Co musíte znát k praktické části atestační zkoušky? ECHOKARDIOGRAFIE

Martin Hutyra
1. interní klinika – kardiologická, Lékařská fakulta Univerzity Palackého a Fakultní nemocnice Olomouc

XXV. výroční sjezd ČKS

10. květen 2012

I. INTERNÍ KLINIKA
KARDIOLOGIE
FAKULTNÍ NEMOCNICE OLOMOUC

PS Kardio 35

17:00-18:30 **Imaging pro mladé kardiology**

Předsedající: A. Linhart, M. Pazderník (Praha)

17:00	278.	**ECHOKVÍZ** J. Pudich (Ostrava)
17:28		**Diskuze**
17:30	279.	**ZÁKLADY ECHOKARDIOGRAFIE KE KARDIOLOGICKÉ ATESTACI** J. Marek (Praha)
17:58		**Diskuze**
18:00	280.	**ZOBRAZOVACÍ METODY V AKUTNÍ KARDIOLOGII** M. Kotrč (Praha)
18:28		**Diskuze**

KOMPLEXNÍ KARDIO VASKULÁRNÍ CENTRUM VFN Praha

Echokardiografie před atestací
Kurz pro neplavce II

MUDr. Josef Marek

II. interní klinika
kardiologie a angiologie
Komplexní kardiovaskulární centrum
VFN a 1. LF UK
Praha

VŠEOBECNÁ FAKULTNÍ NEMOCNICE V PRAZE

KOMPLEXNÍ KARDIO VASKULÁRNÍ CENTRUM VFN Praha

Echokardiografie před atestací
Kurz pro neplavce I - PLAX

MUDr. Josef Marek

II. interní klinika
kardiologie a angiologie
Komplexní kardiovaskulární centrum
VFN a 1. LF UK
Praha

VŠEOBECNÁ FAKULTNÍ NEMOCNICE V PRAZE

I. INTERNÍ KLINIKA KARDIOLOGIE
FAKULTNÍ NEMOCNICE OLOMOUC

Zobrazovací metody srdce

Echokardiografie

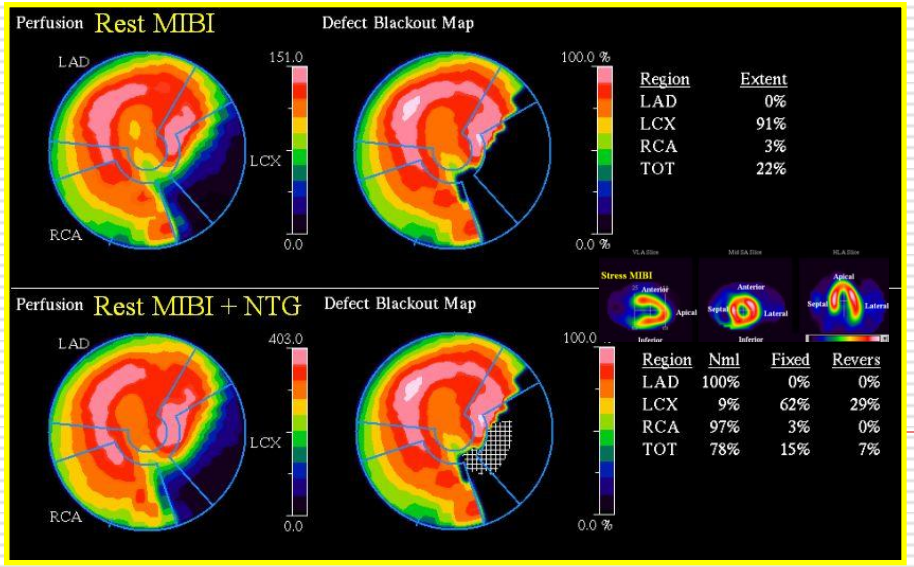
- Dobutaminová zátěžová, deformace myokardu LK…

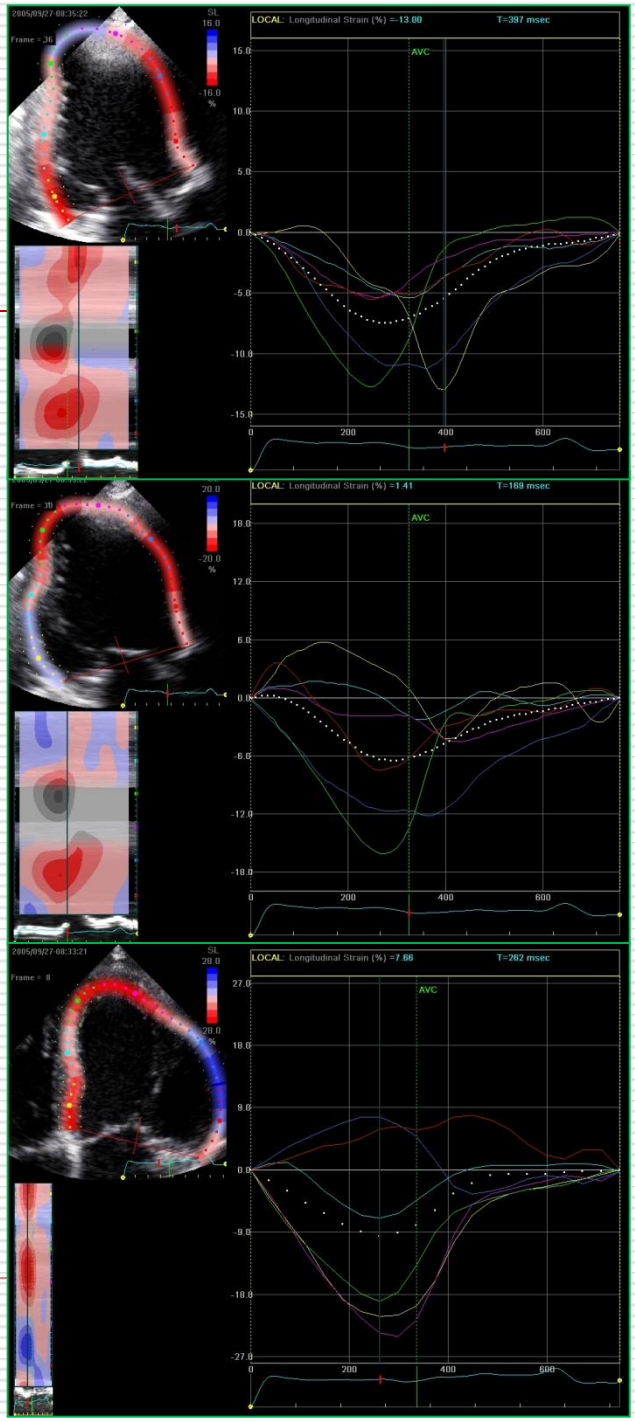
Magnetická rezonance

- T1, T2, LGE…

SPECT a PET myokardu

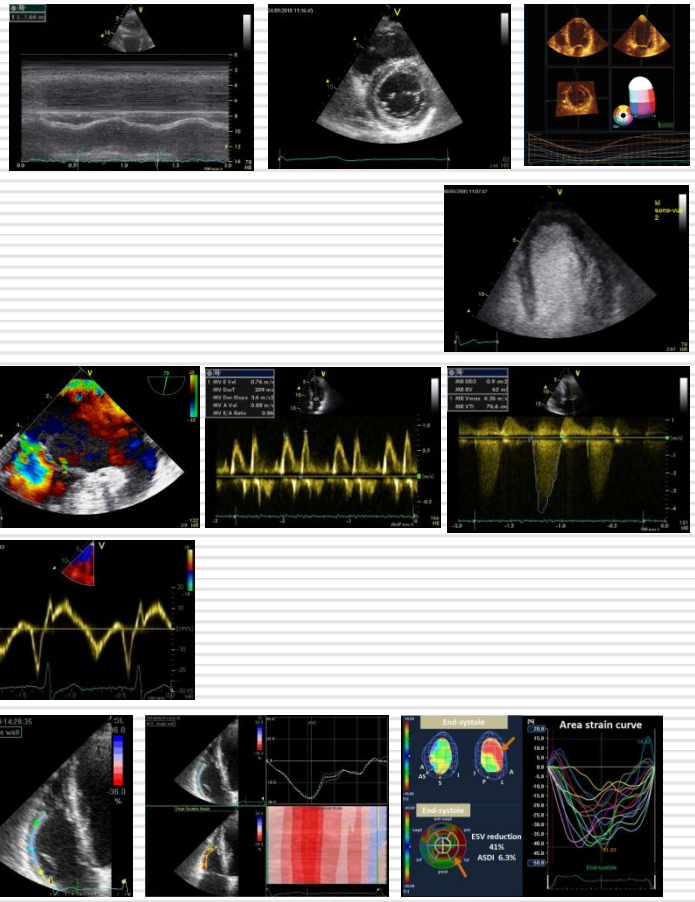
- Perfuzní scintigrafie myokardu
- metabolizmus





Echokardiografie - metody

- **MM/2DE/RT 3DE**
- **CEE**
- **Doppler (CFM, PWD, CWD)**
- **Tissue Doppler imaging**
- **2D/3D strain**



Eur J Echocardiography (2006) 7, 79–108

ELSEVIER

GUIDELINES

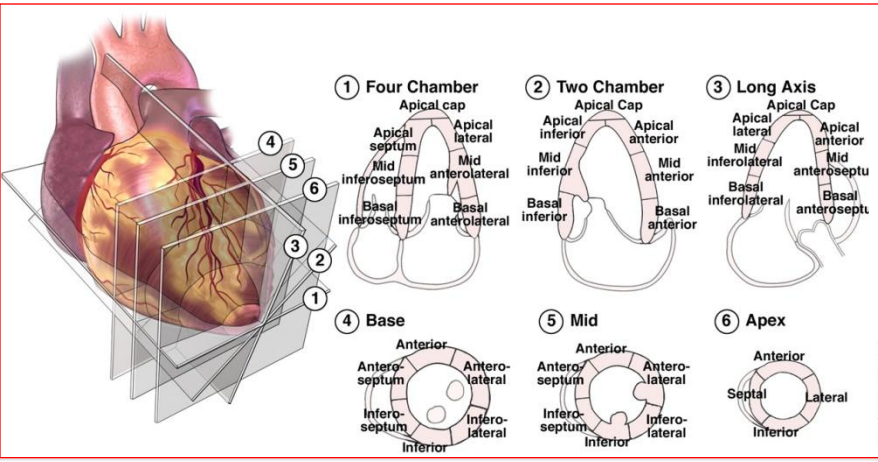
Recommendations for chamber quantification☆

Roberto M. Lang, Michelle Bierig, Richard B. Devereux, Frank A. Flachskampf*, Elyse Foster, Patricia A. Pellikka, Michael H. Picard, Mary J. Roman, James Seward, Jack Shanewise, Scott Solomon, Kirk T. Spencer, Martin St. John Sutton, William Stewart

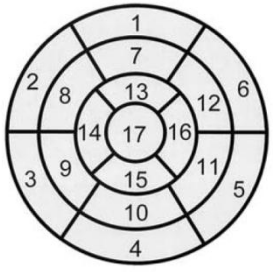
EUROPEAN SOCIETY OF CARDIOLOGY®

Standardized myocardial segmentation and nomenclature for tomographic imaging of the heart: A statement for healthcare professionals from the Cardiac Imaging Committee of the Council on Clinical Cardiology of the American Heart Association

Manuel D. Cerqueira, MD,[b] Neil J. Weissman, MD,[a] Vasken Dilsizian, MD,[b] Alice K. Jacobs, MD,[d] Sanjiv Kaul, MD,[a] Warren K. Laskey, MD,[d] Dudley J. Pennell, MD,[e] John A Rumberger, MD,[c] Thomas Ryan, MD,[a] Mario S. Verani, MDH†,[b] and American Heart Association Writing Group on Myocardial Segmentation and Registration for Cardiac Imaging[a,b,c,d,e]



Left Ventricular Segmentation



1. basal anterior
2. basal anteroseptal
3. basal inferoseptal
4. basal inferior
5. basal inferolateral
6. basal anterolateral
7. mid anterior
8. mid anteroseptal
9. mid inferoseptal
10. mid inferior
11. mid inferolateral
12. mid anterolateral
13. apical anterior
14. apical septal
15. apical inferior
16. apical lateral
17. apex

Coronary Artery Territories

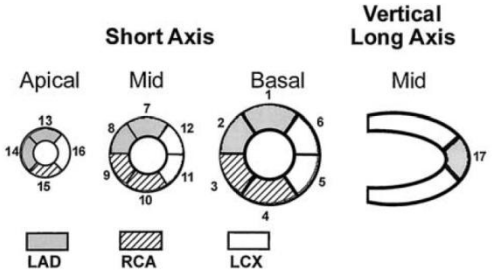


Figure 5. Assignment of the 17 myocardial segments to the territories of the left anterior descending *(LAD)*, right coronary artery *(RCA)*, and the left circumflex coronary artery *(LCX)*. Modified from reference 5.

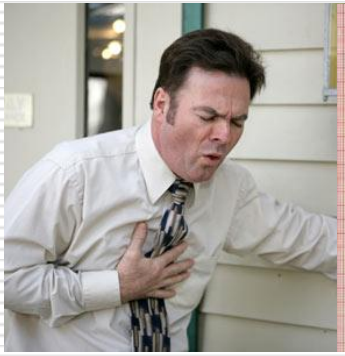
Lang R M et al. Eur J Echocardiogr 2006;7:79-108
Cerqueira MD et al. Standardized myocardial segmentation and nomenclature for tomographic imaging of the heart: A statement for healthcare professionals from the Cardiac Imaging Committee of the Council on Clinical Cardiology of the American Heart Association. Circulation 2002;105:539-42.

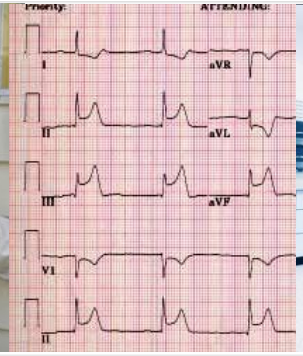
European Heart Journal (2012) **33**, 2569–2619
doi:10.1093/eurheartj/ehs215

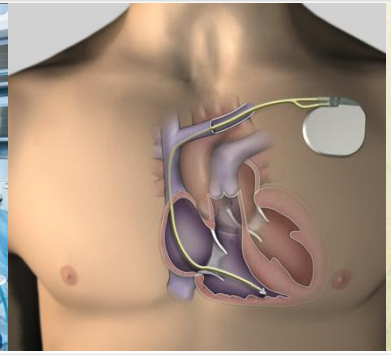
ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation

The Task Force on the management of ST-segment elevation acute myocardial infarction of the European Society of Cardiology (ESC)

Kdy, komu a proč?







