD: a turning point in the natural history

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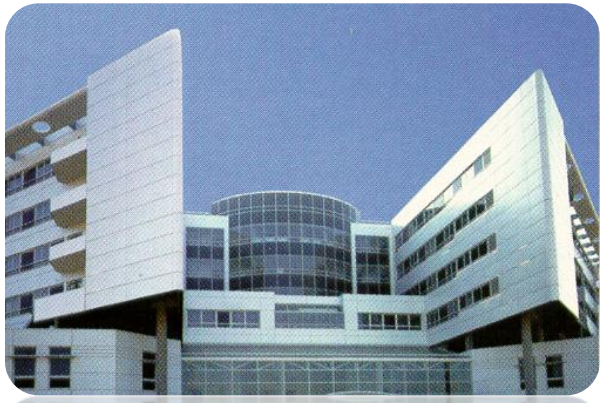


10 years- Rennes Surgical database : Rhythm in Pre-Operative period

	Surgical treatment										Total	
	Mitral V Repair		AoV Repl.		AoV Repl + MV repair		AoV + Mit V Replac		MV replac.			
	N	%	N	%	N	%	N	%	N	%	N	%
Arrhythmia	79	13.7	429	10.1	14	18.9	52	32.5	167	38	740	13.5
Sinus R	482	84.4	3659	86.0	54	73.0	98	62.4	260	59.1	4553	82.8
Other(PM…)	11	1.9	167	3.9	6	8.1	7	4.5	13	3.0	204	3.7

10 years-Rennes Surgical database : Atrial Arrhythmia episod in the post-Op period

	Surgical treatment										Total	
	Mitral V repair		AoV Replac.		AoV replac+ MVRepair		AoV+MV replc.		MV replac.			
	N	%	N	%	N	%	N	%	N	%	N	%
No	336	60.8	2315	57.4	40	60.6	93	66.0	270	66.0	3054	58.7
YES	217	39.2	1715	42.6	26	39.4	48	34.0	139	34.0	2145	41.3

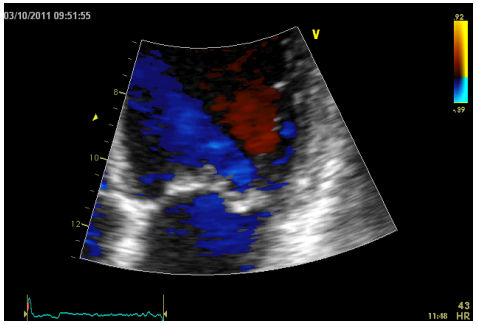
p = 0.0033

10 years-Rennes Surgical database : Atrial Arrhythmia at Hospital Discharge

	Surgical treatment										Total	
	MV Repair.		AV Replac.		AV Replac+ MV repair		AV+MV Replac		MV replac			
	N	%	N	%	N	%	N	%	N	%	N	%
NO	467	84.8	3658	88.7	48	72.7	85	63.9	274	68.0	4532	85.9
YES	84	15.2	467	11.3	18	27.3	48	36.1	129	32.0	746	14.1

What are the Guidelines saying?

For MR

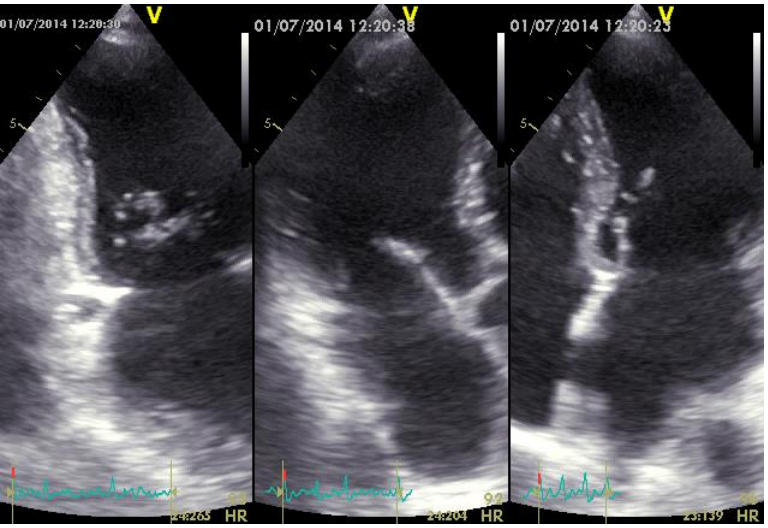


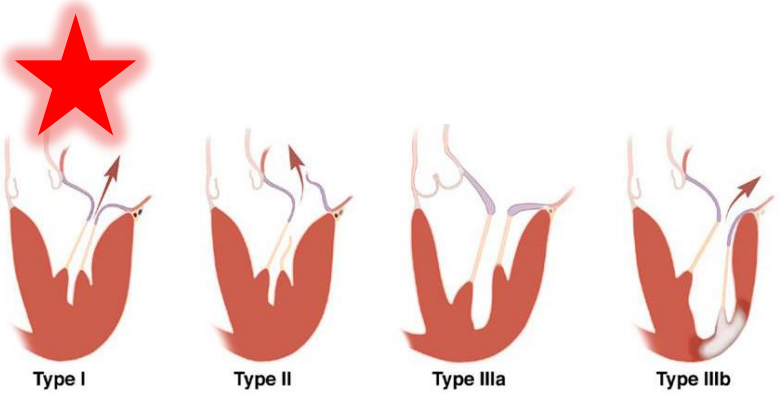
The onset of AF was independently associated with risk of cardiac death and CHF.

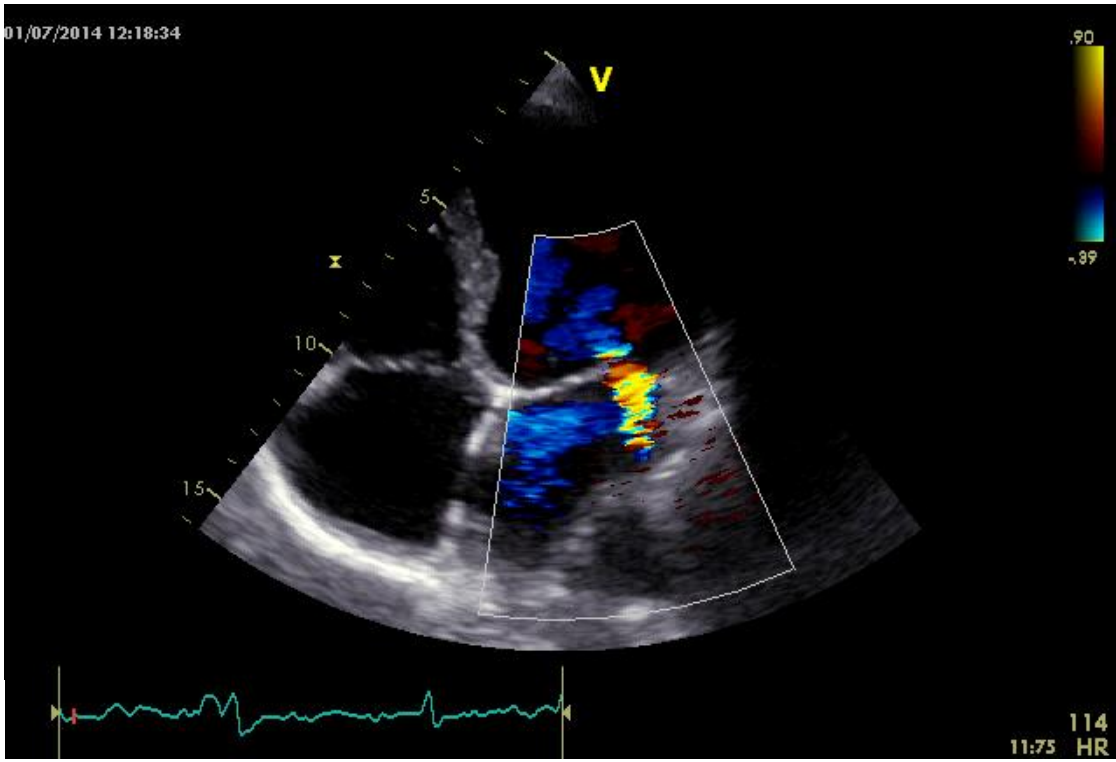
AF is considered as a risk factor of worse outcome in patients with either MS or MR.
AF is considered as a possible indication for intervention even in asymptomatic patients (class IIa and IIb, level of evidence C).

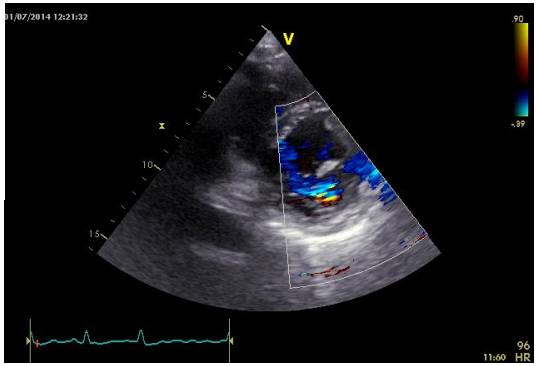
ESC Guidelines. Eur Heart J. 2012 Oct;33(19):2451-96
ACC/AHA Guideliens. J Am Coll Cardiol. 2014 Jun 10;63(22):2438-88

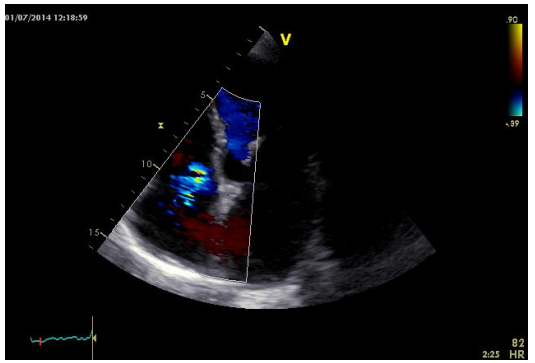
Particular case : Atrial Arrhythmia guilty of the MR!

