



**Οργάνωση:**

Β' Καρδιολογική Κλινική,  
Τμήμα Ιατρικής,  
Σχολή Επιστημών Υγείας,  
Πανεπιστήμιο Ιωαννίνων

# ΗΜΕΡΙΔΑ ΑΝΤΙΜΕΤΩΠΙΣΗΣ ΔΟΜΙΚΩΝ ΚΑΡΔΙΟΠΑΘΕΙΩΝ

ΣΤΕΝΩΣΗ ΔΟΡΤΗΣ  
ΑΝΕΠΑΡΚΕΙΑ ΜΗΤΡΟΕΙΔΟΥΣ

**ΣΑΒΒΑΤΟ**  
**16 ΜΑΡΤΙΟΥ 2019**



**MitraClip: ΕΠΙΛΟΓΗ ΑΣΘΕΝΩΝ, ΕΠΕΜΒΑΣΗ, FOLLOW-UP.  
ΠΑΡΑΔΕΙΓΜΑΤΑ.**

**ΛΑΚΚΑΣ ΛΑΜΠΡΟΣ**  
**ΕΠΙΚΟΥΡΙΚΟΣ ΕΠΙΜΕΛΗΤΗΣ Β΄**  
**Β΄ ΚΑΡΔΙΟΛΟΓΙΚΗ ΚΛΙΝΙΚΗ ΠΓΝΙ**

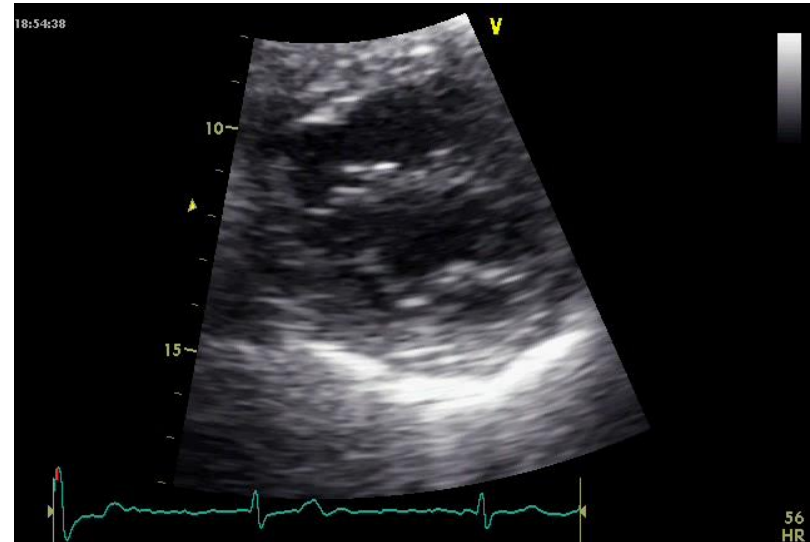
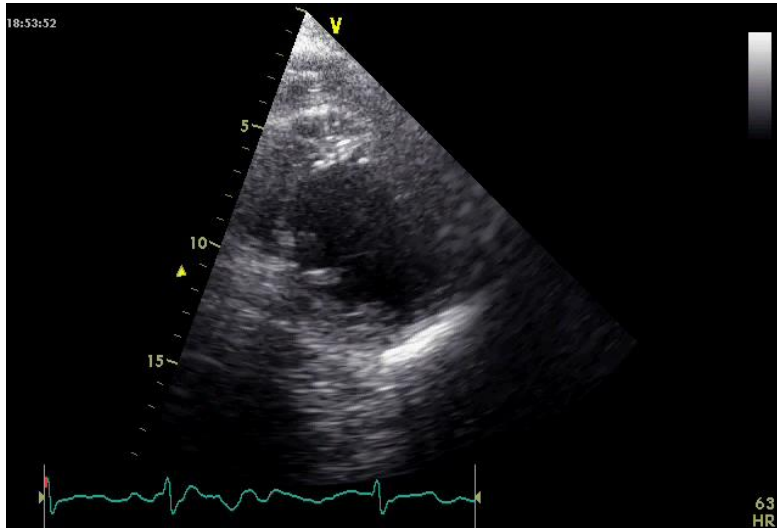
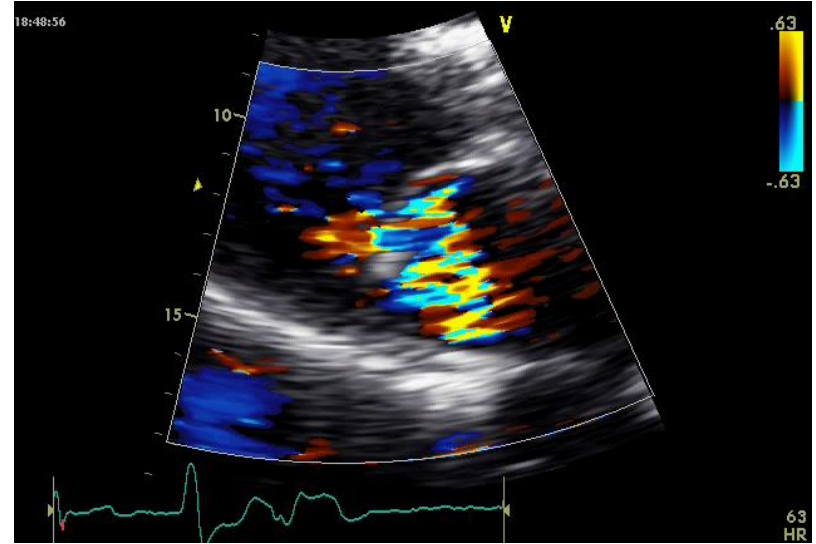
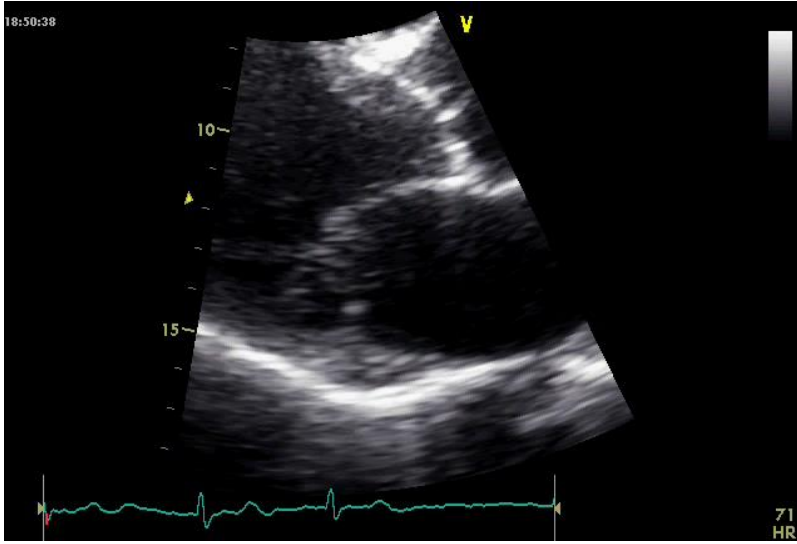
**ΔΕΝ ΕΧΩ ΚΑΜΜΙΑ ΣΥΓΚΡΟΥΣΗ ΣΥΜΦΕΡΟΝΤΩΝ**

## **ΤΟ ΚΑΛΟ ΣΕΝΑΡΙΟ**

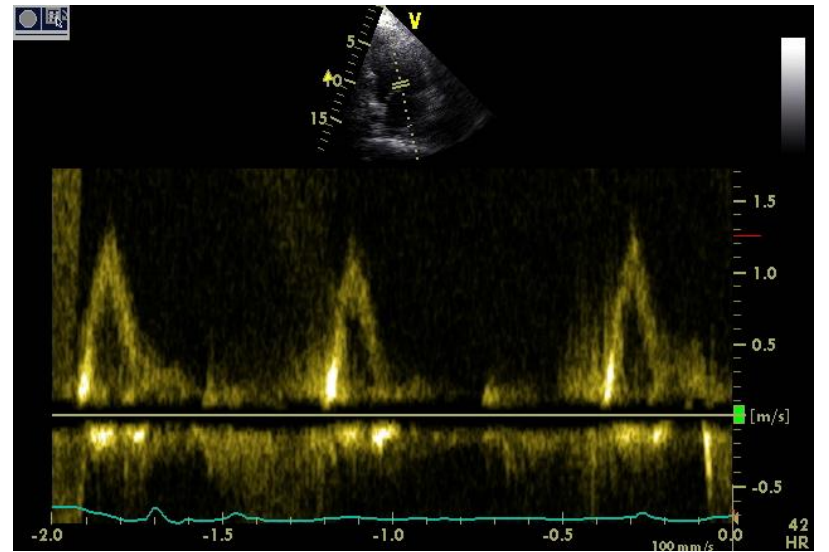
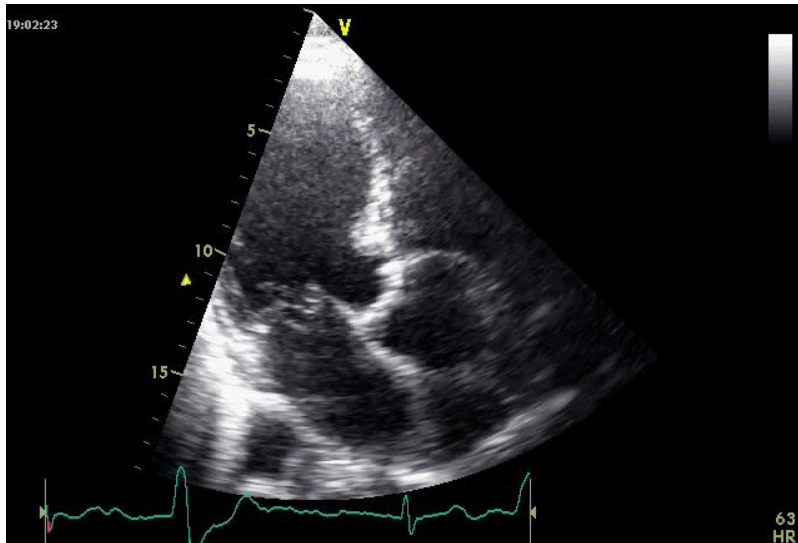
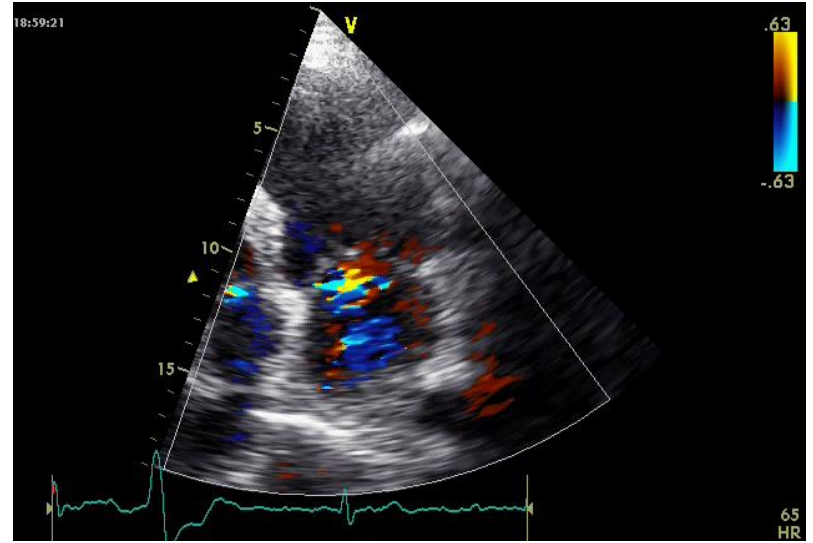
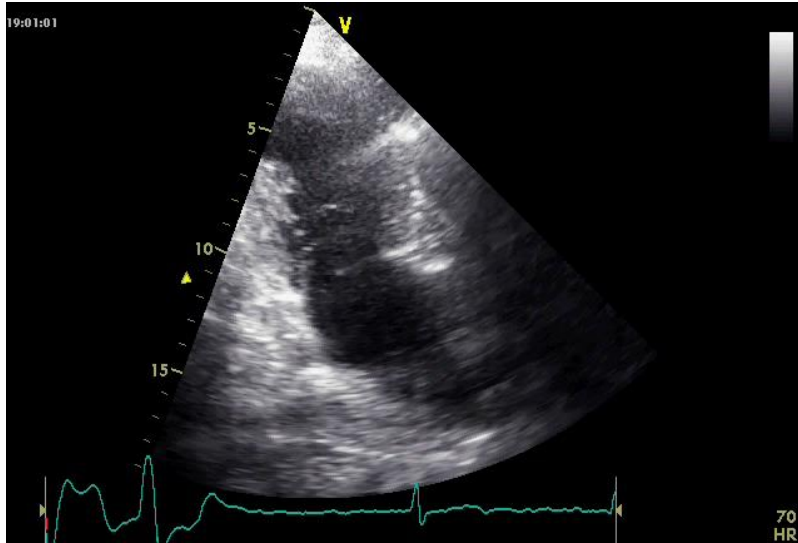
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- **ΠΡΟΣΕΡΧΕΤΑΙ ΓΙΑ ΔΙΕΡΕΥΝΗΣΗ ΑΝΤΙΜΕΤΩΠΙΣΗΣ ΣΟΒΑΡΗΣ ΑΝΕΠΑΡΚΕΙΑΣ ΜΙΤΡΟΕΙΔΟΥΣ ΒΑΛΒΙΔΑΣ**
- **ΝΥΗΑ ΙΙΙ**

