BEDSIDE ASSESSMENT OF PATIENTS WITH STEMI

Prof. Maria Dorobantu, PhD, FESC, FACC
Emergency Hospital of Bucharest, Romania

Presenter Disclosures

- There are no conflicts/ grants/ disclosures for this presentation.

Ecocardiographic assessment

- **Positive diagnosis**
- **Differential diagnosis**
- **Hemodynamic assessment**
- **Reperfusion treatment efficacy**
- **Complications**

2. Perfusion heterogeneity

3.Metabolic impairment

1. Reduced coronary flow

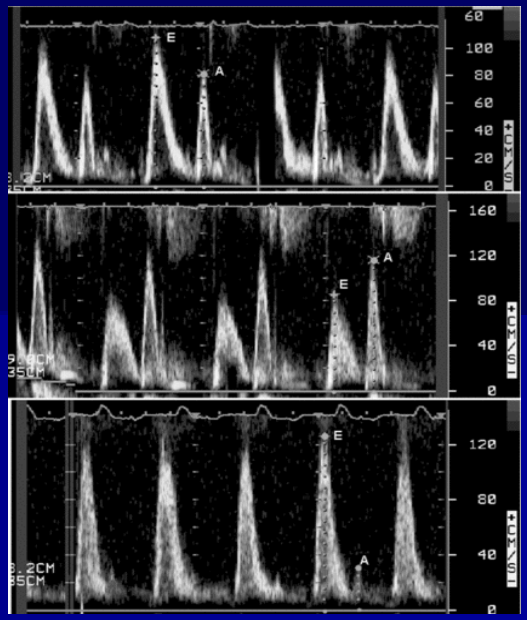
4. Abnormal wall motion
Diastolic dysfunction

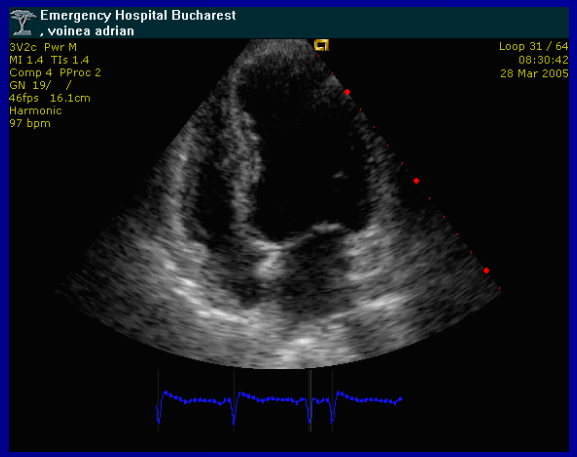
8.Necrosis

5.ECG changes

7.Myocardial injury markers

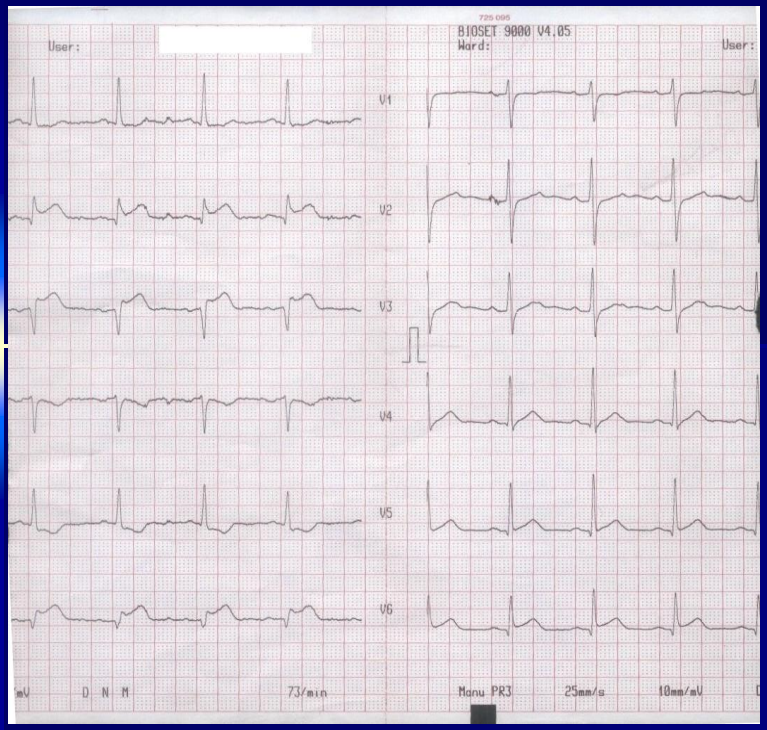
6. Pain





Sb=80-90%; Sp=80-90% for nontransmural MI

Sb=90-95%; Sp=89% for transmural MI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User:
Ward:
User:
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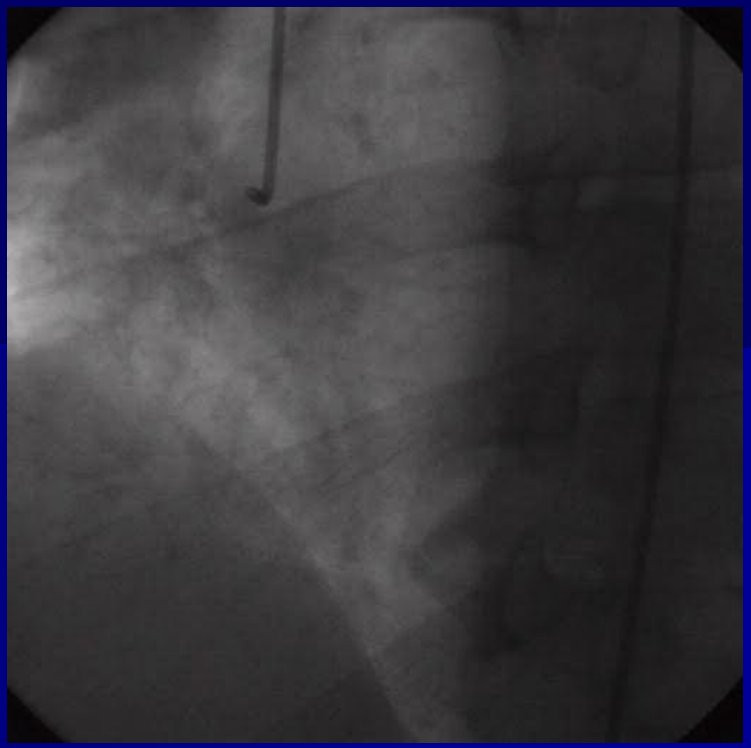
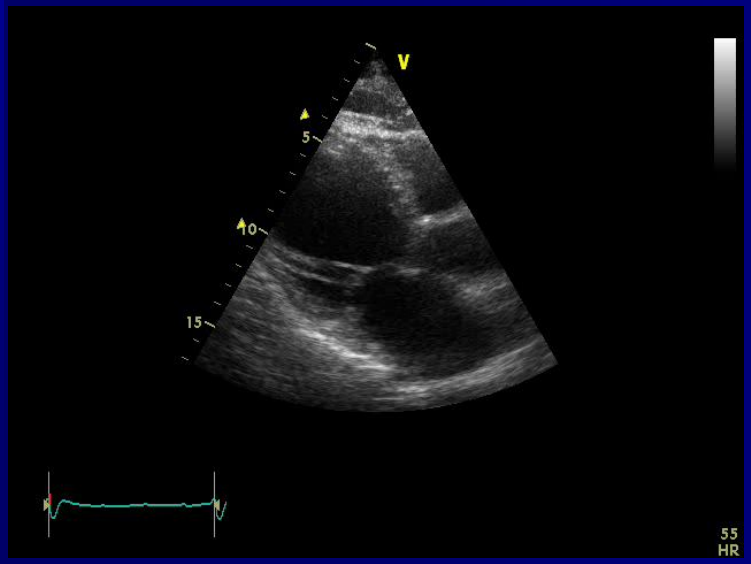
V2
V3
V4
V5
V6
mV
D N M
73/min
Manu PR3
25mm/s
10mm/mV

