LA TERAPIA DELL'INSUFFICIENZA MITRALICA DEGENERATIVA.

Procedura Eco guidata con 3D. Perché eco 3D. Un'indicazione che presenta aspetti clinici e tecnici. Un esempio di stretta collaborazione tra cardiochirurgo e cardiologo esperto in imaging.

Dr. Gloria Tamborini
Responsabile Servizio Interventistica Strutturale,
Area Imaging Cardiovascolare, Centro Cardiologico Monzino

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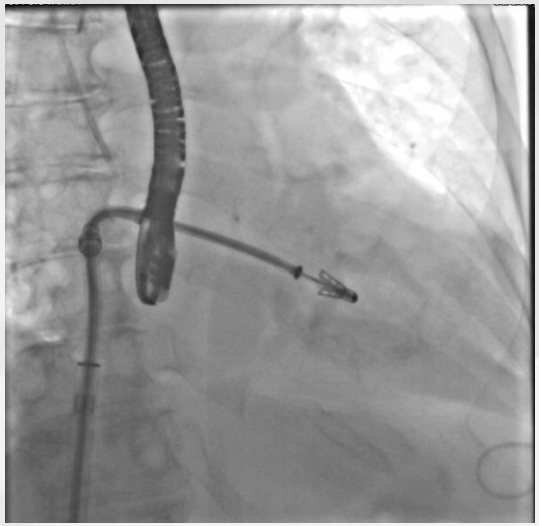
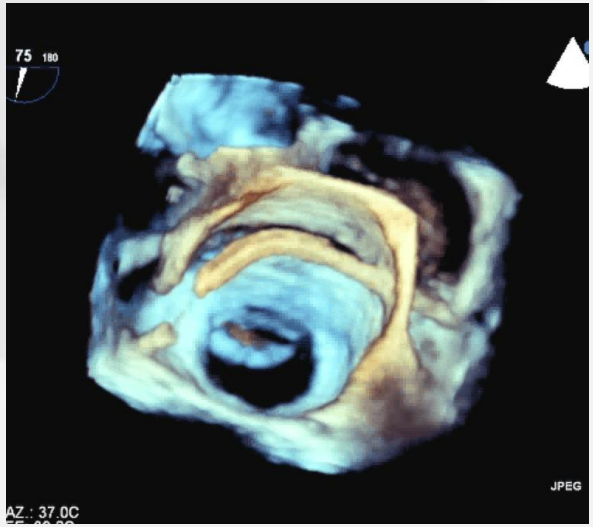
Mitraclip procedure





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Percutaneous Mitral Repair With the MitraClip System

Safety and Midterm Durability in the Initial EVEREST
(Endovascular Valve Edge-to-Edge REpair Study) Cohort

MitraClip:

The following criteria should be considered when deciding to perform catheter based repair of the mitral valve with an implantable device:

- Severe mitral annular calcification.
- Need for emergency surgery for any reason.
- Prior mitral valve leaflet surgery.
- Echocardiographic evidence of intracardiac mass, thrombus or vegetation.
- Active endocarditis or rheumatic heart disease.
- Active infections requiring current antibiotic therapy.
- Patients in whom transesophageal echocardiography (TEE) is contraindicated.
- The presence of a permanent pacemaker or pacing leads that may interfere with placement of the MitraClip implant.

Procedura eco-guidata

- ✓ *Valutazione preoperatoria*
- ✓ *Monitoraggio intraoperatorio*
- ✓ *Valutazione del risultato*

Procedura eco-guidata

- ✓ ***Valutazione preoperatoria***
- ✓ *Monitoraggio intraoperatorio*
- ✓ *Valutazione del risultato*

Valutare le caratteristiche anatomiche della valvola mitralica

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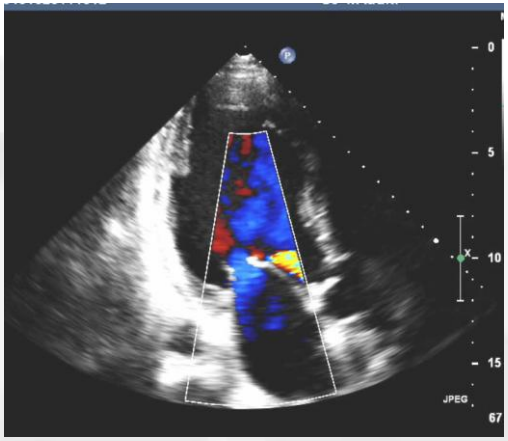
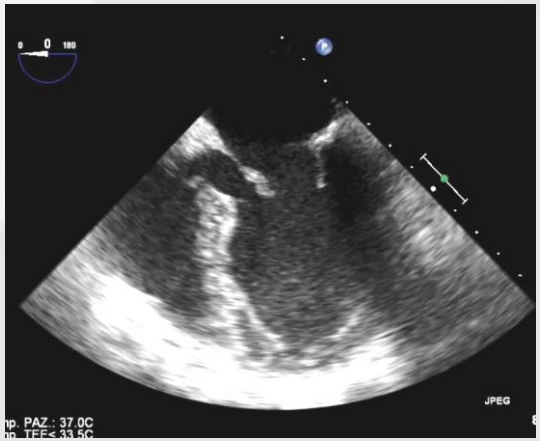
- *Area mitralica > 4 cm2*
- *Lunghezza lembi > 9 m*
- *Presenza rigurgito moderato-severo*
- *Sede rigurgito (A2/P2…)*





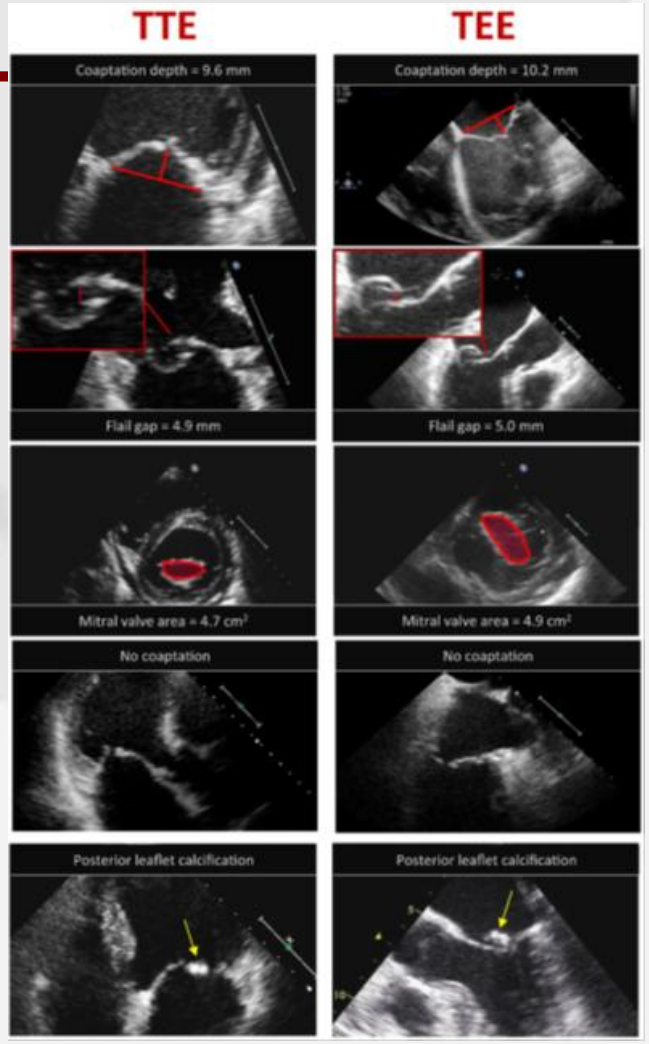
- *Altezza tenting > 12 mm*
- *Lunghezza coaptazione >2 mm*
- *Ampiezza gap-flail > 10 mm*
- *Ampiezza jet rigurgito < 15 mm*

Int J Cardiol 2014

Patients selection for MitraClip: Time to move to transthoracic echocardiographic screening?

Paola Gripari [a,1], Francesco Maffessanti [a,*,1], Gloria Tamborini [a], Manuela Muratori [a], Laura Fusini [a], Sarah Ghulam Ali [a], Cristina Ferrari [a], Francesco Alamanni [a,b], Antonio L. Bartorelli [a,b], Cesare Fiorentini [a,b], Mauro Pepi [a]

	TTE	TEE	TTE vs TEE p-value
Quantitative parameters			
Valvular area 2D (cm^2)	5.6 ± 1.1	6.5 ± 1.3	<0.01
Valvular area 3D (cm^2)	5.5 ± 1.1	5.7 ± 1.2	0.17
Coaptation			
Length (mm)	4.3 ± 1.3	4.1 ± 1.2	0.32
Depth (mm)	10.8 ± 2.3	10.6 ± 2.4	0.26
Flail gap (mm)	5.9 ± 2.6	5.8 ± 2.6	0.45
Leaflet length			
Anterior (mm)	23 ± 3	23 ± 4	0.14
Posterior (mm)	14 ± 4	14 ± 4	0.81
Leaflet thickness			
Anterior (mm)	3.2 ± 1.1	2.6 ± 1.1	<0.01
Posterior (mm)	3.7 ± 1.4	3.0 ± 1.2	<0.01
Jet width (mm)	10.9 ± 3.1	10.5 ± 3.2	0.69



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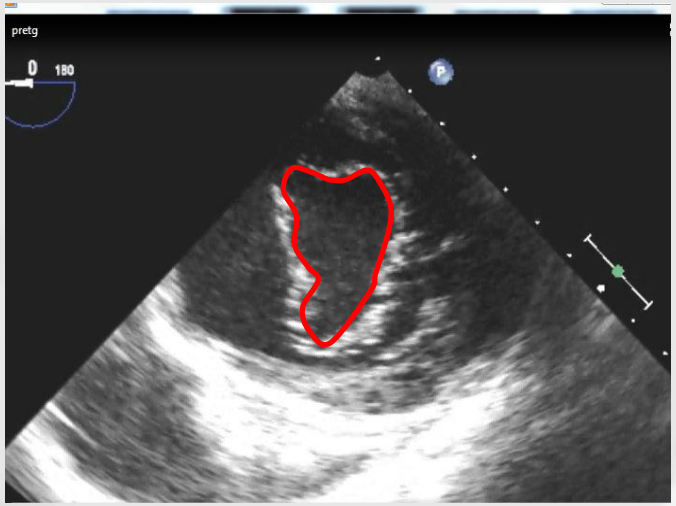
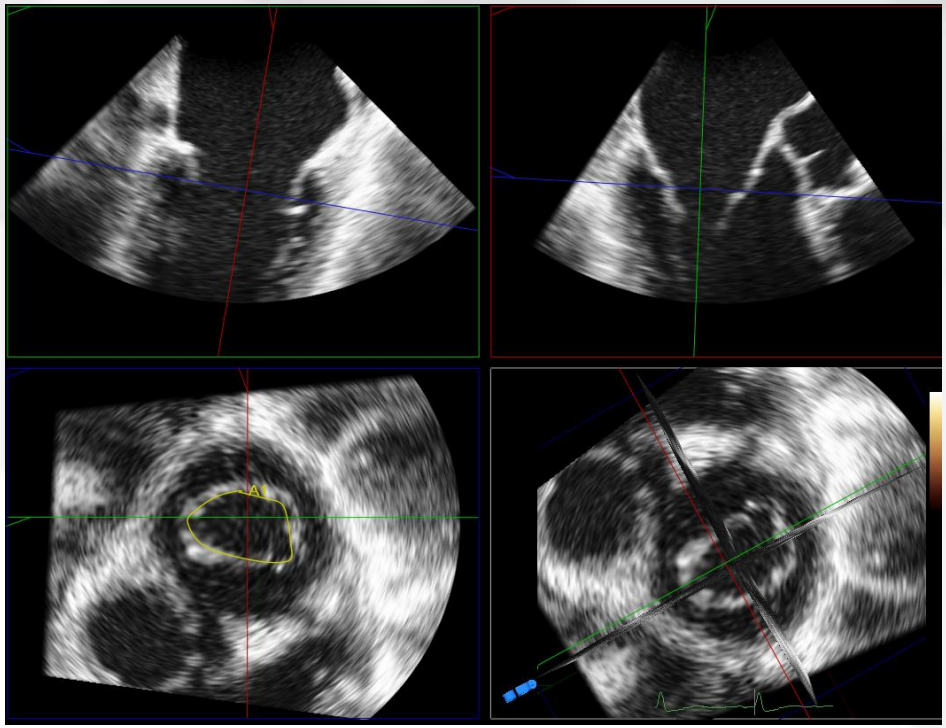
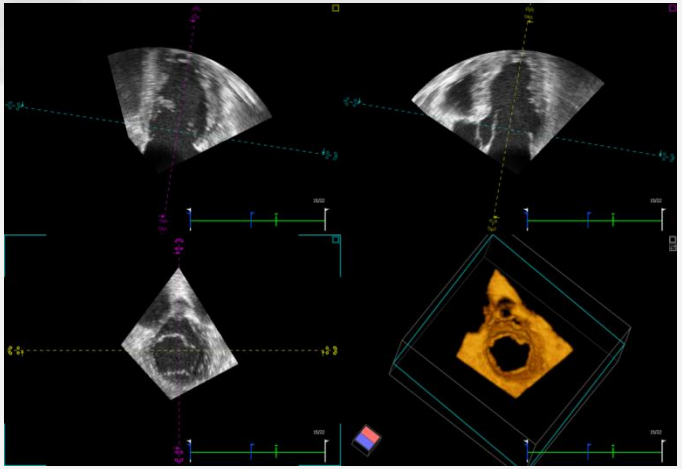
L’area valvolare