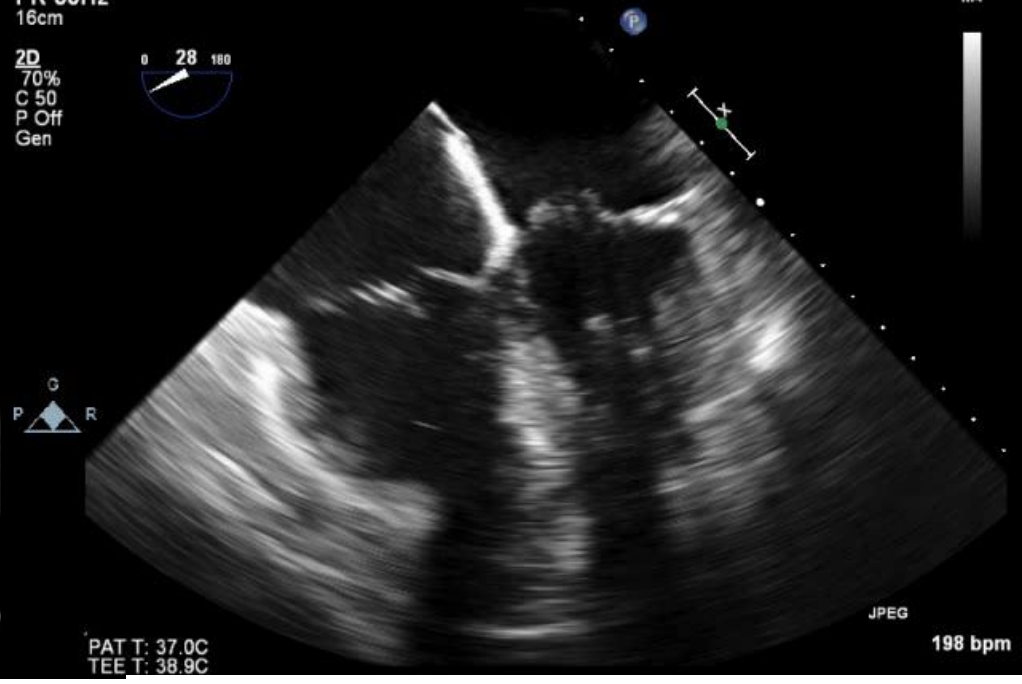
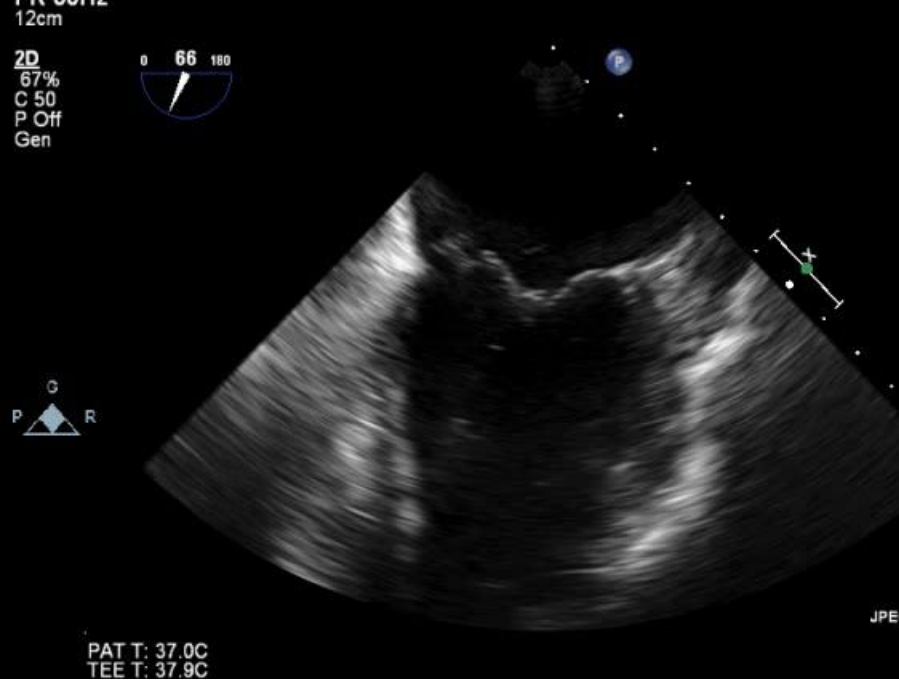
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- **ΣΔ ΥΠΟ ΑΓΩΓΗ**
- **ΑΥ ΥΠΟ ΑΓΩΓΗ**
- **ΧΡΟΝΙΑ ΚΟΛΠΙΚΗ ΜΑΡΜΑΡΥΓΗ**
- **ΥΠΕΡΛΙΠΙΔΑΙΜΙΑ**
- **ΚΑΛΟΗΘΗΣ ΥΠΕΡΠΛΑΣΙΑ**
- **ΧΑΠ ΜΕ ΧΟΡΗΓΗΣΗ ΕΙΣΠΝΕΟΜΕΝΩΝ ΚΑΤ'ΟΙΚΟΝ**

# TTE



# TTE





TOE

**Evaluate mitral valve morphology, LV size and function, LA size**

- Trace or mild MR is common in normal subjects and does not need to be further classified if above are normal
- Dilated LV/abnormal LVEF or dilated LA could be cause or consequence of MR
- An isolated inferolateral or posterobasal wall motion abnormality (e.g., following an MI) with globally preserved LV function can result in secondary MR
- Dilated LV with normal LVEF suggests severe MR
- Flail leaflet is highly specific for severe MR

**Define Leaflet Motion (Carpentier Classification)**

Type I  
Normal

Type II  
Prolapse or Flail

Type IIIA  
Restricted in both systole and diastole

Type IIIB  
Restricted in systole only

Abnormal Leaflet Morphology

Normal Leaflet Morphology

Abnormal Leaflet Morphology by Definition

Abnormal Leaflet Morphology

Normal Leaflet Morphology (minor age-related thickening allowed)

Secondary (atrial functional) MR

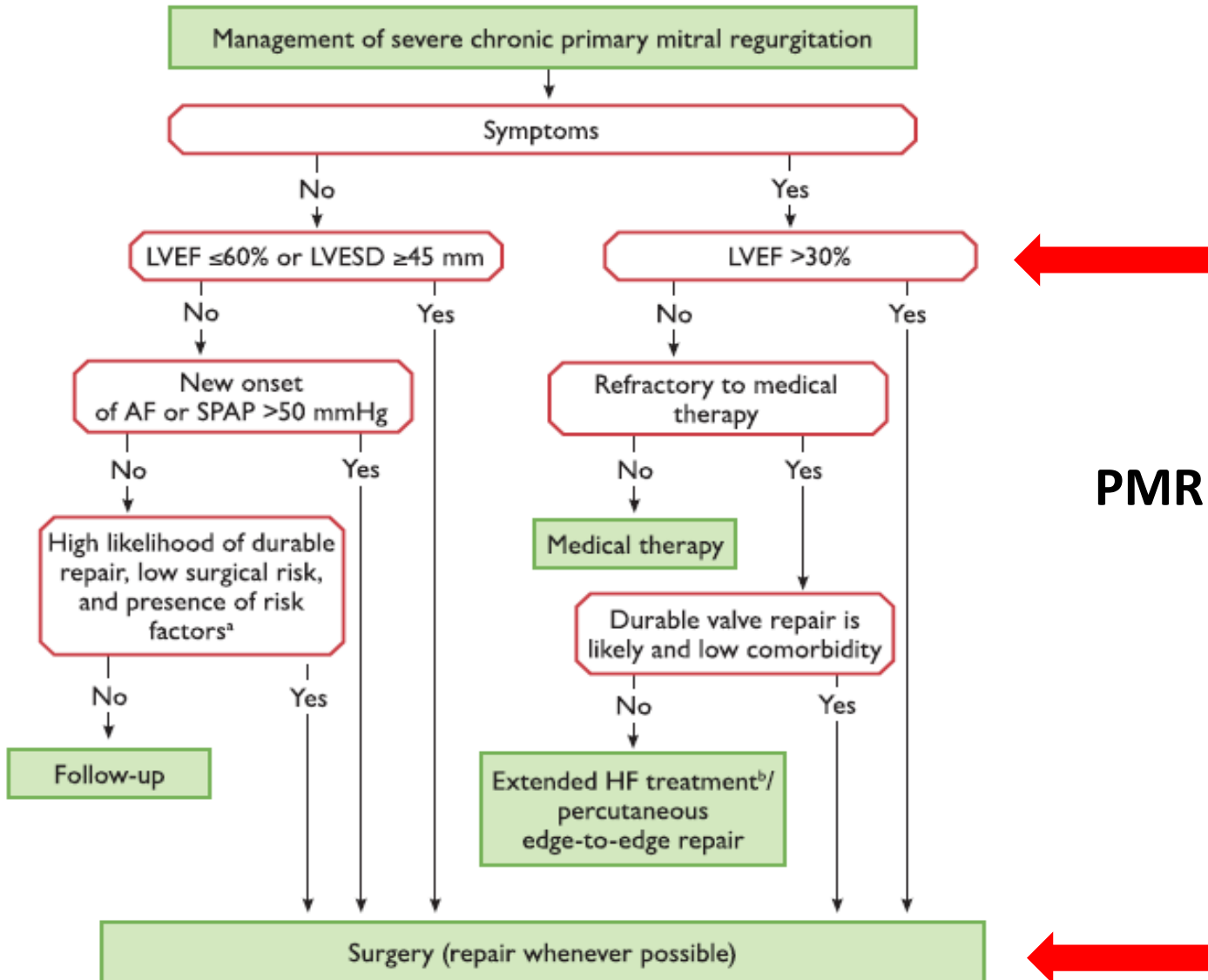
**Mixed Etiology**  
Example: known secondary MR due to ischemic cardiomyopathy with new torn chord and flail leaflet  
Common Pitfall: anterior leaflet override due to posterior leaflet restriction is pure secondary MR and NOT mixed etiology