Hospitalizace - *přijetí*

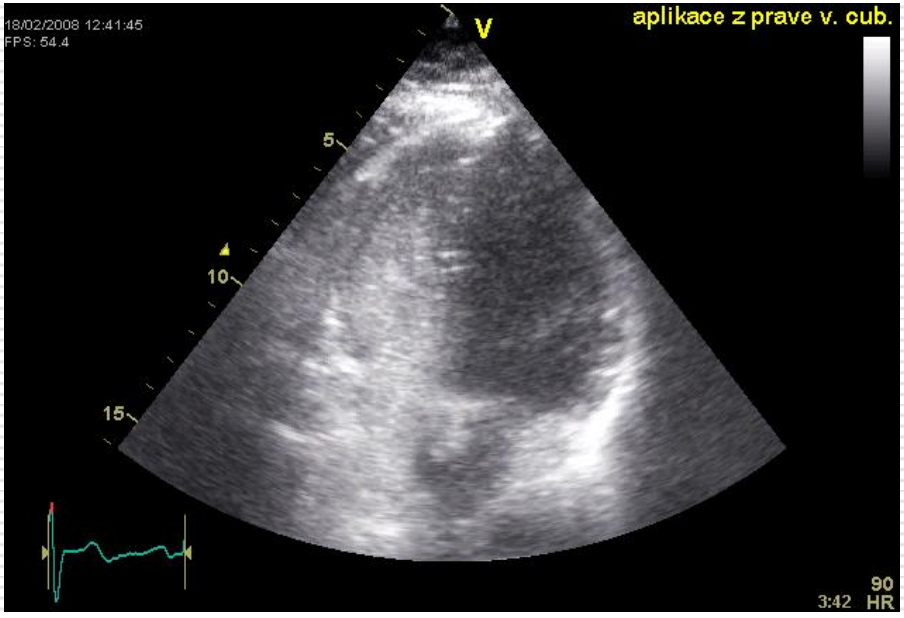
- dimise …

40. den od vzniku IM

	At presentation	Within 48 h	Before or after discharge
Echo at rest	If required for diagnosis	For LV function and presence of thrombus	For LV function, heart failure, shock, or new murmur
Stress ECG			For ischaemia
Stress perfusion SPECT			For viability and ischaemia, infarct size
Stress echo			For viability and ischaemia
PET (rest)			For viability
MRI (rest, stress, contrast-enhanced)			For LV function, infarct size, viability, and ischaemia

Recommendations	Class[a]	Level[b]
At presentation		
In the acute phase, when diagnosis is uncertain, emergency echocardiography may be useful. However, if inconclusive or unavailable and persistent doubt, emergency angiography should be considered.	I	C
After the acute phase		
All patients should have an echocardiography for assessment of infarct size and resting LV function.	I	B
If echocardiography is not feasible, MRI may be used as an alternative.	IIb	C
Before or after discharge		
For patients with multivessel disease, or in whom revascularization of other vessels is considered, stress testing or imaging (e.g. using stress myocardial perfusion scintigraphy, stress echocardiography, positron emission tomography or MRI) for ischaemia and viability is indicated.	I	A
Computed tomography angiography has no role in the routine management of STEMI patients.	III	C

Van de Werf F. et al. Acute Myocardial Infarction in patients presenting with ST-segment elevation. EHJ 2008;29:2909-2945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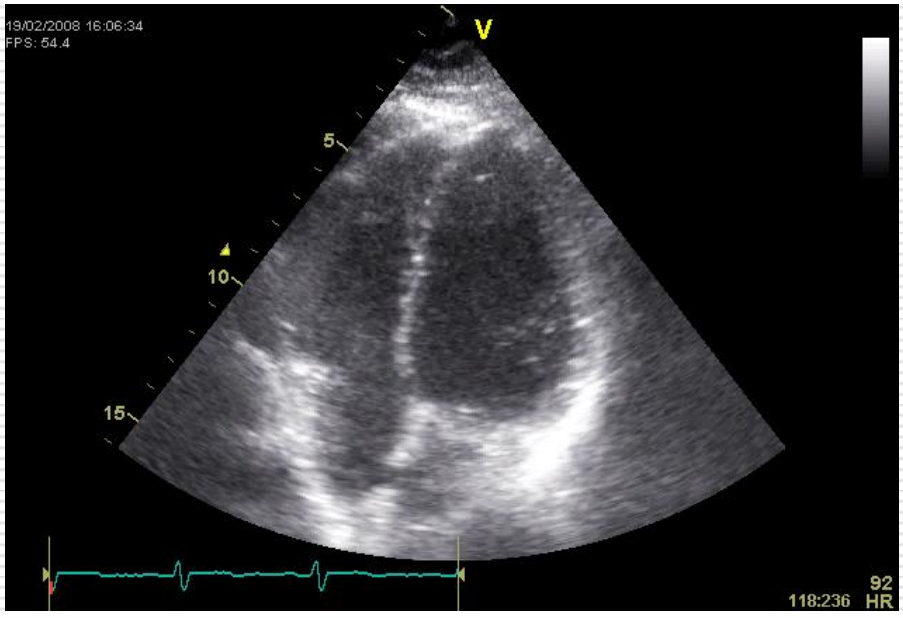
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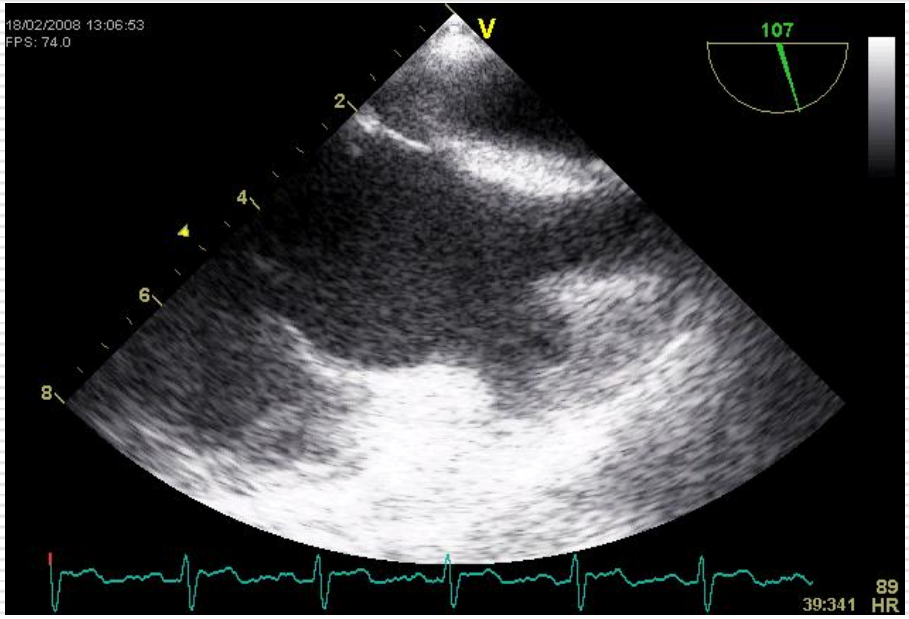
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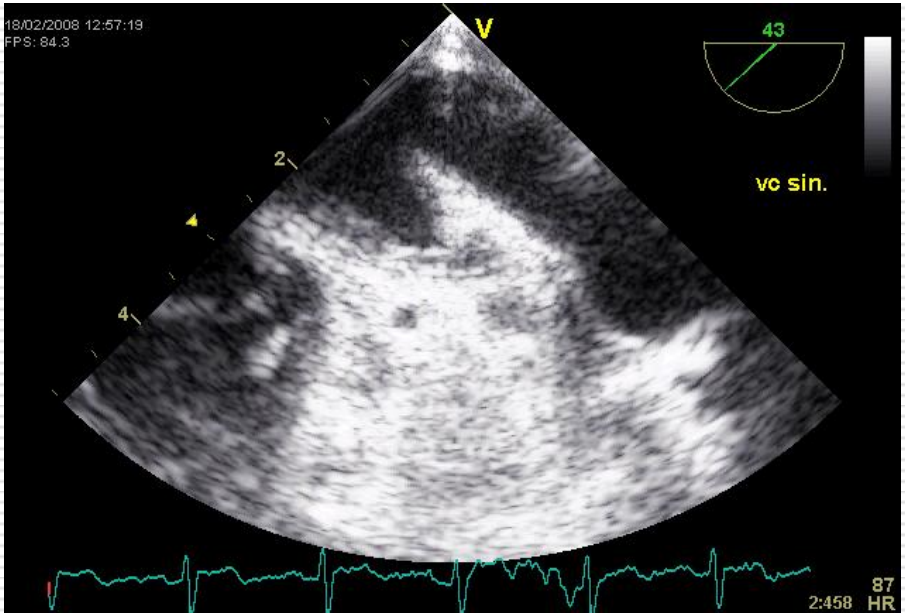
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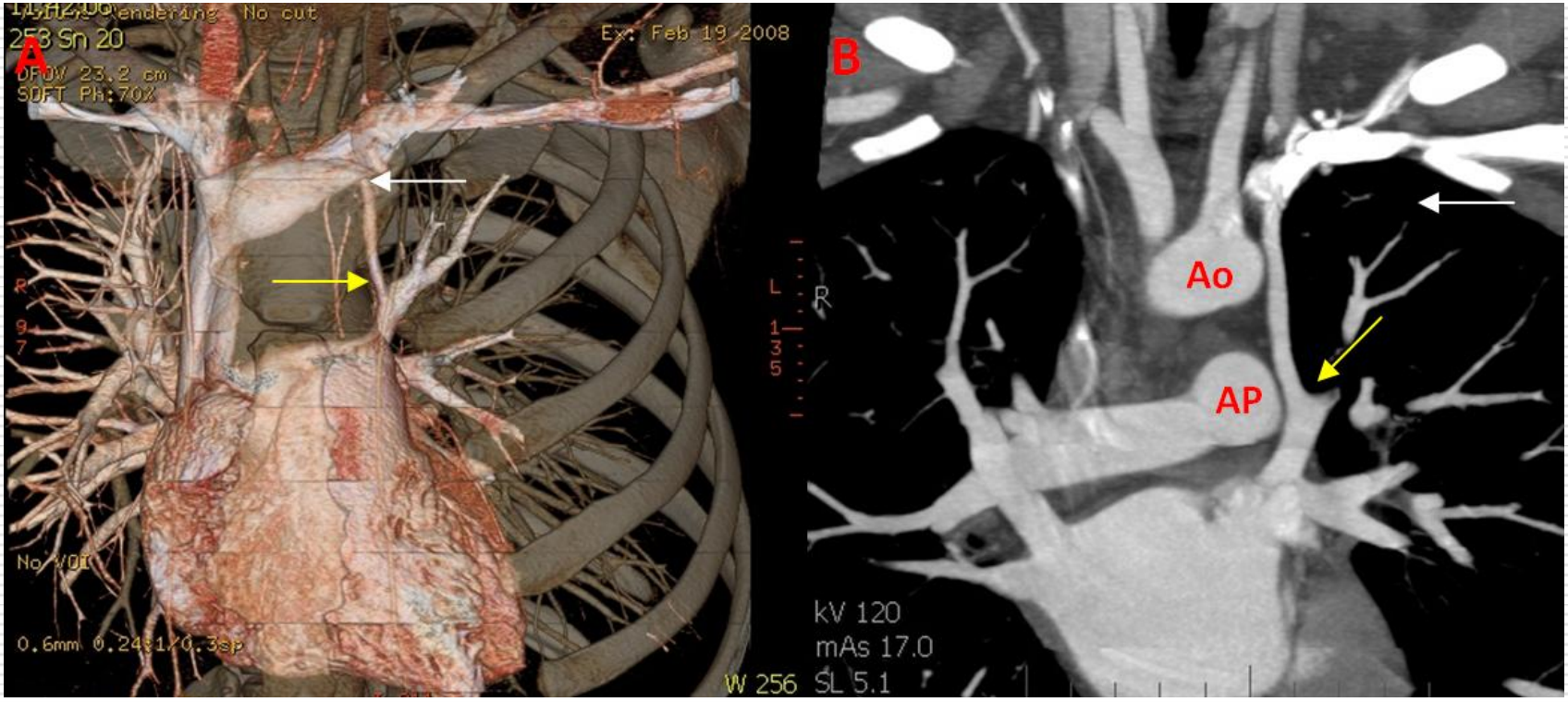
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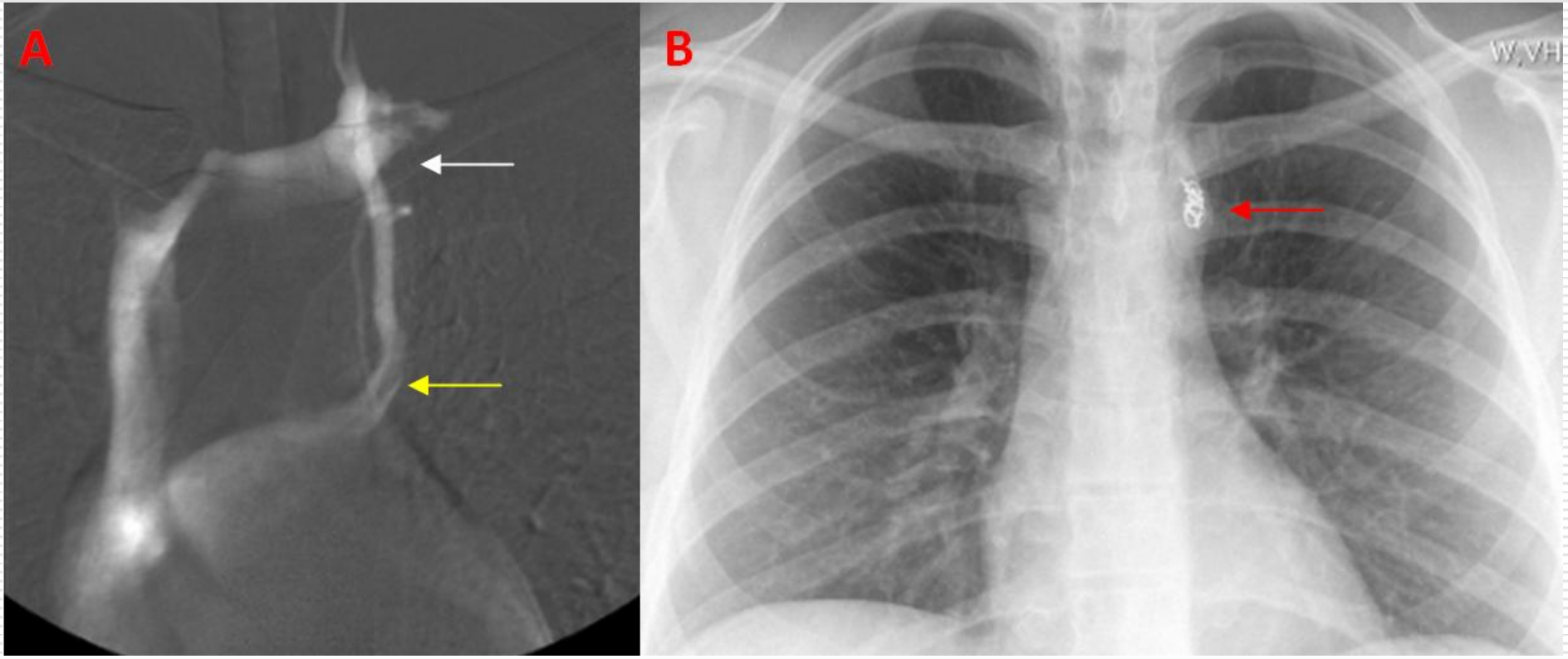
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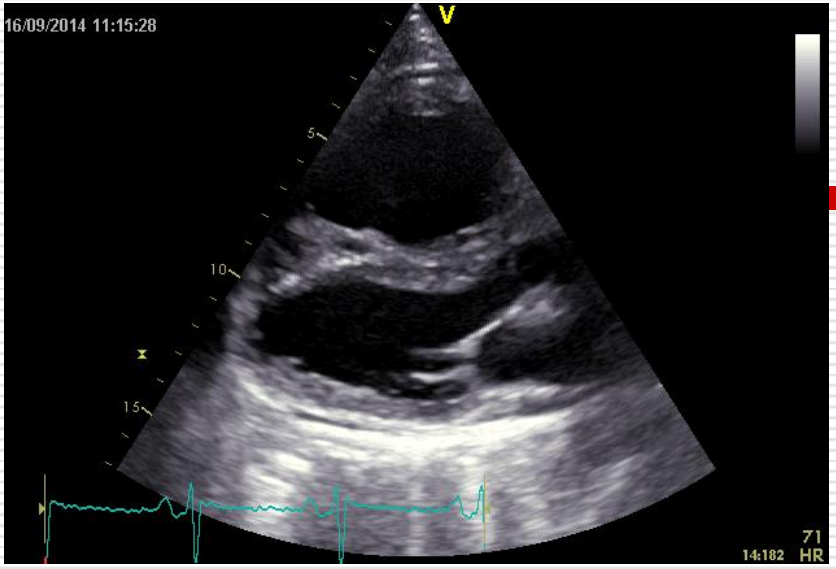