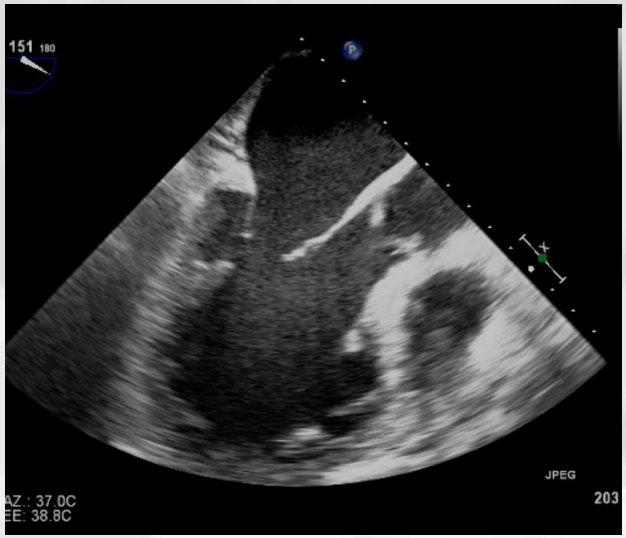
Area planimetrica
> 4 cmq

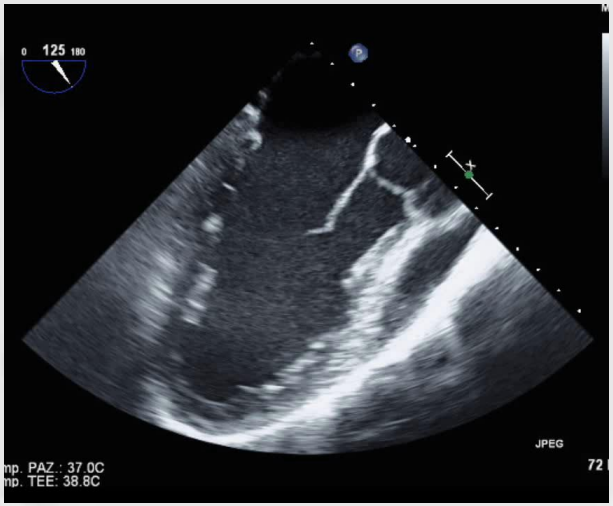


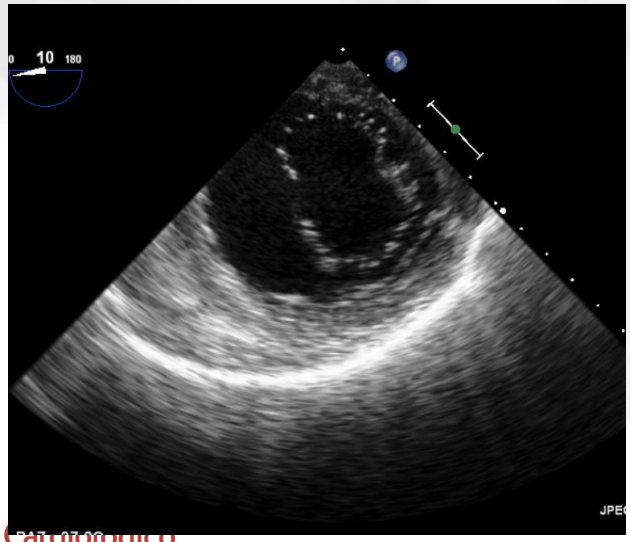


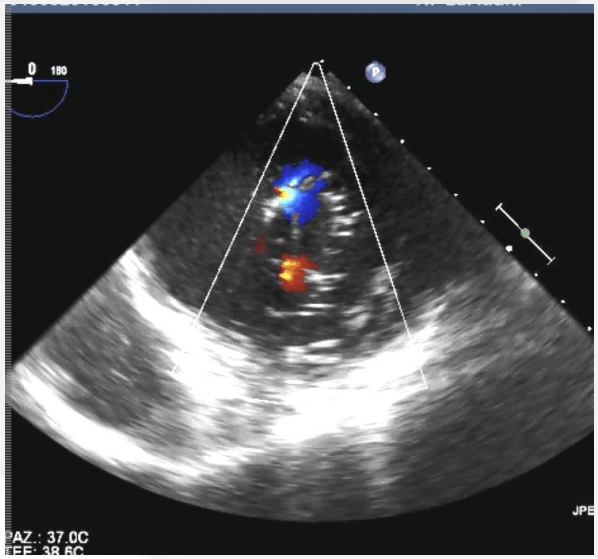


Il rigurgito : l'origine e l'estensione del jet: 2DTEE









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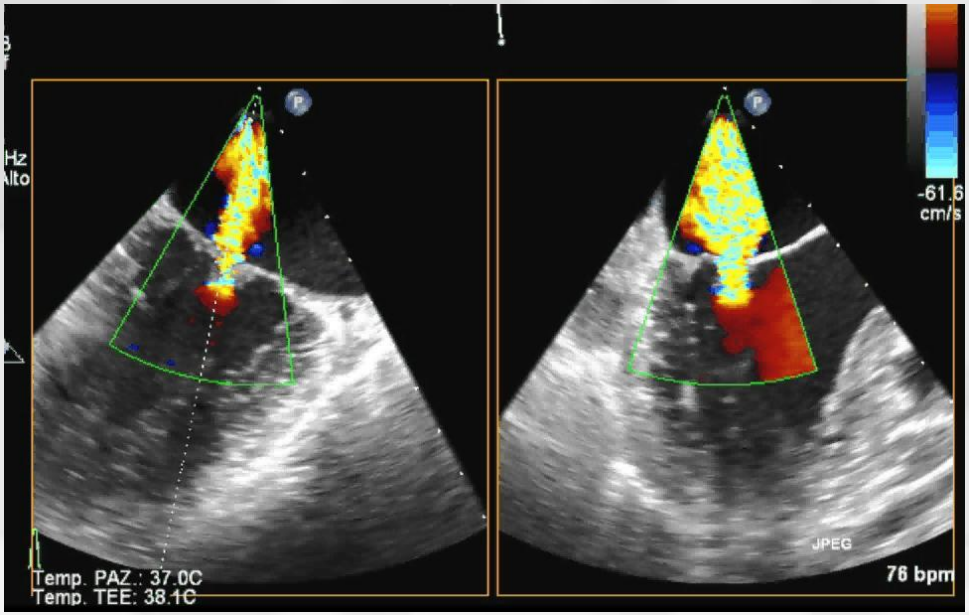
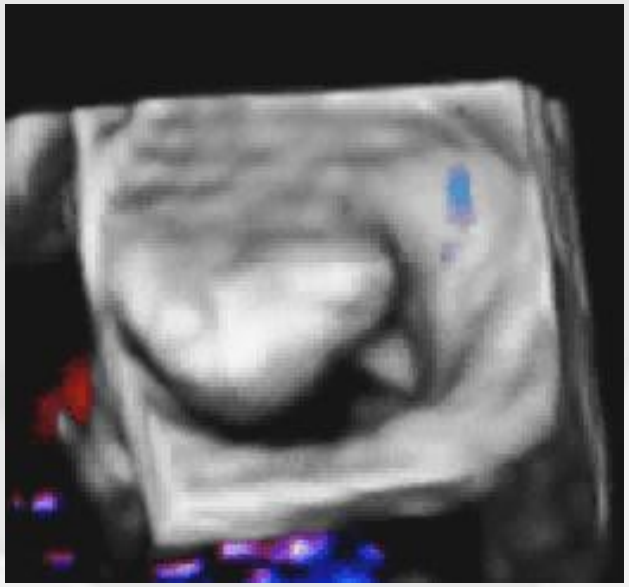
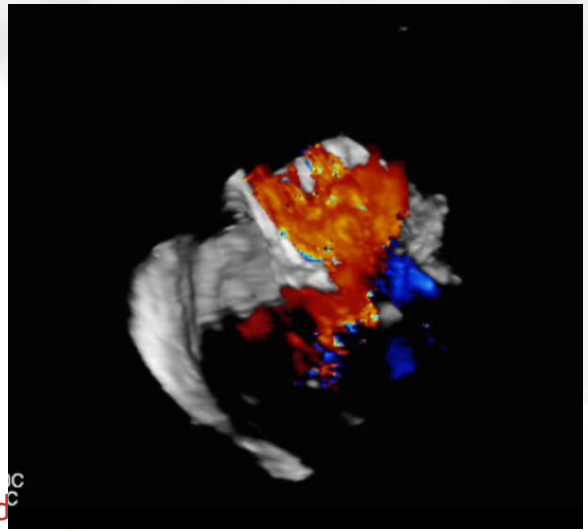
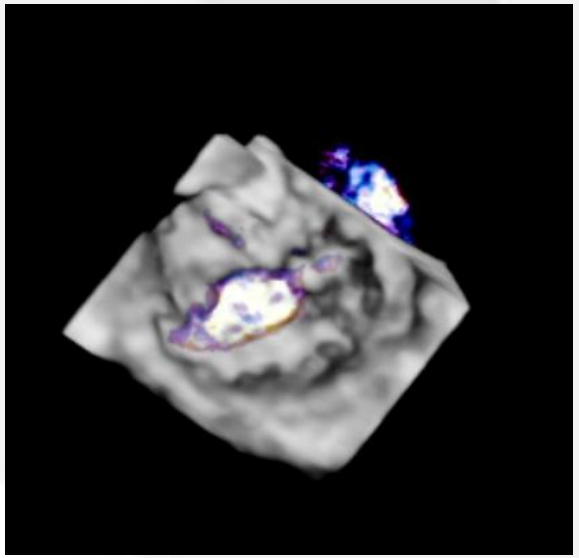
Il rigurgito: l'origine e l'estensione del jet: 3DTEE









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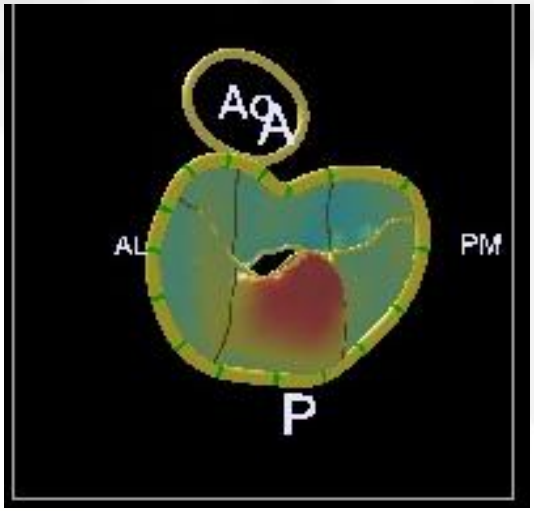
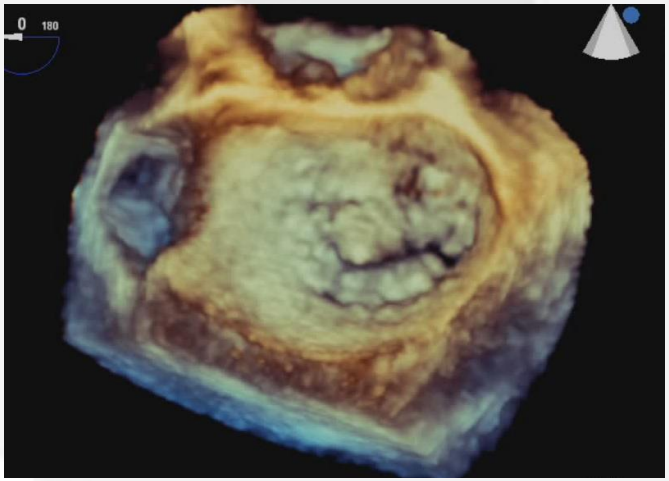
Il rigurgito: l'anatomia valvolare 3D





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Il rigurgito: l'entità

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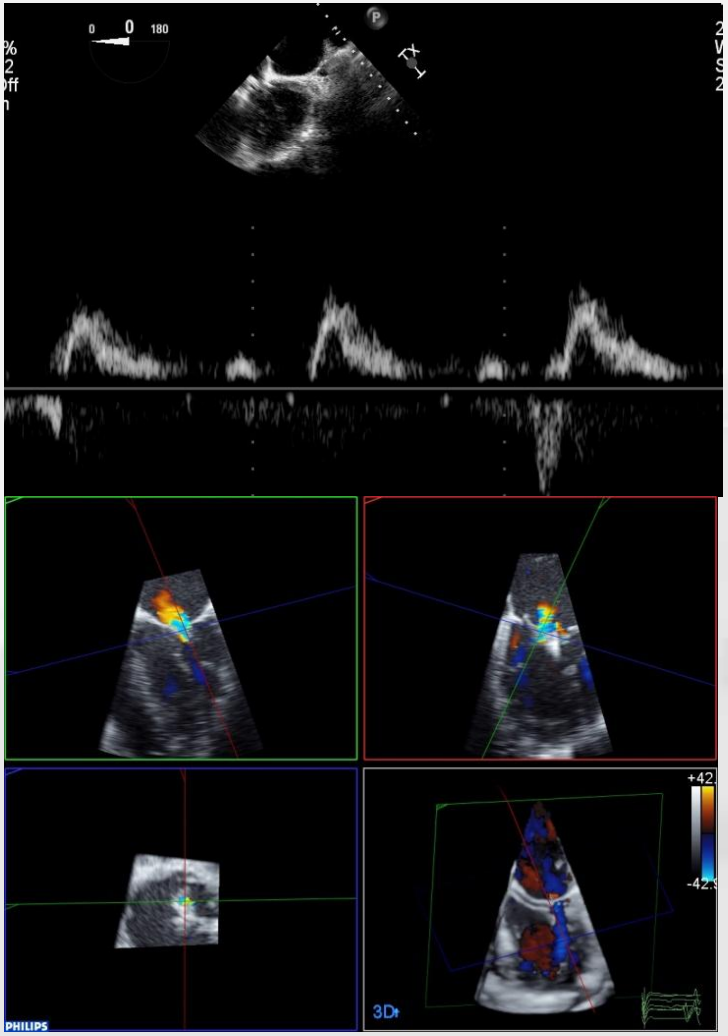
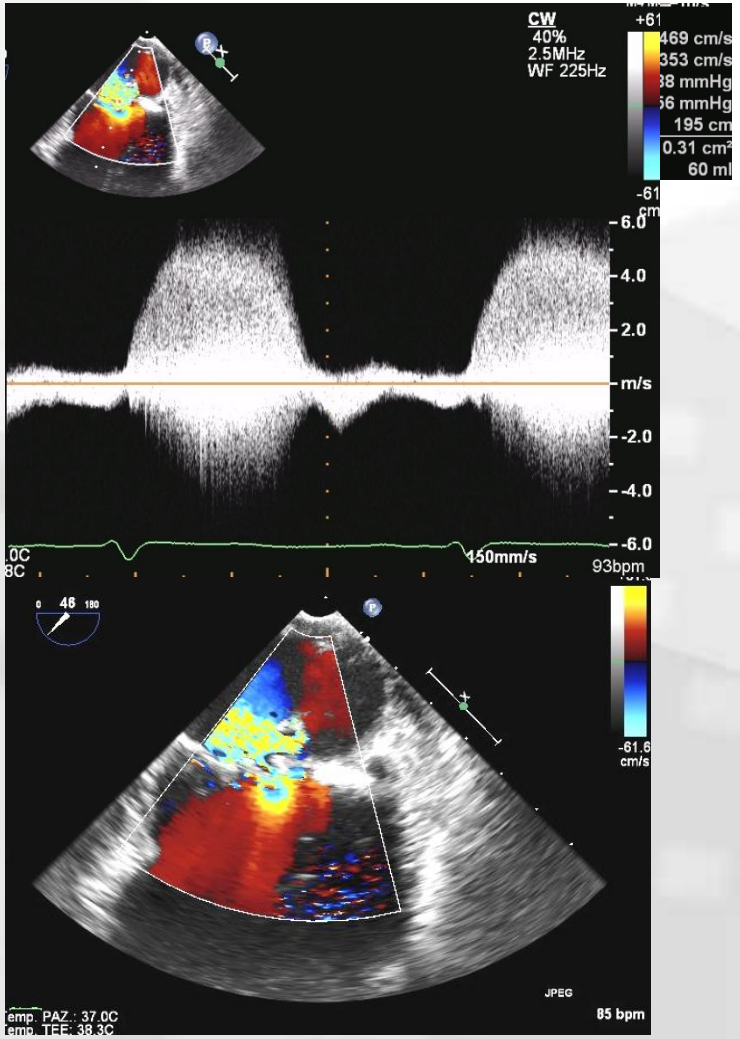
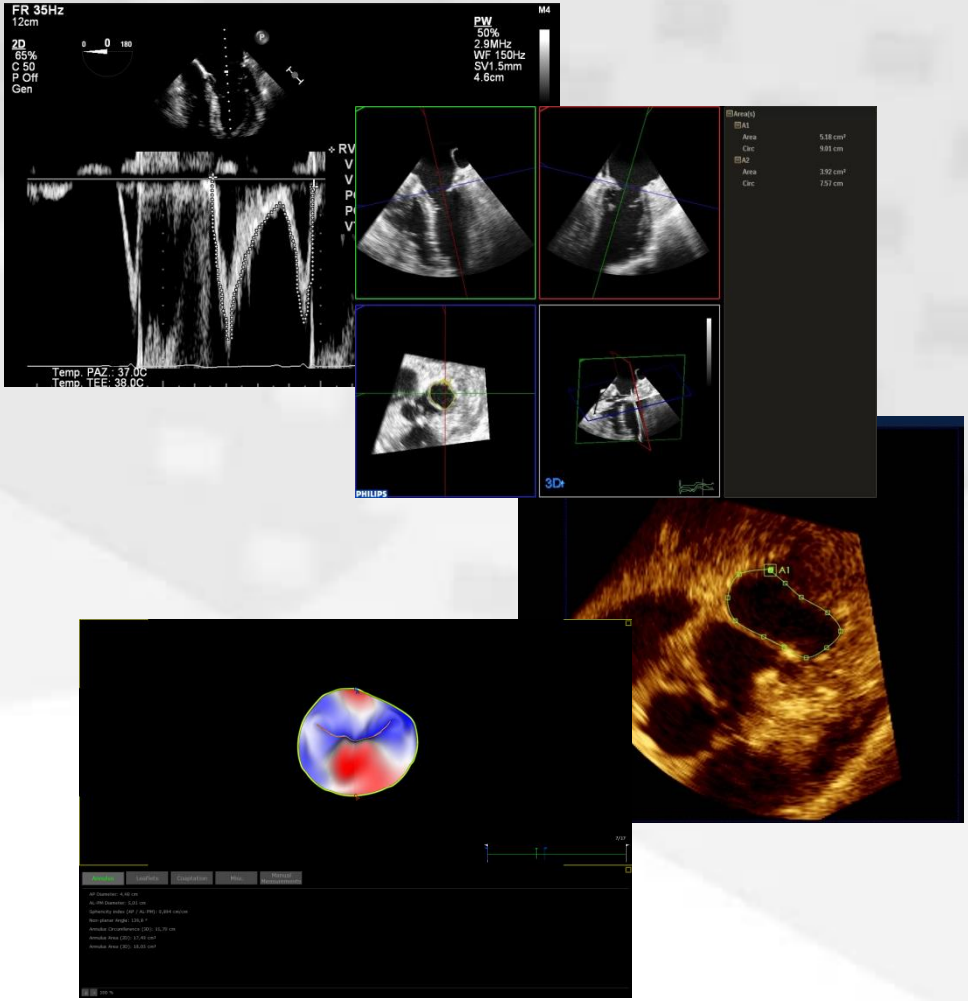
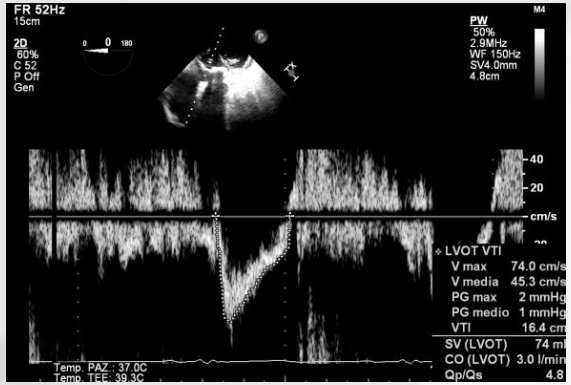




Valutazione quantitativa





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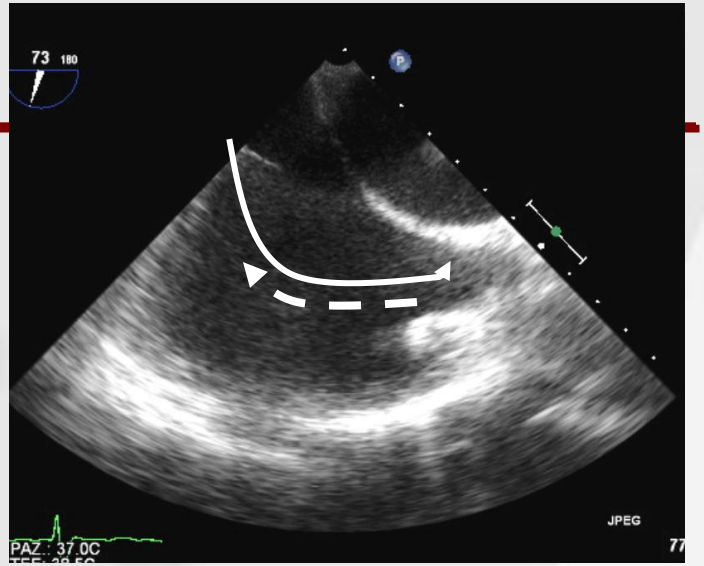
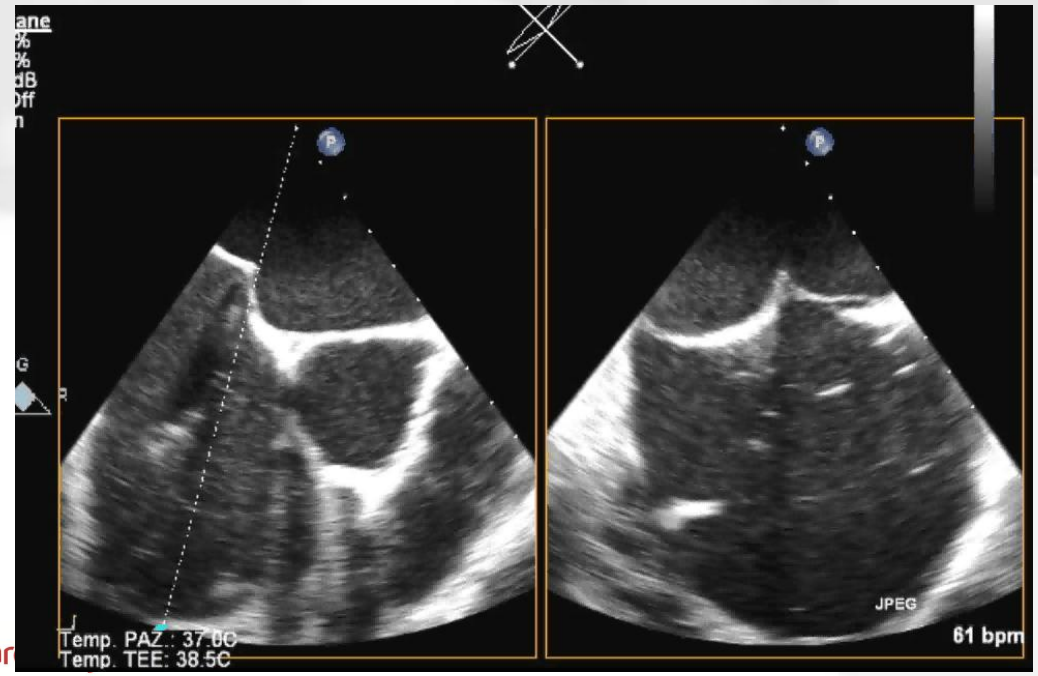
Procedura eco-guidata

- ✓ *Valutazione preoperatoria*
- ✓ *Monitoraggio intraoperatorio*
- ✓ *Valutazione del risultato*

➢ Puntura settale

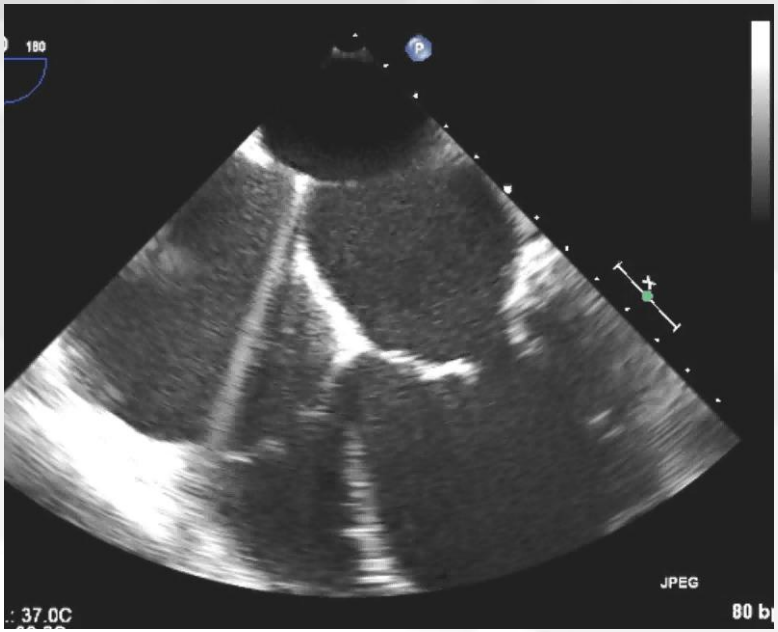
1) Bicavale
2) Asse corto aorta
3) X plane