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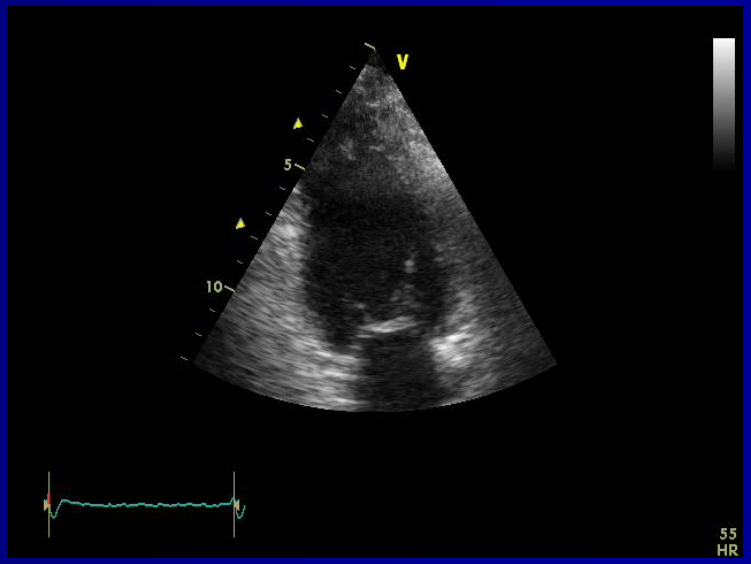
15
55
HR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10
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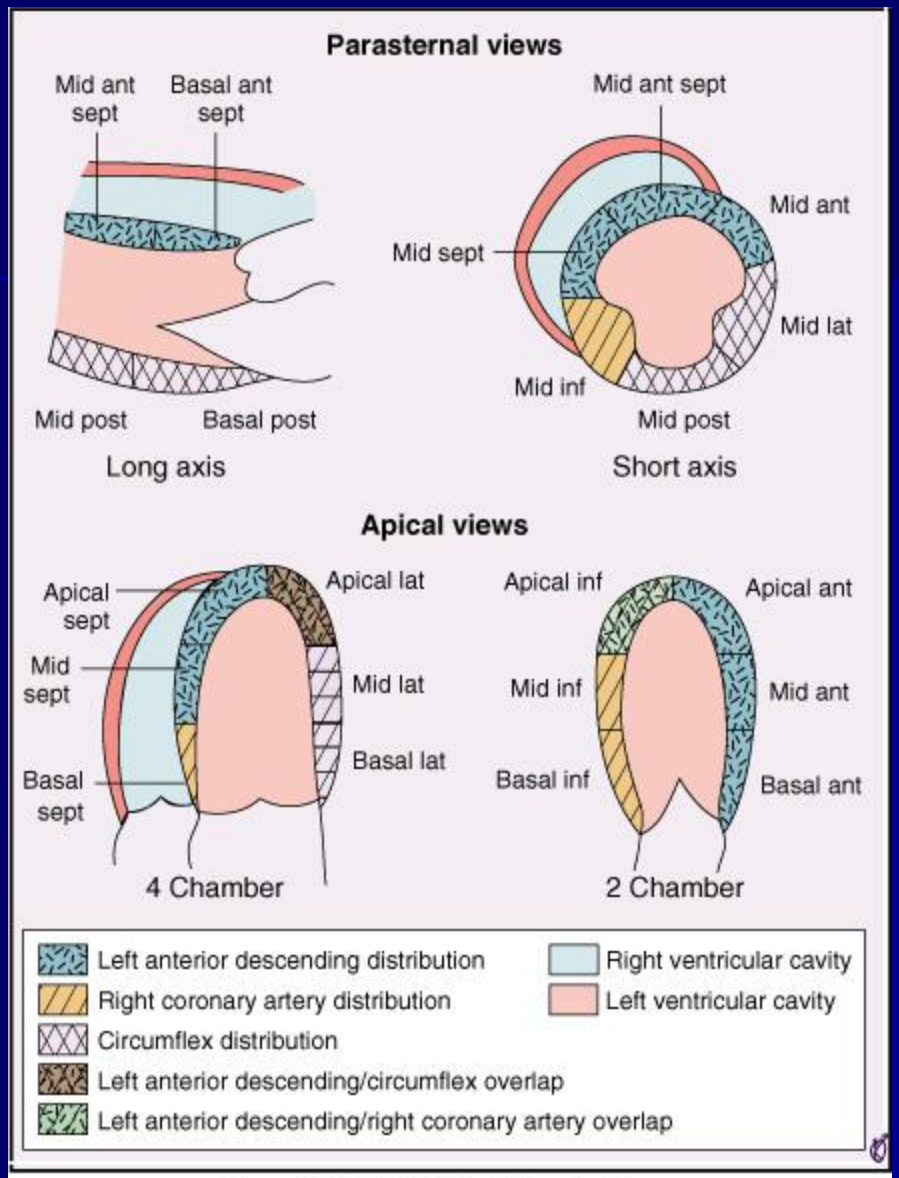
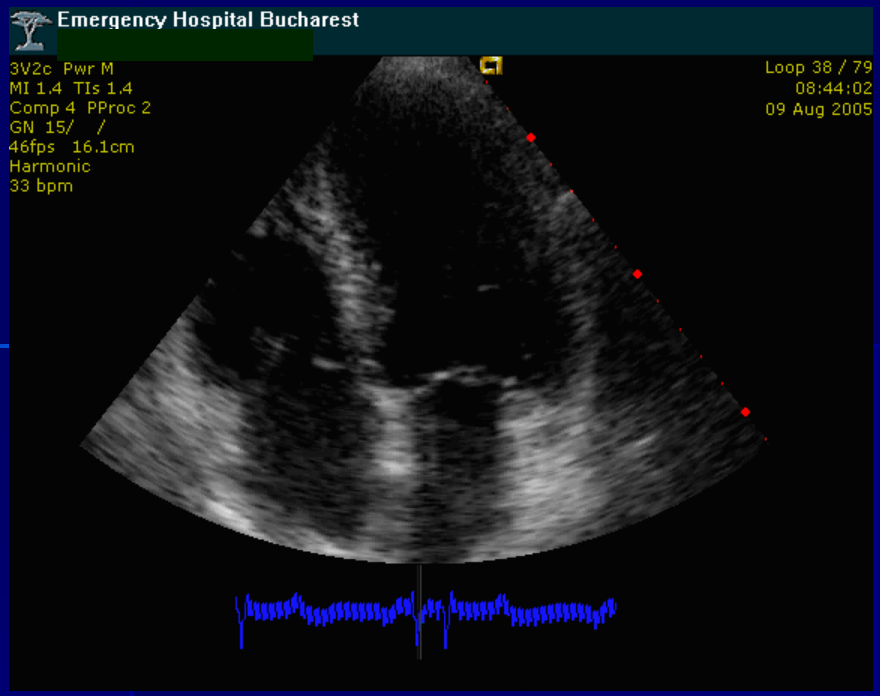
HR