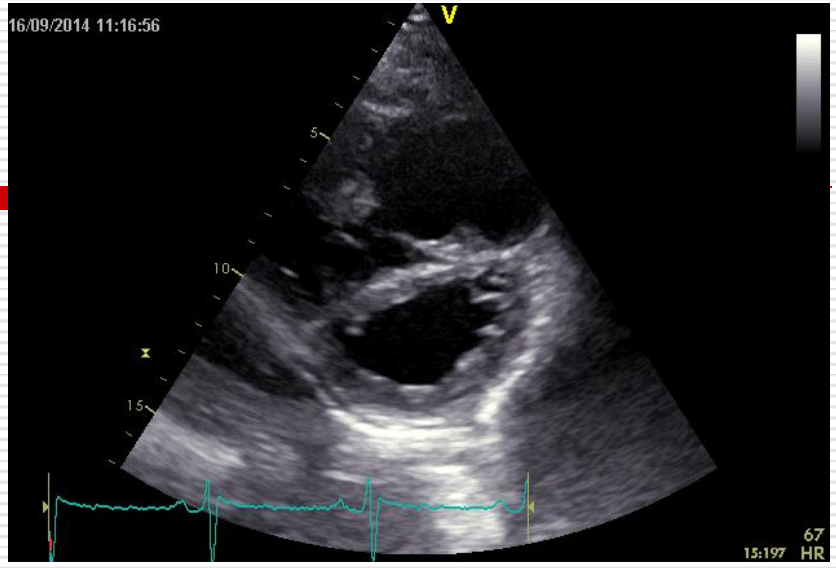

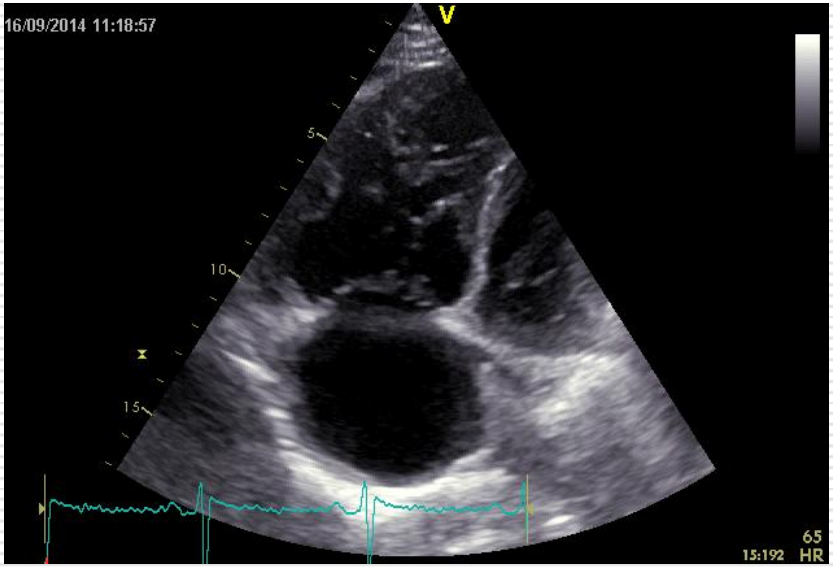

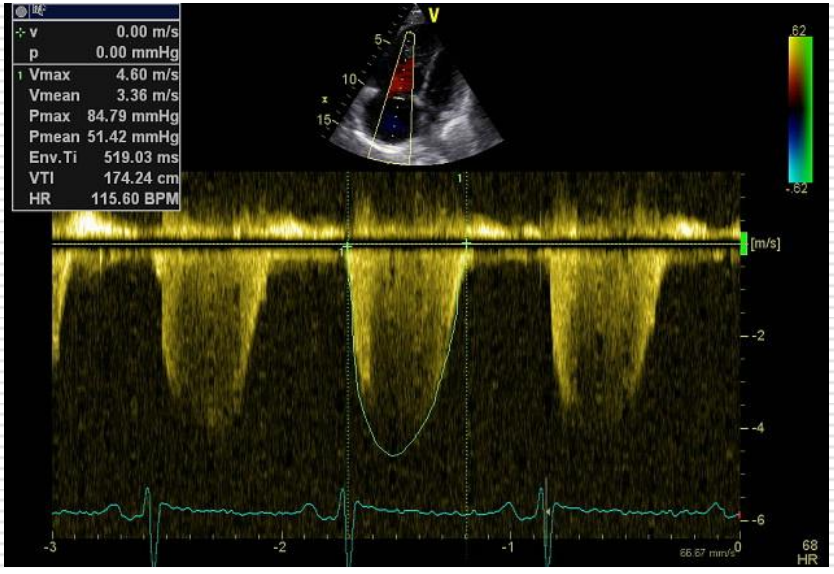

I. INTERNÍ KLINIKA
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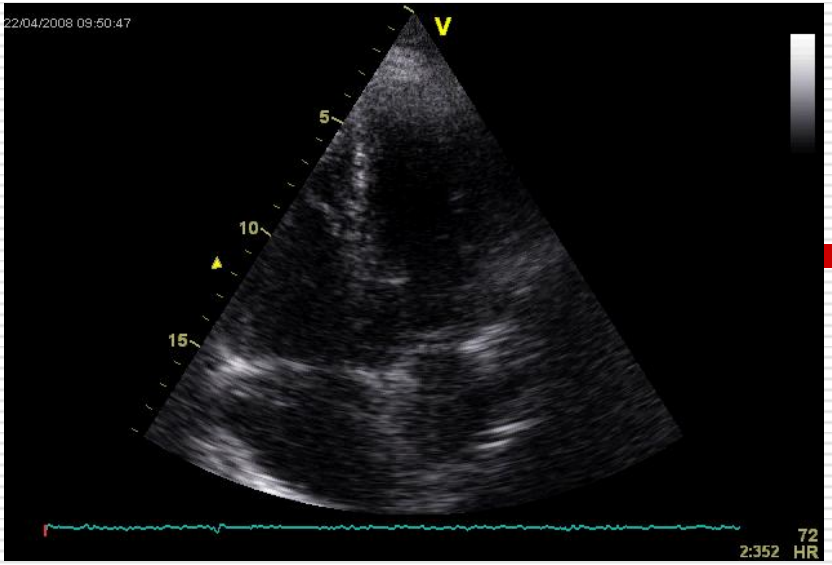

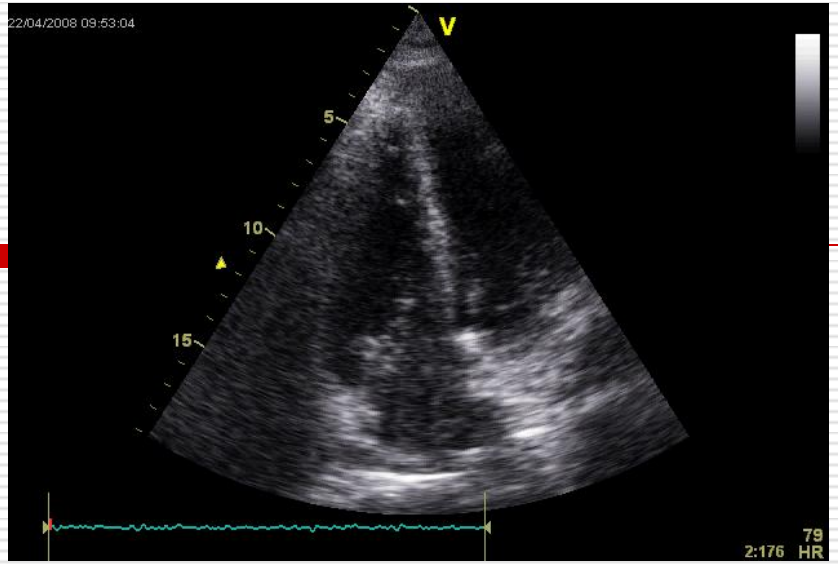

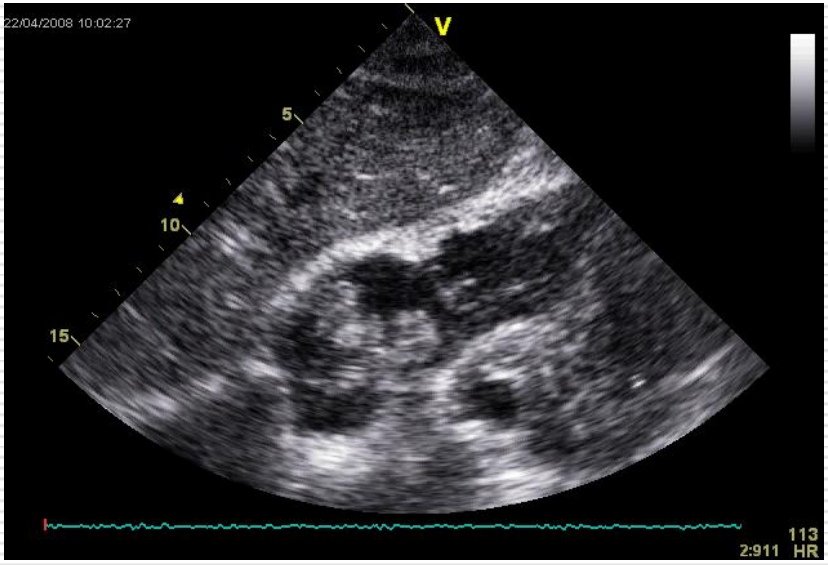

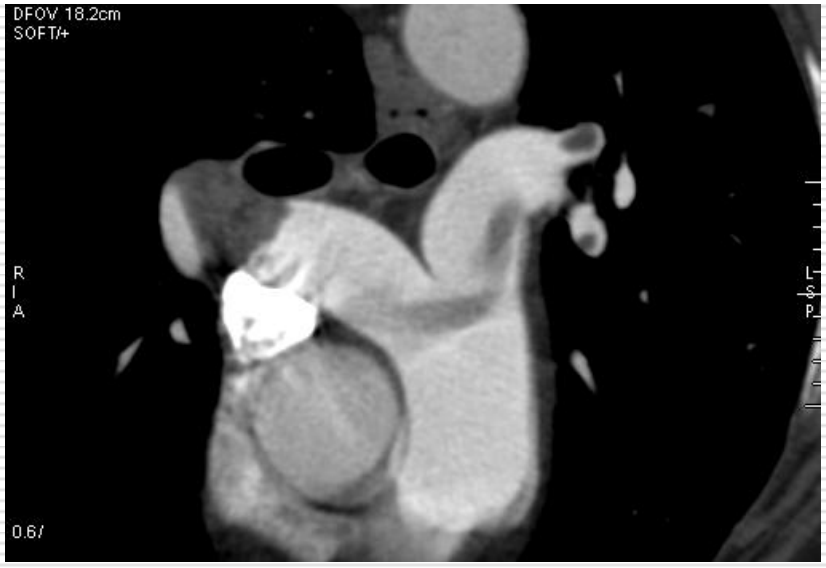

I. INTERNÍ KLINIKA
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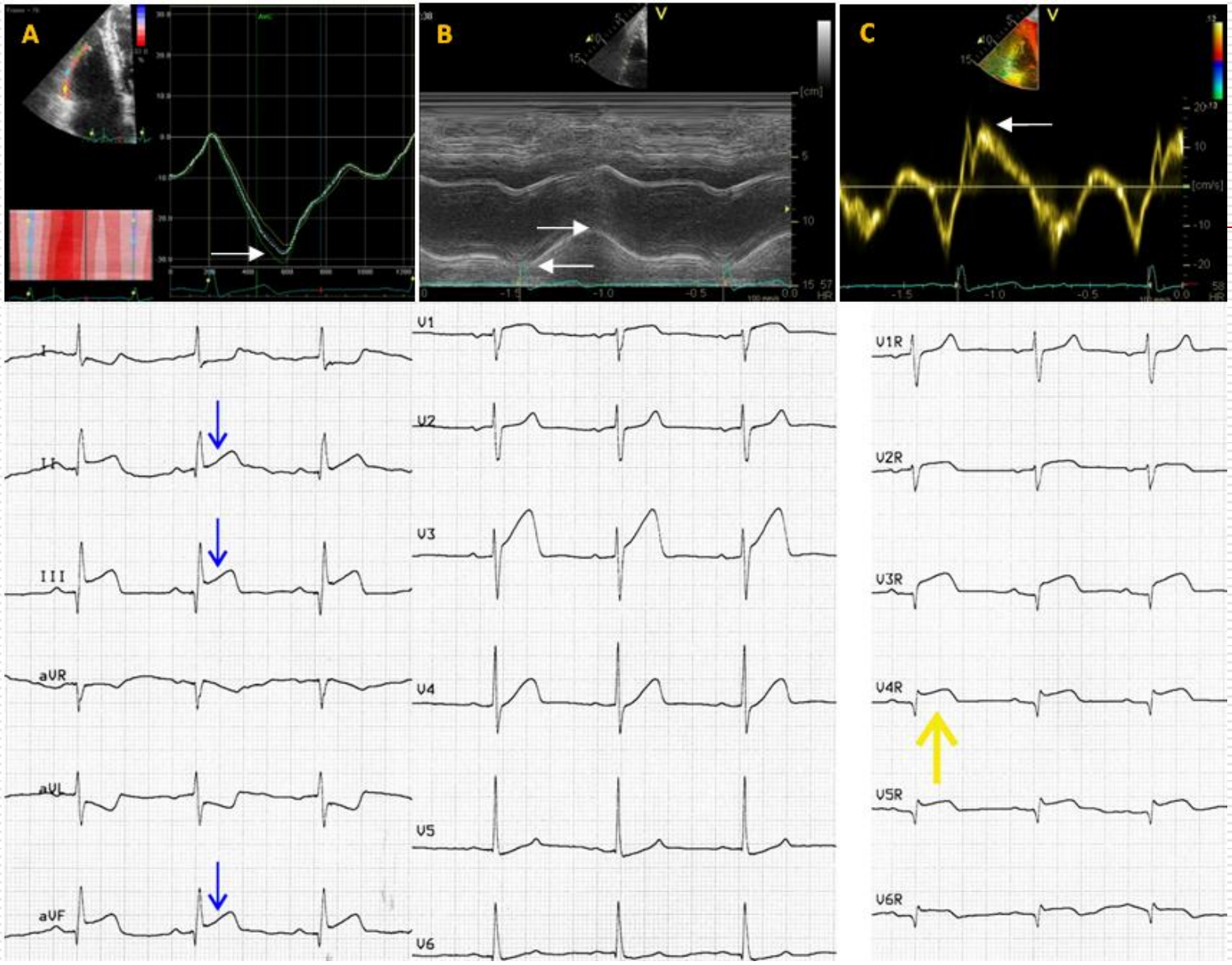
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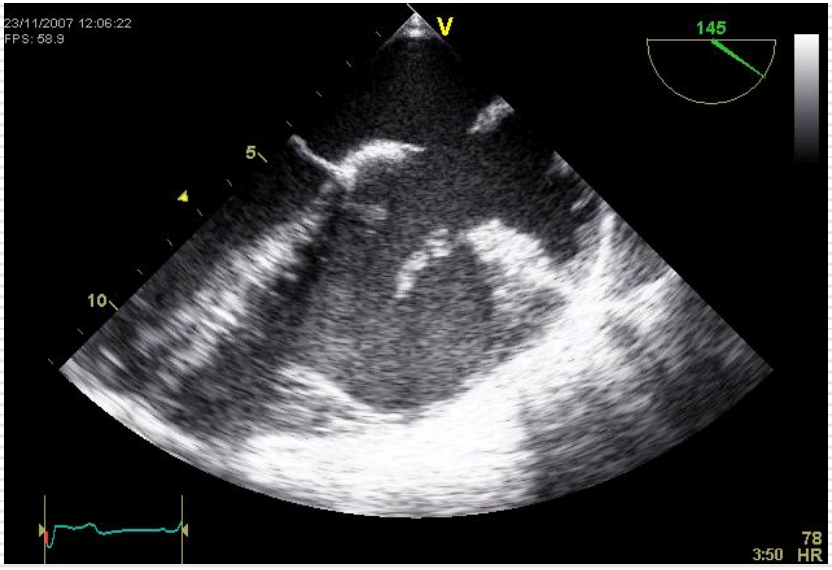
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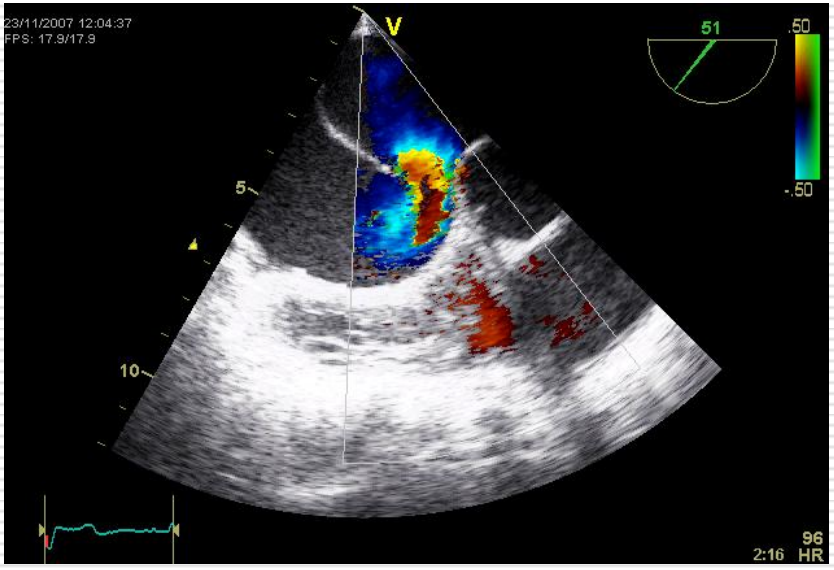
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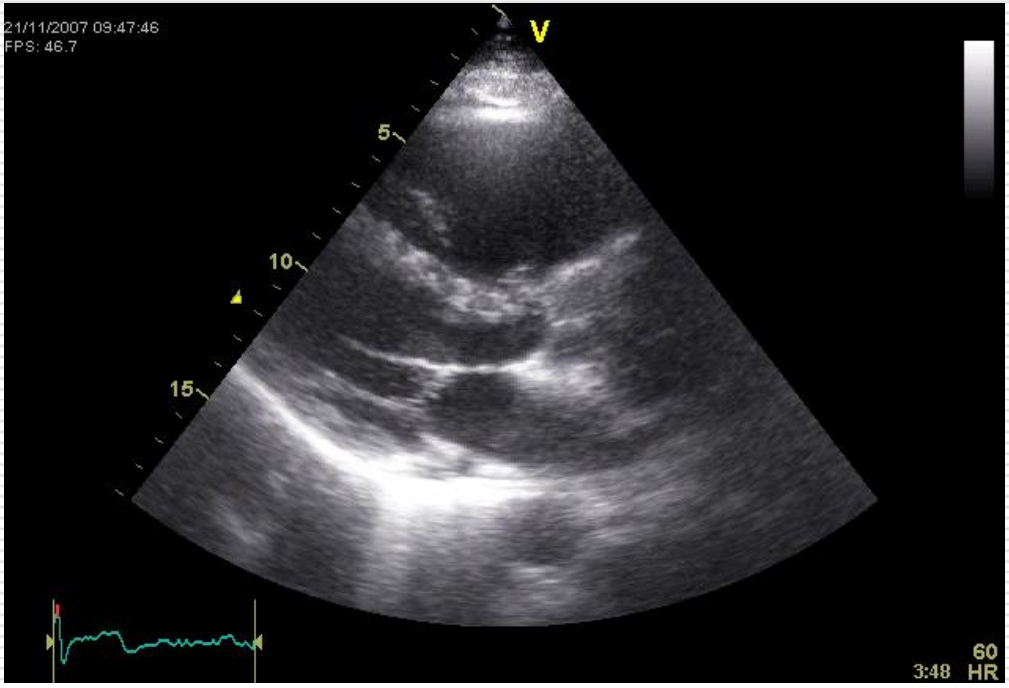
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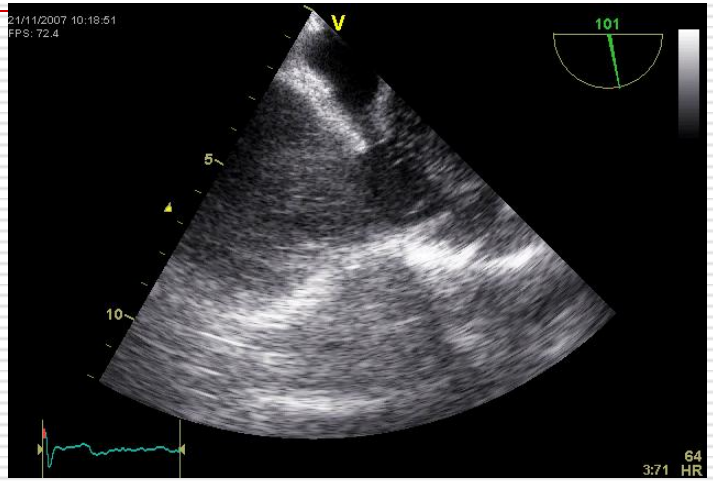
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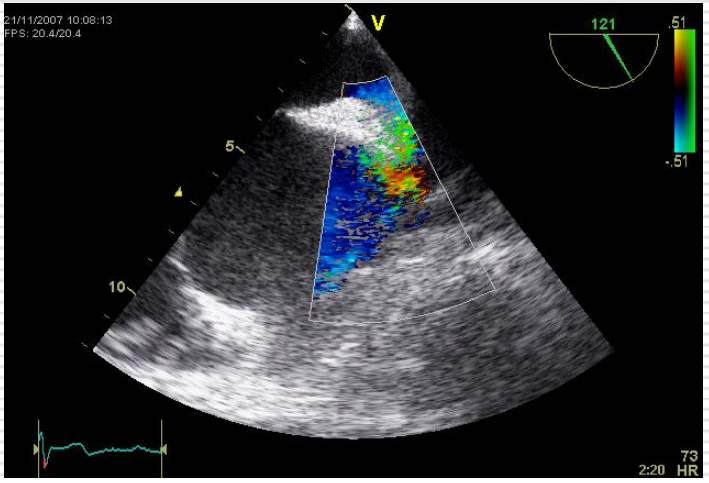
