

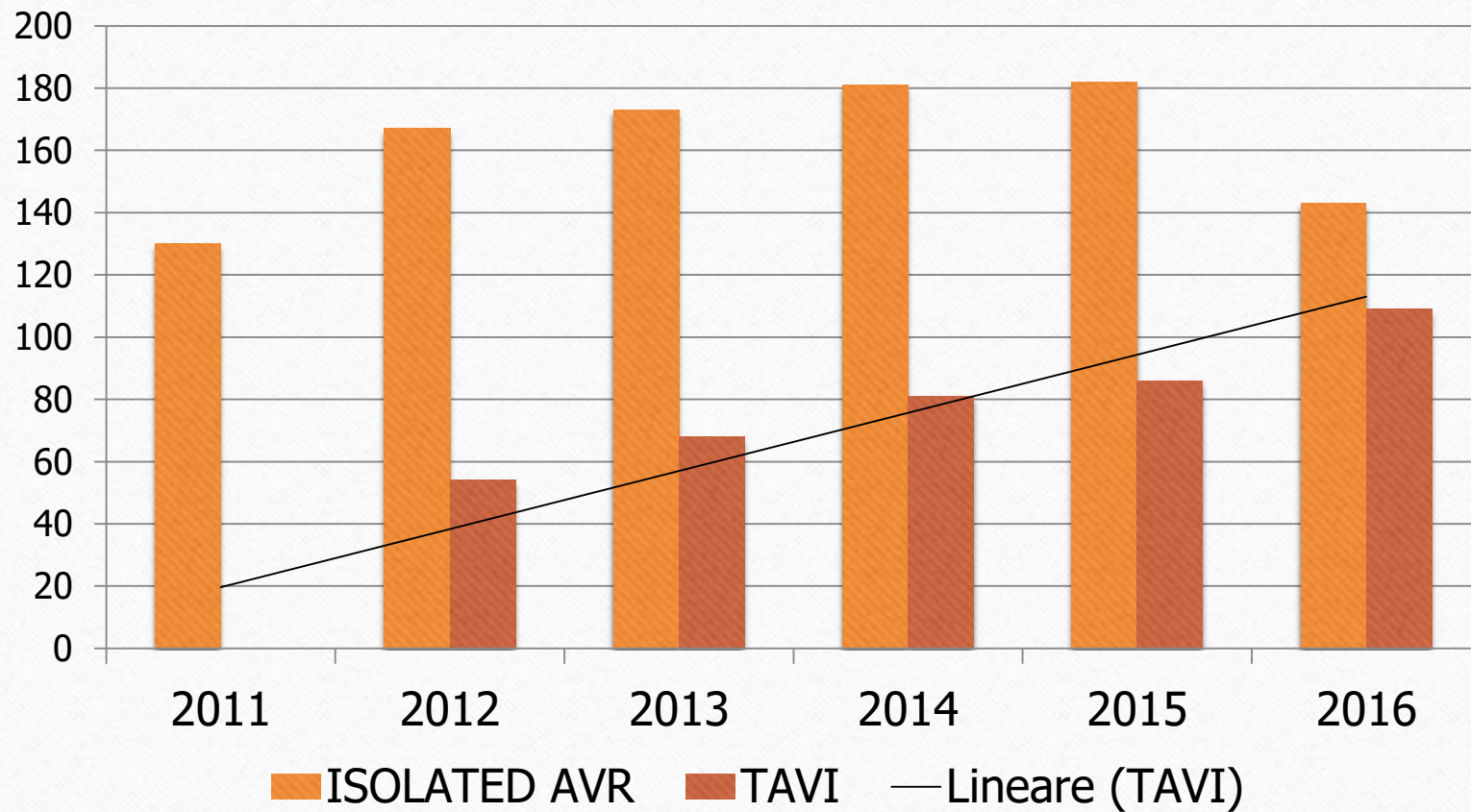
Neochord ed anelli percutanei: a che punto di sviluppo ed applicazione concreta?

Prof F Alamanni

Centro Cardiologico Monzino

Milano





Trends in aortic valve replacement in Germany in 2015: transcatheter versus isolated surgical aortic valve repair

Luise Gaede¹ · Johannes Blumenstein¹ · Won-Keun Kim² · Christoph Liebetrau² ·
Oliver Dörr³ · Holger Nef³ · Christian Hamm^{2,3} · Albrecht Elsässer⁴ ·
Helge Möllmann¹

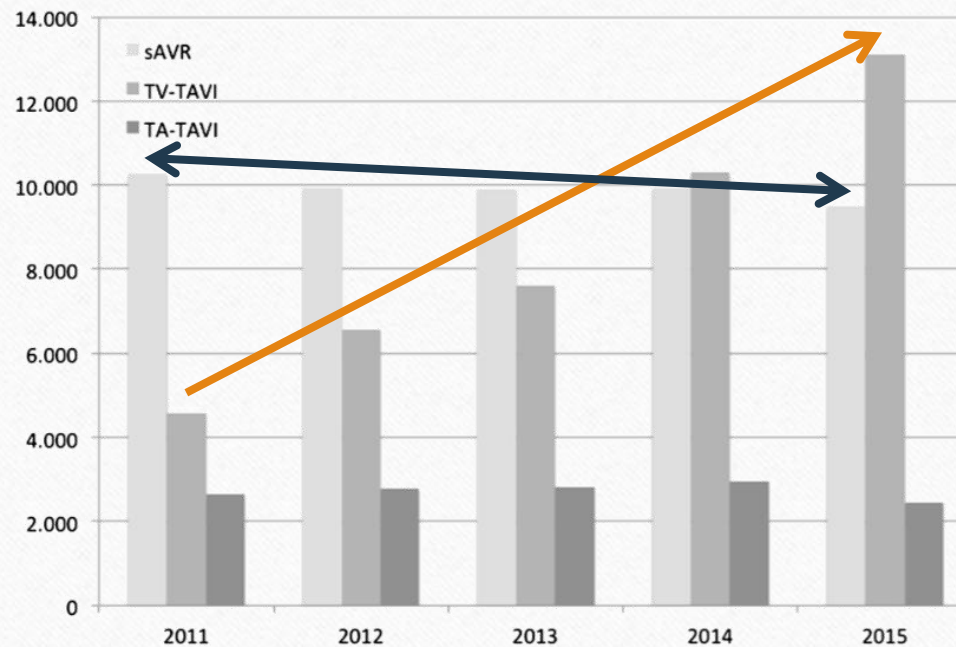
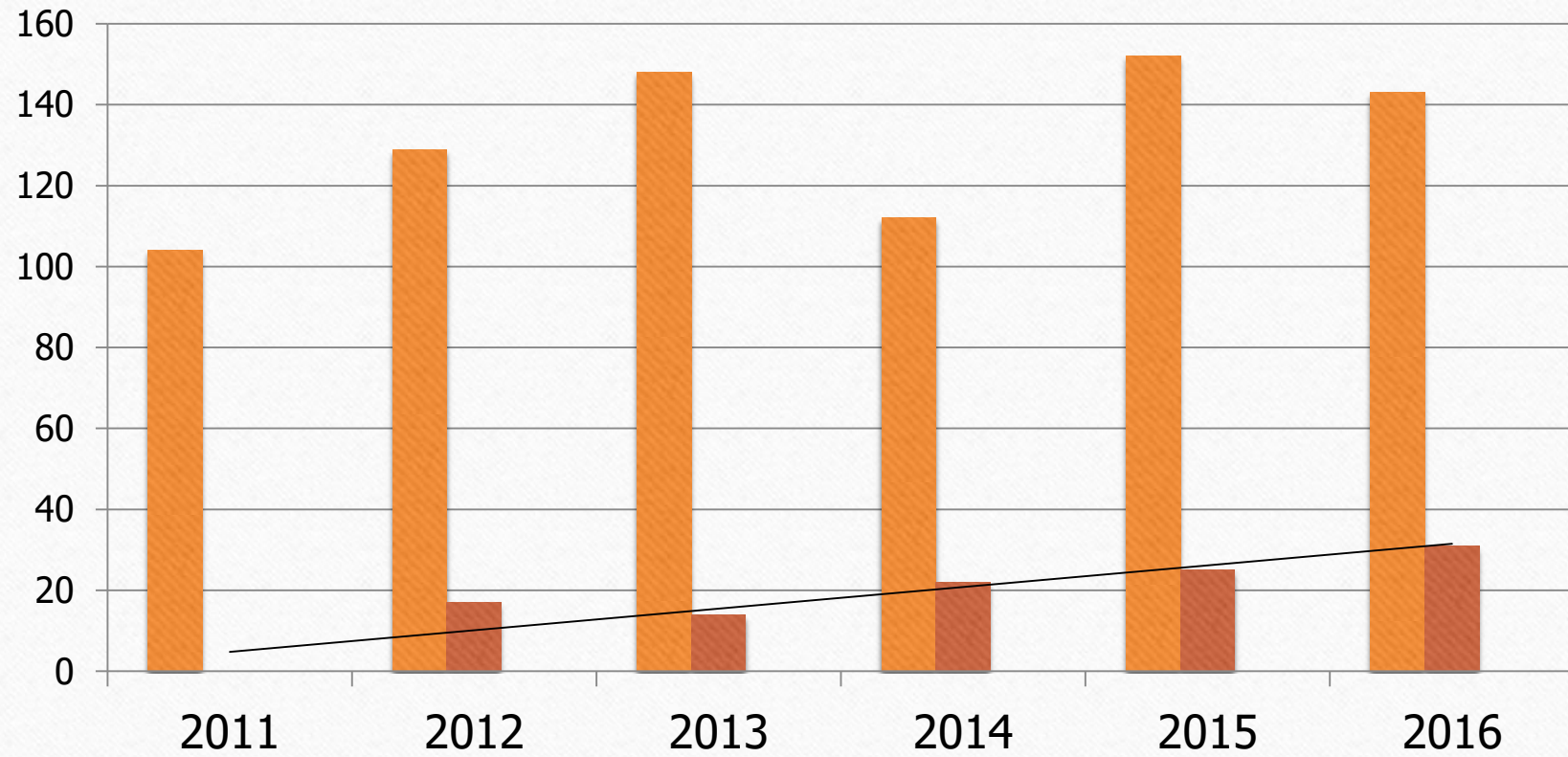


Fig. 1 Incidence of sAVR, TA-TAVI, and TV-TAVI for the years 2012–2015



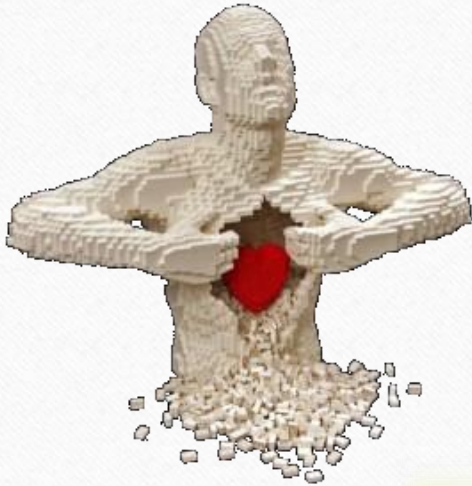
ISOLATED MV

MITRACLIP+NEOCHORD

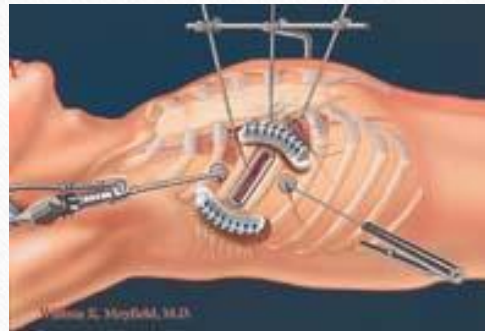
Lineare (MITRACLIP+NEOCHORD)