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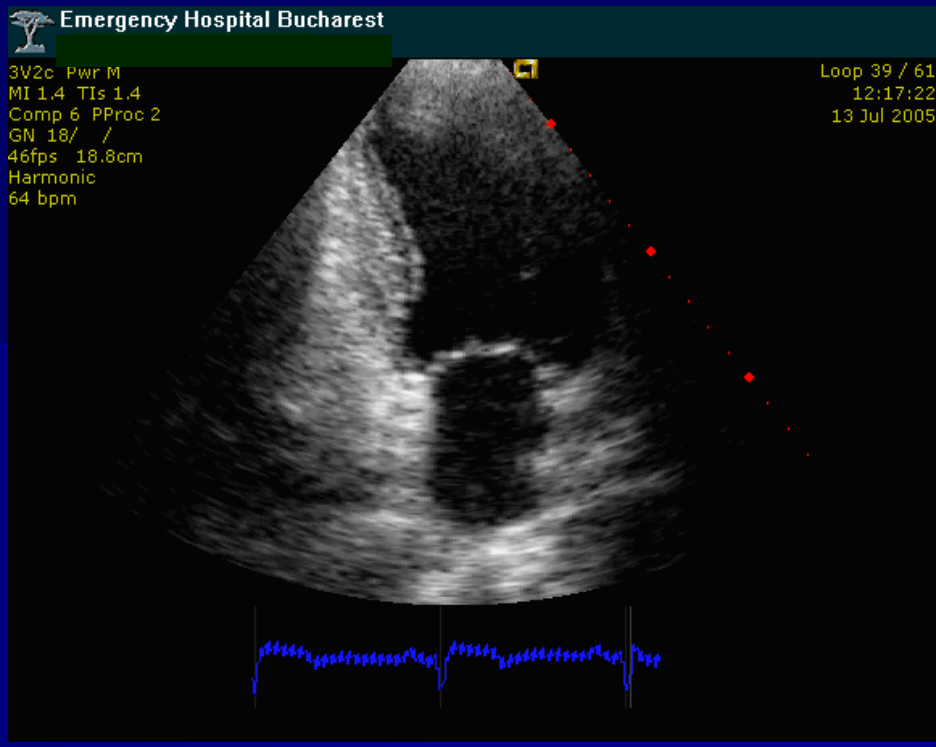
Comp 4 PProc 2
GN 15/ /
46fps 16.1cm
Harmonic
33 bpm
Loop 38 / 79
08:44:02
09 Aug 2005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Loop 39 / 61
12:17:22
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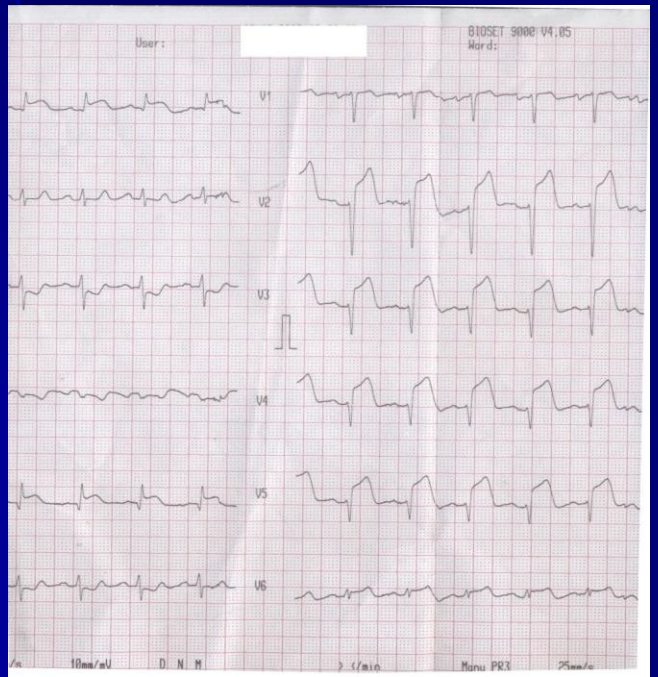
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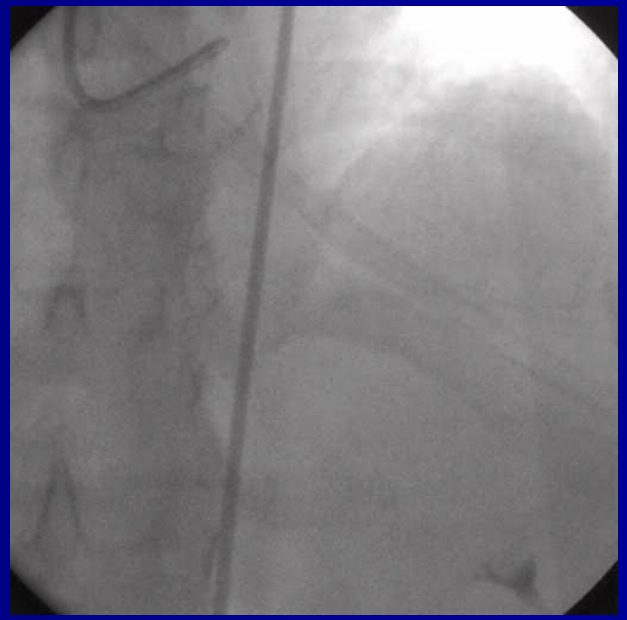
V1
V2
V3
V4
V5
V6



New definition of AMI

Detection of rise and/or fall cardiac biomarkers (preferably troponin) with at least one value above the 99 th percentile of the upper reference limit together with evidence of ischemia with at least one of the following:

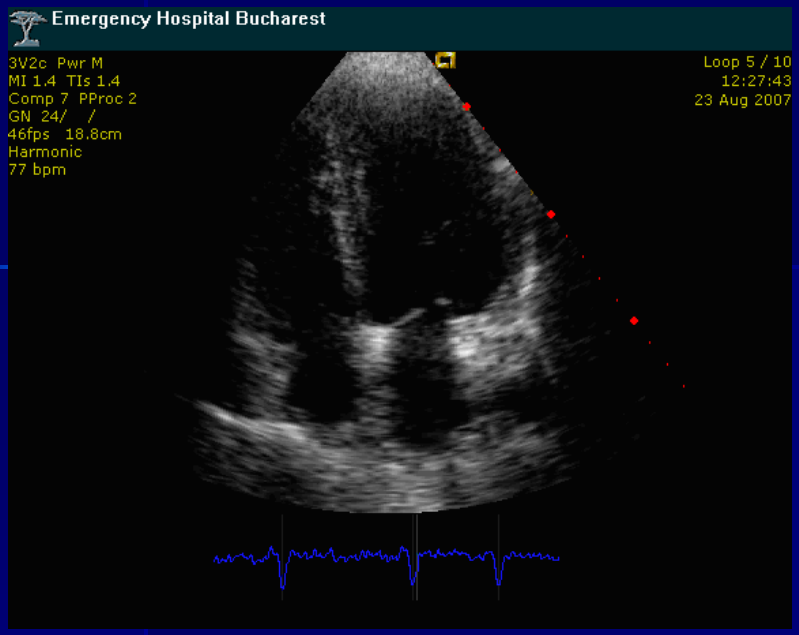
- Symptoms of ischemia
- ECG changes of new ischemia (new ST-T changes or new LBBB)
- Development of pathological Q waves in the ECG
- Imaging evidence of new loss of viable myocardium or new regional wall motion abnormality

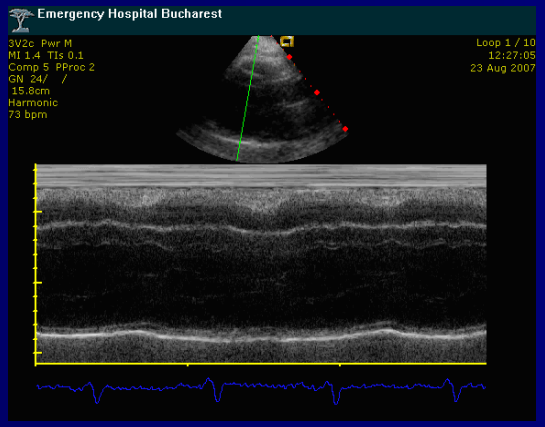
ESC-ACCF-AHA-WHF Universal Definition of Myocardial Infarction 2007

Ecocardiographic assessment

- Positive diagnosis
- Differential diagnosis
- Hemodynamic assessment
- Reperfusion treatment efficacy
- Complications