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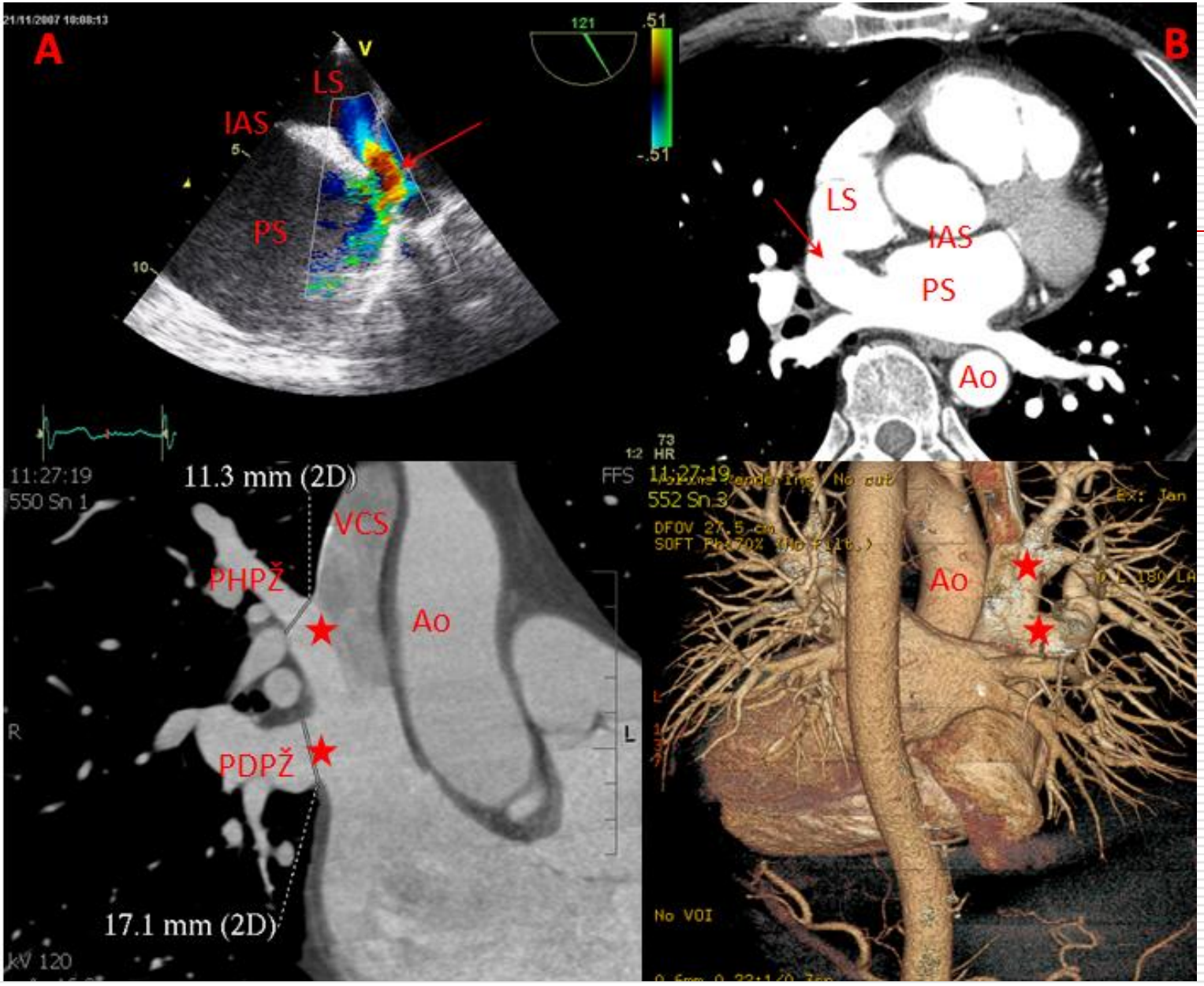
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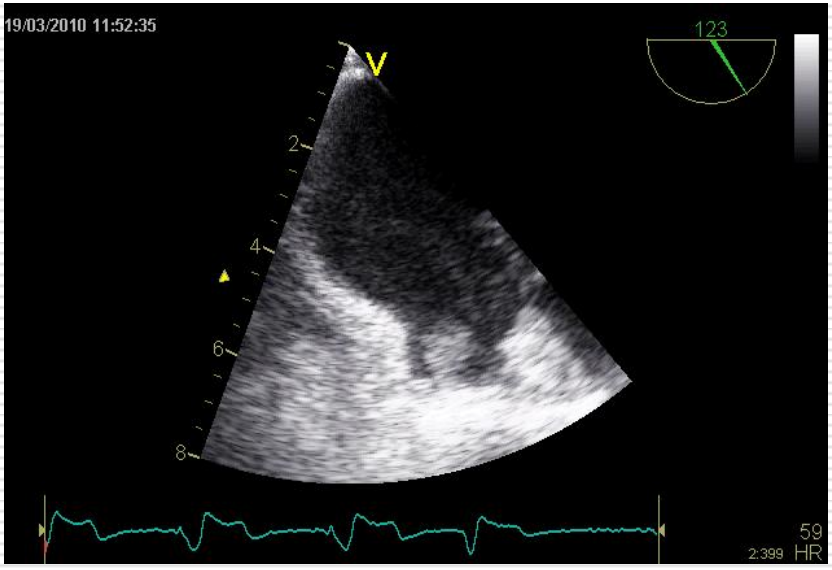
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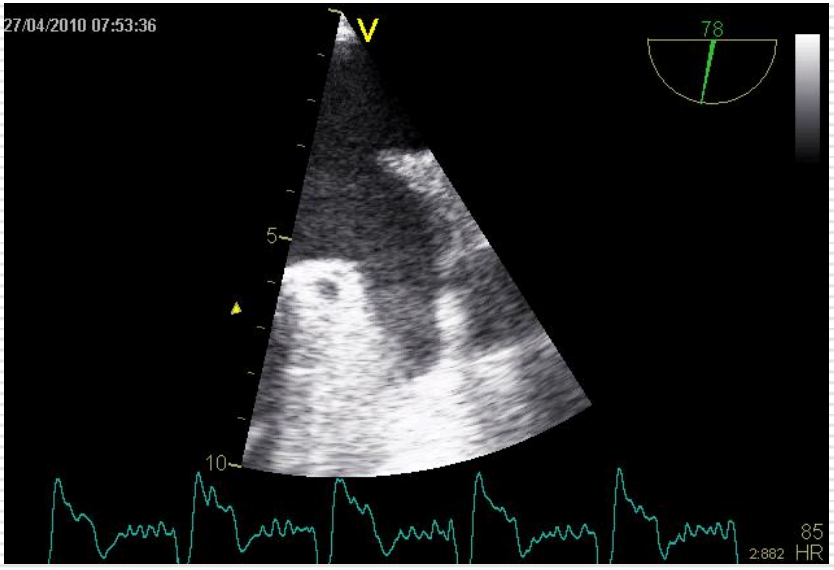
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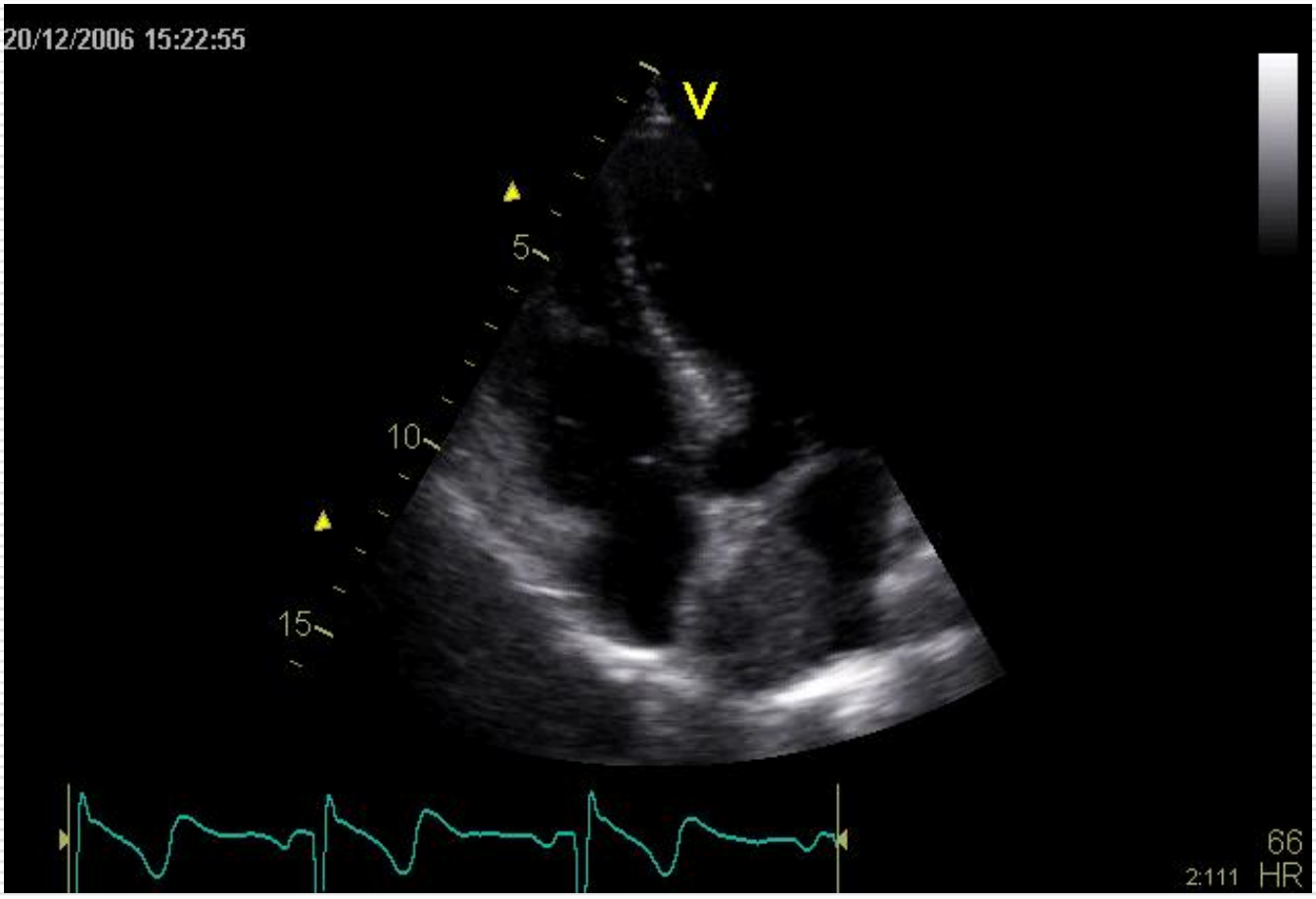
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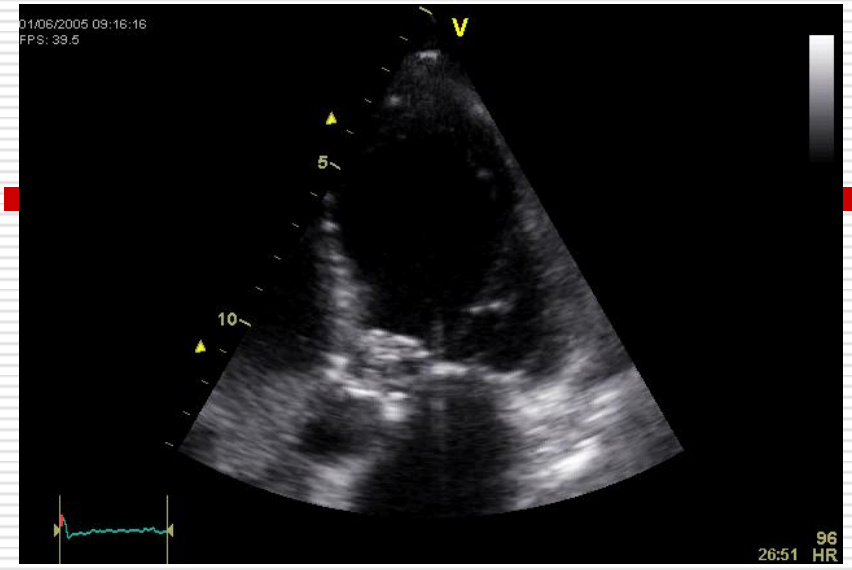
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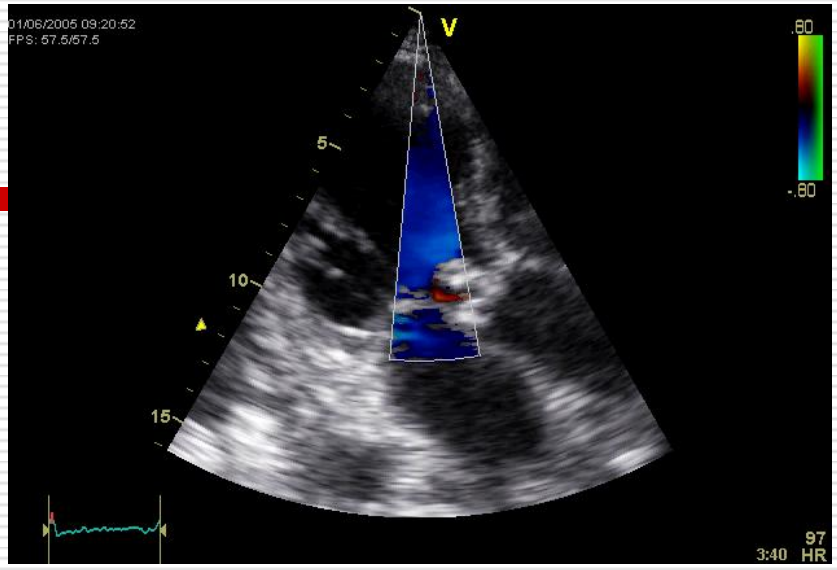
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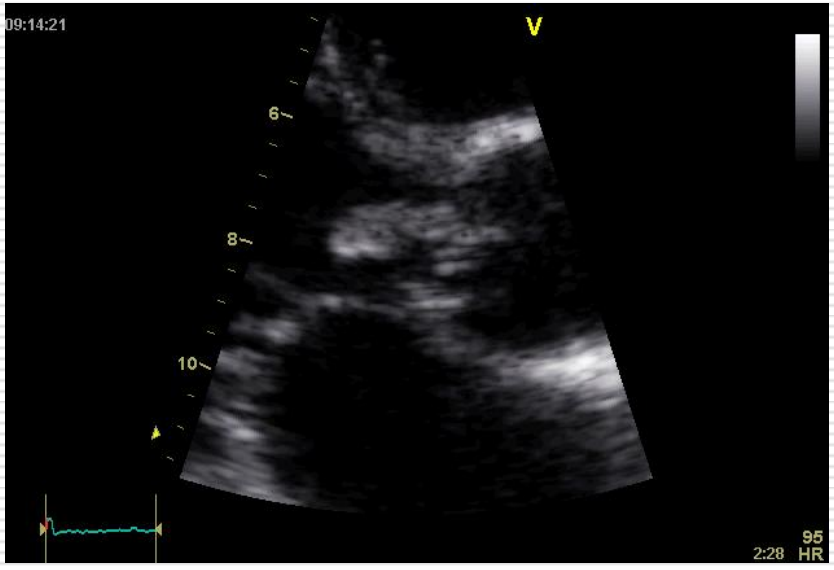
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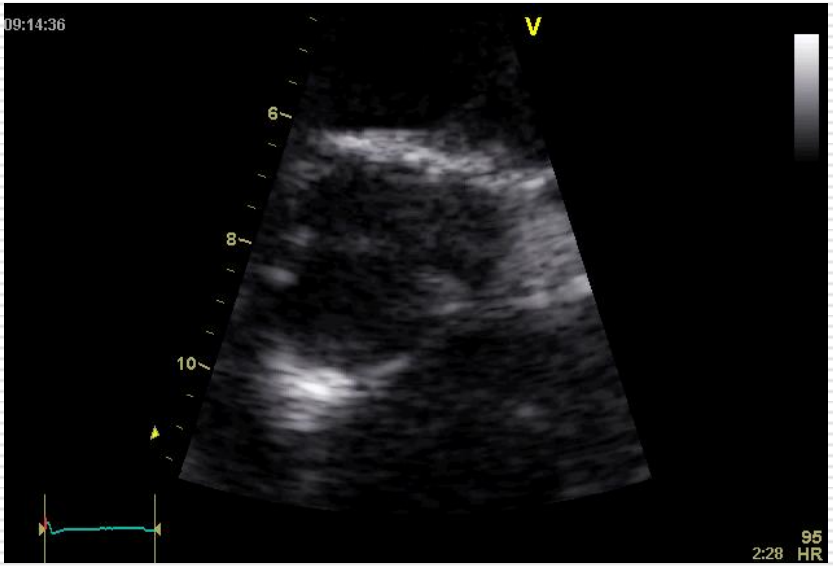
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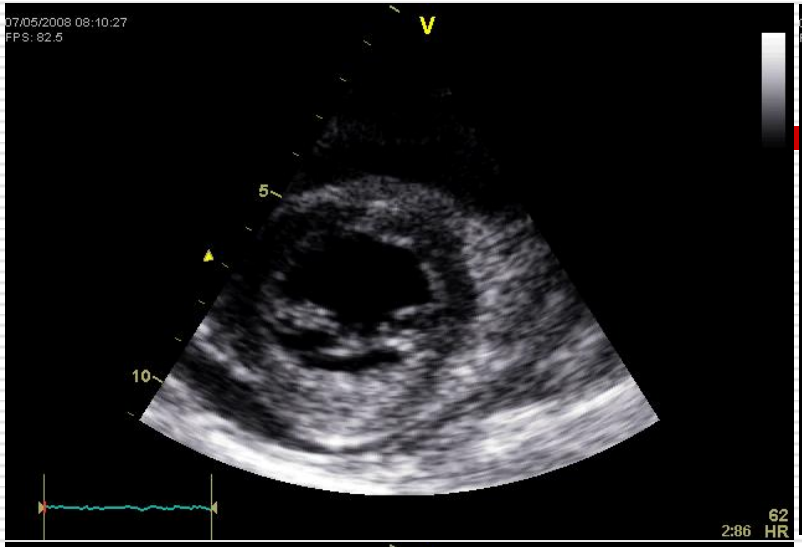
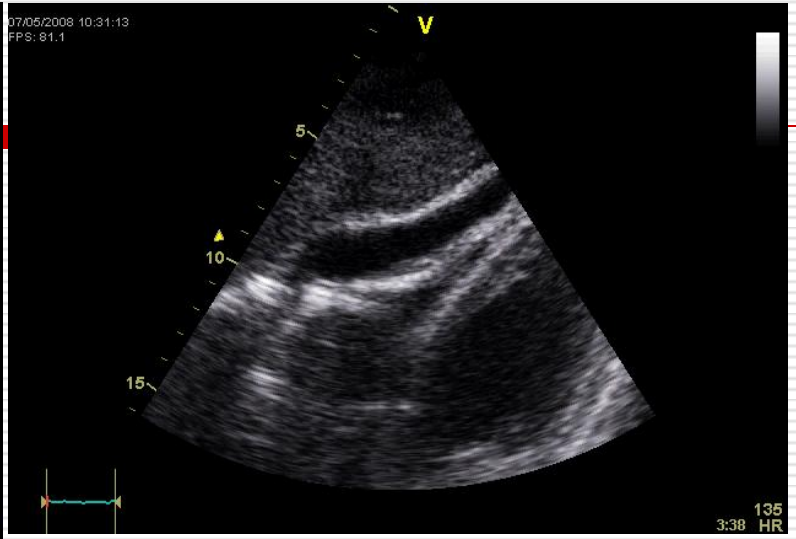
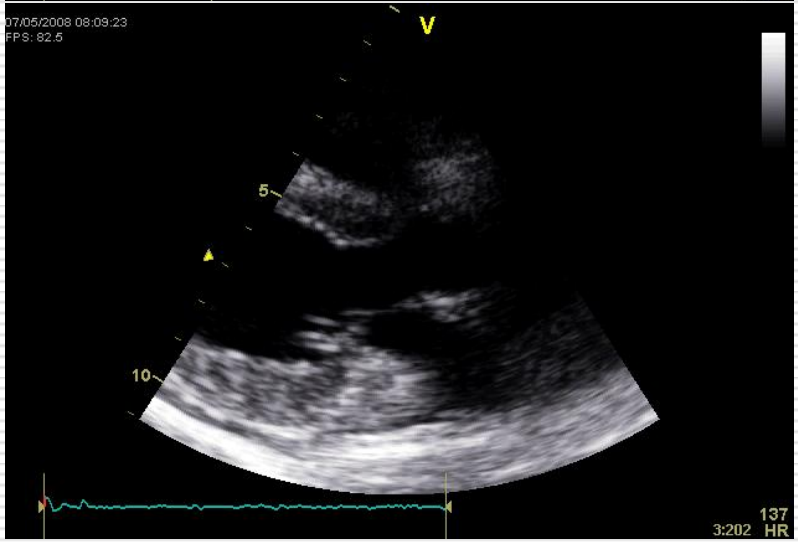
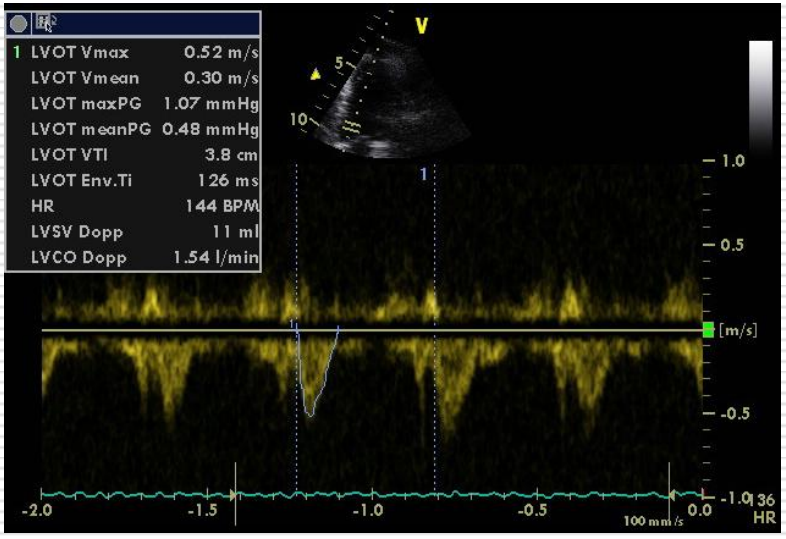
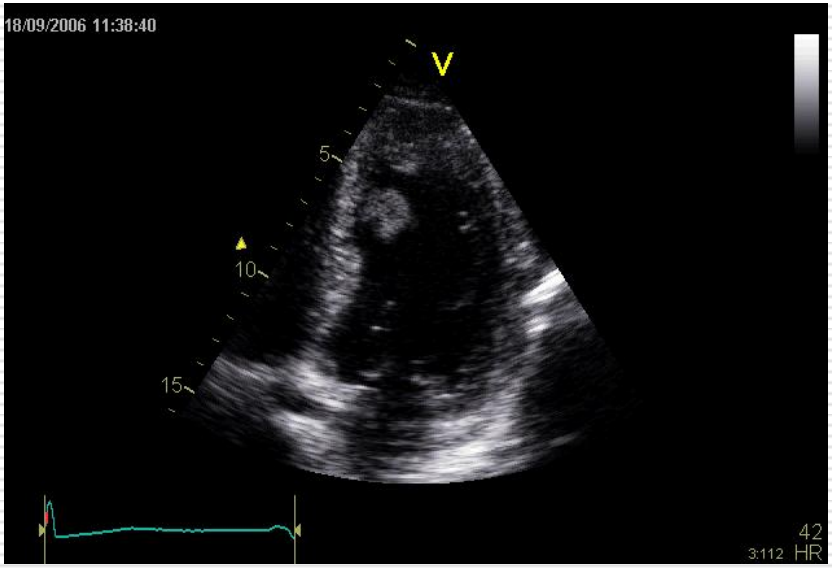
95
2:28 HR

