



Hospices
Civils de
Lyon



Leaflet Prolapse: Apical Neochordae

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<i>Disclosure Statement of Financial Interest</i>	<u>List of companies</u>
> Grant/Research Support	Boeringher, Abbott, Medtronic, Edwards
> Consulting Fees/Honoraria	Edwards, Medtronic, Servier, Abbott
> Major Stock Shareholder/Equity	
> Royalty Income	Delacroix-Chevalier
> Ownership/Founder	
> Intellectual Property Rights	Landanger
> Other Financial Benefit	

Intro



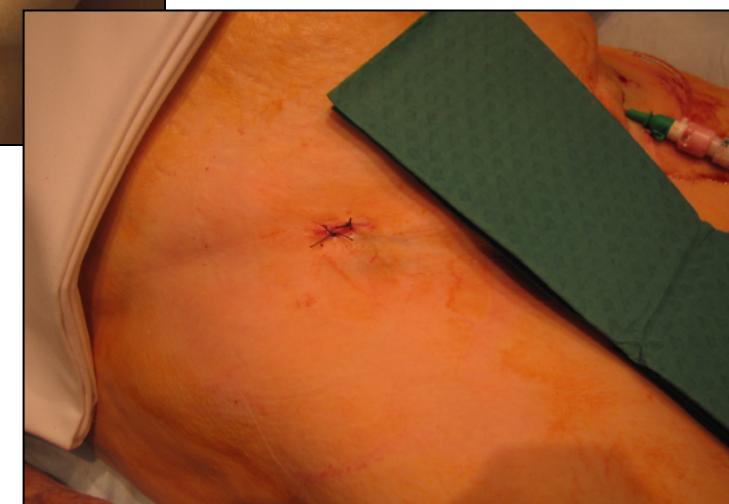
Clip



Neochord



Ring



TAMI

Conclusion

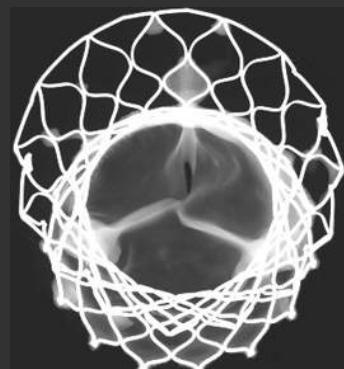


Transcatheter techniques : From repair to prostheses

	Approach	Commercial	In Development	Abandoned
Edge-to-Edge Repair	Abbott Vascular	St. JUDE MEDICAL		
Direct Annuloplasty		Kardium mitralis Valcare Guided Delivery Systems millipede llc.	QuantumCor ReCor Medical	
Indirect Annuloplasty	Cardiac Dimensions		St. JUDE MEDICAL VIACOR Edwards	
Chordal Repair	neoCHORD	Valtech		
Ventricular Remodeling		CardioKinetix Inc. MARDIL MEDICAL BioVentrix	Myocor ACORN	
Enhanced coaptation		middle peak cardiosolutions Mitralix MitrAssist		
MV Replacement		Medtronic neovasc Valtech twelve Cassion Highlife BRAILE endoValve TENDYNE NaviGate		



300 000 TAVI



Partner II

2000 Pts

SURTAVI

2500 Pts

Partner AB

1057 pts

Corevalve US

747 pts

Choice

241 pts

Notion

280 pts



60 000 Clips



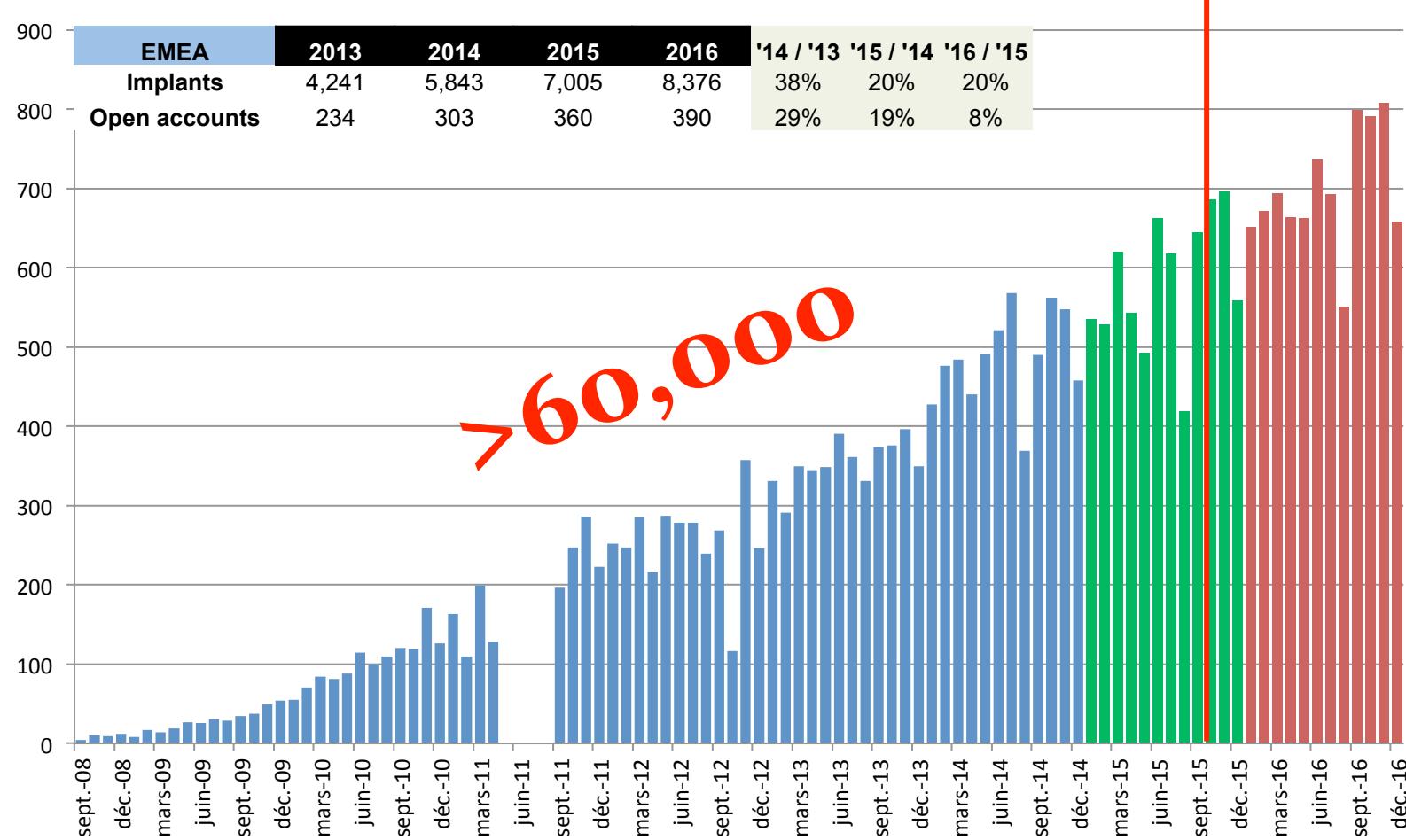
**Coapt 500 pts
Reshape 800 pts
Mitra.fr 288pts**

**Hiride
294 pts**

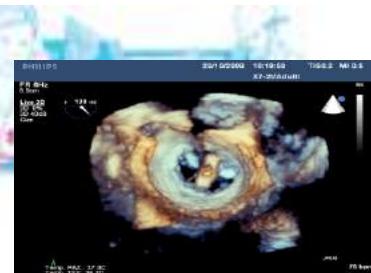
Everest 279 pts



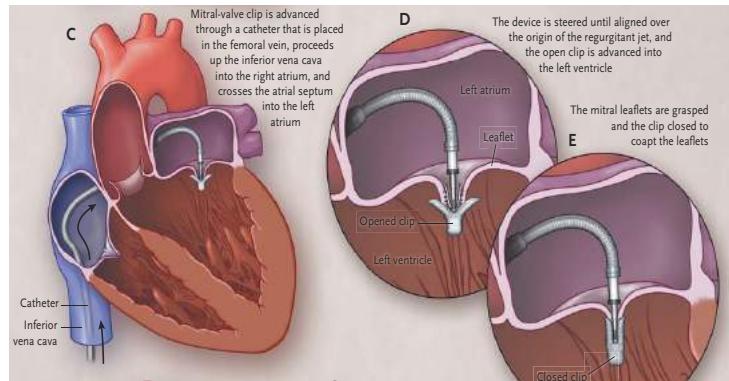
Transcatheter techniques : From Mitraclip to prostheses



Intro



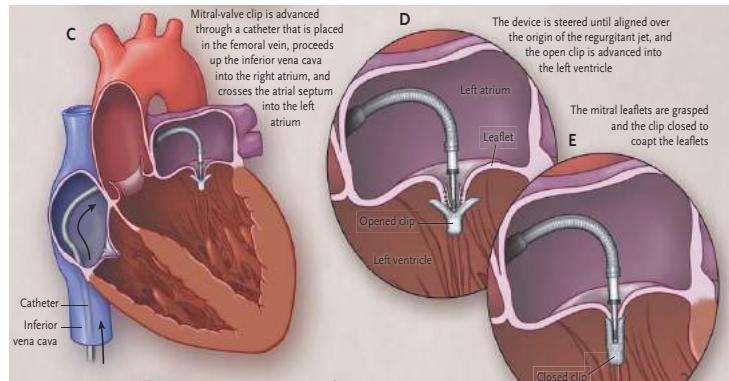
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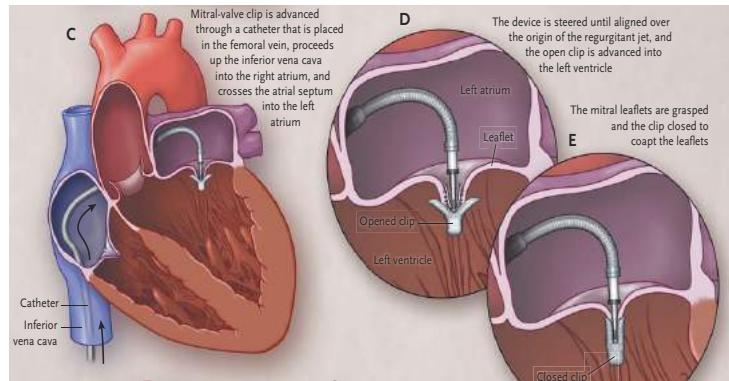
Neochord



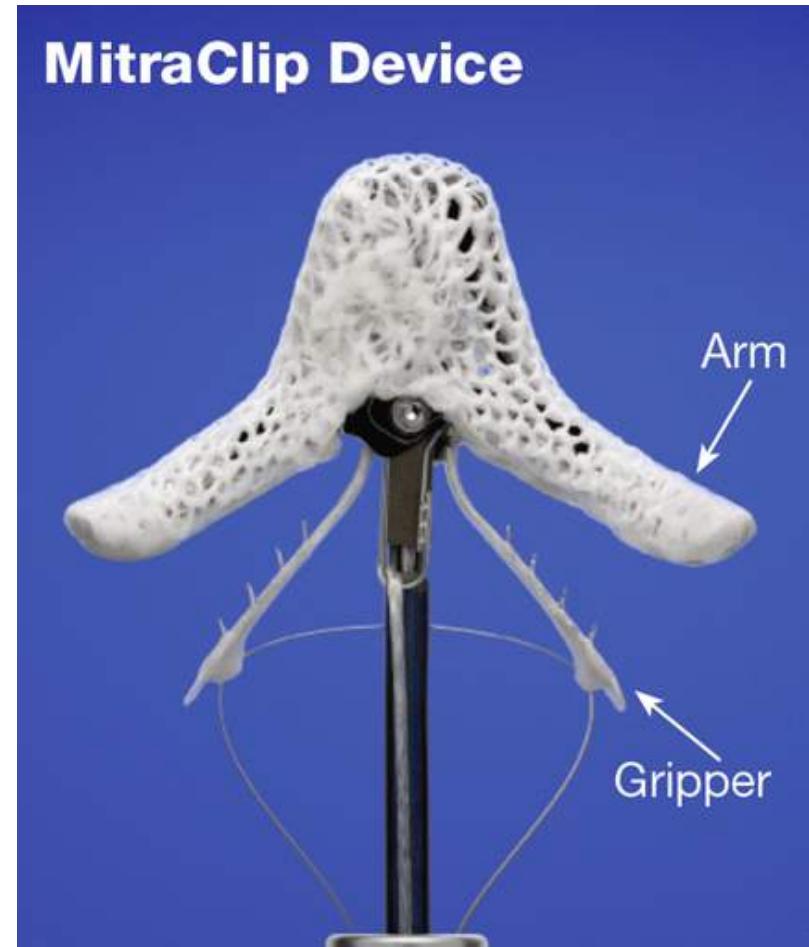
Ring



TAMI

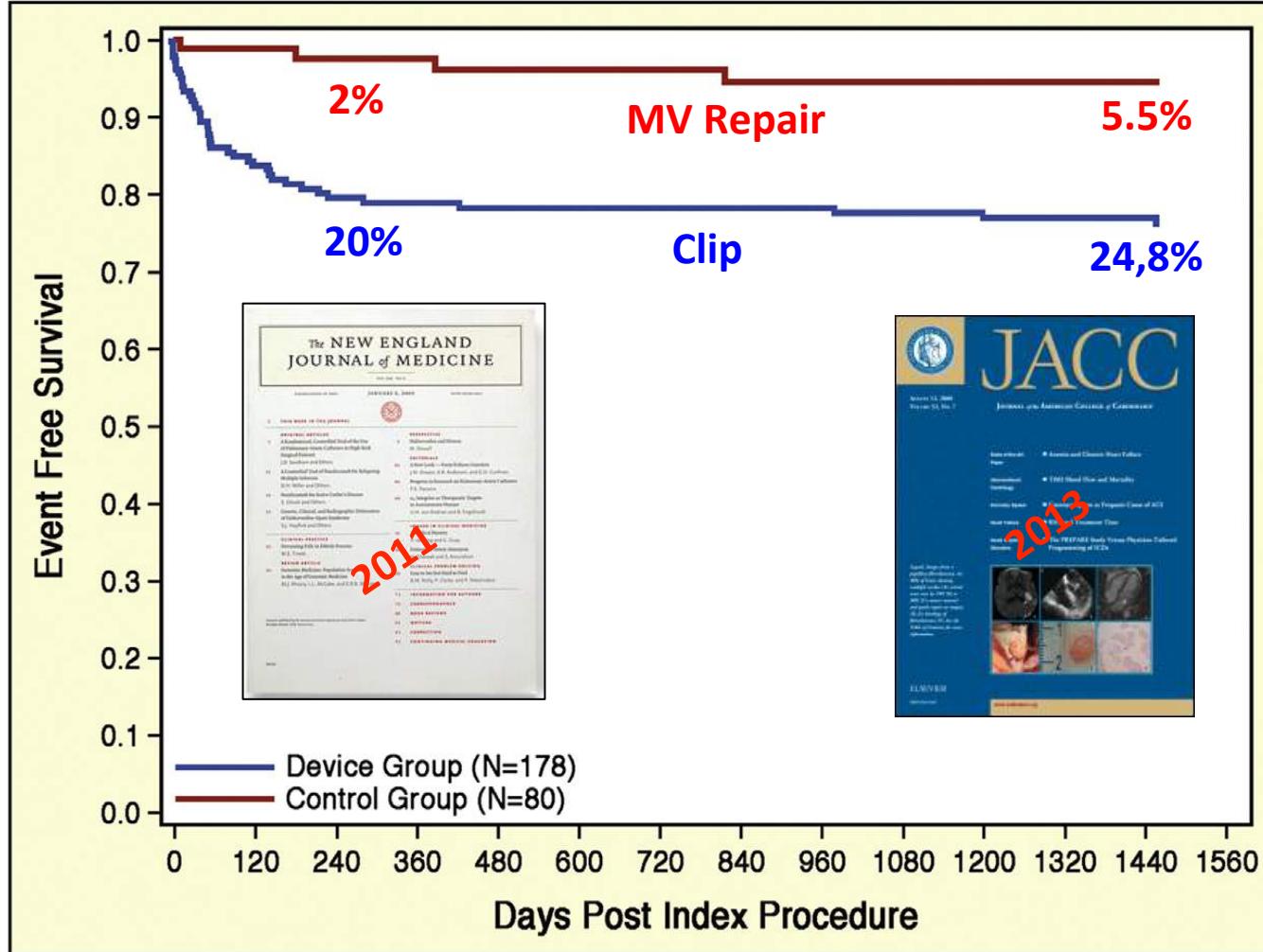


Conclusion





Reoperation at 1 and 4 years





After Everest : Cohorts & Registries ?

Percutaneous Mitral Valve Edge-to-Edge Repair

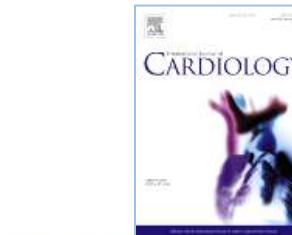
In-Hospital Results and 1-Year Follow-Up of 628 Patients of the 2011-2012 Pilot European Sentinel Registry

Long-term survival after MitraClip® therapy in patients with severe mitral regurgitation and severe congestive heart failure: A comparison among survivals predicted by heart failure models

Thomas Schau (MD)^{a,1,*}, Akihiro Isotani (MD)^{a,1}, Michael Neuss (MD)^a, Maren Schöpp (MD)^a, Martin Seifert (MD)^a, Christin Höpfner (MD)^a, Daniel Burkhoff (MD, PhD)^b, Christian Butter (MD)^a

^a Heart Center Brandenburg in Bernau, Bernau, Germany

^b Columbia University, New York, NY, USA



Association of tricuspid regurgitation with clinical and echocardiographic outcomes after percutaneous mitral valve repair with the MitraClip System: 30-day and 12-month follow-up from the GRASP Registry

Yohei Ohno^{1,2†}, Guilherme F. Attizzani^{1,3,4‡}, Davide Capodanno^{1,5}, Stefano Cannata¹, Fabio Dipasqua¹, Sebastiano Immè¹, Marco Barbanti¹, Margherita Ministeri¹, Anna Caggegi¹, Anna M. Pistrutto¹, Marta Chiarandà¹, Giuseppe Ronisvalle¹, Sandra Giaquinta¹, Silvia Farruggio¹, Sarah Mangiavico¹, Salvatore Scandura¹, Corrado Tamburino^{1,5}, Piera Capranzano^{1,5§}, and Carmelo Grasso^{1,5¶}

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^a Heart Center Brandenburg in Bernau, Bernau, Germany

^b Columbia University, New York, NY, USA

Percutaneous Mitral Valve Repair for Mitral Regurgitation in High-Risk Patients

Results of the EVEREST II Study

Donald D. Głowar, MD,[†] Saibal Kar, MD,[‡] Alfredo Trento, MD,[‡] D. Scott Lim, MD,[‡] Tanvir Bajwa, MD,[‡] Ramon Quesada, MD,[‡] Patrick L. Whitlow, MD,[‡] Michael J. Rinaldi, MD,^{‡,||} Paul Grayburn, MD,^{‡,||} Michael J. Mack, MD,^{‡,||} Laura Mauri, MD,^{‡,||} Patrick M. McCarthy, MD,^{||} Ted Feldman, MD,^{‡,||}



Predictors of clinical outcomes after edge-to-edge percutaneous mitral valve repair

David Capodanno, MD, PhD,^{a,c} Marianna Adamo, MD,^{b,e} Marco Barbanti, MD,^a Cristina Giannini, MD,^c Maria Luisa Laudisa, MD,^d Stefano Cannata, MD,^a Salvatore Cirello, MD,^b Sebastiano Immè, MD,^a Diego Maffeo, MD,^b Francesco Bedogni, MD,^d Anna Sonia Petronio, MD,^c Federica Ettori, MD,^b Corrado Tamburino, MD, PhD,^a and Carmelo Grasso, MD,^a, on behalf of the GRASP-IT Investigators Catania, Brescia, Pisa, and Milan, Italy

Meta-Analysis of the Usefulness of Mitraclip in Patients With Functional Mitral Regurgitation