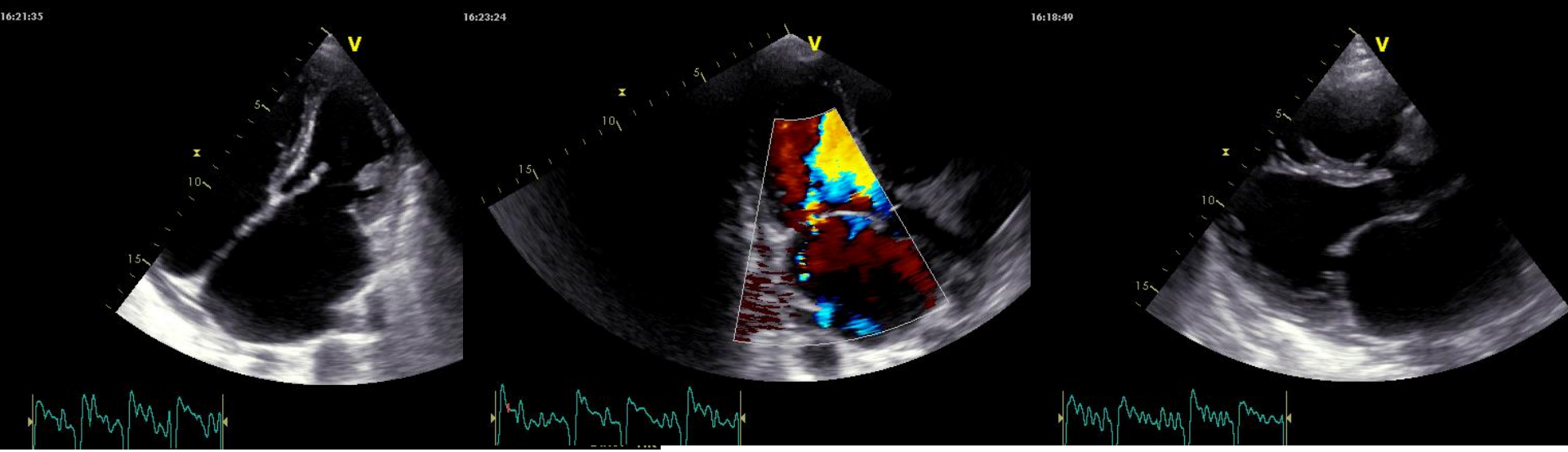








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V
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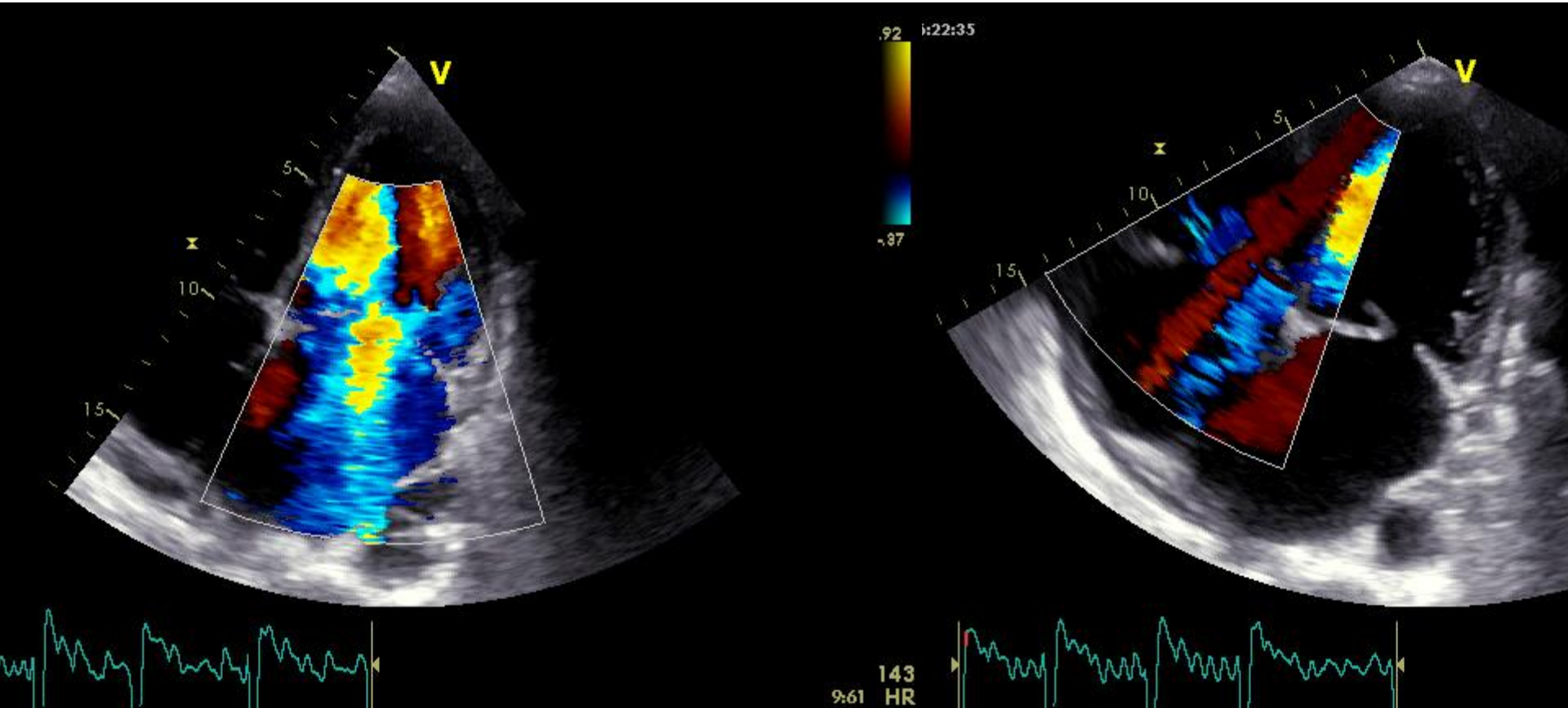
V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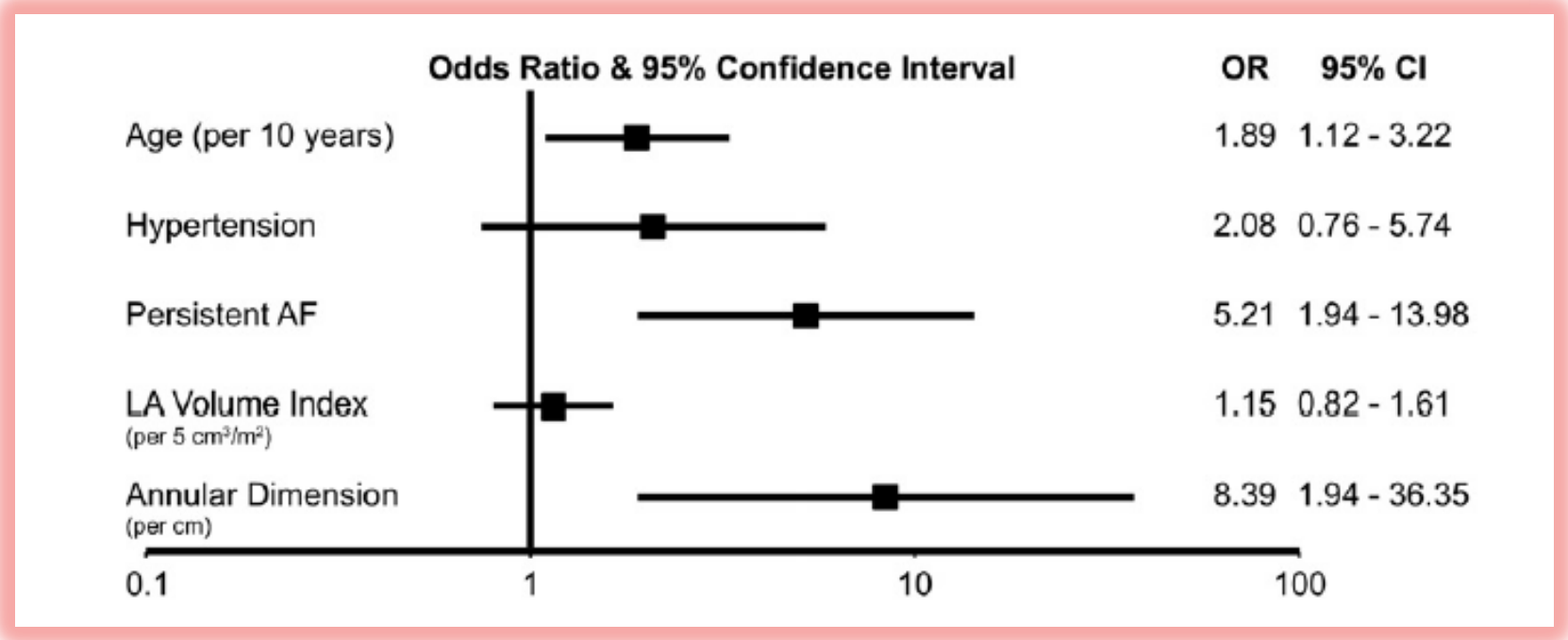
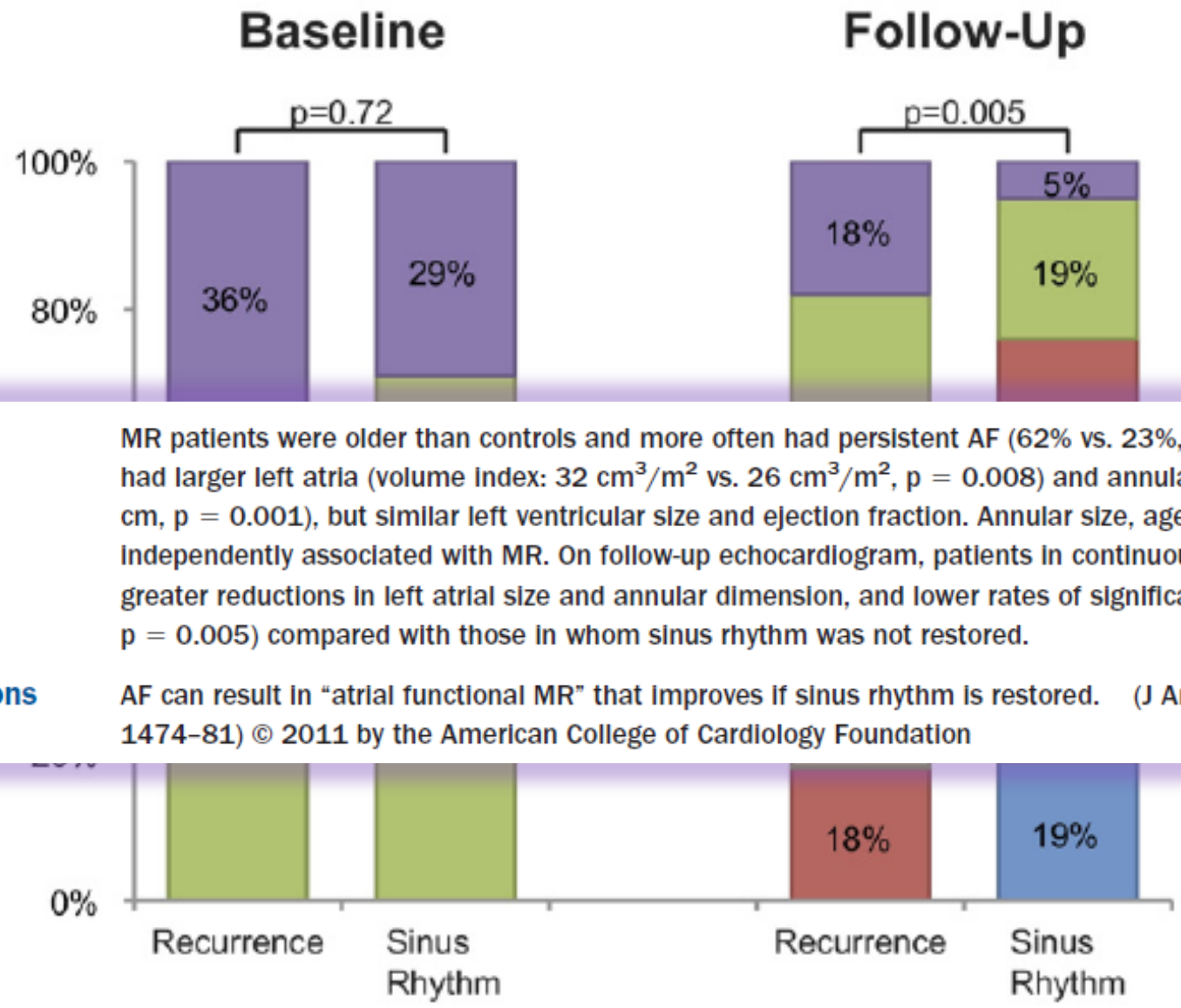
HR

Evidence of Atrial Functional Mitral Regurgitation Due to Atrial Fibrillation

Reversal With Arrhythmia Control



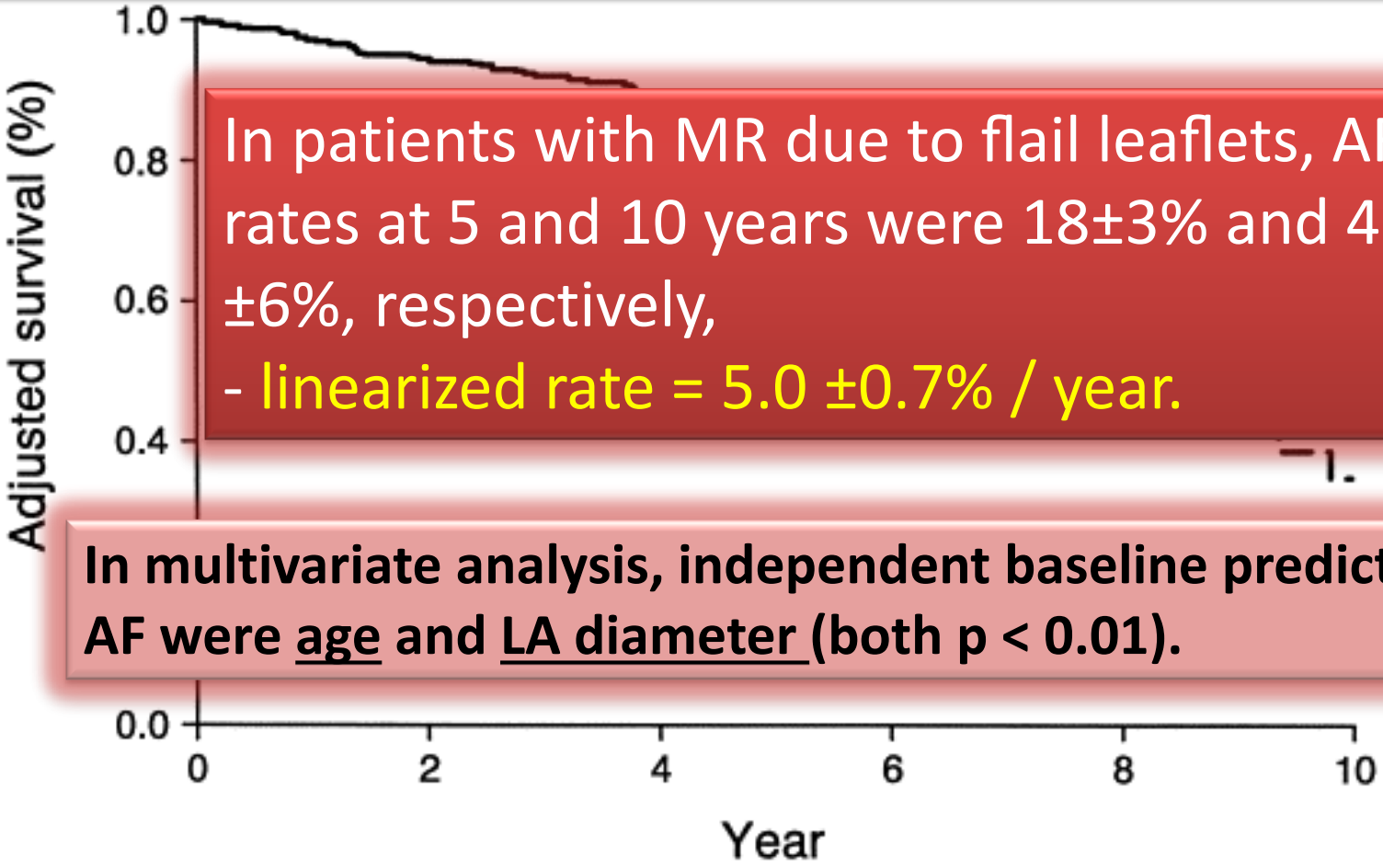
Gertz ZM1, Raina A, Saghy L, Zado ES, Callans DJ, Marchlinski FE, Keane MG, Silvestry FE. Evidence of atrial functional mitral regurgitation due to atrial fibrillation: reversal with arrhythmia control. J Am Coll Cardiol. 2011 Sep 27;58(14):1474-81



Results MR patients were older than controls and more often had persistent AF (62% vs. 23%, $p < 0.0001$). MR patients had larger left atria (volume index: 32 cm^3/m^2 vs. 26 cm^3/m^2, $p = 0.008$) and annular size (3.49 cm vs. 3.23 cm, $p = 0.001$), but similar left ventricular size and ejection fraction. Annular size, age and persistent AF were independently associated with MR. On follow-up echocardiogram, patients in continuous sinus rhythm had greater reductions in left atrial size and annular dimension, and lower rates of significant MR (24% vs. 82%, $p = 0.005$) compared with those in whom sinus rhythm was not restored.