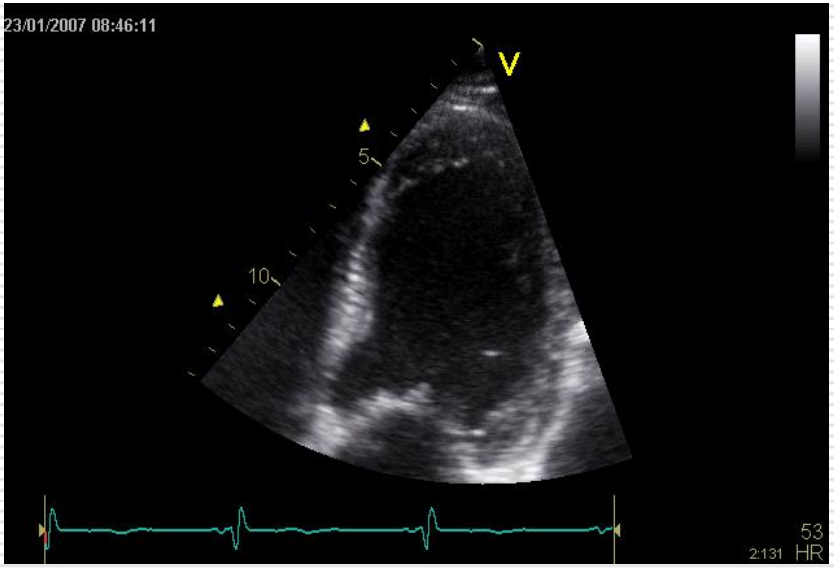

07/05/2008 08:10:27
FPS: 82.5
V
5
10
62
2:86 HR

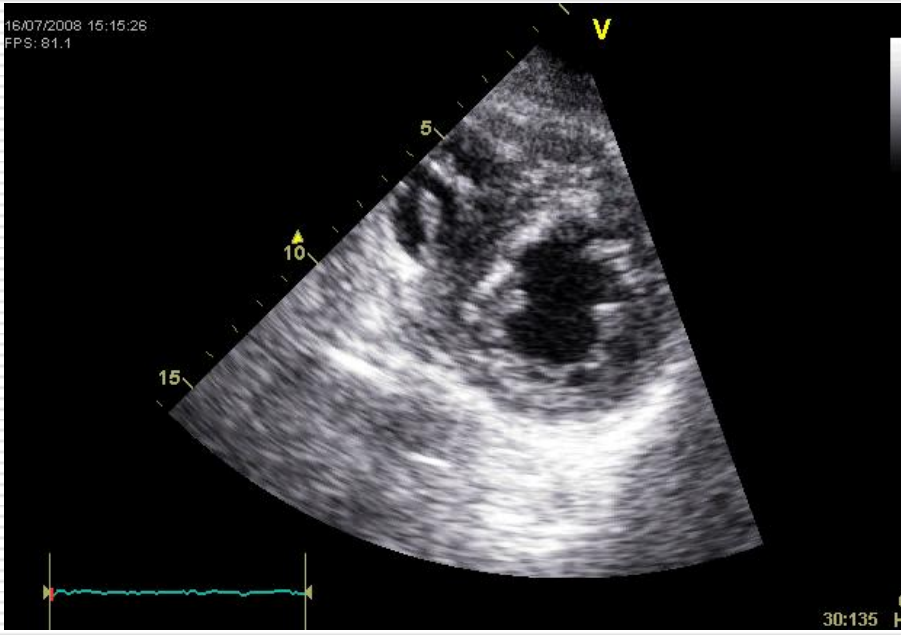

07/05/2008 10:31:13
FPS: 81.1
V
5
10
15
135
3:38 HR

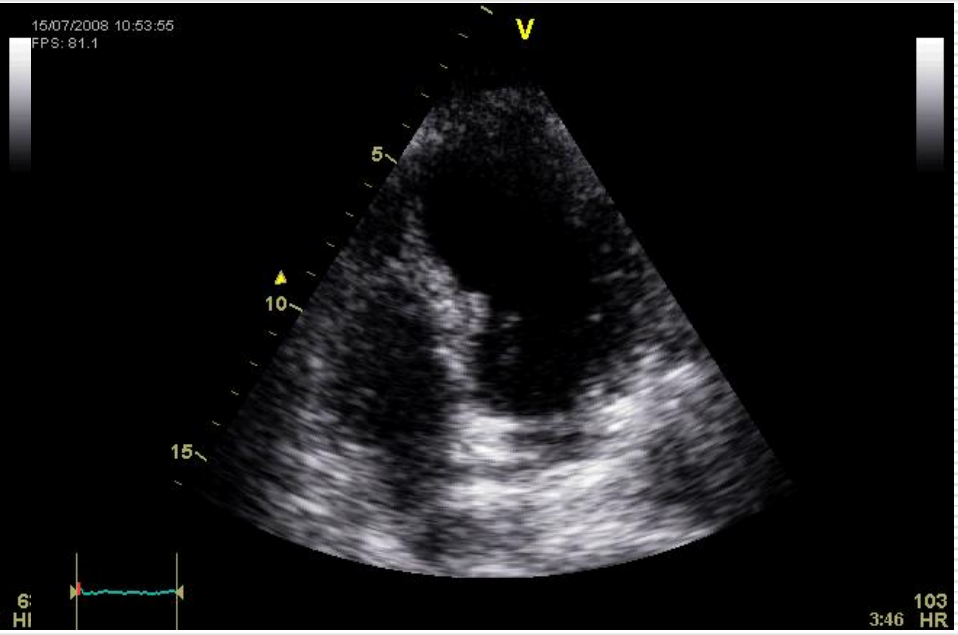

07/05/2008 08:09:23
FPS: 82.5
V
5
10
137
3:202 HR

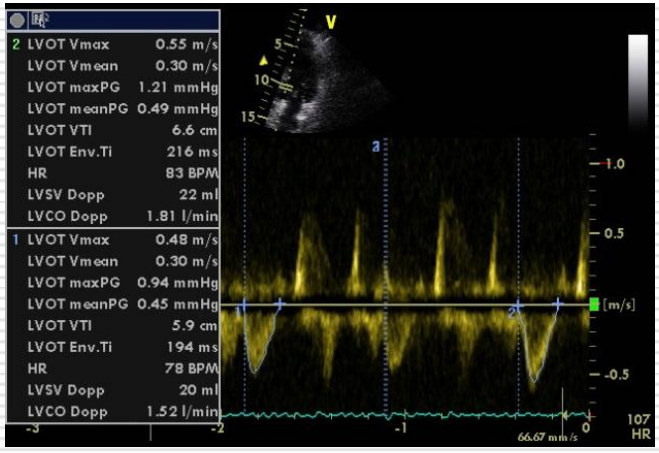

1 LVOT Vmax 0.52 m/s
LVOT Vmean 0.30 m/s
LVOT maxPG 1.07 mmHg
LVOT meanPG 0.48 mmHg
LVOT VTI 3.8 cm
LVOT Env.Ti 126 ms
HR 144 BPM
LVSV Dopp 11 ml
LVCO Dopp 1.54 l/min
V
5
10
1
1.0
0.5
[m/s]
-0.5
-1.0
-2.0
-1.5
-1.0
-0.5
0.0
100 mm/s
136
HR