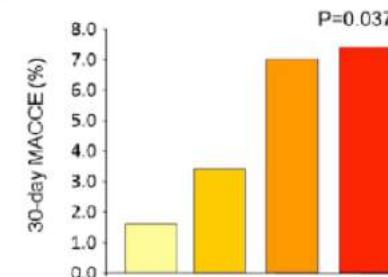
Fabrizio D'ascenzo, MD^a, Claudio Moretti, MD^a, Walter Grosso Marra, MD^a, Antonio Montefusco, MD^a, Pierluigi Omede, MD^a, Salma Taha, MD^{a,b,c}, Davide Castagno, MD^a, Oliver Gaemperli, MD^c, Maurizio Taramasso, MD^d, Simone Frea, MD^a, Stefano Pidello, MD^a, Volker Rudolph, MD^f, Olaf Franzen, MD^g, Daniel Braun, MD^h, Cristina Giannini, MDⁱ, Huseyin Ince, MD^j, Leon Perl, MD^k, Giuseppe Zoccali, MD^l, Sebastiano Marra, MD^a, Maurizio D'Amico, MD^a, Francesco Maisano, MD^m, Mauro Rinaldi, MD^a, and Fiorenzo Gaita, MD^a



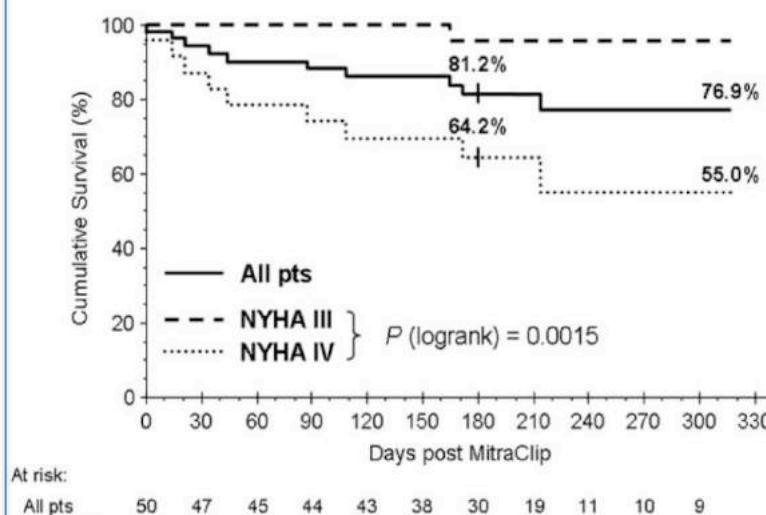


**Influence of non-cardiac comorbidities on outcome
after percutaneous mitral valve repair: results from the German
transcatheter mitral valve interventions (TRAMI) registry**

Influence of extra-cardiac comorbidities →

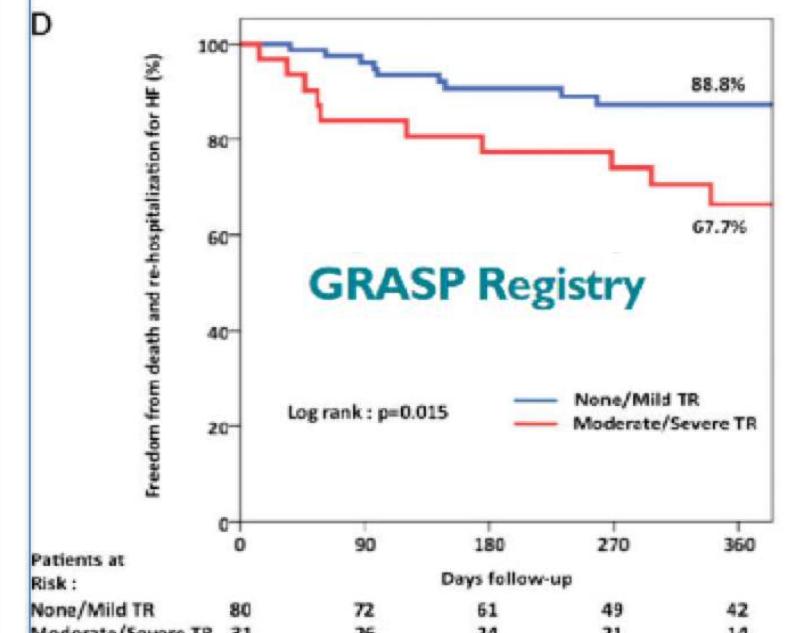


**MitraClip® therapy in patients with end-stage
systolic heart failure**



Franzen O. Eur J Heart Failure 2011; 13: 569–576

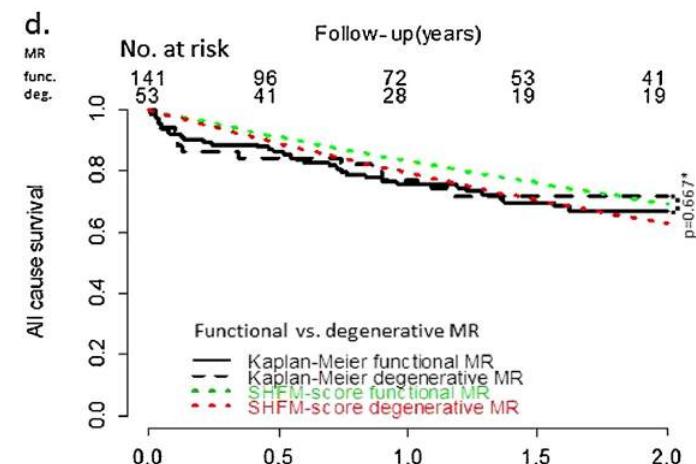
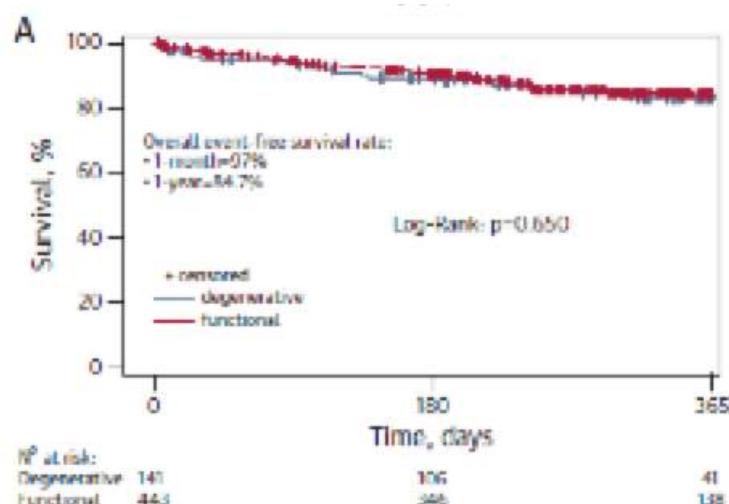
Association of tricuspid regurgitation



Ohno Y. Eur Heart Journal 2014; 15: 51246-55



2) Questionable : Impact on mortality ?



Percutaneous Mitral Valve Edge-to-Edge Repair

In-Hospital Results and 1-Year Follow-Up of 628 the 2011-2012 Pilot European Sentinel Registry

Georg Nickenig, MD, PhD,* Rodrigo Estevez-Loureiro, MD, PhD,† Olaf Franzen, MD,‡ Corrado Tamburino, MD, PhD,§



- 628 patients in Europe (25 centers, 8 countries)
- FU for secondary and primary MR
- 1 year echo assessment

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^aHeart Center Brandenburg in Bernau, Brandenburg, Germany

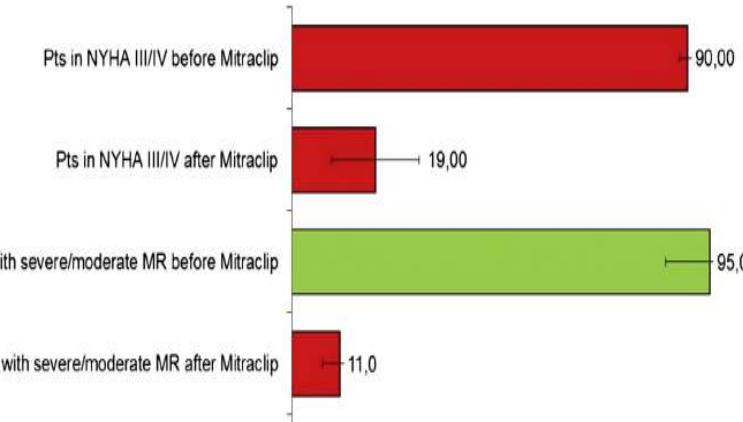
^bColumbia University, New York, NY, USA

2015

- 194 patients (brandeburgh, New york)
- Mortality versus Seattle HF model



3) Likely : Improved Symptoms / decreased MR



Percutaneous Mitral Valve Edge-to-Edge Repair

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- 628 patients in Europe (25 centers, 8 countries)
- FU for secondary and primary MR
- 1 year echo assessment

- Meta analysis
- 9 studies
- 875 patients



Percutaneous Mitral Valve Edge-to-Edge Repair

In-Hospital Results and 1-Year Follow-Up of 628 Patients of the 2011-2012 Pilot European Sentinel Registry

Georg Nickenig, MD, PhD,* Rodrigo Estevez-Loureiro, MD, PhD,† Olaf Franzen, MD,‡ Corrado Tamburino,§

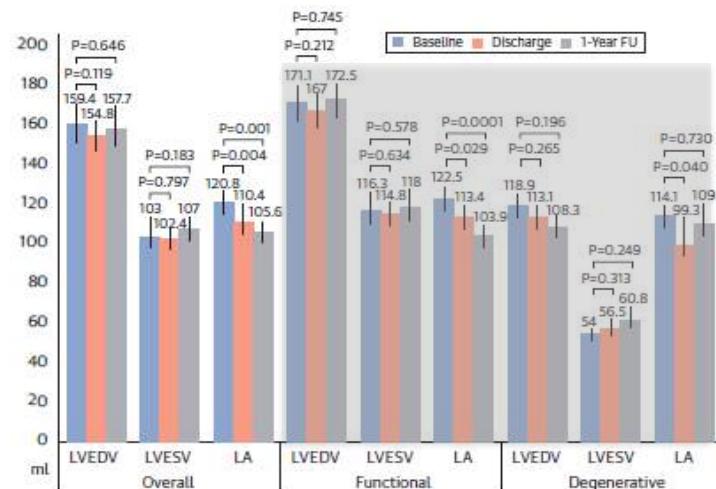


FIGURE 5 Echocardiographic Measurement of Left Ventricular and Left Atrial Volumes at Baseline, Discharge, and 1-Year Follow-Up After TMVR (Paired Data From 368 Patients)

In the overall cohort, a nonsignificant reduction in left ventricular end-diastolic volume (LVEDV) was observed, with a significant reduction in left atrial volume (LA). In functional mitral regurgitation, left ventricular volumes remained stable during follow-up, although a significant reduction in LA was noted. In degenerative mitral regurgitation, the most relevant finding was a reduction in LVEDV over time (nonsignificant). LVEF = left ventricular ejection fraction; LVESV = left ventricular end-systolic volume; TMVR = transcatheter mitral valve repair.

- 628 patients in Europe (25 centers, 8 countries)
- FU for secondary and primary MR
- 1 year echo assessment
- **15 centers with > 90% FU → 368 echo at 1 year**

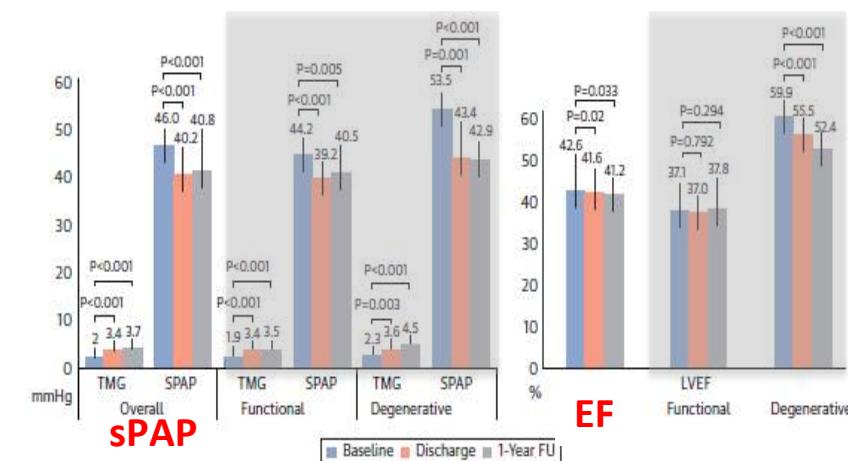


FIGURE 6 Echocardiographic Measurement of Transmural Pressure Gradient, SPAP, and Ejection Fraction, at Baseline, Discharge, and 1-Year Follow-Up

Significant and persistent reductions in systolic pulmonary artery pressure (SPAP) were observed. After transcatheter mitral valve repair, transmural pressure gradient (TMG) (mm Hg) increased significantly, although no cases of severe mitral stenosis were reported. LVEF = left ventricular ejection fraction (%).

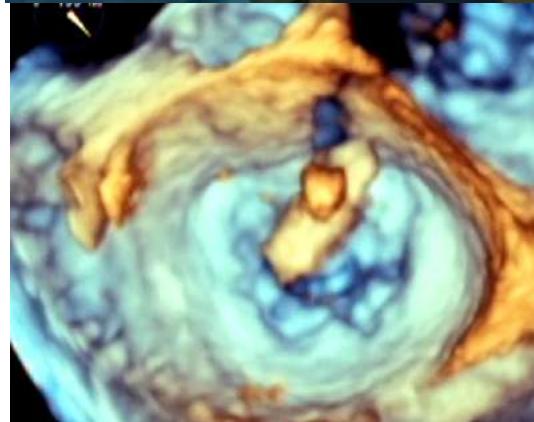
Intro



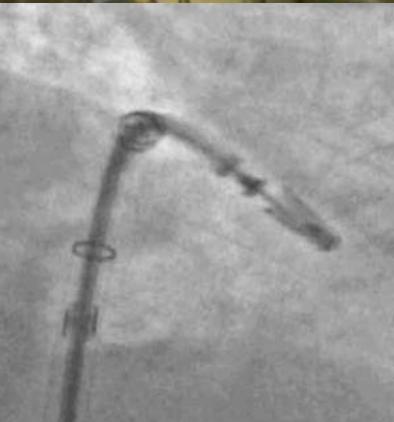
Clip



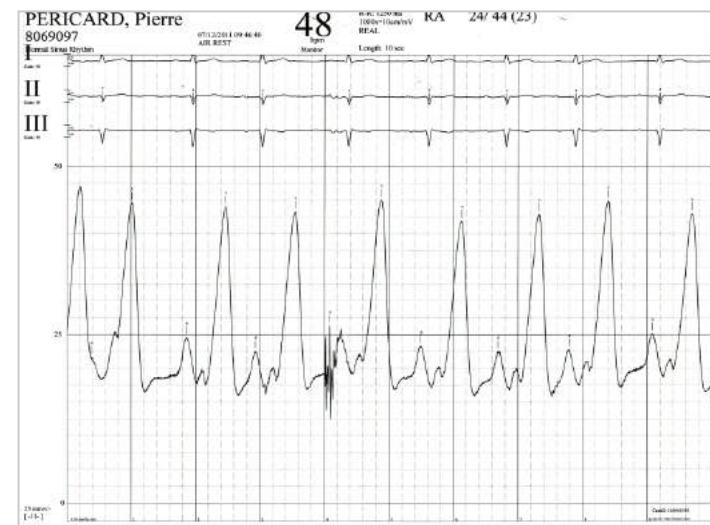
Neochord



Ring



TAMI



Conclusion



Intro

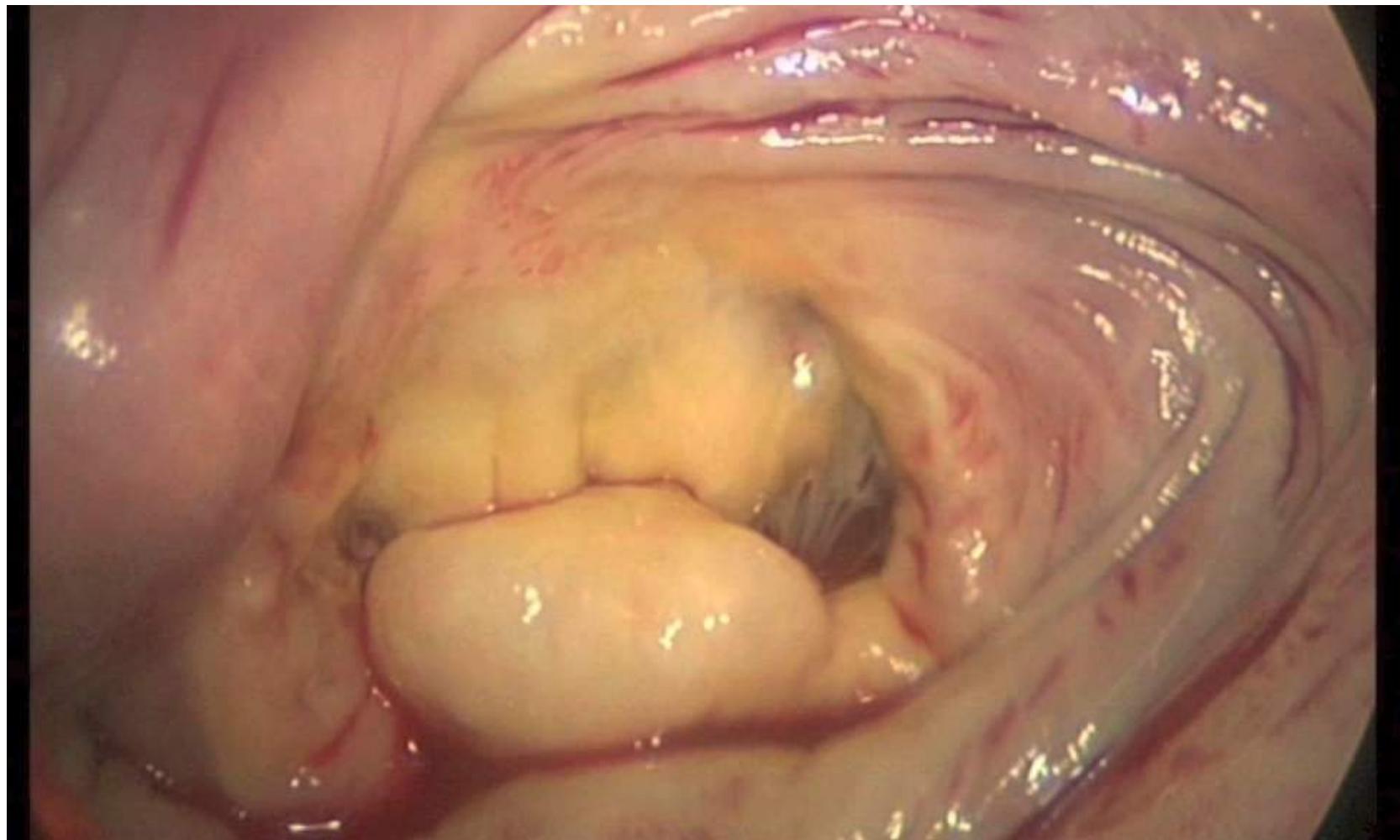
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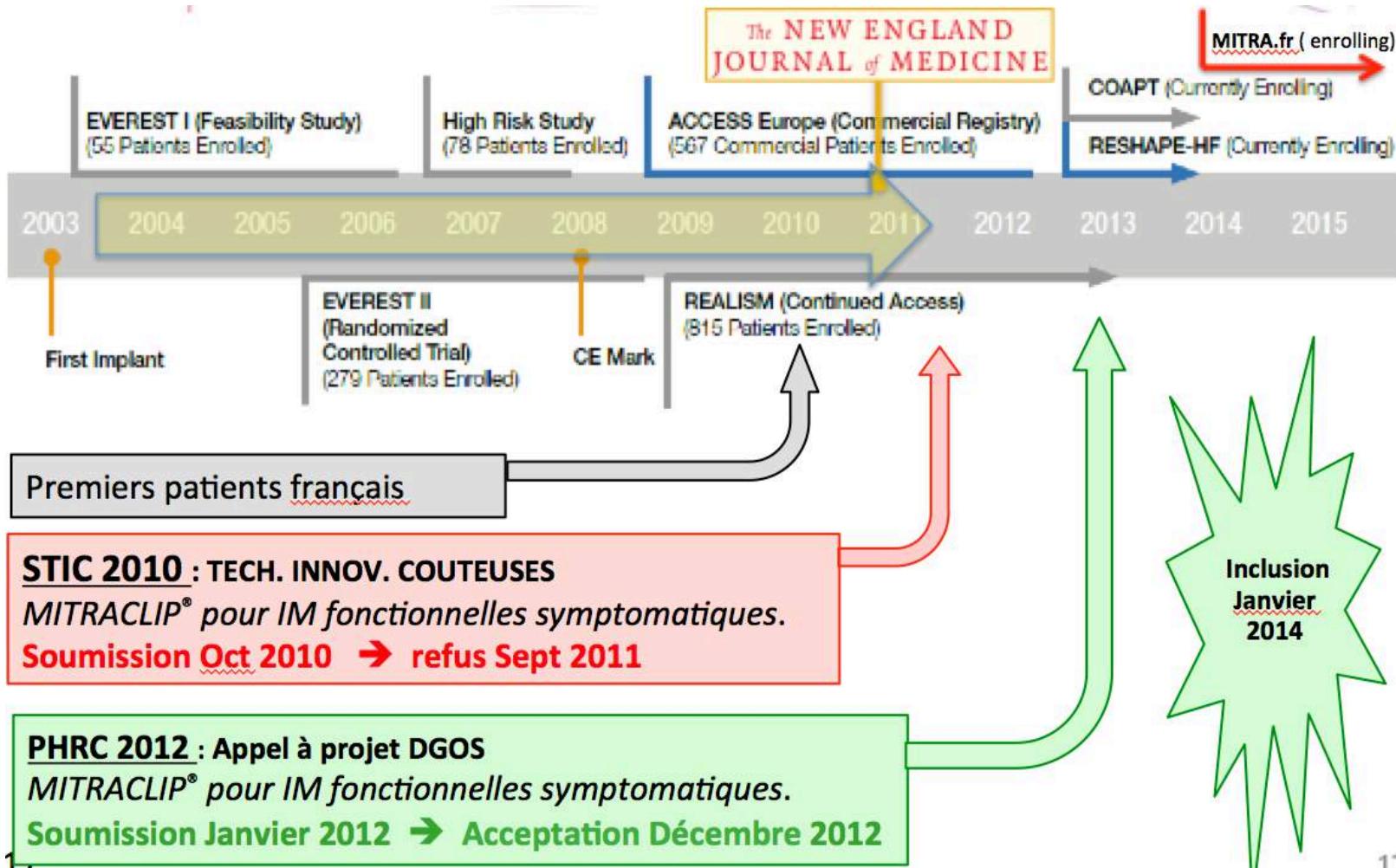
Neochord