MITRAL VALVE SURGERY EVOLUTION

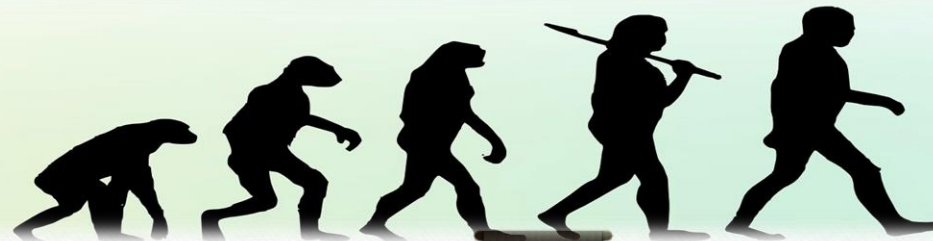
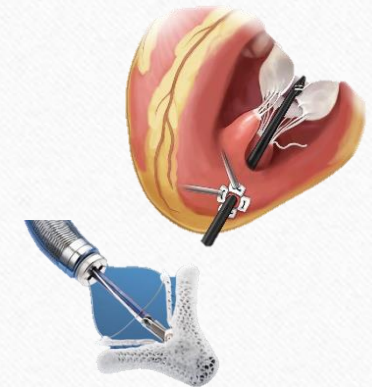
Open Heart Surgery



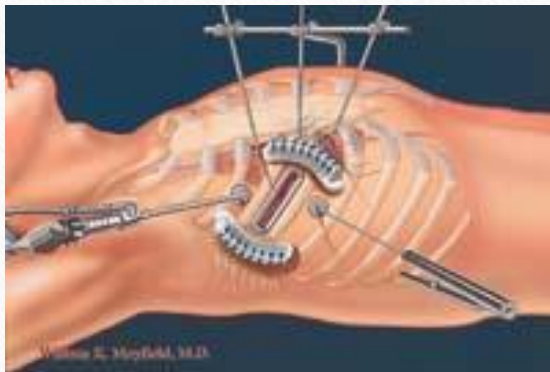
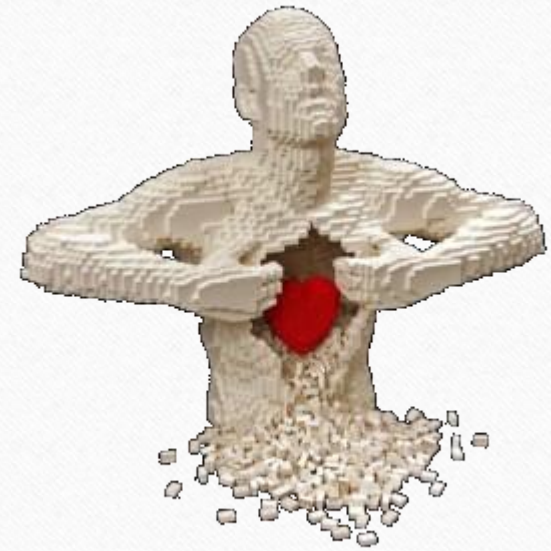
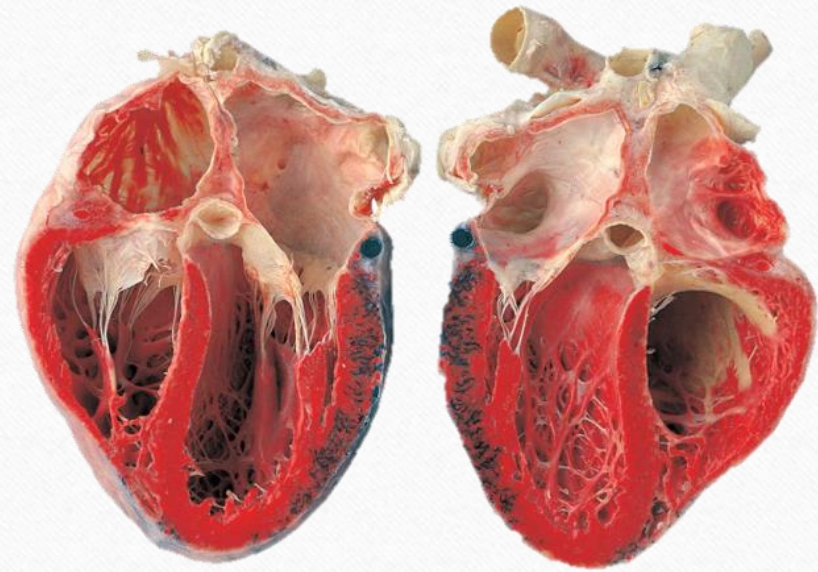
Minimally invasive Surgery



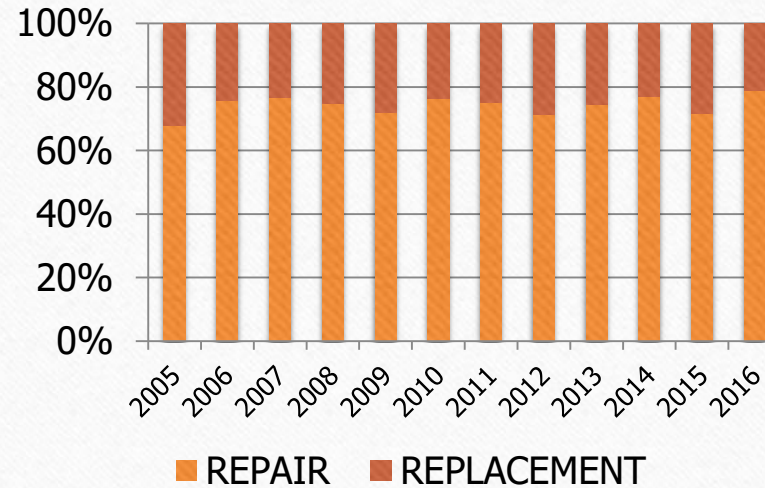
Beating Heart Surgery



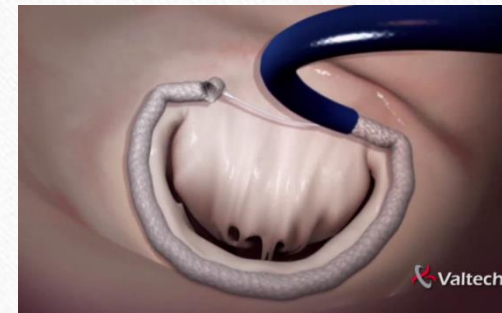
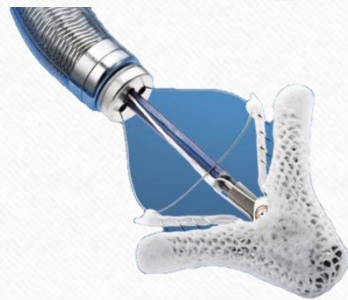
OPEN HEART