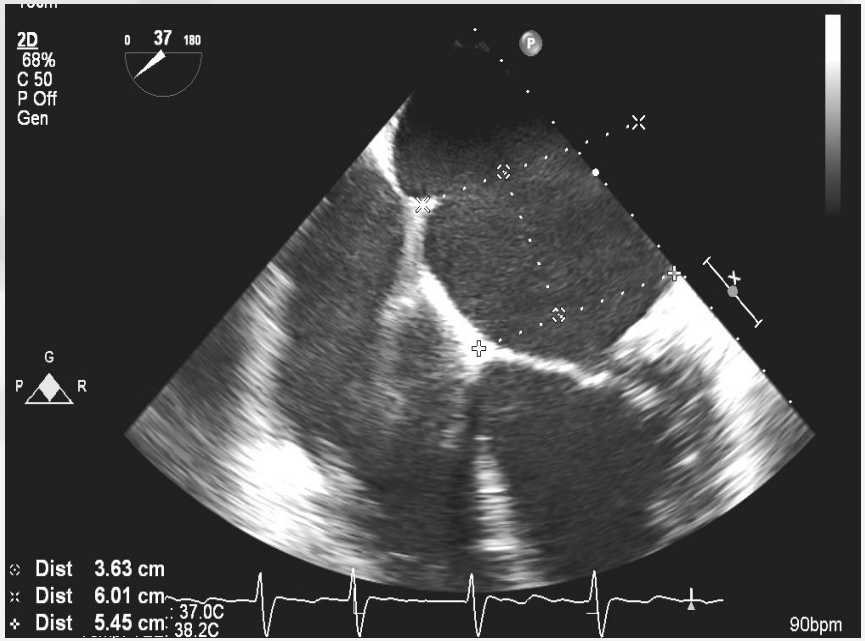




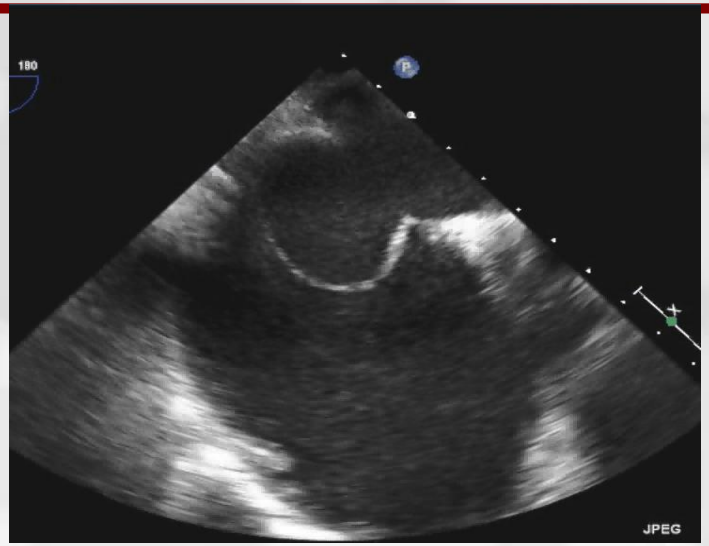
Puntura settale

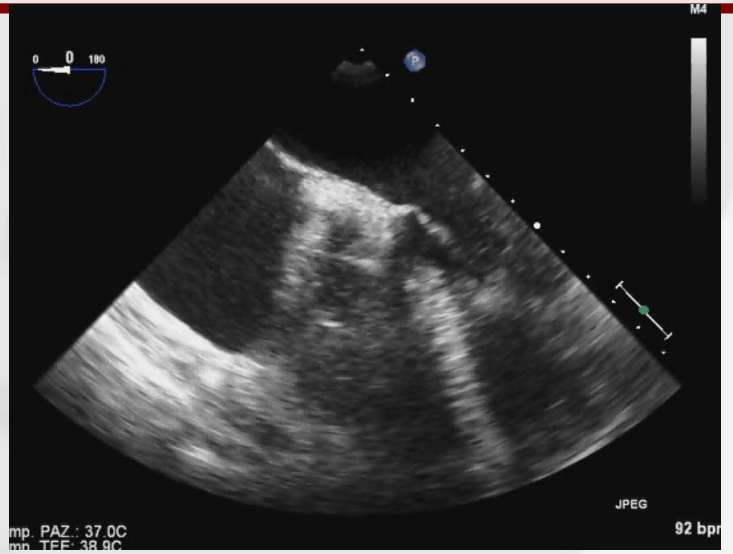
3) la distanza della puntura dall'anello

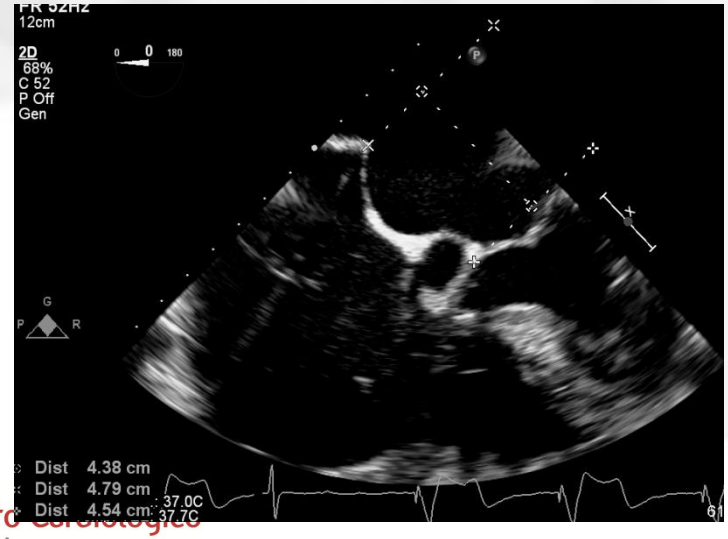


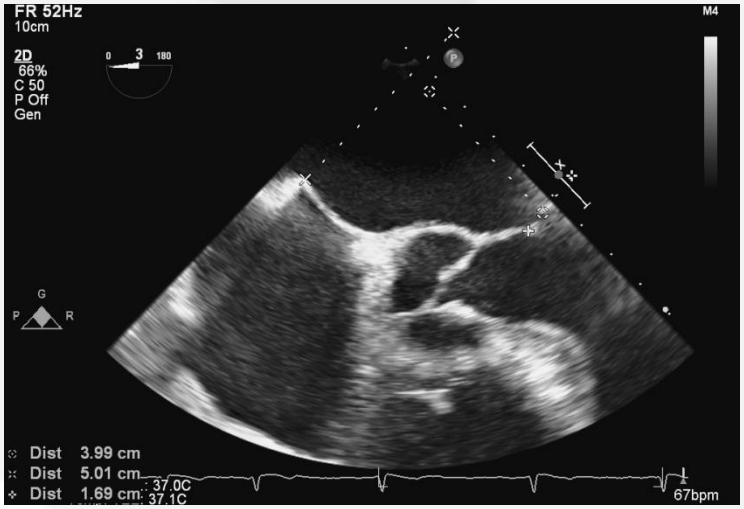


Ma non è sempre facile.....









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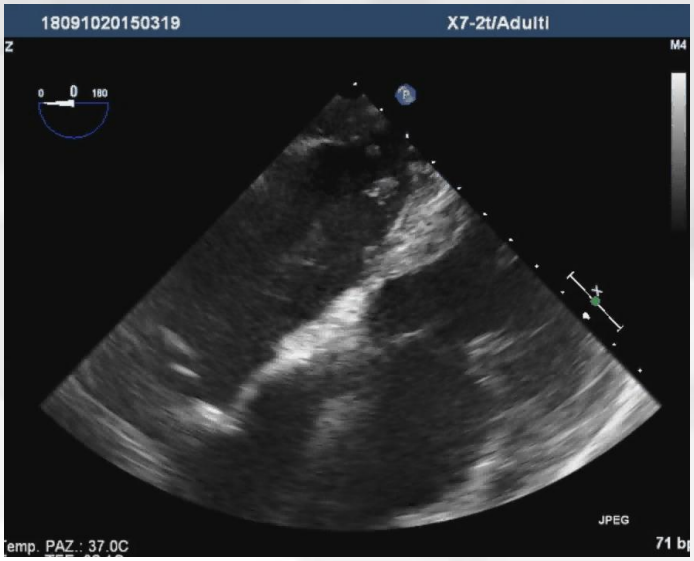
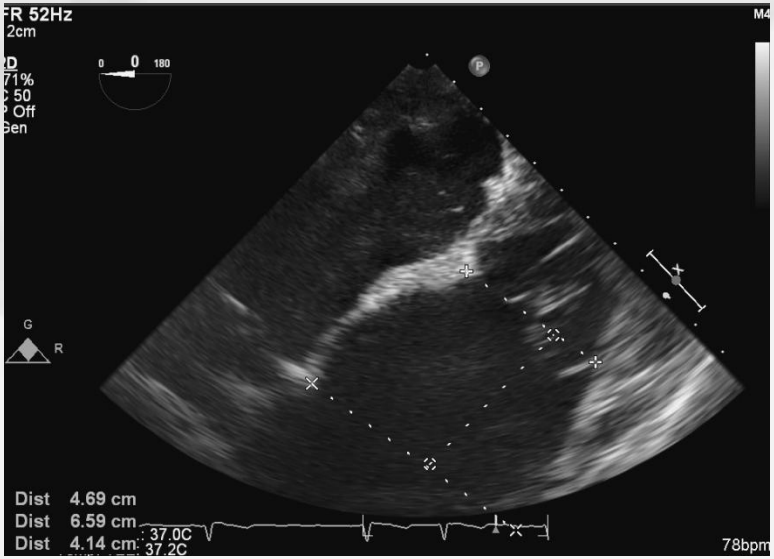
TG deep nella puntura trans-settale





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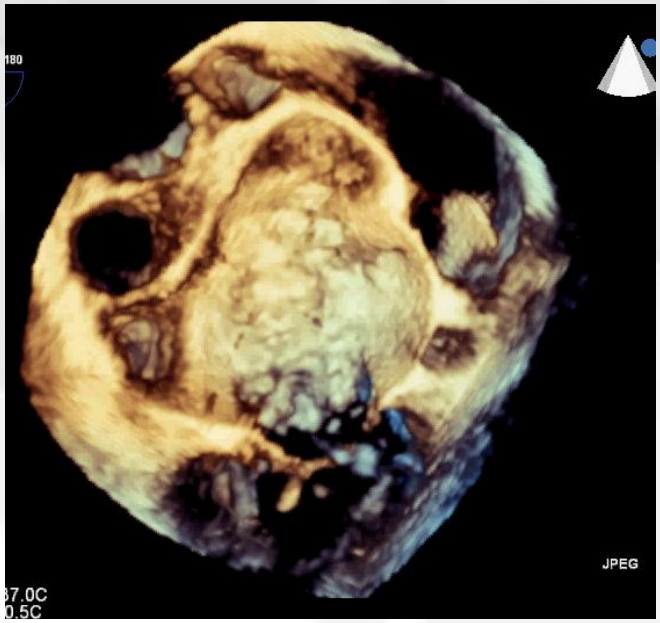
Il 3D nella puntura trans-settale



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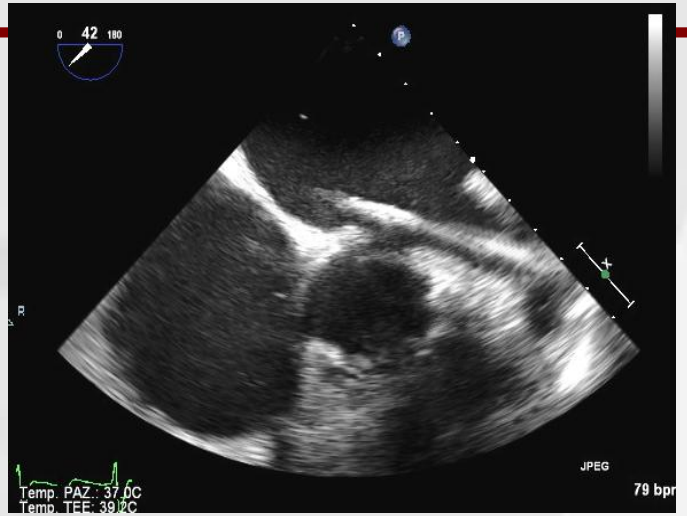
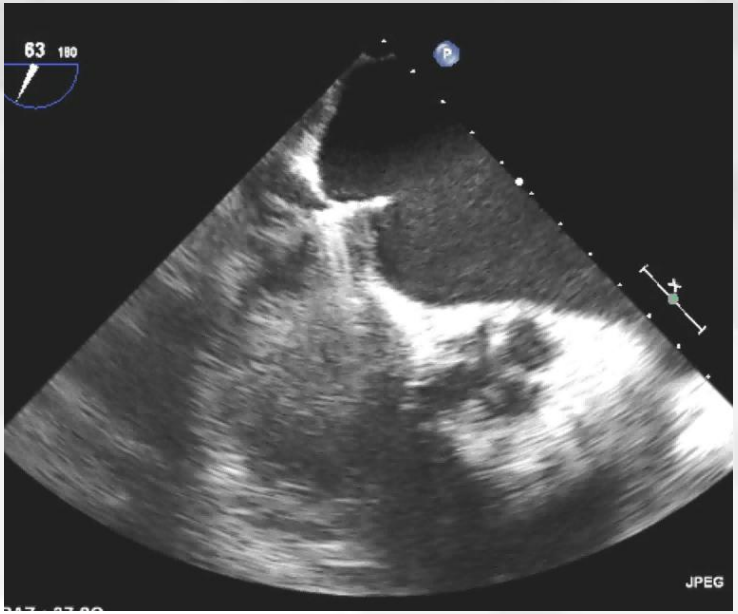
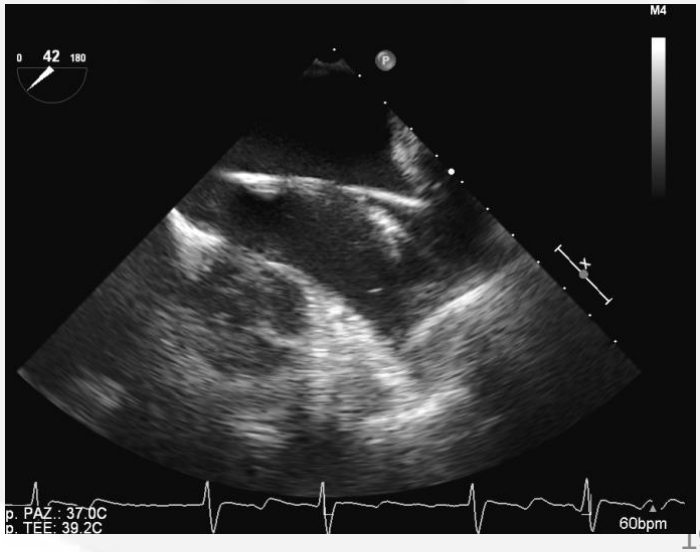
➢ Posizionamento catetere guida

NO: in auricola





SI: in vena polmonare



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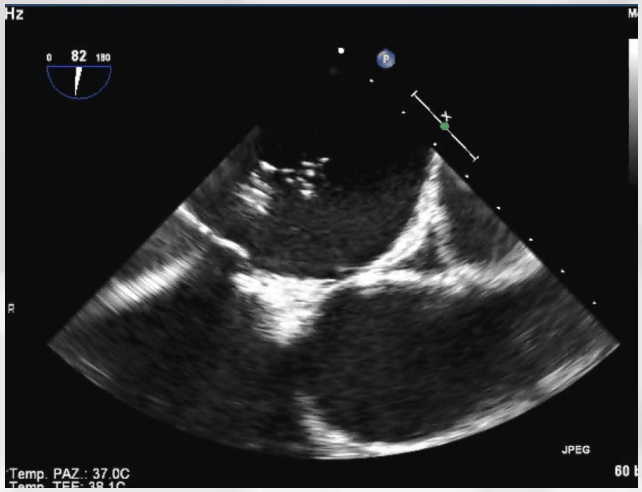
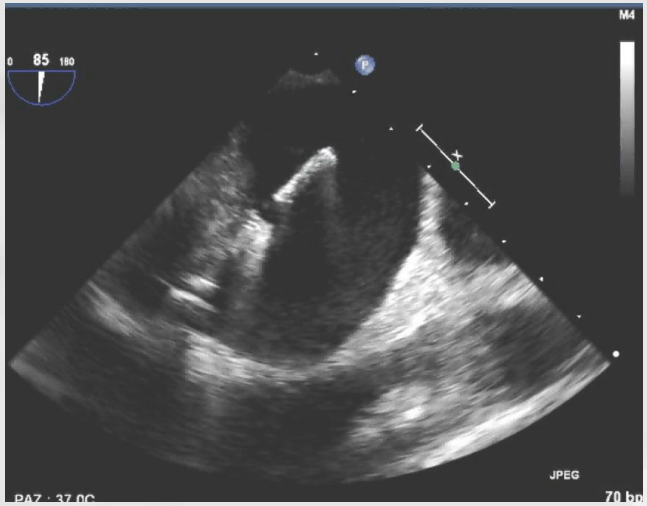
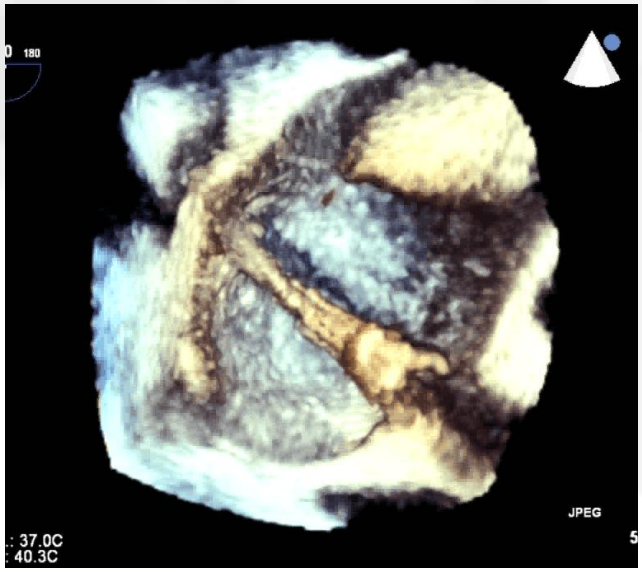
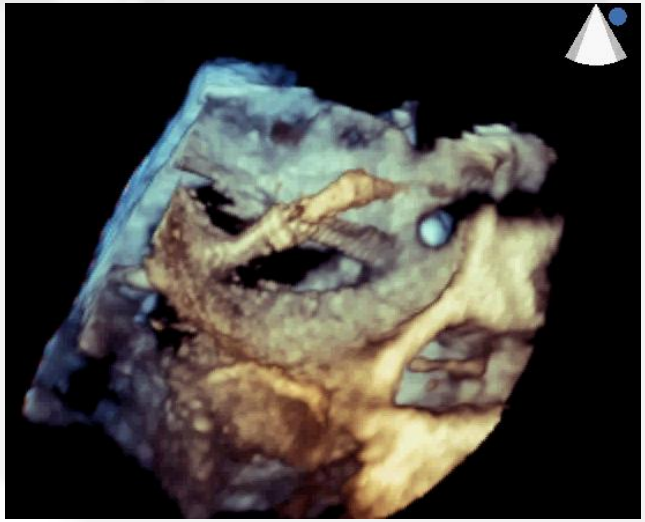
Uscita della clip ed iniziale orientamento