Ring

TAMI

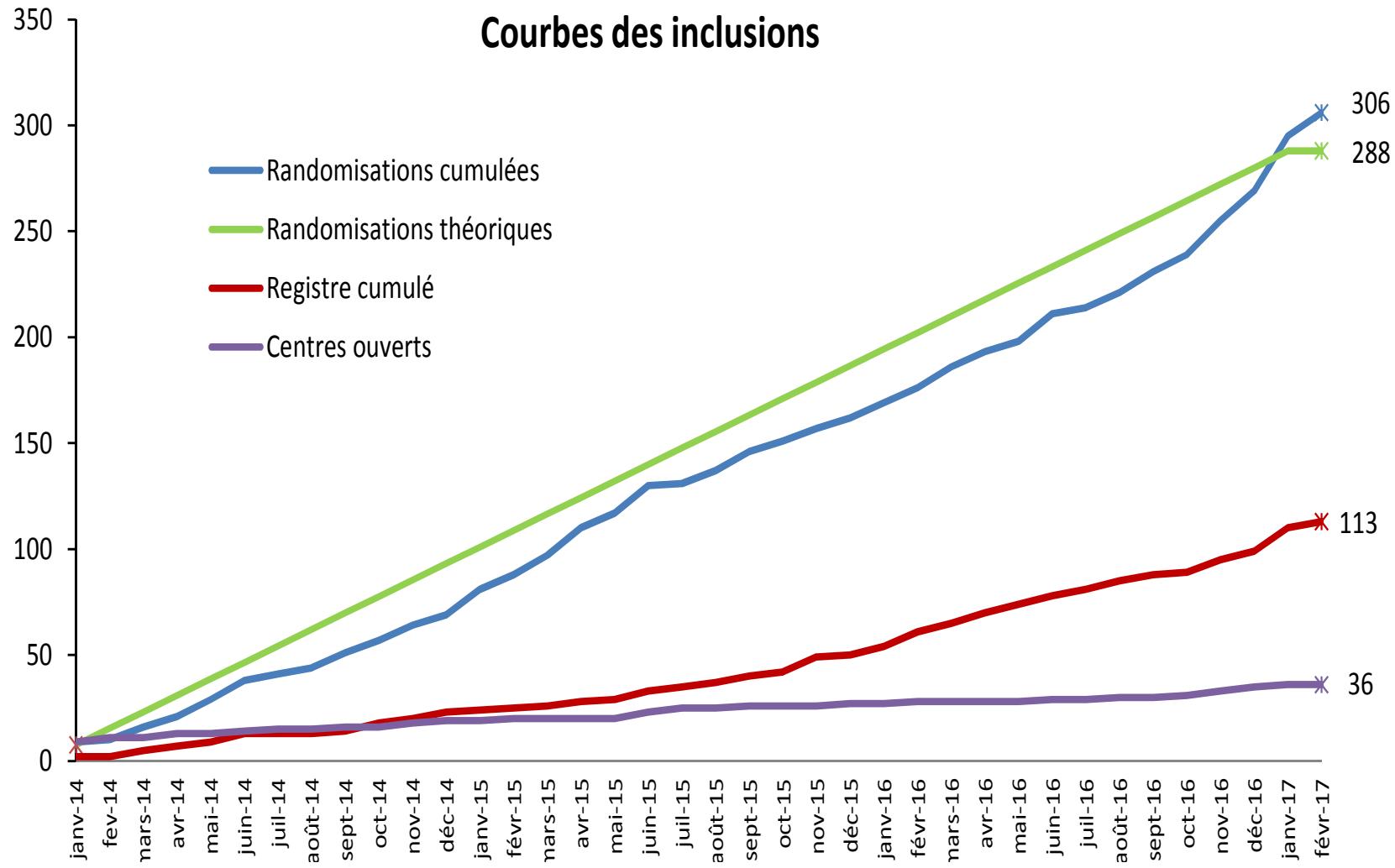
Conclusion

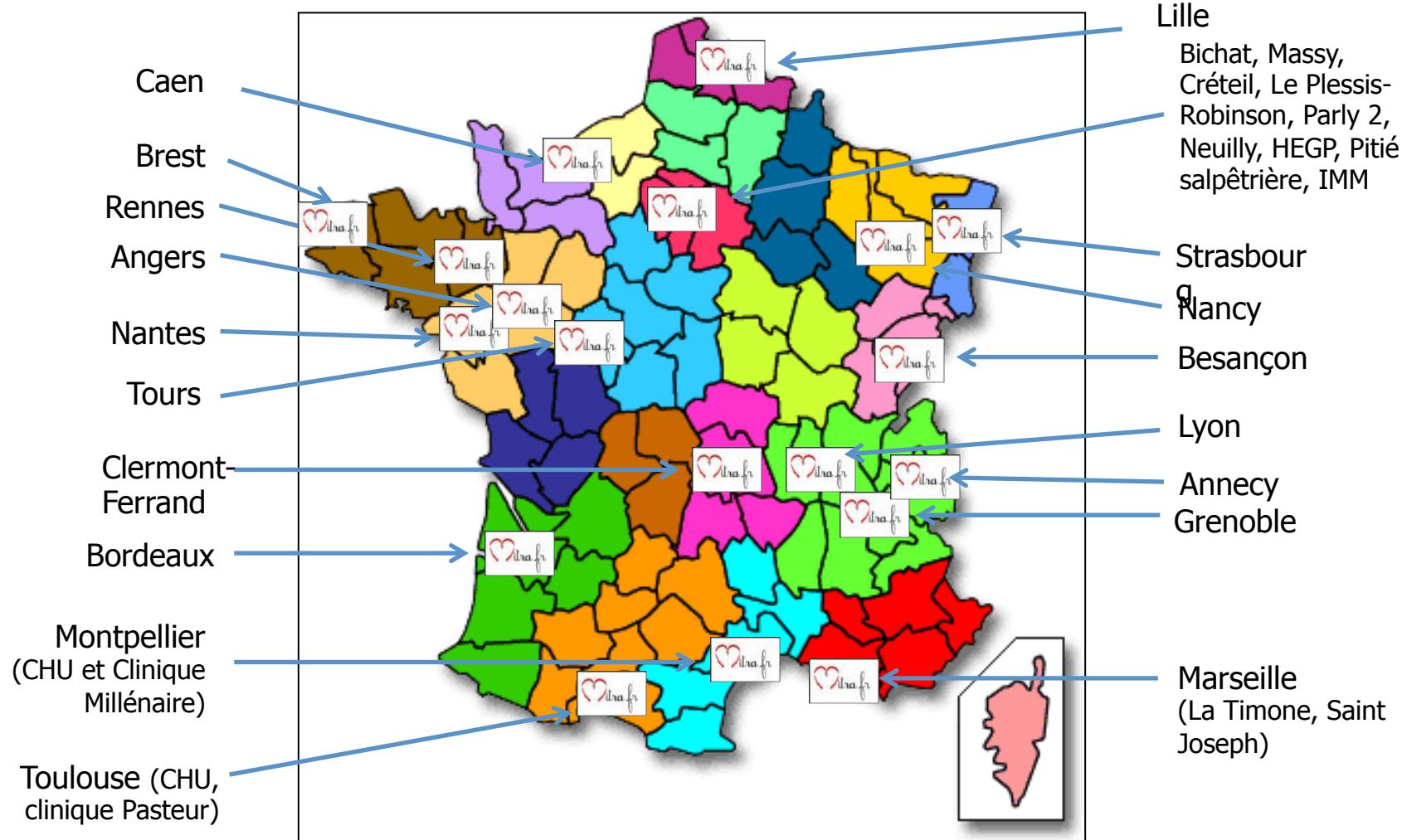






Courbes des inclusions

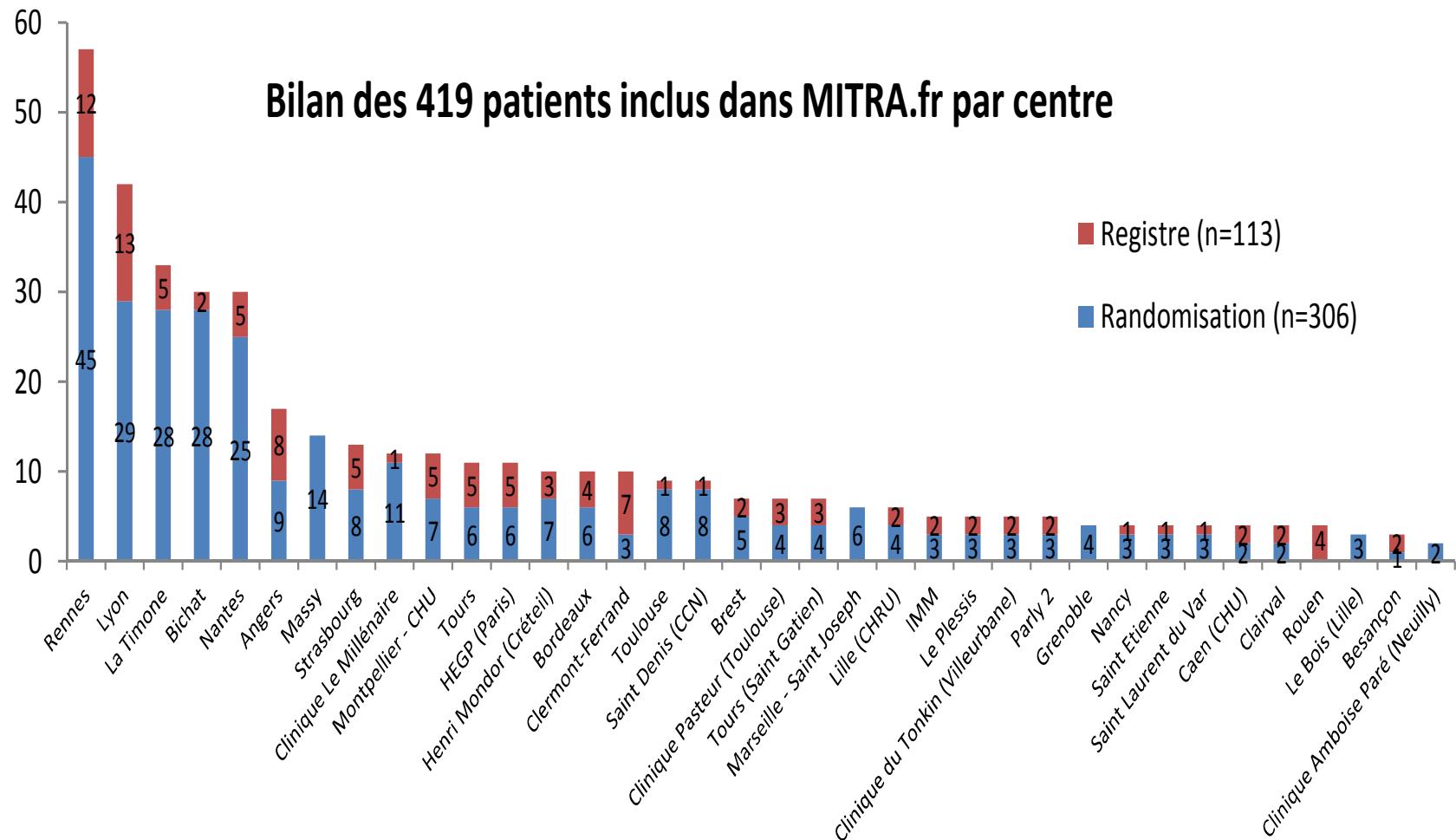




-26 open centers → 295 pts /288 included



Bilan des 419 patients inclus dans MITRA.fr par centre

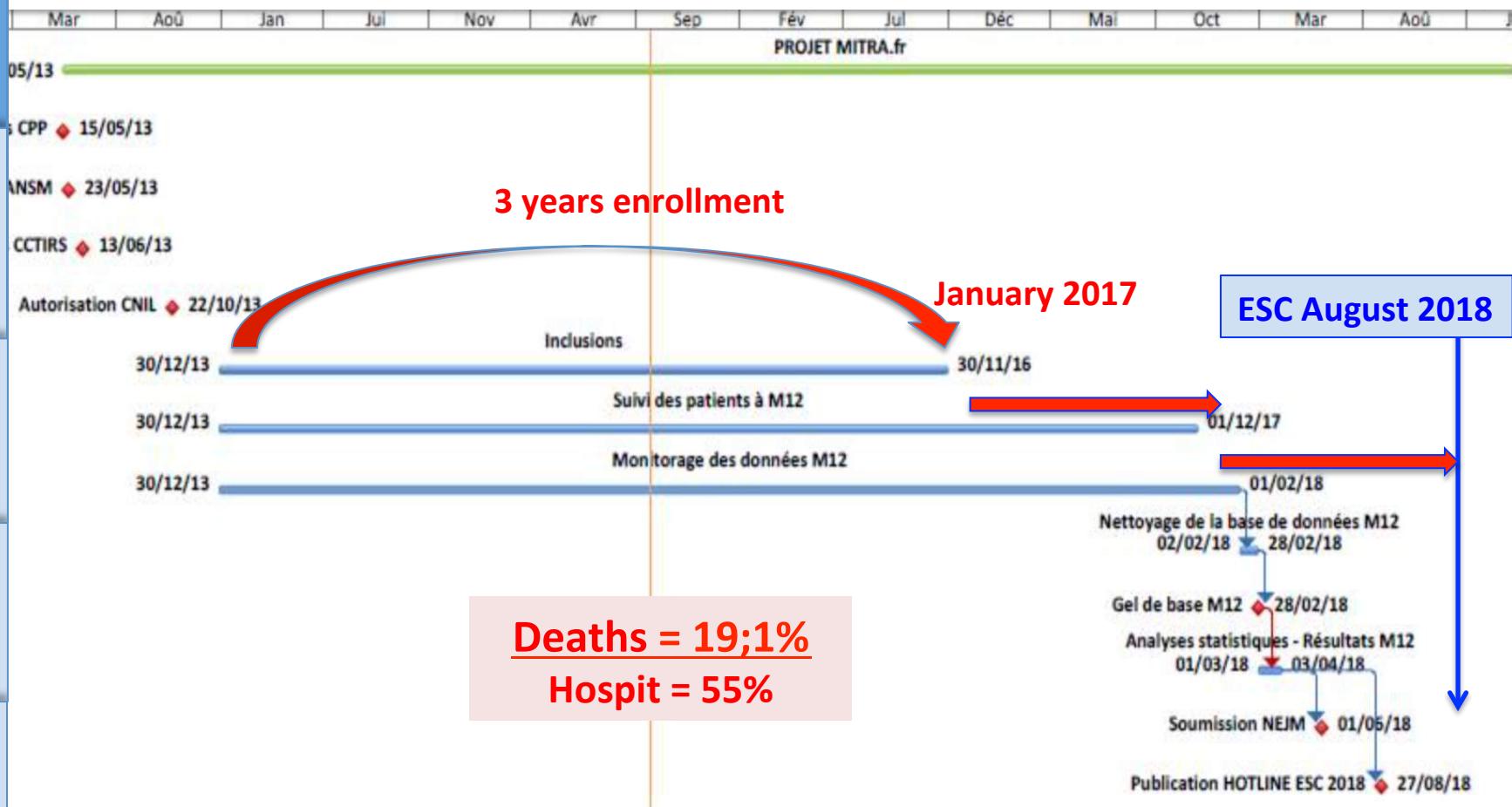


Intro



Clip

MITRA.fr-planning



Neochord

Ring

TAMI

Conclusion

Intro



Clip

Neochord

Ring

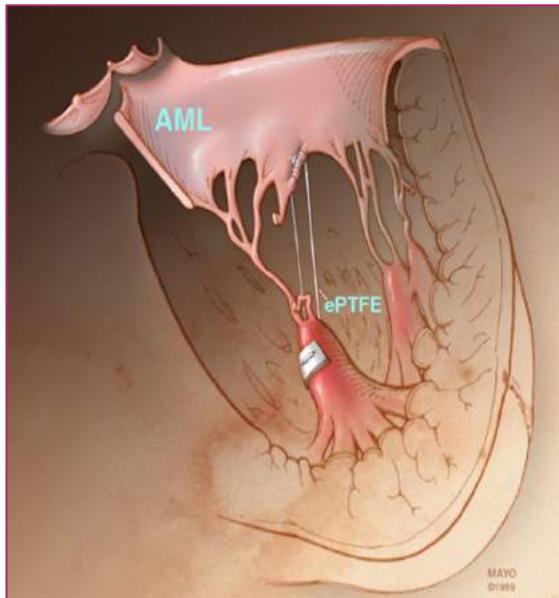
TAMI

Conclusion

	RESHAPE-HF	COAPT	MITRA.fr
Sponsor	Abbott Vascular	Abbott Vascular	PHRC / Abbott
Méthodology	Prospective, randomized	Prospective, randomized	Prospective, randomized
Comparison	Optimal Medical Medication	Optimal Medical Medicatio	Optimal Medical Medication
MR etiology	Secondary MR	Secondary MR	Secondary MR
Ejection Fraction	15 to 40%	> 30%	15 to 40%
Hospitalisation HF < 12 months ?	100%		100%
High Risk Patients		Surgical CI (heart team)	Surgical CI (heart team)
NHYA	III to IV	II, III, IV	II, III, IV
Principal Criteria	% all deaths or rehospitalisation rate HF	Safety et efficacy (hospit pour CHF)	% all deaths ou % hospitalisation HF Idem Shift Ivabradine → Lancet
Hypothesis	18 vs 14 % death and 0,6 vs 0,45 hospit		50% versus 33%
Lost pats	15%		10%
Number of inclusions	400 x 2 Reshape 2	250 x 2 + 200	144 x 2 293
Number of centres	50	75	26