Primary MR

Secondary MR



# HEART TEAM

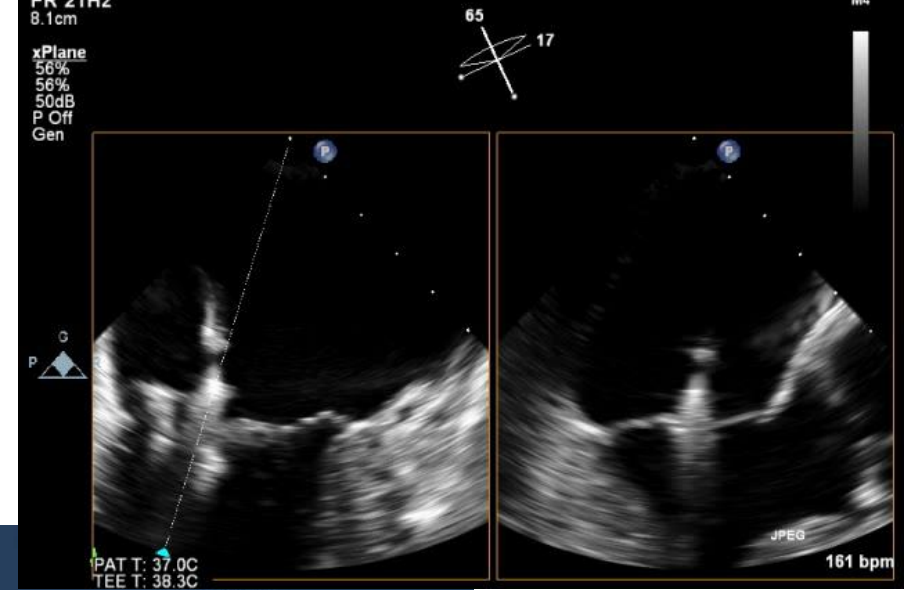
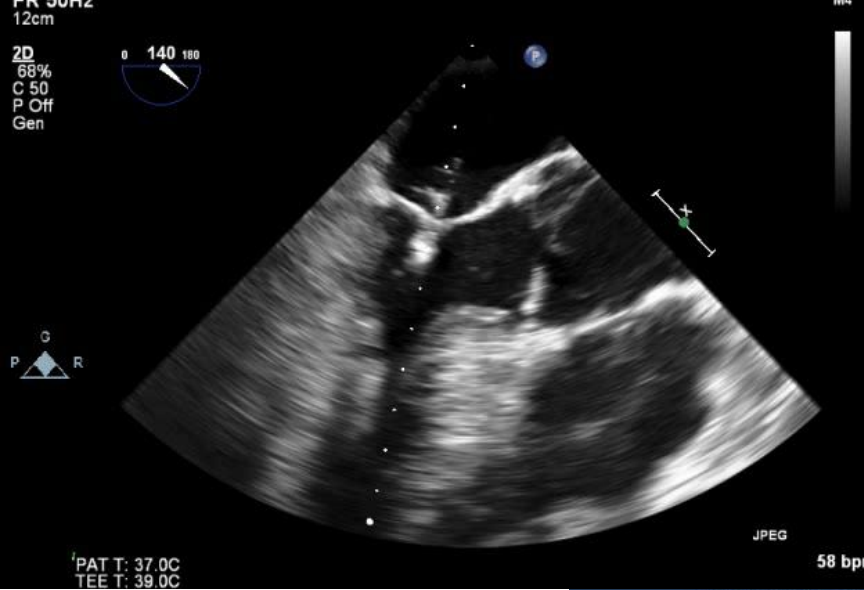


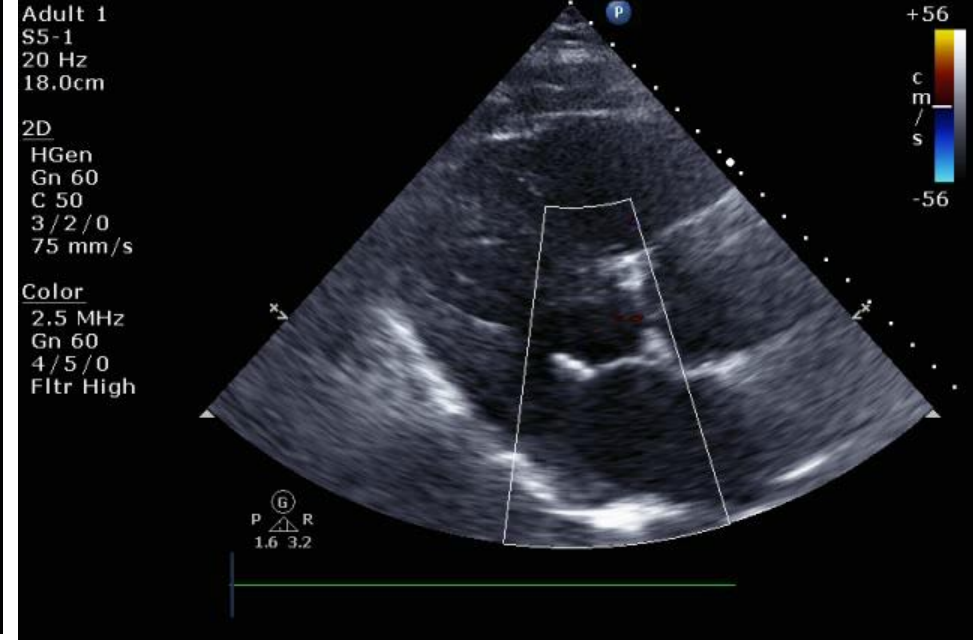
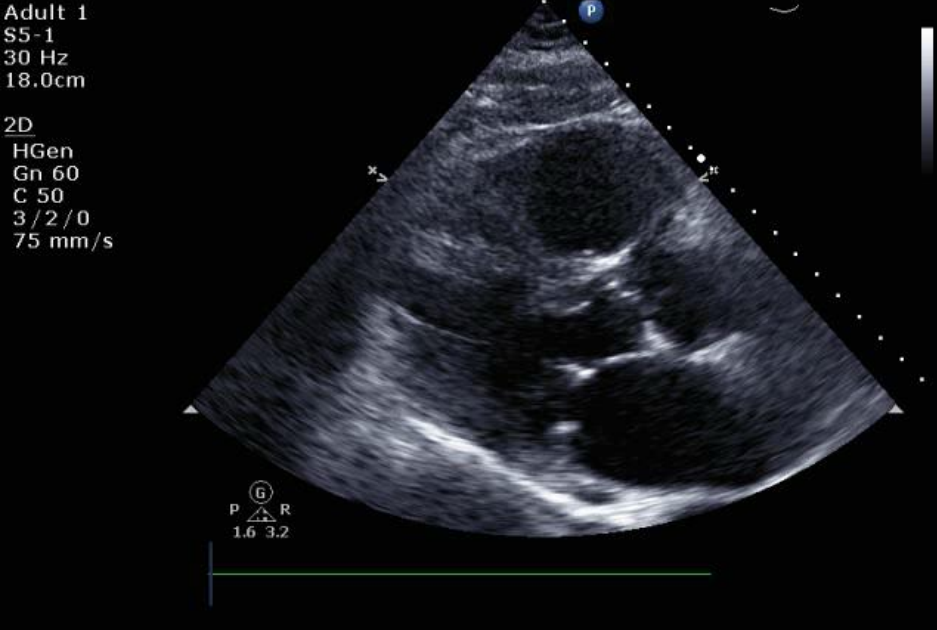
Patient-related factors			Cardiac-related factors		
Age (years)	87	0	Unstable angina <sup>6</sup>	No ▾	0
Gender	Male ▾	0	LV function	Good ▾	0
Chronic pulmonary disease <sup>1</sup>	Yes ▾	.4931341	Recent MI <sup>7</sup>	No ▾	0
Extracardiac arteriopathy <sup>2</sup>	No ▾	0	Pulmonary hypertension <sup>8</sup>	Yes ▾	.7676924
Neurological dysfunction <sup>3</sup>	No ▾	0	Operation-related factors		
Previous Cardiac Surgery	No ▾	0	Emergency <sup>9</sup>	No ▾	0
Creatinine > 200 μmol/ L	No ▾	0	Other than isolated CABG	Yes ▾	.5420364
Active endocarditis <sup>4</sup>	No ▾	0	Surgery on thoracic aorta	No ▾	0
Critical preoperative state <sup>5</sup>	No ▾	0	Post infarct septal rupture	No ▾	0
Logistic ▾ <b>EuroSCORE</b> 25.84 %					
Note: Logistic is now default calculator <input type="button" value="Calculate"/> <input type="button" value="Clear"/>					

- **BNP = 250 pg/ml**

## ΔΕΞΙΟΣ ΚΑΘΗΤΗΡΙΑΣΜΟΣ

- Σ/Δ/ΠΙΕΣΗ RV => 67/9mmHg
- Σ/Δ/Μ ΠΙΕΣΗ ΡΑ => 62/21/34.6mmHg
- ΠΙΕΣΗ ΕΝΣΦΗΝΩΣΗΣ => 28mmHg
- ΚΑΡΔΙΑΚΗ ΠΑΡΟΧΗ =>5L/min
- ΚΑΡΔΙΑΚΟΣ ΔΕΙΚΤΗΣ =>2.54 L/min/m<sup>2</sup>
- ΠΝΕΥΜΟΝΙΚΕΣ ΑΝΤΙΣΤΑΣΕΙΣ =>1.3 WU





**ΤΕΛΕΥΤΑΙΑ ΕΠΑΝΕΚΤΙΜΗΣΗ (ΜΕΤΑ ΑΠΟ 2 ΕΤΗ)**

**ΣΤΑΘΕΡΟΣ ΚΛΙΝΙΚΑ ΚΑΙ ΑΙΜΟΔΥΝΑΜΙΚΑ**

**ΝΥΗΑ ΙΙ**

## **ΤΟ ΚΑΚΟ ΣΕΝΑΡΙΟ**

- **ΠΡΟΚΕΙΤΑΙ ΓΙΑ ΑΣΘΕΝΗ 55 ΕΤΩΝ**
  - **ΠΡΟΣΗΛΘΕ ΓΙΑ ΔΙΕΡΕΥΝΗΣΗ ΣΟΒΑΡΗΣ ΑΝΕΠΑΡΚΕΙΑΣ ΜΙΤΡΟΕΙΔΟΥΣ ΒΑΛΒΙΔΑΣ**
  - **ΚΑΡΔΙΑΚΗ ΑΝΕΠΑΡΚΕΙΑ ΝΥΧΑ ΙΙΙ**