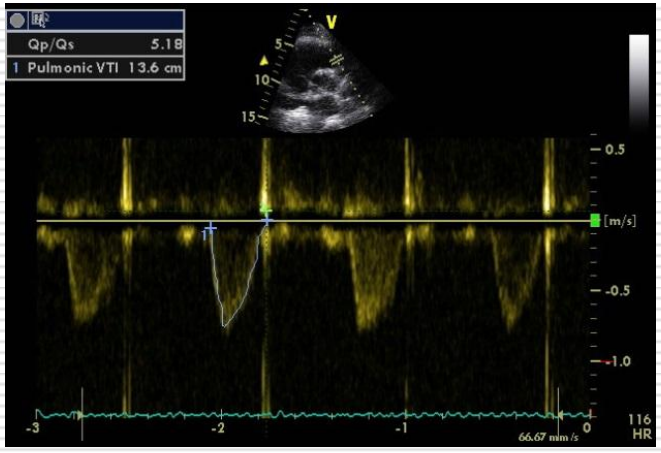

18/09/2006 11:38:40
V
5
10
15
42
3:112
HR

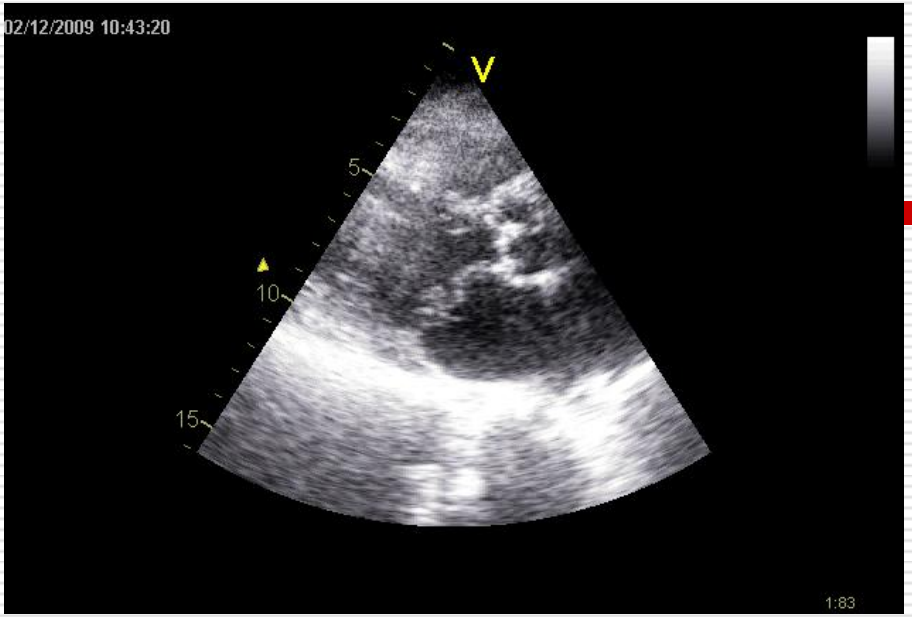

23/01/2007 08:46:11
V
5
10
53
2:131
HR

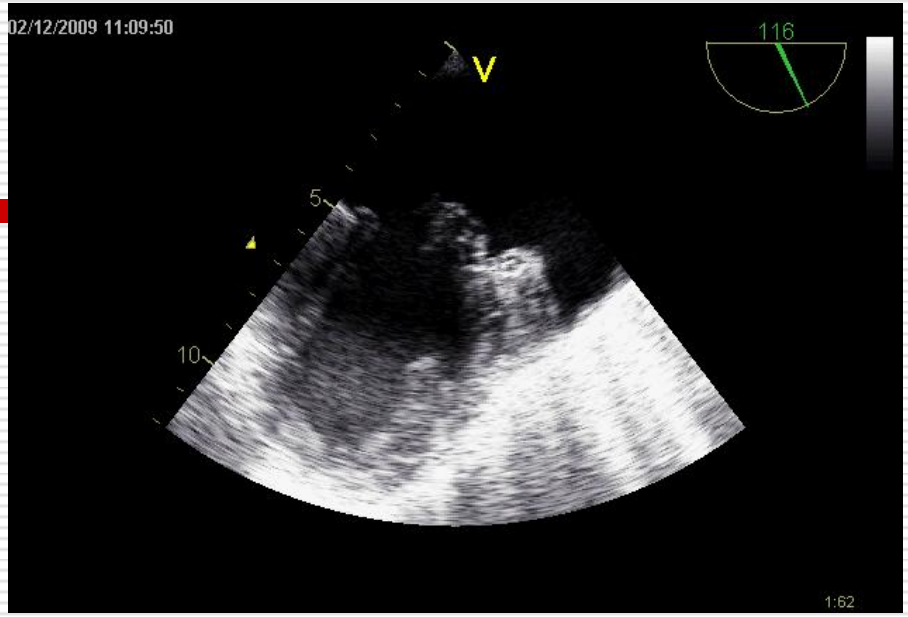

16/07/2008 15:15:26
FPS: 81.1
V
5
10
15
30:135 HI

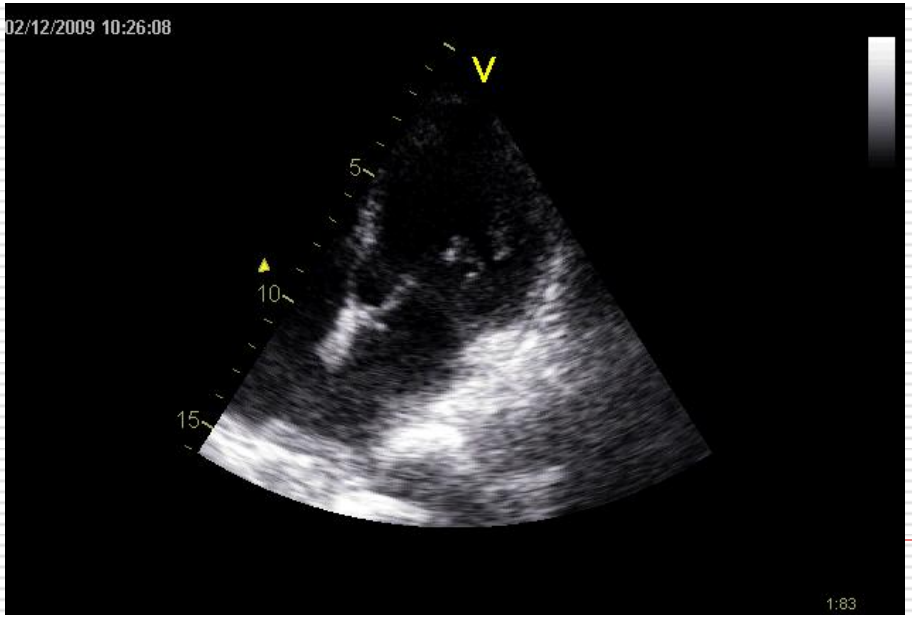

15/07/2008 10:53:55
FPS: 81.1
V
5
10
15
103
3:46 HR

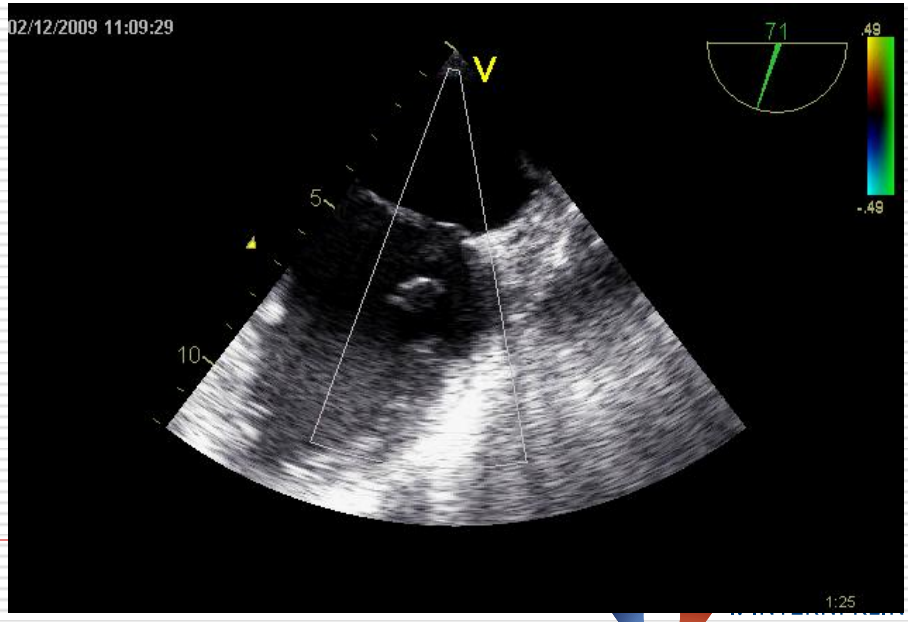

2 LVOT Vmax 0.55 m/s
LVOT Vmean 0.30 m/s
LVOT maxPG 1.21 mmHg
LVOT meanPG 0.49 mmHg
LVOT VTI 6.6 cm
LVOT Env.Ti 216 ms
HR 83 BPM
LVSV Dopp 22 ml
LVCO Dopp 1.81 l/min
1 LVOT Vmax 0.48 m/s
LVOT Vmean 0.30 m/s
LVOT maxPG 0.94 mmHg
LVOT meanPG 0.45 mmHg
LVOT VTI 5.9 cm
LVOT Env.Ti 194 ms
HR 78 BPM
LVSV Dopp 20 ml
LVCO Dopp 1.52 l/min
V
1.0
0.5
[m/s]
-0.5
66.67 mm/s
107
HR


Qp/Qs 5.18
1 Pulmonic VTI 13.6 cm
V
0.5
[m/s]
-0.5
-1.0
66.67 mm/s
116
HR









KARDIOLOGIE
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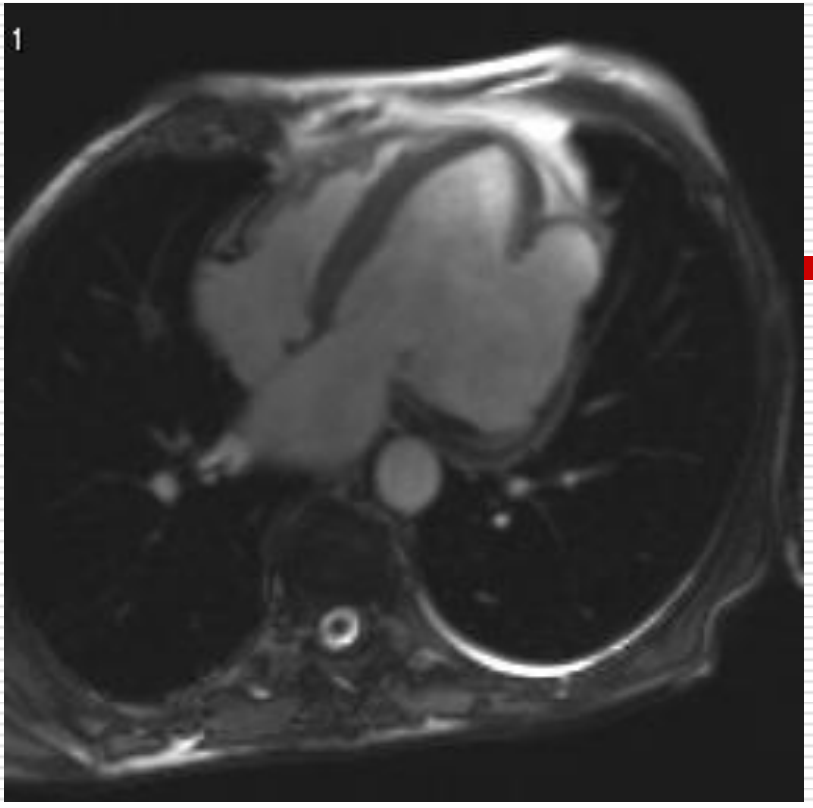
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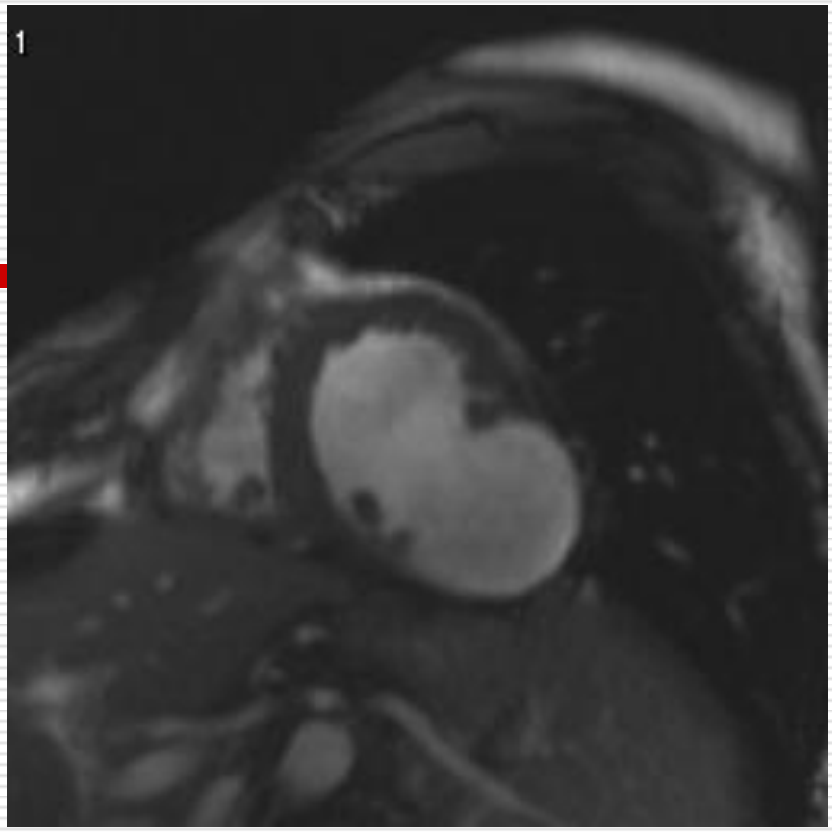
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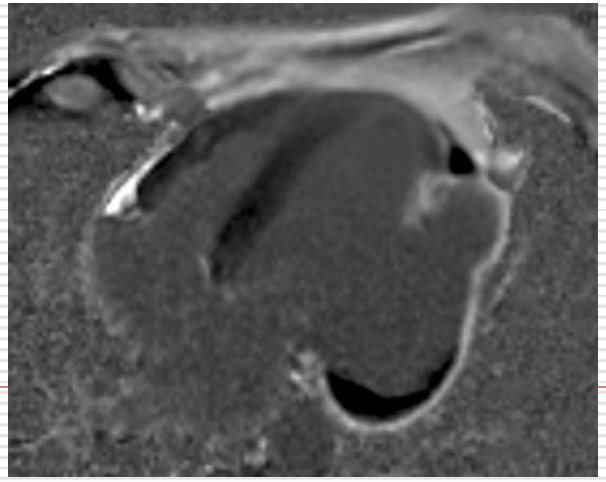