Transapical Off Pump MV Repair



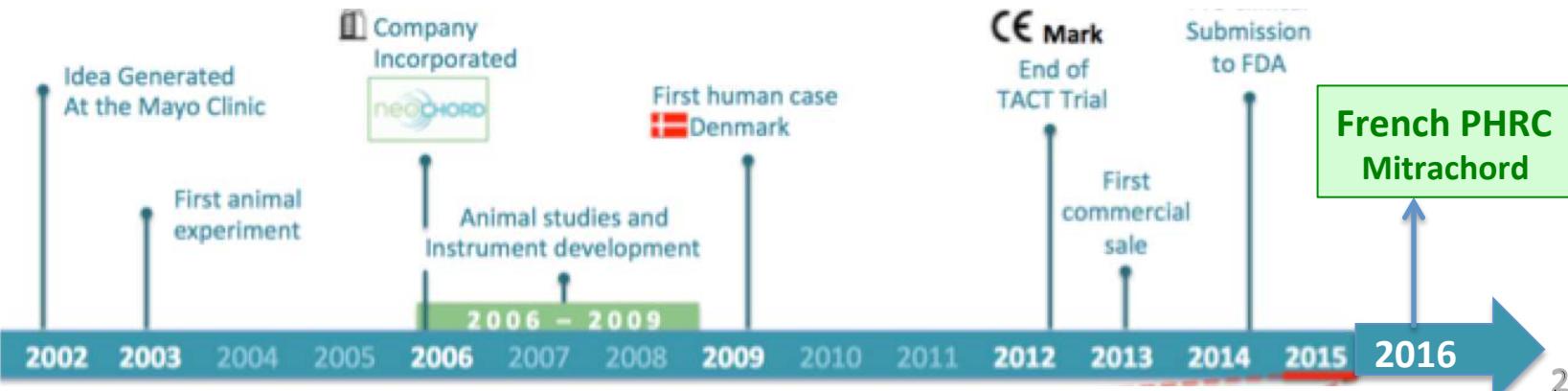
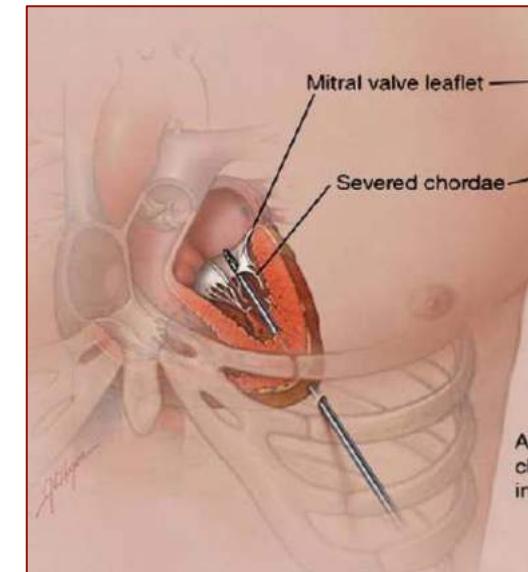
2009 : 1^{er} patient

2013 : CE mark

2014 : 100 Pts

2015 : 300 Pts

2016 : > 600 Pts



Intro

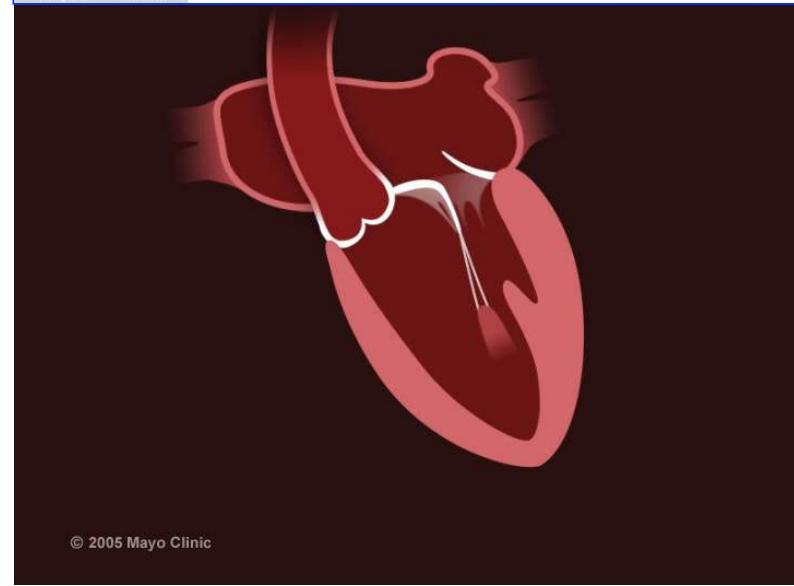
Clip

Neochord

Ring

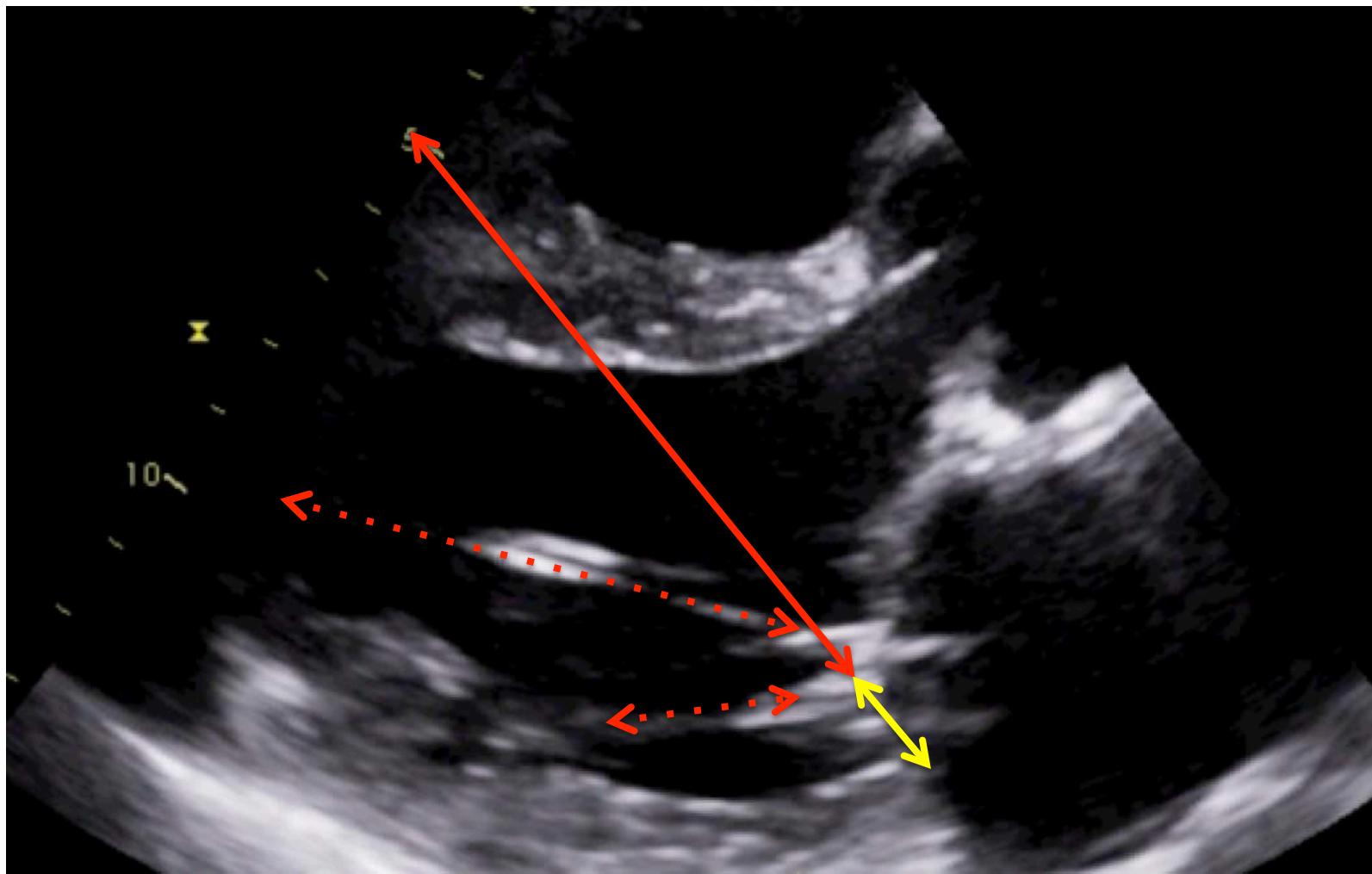
TAMI

Conclusion





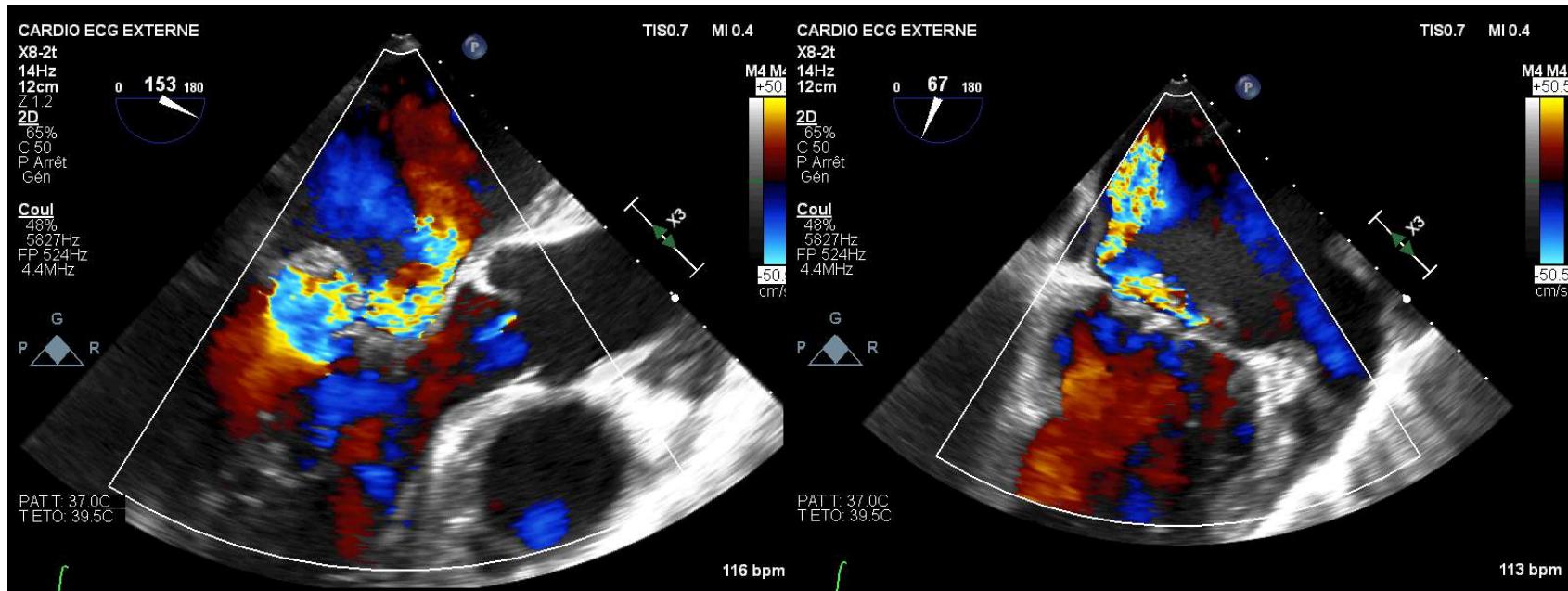
Apical Neochord





Severe P2 prolaps :

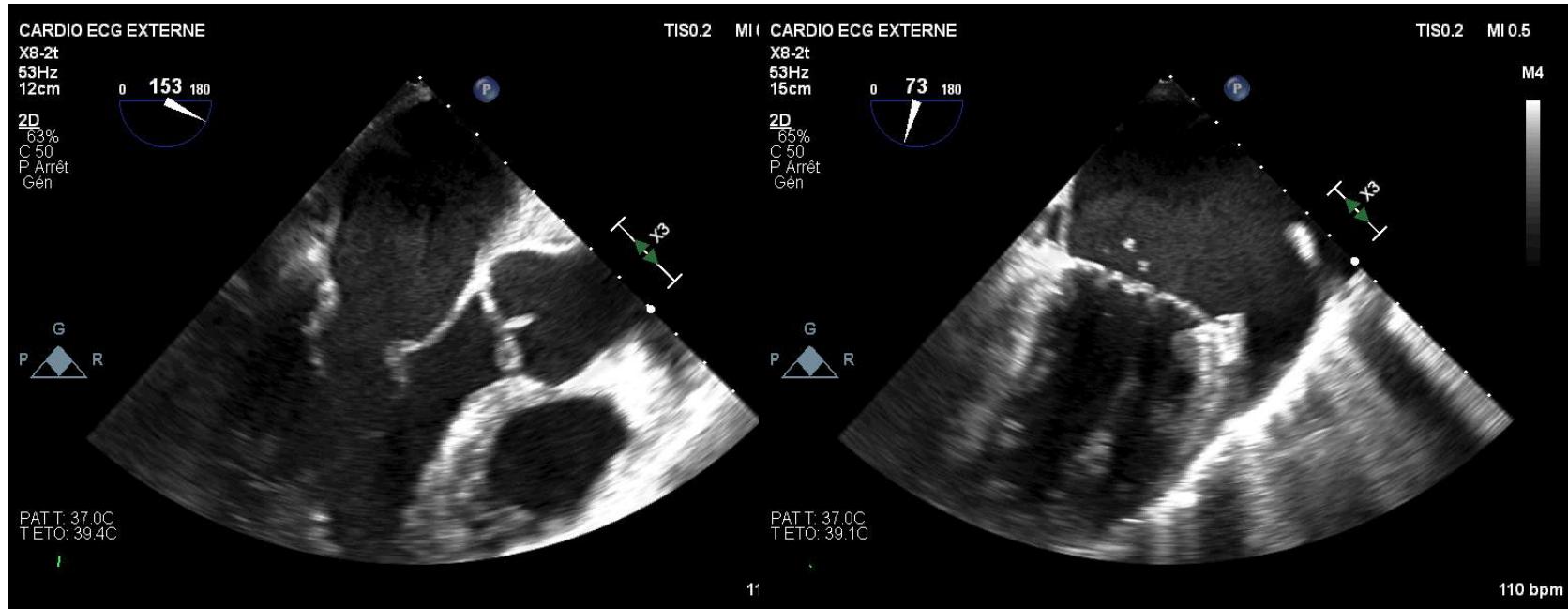
- excess tissue
- no annular dilatation





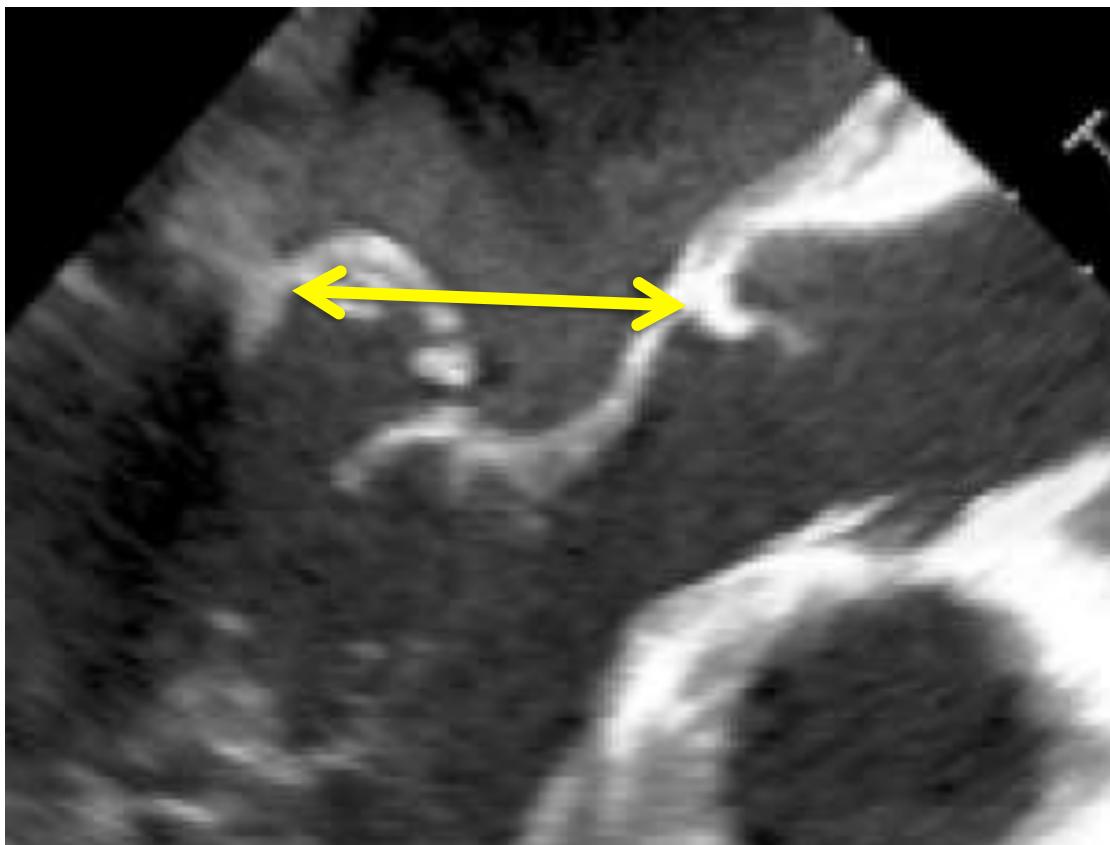
Severe P2 prolaps :

- excess tissue
- no annular dilatation





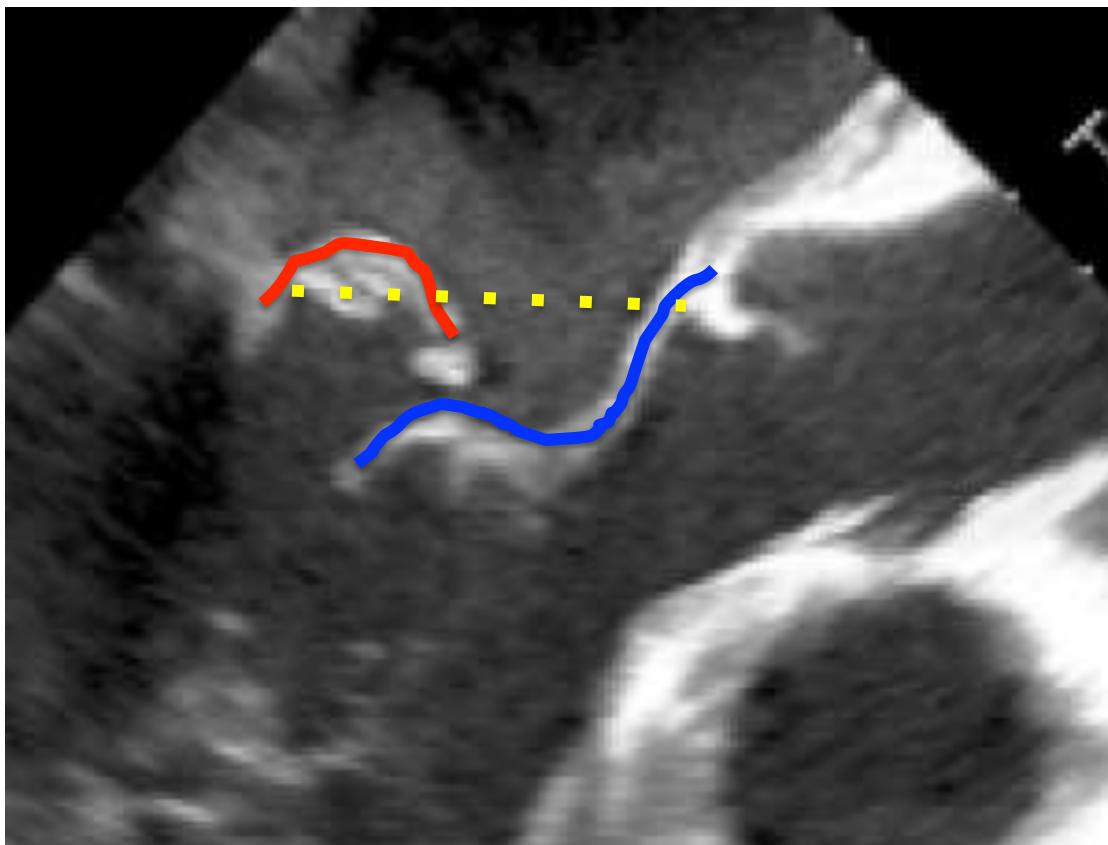
No dilatation < AP distance <<< Leaflet to Annulus Index



$$\frac{\text{PML} + \text{AML}}{\text{AP}} > 1.25 \text{ predictive of success}$$