MITRAL VALVE



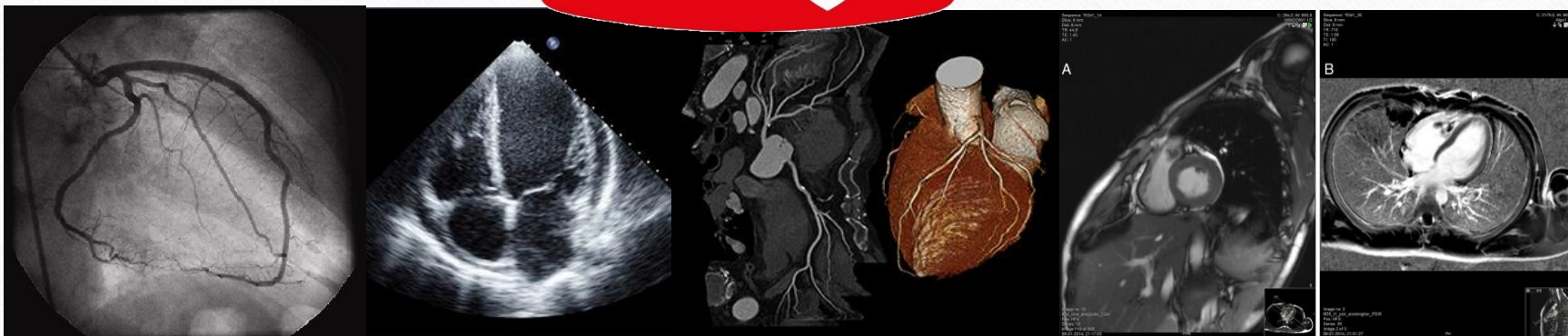
Beating and closed heart



CLOSED HEART



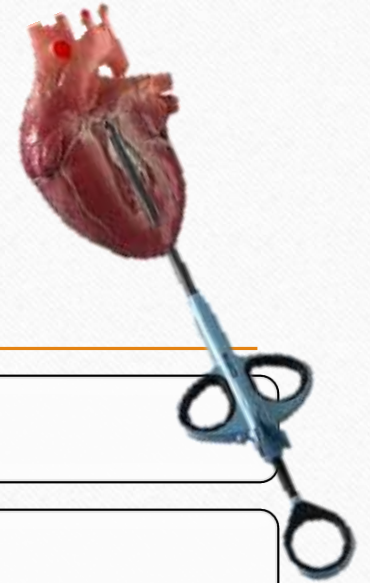
BEATING HEART



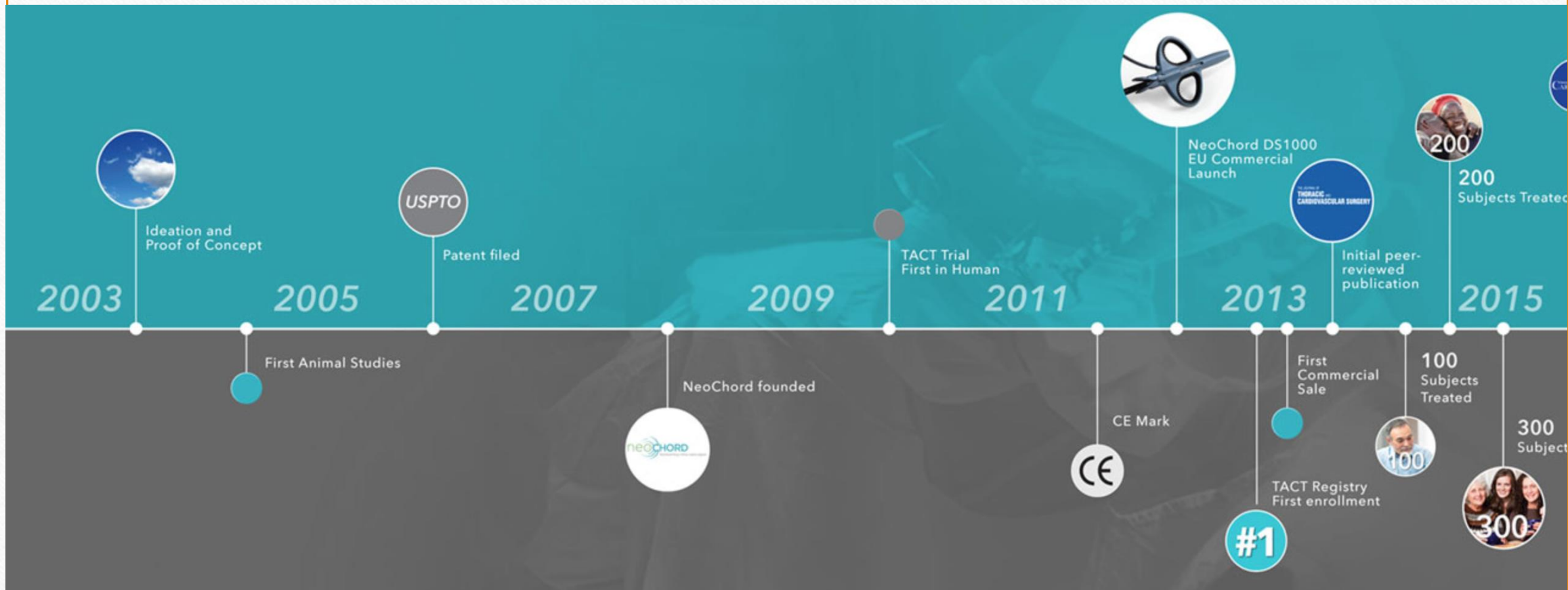
THERAPEUTIC OPTIONS

- Mitraclip
- Neochord
- Percutaneous ring
- Transcatheter Valve

NEOCHORD



- 2009 • 1° in Man
- 2009-2012 • TACT Trial (n=30)
- 2012 • CE Mark
- 2013 • TACT Registry
- 10/2014 • Experience with 147 pts



MORE THAN 850 PATIENT HAVE BEEN TREATED TODAY

NEOCHORD – patient stratification

Type A “Ideal” Patient:

- Central P2 prolapse
- >8mm predicted coaptation length with repair

Type B “Adequate” Patient:

- Less than 8 mm coaptation length
- Prolapse extending to posterior leaflet

Type C “Challenging” Patient:

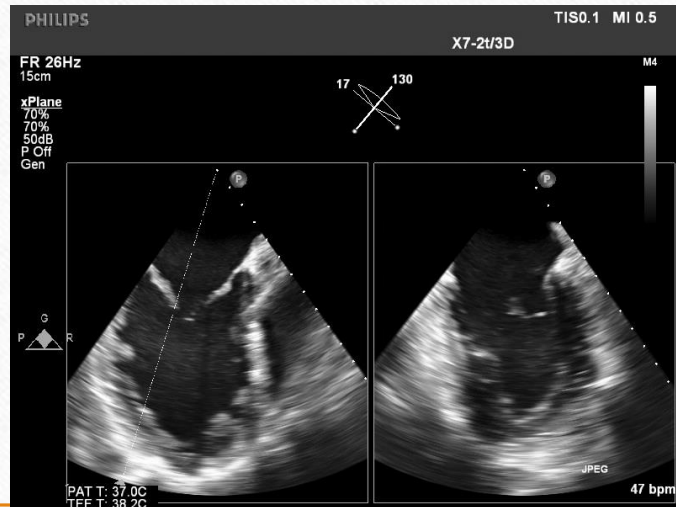
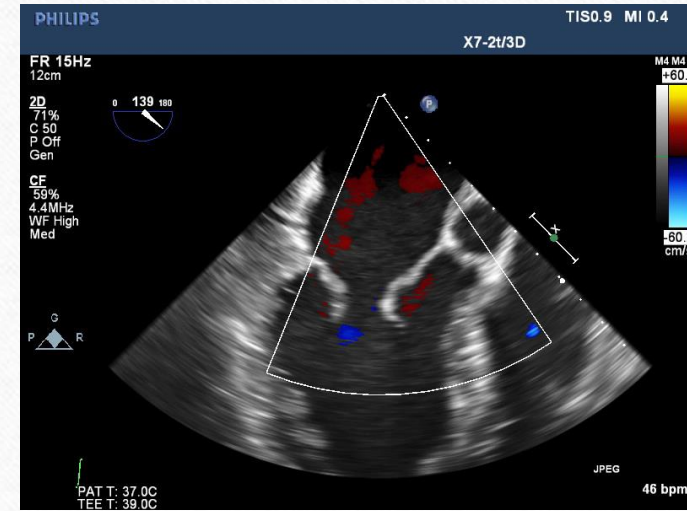
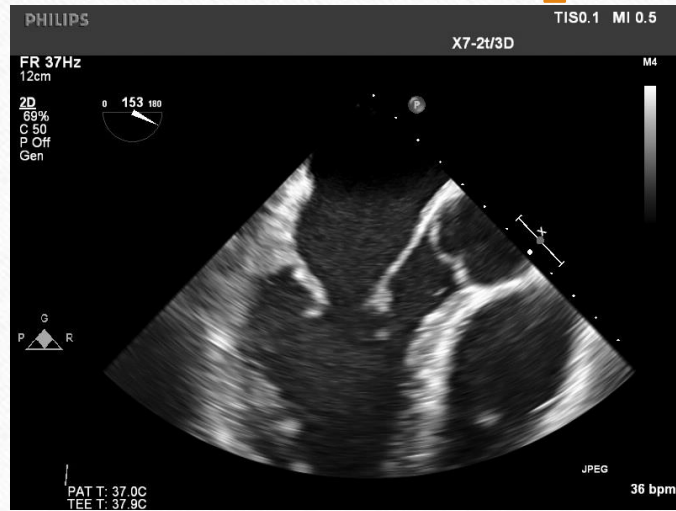
- Prolapse extending to commissures or anterior leaflet
- LV dilatation with thinning of leaflets
- Central regurgitant jet component
- Calcified leaflet segments



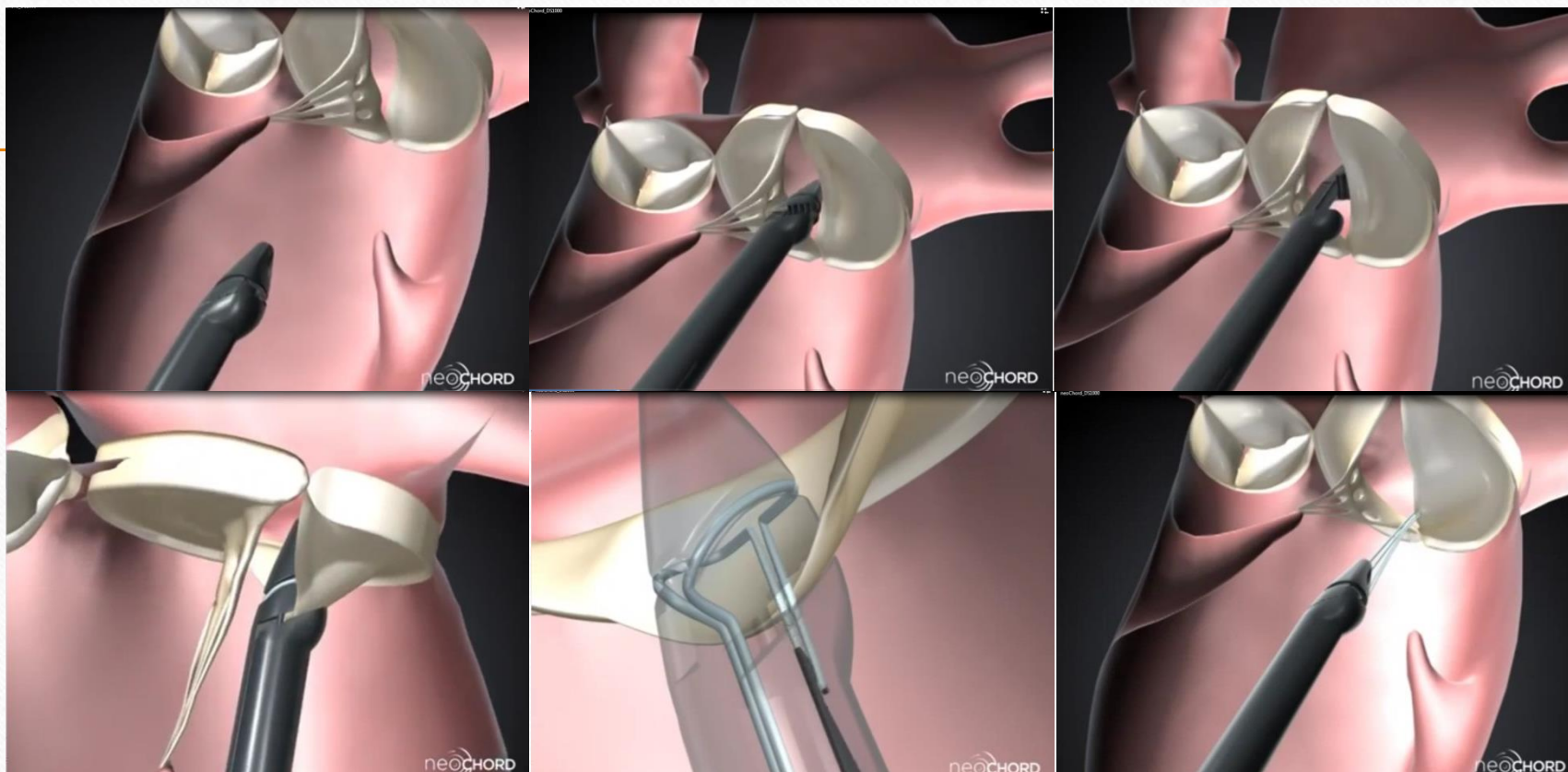
Failure MV
Plasty?

The ideal candidate is a low or moderate risk patient with severe degenerative MR, with prolapse centered around the P2 scallop and good leaflet Coaptation Potential (absolute annular dimensions not important).