Conclusions AF can result in "atrial functional MR" that improves if sinus rhythm is restored. (J Am Coll Cardiol 2011;58: 1474–81)

Atrial fibrillation complicating the course of degenerative mitral regurgitation : Determinants and long-term outcome under conservative management

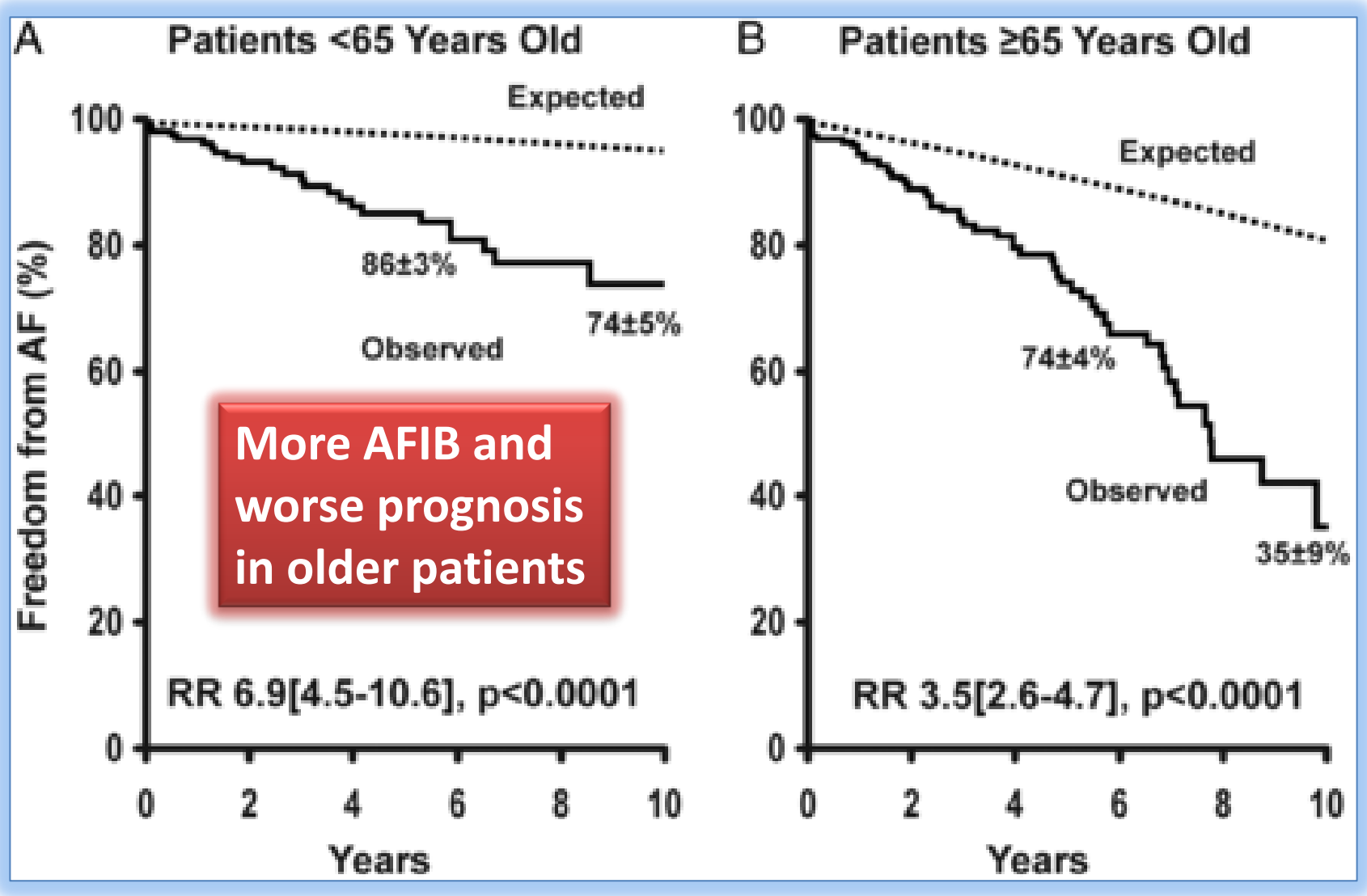


In patients with MR due to flail leaflets, AF rates at 5 and 10 years were 18±3% and 48 ±6%, respectively,
- linearized rate = 5.0 ±0.7% / year.

In multivariate analysis, independent baseline predictors of AF were age and LA diameter (both p < 0.01).

Survival of patients with mitral regurgitation due to flail leaflets adjusted for age, gender, ejection fraction and symptoms at baseline, and separating at the fourth year after diagnosis those patients with and those without post-diagnosis A Fib.

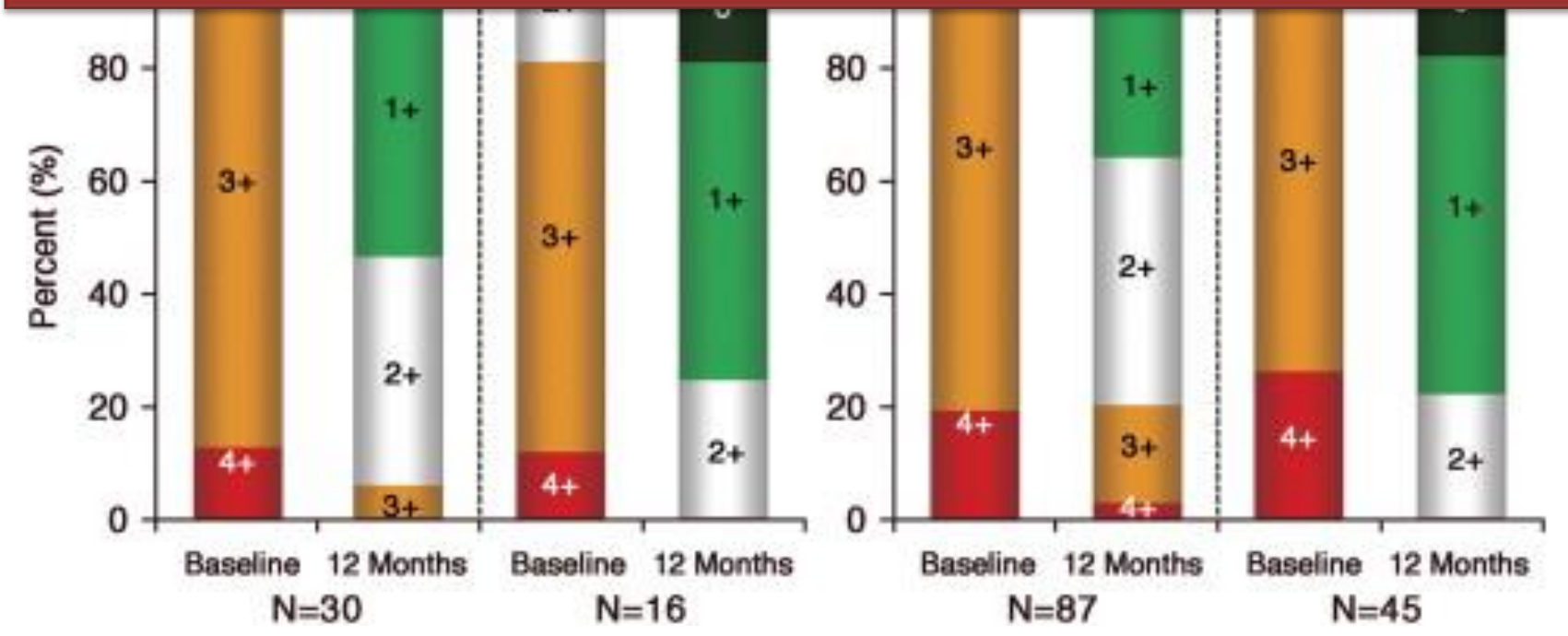
Grigioni F et al. Journal of the American College of Cardiology, Volume 40, Issue 1, 2002, 84 - 92



MIDA = registry of MR due to flail leaflets including 862 patients (65+12 years) diagnosed by echocardiography. The 498 older patients (≥65 years at diagnosis) compared with the 364 younger.

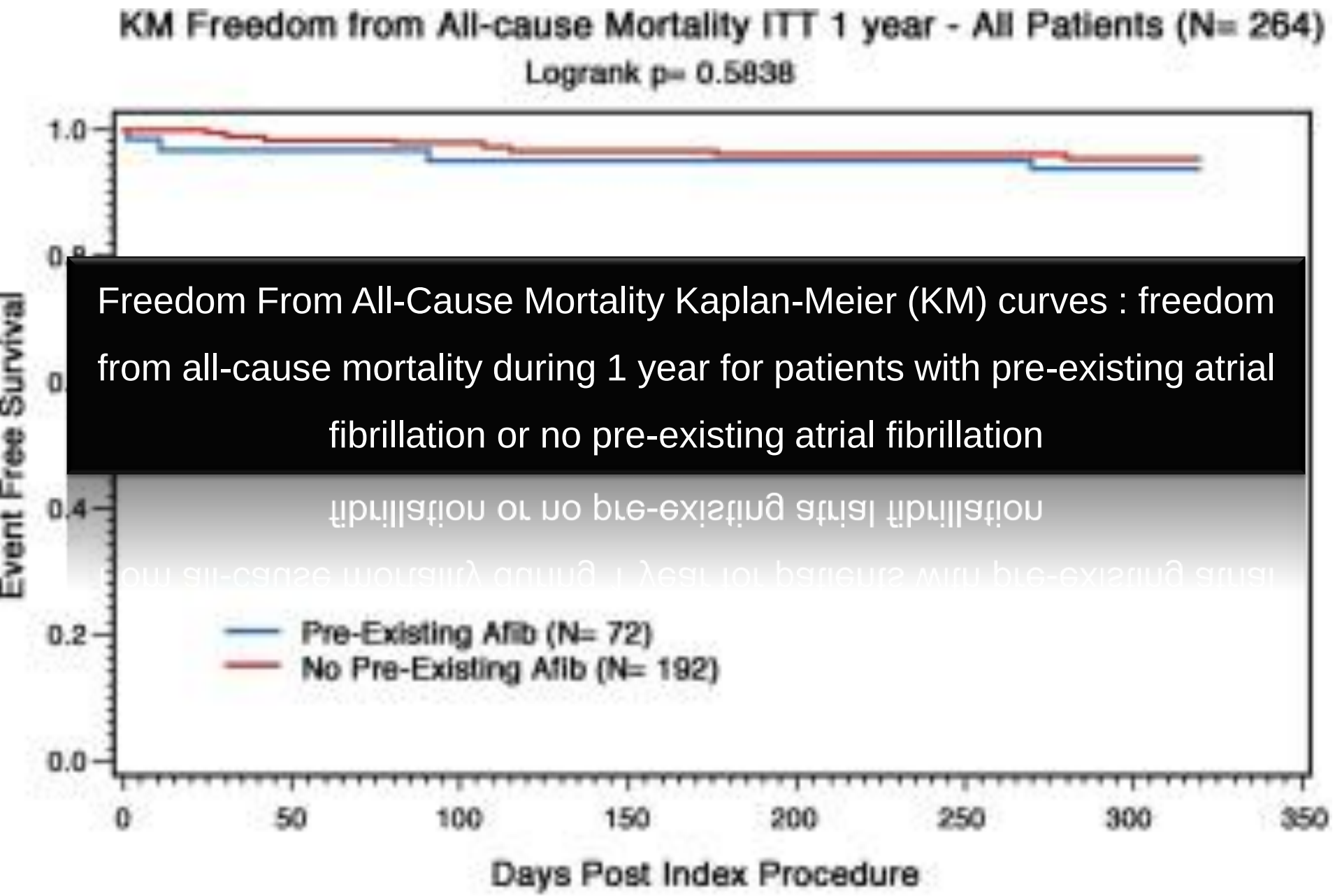
EuropeanHeart Journal (2013) 34, 2600–2609

AFIB is associated with more advanced valvular disease and non cardiac comorbidities. However the efficacy of Mitraclip therapy is similar for patients with and without AFib



MR Grade at Baseline and at 12 Months The change in mitral regurgitation (MR) grade (0 to 4+) by rhythm (with or no atrial fibrillation)

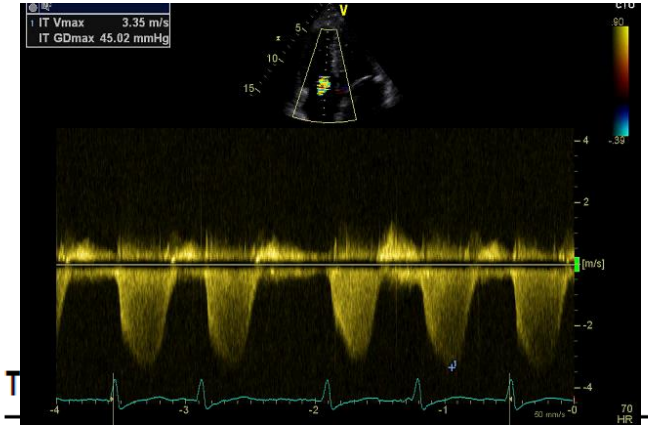
Howard C. Herrmann , Zachary M. Gertz , Frank E. Silvestry , Susan E. Wiegers , Y. Joseph Woo , James Hermiller , ...
Effects of Atrial Fibrillation on Treatment of Mitral Regurgitation in the EVEREST II (Endovascular Valve Edge-to-Edge Repair Study) Randomized Trial
Journal of the American College of Cardiology, Volume 59, Issue 14, 2012, 1312 - 1319



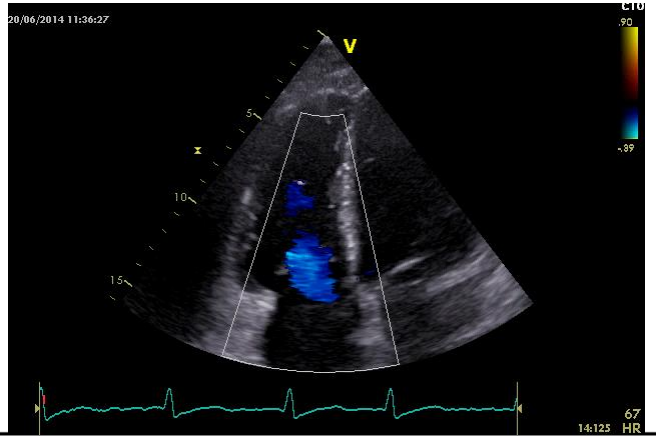
Freedom From All-Cause Mortality Kaplan-Meier (KM) curves : freedom from all-cause mortality during 1 year for patients with pre-existing atrial fibrillation or no pre-existing atrial fibrillation

Journal of the American College of Cardiology, Volume 59, Issue 14, 2012, 1312 - 1319