Leaflet to Annulus Index > AP distance



$\frac{\text{PML} + \text{AML}}{\text{AP}} > 1.25$ predictive of success

Intro

Clip

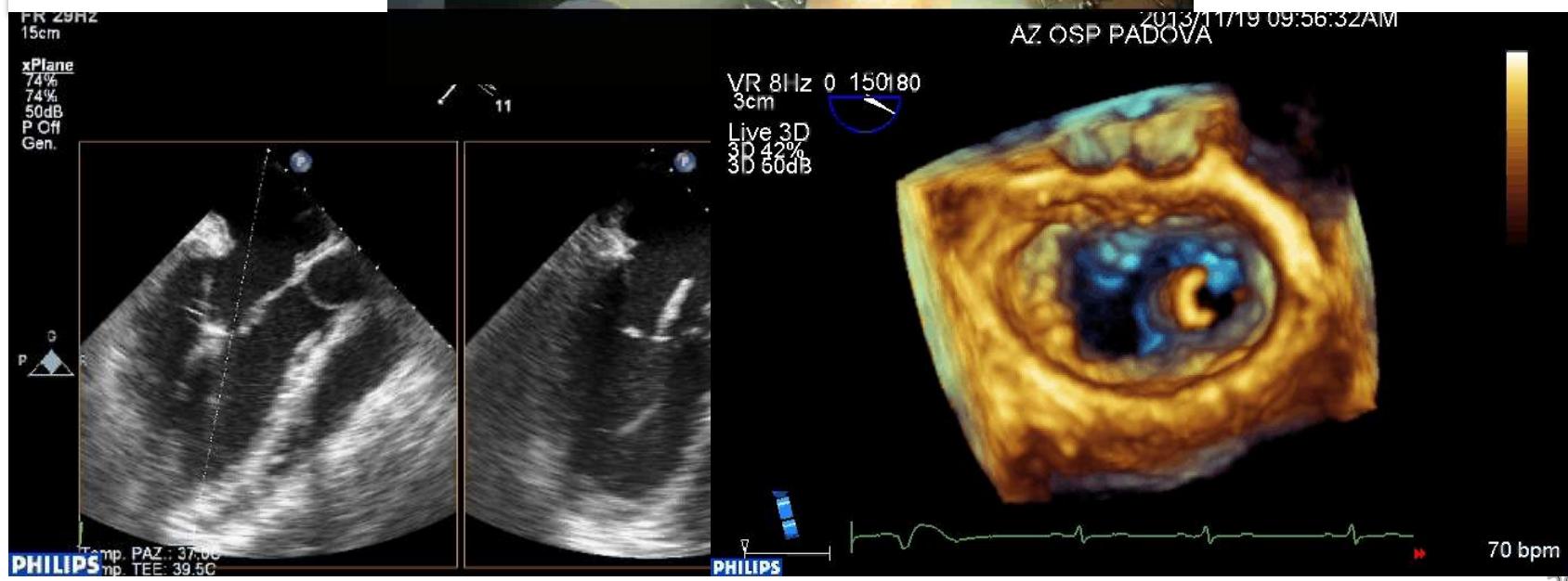
Neochord

Ring

TAMI

Conclusion

Implantation Technique



Intro



Clip

Neochord

Ring

TAMI

Conclusion



Intro

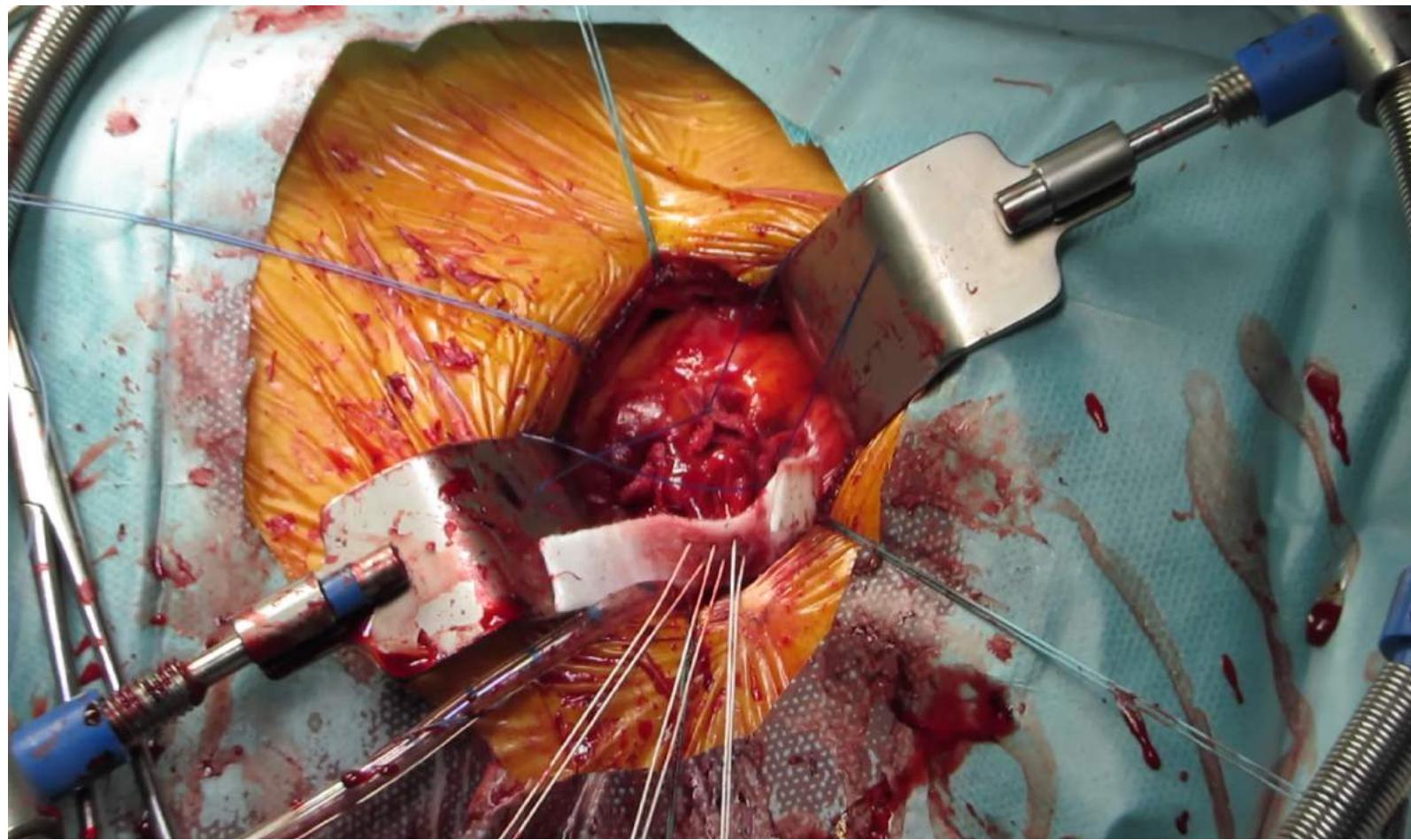
Clip

Neochord

Ring

TAMI

Conclusion



Intro



What are the forces ? Which Tension is most suitable ?

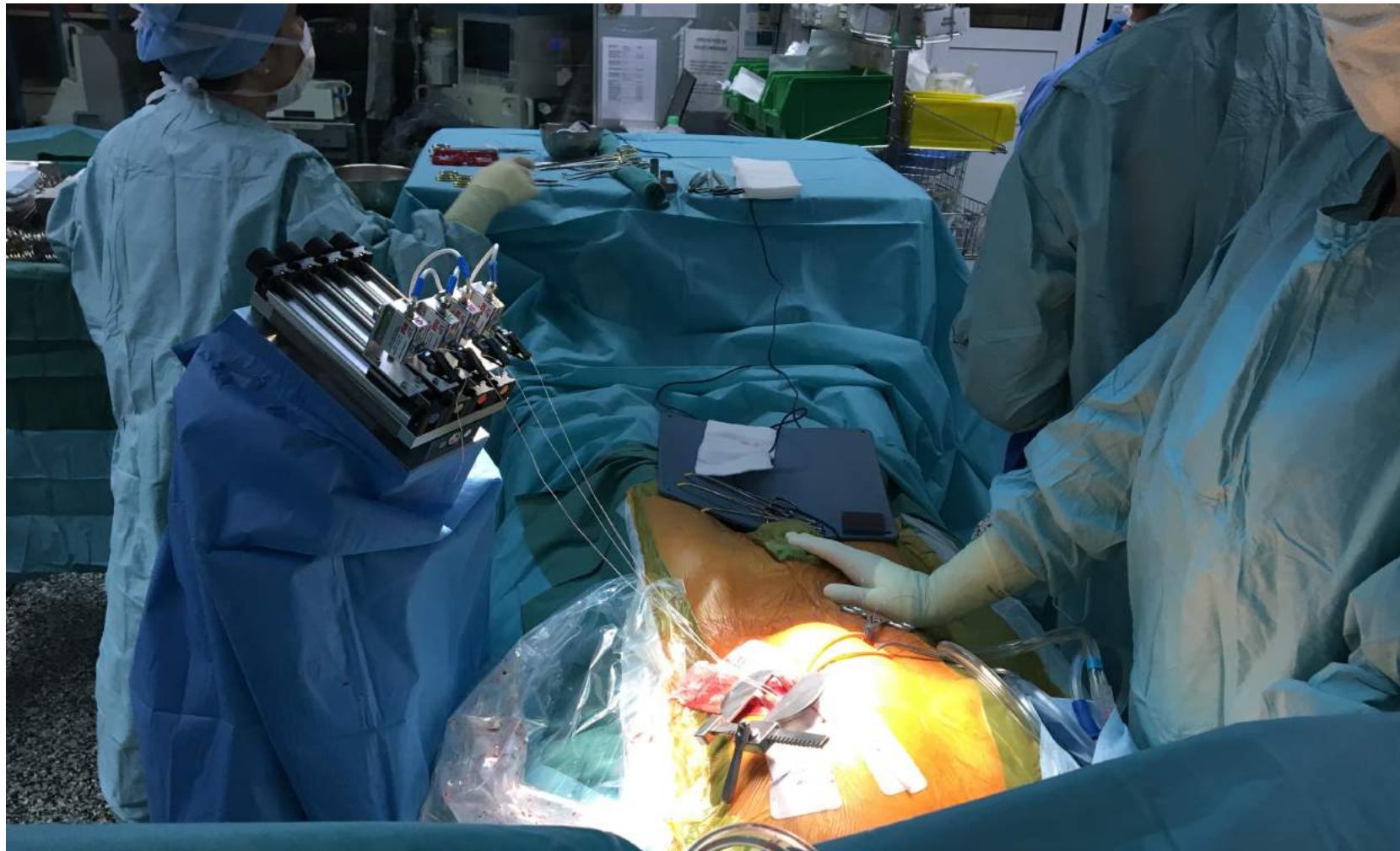
Clip

Neochord

Ring

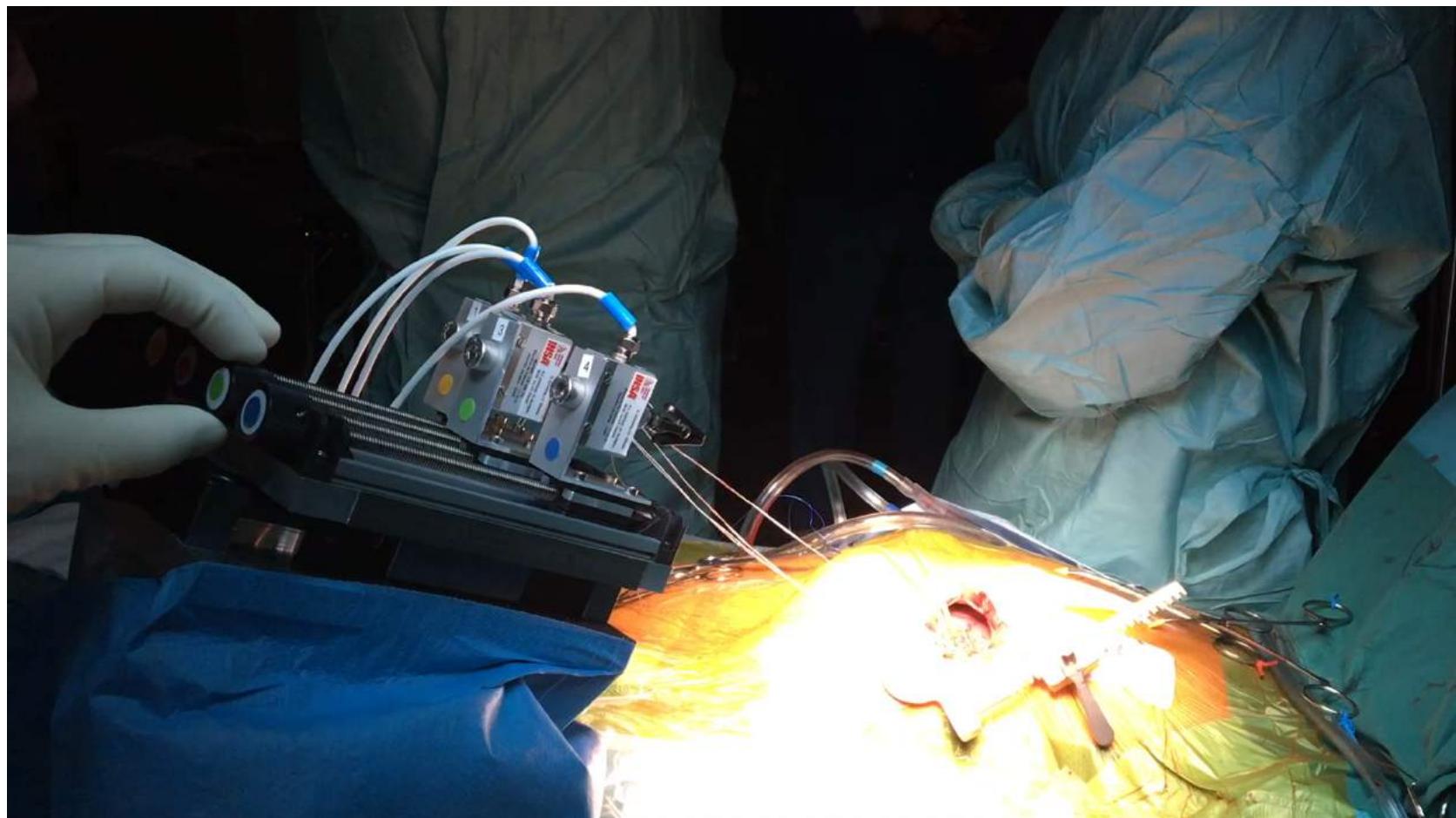
TAMI

Conclusion





What are the forces ? Which Tension is most suitable ?



Intro



Clip

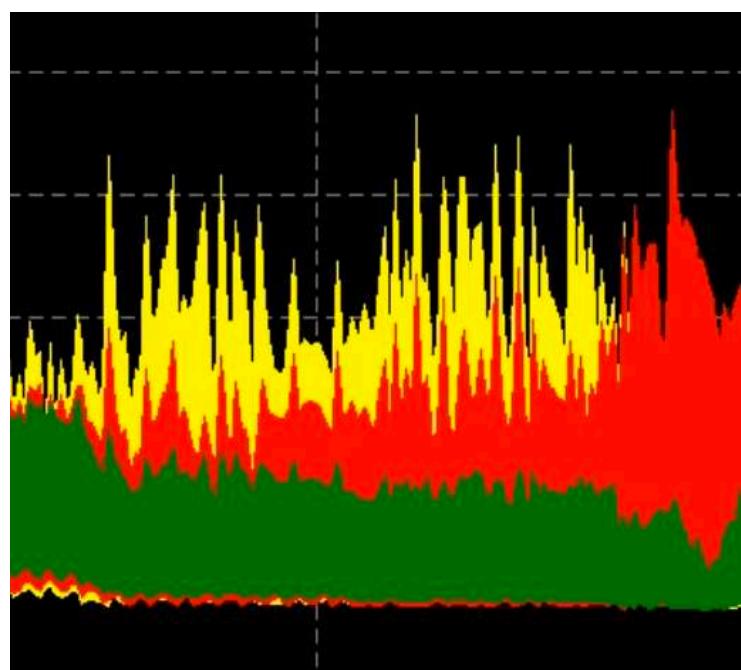
Neochord

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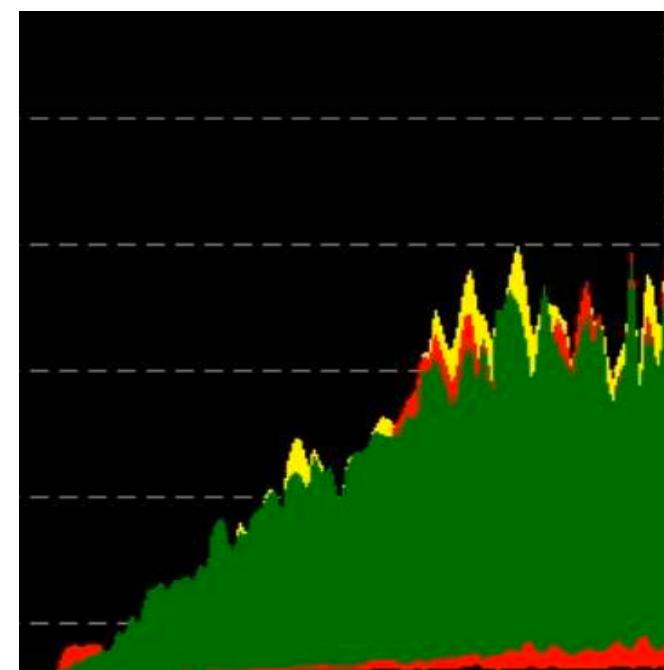
Conclusion

Manual Assessment



AI 1/PEAK-PEAK [N]	AI 2/PEAK-PEAK [N]	AI 3/PEAK-PEAK [N]
124	0.84	0.32
Sensor 1	Sensor 2	Sensor 3

Assessed Control



AI 1/PEAK-PEAK [N]	AI 2/PEAK-PEAK [N]	AI 3/PEAK-PEAK [N]
0.64	0.50	0.45
Sensor 1	Sensor 2	Sensor 3