NEOCHORD – preoperative screening

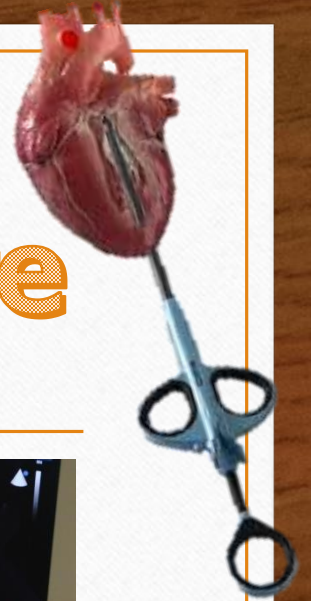
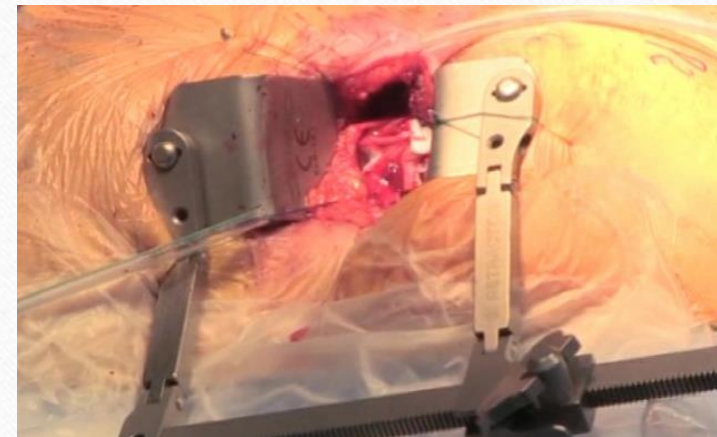
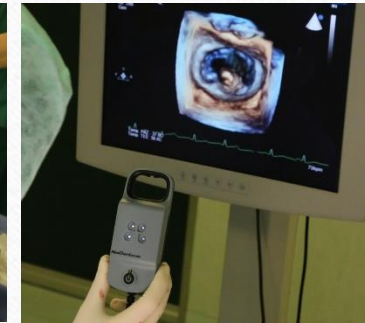


NEOCHORD DS 1000

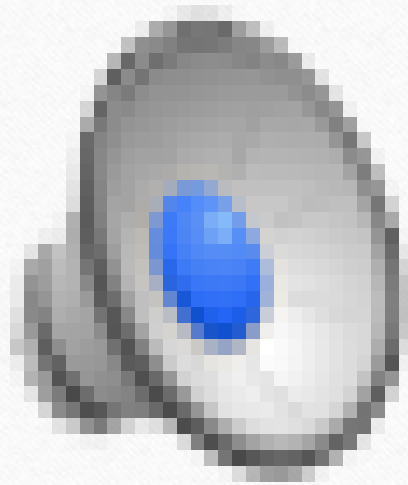


NEOCHORD – Surgical procedure

- Left minithoracotomy
- Plastic bag to collect blood
- Exposition of the apex by pulling out the pericardium
- Double purse string with pledgets
 - 1-2 cm lateral - posterior
 - Smaller than for TAVI
- **IMAGING and COLLABORATION**



NEOCHORD – Surgical procedure

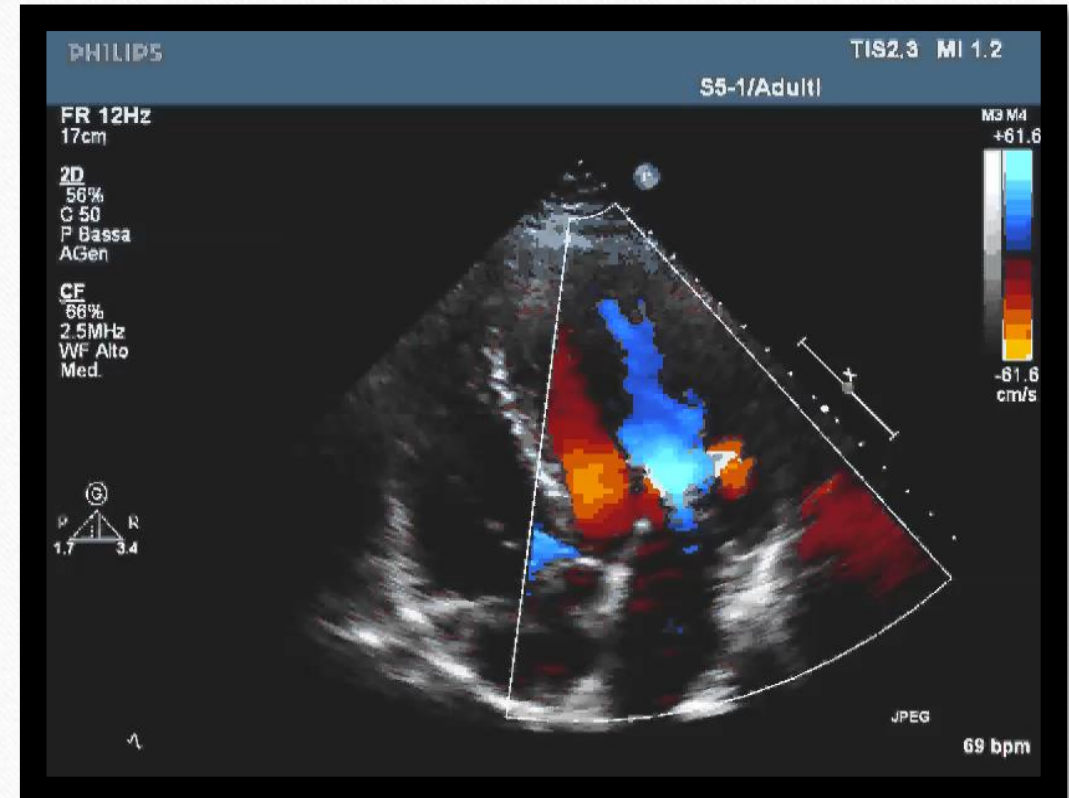
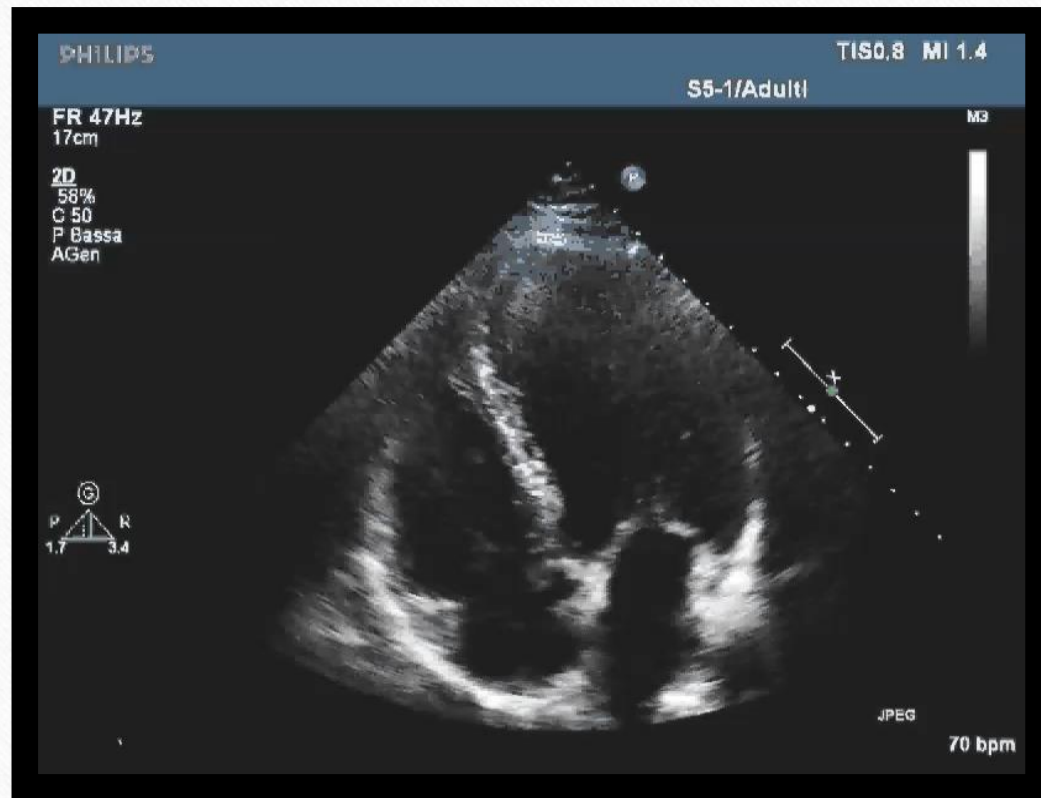


NEOCHORD

Procedure with a “limited” learning curve

Early results are encouraging especially if anatomical criteria predict a correct coaptation height following the repair

NEOCHORD – PREOPERATIVE SCREENING

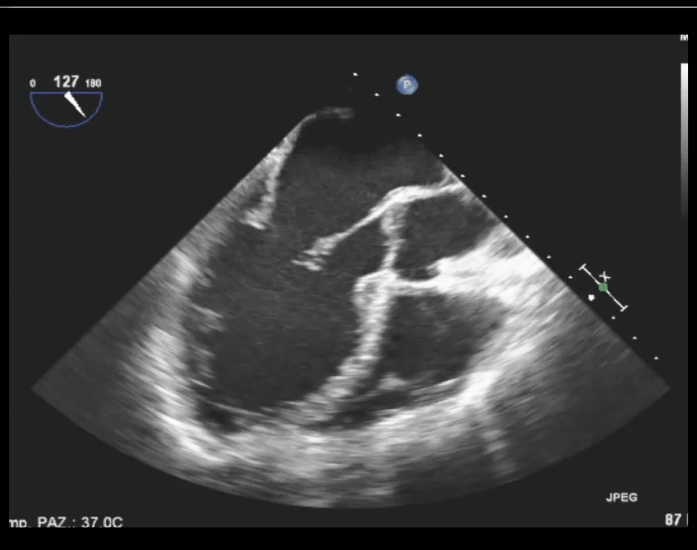
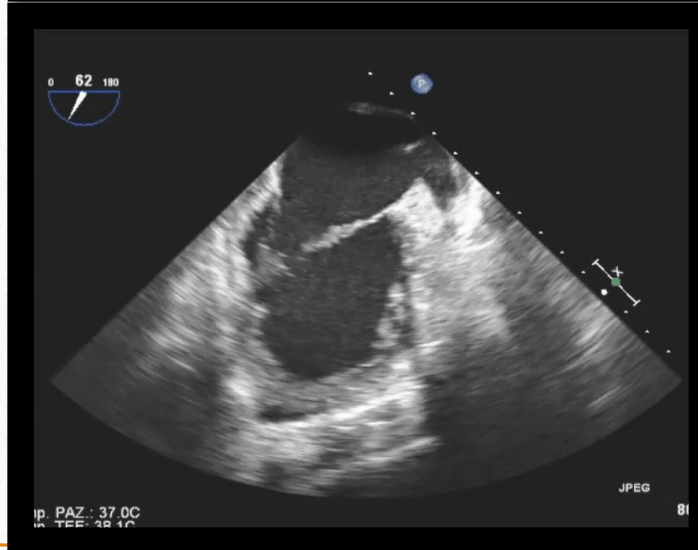
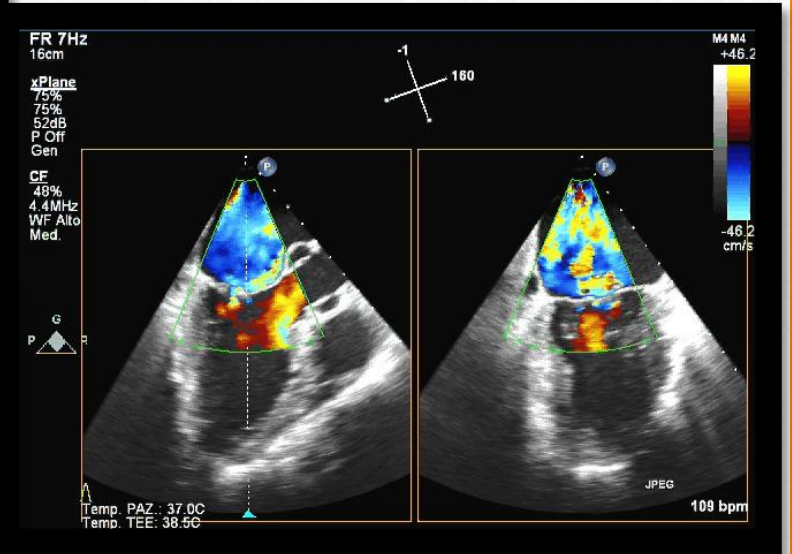
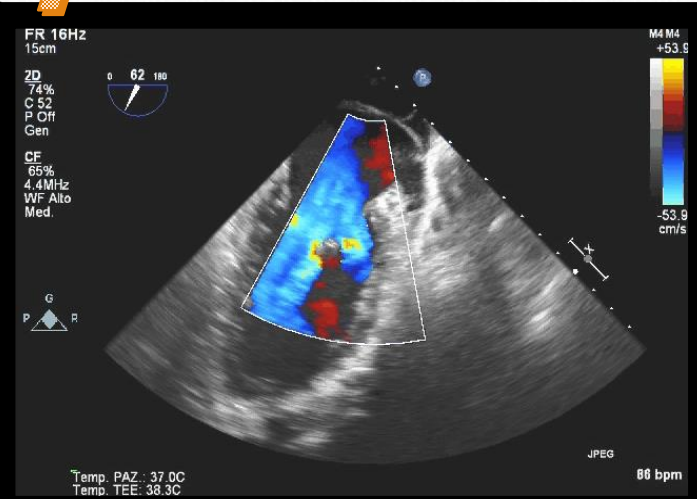