Recurrence of Afib post-operatively

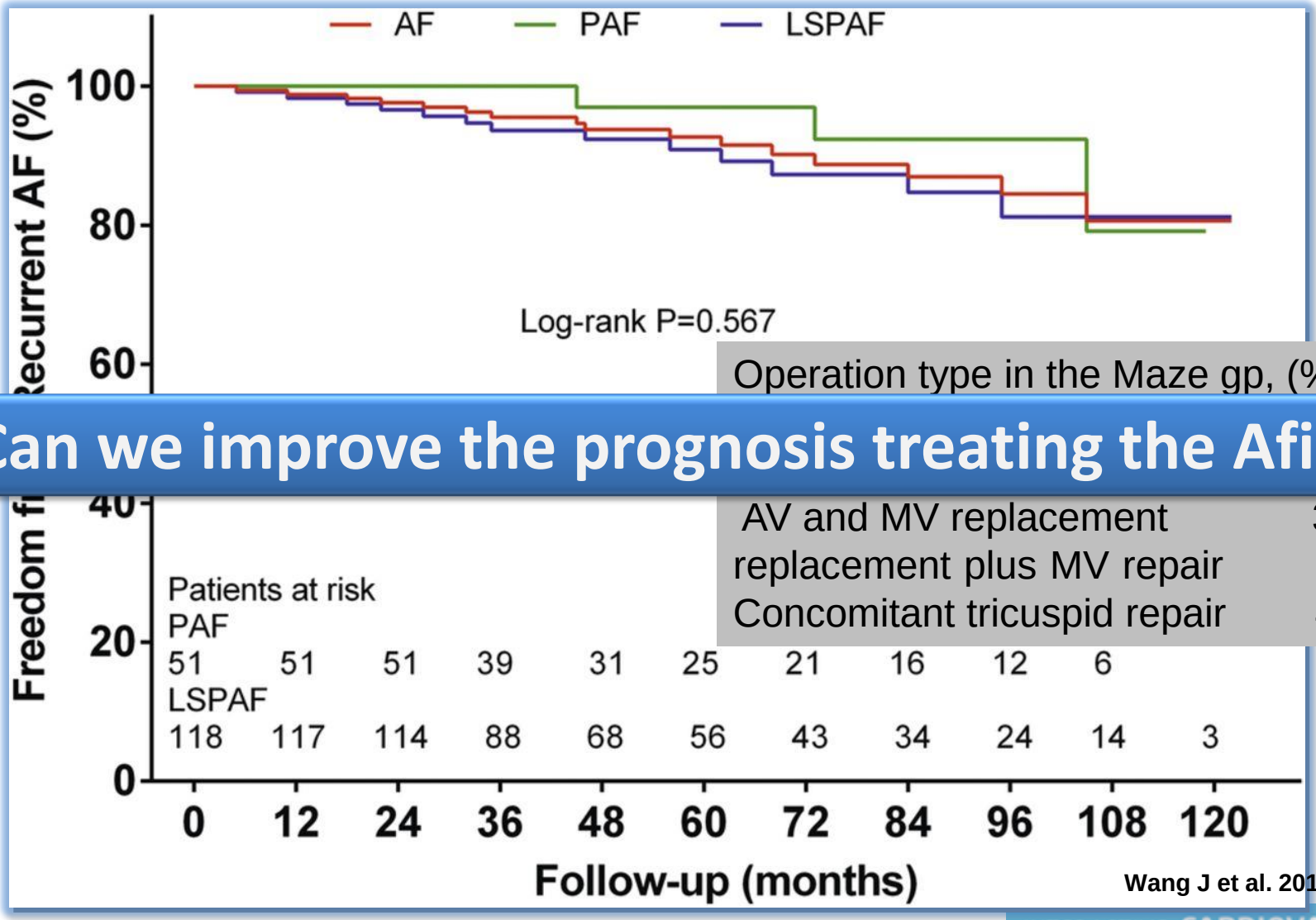


T recurrence of atrial fibrillation



Variables	No Afib (n=72)	Afib (n=20)	Univariate	Multivariate	
			p-value	p-value	OR
Age (yrs)	54.2±10.4	62.2±7.1	.000	.010	1.093 (1.021～1.169)
Female sex	45 (62.5%)	14 (70.0%)	.536		
Rheumatic etiology	50 (69.4%)	10 (50.0%)	.106		
Preop moderate or severe TR	21 (29.2%)	12 (60.0%)	.011	.033	3.597 (1.111～11.646)
Afib durarion (yrs)	6.5±6.0	10.6±6.6	.010	.207	1.059 (.969～1.157)
Preop LA size (mm)	60.7±10.8	63.9±14.6	.286	.440	.977 (.920～1.037)
LA reduction plasty	2 (2.8%)	1 (5.0%)	.525		
CPB time (min)	225.6±49.3	219.1±32.7	.493		
ACC time (min)	153.8±41.8	142.6±35.3	.277		
Immediate postop LA size (mm)	52.1±7.8	56.9±7.7	.017	.217	1.064 (.964～1.175)

Kaplan–Meier analysis of freedom from recurrent Afib in patients after the maze procedure.



Operation type in the Maze gp, (%)

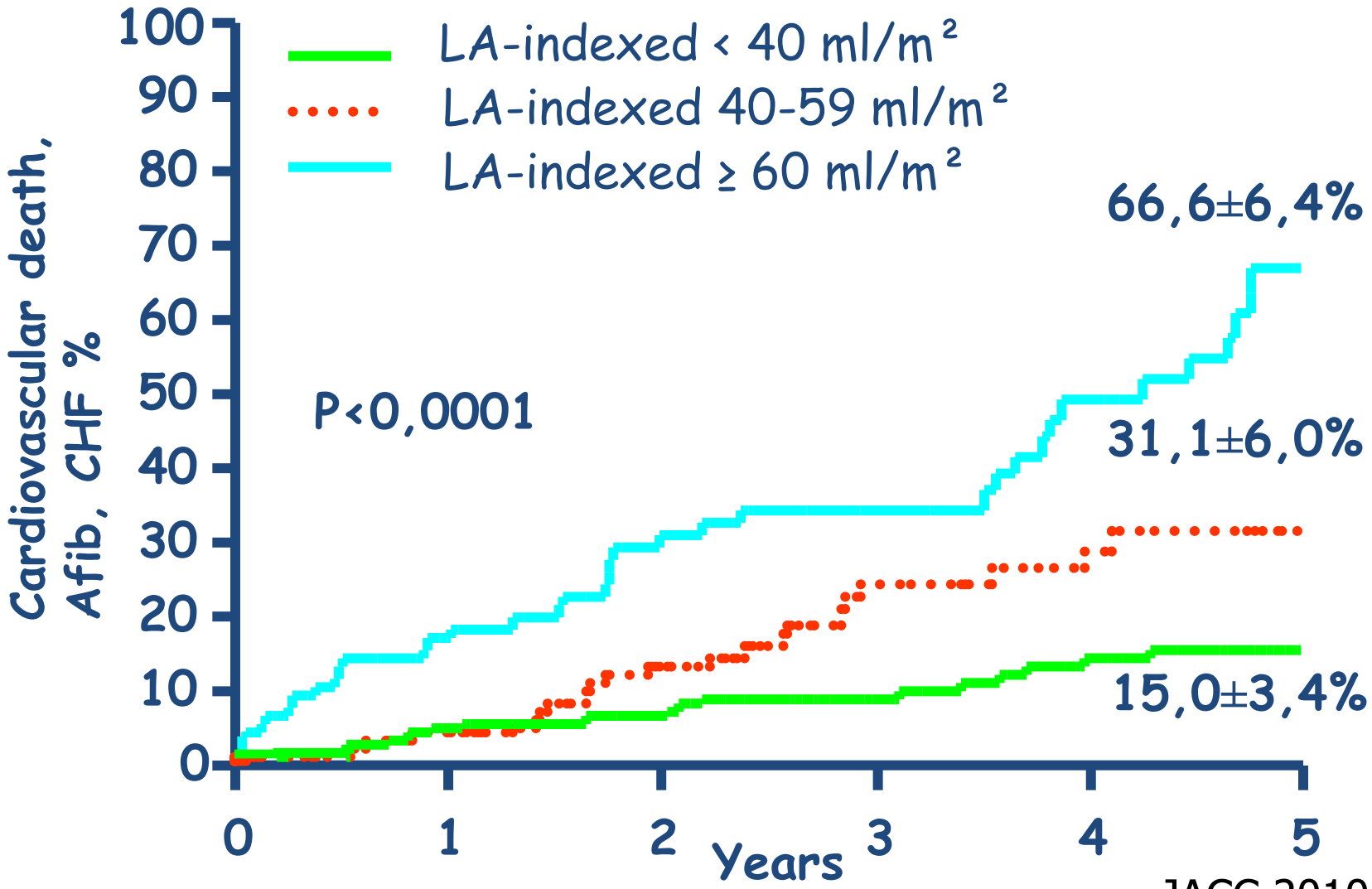
AV and MV replacement	34.4%
replacement plus MV repair	3.8%
Concomitant tricuspid repair	42.3%

Can we improve the prognosis treating the Afib?

Wang J et al. 2014

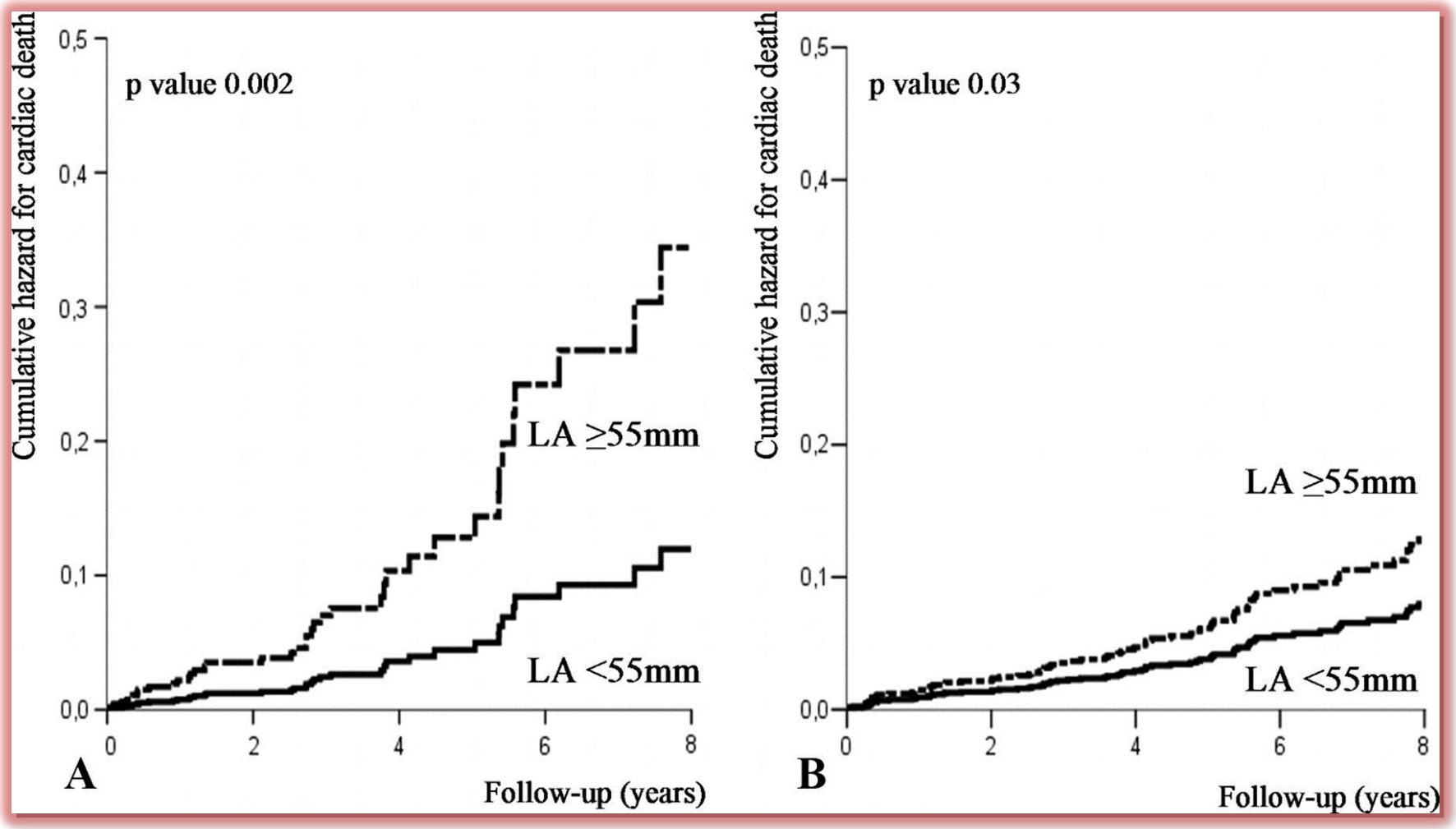
INTERACTIVE CARDIOVASCULAR AND THORACIC SURGERY

LA Volume (CV death, Afib, CHF)

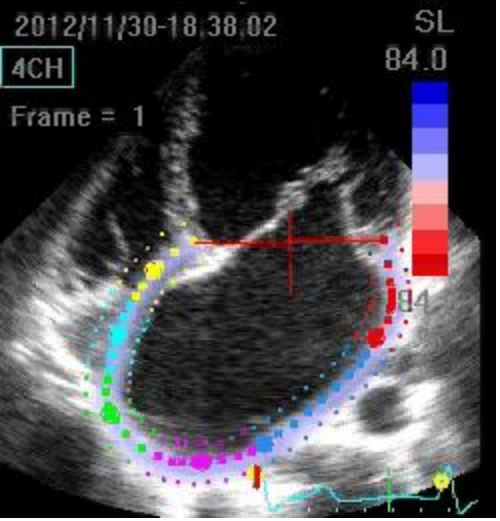


JACC 2010; 56: 57

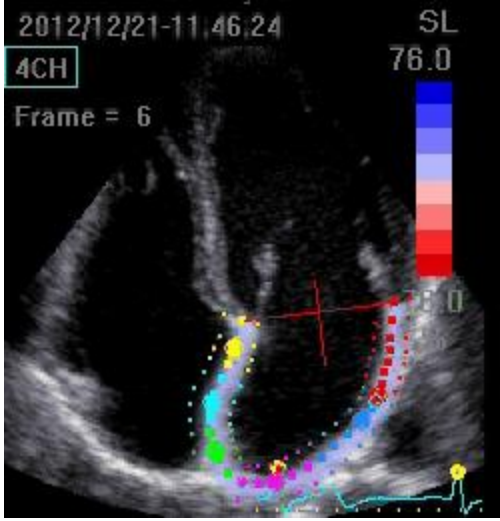
Cumulative hazard functions plots for cardiac death in patients with LA diameter <55 mm and ≥55 mm under conservative treatment (A) and surgical treatment (B).