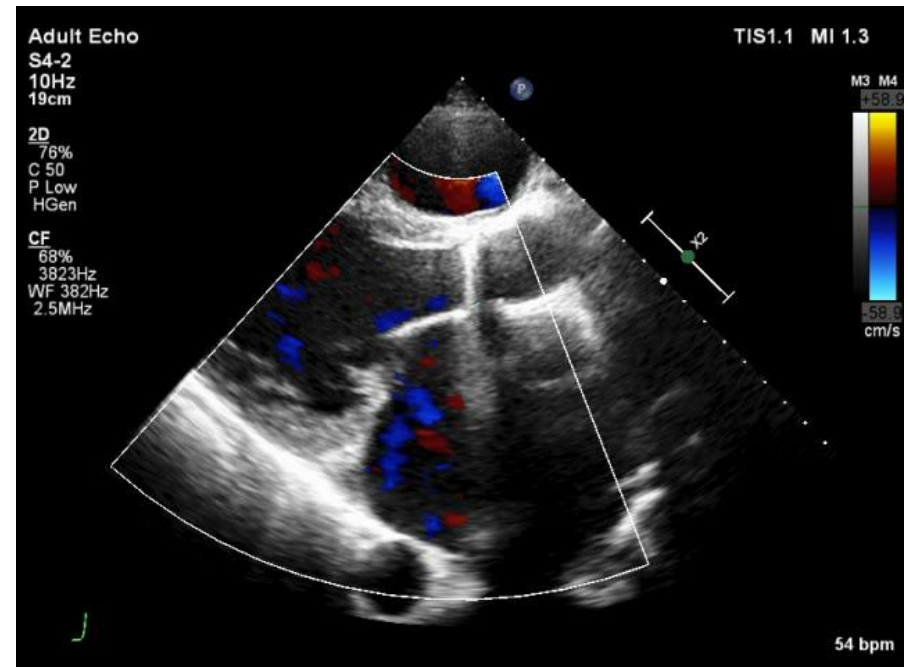
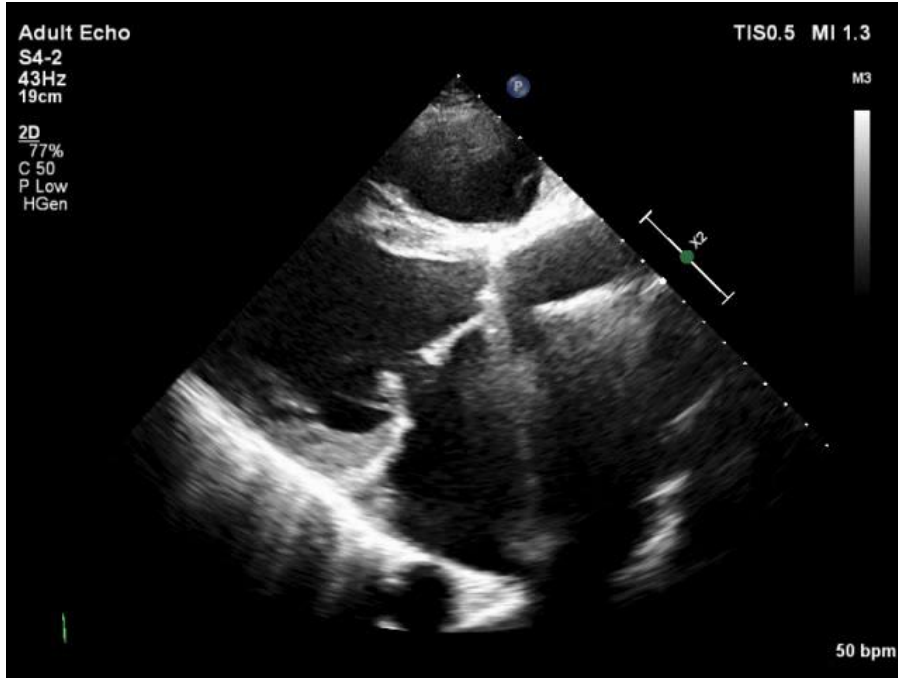
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  - **1978 (16 ΕΤΩΝ) ΑΝΑΦΕΡΕΤΑΙ AVR**
    - **ΜΕΤΑΛΛΙΚΗ ΒΑΛΒΙΔΑ**
    - **STARR EDWARDS – ΙΙΑ – 1260**
    - **ΛΟΓΩ ΑΝΕΥΡΥΣΜΑΤΟΣ ΣΤΗΝ ΑΝΙΟΥΣΑ ΑΟΡΤΗ**
      - **ΑΝΕΥΡΥΣΜΑΤΟΡΡΑΦΗ**
    - **ΑΝΑΦΕΡΕΤΑΙ ΜΙΚΤΗ ΝΟΣΟΣ ΑΟΡΤΙΚΗΣ ΒΑΛΒΙΔΑΣ**
    - **ΔΕΝ ΓΝΩΡΙΖΕΙ ΑΝ ΕΙΝΑΙ ΔΙΠΤΥΧΗ**
    - **ΠΙΘΑΝΟΣ ΡΕΥΜΑΤΙΚΟΣ ΠΥΡΕΤΟΣ;**
    - **ΜΙΚΡΗ ΑΝΕΠΑΡΚΕΙΑ ΜΙΤΡΟΕΙΔΟΥΣ**



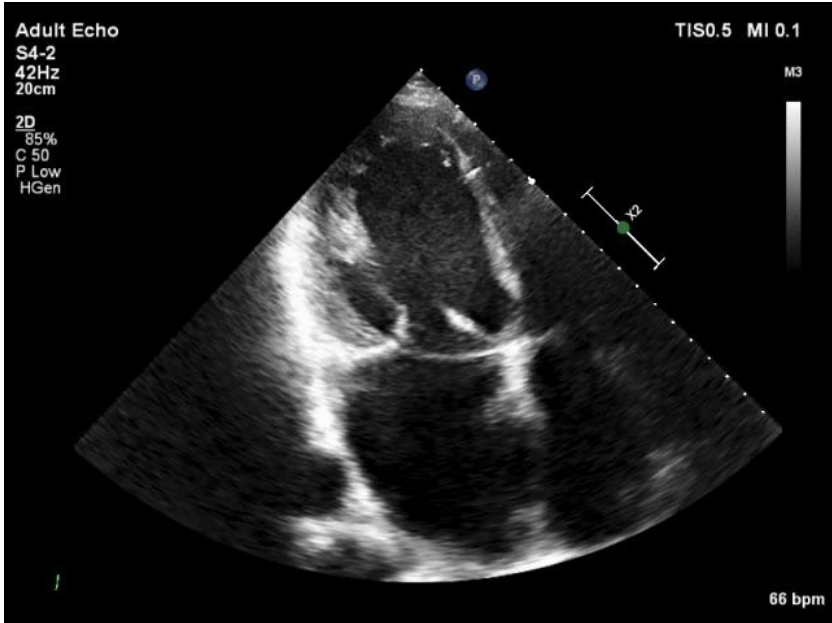
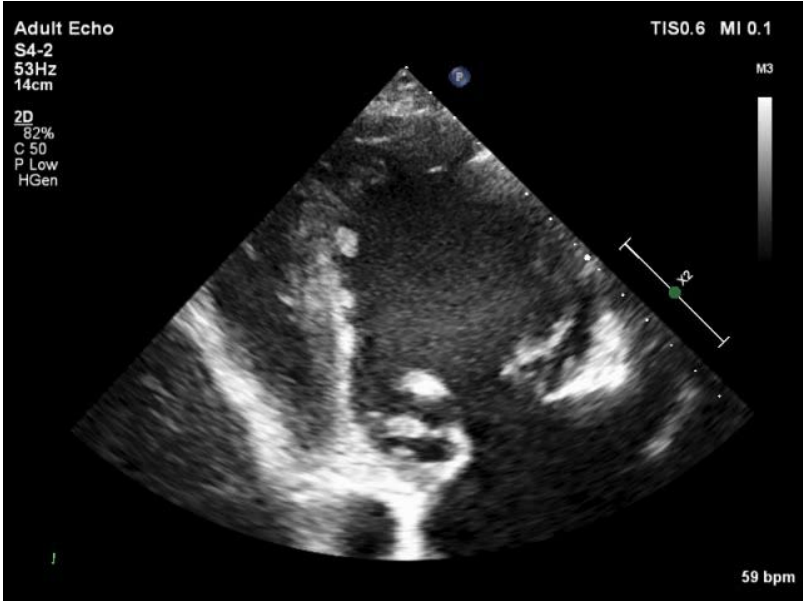
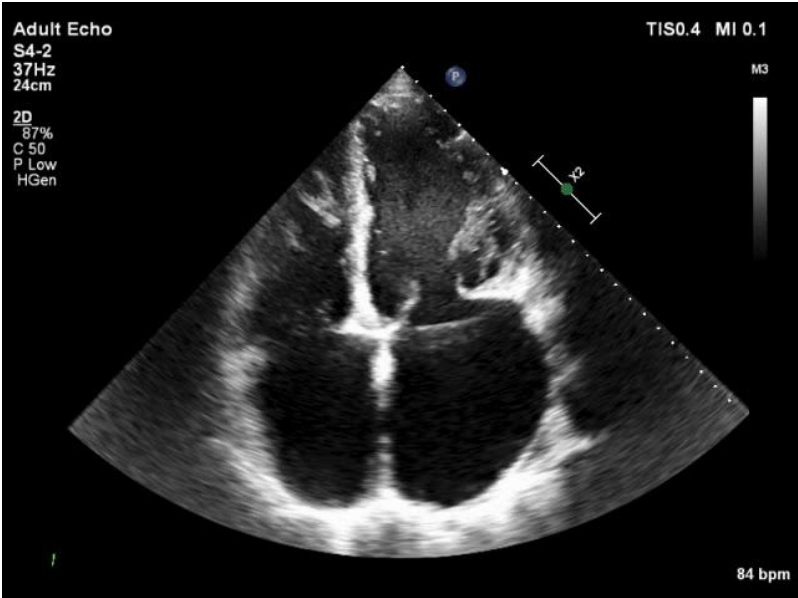
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  - **2006 ΑΝΕΥΡΥΣΜΑ ΑΝΙΟΥΣΑΣ ΑΟΡΤΗΣ**
    - **BENTALL**
    - **ΝΕΑ ΜΕΤΑΛΛΙΚΗ ΑΟΡΤΙΚΗ ΒΑΛΒΙΔΑ**
    - **ST JUDE 25mm**
    - **ΑΝΑΦΕΡΕΤΑΙ Η ΥΠΑΡΞΗ ΣΗΜΑΝΤΙΚΗΣ ΑΝΕΠΑΡΚΕΙΑΣ ΜΙΤΡΟΕΙΔΟΥΣ ΒΑΛΒΙΔΑΣ**
    - **ΠΡΟΦΟΡΙΚΑ ΜΑΛΛΟΝ ΜΕΤΡΙΑ**
    - **ΟΔΗΓΙΕΣ ΓΙΑ ΣΥΝΤΗΡΗΤΙΚΗ ΑΝΤΙΜΕΤΩΠΙΣΗ**

- **2006 ΣΤΕΦΑΝΙΟΓΡΑΦΙΑ ΠΡΟ ΤΟΥ ΧΕΙΡΟΥΡΓΕΙΟΥ**
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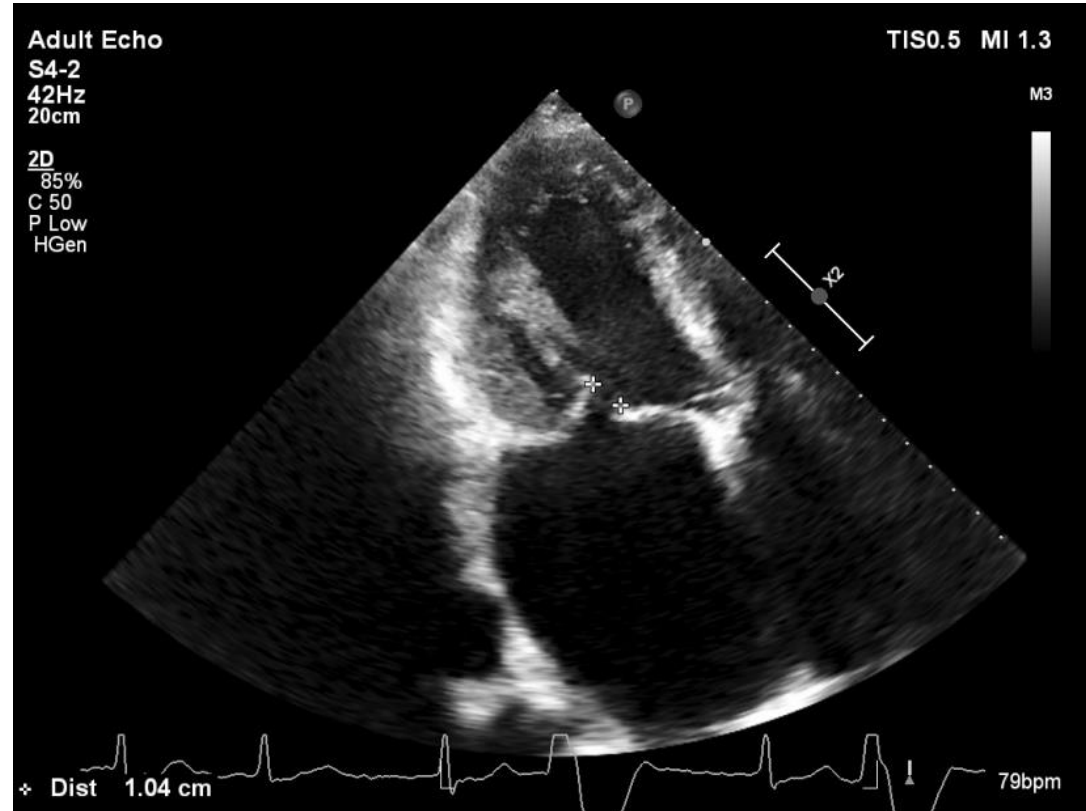
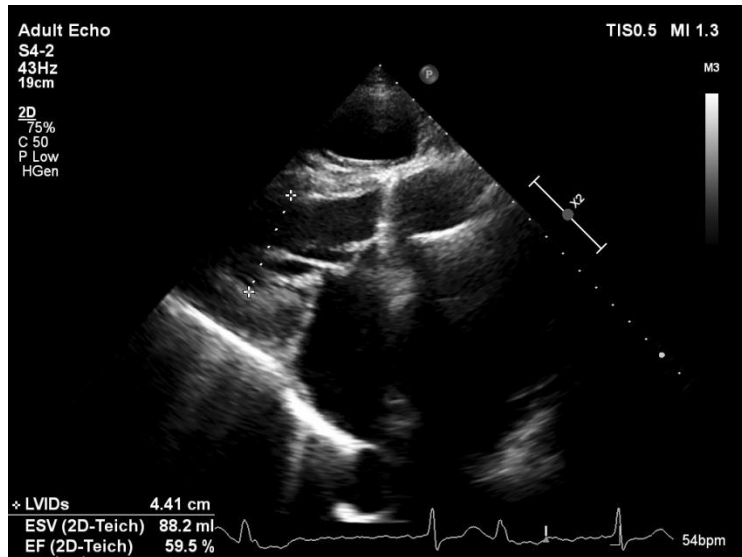
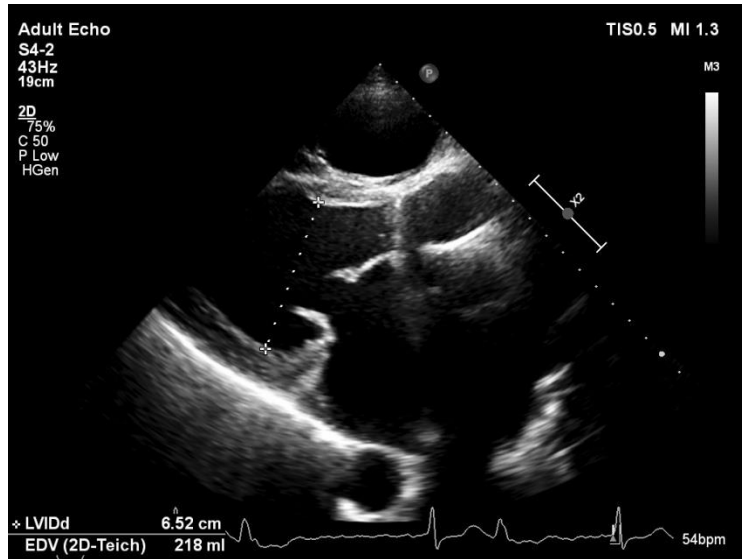
# TTE