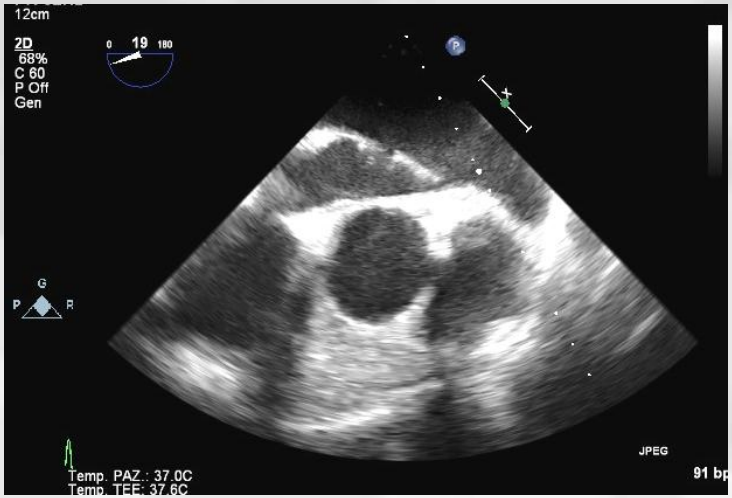


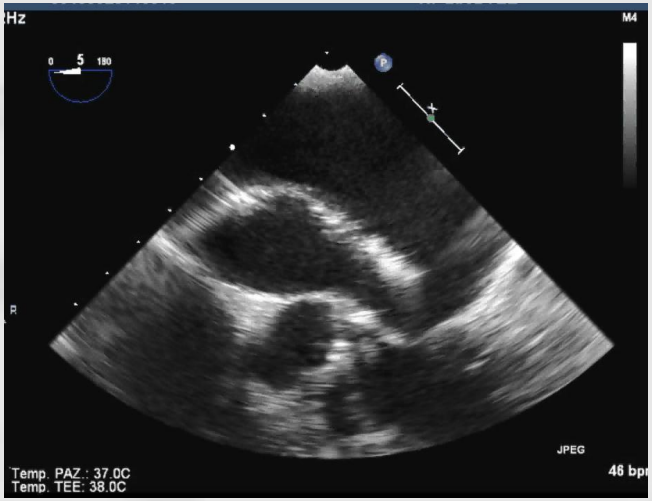


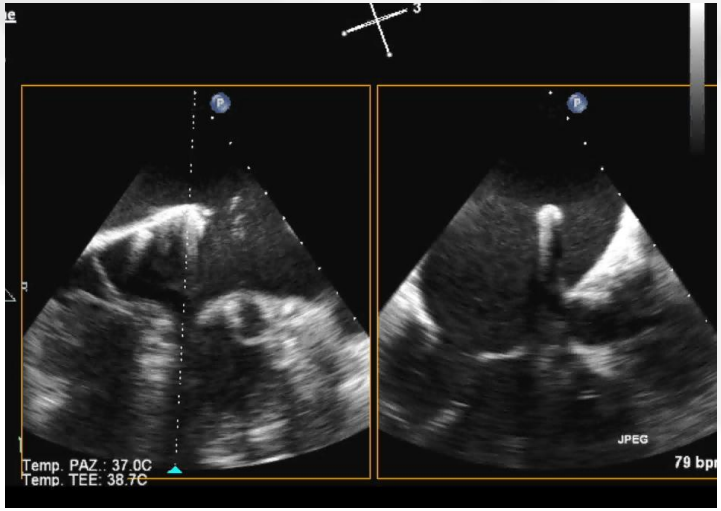


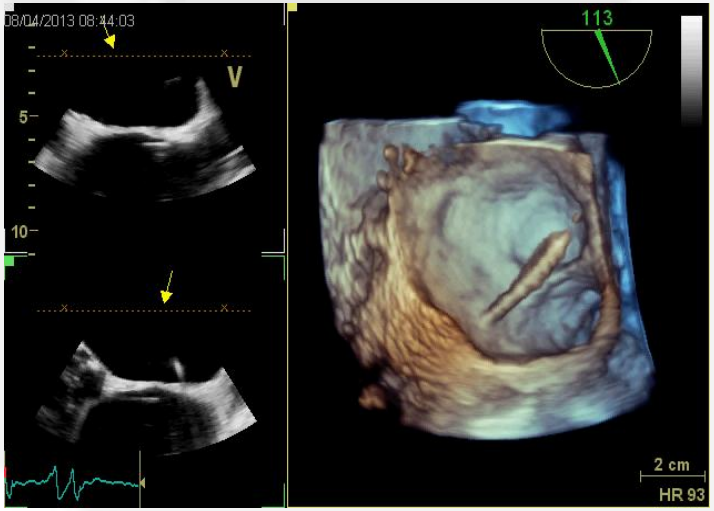


Uscita della clip ed iniziale orientamento









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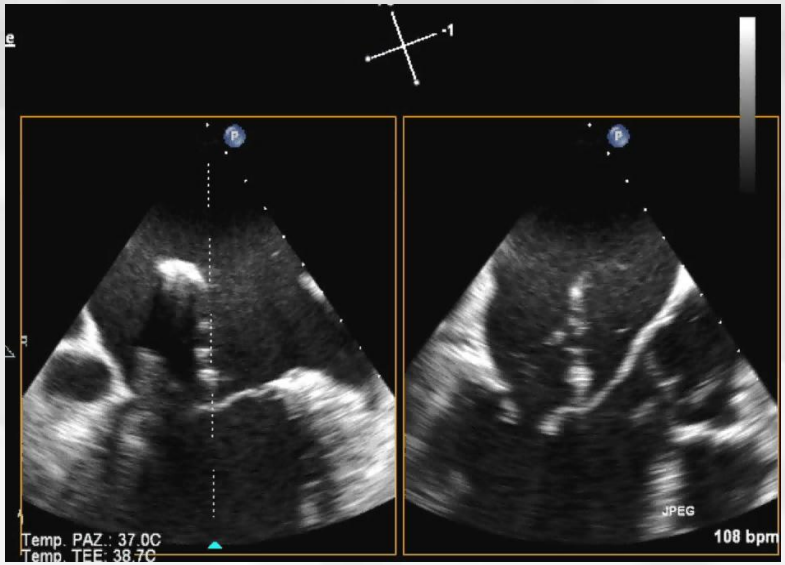
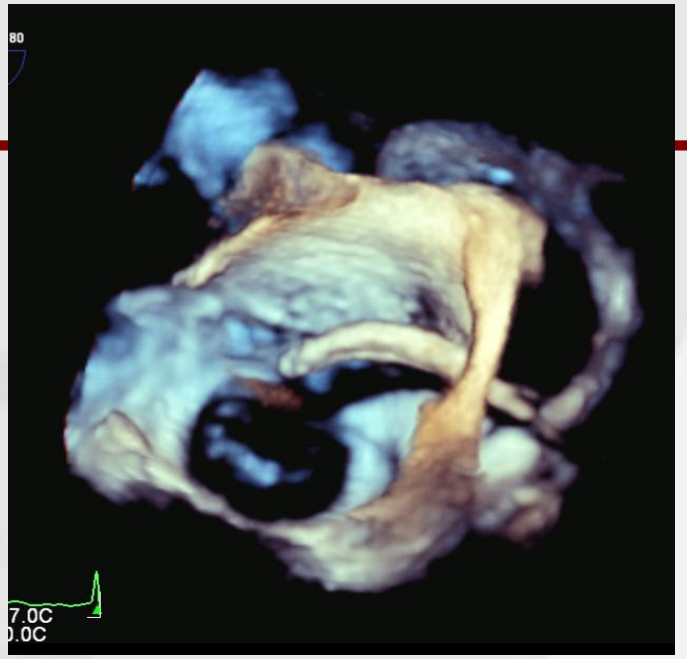
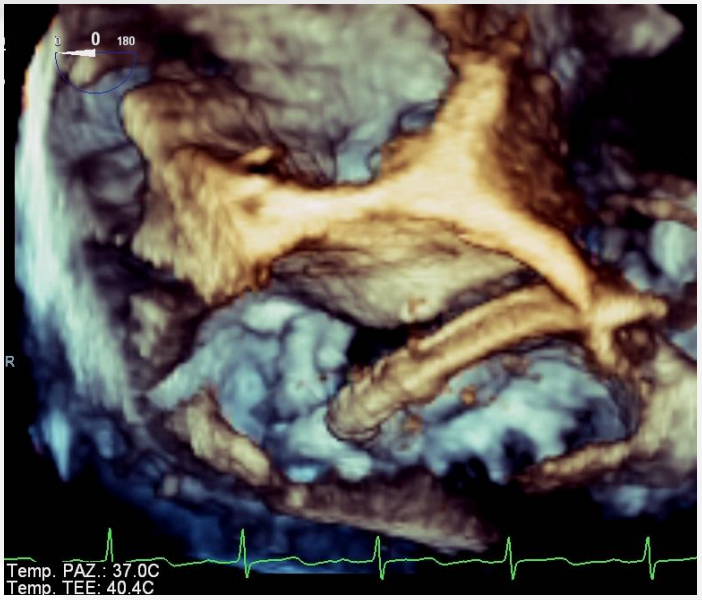
Avanzamento della clip







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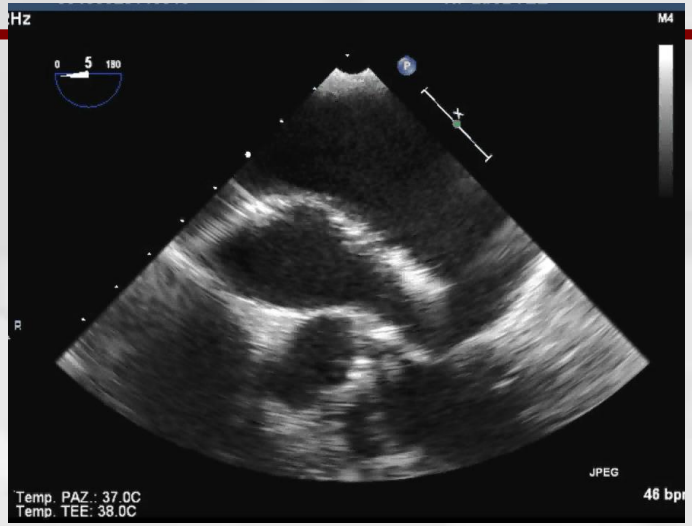

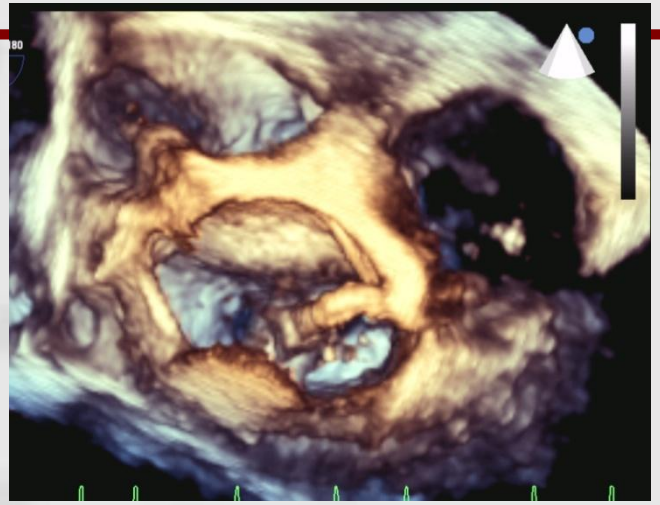

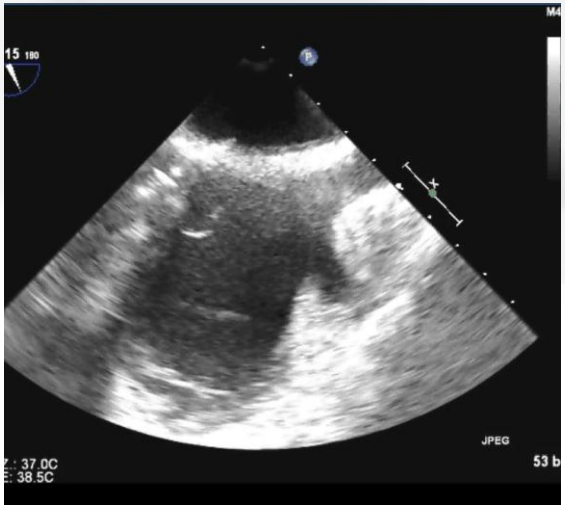

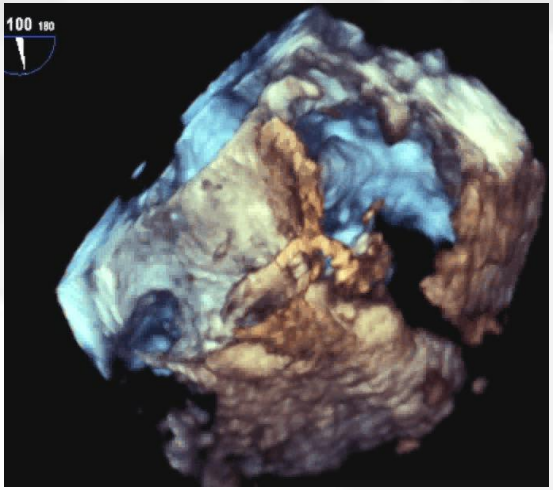

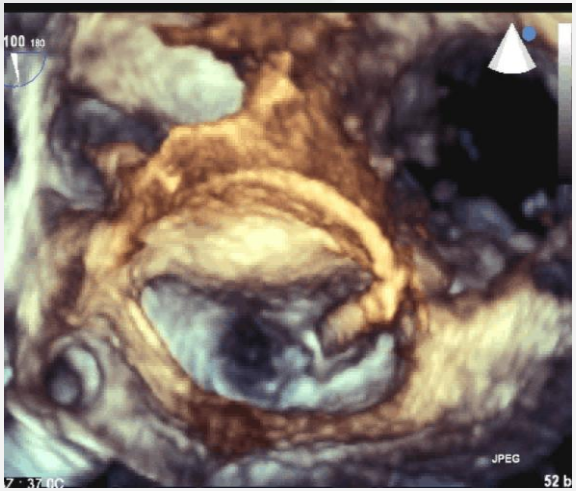

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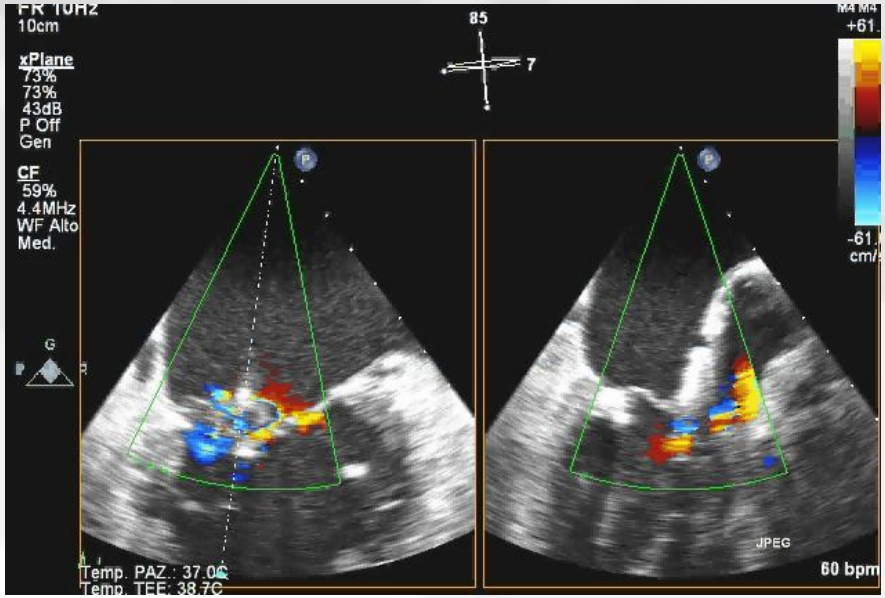
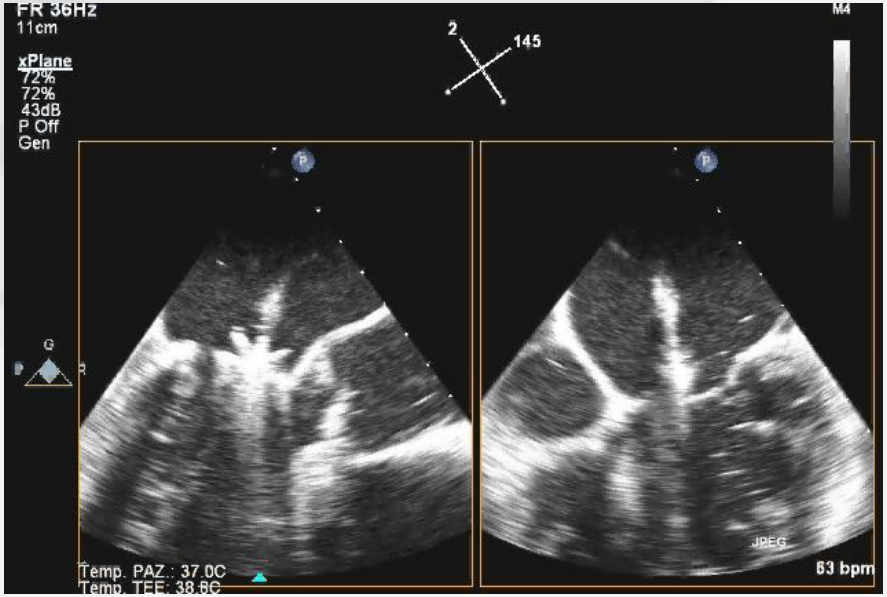
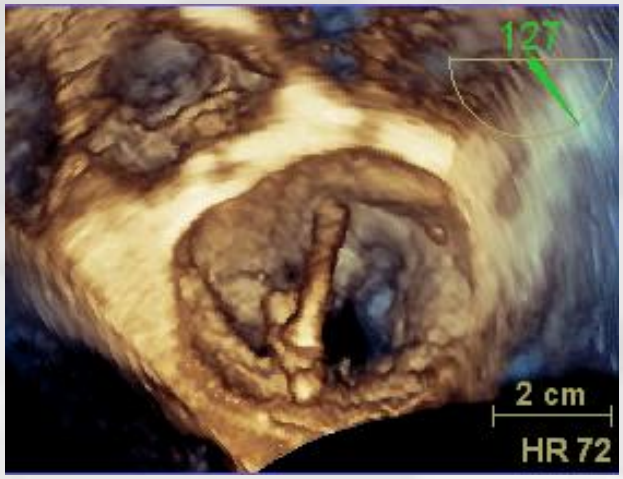
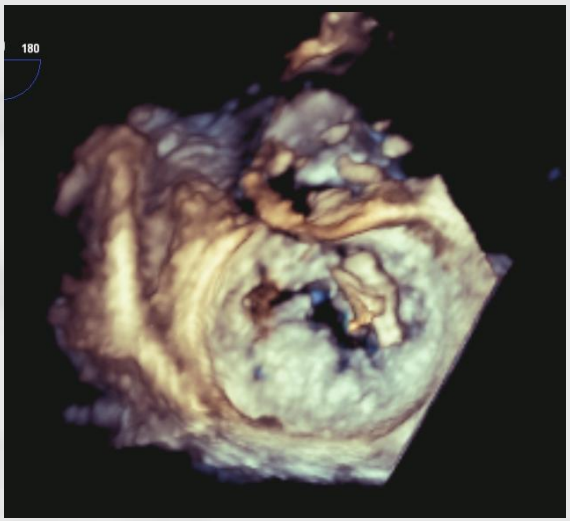
La direzione e l'orientamento della clip