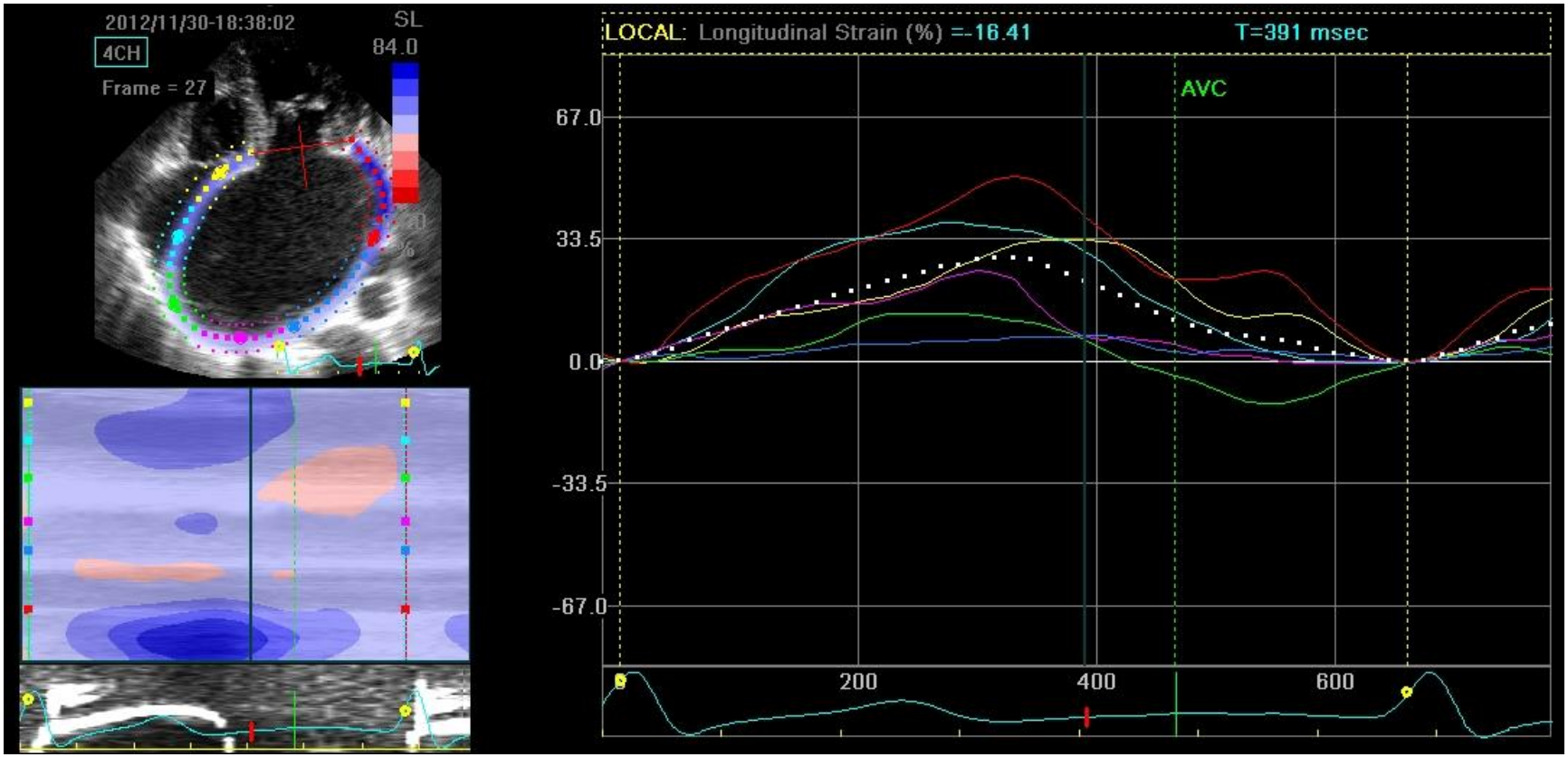


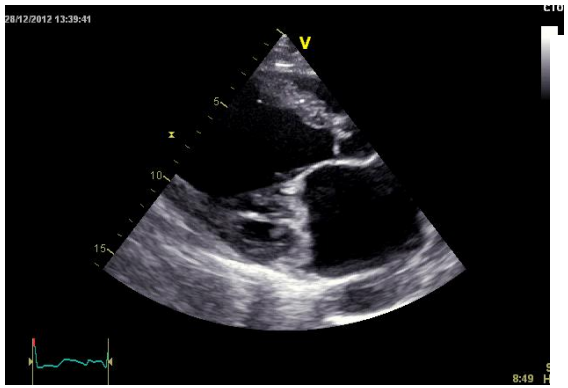
Rusinaru D et al. Circ Cardiovasc Imaging. 2011;4:473-481

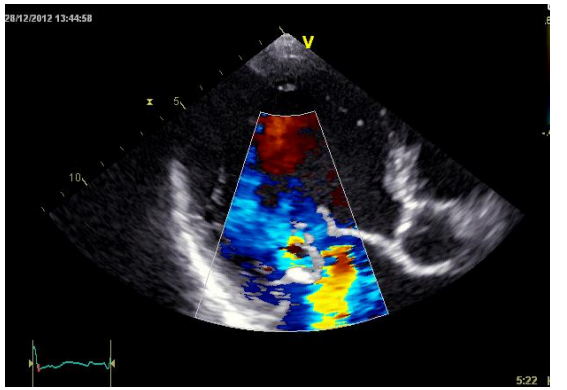


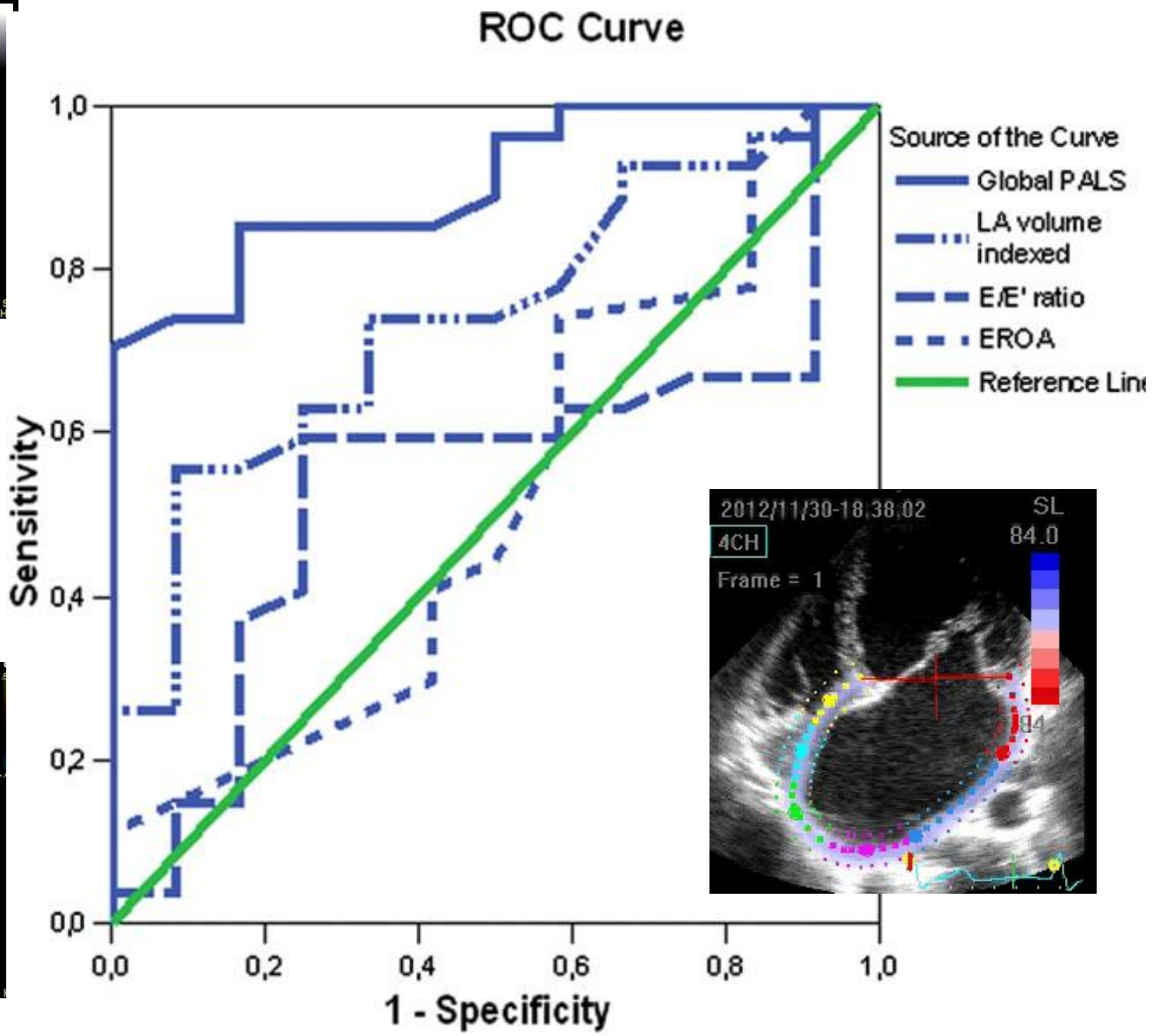
Interest in looking at LA longitudinal Strain



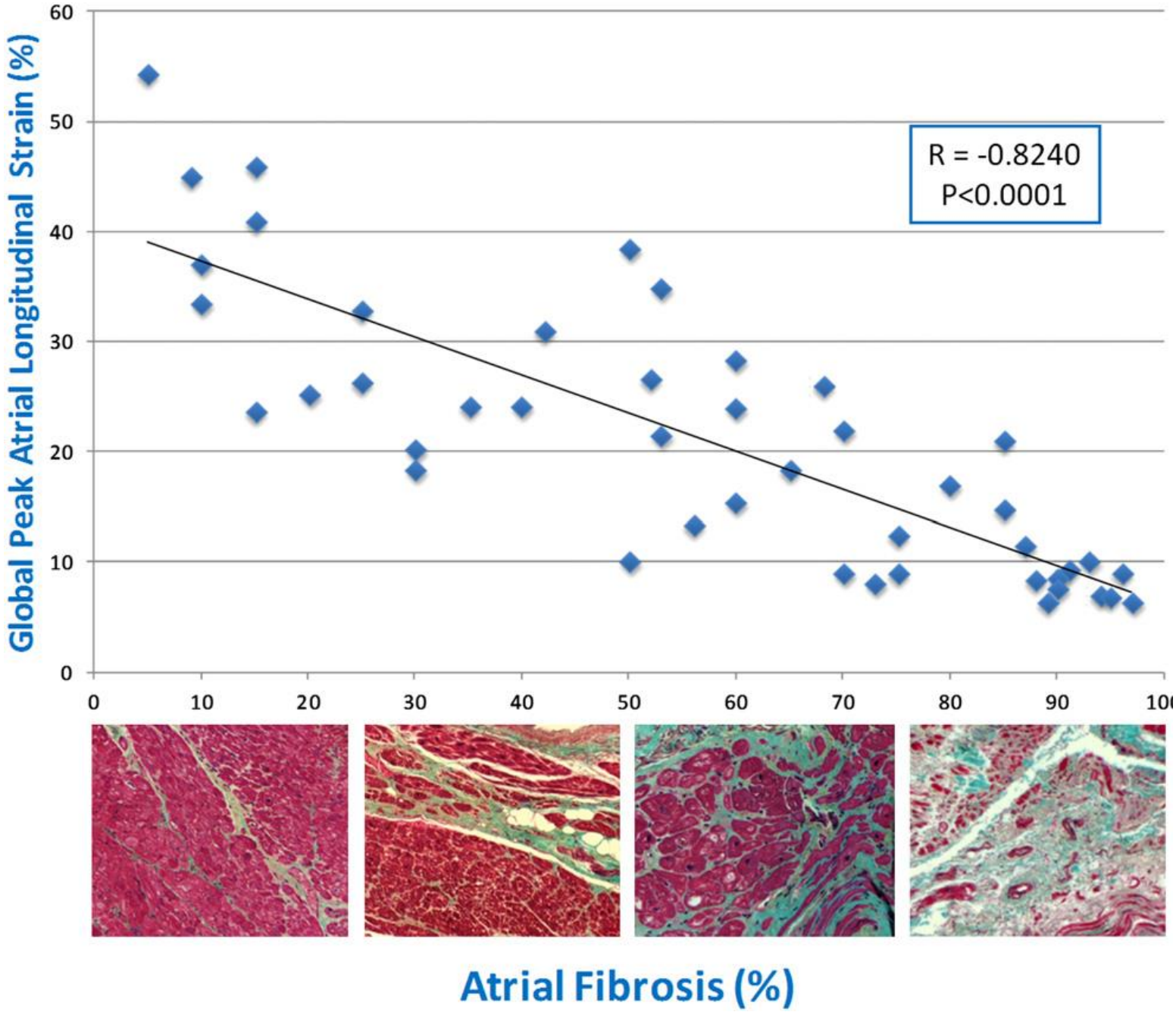




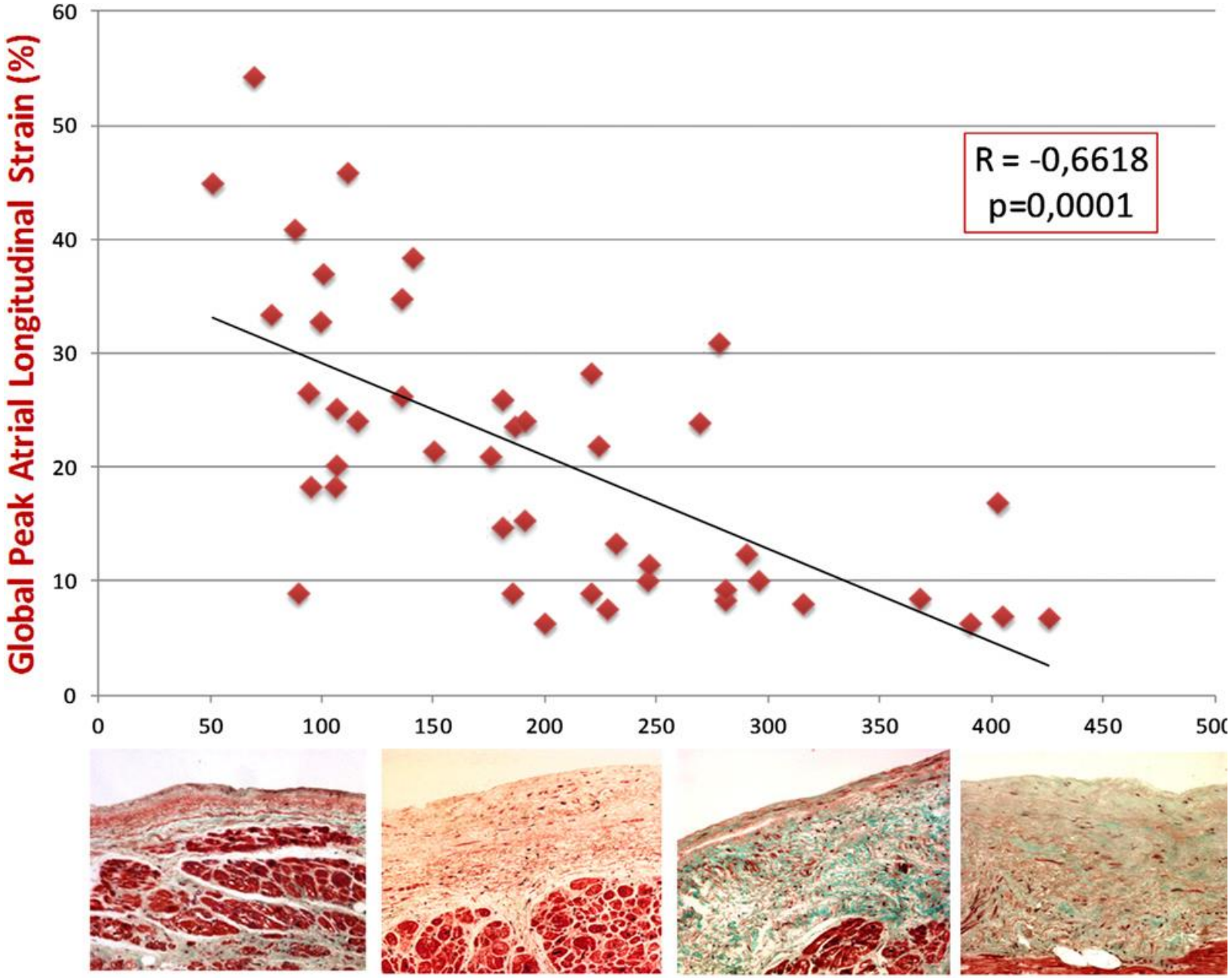




Cameli et al. Am J cardiol 2013



Cameli et al. Am J cardiol 2013

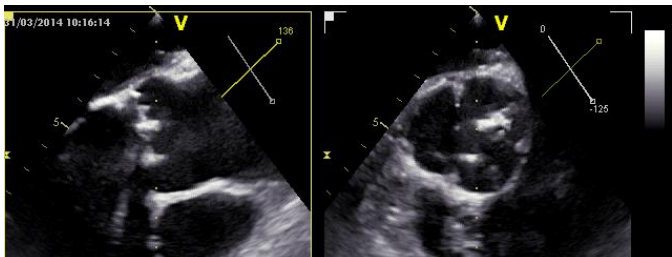

Global Peak Atrial Longitudinal Strain (%)
60
50
40
30
20
10
0
R = -0,6618
p=0,0001
0
50
100
150
200
250
300
350
400
450
500
Atrial Endocardial Thickness (µm)