# TTE

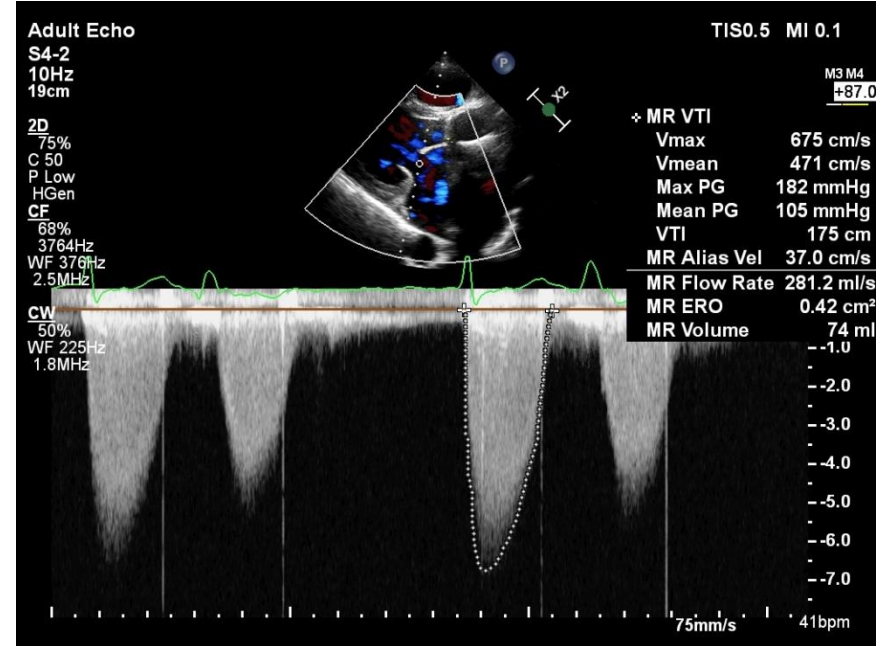
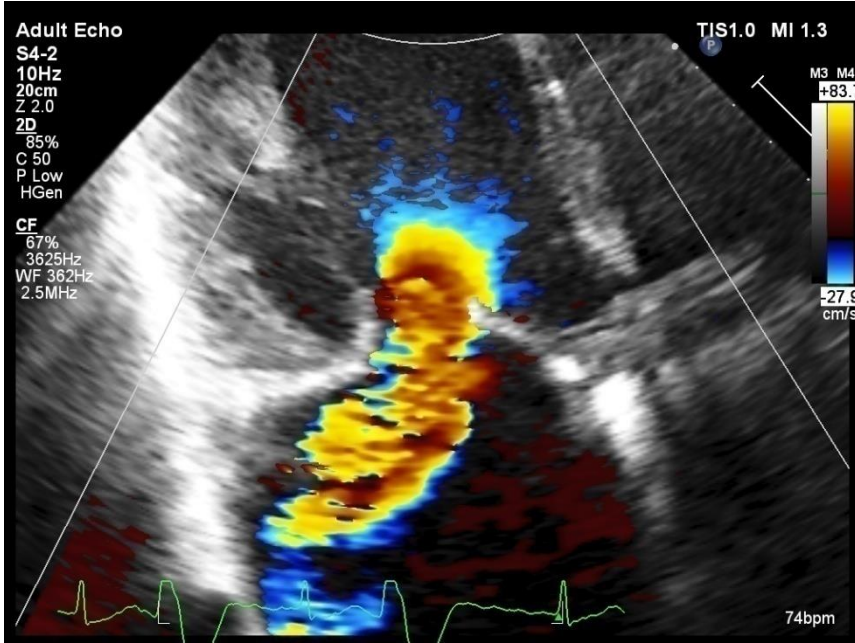


# TTE

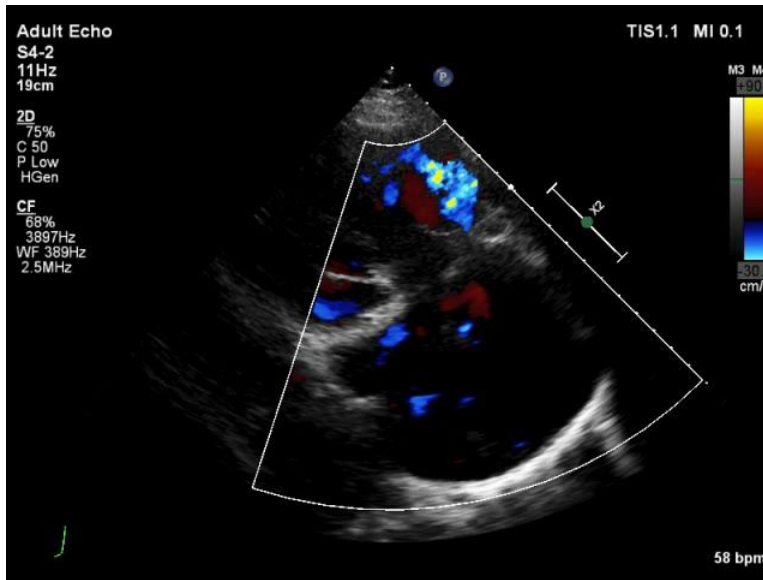
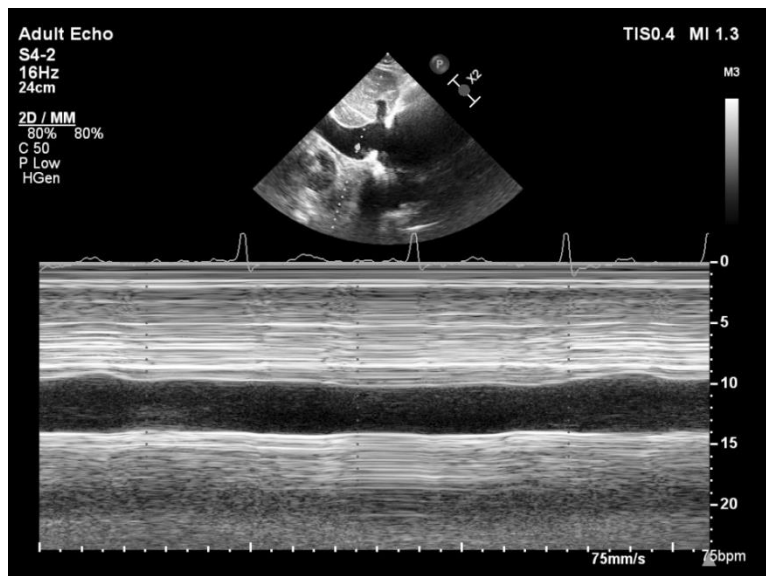
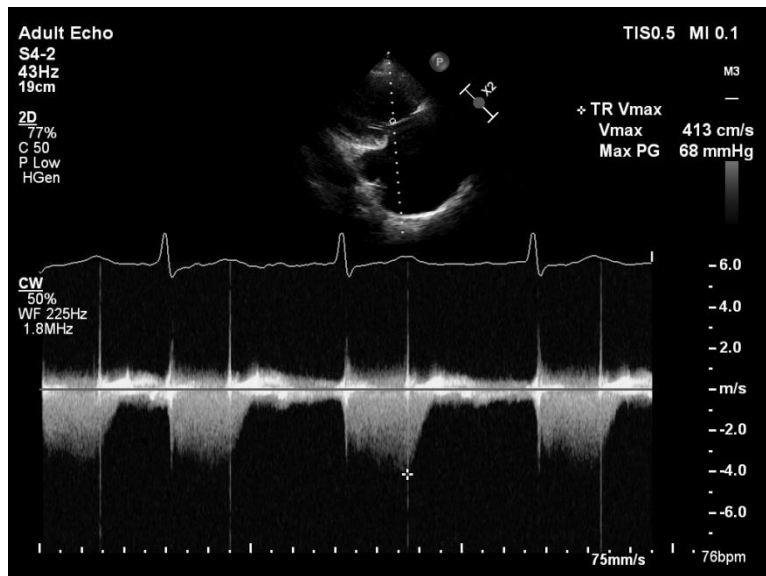


**ΔΙΑΤΕΤΑΜΕΝΟΣ ΔΑΚΤΥΛΙΟΣ ΜΙΤΡΟΕΙΔΟΥΣ ΒΑΛΒΙΔΑΣ**

# TTE



# TTE



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- Trace or mild MR is common in normal subjects and does not need to be further classified if above are normal
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- Dilated LV with normal LVEF suggests severe MR
- Flail leaflet is highly specific for severe MR

**Define Leaflet Motion  
(Carpentier Classification)**

Type I

Normal

Type II

Prolapse or  
Flail

Type IIIA

Restricted in  
both systole  
and diastole

Type IIIB

Restricted in  
systole only

Abnormal  
Leaflet  
Morphology

Normal  
Leaflet  
Morphology

Abnormal Leaflet  
Morphology by  
Definition

Abnormal  
Leaflet  
Morphology

Normal Leaflet  
Morphology  
(minor age-related  
thickening allowed)

Secondary  
(atrial functional)  
MR

Primary MR

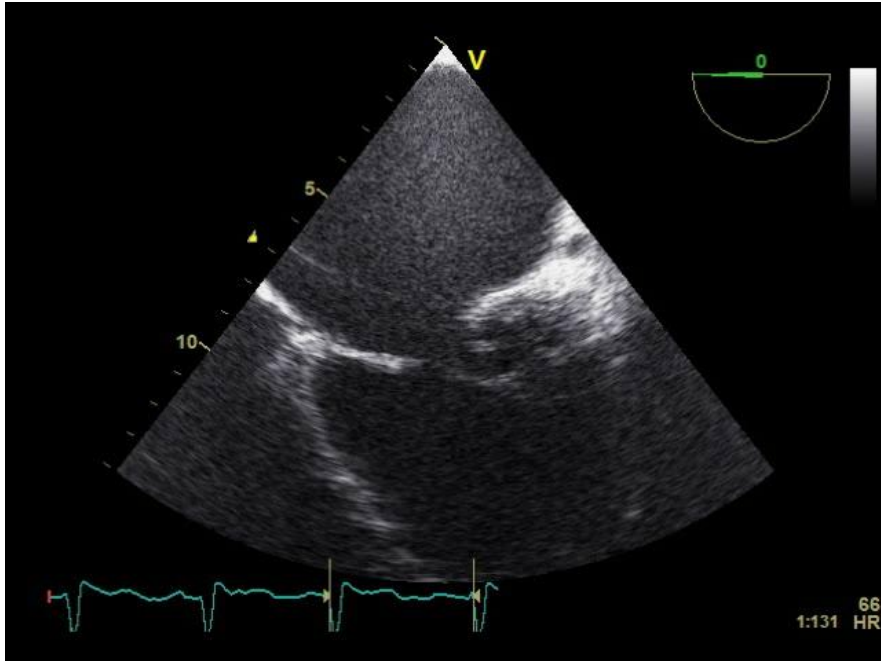
**Mixed Etiology**

Example: known secondary MR due to ischemic cardiomyopathy with new torn chord and flail leaflet  
Common Pitfall: anterior leaflet override due to posterior leaflet restriction is pure secondary MR and NOT mixed etiology