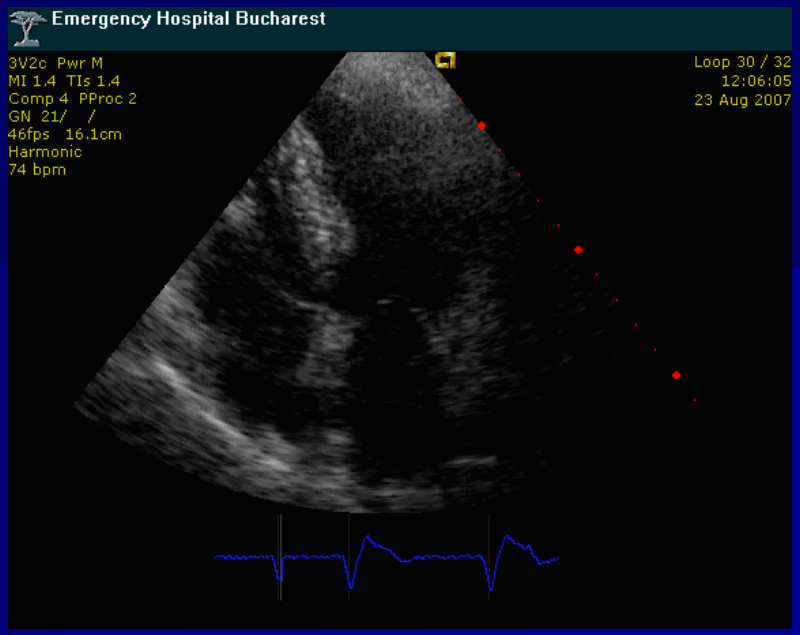
LBBB with ischemia

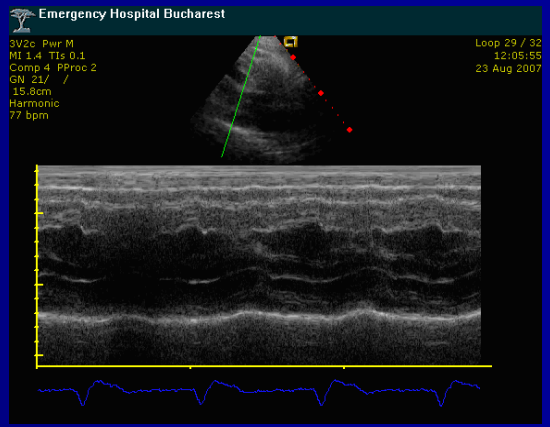




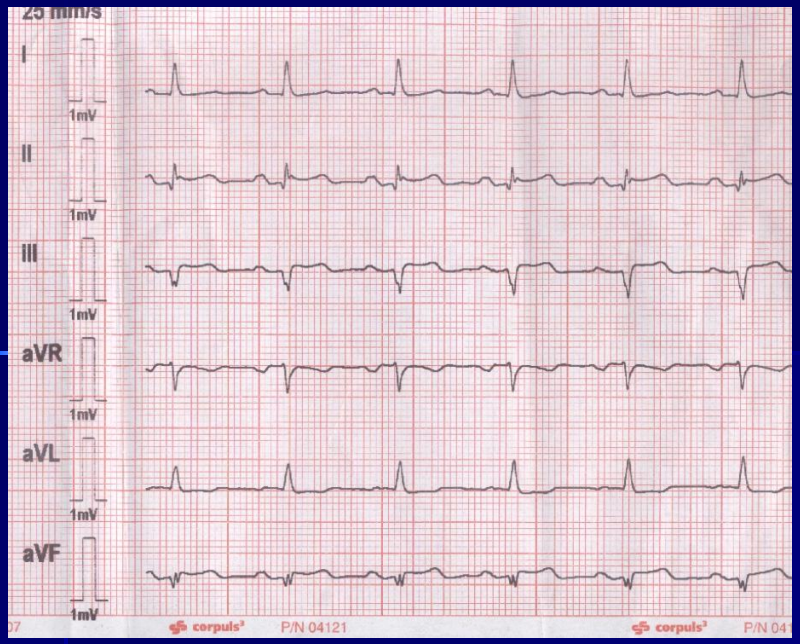
- Apex and anterior wall
- Abnormal LV geometry
- Loss of thickness
- Dissyncronism-

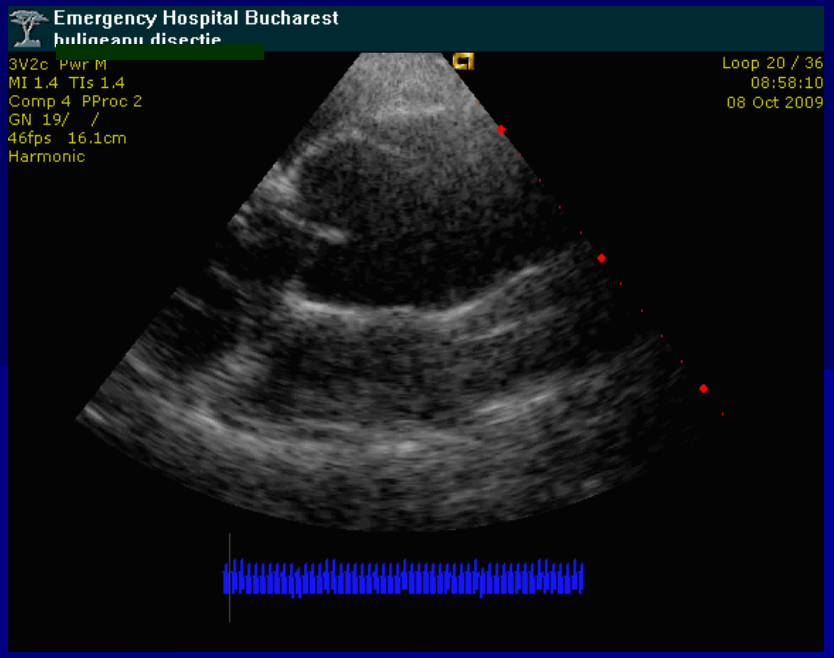
LBBB without ischemia



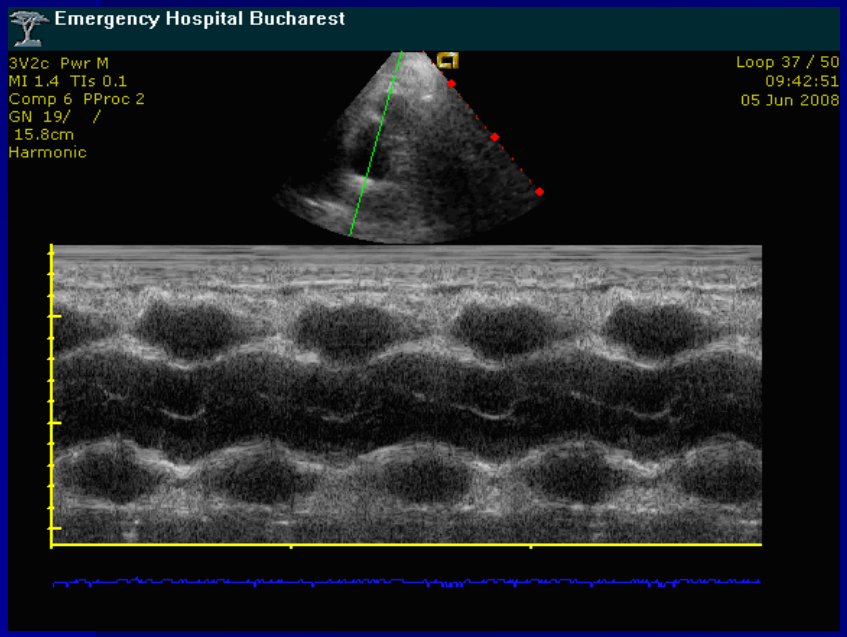


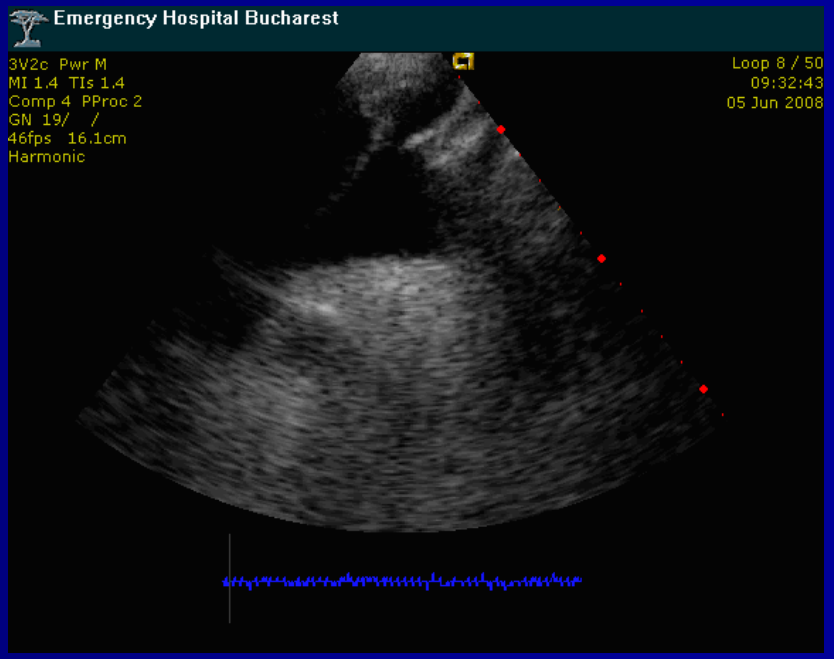
- No apex and anterior wall
- Normal geometry
- Multiphasis contraction
- Dissyncronism +