Intro



Clip

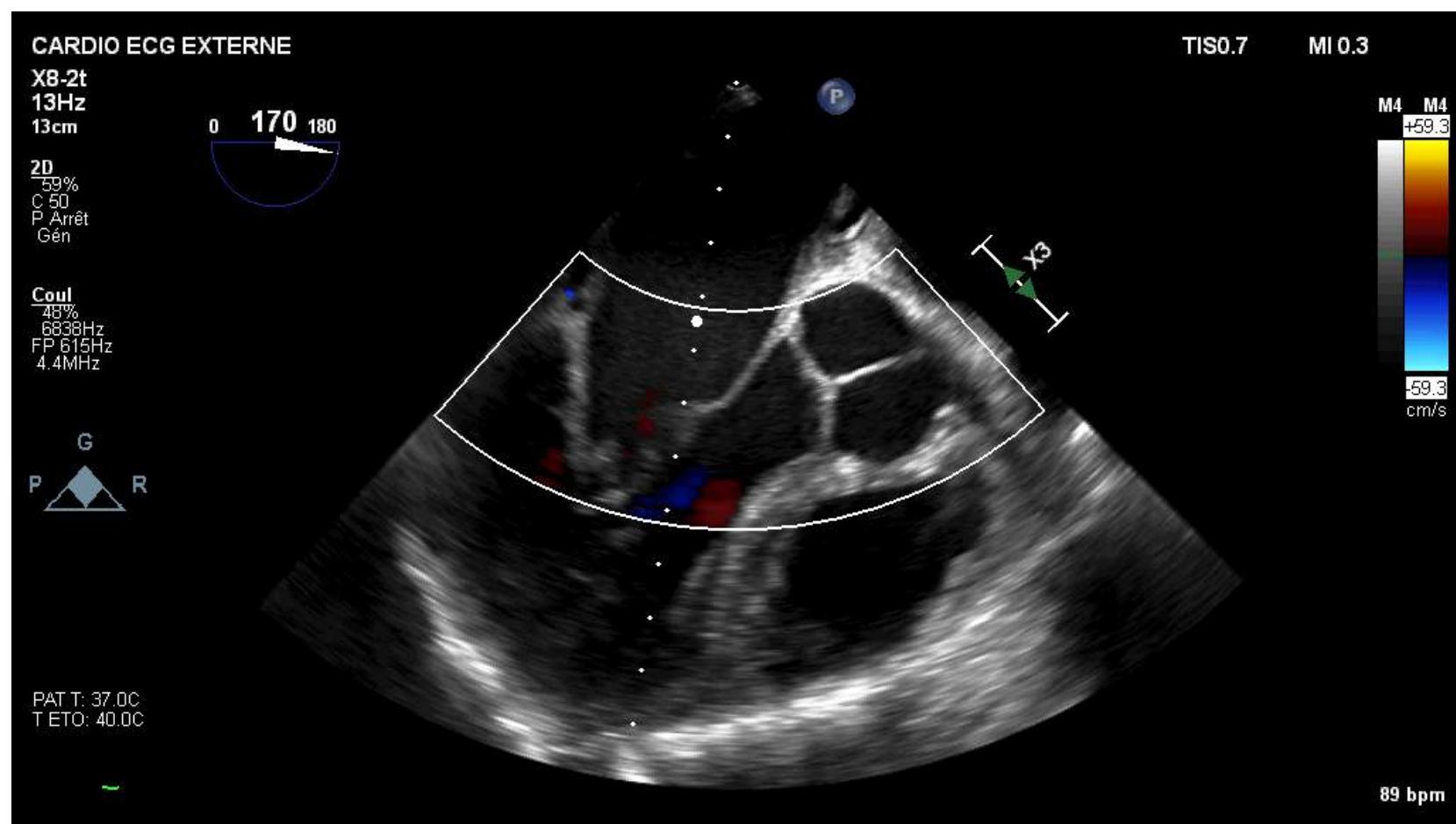
Neochord

Ring

TAMI

Conclusion

Final result → equivalent to standard Surgery

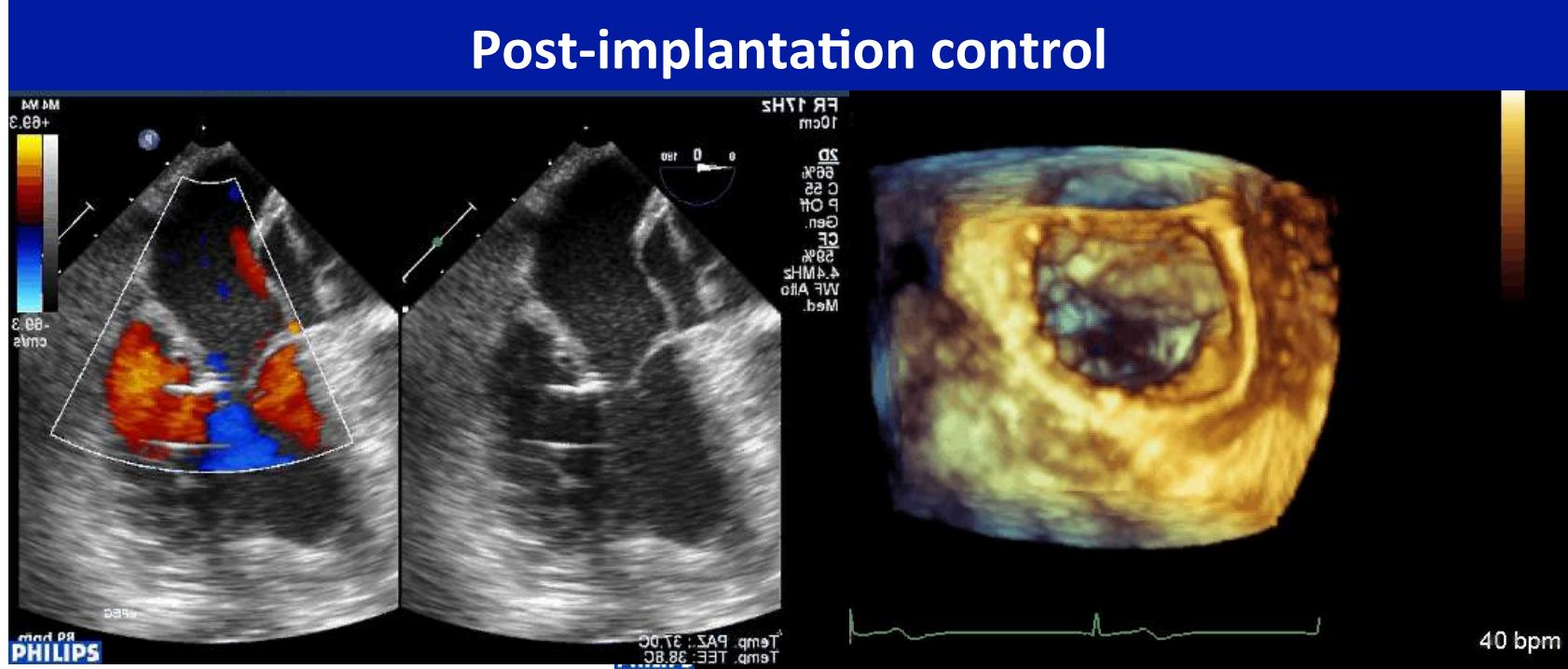


Intro



Clip

Post-implantation control



Neochord

Ring

TAMI

Conclusion

**92 patients***Dr Andrea COLLI – Padua*

Age (years)	65 (57-75)
Male	68 (73,9%)
Euroscore-II (%)	1,17 (0,7-1,9)
Previous Cardiac Surgery	3 (3,3%)
- NYHA I	10 (10,9%)
- NYHA II	42 (45,7%)
- NYHA III	39 (42,3%)
- NYHA IV	1 (1,1%)
MR grade	
- Absent/trace	0 (0%)
- Mild	0 (0%)
- Moderate	0 (0%)
- Severe	92 (100%)



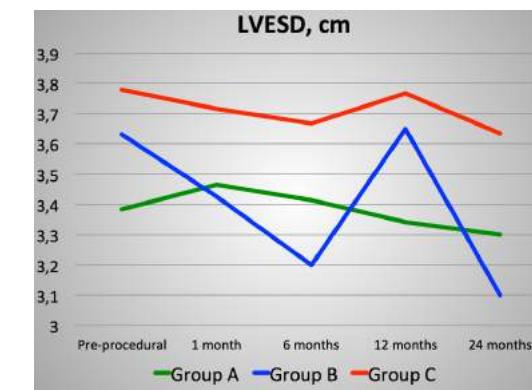
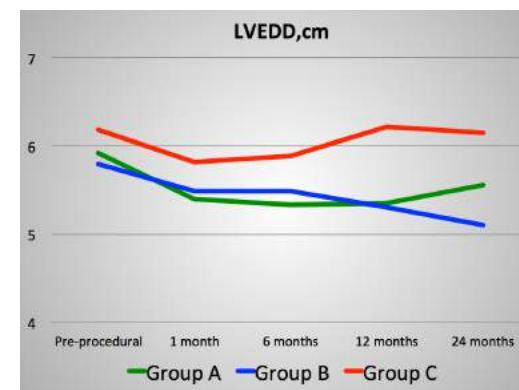
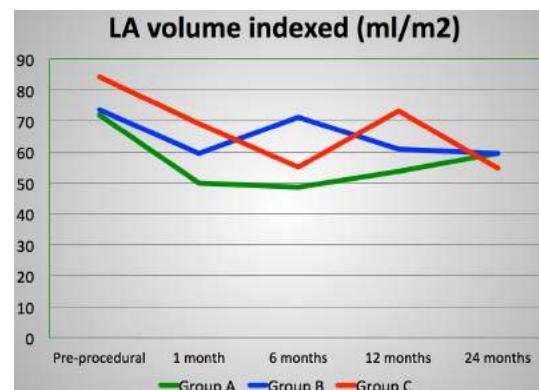
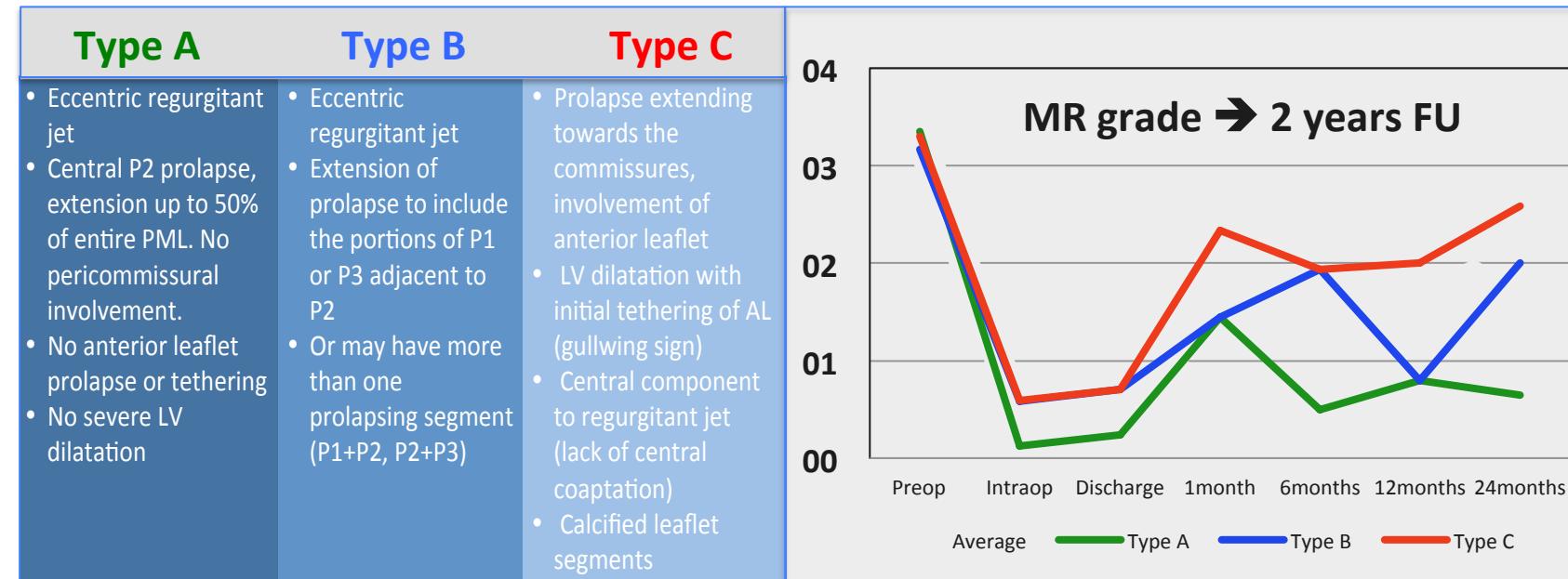
	Baseline Characteristics	Median (I-III Quartile) or N (%)
Anatomic MV type	<ul style="list-style-type: none"> - A - B 	32 (34,8%) 60 (65,2%)
Left ventricular ejection fraction (%)	<ul style="list-style-type: none"> - ≤ 30 - 31-55 - > 55 	62 (58-67) 0 (0%) 22 (23,9%) 70 (76,1%)
Left ventricular end diastolic volume (ml/m^2)	<ul style="list-style-type: none"> - < 70 - 70-100 - > 100 	81,0 (70,9-91,9) 20 (21,7%) 63 (68,4%) 9 (9,8%)
Pulmonary artery hypertension (mmHg)	<ul style="list-style-type: none"> - ≤ 25 - 26 – 35 - 36 – 45 - > 45 	31.5 (26,8-40) 21 (22,8%) 34 (36.9%) 14 (15,2%) 19 (20.7%)



Operative Characteristics

Median (I-III Quartile) or N (%)

Neochordae in place (n)	4 (3-4) 3 (3,2%) 26 (28,3%) 45 (48,9%) 13 (14,1%) 4 (4,3%) 1 (1,1%)
Conversion to conventional surgery	1 (1,1%)
Procedural ECMO support	2 (2,2%)
Procedural IABP support	1 (1.1%)
Access site complications	0 (0.0%)
Ventricular fibrillation	1 (1,1%)
Operative time (min)	130 (116-155)



Intro

Clip

Neochord

Ring

TAMI

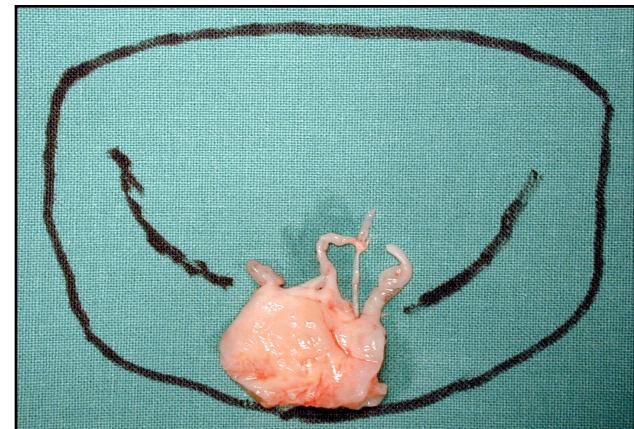
Conclusion



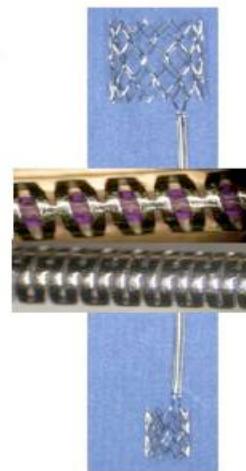
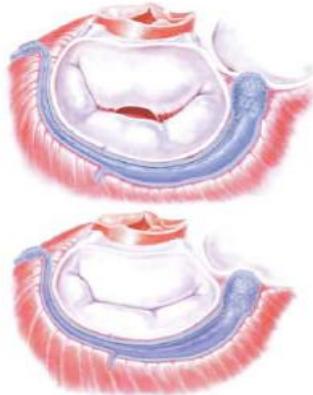
1) Annuloplasty



2) Leaflet repair

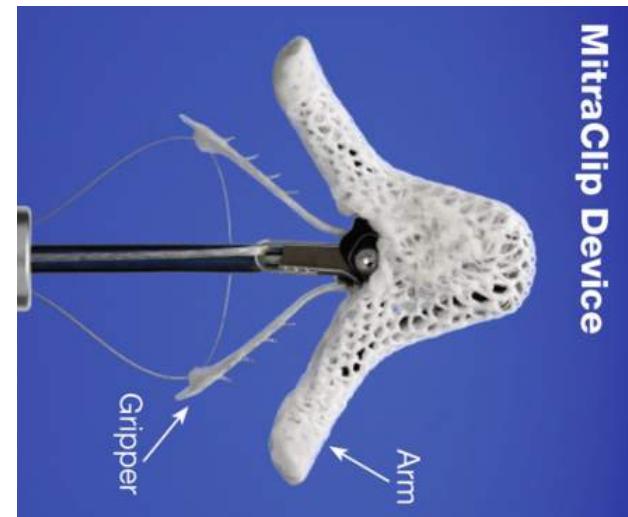


The MONARC system
Delayed Release-*in situ*



Webb et al Circulation 113:851-855, 2006

MitraClip Device



Intro



INDIRECTE Annuloplasty « Carillon »

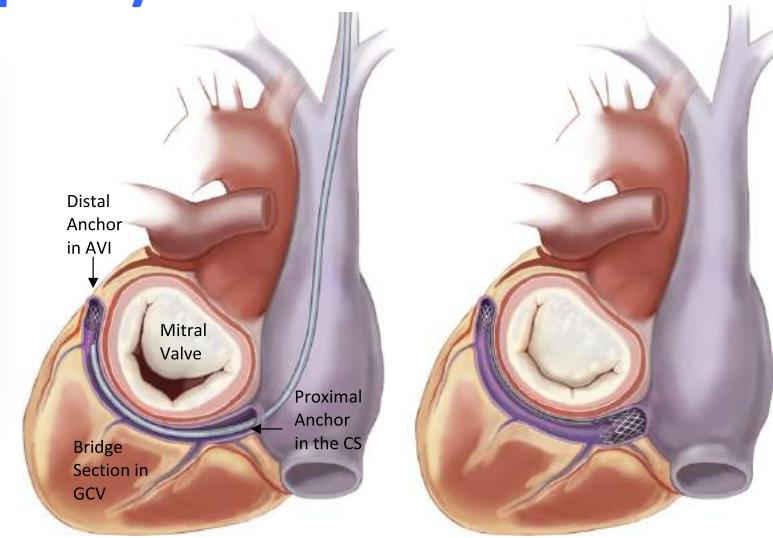
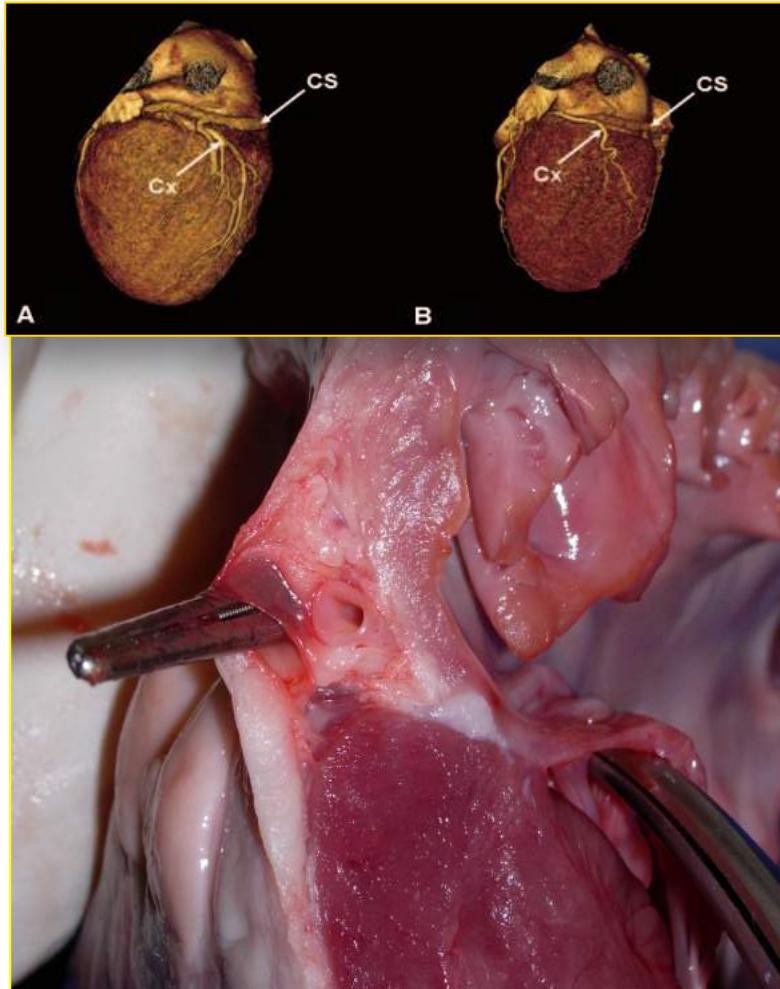
Clip