Afib in patients adressed for AVR : 19.2%

- Renal failure
- Histoy of stroke

Highest Euroscore

NYHA III-IV: 54%



Wang et al. Interac CardioVasc Surgery 2014; 19: 218

What are the Guidelines saying?

For AoS

No impact of the Heart Rhythm on the indication for surgery

Surgical ablation should be considered in patients with symptomatic AF and may be considered in patients with asymptomatic AF, if feasible with minimal risk.
The decision should be individualized according to clinical variables, such as age, the duration of AF, and left atrial size.
No evidence supports the systematic surgical closure of the LA appendage, unless as part of AF ablation surgery.

ESC Guidelines. Eur Heart J. 2012 ;33(19):2451-96
ACC/AHA Guideliens. J Am Coll Cardiol. 2014 ;63(22):2438

Afib prevalence increases with age (independently of any HVD)

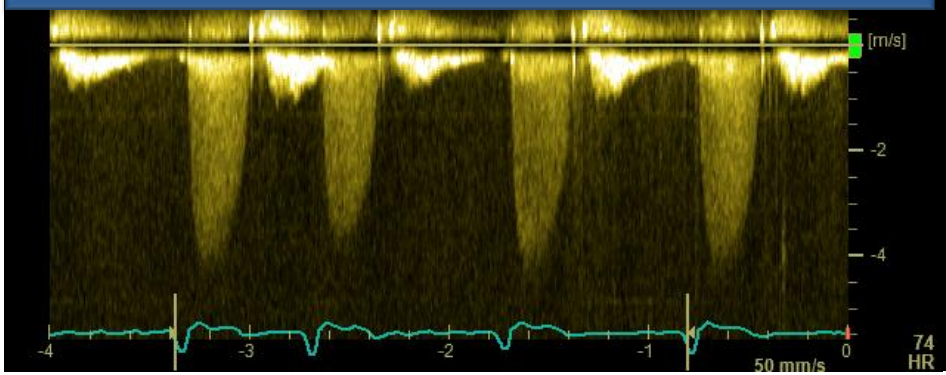
- Because of similar risk factors, AFib and degenerative AoS may coexist in ≤50% of patients.

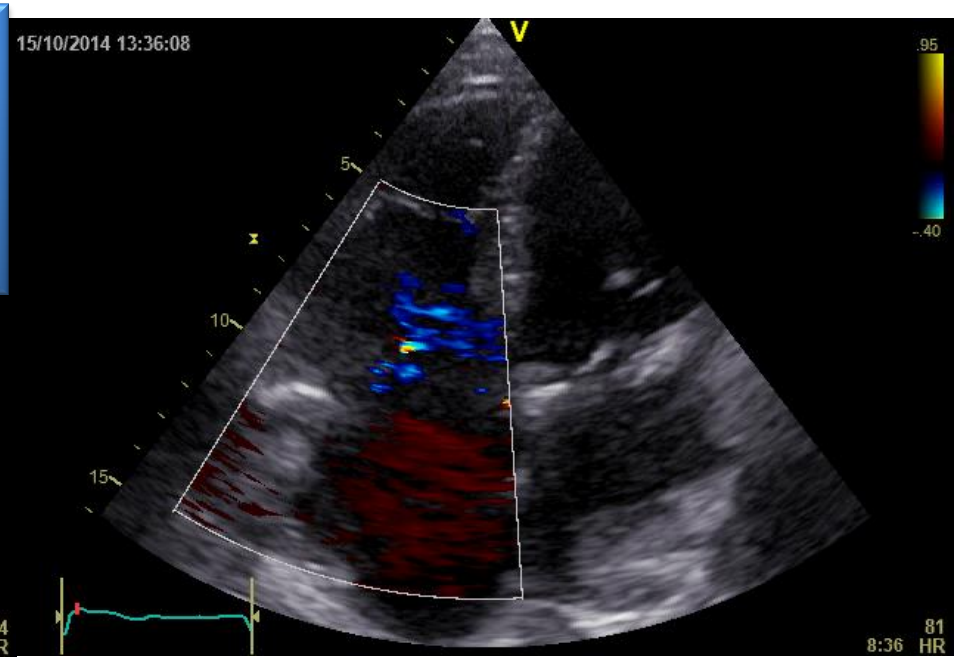
- Afib has an important impact on cardio-vascular morbidity and mortality and is an independent predictor for adverse cardiac and cerebrovascular events after surgical aortic valve replacement

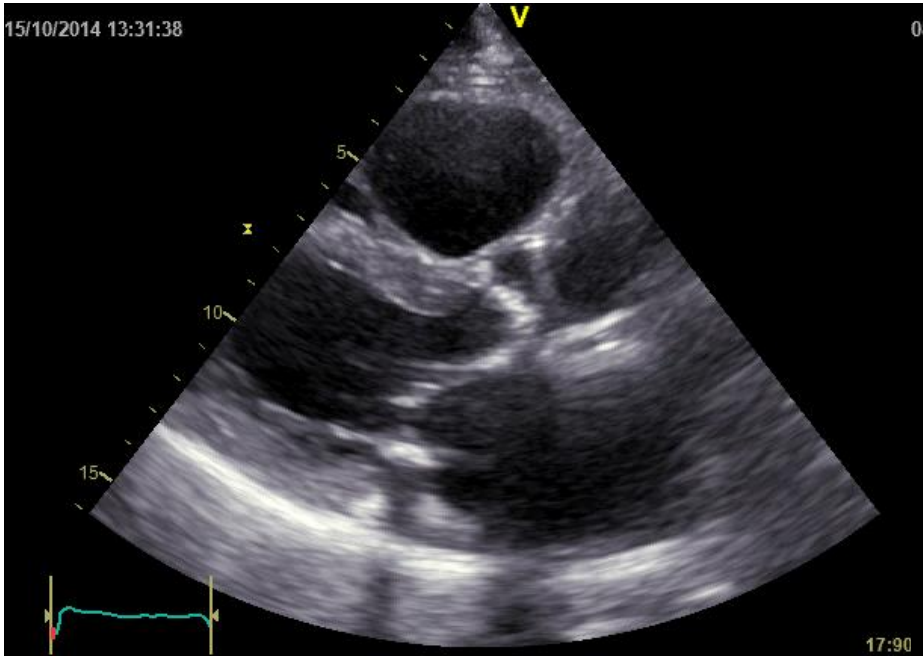
Prevalence of Afib in TAVI :

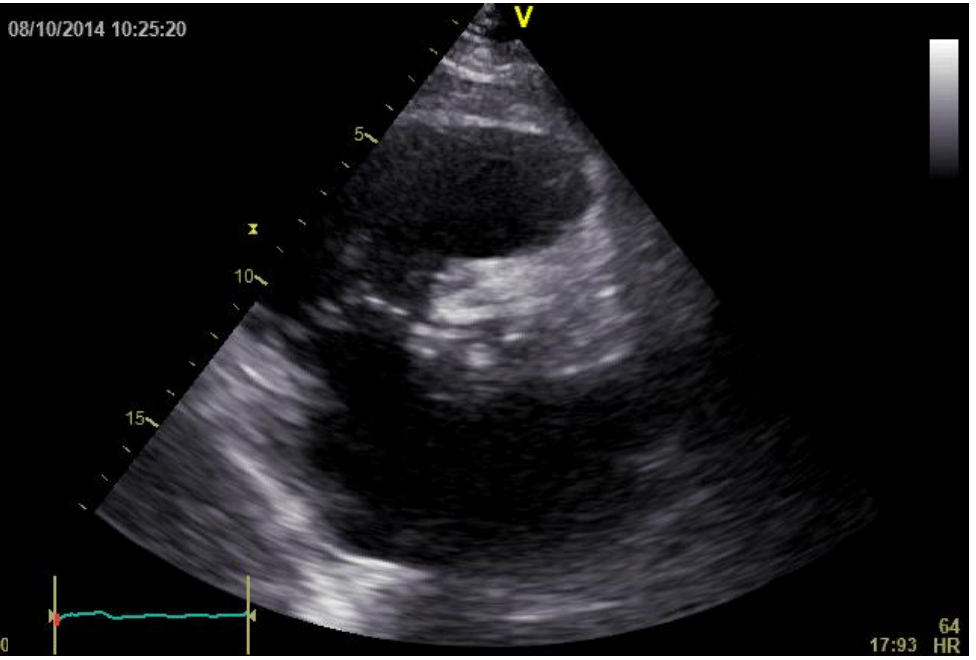
- FRANCE 2:	25.5%
- PARTNER A:	40%
- STS registry:	41%
- GARY registry :	29%
- CHOICE:	33.3%
- Corevalve pivotal trial:	41 %

Importance of assessing the Tricuspid Valve : Annulus, regurgitation…









Long-term outcome of elderly patients with severe aortic stenosis as a function of treatment modality

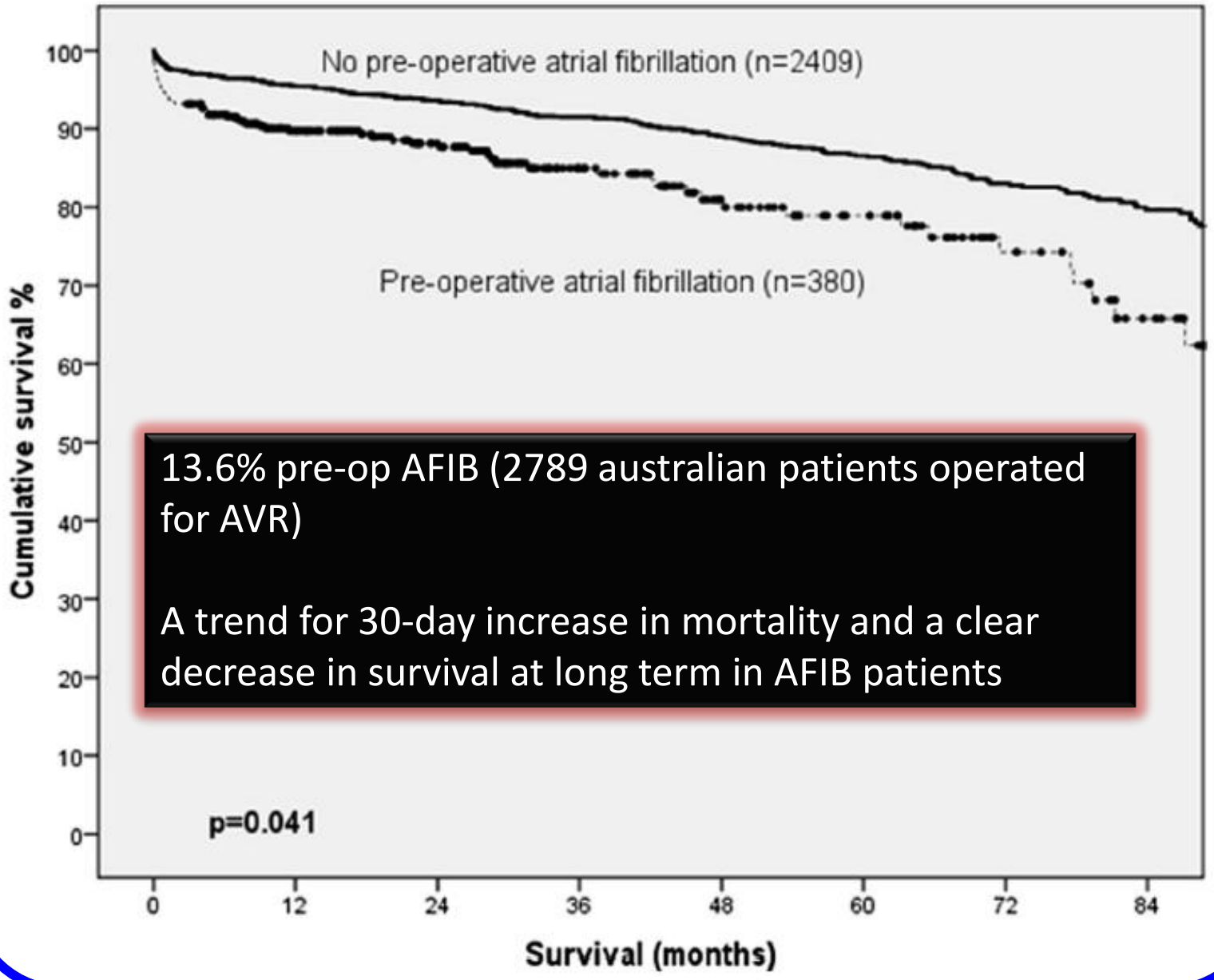
Among 442 patients (median age 83 years, median STS-score 4.7) allocated to

- ✓ **MT (n=78),** **(all-cause mortality 81%)**

- ✓ Body mass index ≤20 kg/m2 (HR 1.60, 95% CI 1.04 to 2.47),
- ✓ Diabetes (HR 1.48, 95% CI 1.03 to 2.12),
- ✓ Peripheral vascular disease (HR 2.01, 95% CI 1.44 to 2.81),
- ✓ **Atrial fibrillation (HR 1.74, 95% CI 1.28 to 2.37)**
- ✓ Pulmonary hypertension (HR 1.43, 95% CI 1.03 to 2.00)

were identified as independent predictors of mortality.