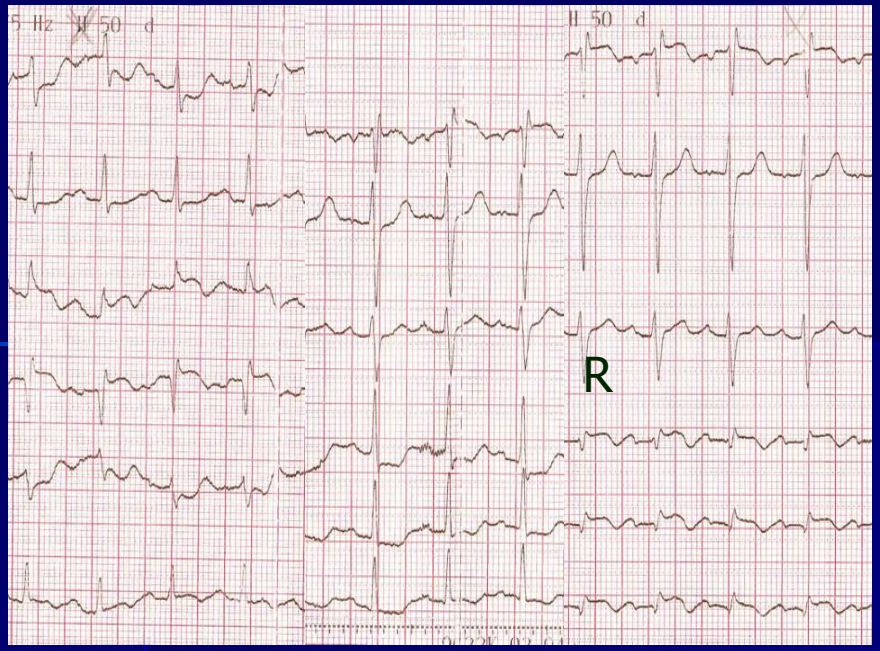


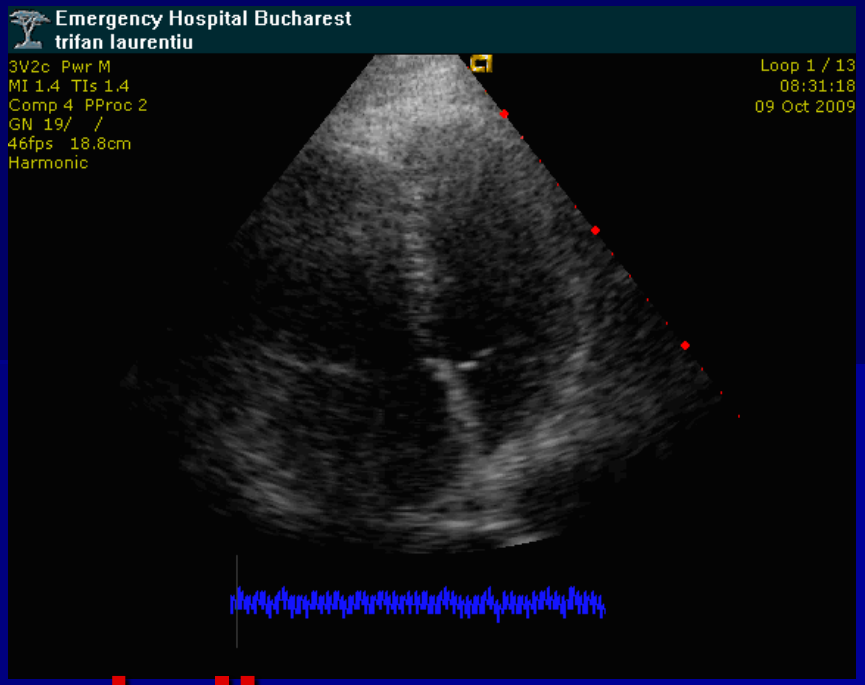


Aortic dissection

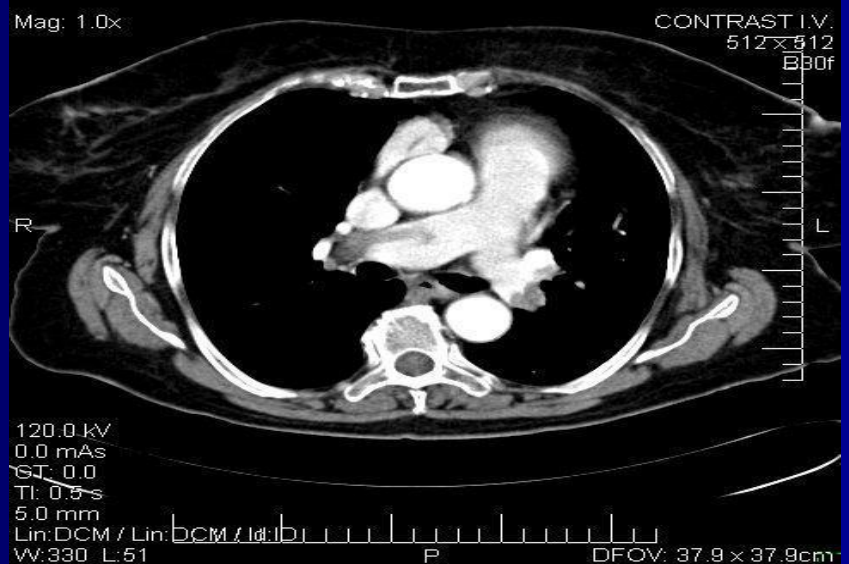


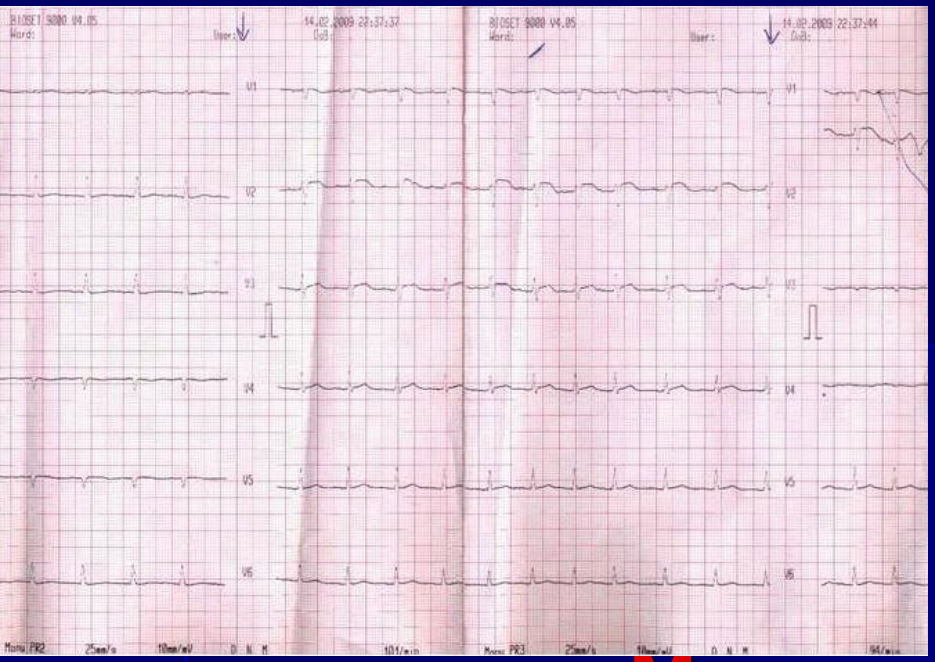


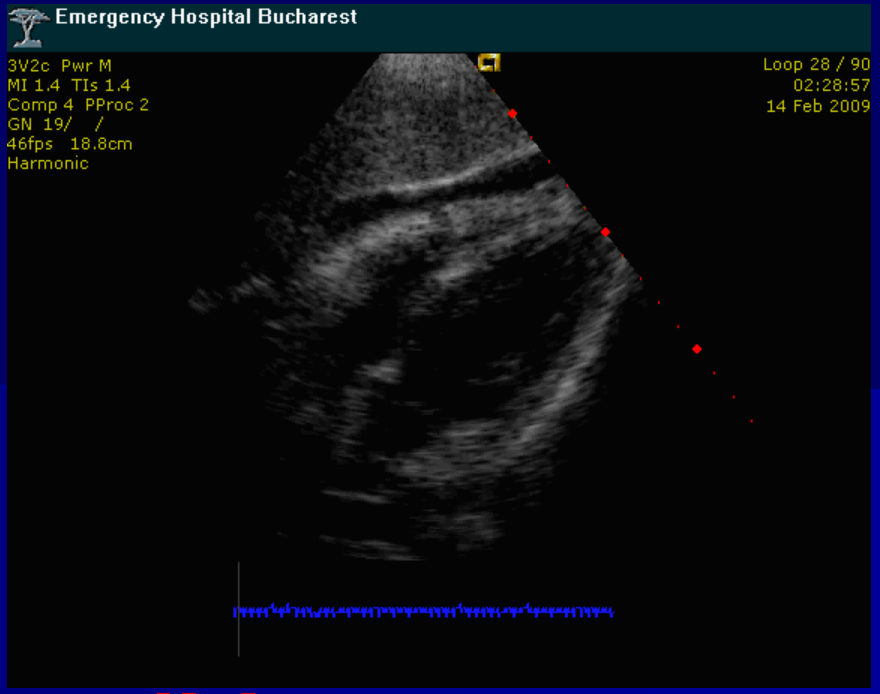




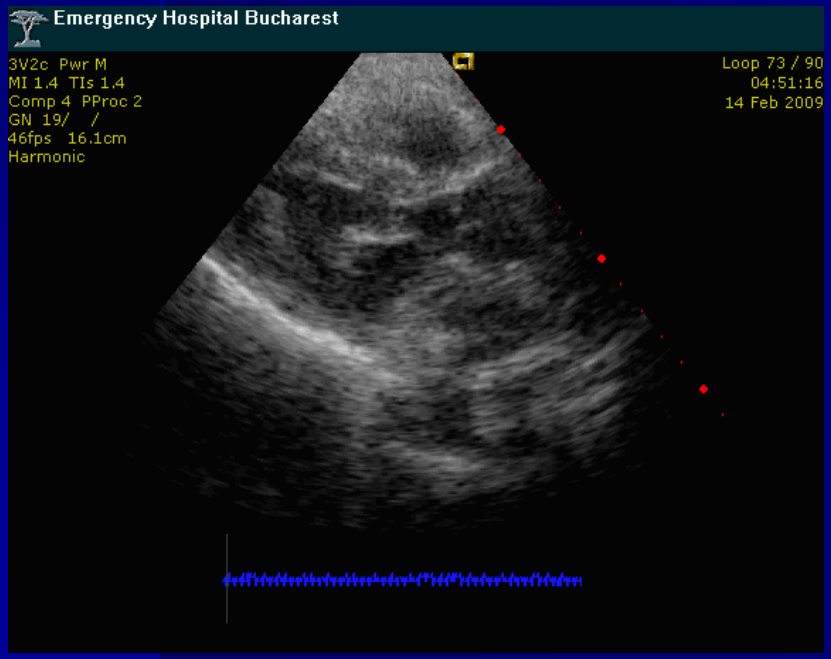
Pulmonary embolism

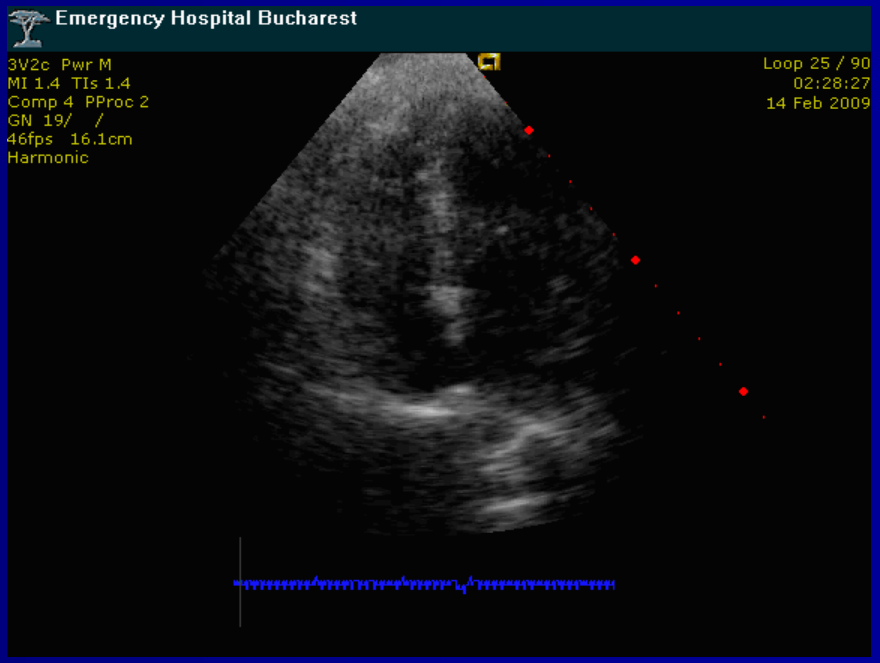






Myopericarditis





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- Gu YL, Silvas T, van der Horst ICC, Zijlstra F, Conditions mimicking acute ST-elevation myocardial