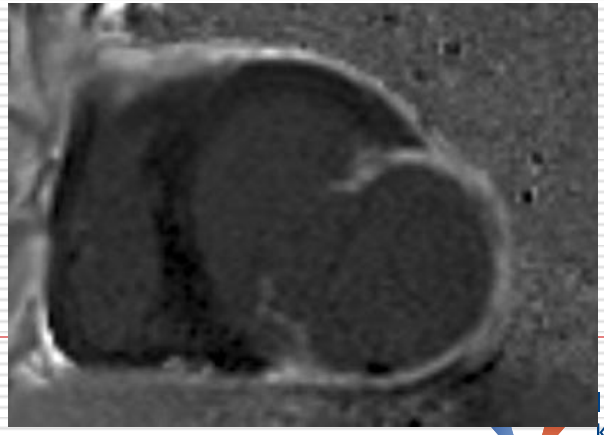

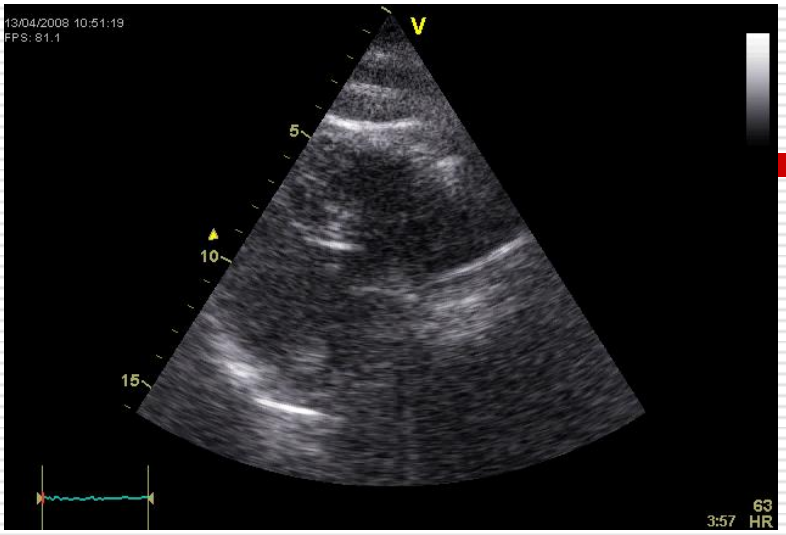

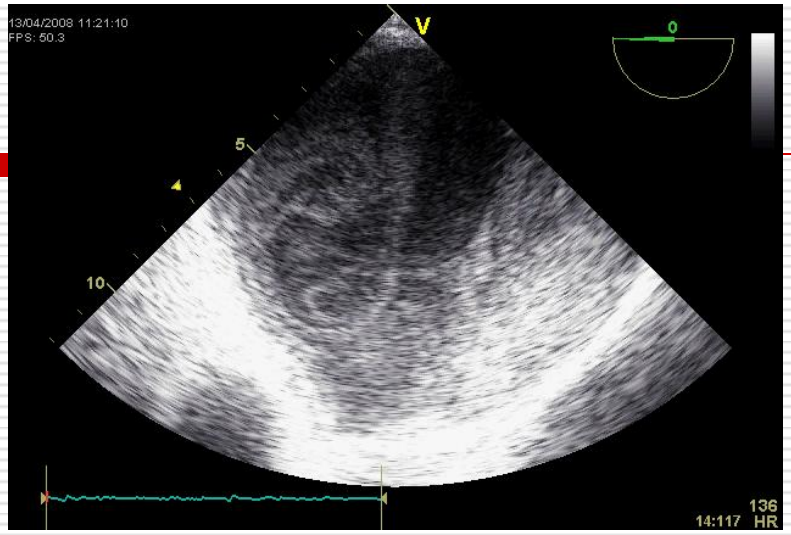

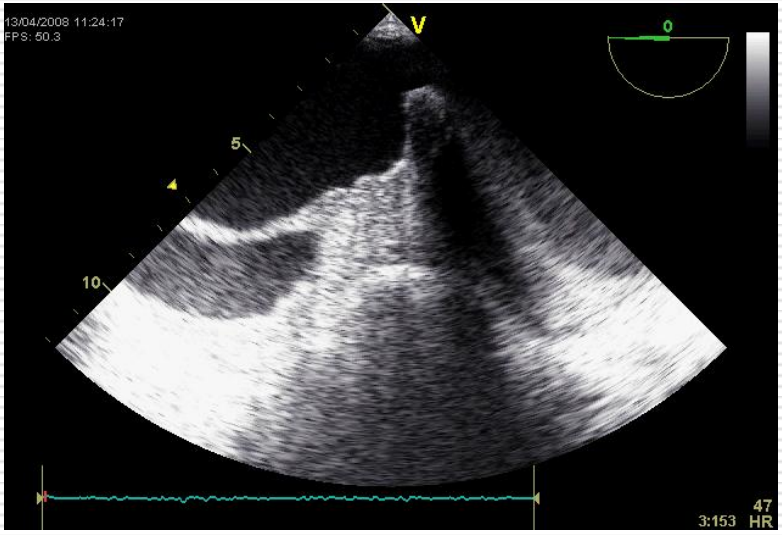

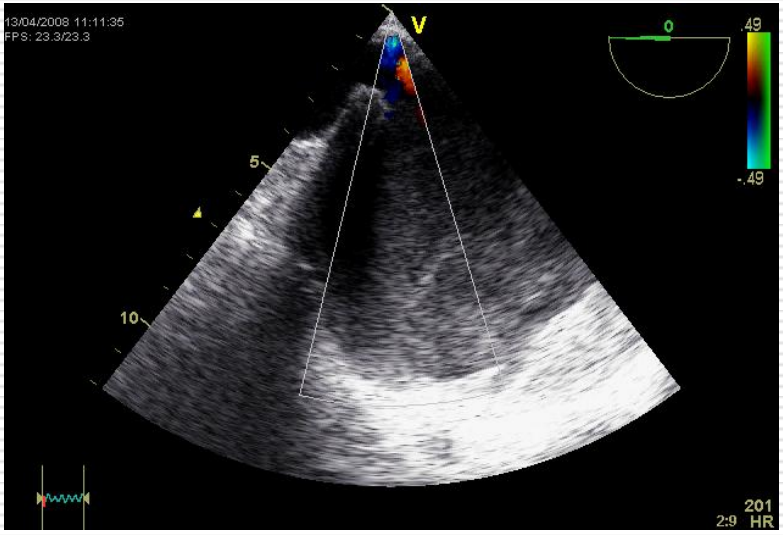

I. INTERNÍ KLINIKA
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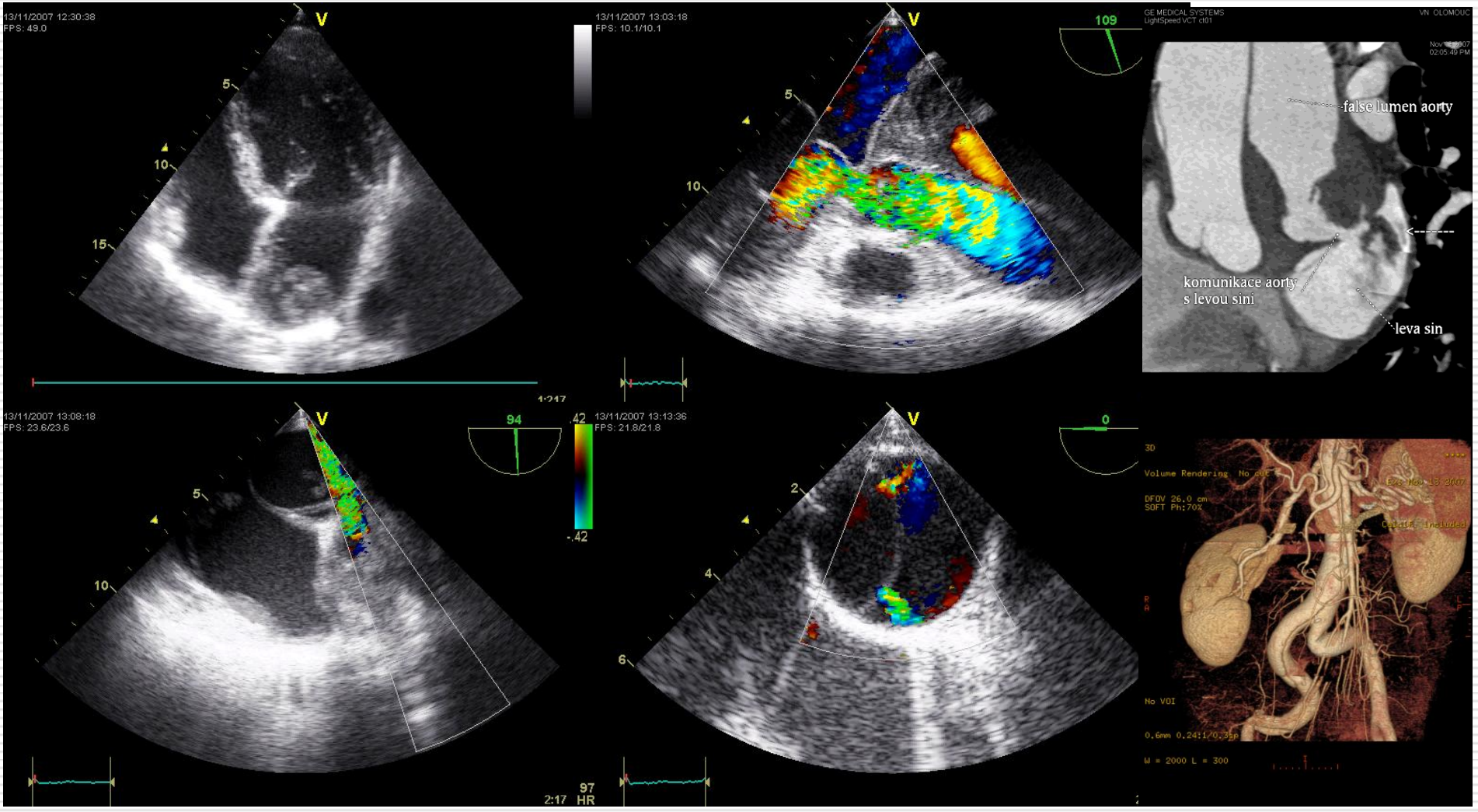
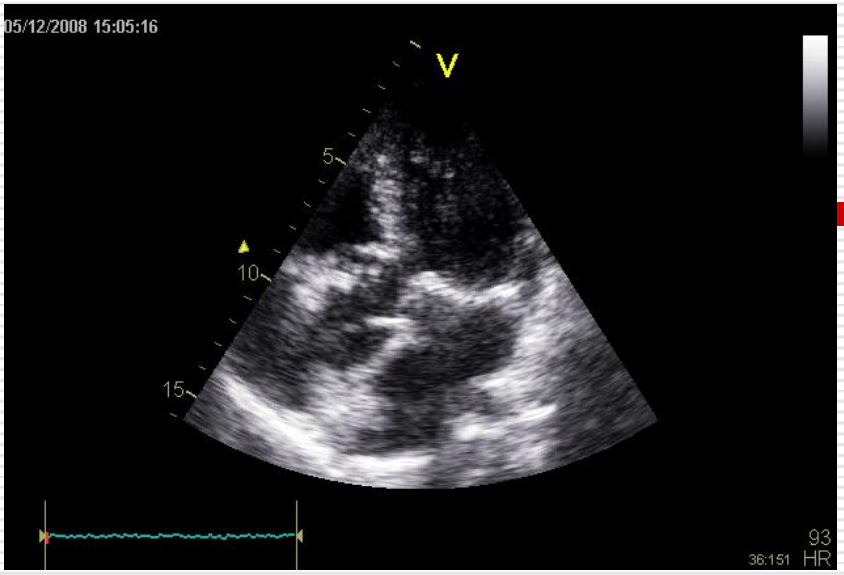
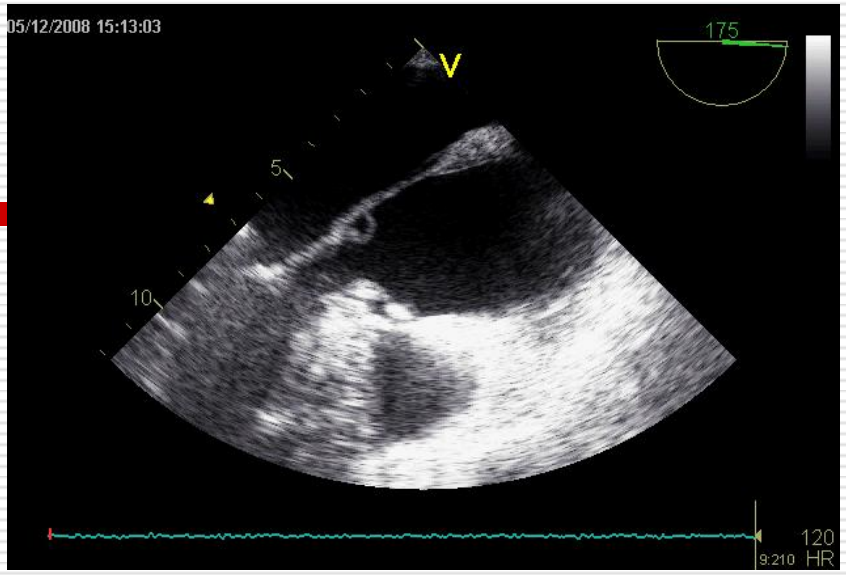
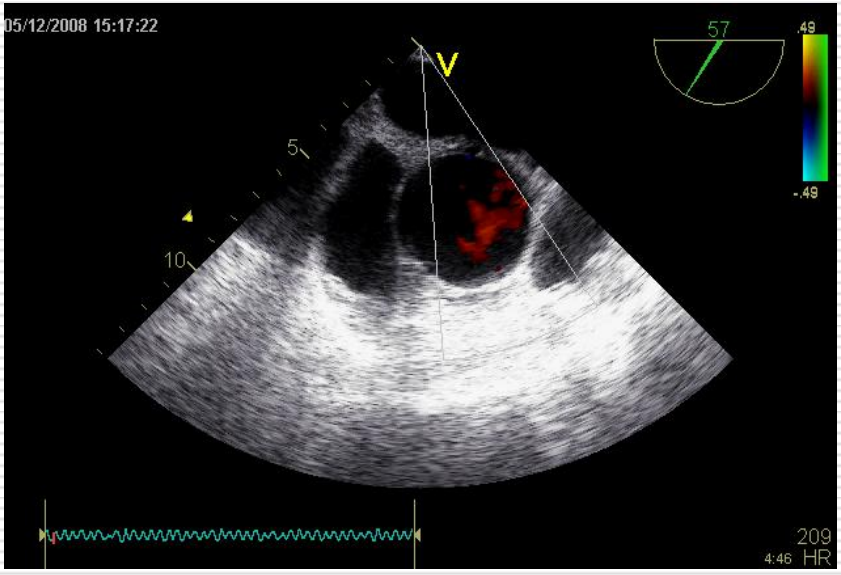
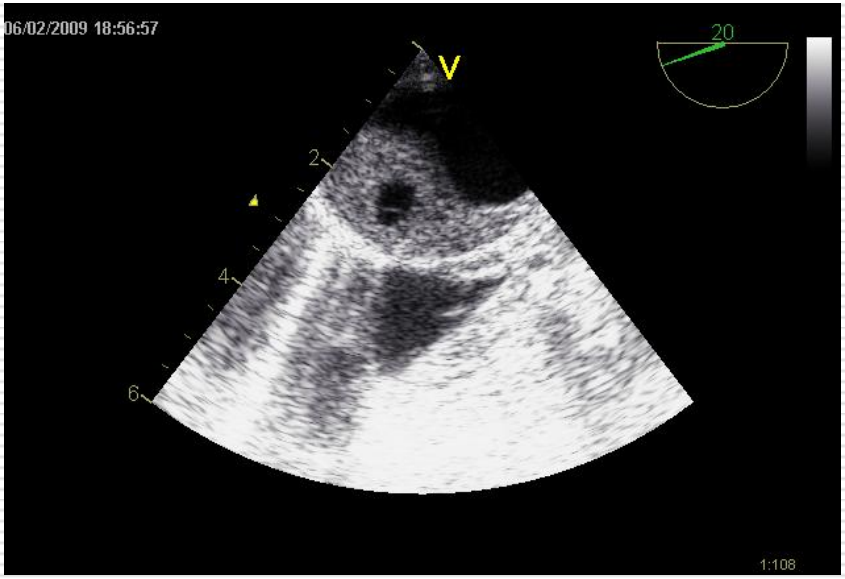

13/11/2007 12:30:38
FPS: 49.0
13/11/2007 13:03:18
FPS: 10.1/10.1
109
GE MEDICAL SYSTEMS
LightSpeed VCT ct01
false lumen aorty
komunikace aorty
s levou sini
leva sin
13/11/2007 13:08:18
FPS: 23.6/23.6
94
.42
-.42
13/11/2007 13:13:36
FPS: 21.8/21.8
0
Volume Rendering
DFOV 26.0 cm
SOFT Ph:70%
No VOI
97
HR