Pilgrim T et al. Heart 2014 (online)



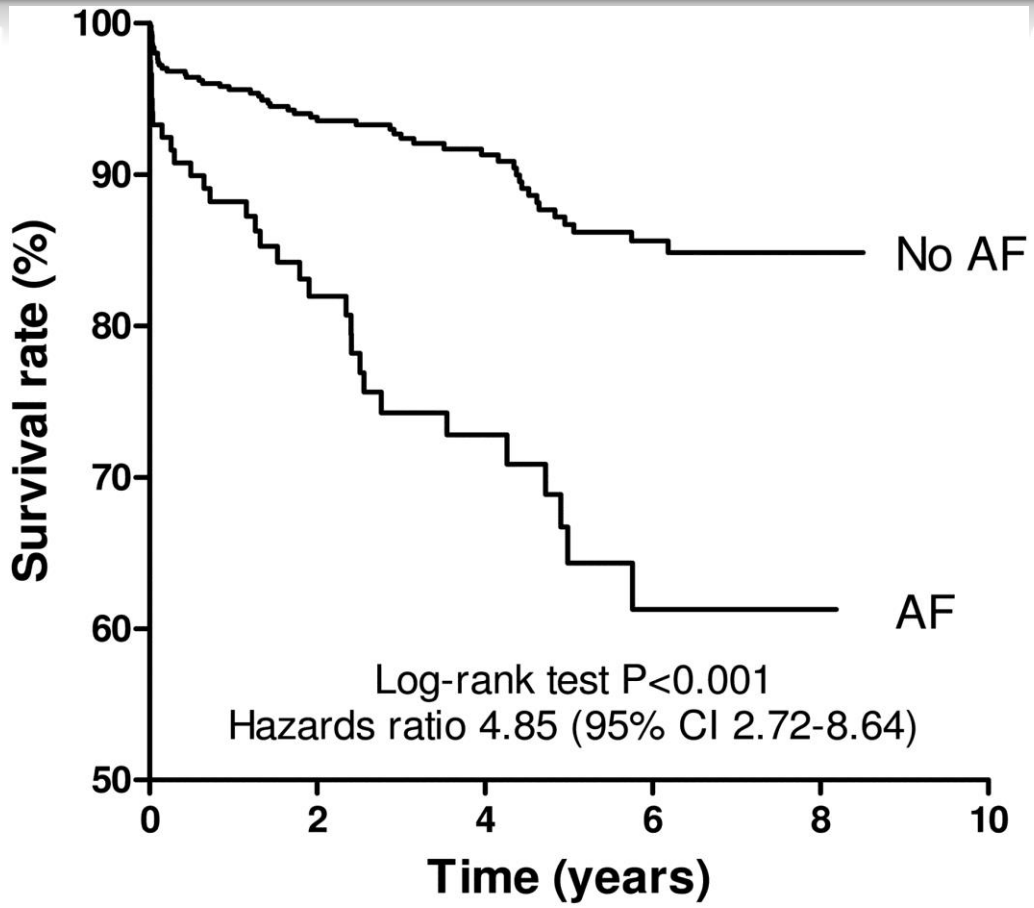
13.6% pre-op AFIB (2789 australian patients operated for AVR)

A trend for 30-day increase in mortality and a clear decrease in survival at long term in AFIB patients

Saxena et al. Can J Cardiol 2013; 29: 697

Preoperative AFIB predicts mortality & morbidity after AVR

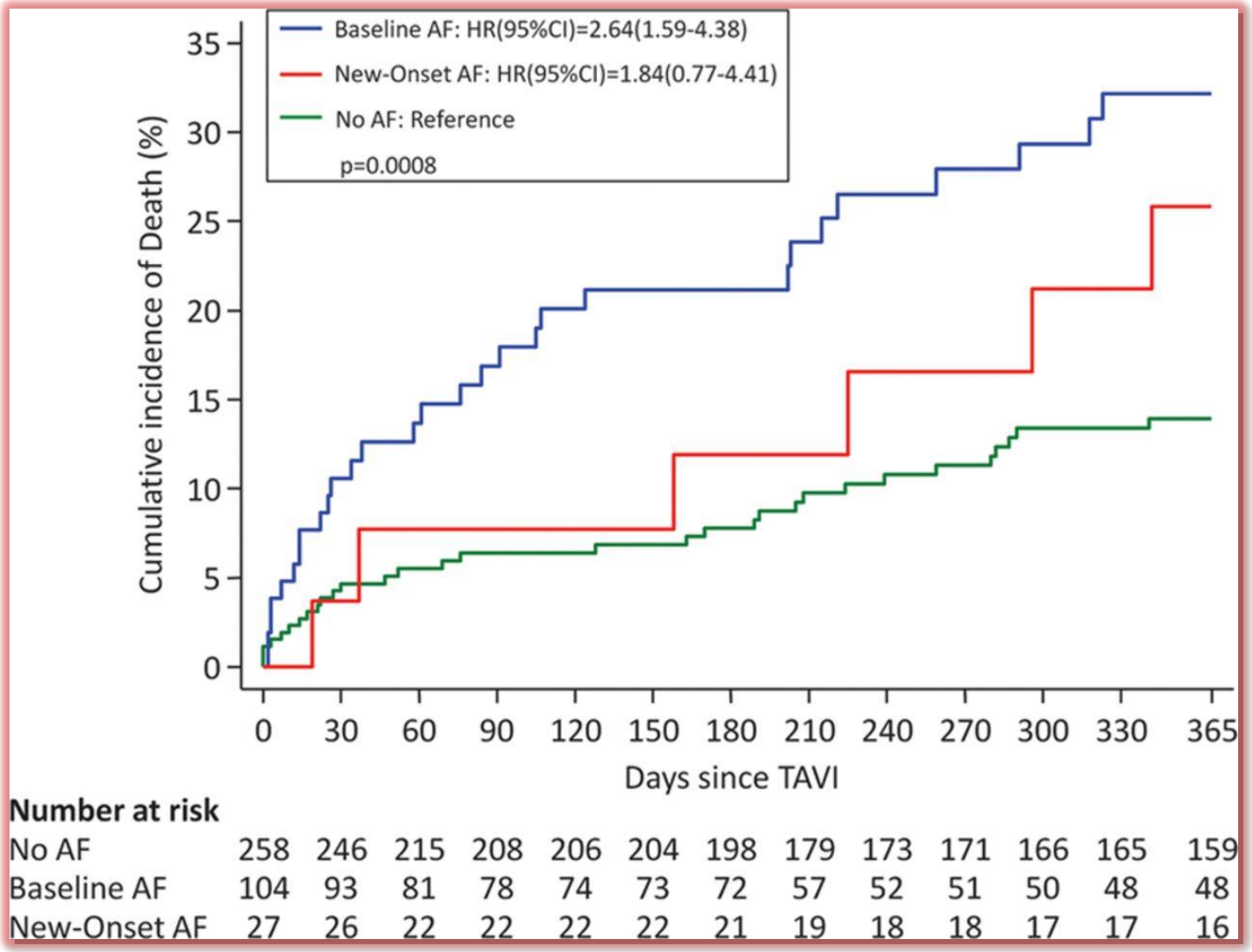
Isolated AVR patients at Auckland City Hospital 2005–2012 were divided into those with and without preoperative . Of 620 consecutive patients, **19.2% had permanent or paroxysmal AF preoperatively**



Although patients with AF undergoing AVR have a higher prevalence of baseline risk factors, AF remained independently associated with operative mortality, morbidity and long-term mortality.

Interactive CardioVascular &ThoracicSurgery19(2014)218–222

In a TAVI population : Cumulative incidence of all-cause mortality among patients with preexisting, new-onset atrial fibrillation (AF), and patients without AF during the follow-up period of 12 months.



Number at risk

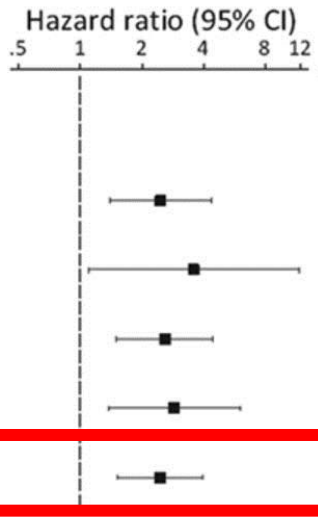
No AF	258	246	215	208	206	204	198	179	173	171	166	165	159
Baseline AF	104	93	81	78	74	73	72	57	52	51	50	48	48
New-Onset AF	27	26	22	22	22	22	21	19	18	18	17	17	16

Stortecky S et al. Circ Cardiovasc Interv. 2013;6:77-84

Stratified analysis according to type of atrial fibrillation (AF) for all-cause mortality at 12 months.

All-cause Mortality at 12 Months According to Atrial Fibrillation Classification

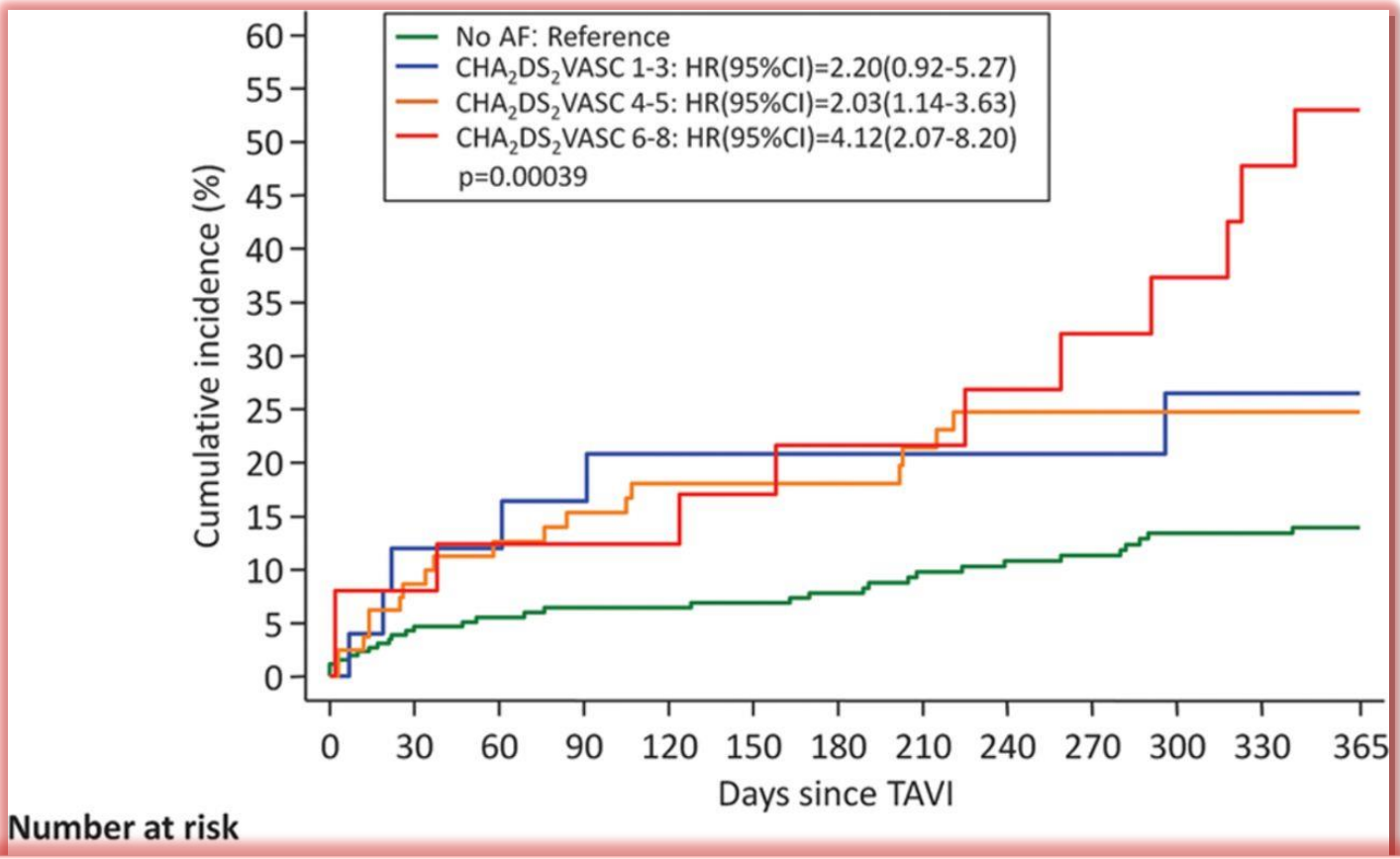
	n	events (%)	HR (95% CI)	p - value
No Atrial Fibrillation (Pre and Post)	258	31 (12.0%)	reference	
Permanent Atrial Fibrillation	70	19 (27.1%)	2.47 (1.40-4.38)	0.002
Persistent Atrial Fibrillation	8	3 (37.5%)	3.60 (1.10-11.78)	0.034
Permanent / Persistent Atrial Fibrillation	78	22 (28.2%)	2.59 (1.50-4.47)	0.001
Paroxysmal Atrial Fibrillation / Atrial Flutter	31	9 (29.0%)	2.88 (1.37-6.05)	0.005
Any Atrial Fibrillation (Pre or Post)	131	35 (26.7%)	2.45 (1.51-3.98)	<0.0001



Afib is associated with a 2-fold increased risk of all-cause and cardiovascular mortality among patients undergoing TAVI at 1-year follow-up.