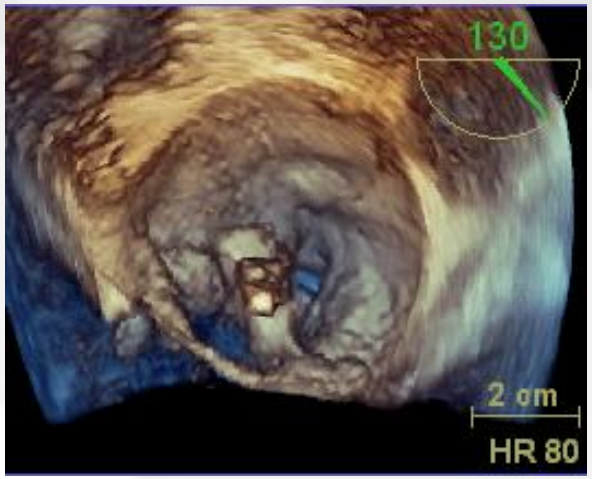




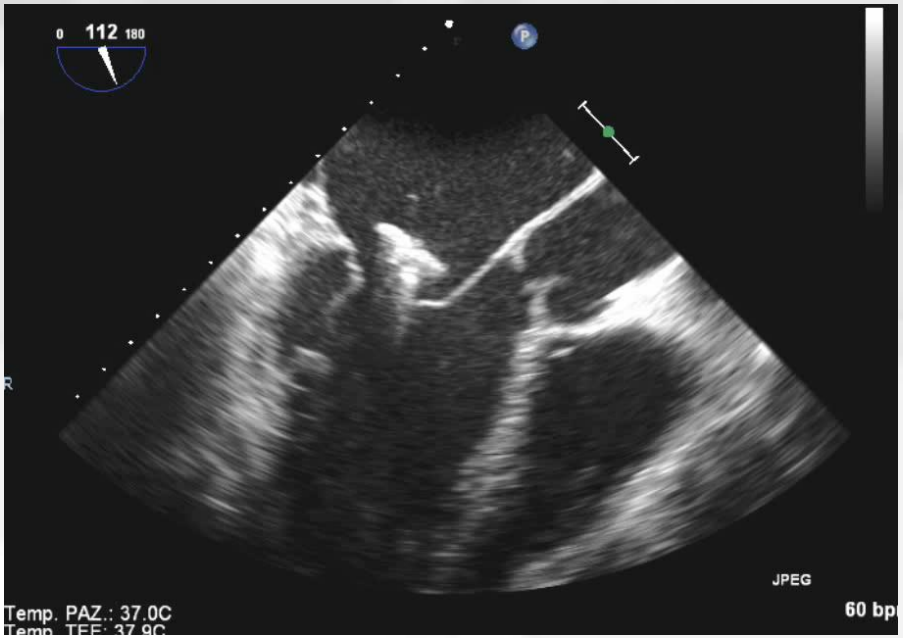
➢ L'orientamento della clip

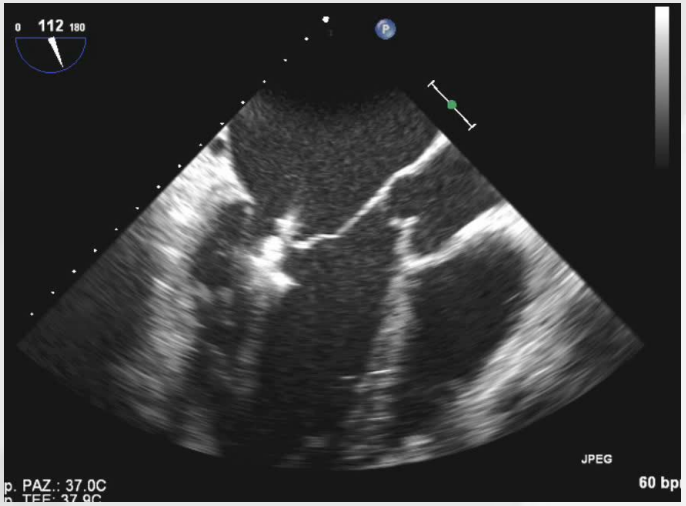


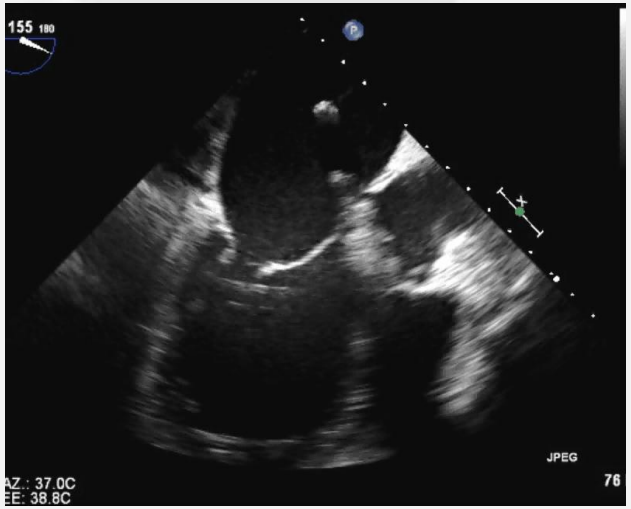




➢ Posizionamento della clip







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Procedura eco-guidata

- ✓ *Valutazione preoperatoria*
- ✓ *Monitoraggio intraoperatorio*
- ✓ *Valutazione del risultato*

Procedura eco-guidata

- ✓ *Valutazione preoperatoria*
- ✓ *Monitoraggio intraoperatorio*
- ✓ ***Valutazione del risultato***

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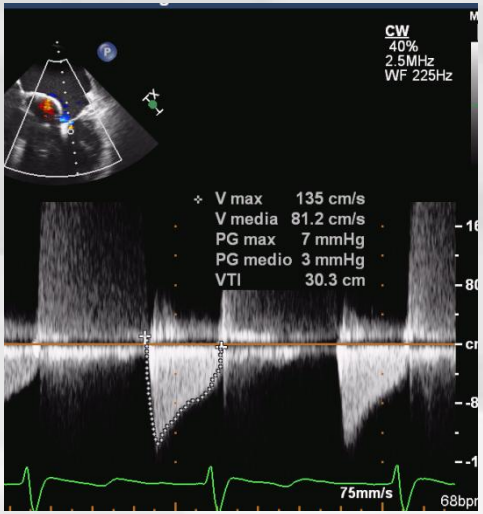
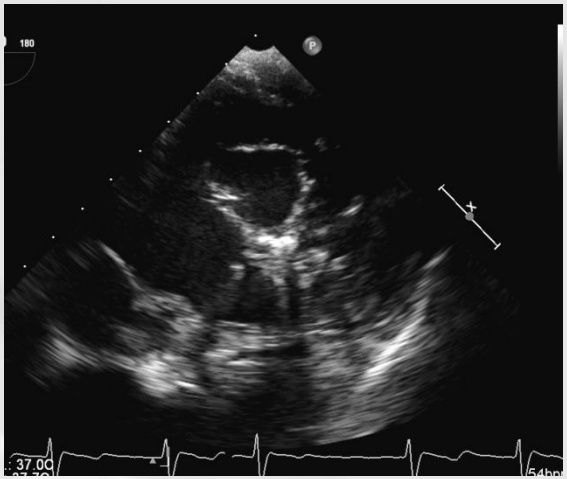
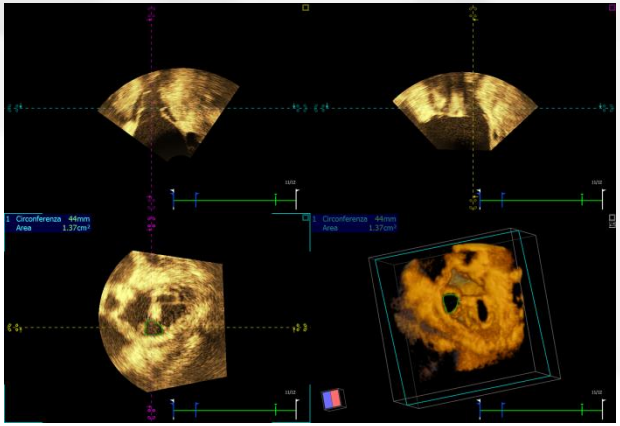
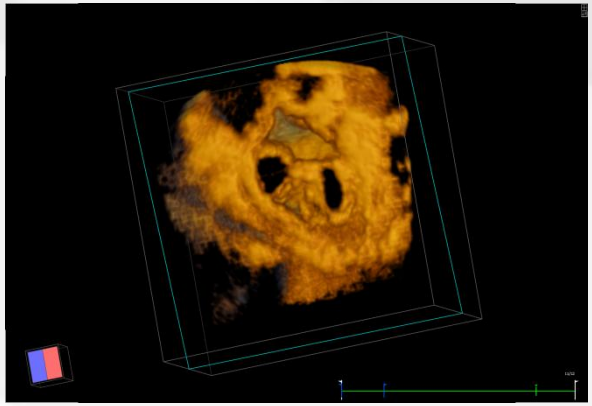
➢ Abbiamo creato stenosi funzionale?

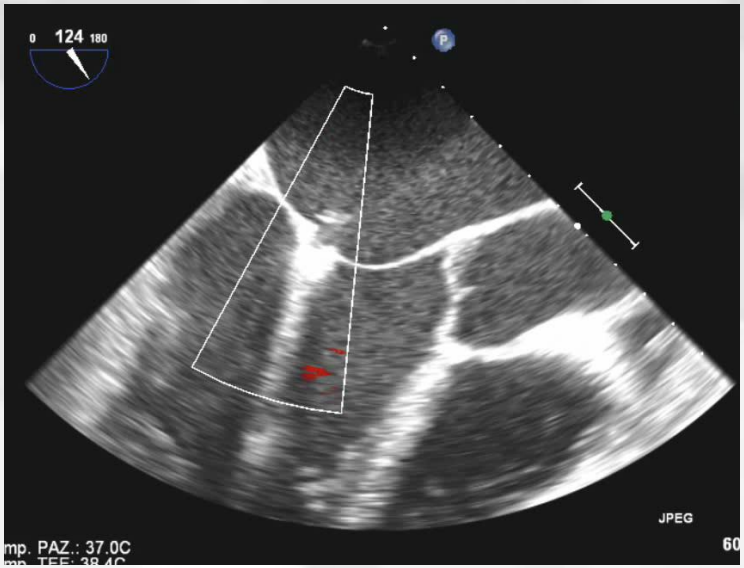


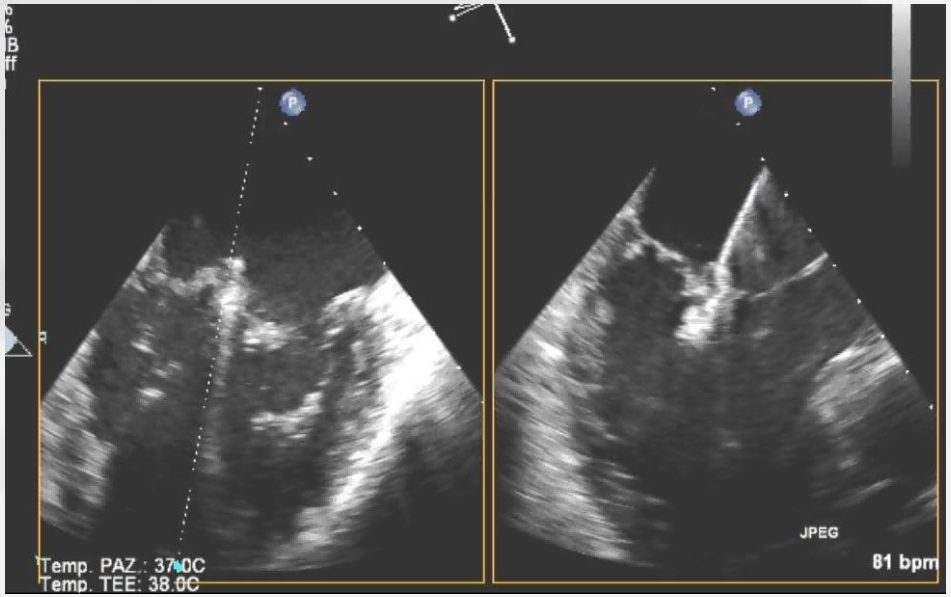






➢ La clip è fissata bene ?





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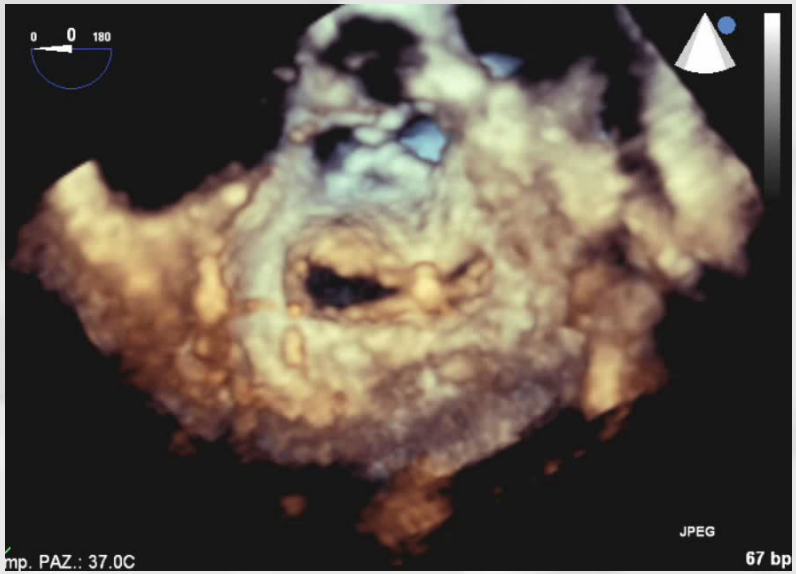
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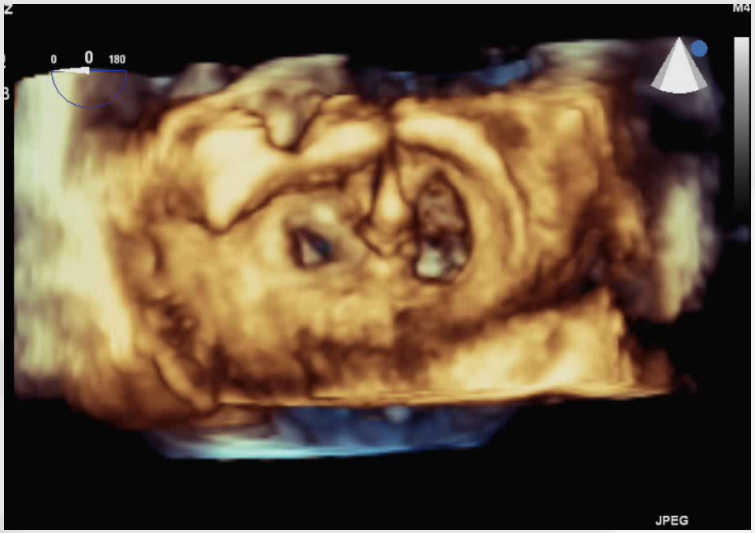
mp. PAZ.: 37.0C
67 bp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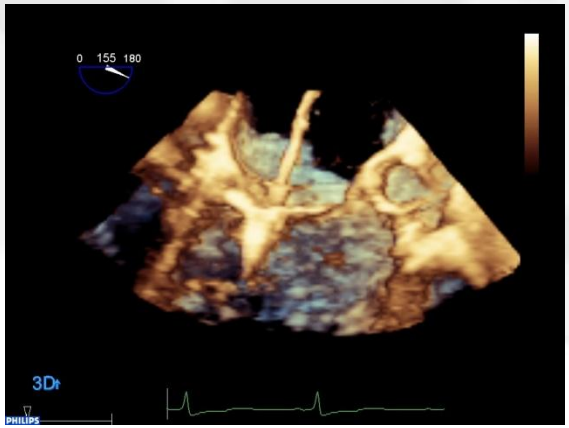
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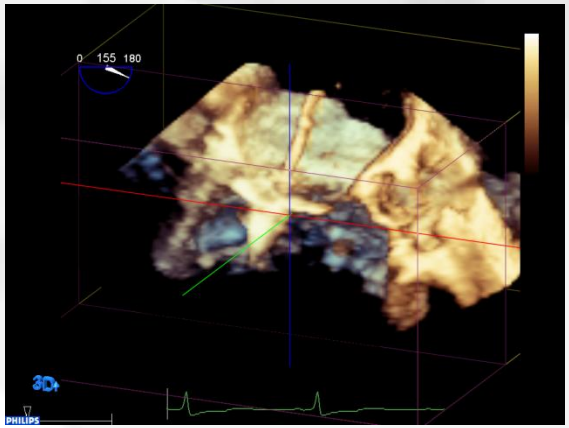
3D
PHILIPS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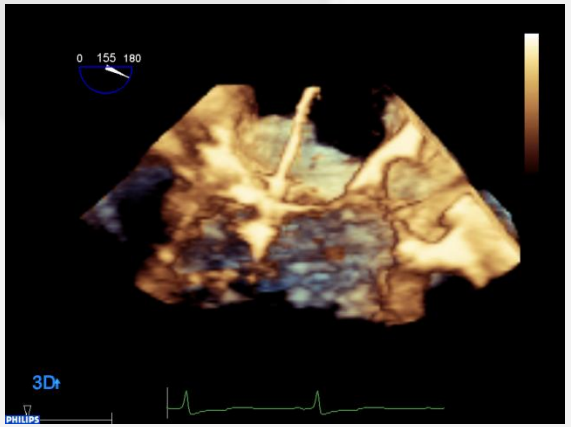
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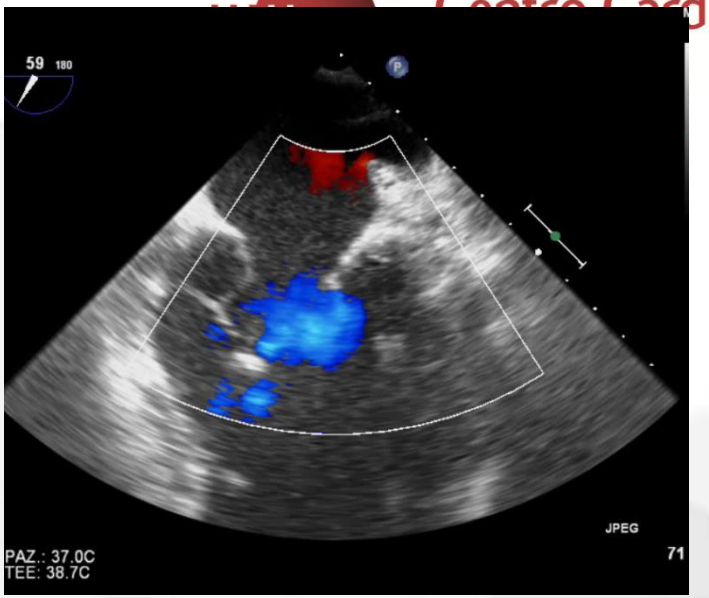
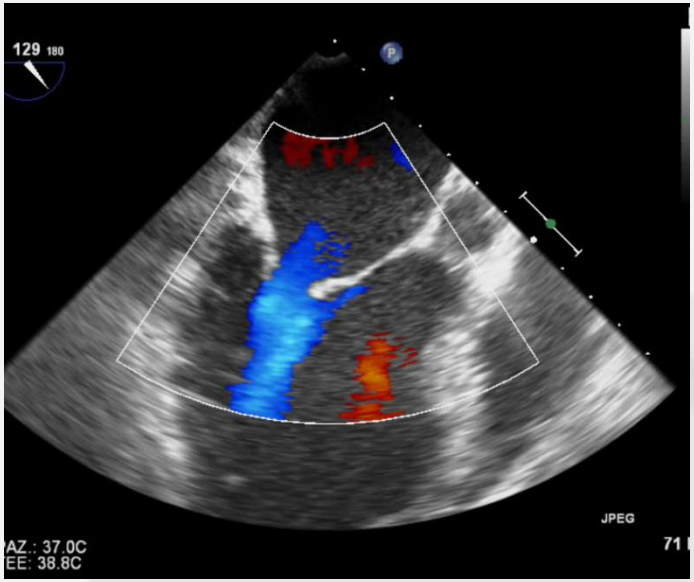

59 180
JPEG
PAZ.: 37.0C
TEE: 38.7C
71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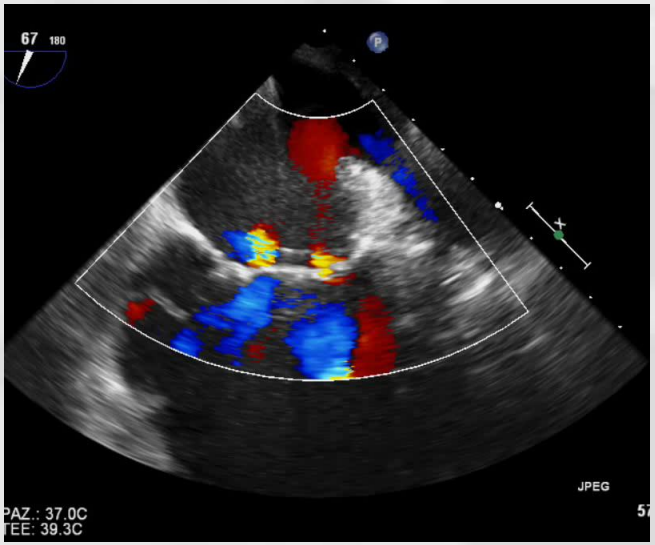
EE: 38.8C
71