CLINICAL CASE

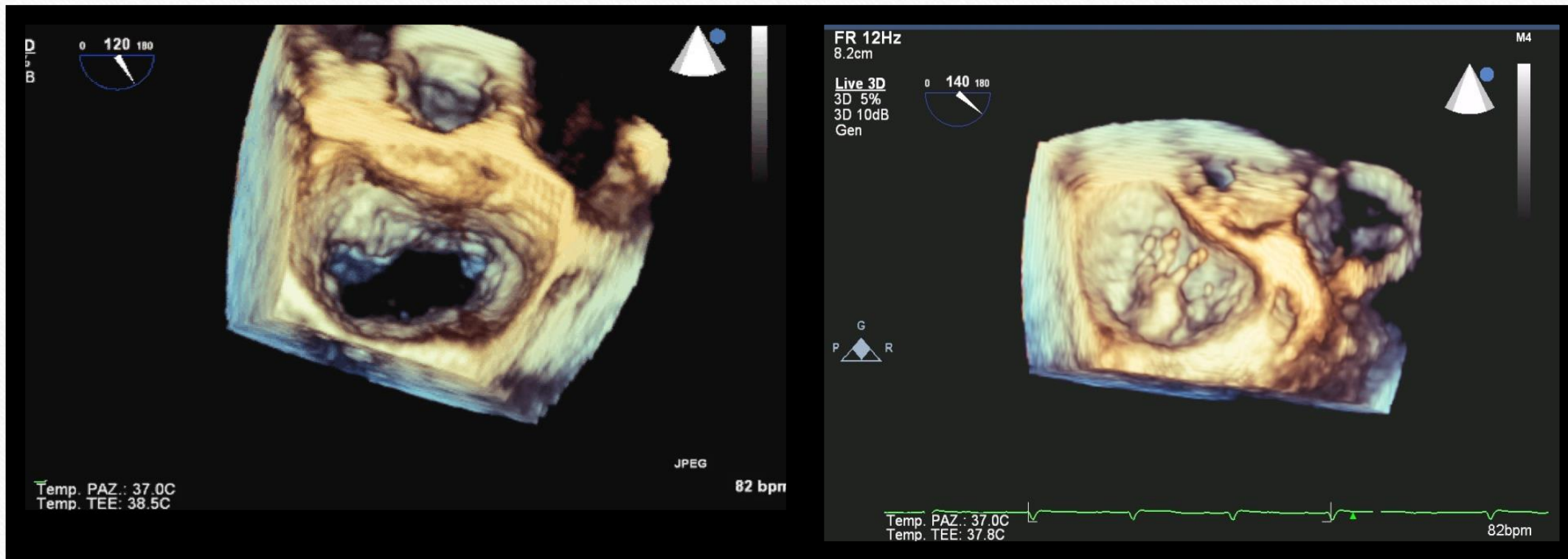
♀, 59 yrs old
45 Kg, 150 cm, BSA 1,37
COPD
severe MR, P2 flail

<u>Ascendig aortic diameter</u>	28 mm
<u>Aortic root diameter</u>	29 mm
Left ventricular end diastolic diameter (LVEDD)	44 mm
Left ventricular end <u>sistolic</u> diameter (LVESD)	27 mm
Left ventricular end diastolic diameter (LVEDV)	122 ml
Left ventricular end <u>sistolic</u> diameter (LVESV)	39 ml
Left ventricular <u>eiection</u> fraction (EF%)	68 %
Left atrial area	26 cm ²
Pulmonary arterial systolic pressure (PAPs)	29 mmHg
<u>Effective Regurgitant Orifice</u> (mm ²)	0.6
<u>Regurgitant Volume</u> (mL/beat)	82

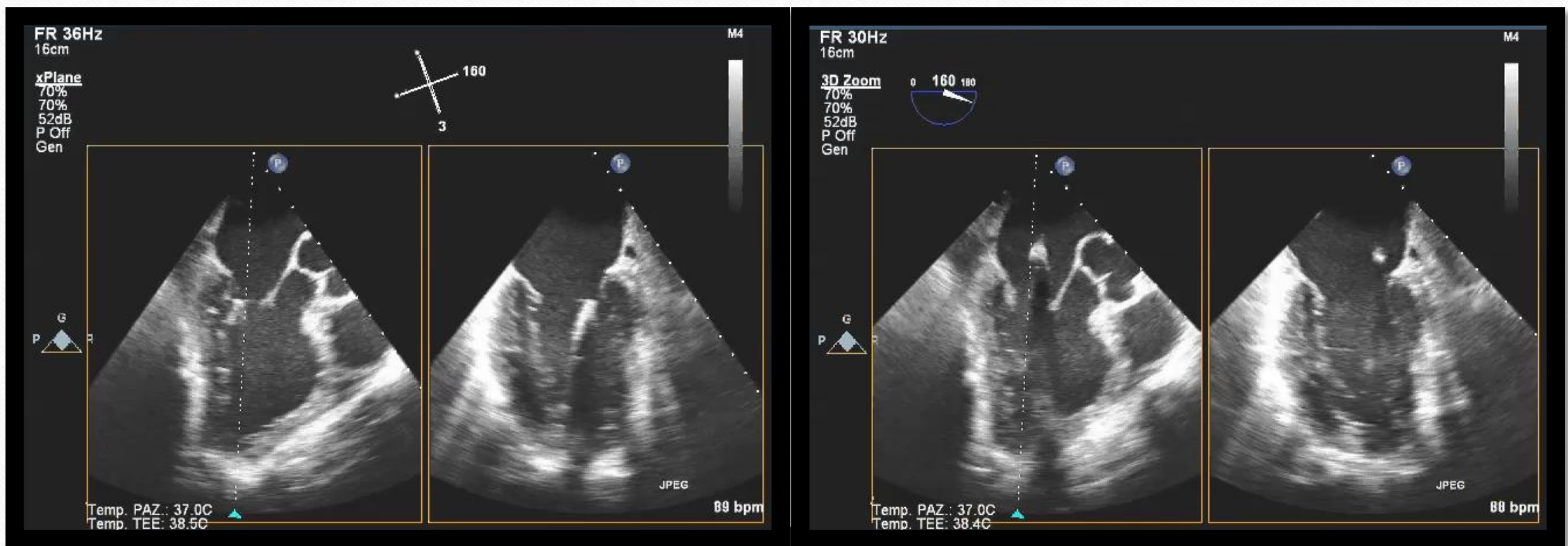
2D/3D TEE PRE



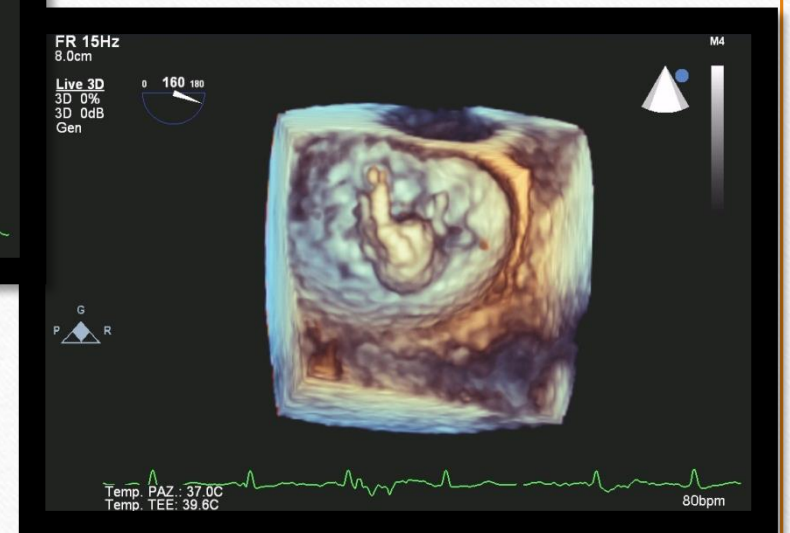
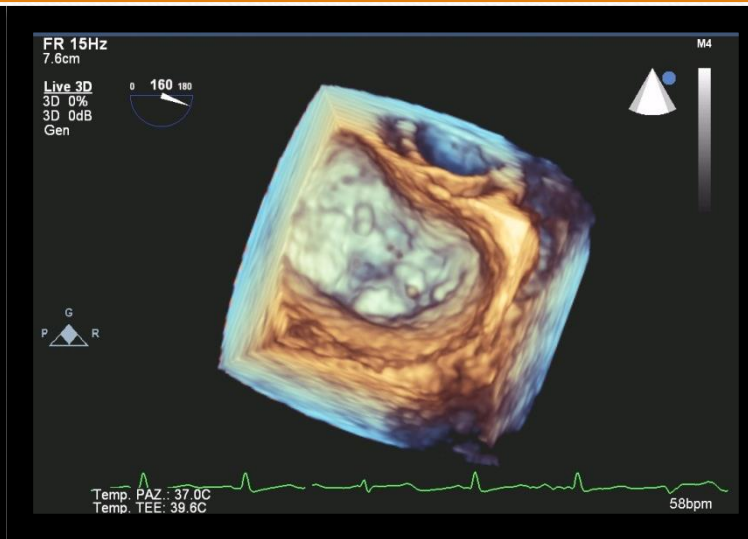
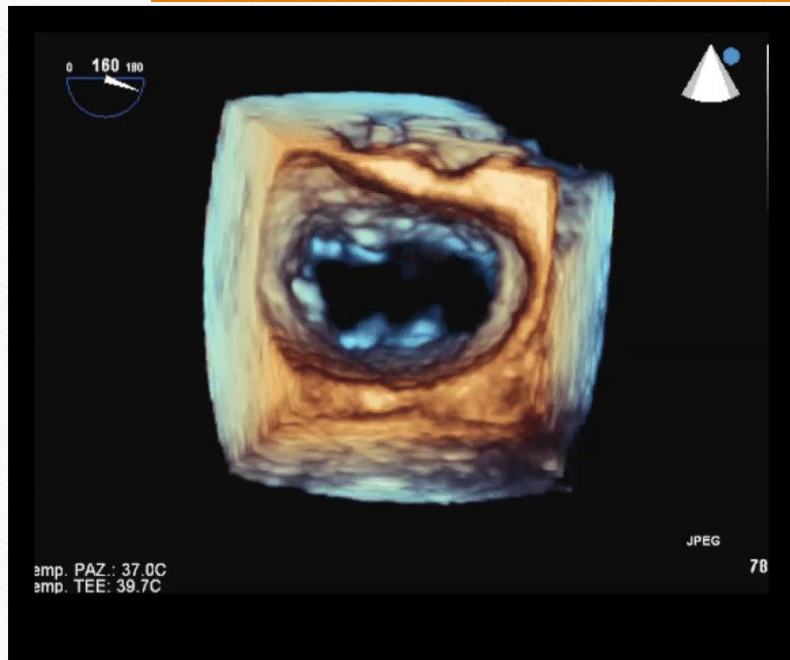
3D TEE ZOOM PRE