Stortecky S et al. Circ Cardiovasc Interv. 2013;6:77-84

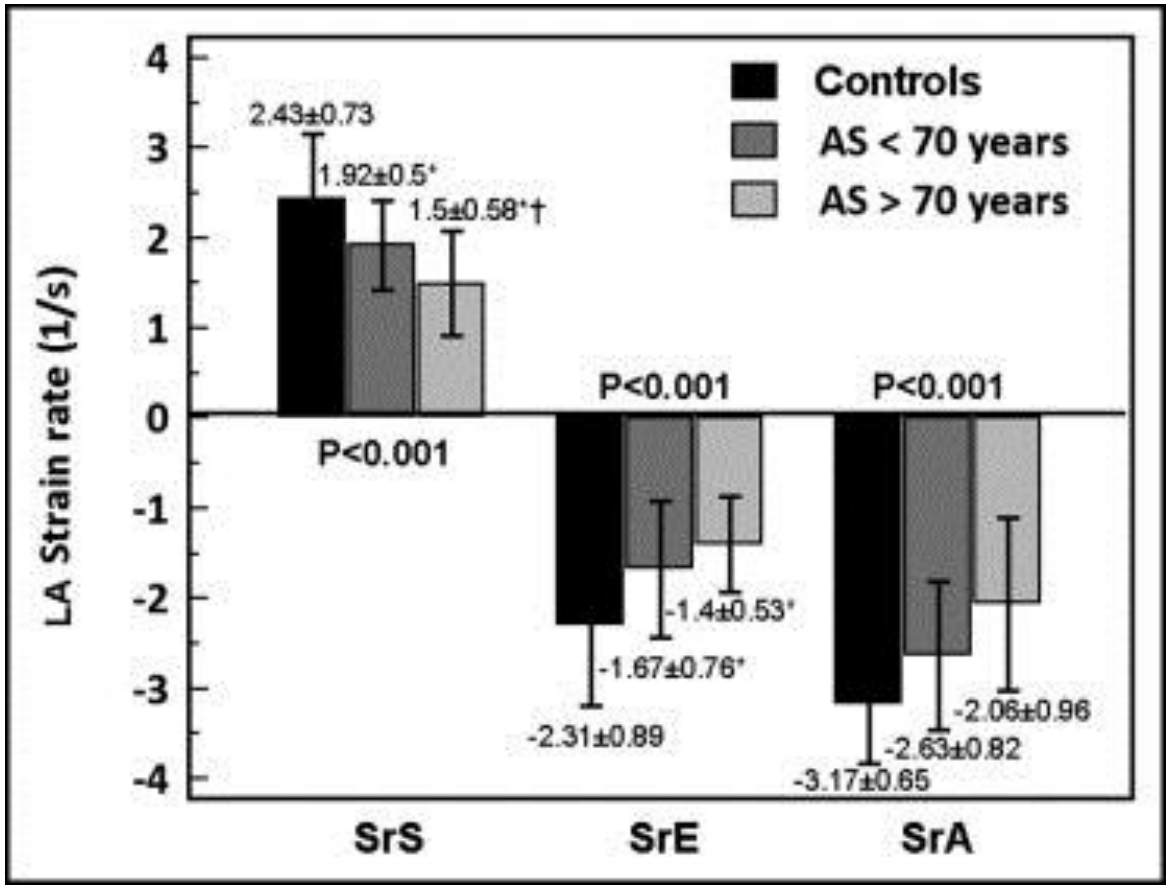
Cumulative incidence of all-cause mortality among patients with atrial fibrillation (AF) compared with patients without AF according to the CHA2DS2–VASC risk stratification.

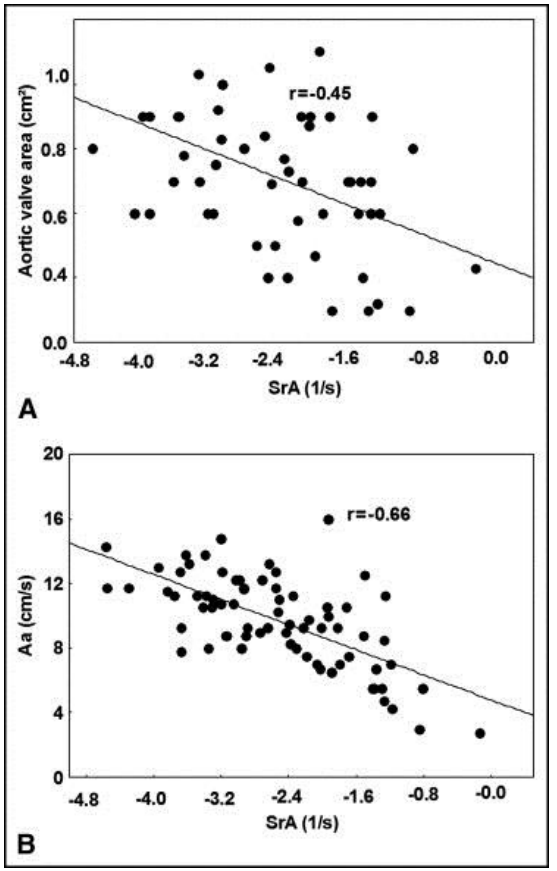


in a TAVI population, the CHA2DS2–VASC score directly correlates with the risk of all-cause mortality

Stortecky S et al. Circ Cardiovasc Interv. 2013;6:77-84

Not waiting the Afib, should we consider LA dysfunction and dilatation?





Impact of Aortic Valve Stenosis on Left Atrial Phasic Function

The American Journal of Cardiology, Volume 106, Issue 8, 2010, 1157 - 1162

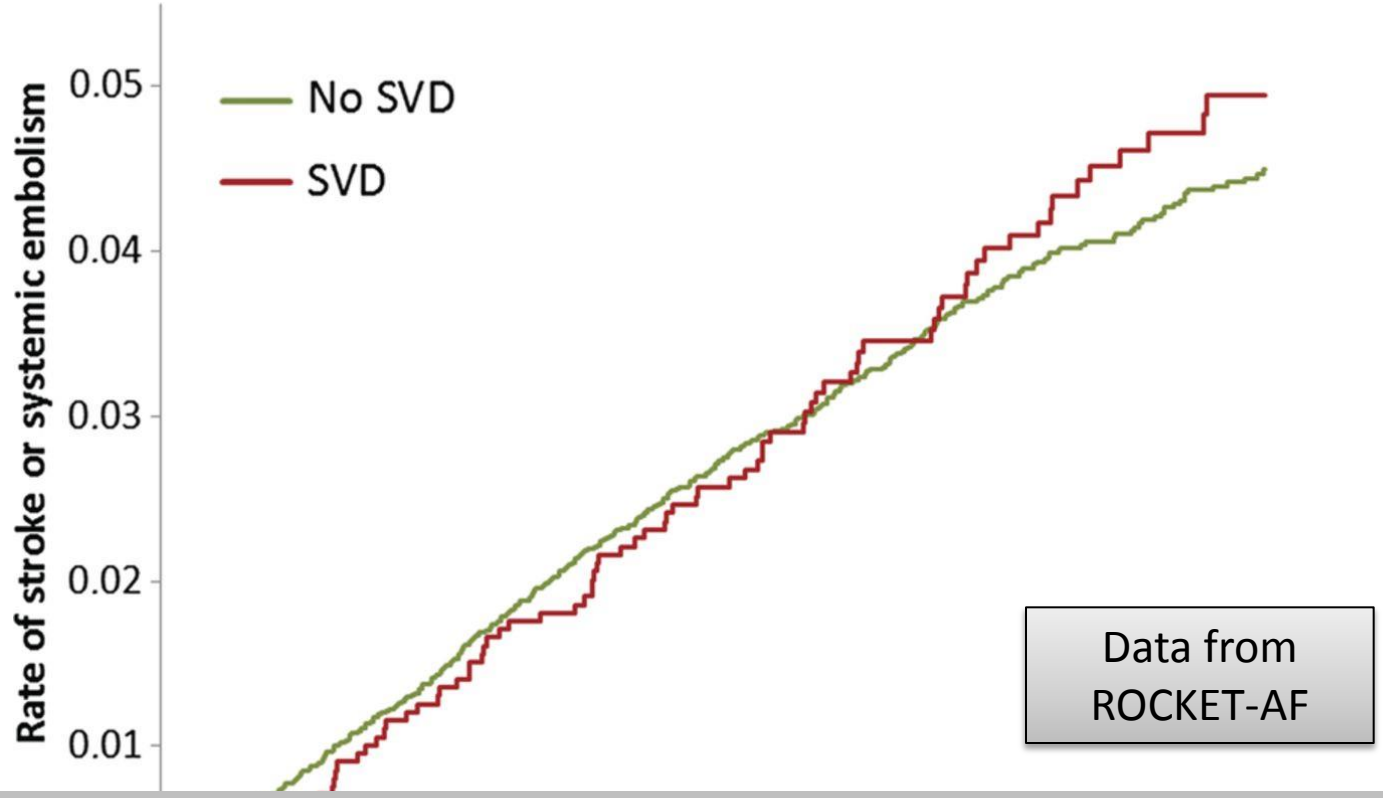
What's the definition of a Valvular Afib in 2014?

with the notable exception of mitral stenosis all forms of valvular heart disease accompanying AF do not appear to increase the risk of thrombo-embolism beyond the level entailed by AF alone, and do not apparently act as additional risk factors.

Valve prosthesis and Mitral stenosis are contra-indication for NOACs

Eur Heart J 2014 (in press)

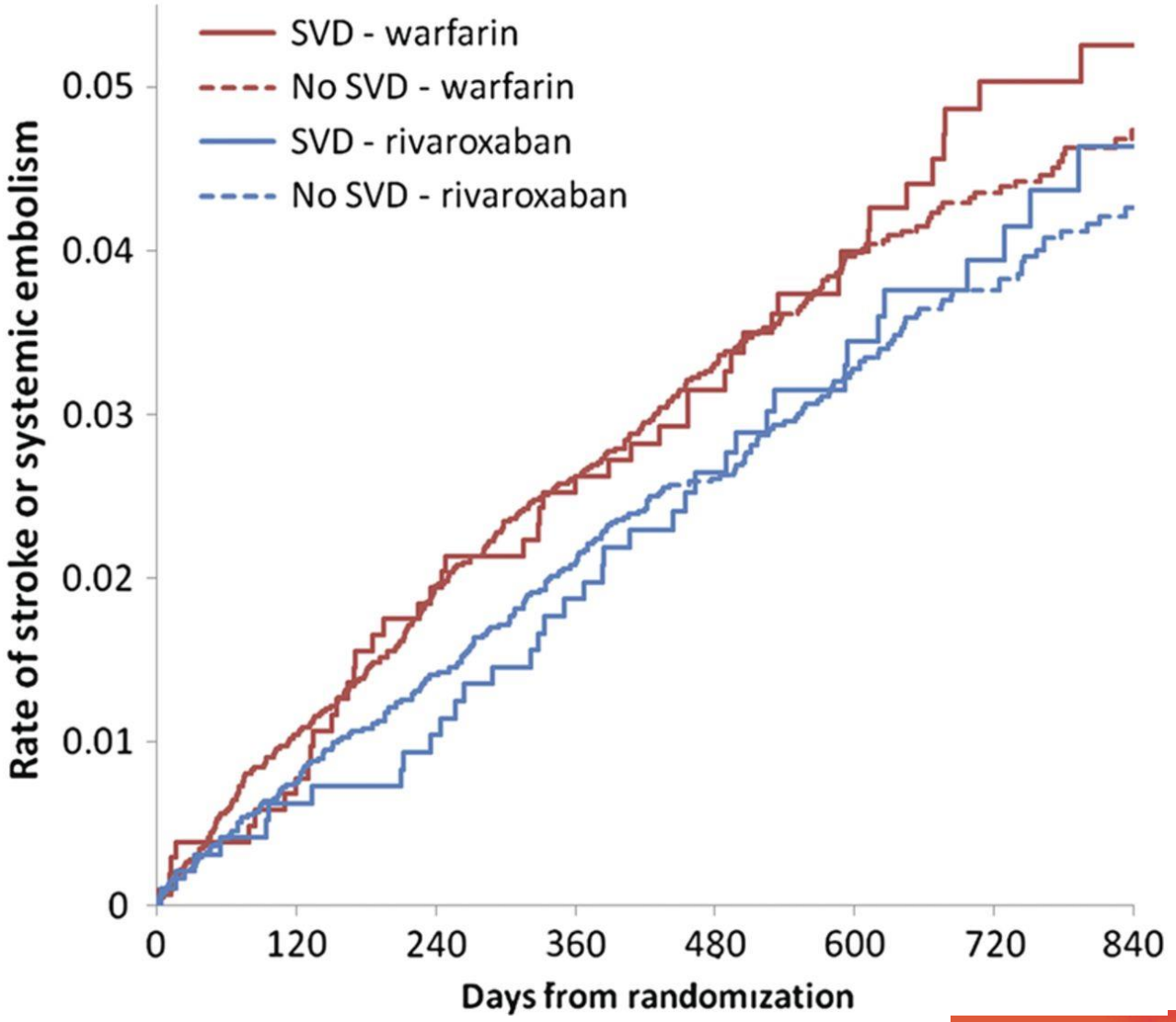
Unadjusted primary combined outcome parameters of stroke or systemic embolism in patients without (no SVD) and with (SVD) significant valvular disease.



Efficacy of rivaroxaban vs.warfarin was similar in patients with and without SVD;
however, the observed risk of bleeding was higher with rivaroxaban inpatients with SVD

Breithardt G et al. Eur Heart J
European Heart Journal

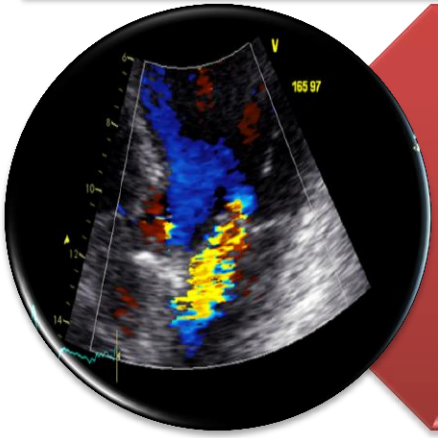
Unadjusted primary combined outcome parameters of stroke or systemic embolism in patients with and without significant valvular disease (SVD) randomized to either rivaroxaban or warfarin.



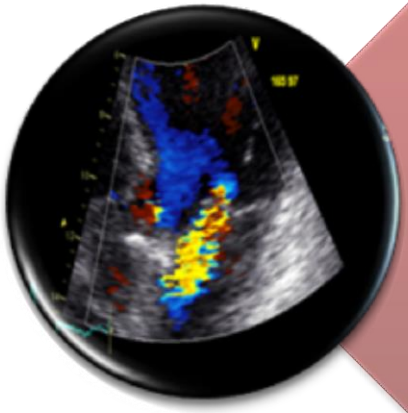
Breithardt G et al. Eur Heart J 2014

European Heart Journal

Conclusions



Afib: independently associated with risk of cardiac death and CHF after treatment of the HVD.



A new Afib should probably be considered with more attention in a HVD patient