67 180
JPEG
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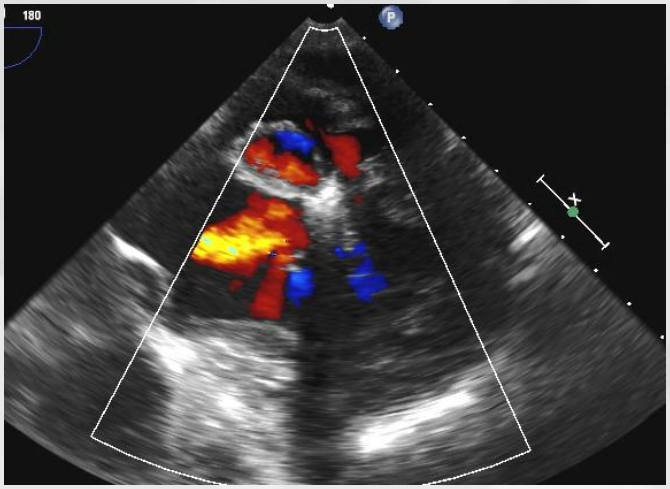
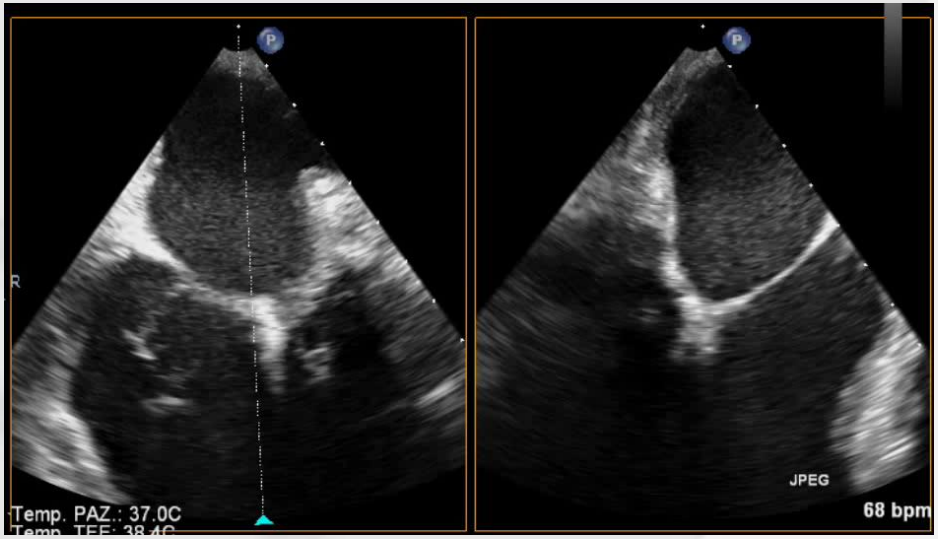
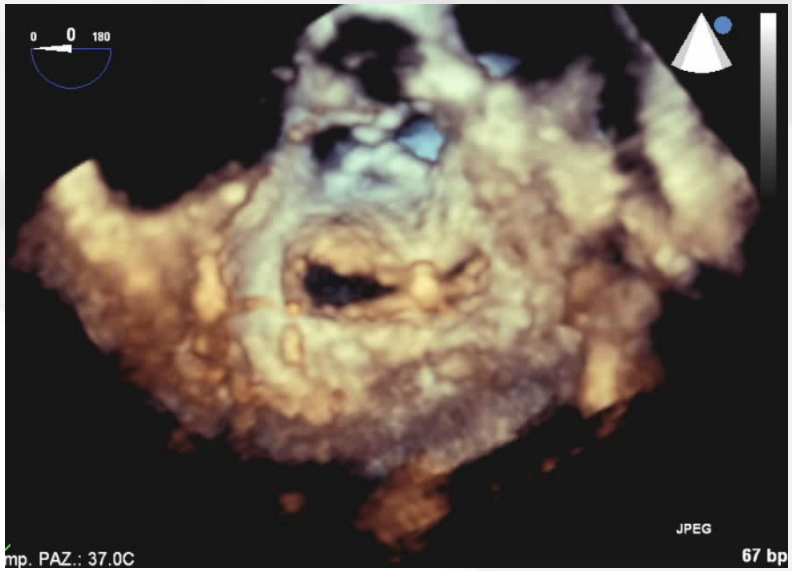
Dopo la prima clip







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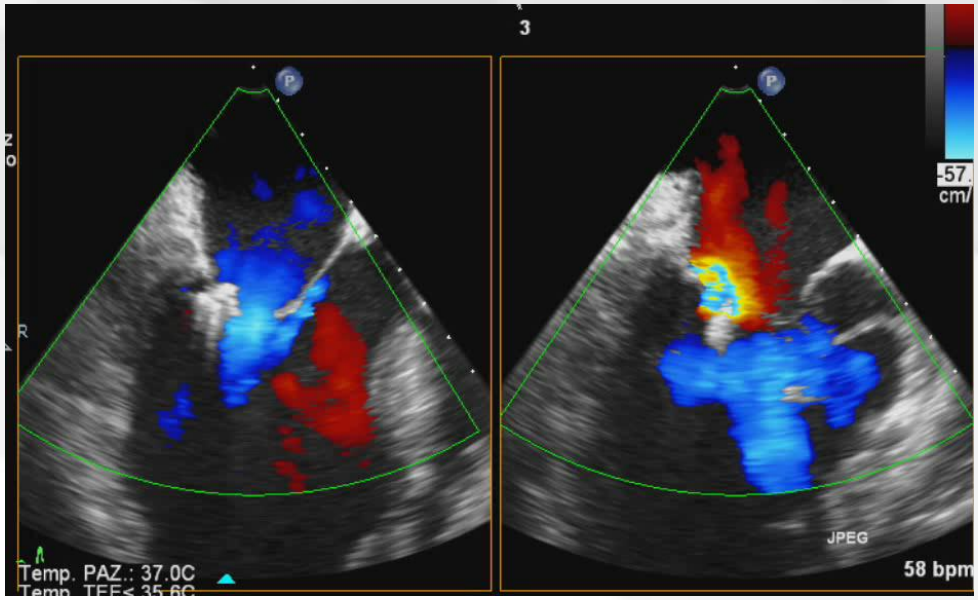
48 ore dopo



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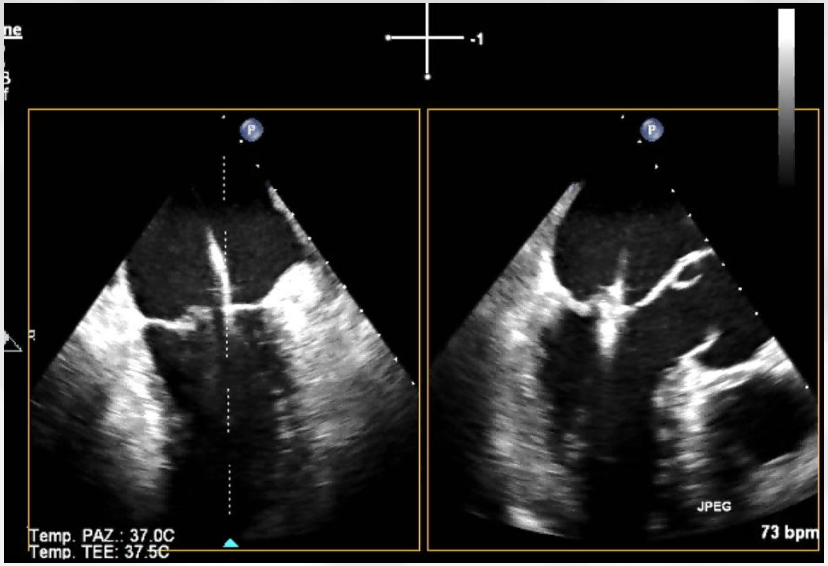
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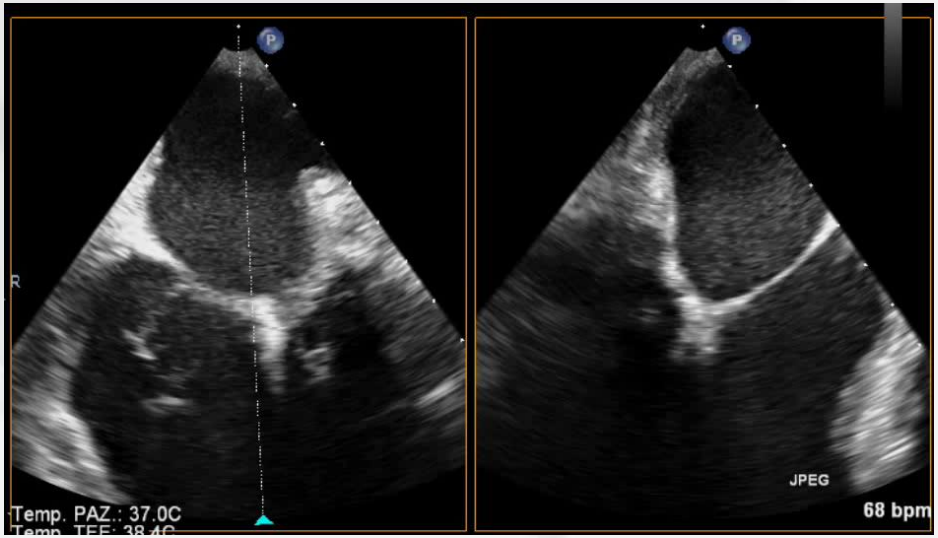
JPEG
73 bpm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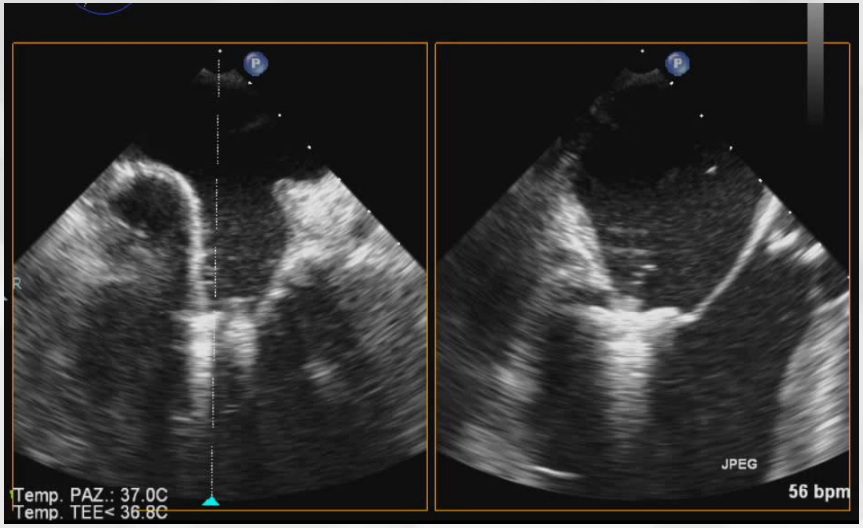
68 bpm

2° procedura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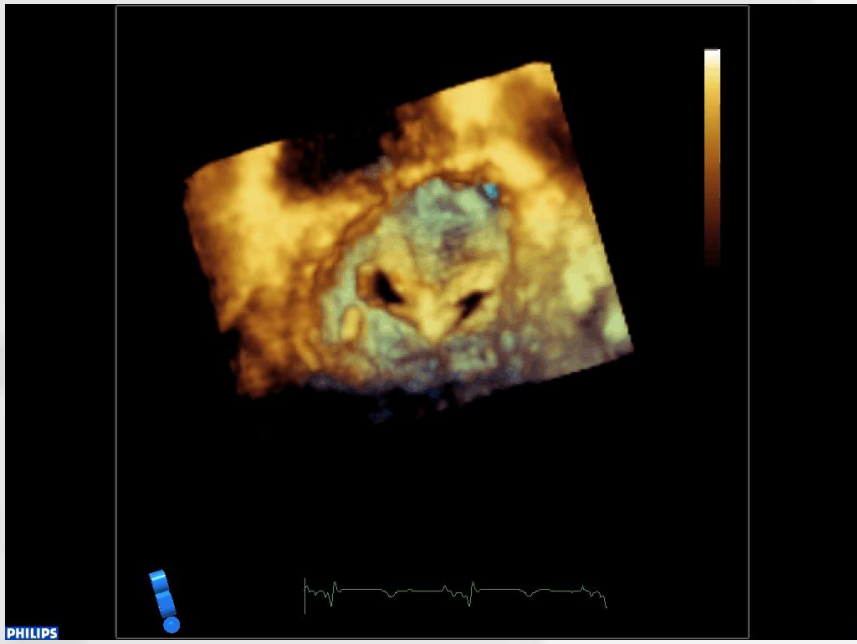
56 bpm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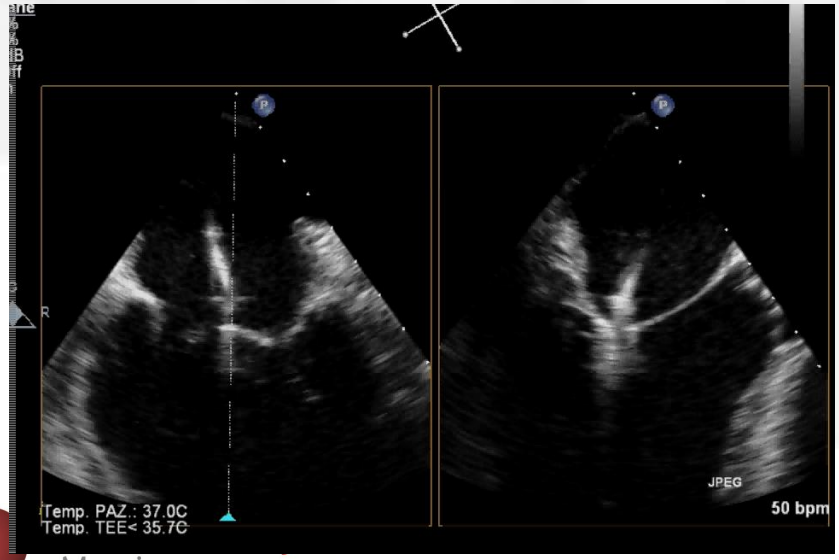
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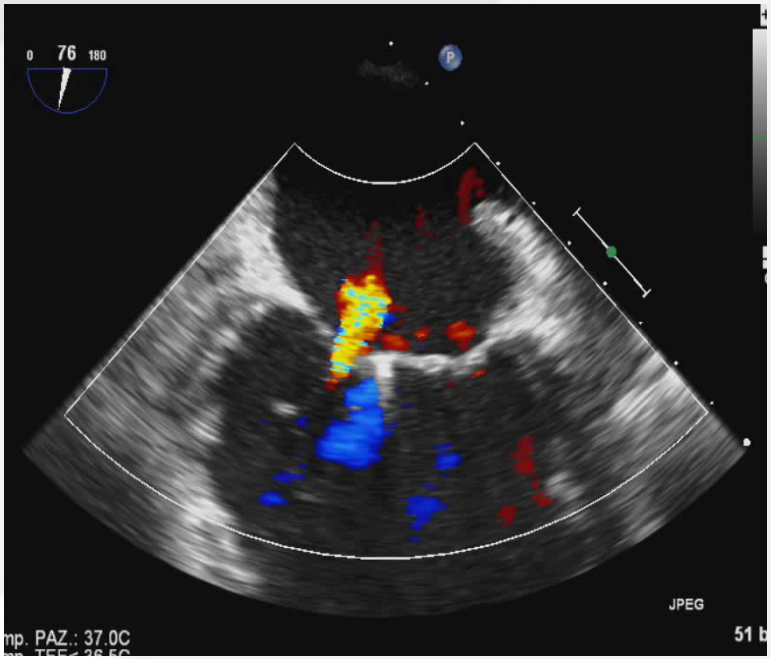
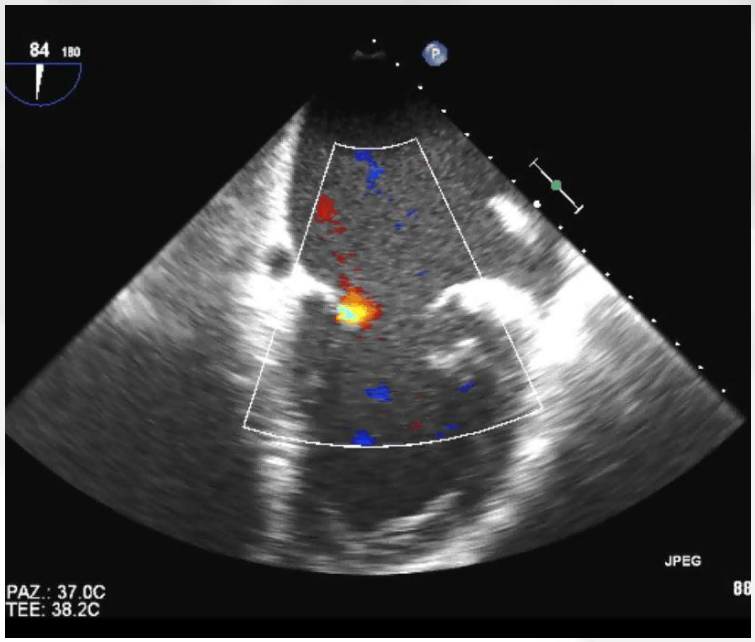

0
76
180
JPEG

➢ *Abbiamo ottenuto riduzione del rigurgito?*

Basale



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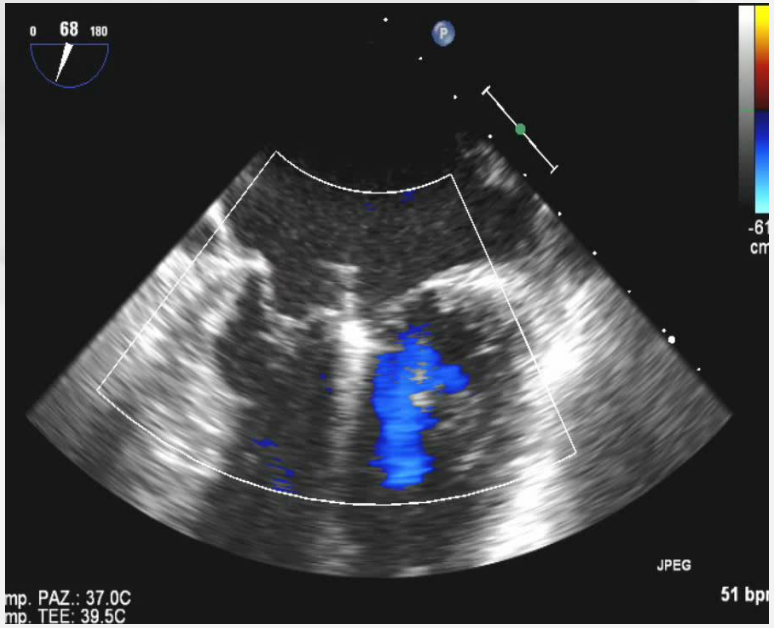
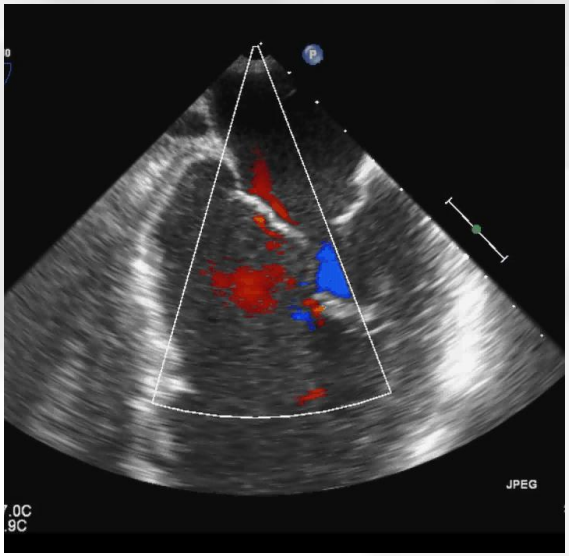