infarction in patients reffered for primary percutaneous intervention, Neth Heart J 2008; 16(10):325-331.
- Costantini M,Tritto C, Licci E, et al. Myocarditis with ST-Elevation Myocardial Infarction presentation in young man. A case series of 11 patients. *Int J Cardiol* 2005;101:157-8.

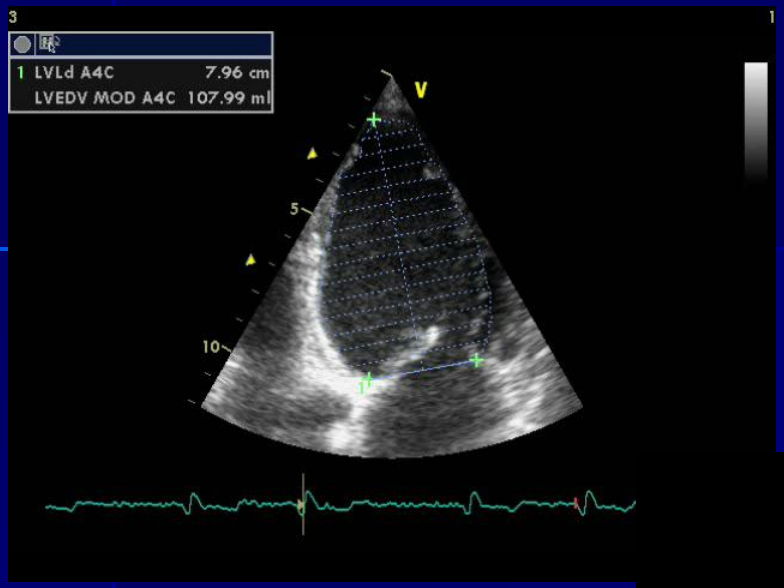
Ecocardiographic assessment

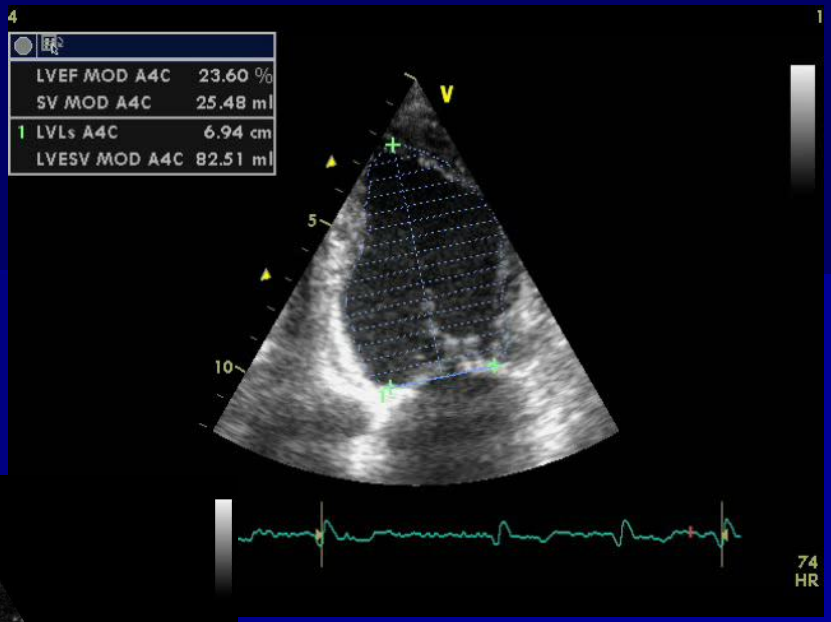
- Positive diagnosis
- Differential diagnosis
- Hemodynamic assessment
- Reperfusion treatment efficacy
- Complications