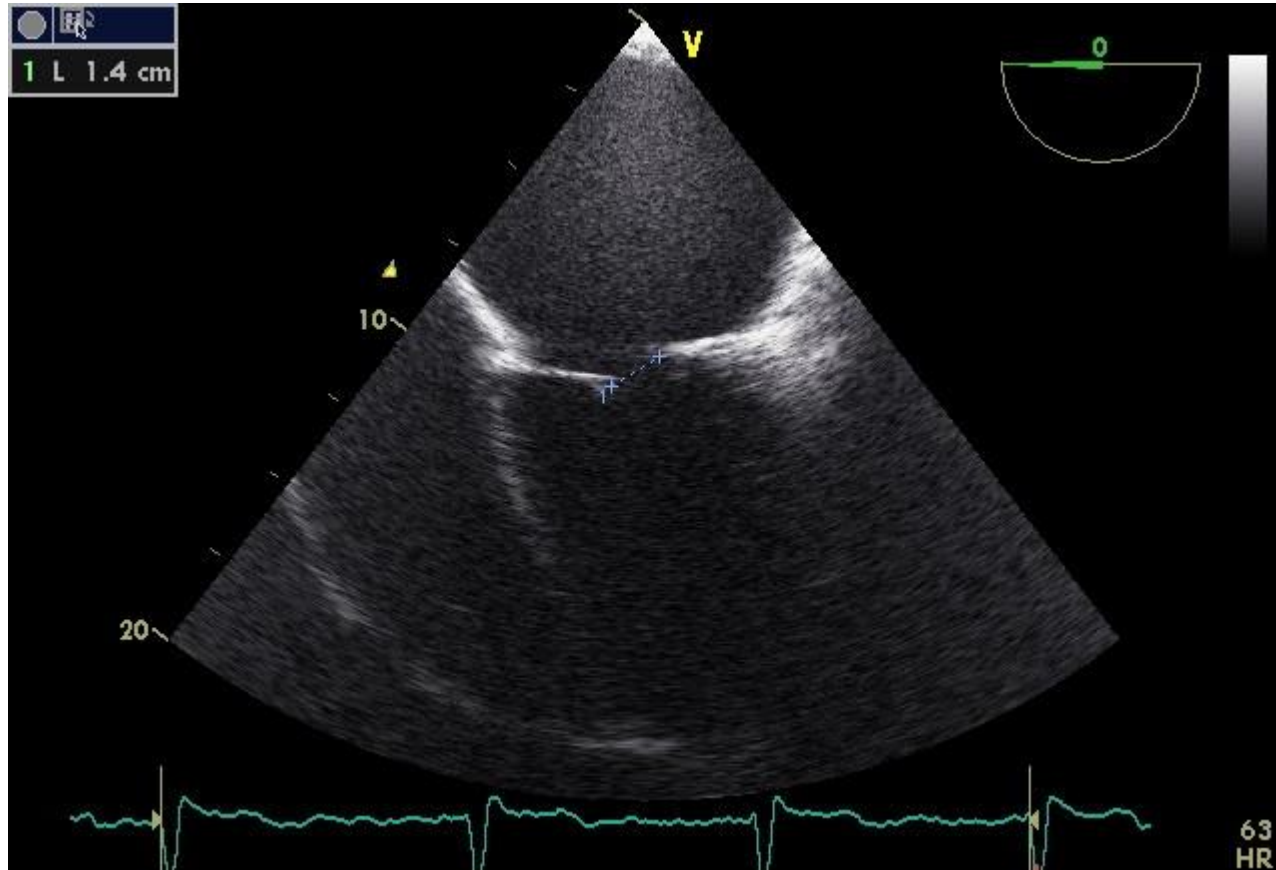
Secondary MR



# TOE



# TOE



- **Ο ΑΣΘΕΝΗΣ ΤΕΘΗΚΕ ΣΕ ΥΨΗΛΕΣ ΔΟΣΕΙΣ ΔΙΟΥΡΗΤΙΚΩΝ**
- **ΥΠΟΛΟΙΠΗ ΑΓΩΓΗ ΚΑΡΔΙΑΚΗΣ ΑΝΕΠΑΡΚΕΙΑΣ**
- **ΚΛΙΝΙΚΗ ΚΑΙ ΕΡΓΑΣΤΗΡΙΑΚΗ ΒΕΛΤΙΩΣΗ**

- **BNP = 190 pg/ml**

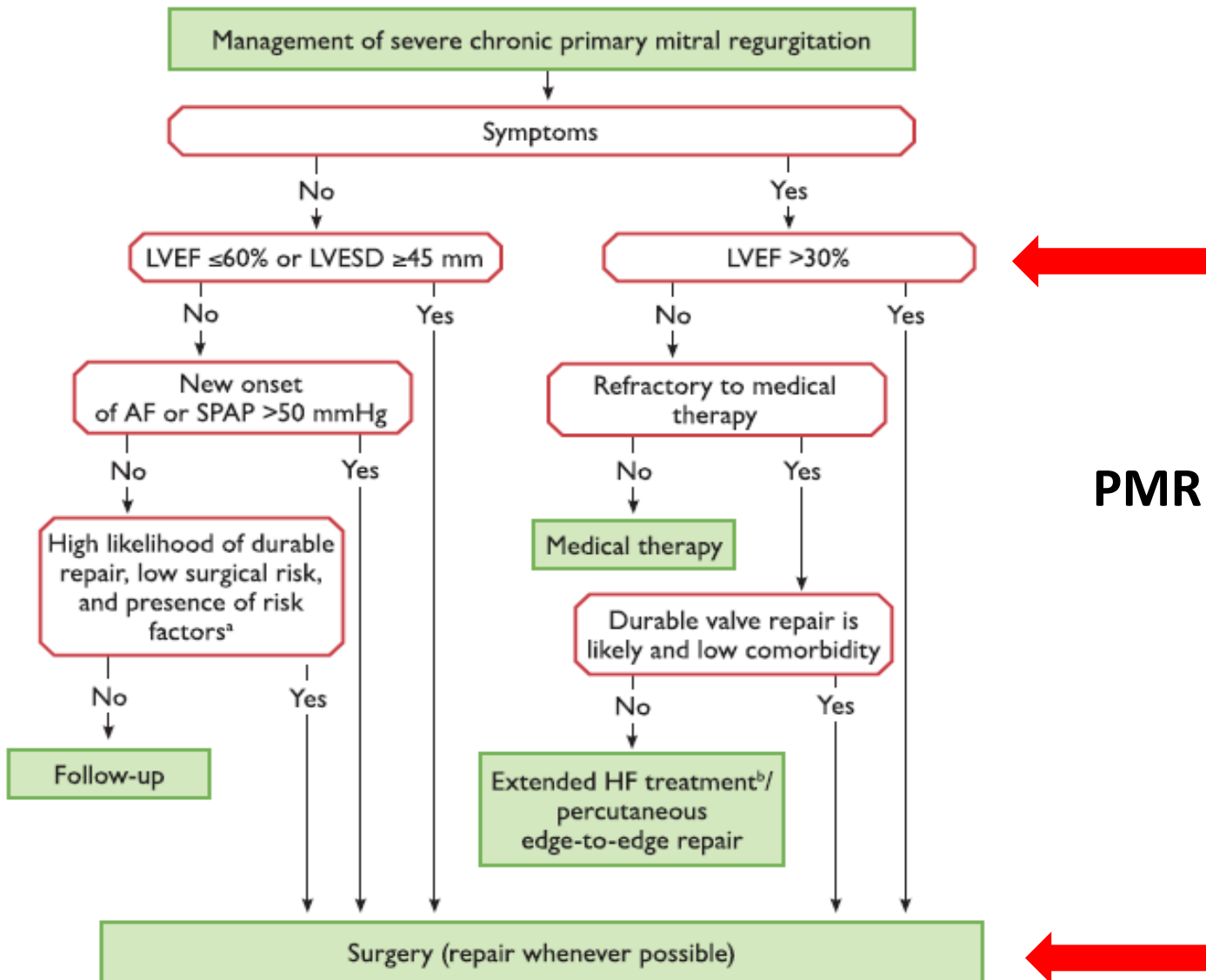
## ΔΕΞΙΟΣ ΚΑΘΗΤΗΡΙΑΣΜΟΣ

- Σ/Δ/ΠΙΕΣΗ RV => 70/8mmHg
- Σ/Δ/Μ ΠΙΕΣΗ ΡΑ => 64/22/34.6mmHg
- ΠΙΕΣΗ ΕΝΣΦΗΝΩΣΗΣ => 27mmHg
- ΚΑΡΔΙΑΚΗ ΠΑΡΟΧΗ =>5.15 L/min
- ΚΑΡΔΙΑΚΟΣ ΔΕΙΚΤΗΣ =>2.69 L/min/m<sup>2</sup>
- ΠΝΕΥΜΟΝΙΚΕΣ ΑΝΤΙΣΤΑΣΕΙΣ =>1.475 WU

# HEART TEAM

- **ΕΡΩΤΗΜΑ 1**
  - ΠΡΕΠΕΙ ΝΑ ΑΝΤΙΜΕΤΩΠΙΣΤΕΙ Η ΜΙΤΡΟΕΙΔΙΚΗ ΑΝΕΠΑΡΚΕΙΑ;
  
- **ΕΡΩΤΗΜΑ 2**
  - ΜΕ ΠΟΙΟΝ ΤΡΟΠΟ;

# ΧΡΕΙΑΖΕΤΑΙ ΑΝΤΙΜΕΤΩΠΙΣΗ Η MR;



- **ΦΑΡΜΑΚΕΥΤΙΚΗ ΑΓΩΓΗ**
  - **ΟΧΙ ΜΟΝΑΔΙΚΗ ΛΥΣΗ ΣΥΜΦΩΝΑ ΜΕ ΤΙΣ ΚΑΤΕΥΘΥΝΤΗΡΙΕΣ ΟΔΗΓΙΕΣ**



- **ΧΕΙΡΟΥΡΓΙΚΗ ΑΝΤΙΚΑΤΑΣΤΑΣΗ**
  - **ΥΠΕΡ**
    - **ΚΑΤΕΥΘΥΝΤΗΡΙΕΣ ΟΔΗΓΙΕΣ**
  - **ΚΑΤΑ**
    - **ΘΑ ΕΙΝΑΙ ΤΟ ΤΡΙΤΟ ΧΕΙΡΟΥΡΓΕΙΟ**
    - **ΑΥΞΗΜΕΝΟΣ ΔΙΕΓΧΕΙΡΗΤΙΚΟΣ ΚΙΝΔΥΝΟΣ**
    - **ΜΕΓΑΛΟ ΜΕΓΕΘΟΣ ΜΙΤΡΟΕΙΔΙΚΟΥ ΔΑΚΤΥΛΙΟΥ**