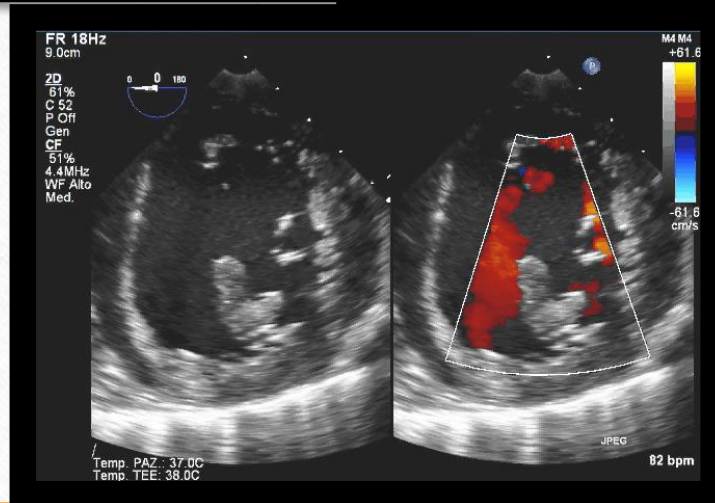
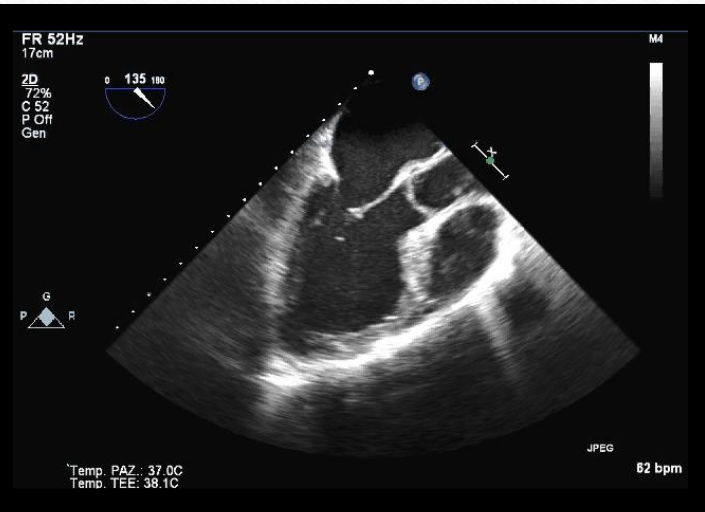
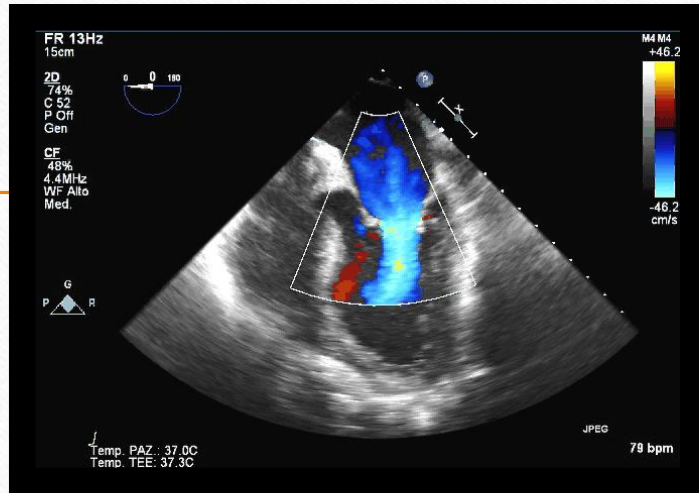
TEE XPLANE MONITORING



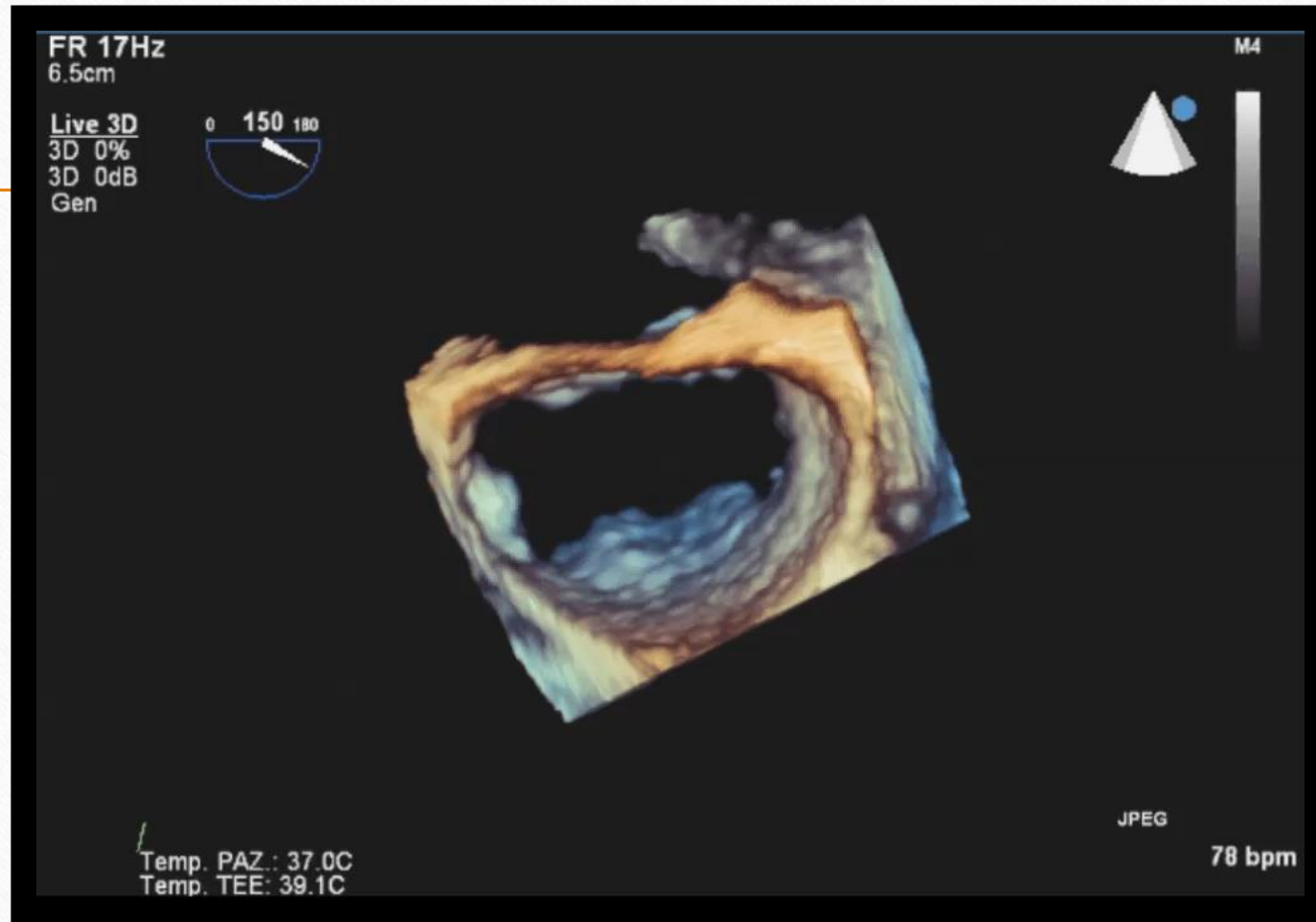
3D TEE ZOOM MONITORING



TEE POST



3D TEE ZOOM POST

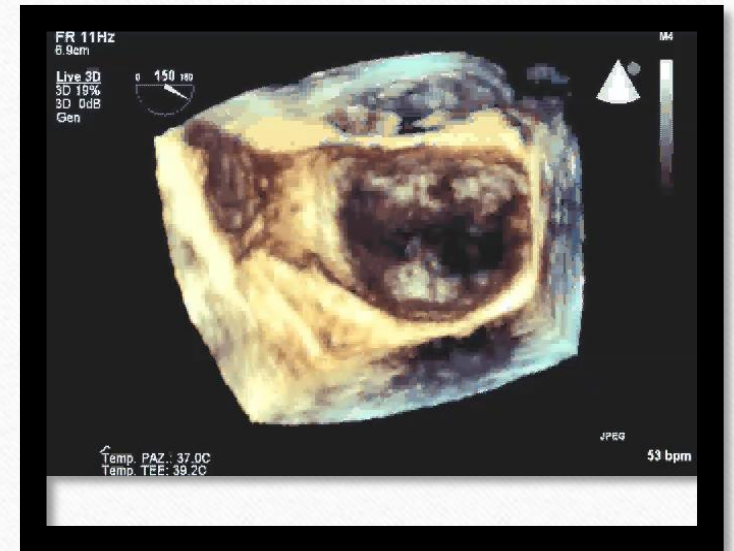
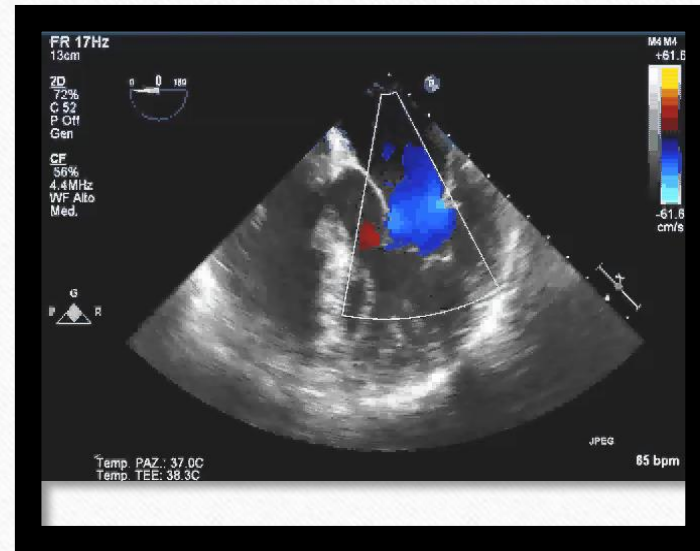