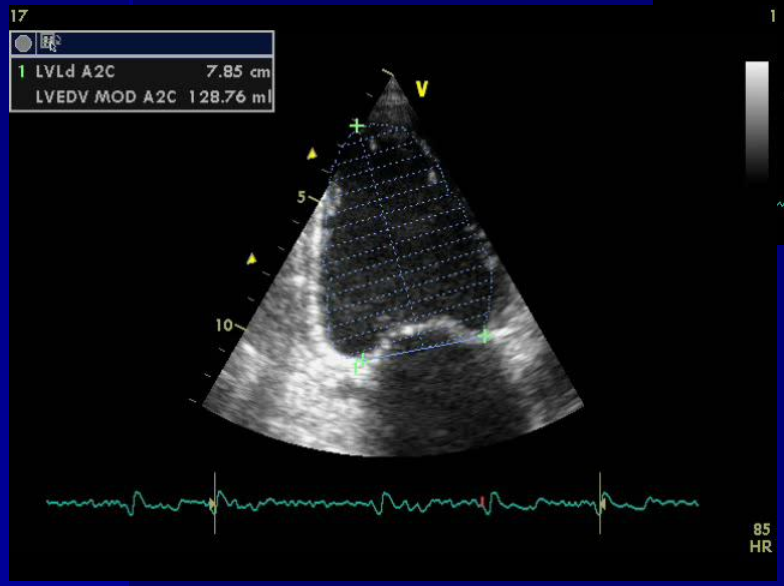
Hemodynamic assessment

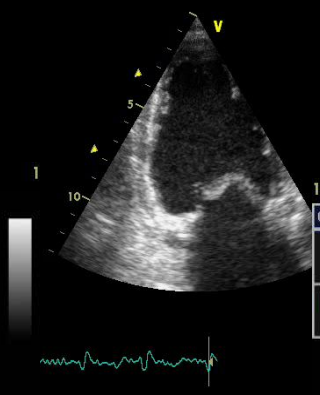
- LVD and LVS volumes
- Left ventricular ejection fraction
- Diastolic transmitral inflow and left atrium intracapillary pressure
- Cardiac output
- Right ventricular function

Hemodynamic assessment

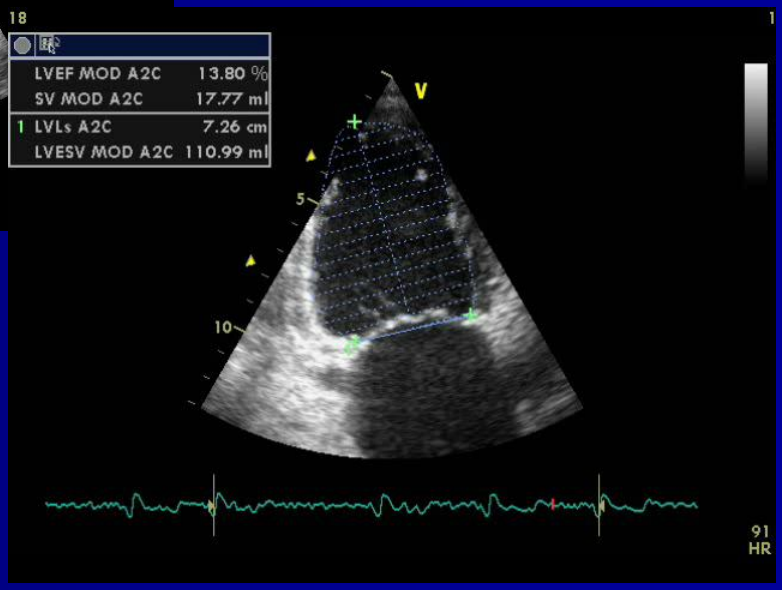




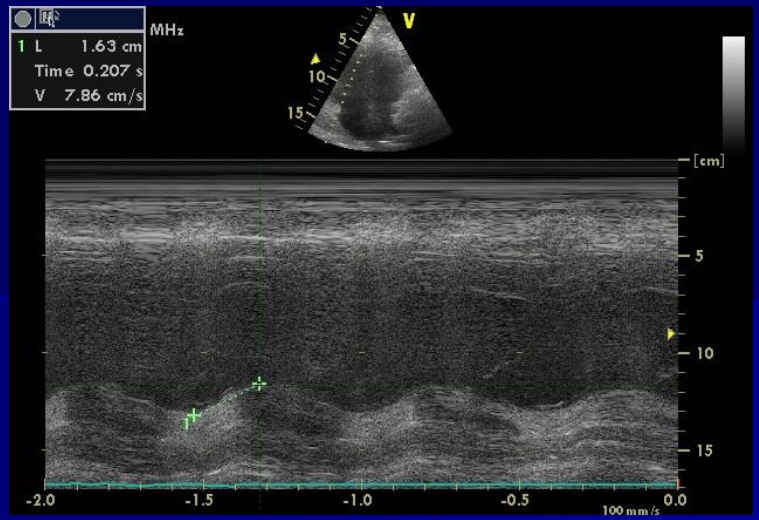




LVEF



TAPSE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V 7.86 cm/s
MHz
V
[cm]
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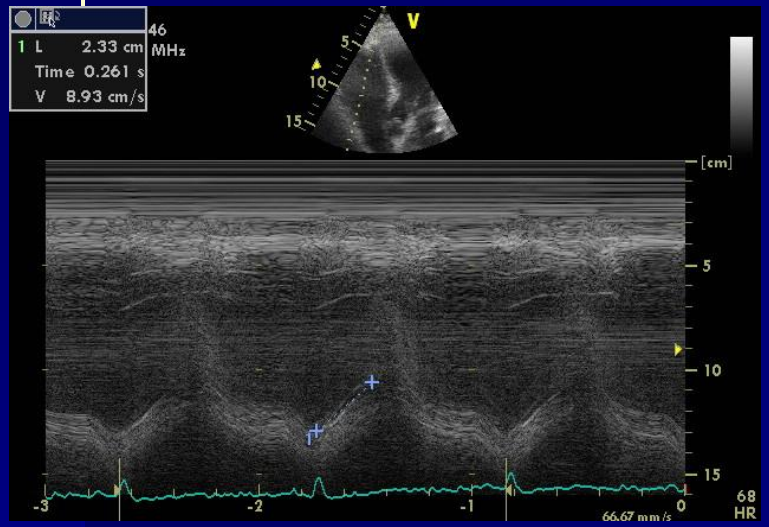
-1.5
-1.0
-0.5
0.0
100 mm/s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MHz
V
[cm]
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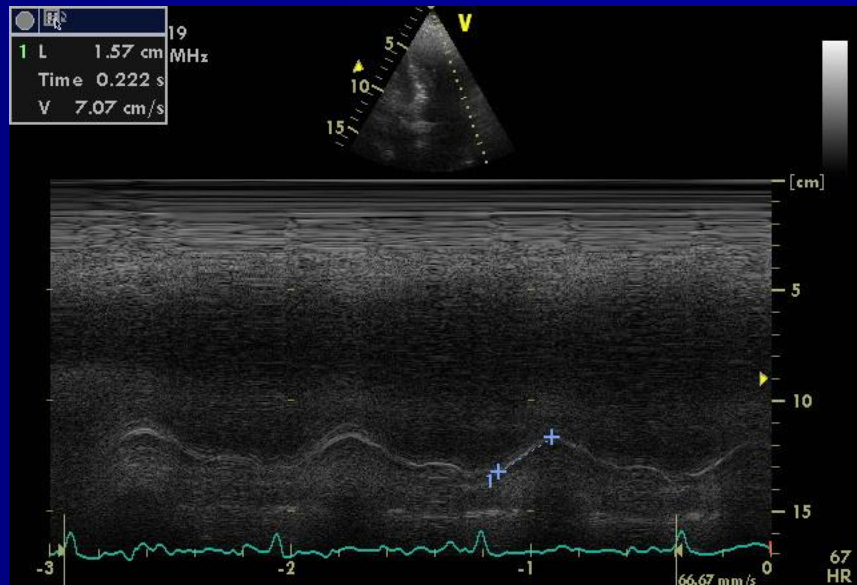
-2
-1
0
66.67 mm/s
68
HR