- **ΧΕΙΡΟΥΡΓΙΚΗ ΕΠΙΔΙΟΡΘΩΣΗ**

**TABLE 5** Feasibility of Surgical Mitral Valve Repair

	<b>Ideal Pathoanatomy</b>	<b>Challenging Pathoanatomy</b>	<b>Relative Pathoanatomic Contraindications</b>
Primary lesion location	Posterior leaflet only	Anterior leaflet or bileaflet	None
Leaflet calcification	None	Mild	Moderate to severe
Annular calcification	None	Mild to moderate with minimal leaflet encroachment	Severe or with significant leaflet encroachment
Subvalvular apparatus	Thin, normal	Mild diffuse thickening or moderate focal thickening	Severe and diffuse thickening with leaflet retraction
Mechanism of MR	Type II fibroelastic deficiency or focal myxomatous prolapse or flail	Type II forme fruste or bileaflet myxomatous (Barlow's) disease; Type I healed or active endocarditis; Type IIIA/B with mild restriction or leaflet thickening	Type IIIB with severe tethering and inferobasal aneurysm; Type IIIA with severe bileaflet calcification; Type I active infection with severe leaflet or annular tissue destruction
Unique anatomic complexities	None	Redo cardiac operation or mitral re-repair; anatomic predictors of systolic anterior motion (e.g., septal hypertrophy); adult congenital anomalies; focal papillary muscle rupture	Mitral valve reoperation with paucity of leaflet tissue; diffuse radiation valvulopathy; papillary muscle rupture with shock

- **MITRACLIP**

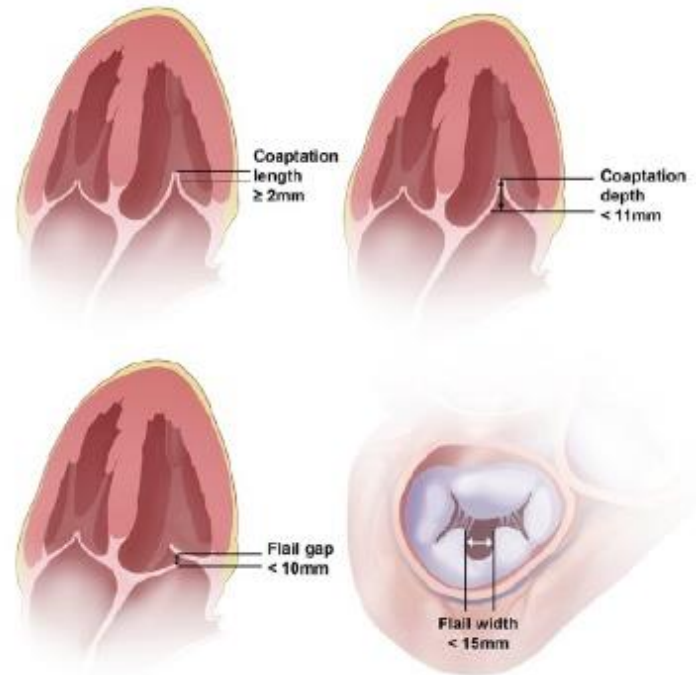
Data from peer-reviewed journals	IFU-Warnings <sup>4</sup>	IFU-Contraindications <sup>4</sup>
<ul style="list-style-type: none"> <li>• Central pathology in Segment A2-P2<sup>(1,2,3)</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Primary regurgitant jet outside of the A2-P2 area and/or presence of a clinically significant 2<sup>nd</sup> jet</li> </ul>	<ul style="list-style-type: none"> <li>• Patients who cannot tolerate procedural anticoagulation or post procedural anti-platelet regimen</li> <li>• Active endocarditis of the mitral valve</li> <li>• Rheumatic mitral valve disease</li> <li>• Evidence of intracardiac, inferior vena cava (IVC) or femoral vein thrombus</li> </ul>
<ul style="list-style-type: none"> <li>• No leaflet calcification at the grasping area<sup>(1)</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Severe leaflet calcification in the grasping area</li> <li>• Severe calcification of the annulus and/or subvalvular apparatus, such as the chordae tendinae</li> </ul>	
<ul style="list-style-type: none"> <li>• Mitral valve opening area &gt;4cm<sup>2(1,2,3)</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Mitral valve orifice area &lt; 4cm<sup>2</sup></li> </ul>	
<ul style="list-style-type: none"> <li>• Flail-width &lt;15mm<sup>(1,2,3)</sup></li> <li>• Flail-gap &lt;10mm<sup>(1,2,3)</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Leaflet Flail gap ≥ 10mm and/or Leaflet Flail width ≥ 15mm</li> </ul>	
<ul style="list-style-type: none"> <li>• Mobile length of the posterior leaflet ≥10 mm<sup>(1,2,3)</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Severely restricted posterior leaflet</li> </ul>	
<ul style="list-style-type: none"> <li>• Coaptation depth &lt;11mm<sup>(1,2,3)</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Cleft or perforation in the grasping area</li> <li>• Coaptation length &lt;2mm</li> <li>• Intracardiac mass</li> </ul>	

# MITRACLIP – EVEREST CRITERIA

## MitraClip anatomical patient selection considerations

### Recommended criteria<sup>1</sup>

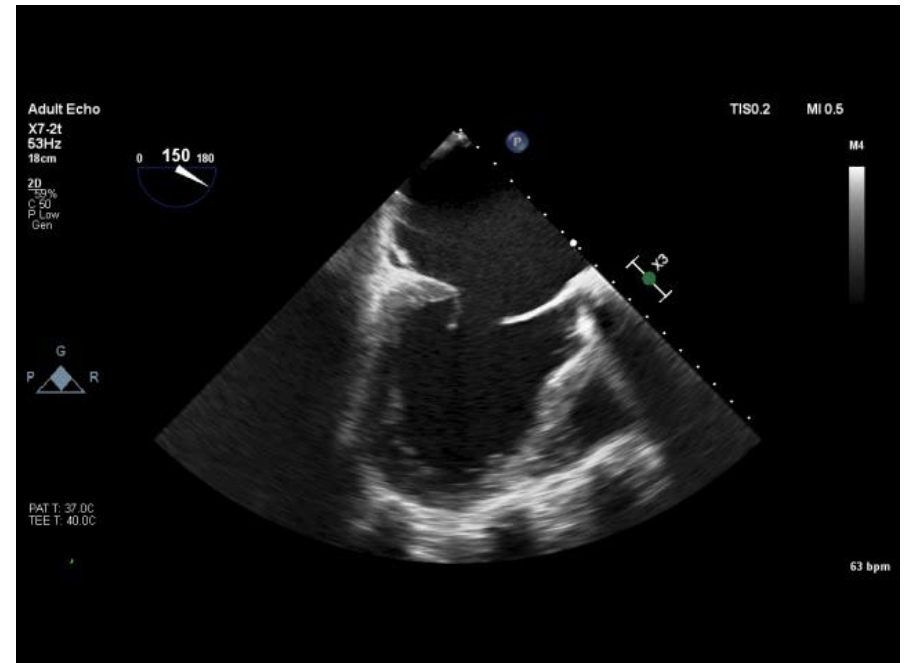
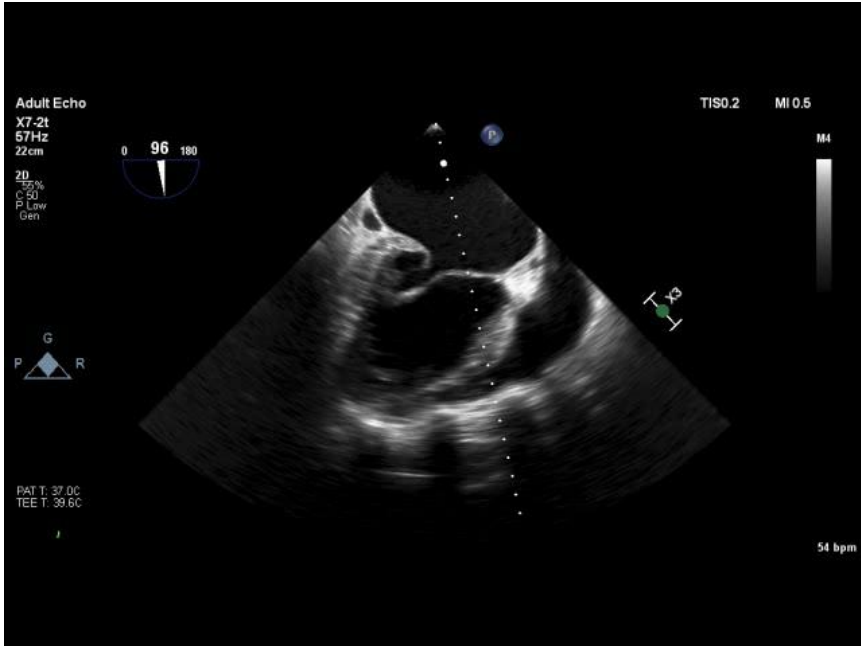
- Moderate to severe MR (Grade 3 or more out of 4 grades)
- Pathology in A2-P2 area
- Coaptation length > 2 mm (depending on leaflet mobility)
- Coaptation depth < 11 mm
- Flail gap < 10 mm
- Flail width < 15 mm
- Mitral valve orifice area > 4cm<sup>2</sup> (depending on leaflet mobility)
- Mobile leaflet length > 1 cm



1. The current patient considerations are based on EVEREST II and commercial European experience to date. The MitraClip Patient Selection Considerations document has been endorsed by Expert Opinion (Crossroads institute).

- **ΑΠΟΦΑΣΙΣΤΗΚΕ 3D ΤΟΕ ΑΦΟΥ Ο ΑΣΘΕΝΗΣ ΕΧΕΙ ΗΔΗ ΒΕΛΤΙΩΘΕΙ ΜΕ ΔΙΟΥΡΗΣΗ**

# TOE



# 3D TOE



- **ΑΡΧΙΚΑ ΑΠΟΦΑΣΙΣΤΗΚΕ ΕΝΤΑΤΙΚΗ ΔΙΟΥΡΗΣΗ ΚΑΙ ΕΠΑΝΕΚΤΙΜΗΣΗ.**
  - **ΝΕΟΣ ΔΕΞΙΟΣ ΚΑΘΕΤΗΡΙΑΣΜΟΣ**
    - **ΧΑΜΗΛΗ ΡVΡ**
  - **ΝΕΟ ΤΤΕ ΚΑΙ ΤΟΕ**
    - **ΔΑΚΤΥΛΙΟΣ 6.2cm -> 5.2cm**
  - **ΝΥΗΑ III -> II**



# ΕΡΩΤΗΣΗ

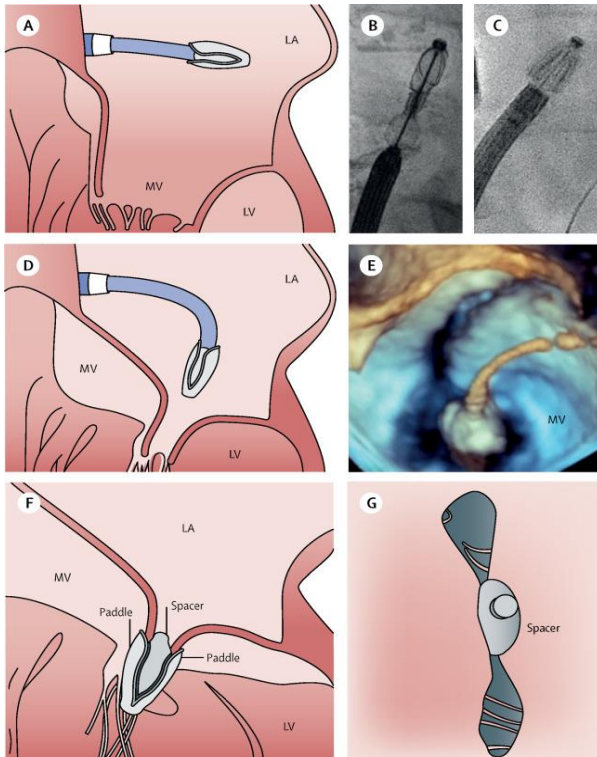
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- **ΧΕΙΡΟΥΡΓΙΚΗ ΑΝΤΙΚΑΤΑΣΤΑΣΗ**
  - **ΤΟΠΟΘΕΤΗΣΗ ΜΕΤΑΛΛΙΚΗΣ ΒΑΛΒΙΔΑΣ**
  - **ΑΝΕΞΑΡΤΗΤΑ ΑΠΟ ΤΟΝ ΧΕΙΡΟΥΡΓΙΚΟ ΚΙΝΔΥΝΟ**