CLINICAL CASE

♂, 62 yrs old
82 Kg, 174 cm, BSA 1,96
severe MR, P2 flail

Ascendig aortic diameter	33 mm
Aortic root diameter	34 mm
Left ventricular end diastolic diameter (LVEDD)	50 mm
Left ventricular end systolic diameter (LVESD)	32 mm
Left ventricular end diastolic diameter (LVEDV)	153 ml
Left ventricular end systolic diameter (LVESV)	52 ml
Left ventricular eiection fraction (EF%)	66 %
Left atrial area	22 cm ²
Pulmonary arterial systolic pressure (PAPs)	37 mmHg
Effective Regurgitant Orifice (mm ²)	0.46
Regurgitant Volume (mL/beat)	64

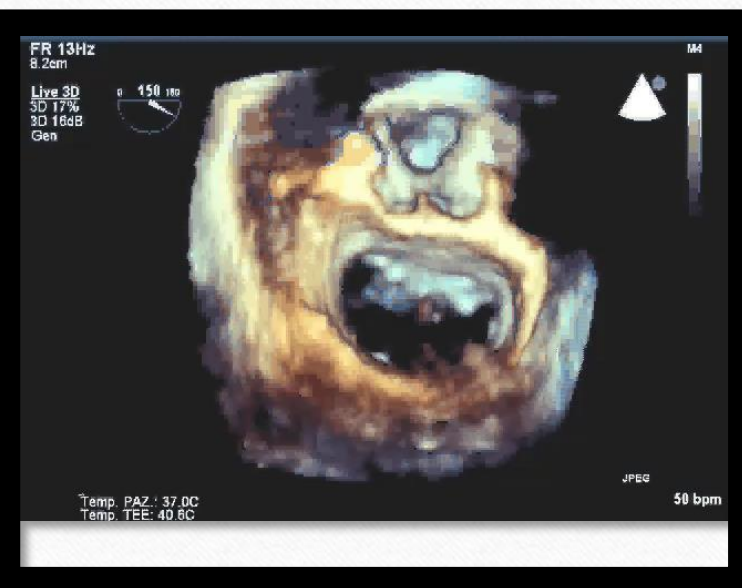
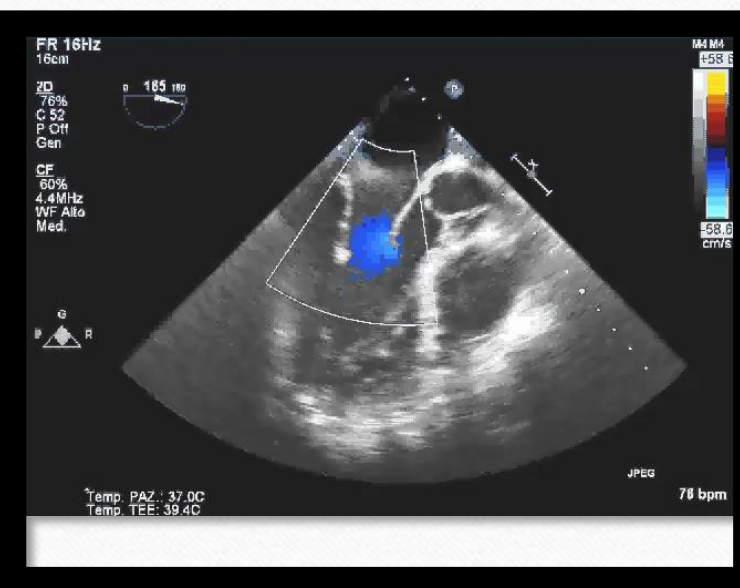
2D/3D TEE pre



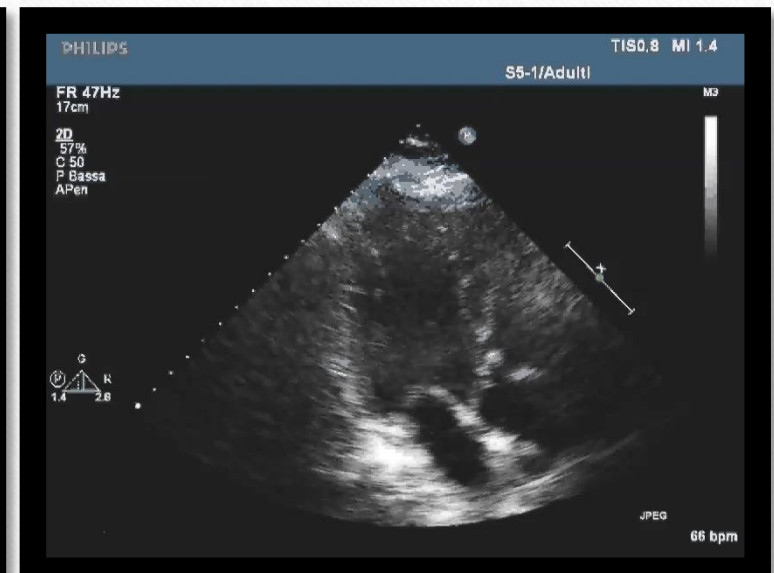
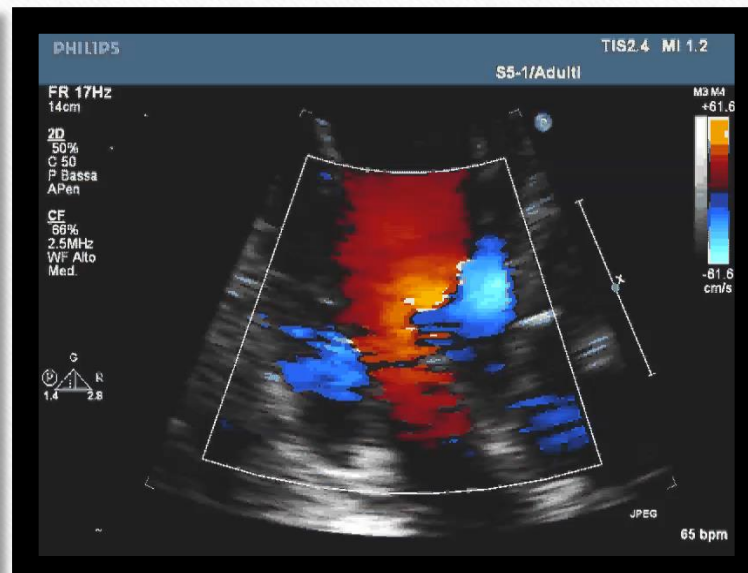
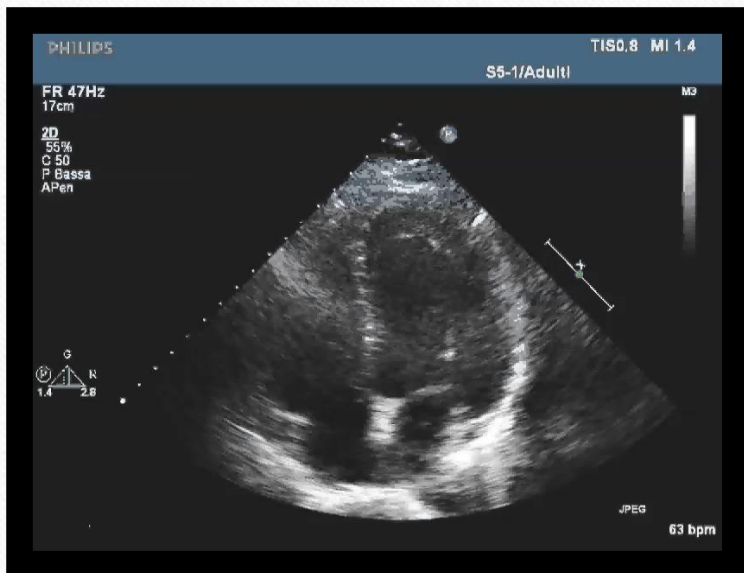
3D TEE intraprocedure



2D/3D TEE POST PROCEDURE

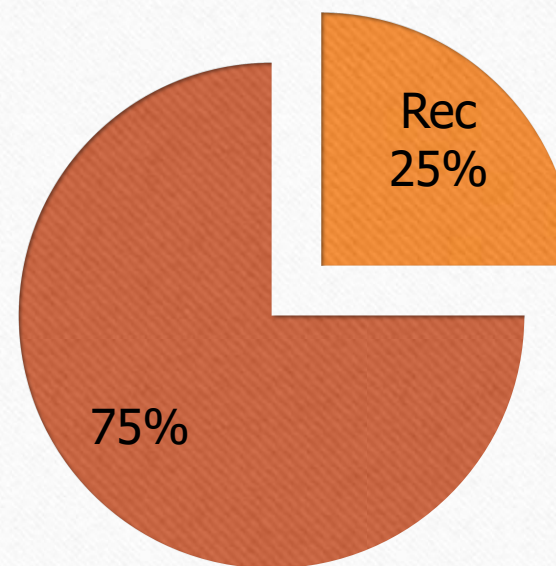


2D/3D TT POST PROCEDURE 6 month later



Reasons for Recurrence of MR

- NeoChord Dehiscence
 - Historically main concern
 - Greatly reduced since multiple Neochords and postero-lateral entry site
 - Now in about 25% of recurrences



Interference between Neochordae
and native's chordae

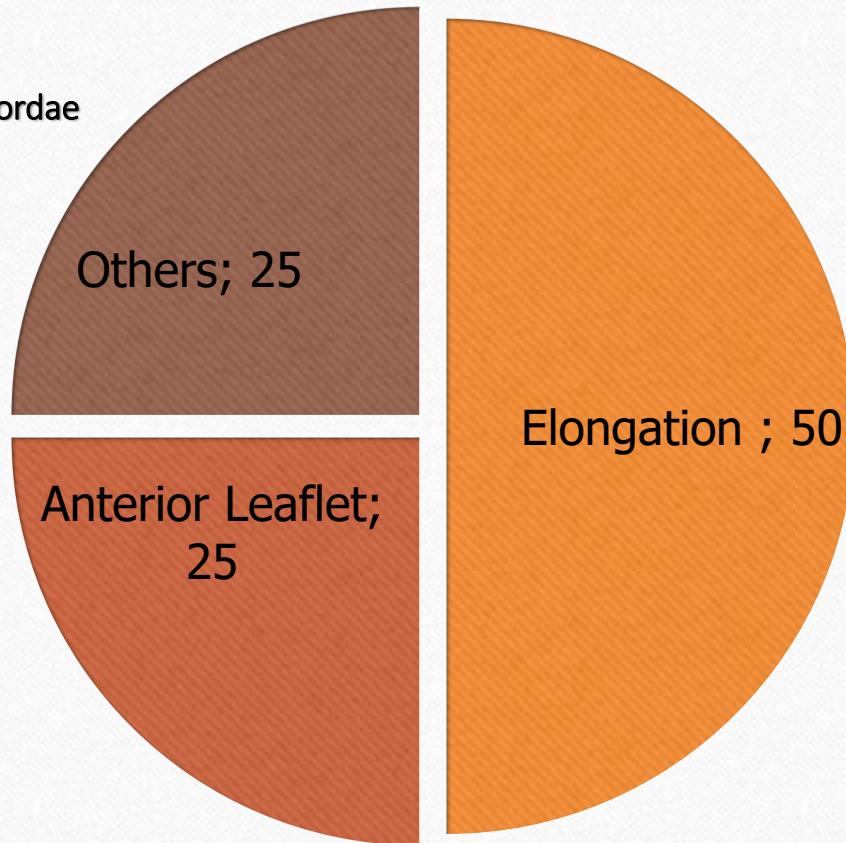
Others; 25

Anterior Leaflet;
25

Neochordae's rupture
Other native's chord rupture

Elongation ; 50

Reverse remodeling?
LV Apical fixation issue?