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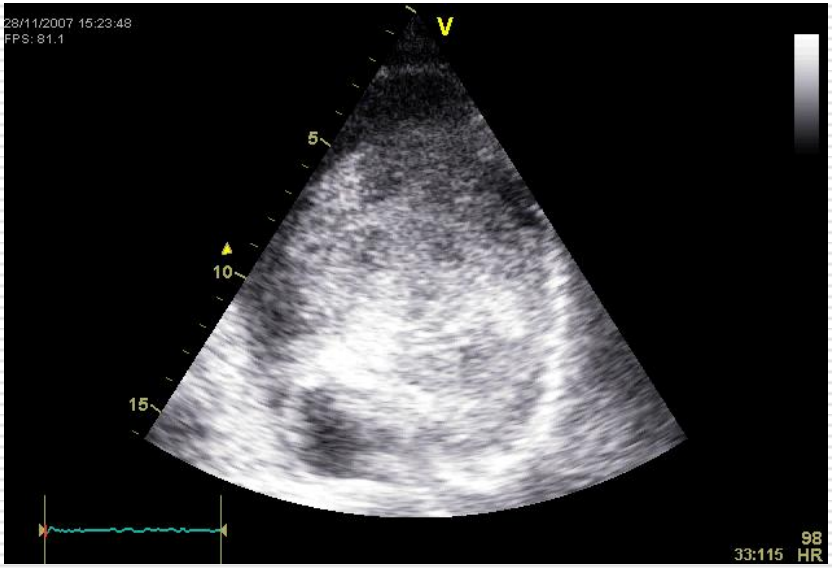
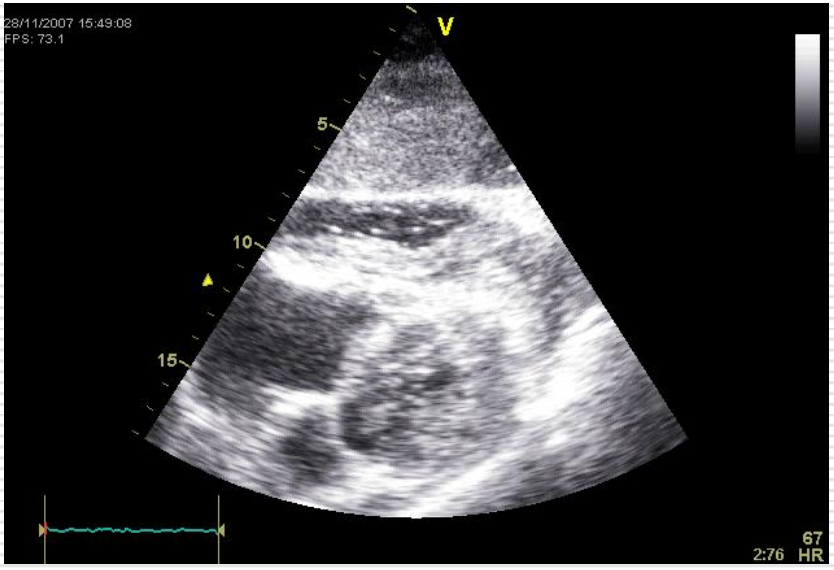
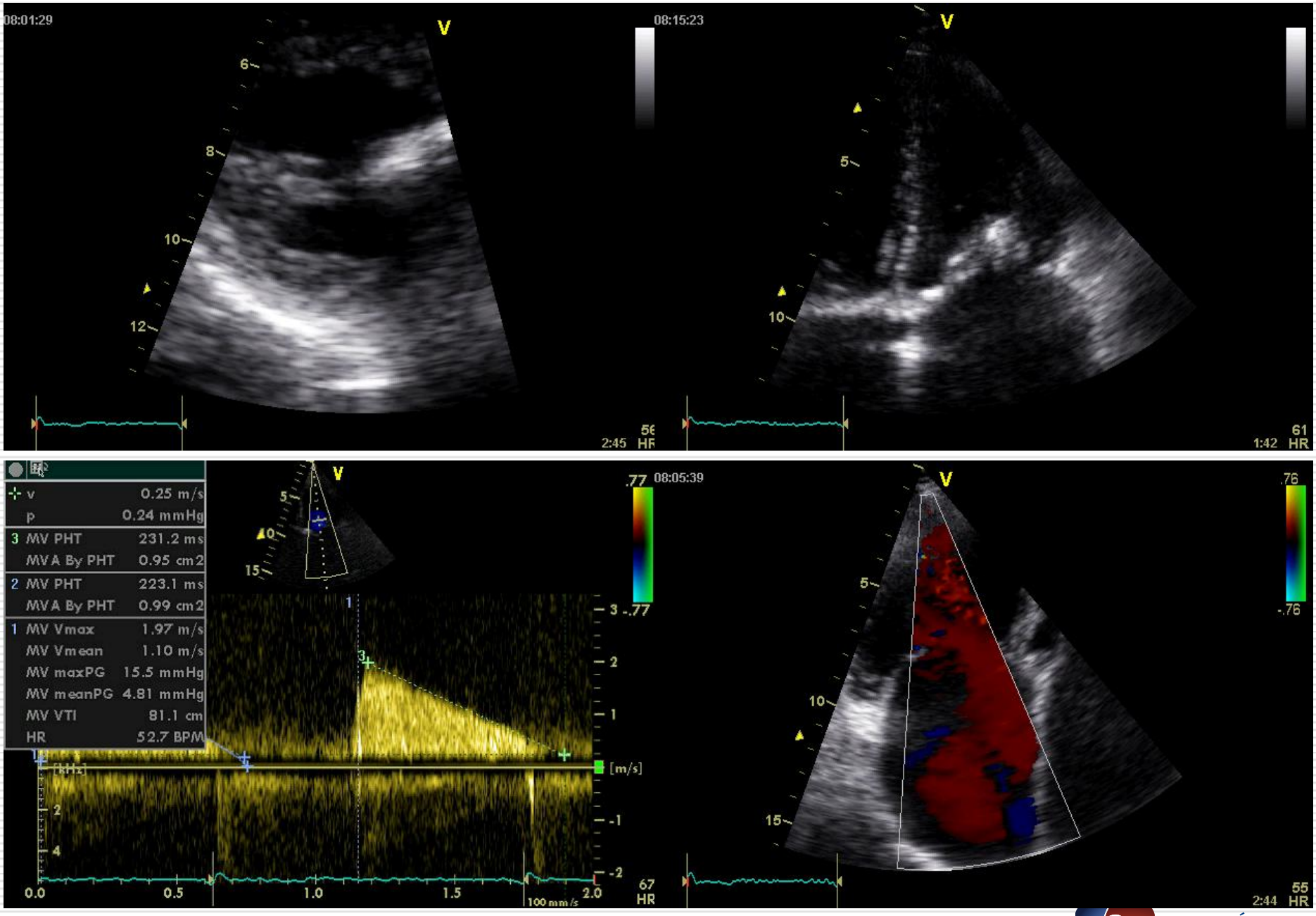

28/11/2007 15:23:48
FPS: 81.1
V
5
10
15
98
33:115 HR


28/11/2007 15:49:08
FPS: 73.1
V
5
10
15
67
2:76 HR



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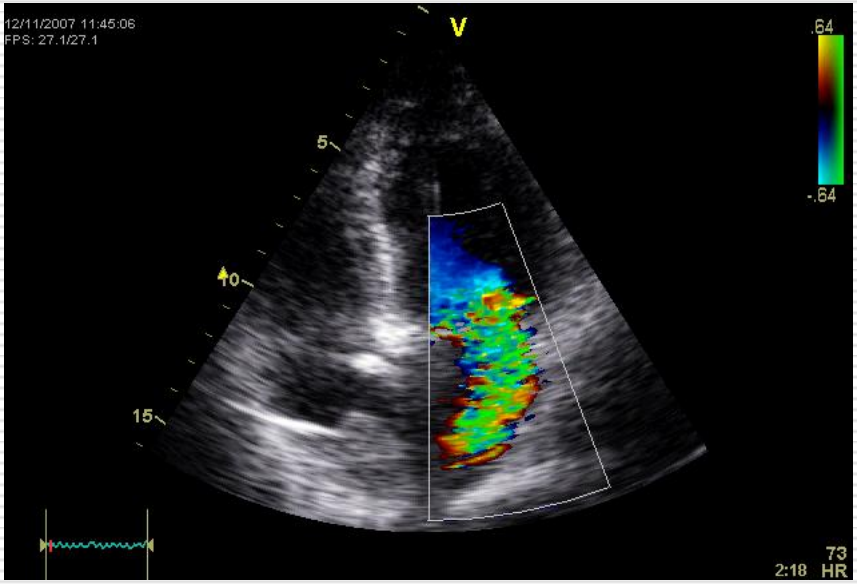
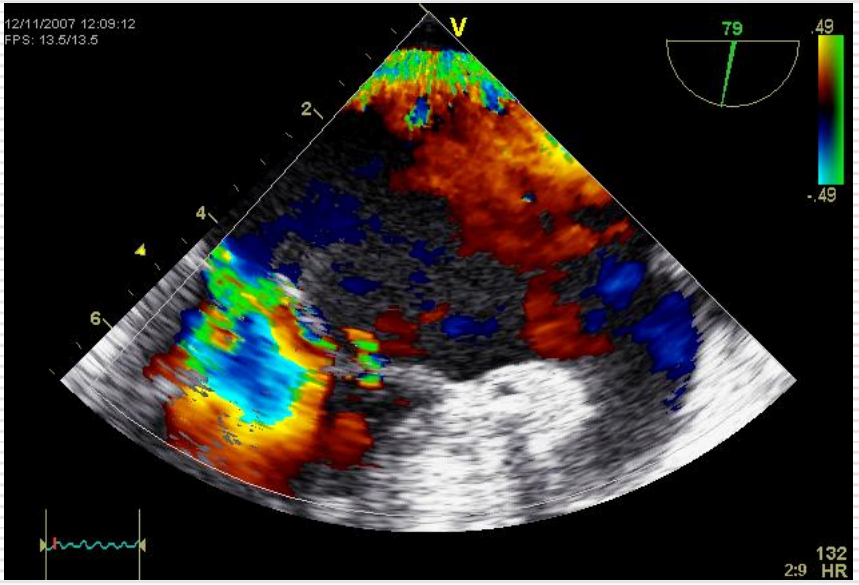
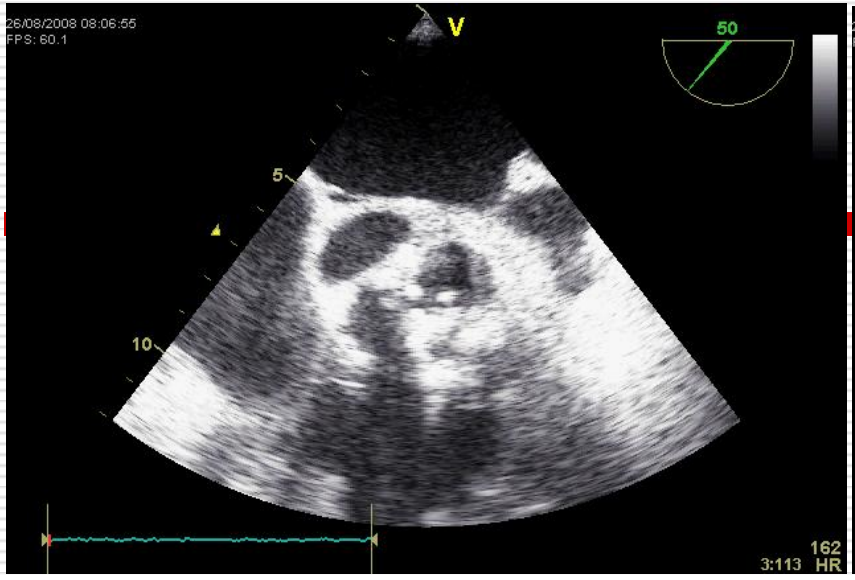
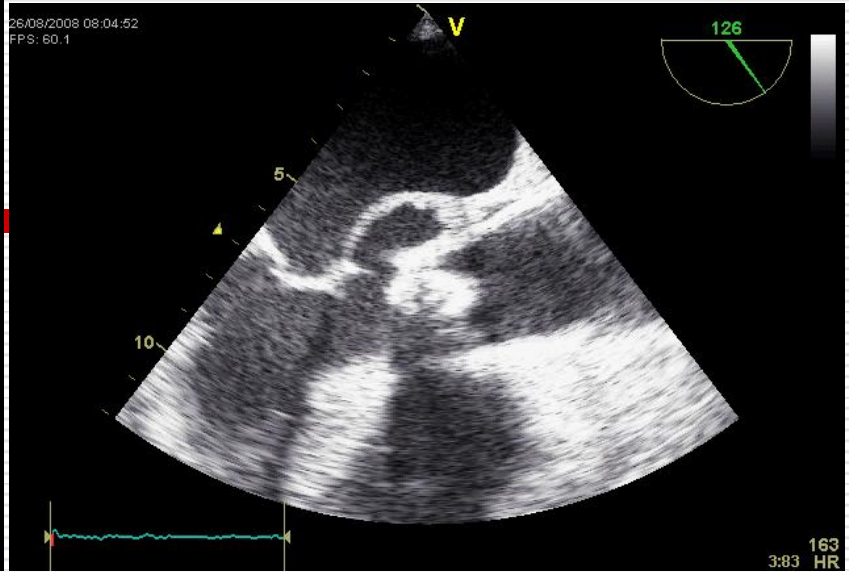
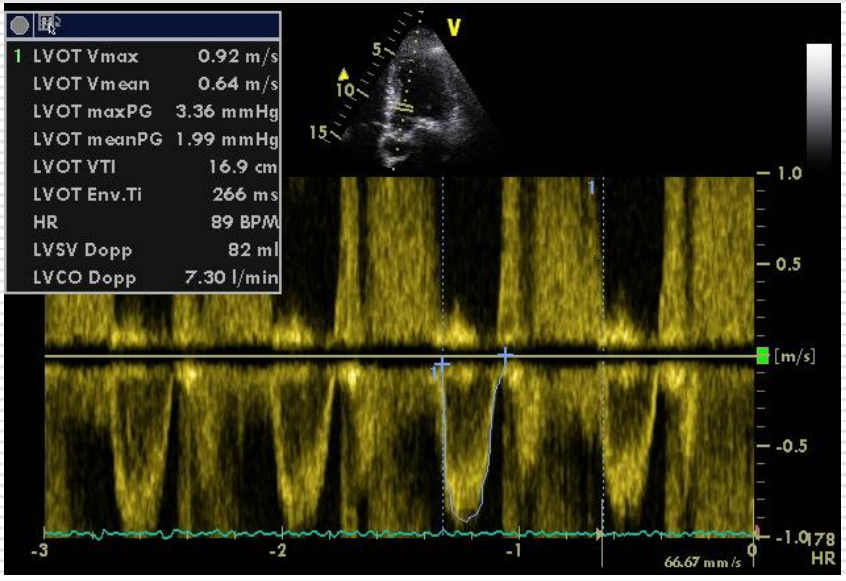
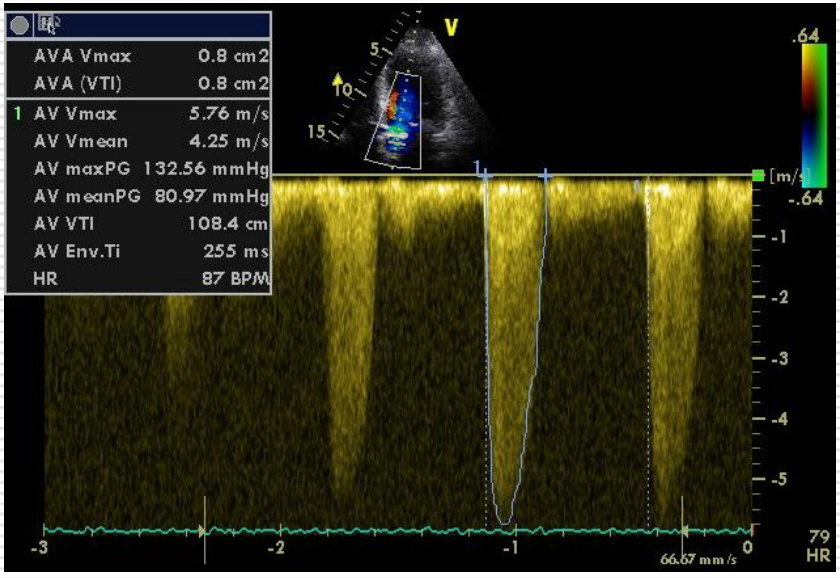

12/11/2007 11:45:06
FPS: 27.1/27.1
V
.64
-.64
5
10
15
73
2:18 HR


12/11/2007 12:09:12
FPS: 13.5/13.5
V
79
.49
-.49
2
4
6
132
2:9 HR


26/08/2008 08:06:55
FPS: 60.1
50
3:113
162
HR


26/08/2008 08:04:52
FPS: 60.1
126
3:83
163
HR


1 LVOT Vmax 0.92 m/s
LVOT Vmean 0.64 m/s
LVOT maxPG 3.36 mmHg
LVOT meanPG 1.99 mmHg
LVOT VTI 16.9 cm
LVOT Env.Ti 266 ms
HR 89 BPM
LVSV Dopp 82 ml
LVCO Dopp 7.30 l/min
[m/s]
66.67 mm/s
78
HR


AVA Vmax 0.8 cm2
AVA (VTI) 0.8 cm2
1 AV Vmax 5.76 m/s
AV Vmean 4.25 m/s
AV maxPG 132.56 mmHg
AV meanPG 80.97 mmHg
AV VTI 108.4 cm
AV Env.Ti 255 ms
HR 87 BPM
[m/s]
66.67 mm/s
79
HR

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