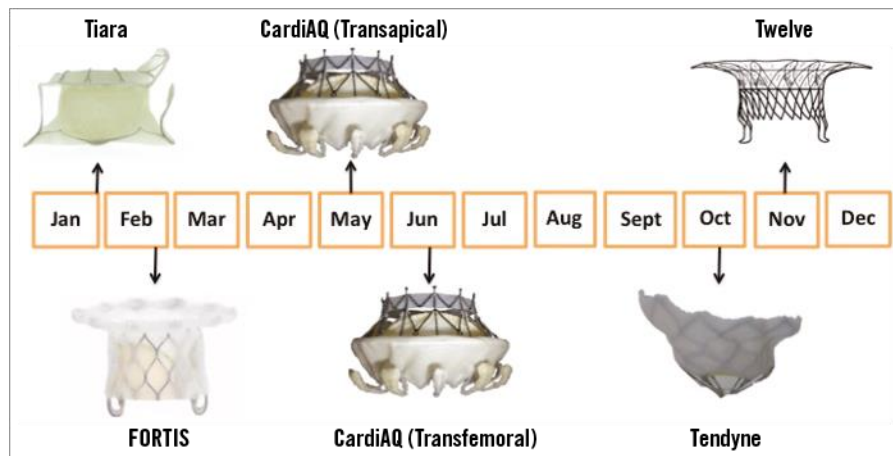
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- **ΤΟΠΟΘΕΤΗΣΗ ΜΙΤΡΑΣΛΙΡ ΥΠΟ ΠΡΟΫΠΟΘΕΣΕΙΣ**
- **ΕΠΑΝΕΚΤΙΜΗΣΗ ΣΤΟ ΜΕΛΛΟΝ ΓΙΑ ΑΛΛΗ ΘΕΡΑΠΕΙΑ**

- ΔΙΕΡΕΥΝΗΣΗ ΤΟΠΟΘΕΤΗΣΗΣ ΥΠΟ ΠΡΟΫΠΟΘΕΣΕΙΣ ΑΛΛΗΣ ΜΙΤΡΟΕΙΔΙΚΗΣ ΔΙΑΚΑΘΕΤΗΡΙΑΚΗΣ ΣΥΣΚΕΥΗΣ

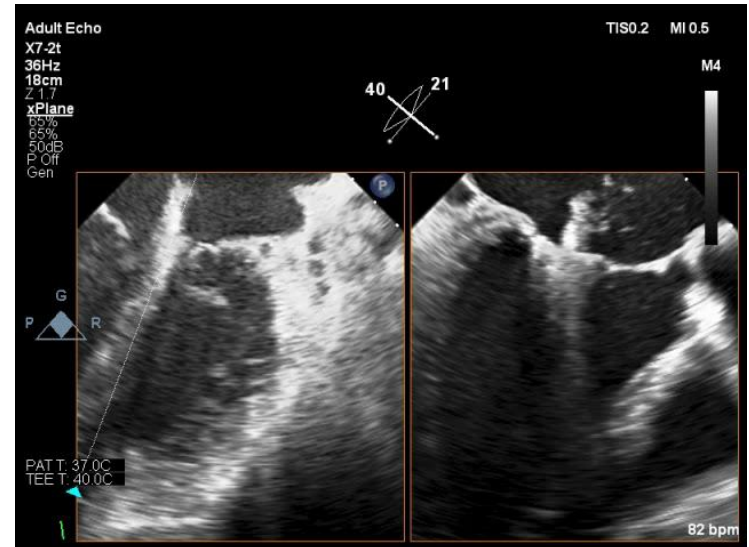
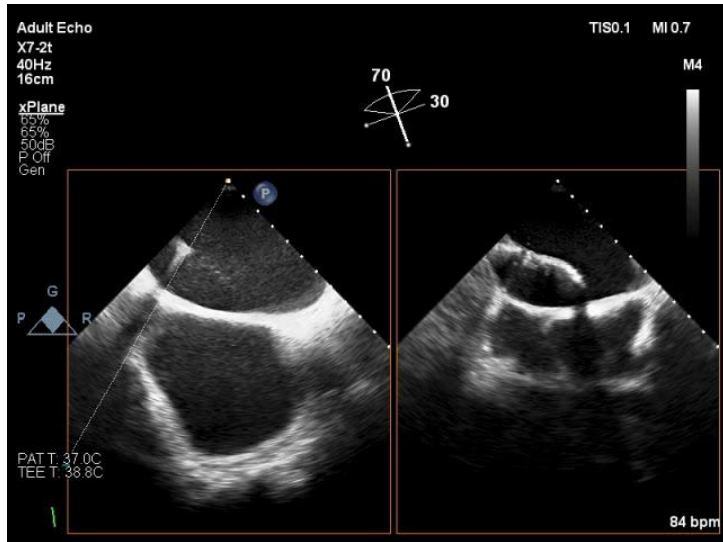


# • ΤΟΠΟΘΕΤΗΣΗ ΑΛΛΟΥ ΤΥΠΟΥ ΒΑΛΒΙΔΑΣ

Valve	MR Target	Approach	Current Status
Tendyne	Secondary	TA	CE Trial, US EFS
Tiara	Primary/Secondary	TA	CE Trial, US EFS
CardiaQ	Primary/Secondary	TA, TF	CE Trial, US EFS
Twelve	Secondary	TA	OUS EFS
Fortis	Secondary	TA	OUS EFS halted
MValve	Primary/Secondary	TA	OUS EFS
Cephea	Secondary	TF	In Development
Cardiovalve	Secondary	TF	In Development
MitrAssist	Primary/Secondary	TA	In Development
HghLife MVR	Secondary	TA, TF	In Development
MitraCath	Secondary	TA	In Development
EndoValve	Secondary	TF	In Development
Navigate TMVR	Secondary	TA, TF	In Development

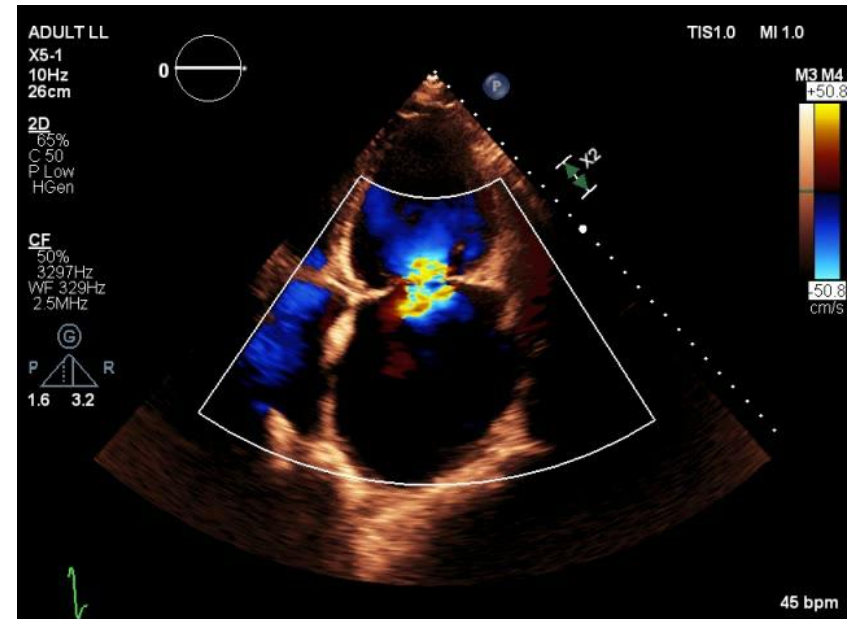
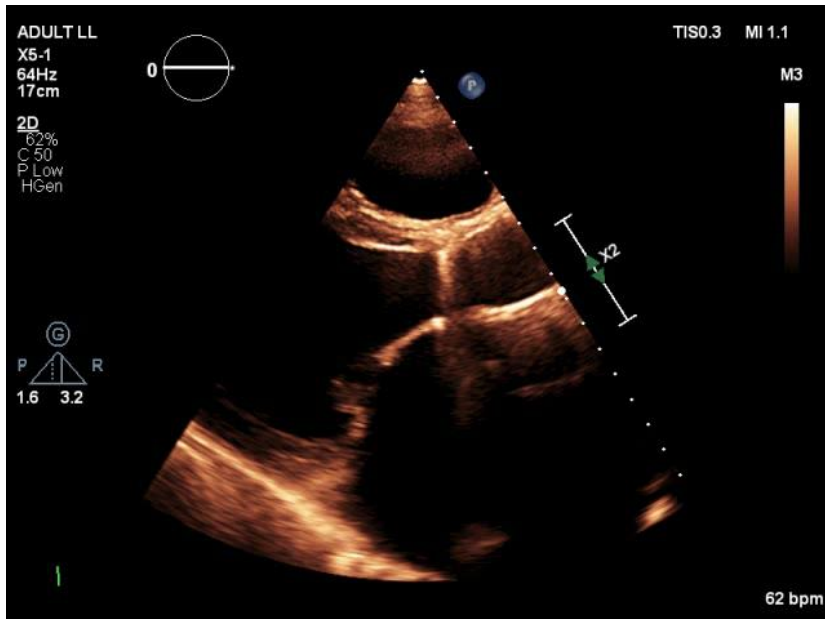


# MITRACLIP



## 5 ΜΗΝΕΣ ΜΕΤΑ

- ΑΣΘΕΝΗΣ ΣΤΑΘΕΡΟΣ ΚΛΙΝΙΚΑ ΚΑΙ ΑΙΜΟΔΥΝΑΜΙΚΑ
- ΝΗΥΑ ΙΙ



ADULT LL

X5-1

12Hz

16cm

Live 3D

2D / 3D

% 74 / 52

C 49 / 41

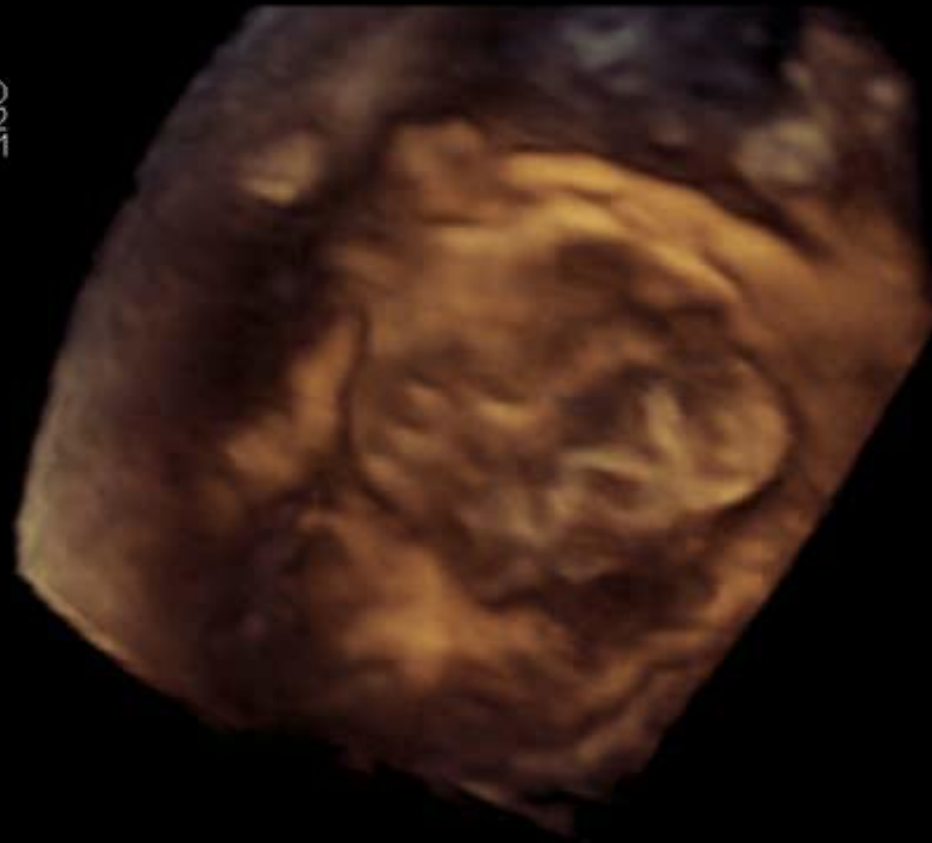
HGen

3D Beats 1

TIS0.3

MI 0.7

M3



r

57 bpm



**ΕΥΧΑΡΙΣΤΩ**