NEOCHORD

Procedure with a “limited” learning curve

Early results are encouraging especially if anatomical criteria predict a correct coaptation height following the repair

PERCUTANEOUS RING



Edwards Cardioband Mitral Repair System Key Advantages



Transseptal access and supra-annular fixation

designed for safety



Step-wise deployment and adjustable size

conforms to each patient's specific annular geometry



Significant reduction of annular diameter

improves coaptation



Preserves native anatomy

keeping future options open

Edwards Cardioband Mitral Repair System CE Mark Trial

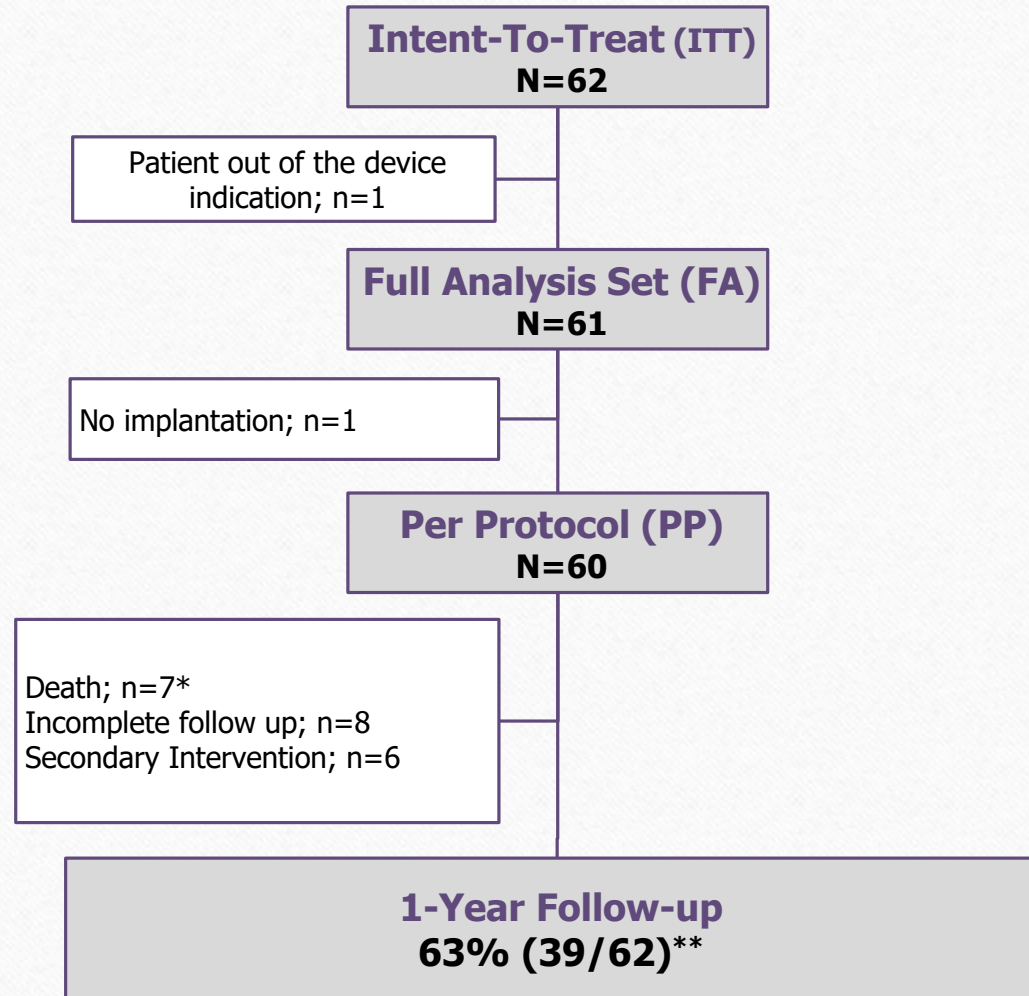
Single arm, multicenter, prospective study with intra-subject comparisons to evaluate the performance and safety of the Edwards Cardioband Mitral Repair System for repair of functional mitral regurgitation



A. Vahanian, Multicentre trial results of the transcatheter mitral valve repair system for functional mitral regurgitation, presented at PCR London Valves 2017.

Edwards Cardioband Mitral CE Mark Trial

Patient Flow

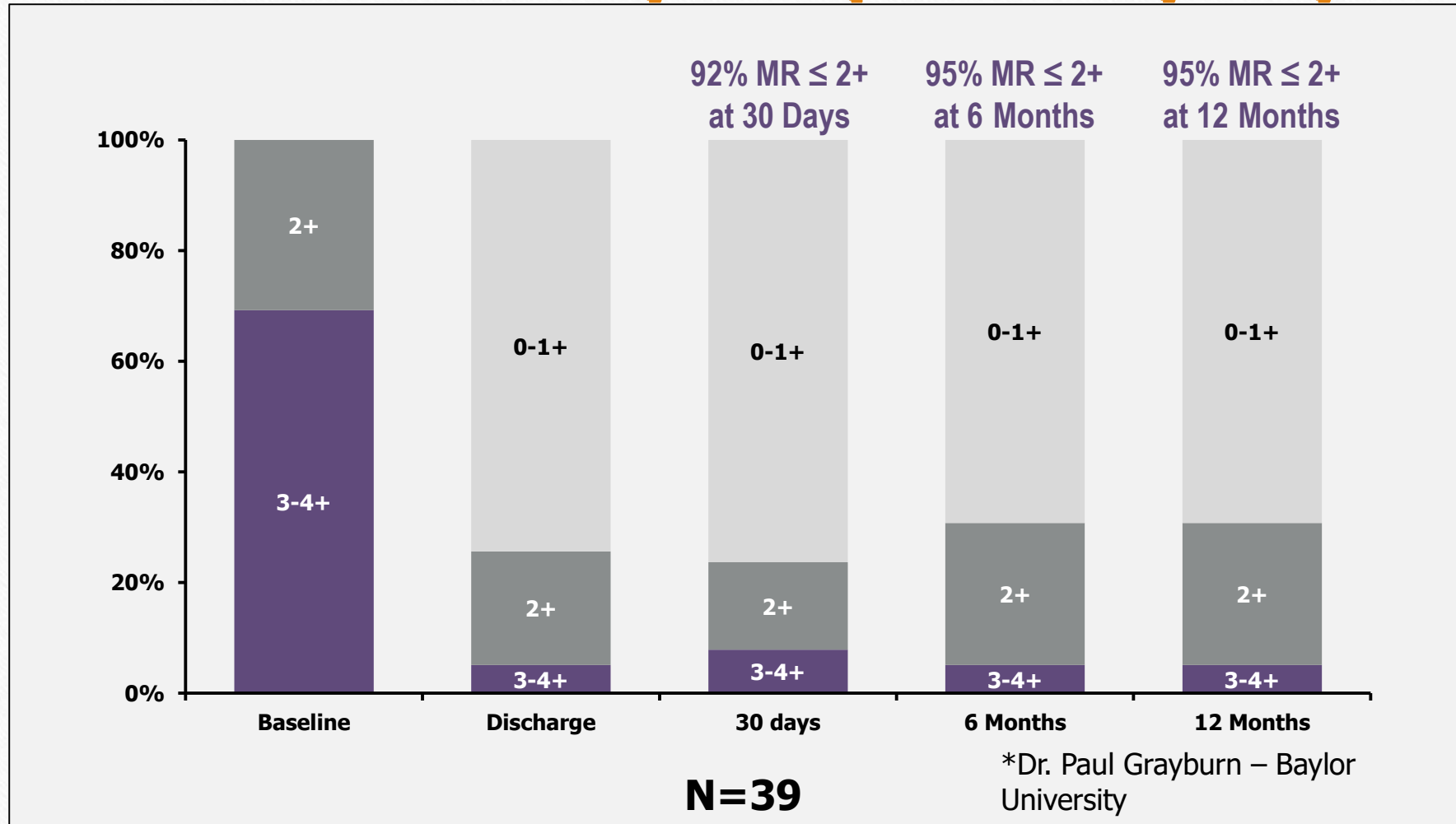


* 2/7 patients died due to complications of elective open heart surgery.

**39 patients completed echo follow up at 1 year. 38 patients completed clinical follow up at 1 year.

Edwards Cardioband Mitral CE Mark Trial

MR reduction sustained at 1 year in paired analysis by core lab*



Individualize the therapy Precision surgery

- Anatomy and function
- Comorbidities, Life expectancy
- Compare risk and probability of success
- Preservation of surgical option
- Patient informed consent for therapy
- Surgeons will do procedures

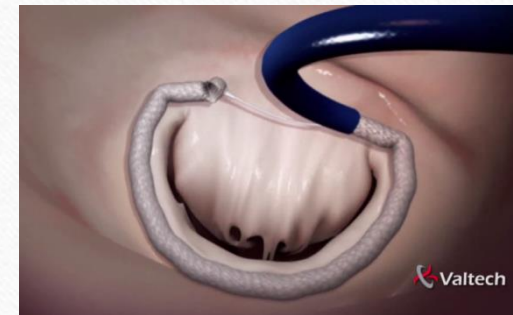
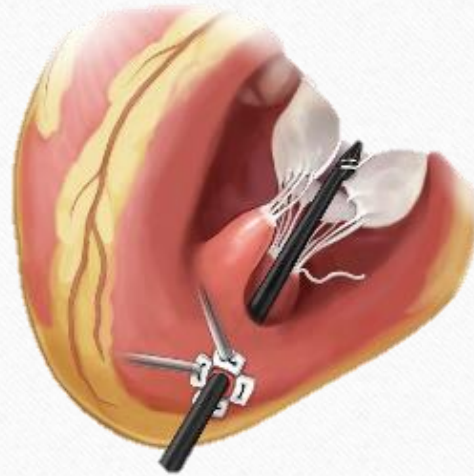
Heart
Operative
Team



CONCLUSIONS

- currently: Minimally invasive surgery forces us to give up perfect correction (Respect, cordae, ring...)

BEATING
HEART



- In the FUTURE: Experience with percutaneous ring could reduce the amount of open heart surgery

Paradigm inversion



NEOCHORD

Low-moderate risk pts

P2 prolapse, good coaptation; LV dilatation?

Surgical MV Repair

Complex prolapse

Traditional surgery risk acceptable

MITRACLIP

High risk pts

No good candidate for open heart surgery;

Diffucult management LV with Neochord



CONCLUSIONS

- In isolated aortic valve replacement also in Italy TAVI and AVR are about 50%; for mitral valve we have to wait but milestone has been laid... **BE READY TO SUSTAIN THE FUTURE**
- Surgeons must have to deal not only with TAVR but also with all the mitral valve structural interventional surgery on beating heart



thank you!