➢ *Abbiamo ottenuto riduzione del rigurgito?*

Basale



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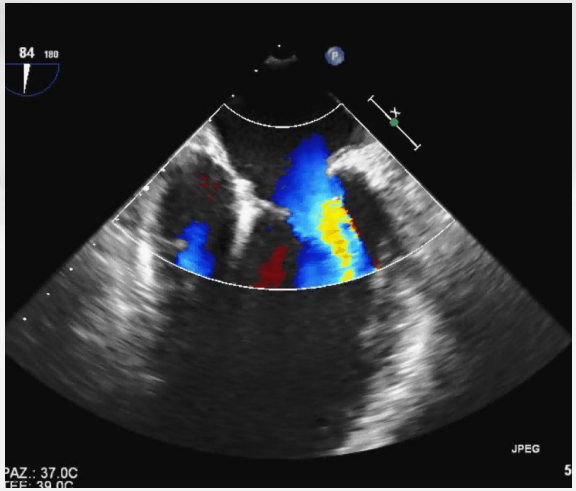

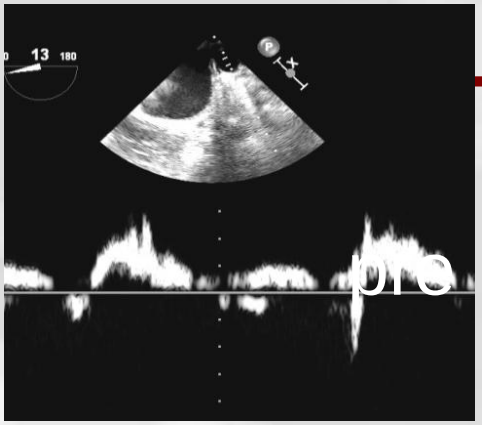

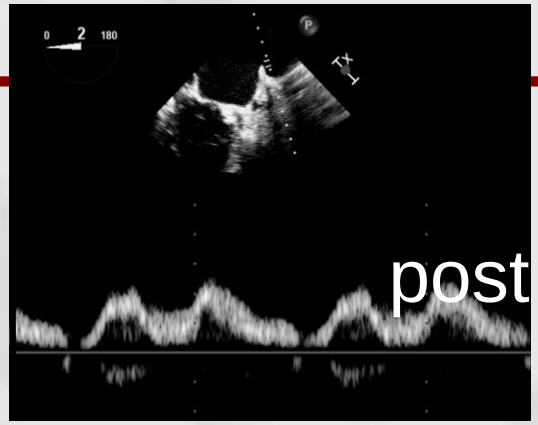

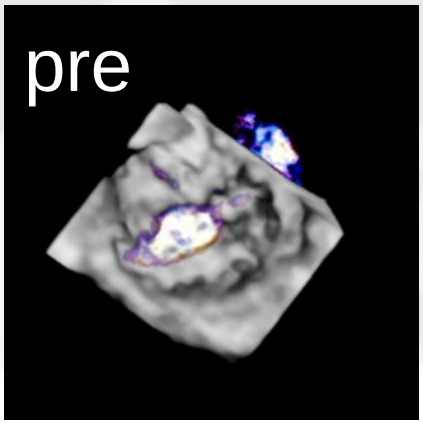

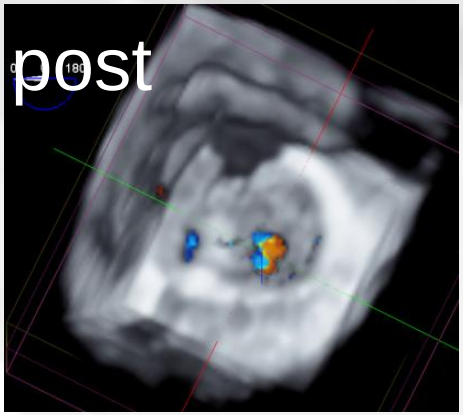

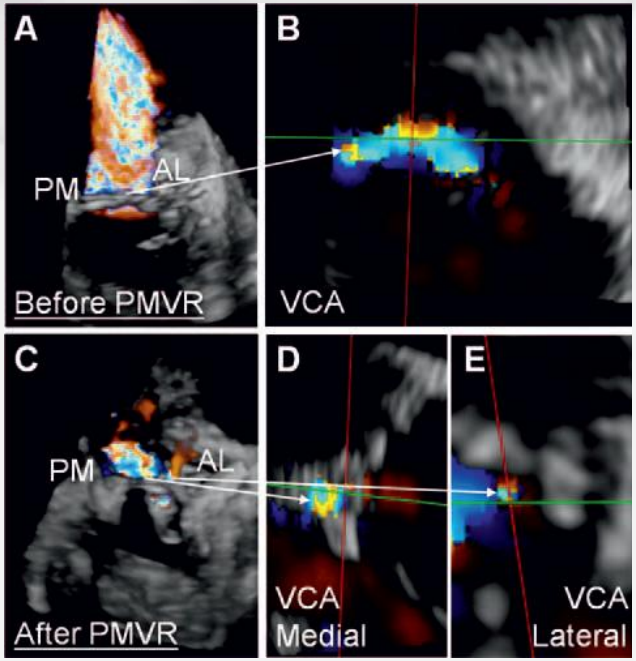

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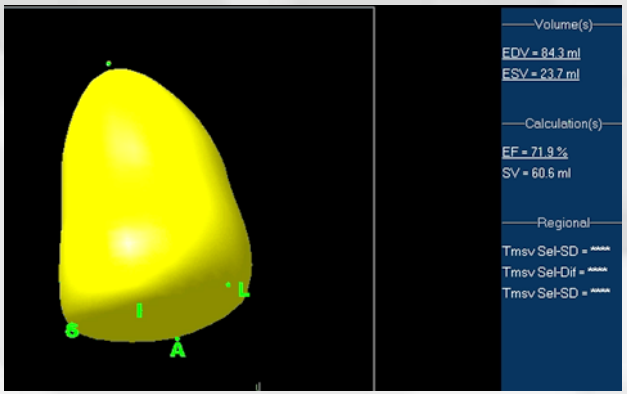
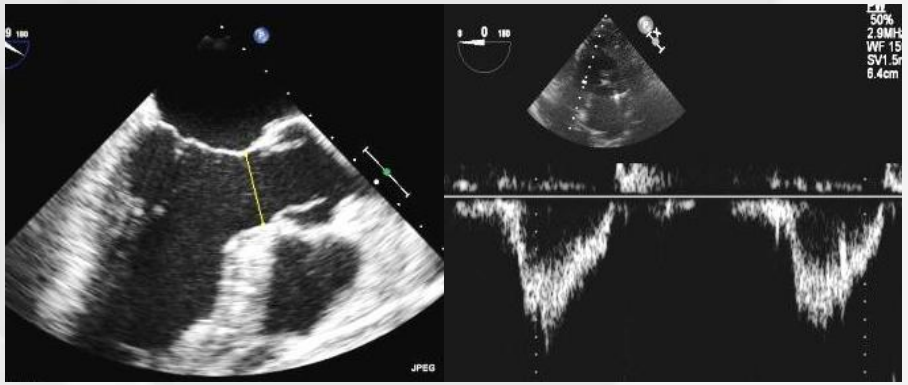
Altiok et al.
Circ Cardiovasc Imaging. 2012.

J Am Soc Echocardiogr 2011;24:937-65.)

EAE/ASE Recommendations for the Use of Echocardiography in New Transcatheter Interventions for Valvular Heart Disease

Jose L. Zamorano[1*†], Luigi P. Badano[2], Charles Bruce[3], Kwan-Leung Chan[4], Alexandra Gonçalves[5], Rebecca T. Hahn[6], Martin G. Keane[7], Giovanni La Canna[8], Mark J. Monaghan[9], Petros Nihoyannopoulos[10], Frank E. Silvestry[7], Jean-Louis Vanoverschelde[11], and Linda D. Gillam[12‡], *Rochester, Minnesota; Otttawa, Ontario, Canada; Porto, Portugal; New York, New York; Philadelphia, Pennsylvania; London, United Kingdom; Brussels, Belguim; Morristown, New Jersey*





3D SV – Ao SV

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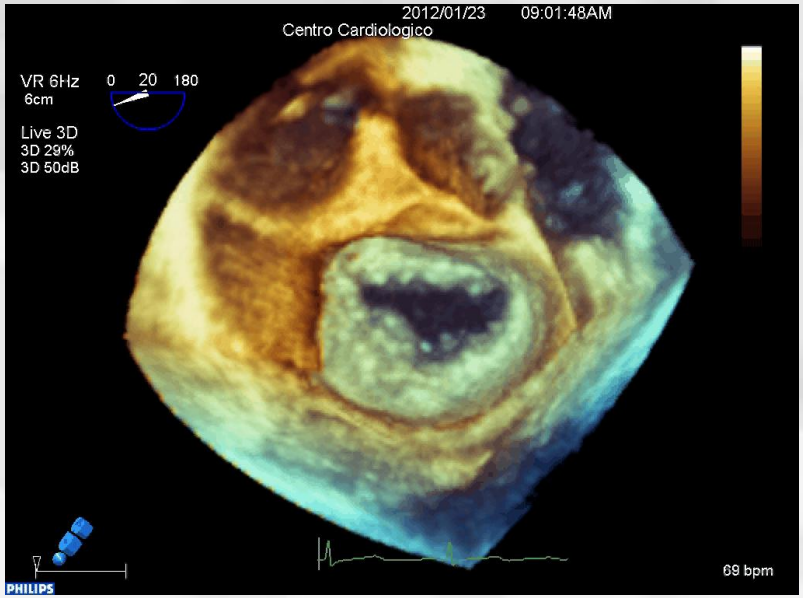
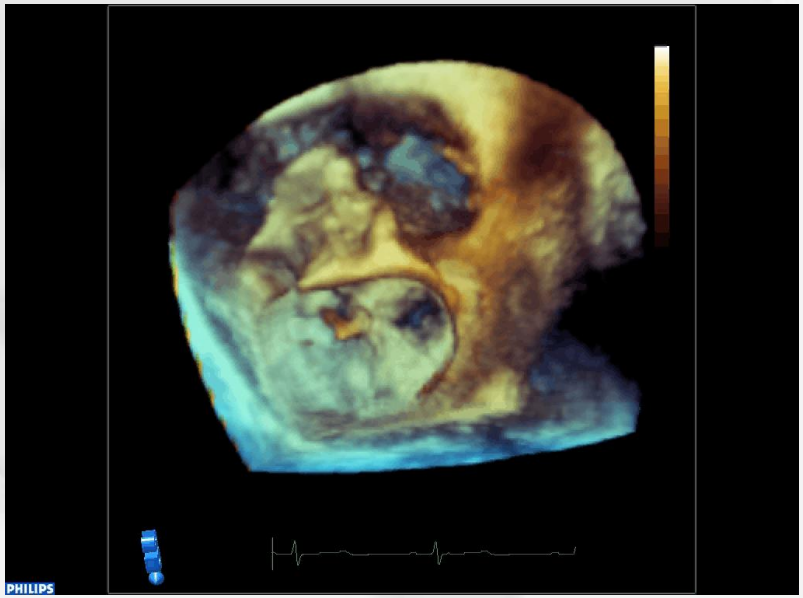

2012/01/23 09:01:48AM
Centro Cardiologico
VR 6Hz
6cm
0 20 180
Live 3D
3D 29%
3D 50dB
69 bpm
PHILIPS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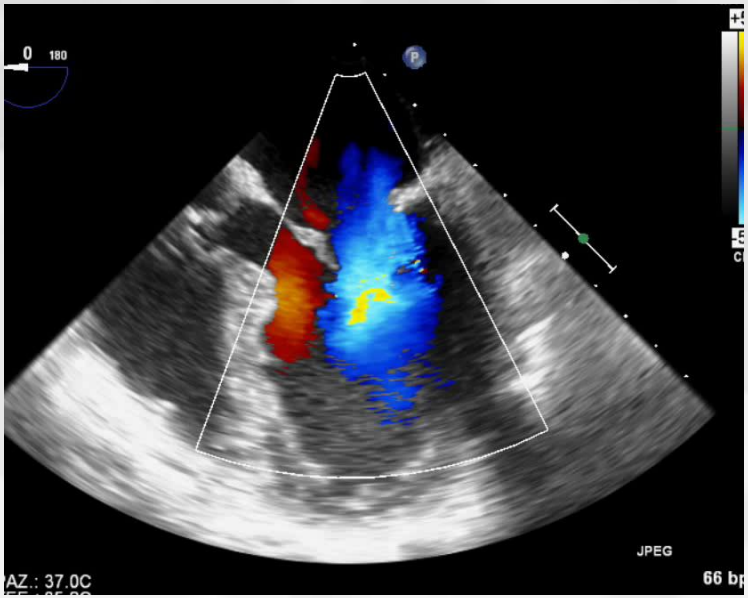

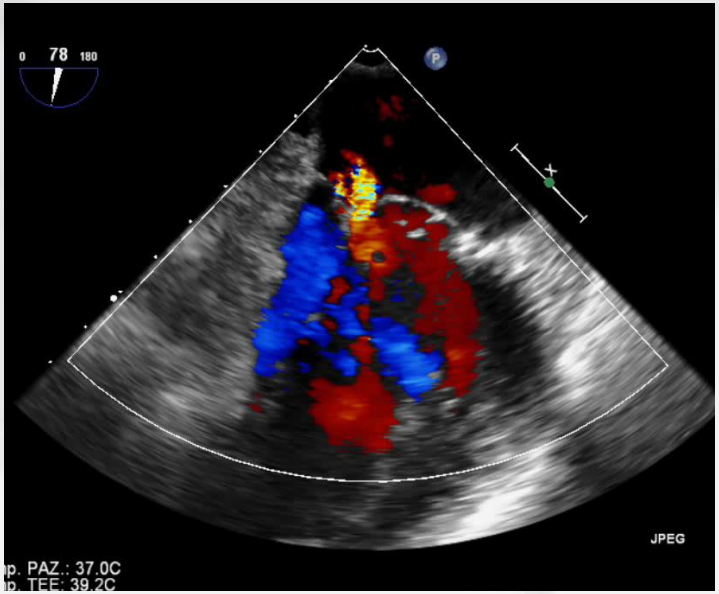

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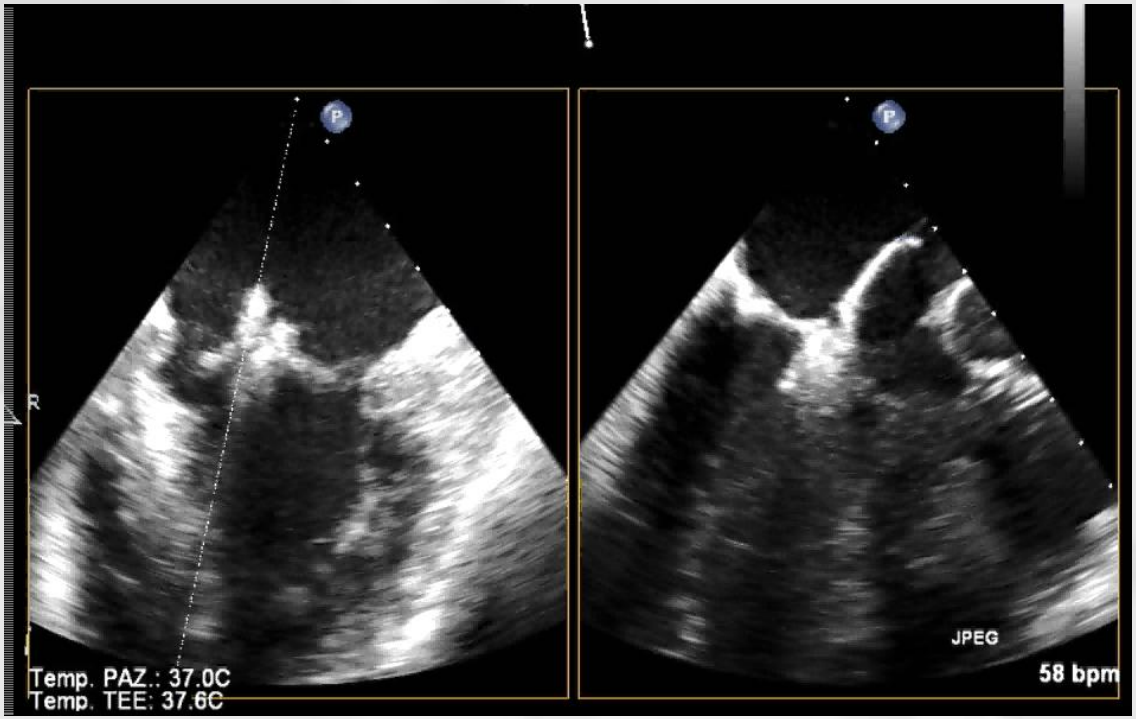
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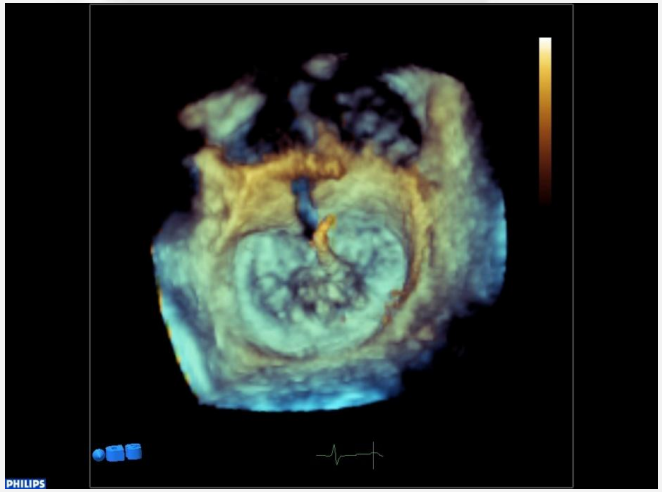
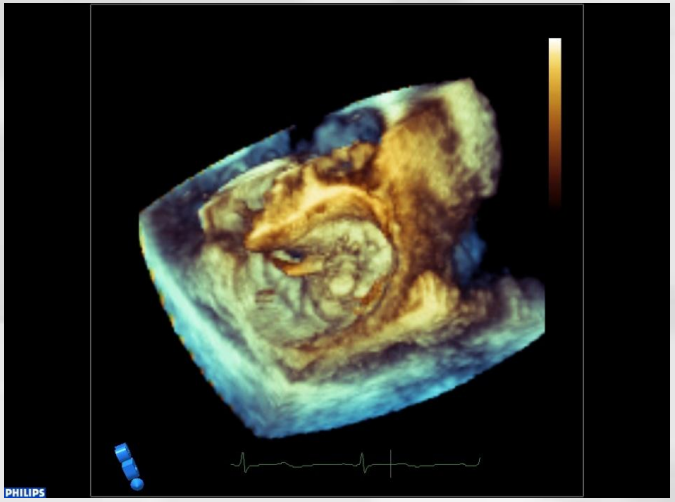
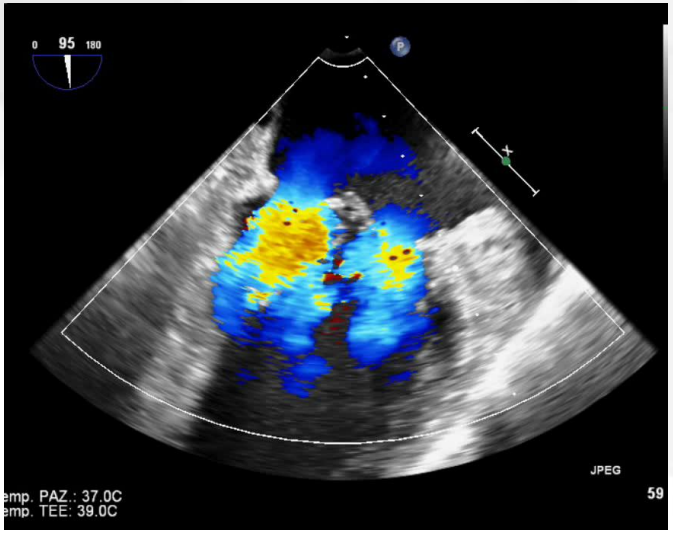
Temp. TEE: 37.6C
JPEG
58 bpm