Neochord

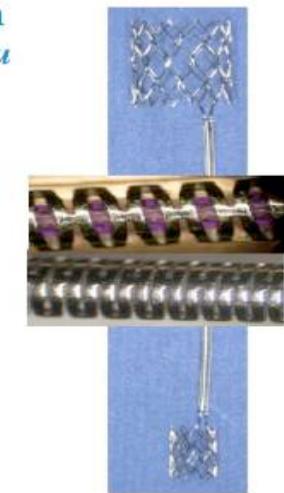
Ring

TAMI

Conclusion



The MONARC system
Delayed Release-*in situ*



Webb et al Circulation 113:851-855, 2006

Intro



Clip

Neochord

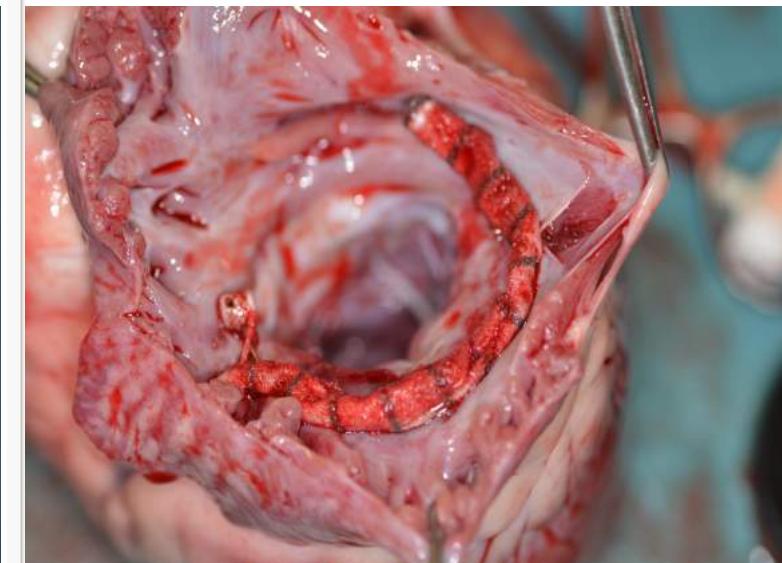
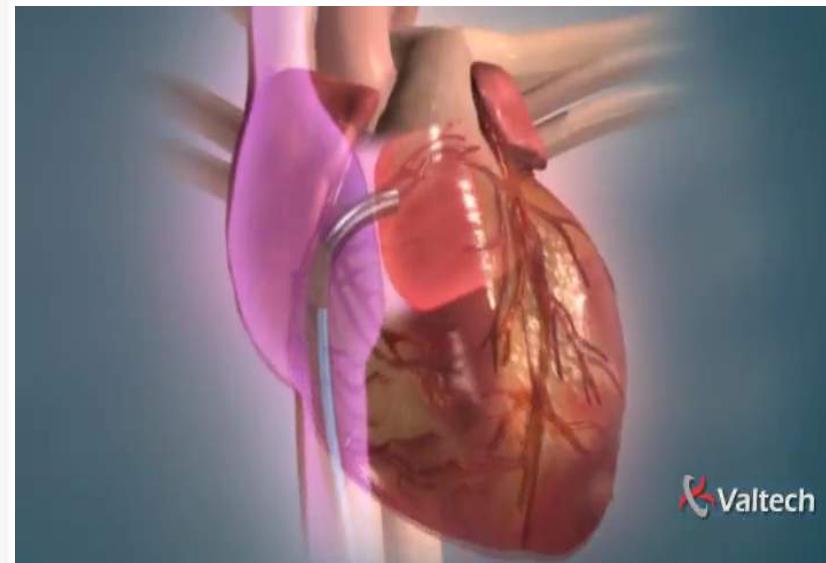
Ring

TAMI

Conclusion

Direct Annuloplasty “CARDIOBAND”

First in man in 2013



Valtech

Intro



Clip

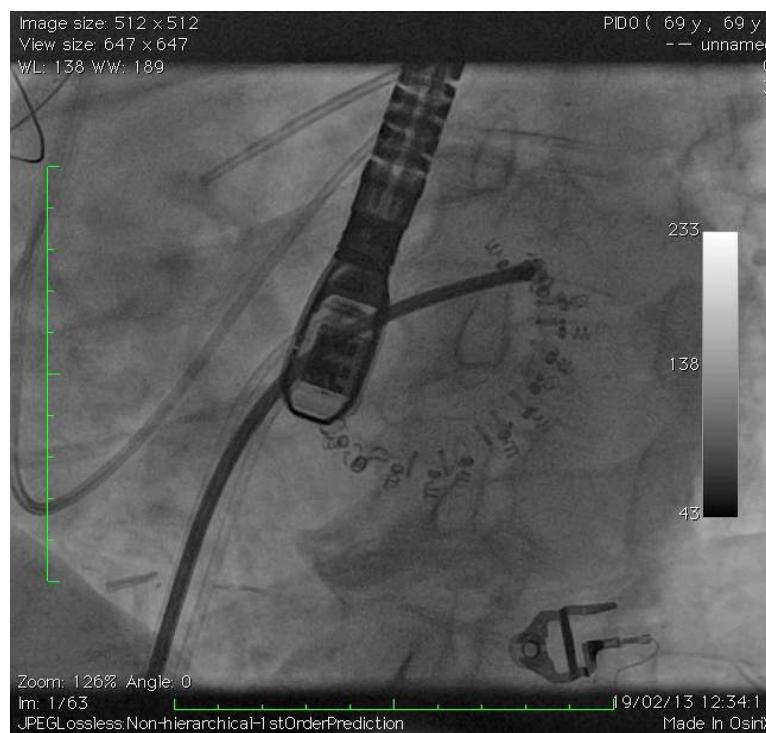
Neochord

Ring

TAMI

Conclusion

Valtech Cardio – CARDIOBAND

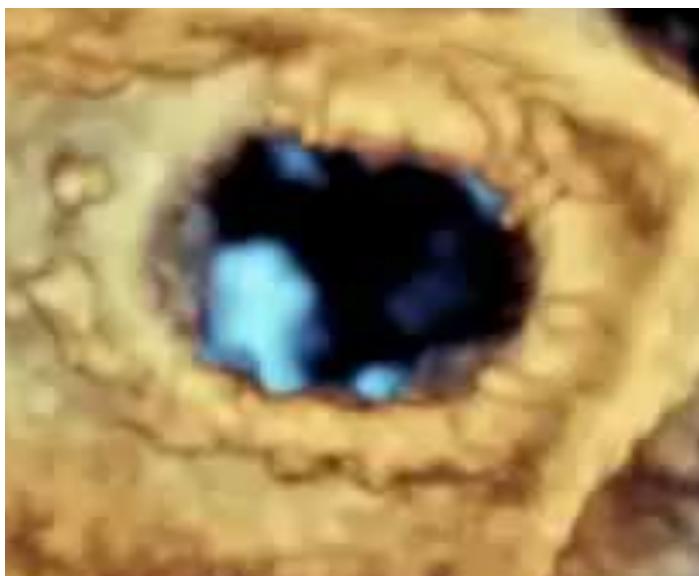


Intro



Clip

Which is surgical ? Percutaneous ?

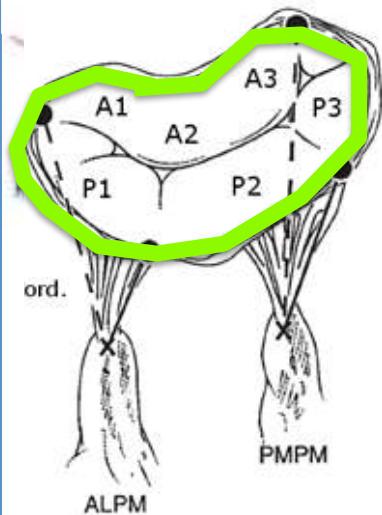


Surgical Ring



Cardioband

Conclusion



Cardioband, a transcatheter surgical-like direct mitral valve annuloplasty system: early results of the feasibility trial

Francesco Maisano^{1*}, Maurizio Taramasso¹, Georg Nickenig²,

European Heart Journal
2016

31 patients, IM fonctionnelles

- 100% de succès d'implantation
- Mortalité 30 jours 5%
- Mortalité à 7 mois 9,7%

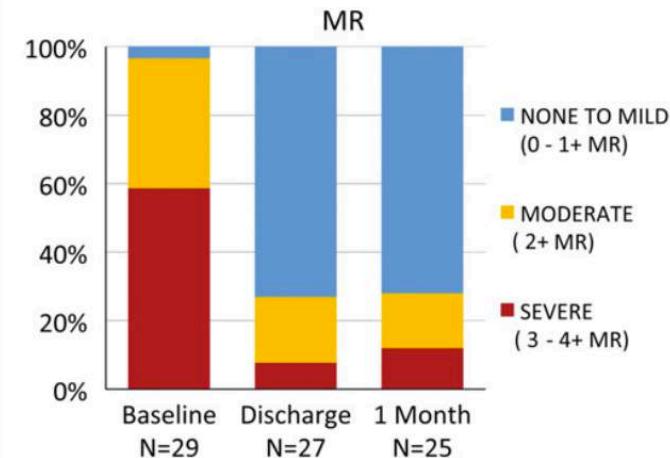
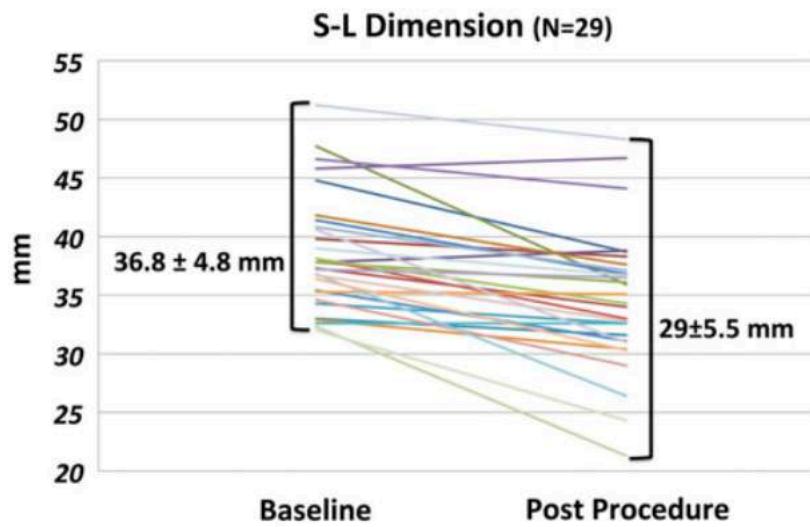


Figure 6 Mitral regurgitation reduction by transoesophageal echocardiography at baseline ($N = 29$) discharge ($N = 27$) and 1-month follow-up ($N = 25$) for the first 31 patients (core-lab assessment). Twenty-seven patients were analysed at discharge; two patients died prior to discharge and the echo results were uncertain by core-lab for two patients. Twenty-five of the 31 patients were analysed at 1-month follow-up; two died prior to discharge, one withdrew prior to 1-month follow-up, the echo results were uncertain for two patients. One patient had mild MR measured by transoesophageal echocardiography at baseline, but had moderate mitral regurgitation as determined by transoesophageal echocardiography and was therefore included in the study.

Intro

Clip

Neochord

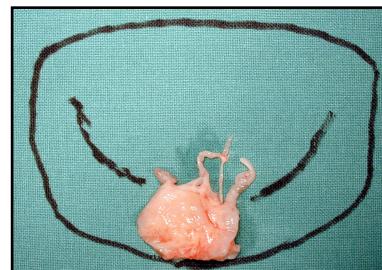
Ring

TAMI

Conclusion



Surgical MV Repair



+



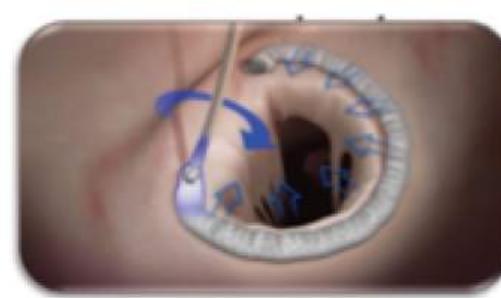
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Carpentier French Correction

Percutaneous Mitral Plasty techniques



+

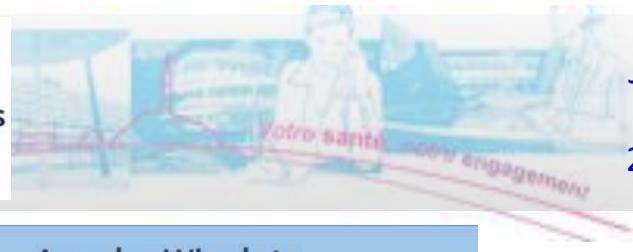


=

Fully percutaneous Mitra valve repair

Transcatheter Mitral Valve Replacement

Insights From Early Clinical Experience and Future Challenges



Ander Regueiro, MD,^a Juan F. Granada, MD,^b François Dagenais, MD,^a Josep Rodés-Cabau, MD^a

Intro

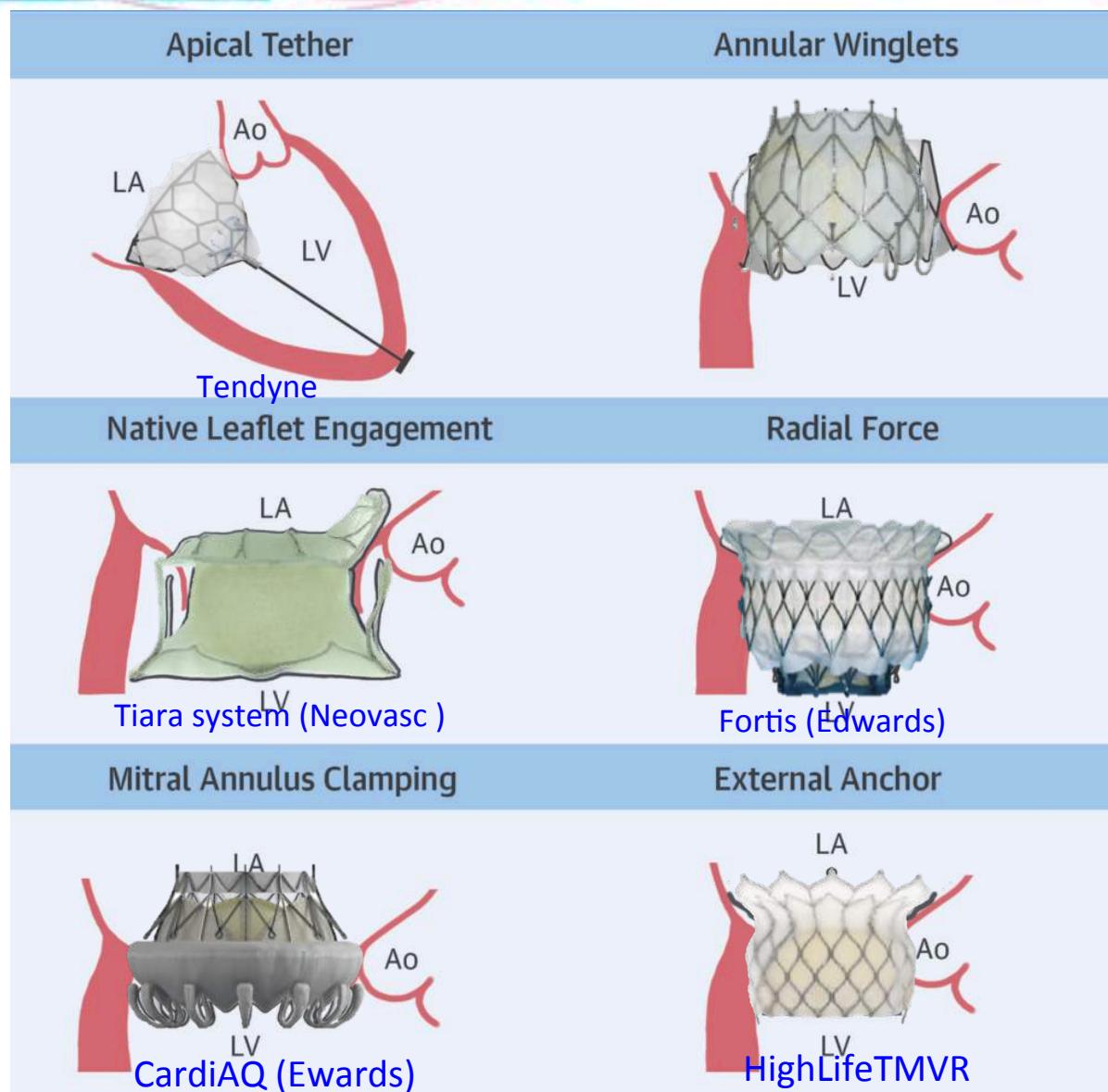
Clip

Neochord

Ring

TAMI

Conclusion



Intro



Valve in MAC

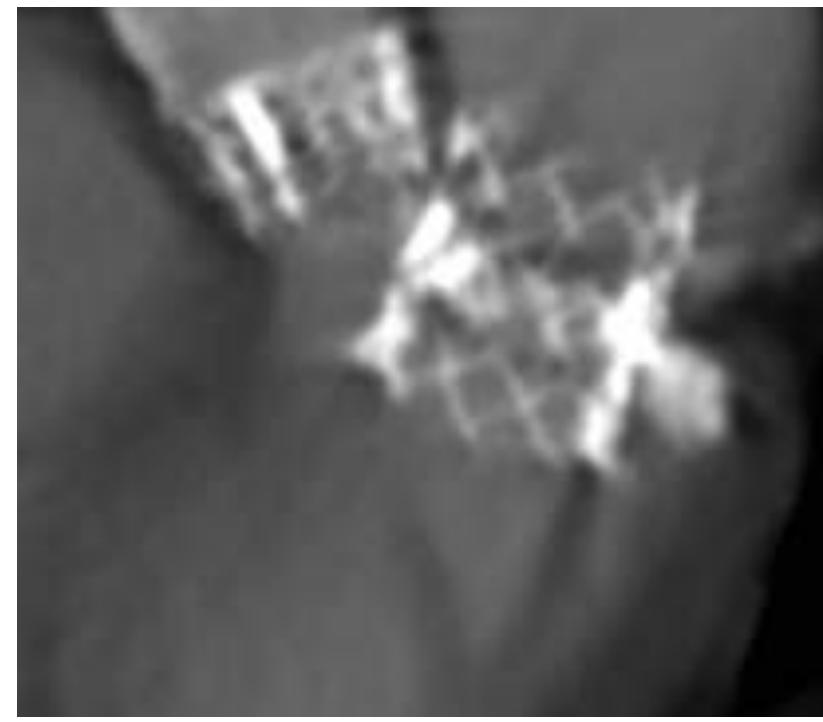
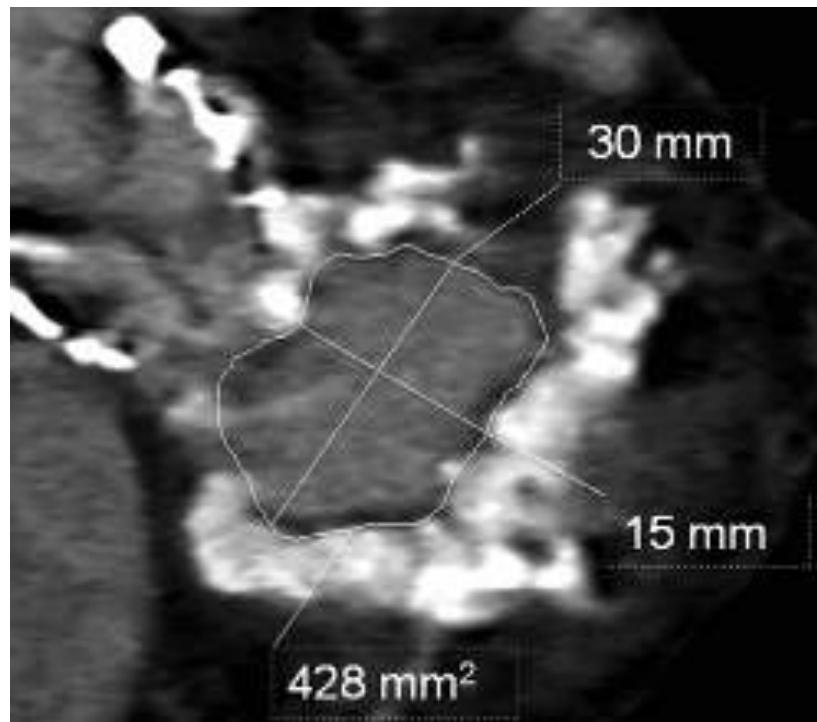
Clip

Neochord

Ring

TAMI

Conclusion

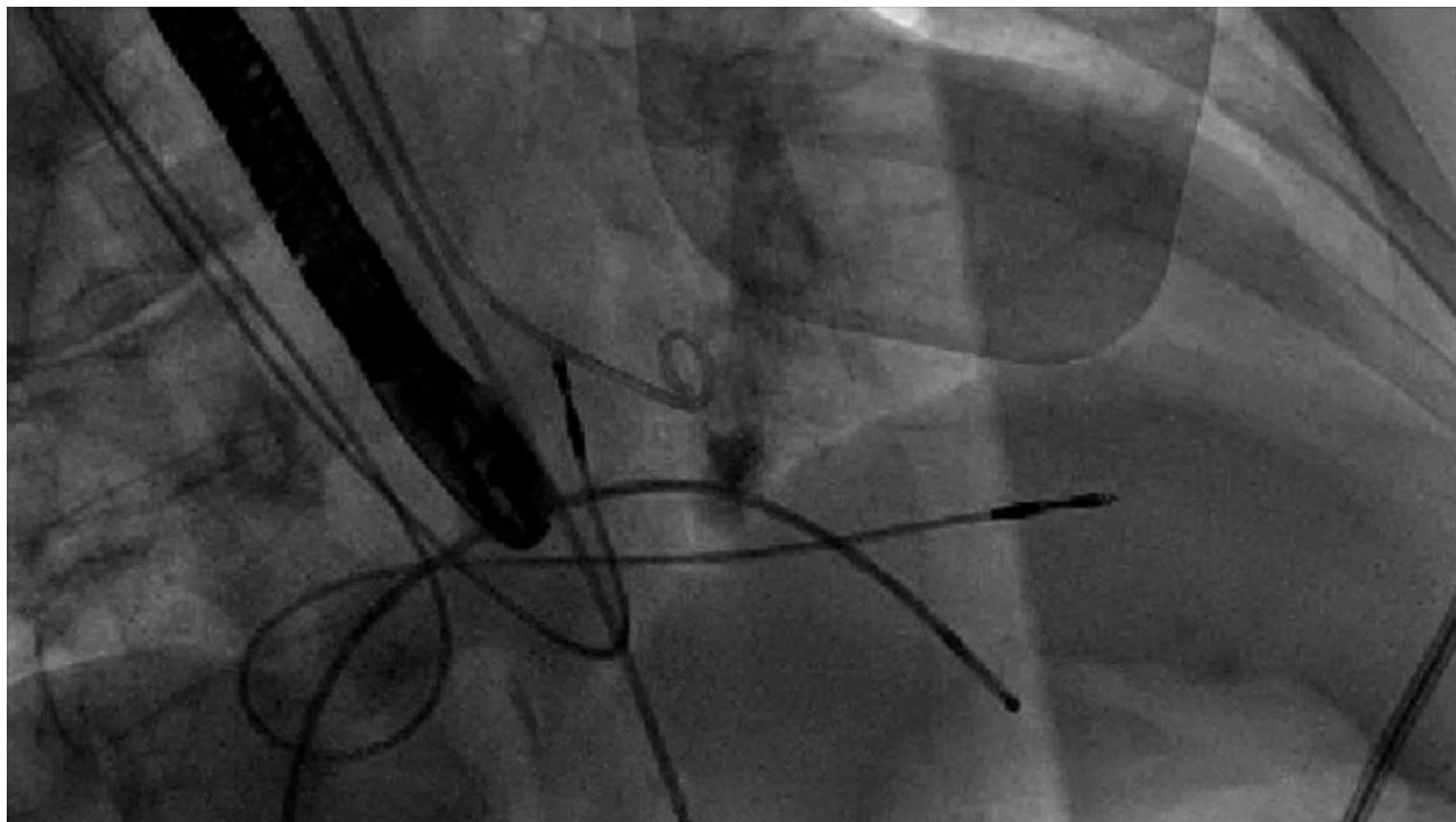


Intro



Clip

Valve in MAC



Conclusion

Intro



Clip

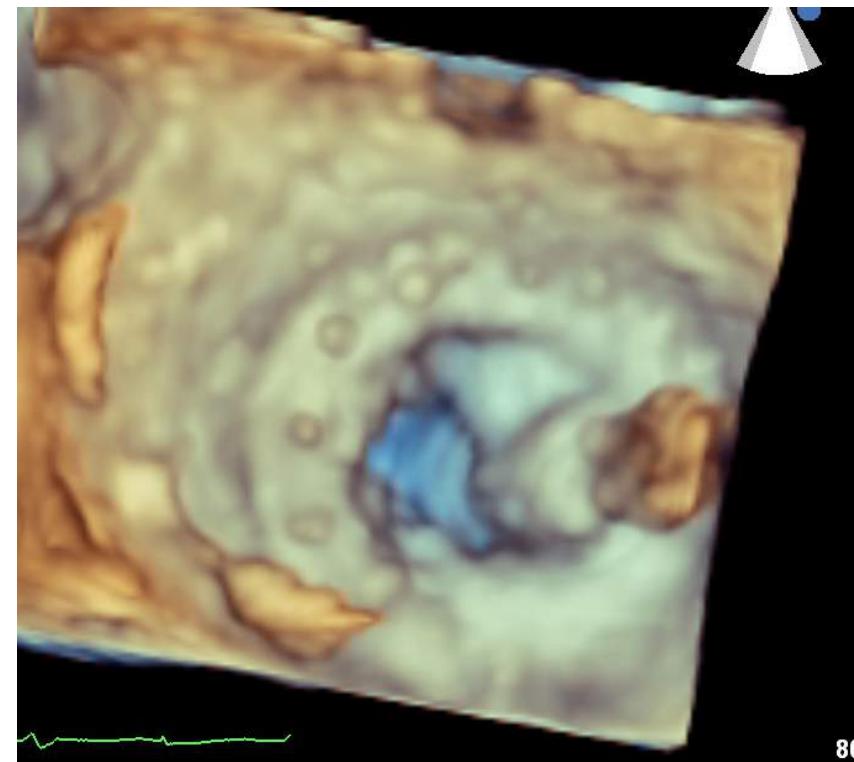
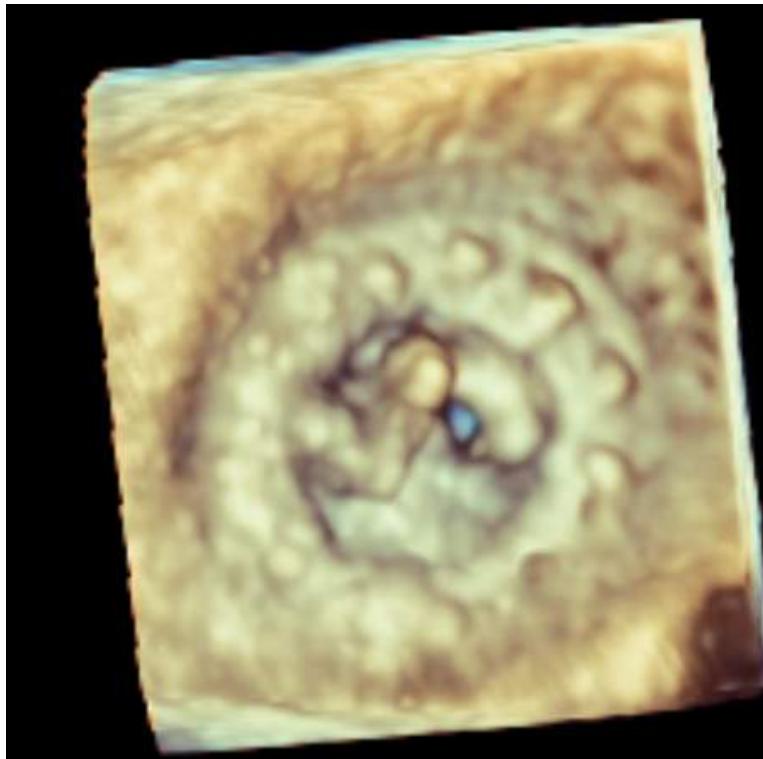
Neochord

Ring

TAMI

Conclusion

Valve in Valve

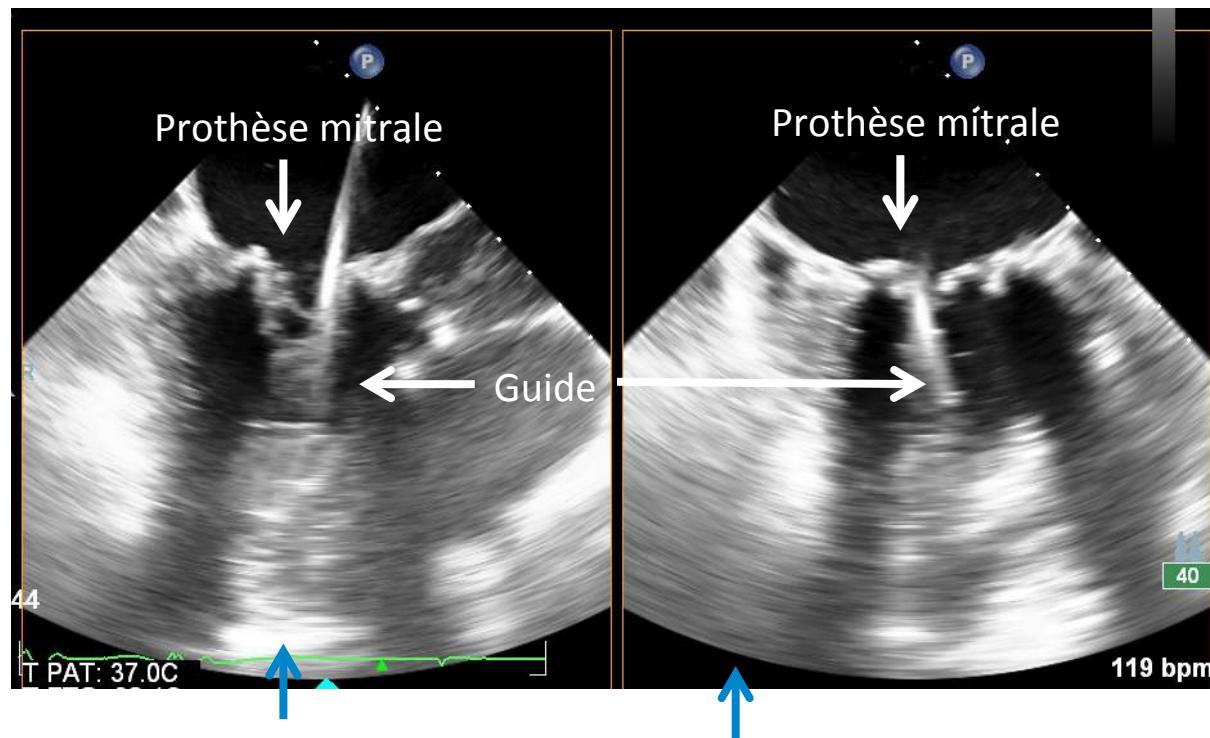


80

51



Guidage échographique de l'implantation de la prothèse



Vue en biplan de la progression du guide à partir de l'apex du ventricule gauche (flèche bleue)

Intro

Clip

Neochord

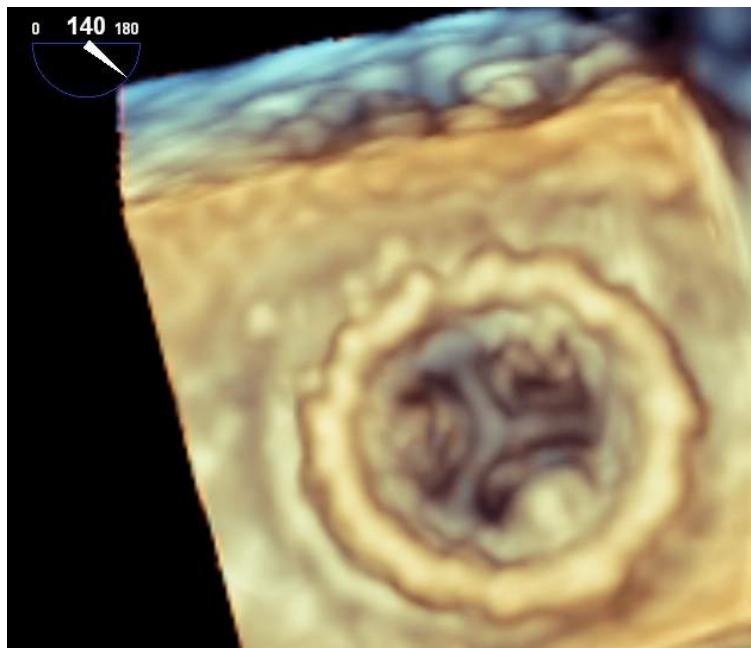
Ring

TAMI

Conclusion



Valve in Valve



Systoly



Diastoly

Intro

Clip

Neochord

Ring

TAMI

Conclusion

Transcatheter Mitral Valve Replacement

Insights From Early Clinical Experience and Future Challenges



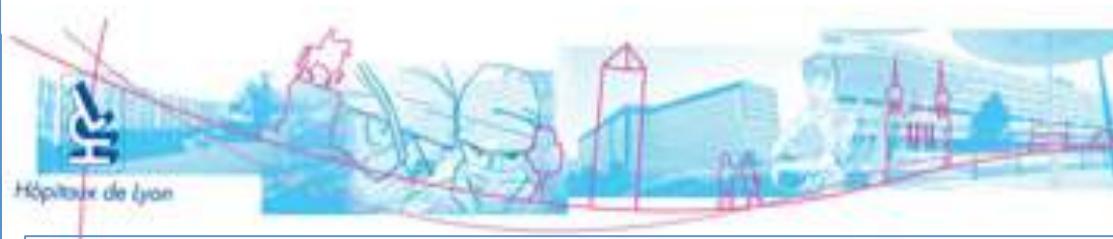
Ander Regueiro, MD,^a Juan F. Granada, MD,^b François Dagenais, MD,^a Josep Rodés-Cabau, MD^a

TABLE 3 TMVR System Preliminary Clinical, Procedural, and Follow-Up Features

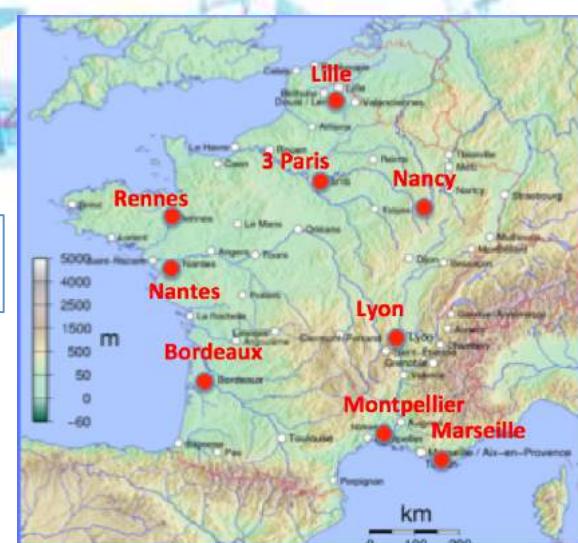
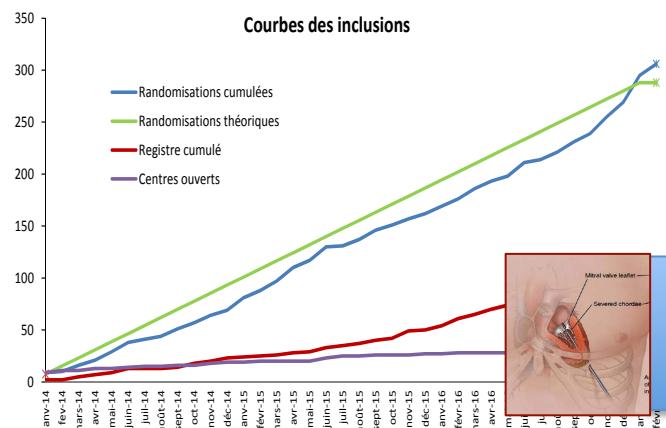
	CardiAQ-Edwards (N = 13)	Intrepid TMVR (N = 27)	Fortis* (N = 13)	Neovasc Tiara (N = 19)	Tendyne† (N = 30)	Caisson (N = 5)	HighLife (N = 6)
Baseline characteristics							
Age, yrs	NA	74 (58-90)	71 ± 8	73 (39-89)	75.9 (55-91)	77.4 (70-91)	69 (57-79)
Female	2/13 (15.4)	9/27 (33.3)	3/13 (23.1)	6/19 (31.6)	5/30 (16.7)	3/5 (60.0)	2/6 (33.3)
STS PROM score	NA	6.2 (1.0-23.3)	7.2 ± 3.6	10.7 (2.09-47.7)	7.3 (2.0-16.0)	8.8 (5-10)	3.3 (2.5-4.9)
NYHA functional class ≥III	NA	23/27 (85.3)	13/13 (100)	19/19 (100)	16/30 (53)	5/5 (100)	6/6 (100)
LVEF, %	40 (20-72)	NA	34	34 (15-65)	47.1 ± 9.2	42.6 (28-58)	33.7 (20-50)
<30%	NA	5/27 (18.5)	NA	5/19 (26)	3/29 (10.3)	1/5 (20.0)	1/6 (16.7)
30%-49%	NA	14/27 (51.8)	NA	13/19 (68)	14/29 (48.3)	2/5 (40.0)	4/6 (66.7)
≥50%	NA	8/27 (29.6)	NA	1/19 (5)	12/29 (41.4)	2/5 (40.0)	1/6 (16.7)
Ischemic/functional MR	9/13 (69.2)	21/27 (77.8)	12/13 (92.3)	12/19 (63.2)	23/30 (76.7)	3/5 (60.0)	3/6 (50.0)
Procedural and 30-day data							
Technical success	12/13 (92.3)	24/26 (92.3)‡	10/13 (76.9)	16/19 (84.2)	28/30 (93.3)	4/5 (80.0)	5/6 (83.3)
Valve dislocation/embolization	NA	NA	2/15 (15.4)	3/19 (15.8)	0/30 (0.0)	0/5 (0.0)	0/5 (0.0)
Conversion to open-heart surgery	NA	NA	2/15 (15.4)	3/19 (15.8)	0/30 (0.0)	0/5 (0.0)	1/6 (16.7)
Post-procedural ≥ moderate MR	NA	0/26 (0.0)	0/9 (0.0)	NA	1/30 (3.3)	0/4 (0.0)	0/6 (0.0)
LVOT obstruction	NA	0/26 (0.0)	0/9 (0.0)	0/19 (0.0)	1/30 (3.3)	0/4 (0.0)	0/6 (0.0)
Procedural mortality	2/13 (15.4)	4/27 (14.8)	4/13 (30.8)§	0/19 (0.0)	0/30 (0.0)	0/5 (0.0)	1/6 (16.7)
30-day moderate or severe MR	NA	NA	NA	NA	0/26 (0.0)	0/3 (0.0)	0/4 (0.0)
All-cause 30-day mortality	7/13 (53.8)	6/25 (24.0)	5/13 (38.5)	3/19 (15.8)	1/30 (3.3)	1/4 (25.0)	2/6 (33.3)
Follow-up							
Follow-up, months	NA	8.1 (0-20.7)	6 (1-15)	NA	NA¶	3.4 (3-4)	4.1 (3-6)
MR ≥ moderate	NA	0/24 (0.0)	0/8 (0.0)	0/14 (0.0)	0/5 (0.0)	0/4 (0.0)	0/4 (0.0)
NYHA functional class ≥III	NA	2/18 (11.1)	2/8 (25.0)	NA	NA	0/3 (0.0)	0/4 (0.0)
Mortality	7/13 (53.8)	7/27 (25.9)	6/13 (46.2)	3/19 (15.8)	0/5 (0.0)	1/4 (25.0)	2/6 (33.3)

Values are mean (range), mean ± SD, or n/N (%). *In late 2015, Edwards Lifesciences stopped the FORTIS program. The valve is not currently available. †>50 implants up to June 2016; 32 early feasibility study implants, 5 compassionate use implants. Results of the first 30 early feasibility study cases are available (43). ¶In 1 patient, deployment was not attempted. §In-hospital mortality. ||Repeated echocardiography was performed in 26 of the 27 patients with a prosthesis in situ. ¶Follow-up data for longer than 30 days from 5 patients, 2 patients with follow-up for up to 6 months, and 3 patients with follow-up for up to 18 months.

LVEF = left ventricular ejection fraction; MR = mitral regurgitation; NYHA = New York Heart Association; STS PROM = Society of Thoracic Surgeons' perioperative mortality risk; other abbreviations as in Tables 1 and 2.

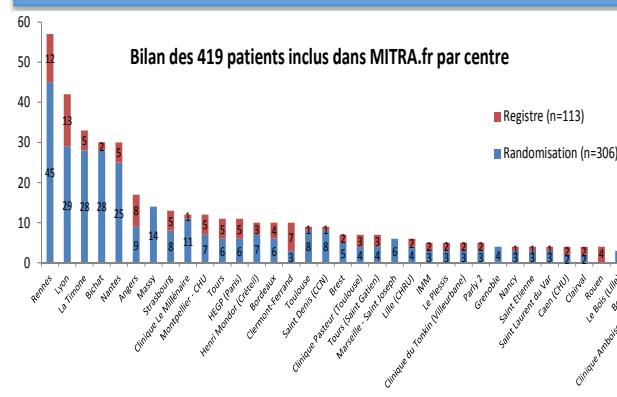


CONCLUSION → Prospective French Studies



PHRC 2015 *Mitrachord Primary MR / surg*

2017 2018 2019 2020



PHRC 2016 Primary MR High risk

2018 2019 2020

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2021



Reimbursement

Contraindication to Surgery