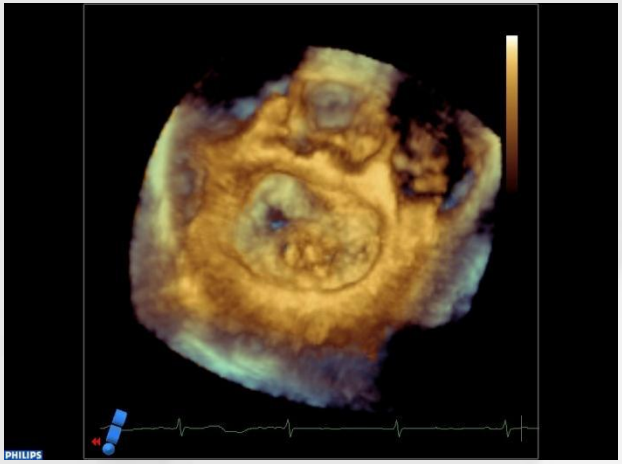

PHILIPS

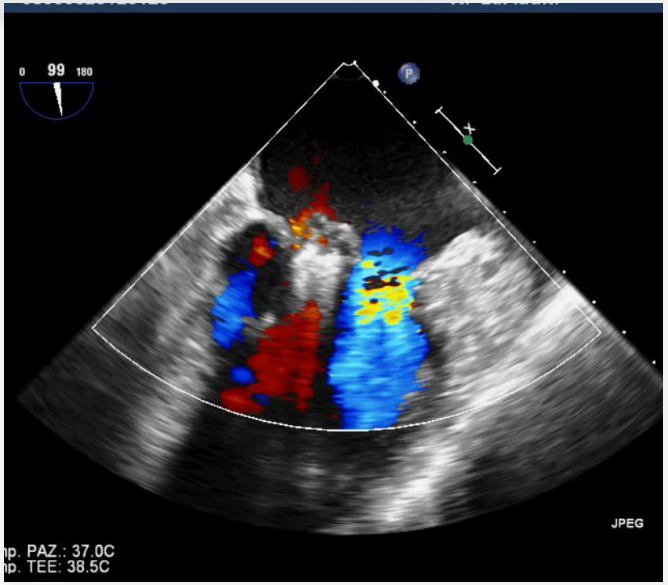
Dopo 1 clip





Dopo 2 clip





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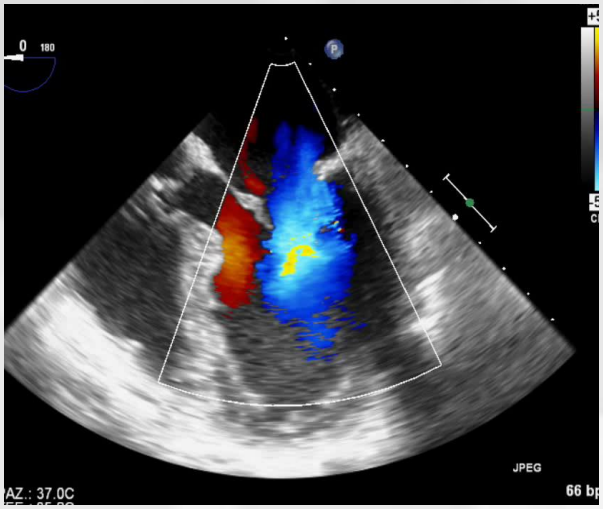
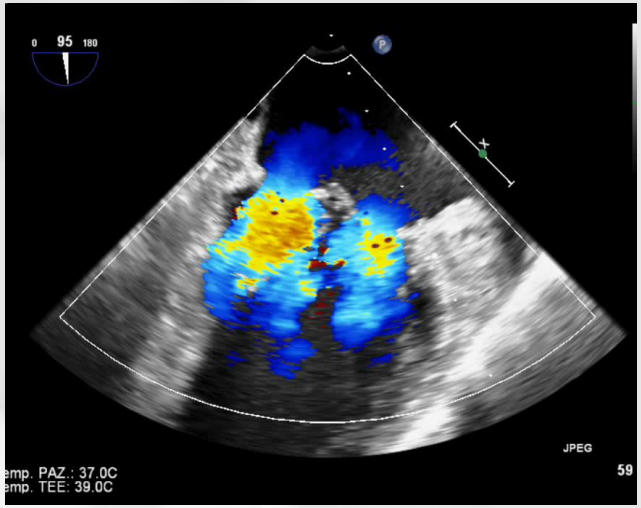
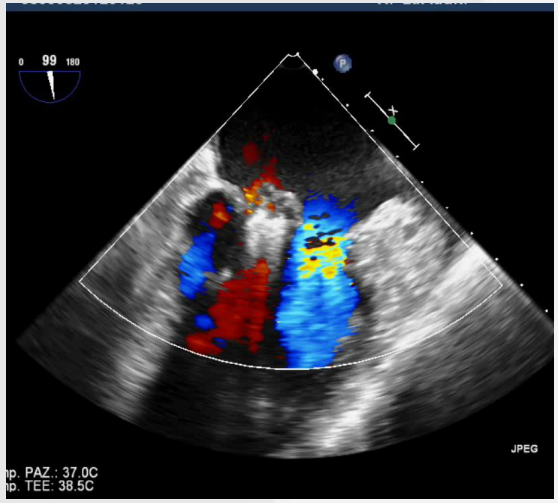
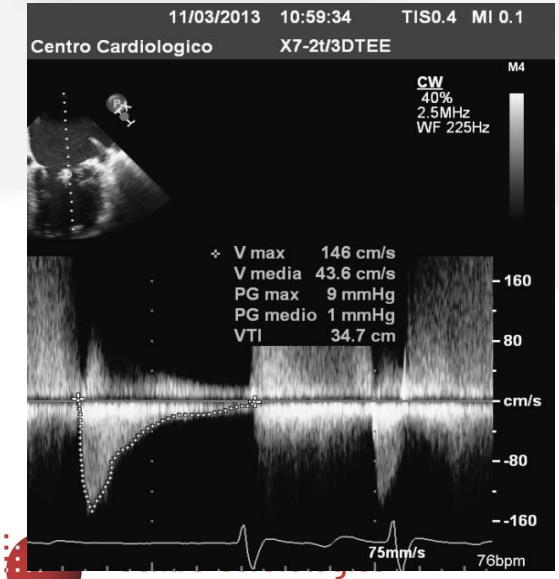
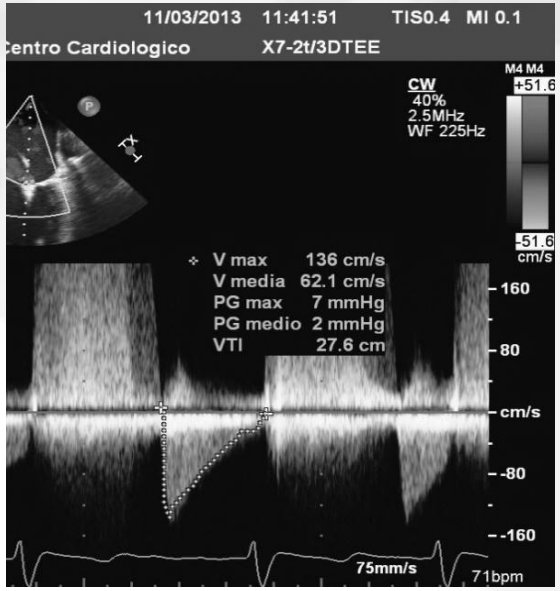
Basale Dopo 1 clip Dopo 2 clip

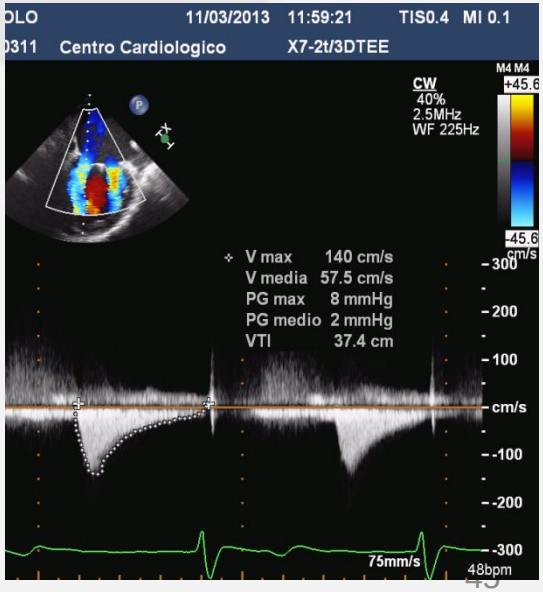












J Am Soc Echocardiogr 2011;24:937-65.)

EAE/ASE Recommendations for the Use of Echocardiography in New Transcatheter Interventions for Valvular Heart Disease

Jose L. Zamorano[1*†], Luigi P. Badano[2], Charles Bruce[3], Kwan-Leung Chan[4], Alexandra Gonçalves[5], Rebecca T. Hahn[6], Martin G. Keane[7], Giovanni La Canna[8], Mark J. Monaghan[9], Petros Nihoyannopoulos[10], Frank E. Silvestry[7], Jean-Louis Vanoverschelde[11], and Linda D. Gillam[12‡], *Rochester, Minnesota; Otttawa, Ontario, Canada; Porto, Portugal; New York, New York; Philadelphia, Pennsylvania; London, United Kingdom; Brussels, Belguim; Morristown, New Jersey*

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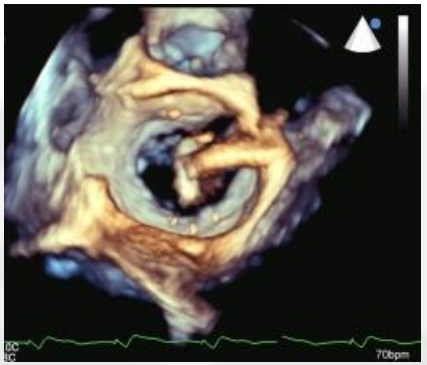
ECHOCARDIOGRAPHY FOR EDGE-TO-EDGE CLIP REPAIR

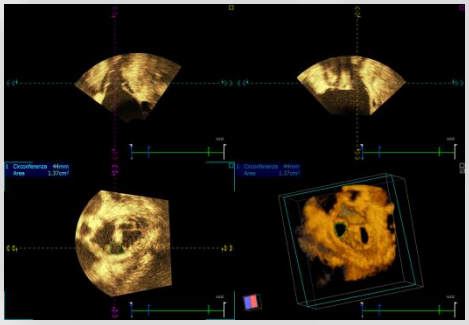


- 3D TEE permette la miglior visualizzazione dei segmenti di valvola coinvolti attraverso la atrial e/o la ventricular surgical view

- La sonda 3DTEE mediante xplane facilita la puntura transsettale e successivamente velocizza il corretto indirizzo della clip nel punto di maggior rigurgito

- 3DTEE è il metodo più immediato e accurato per verificare il corretto posizionamento della clip perpendicolare alla linea commissurale

- 3D TEE è ideale nel permettere la planimetria degli orifizi creati dalla clip ed eventualmente la loro eccentricità



- 3D color permette una facile localizzazione della sede di rigurgito residuo e la stima quantitativa con la valutazione dell'orifizio rigurgitante

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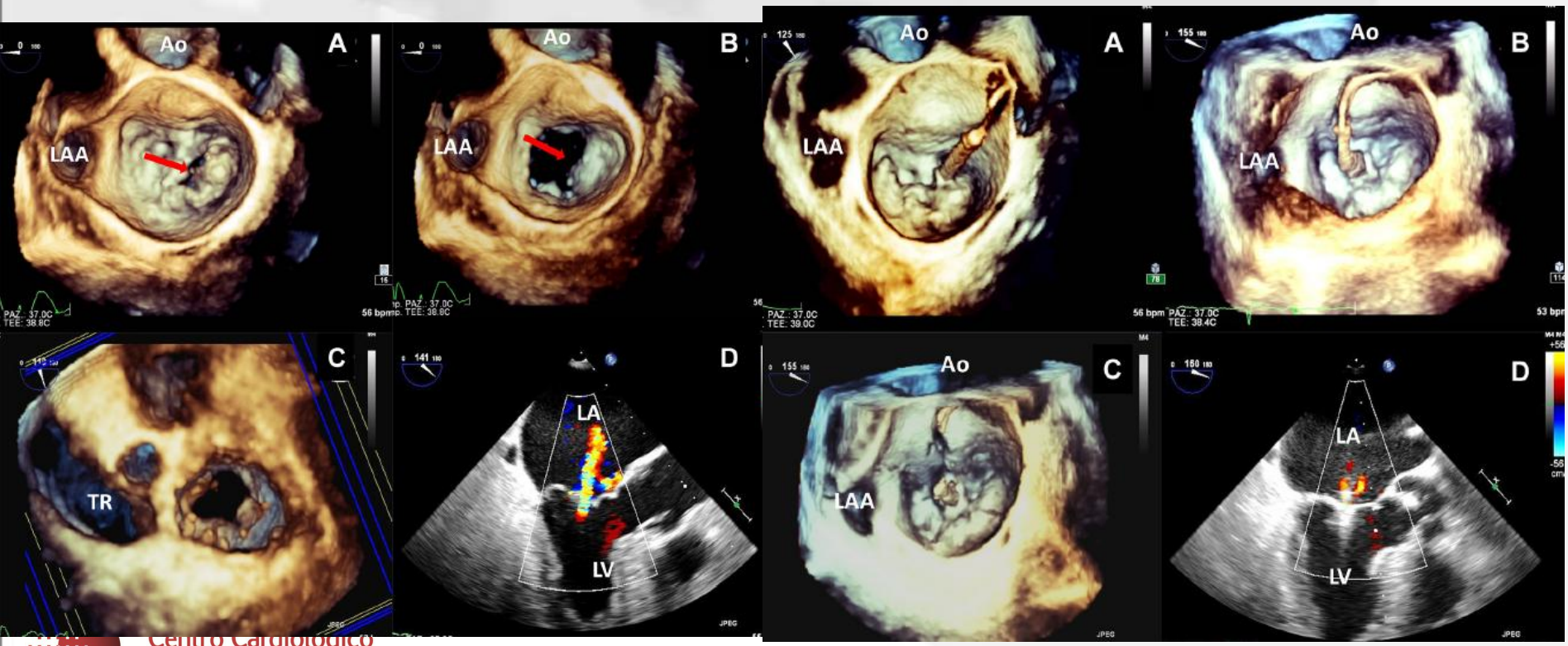
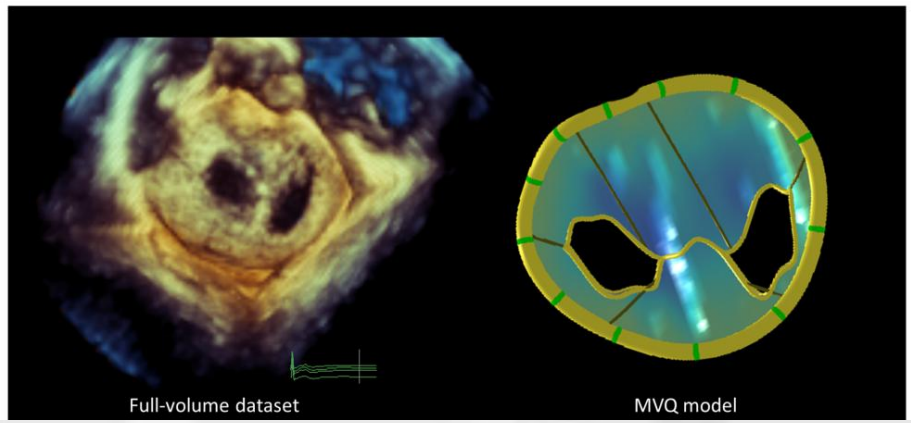
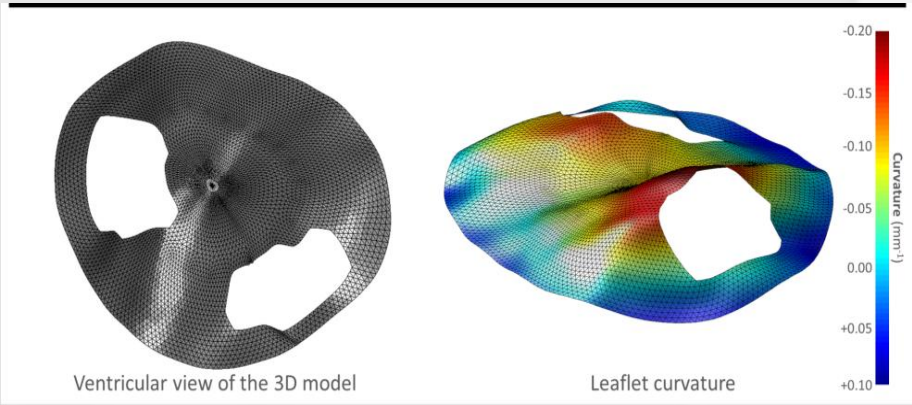
MitraClip Implantation in a Previous Surgical Mitral Valve Edge-to-Edge Repair

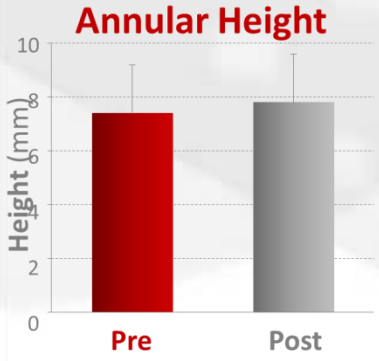
Vera E. Bottari, MD,* Gloria Tamborini, MD,* Antonio L. Bartorelli, MD,*† Francesco Alamanni, MD,*† Mauro Pepi, MD*

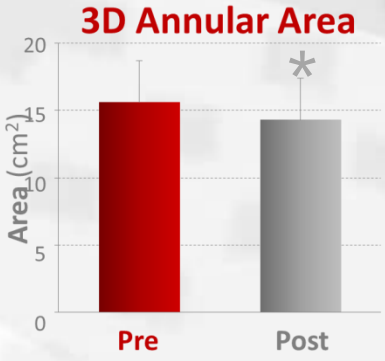


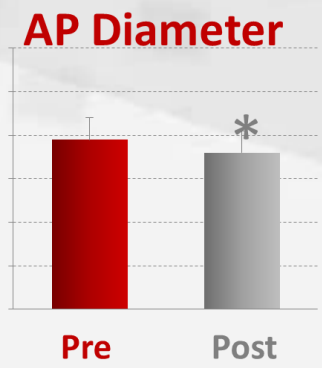
Effects of MitraClip on Mitral Annulus and Leaflet Morphology: Intraprocedural TEE evaluation. Maffessanti F. et al. Euroecho 2013

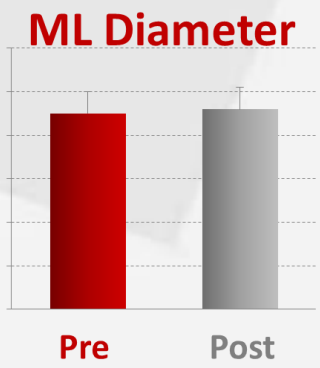












3D TEE allows the quantitative description of the morphological changes of both MV annulus and leaflets associated with MitraClip implantation. These MV alterations are determinant of increased leaflet stress, and may lead to structural changes of the valvular apparatus and/or affect the durability of the repair in the long term. These hypotheses should be confirmed in future studies.

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➢ La direzione della clip