MAPSE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MHz
V
[cm]
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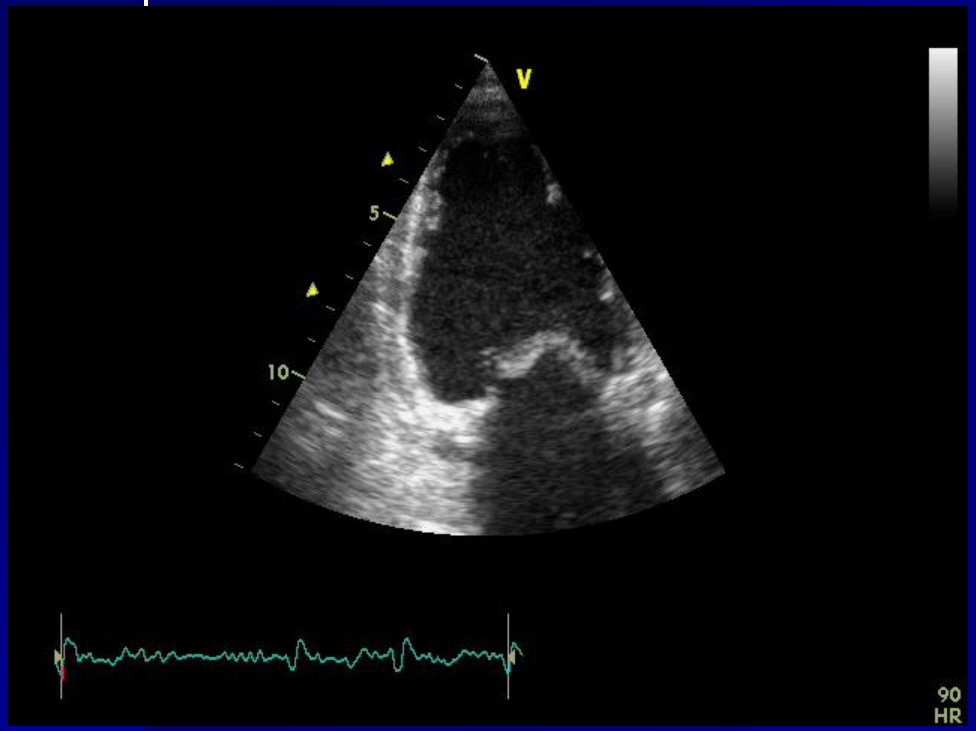
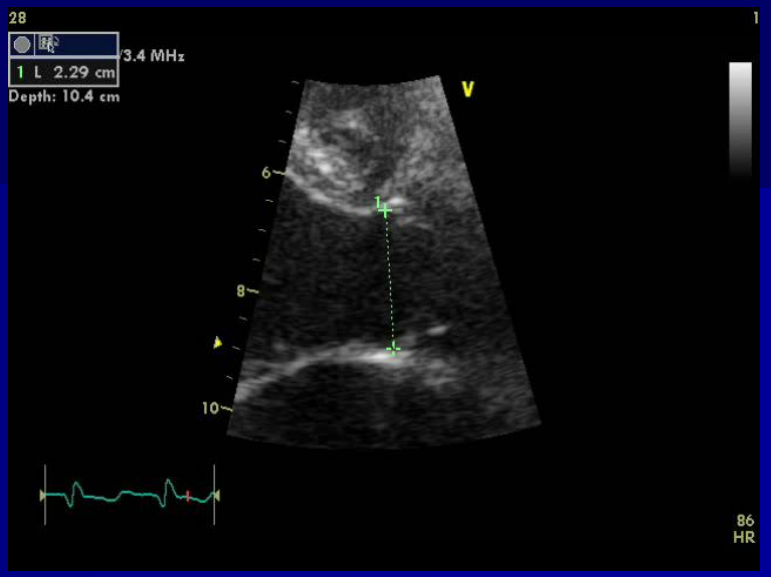
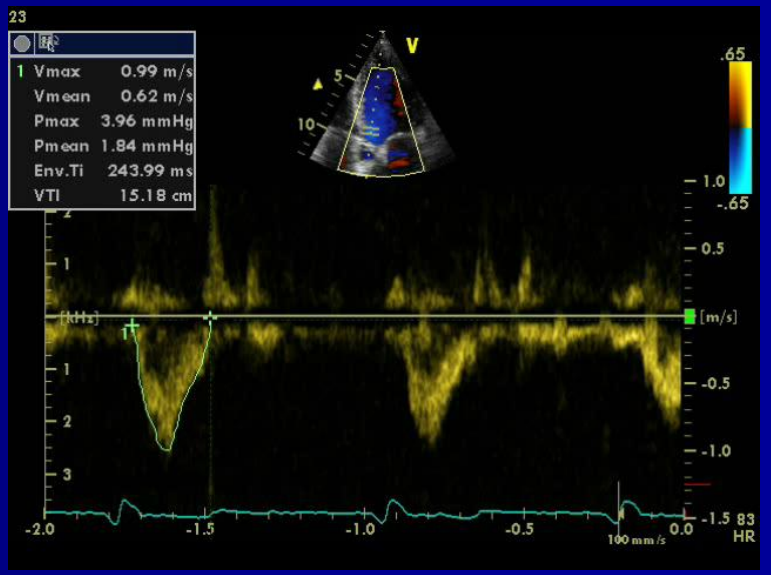
-2
-1
0
66.67 mm/s
67
HR

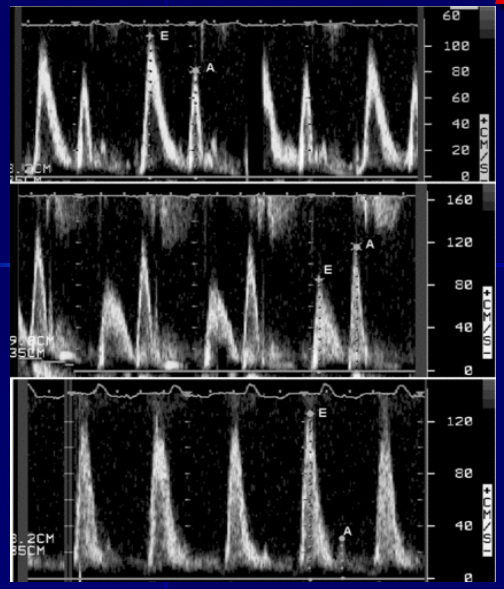
Hemodynamic assessment

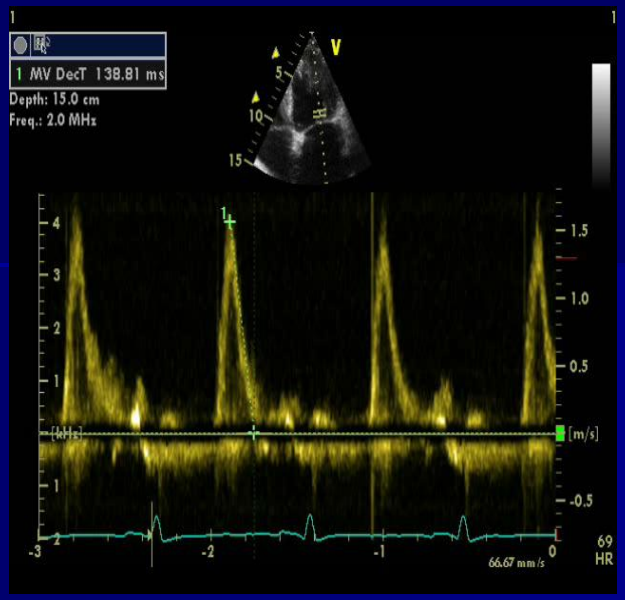


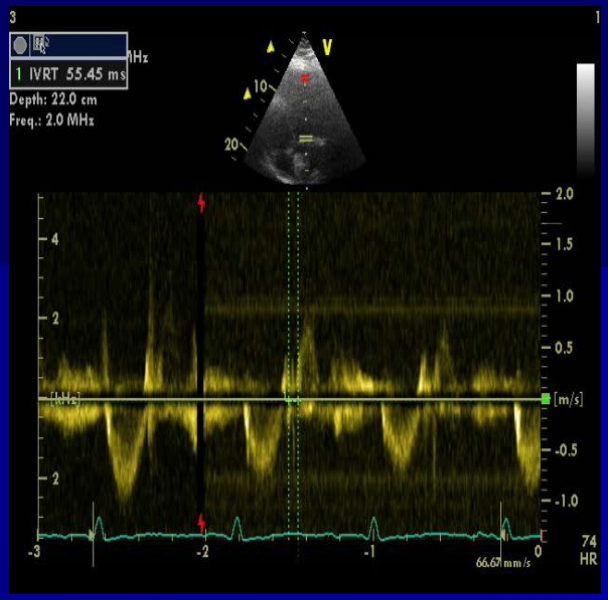


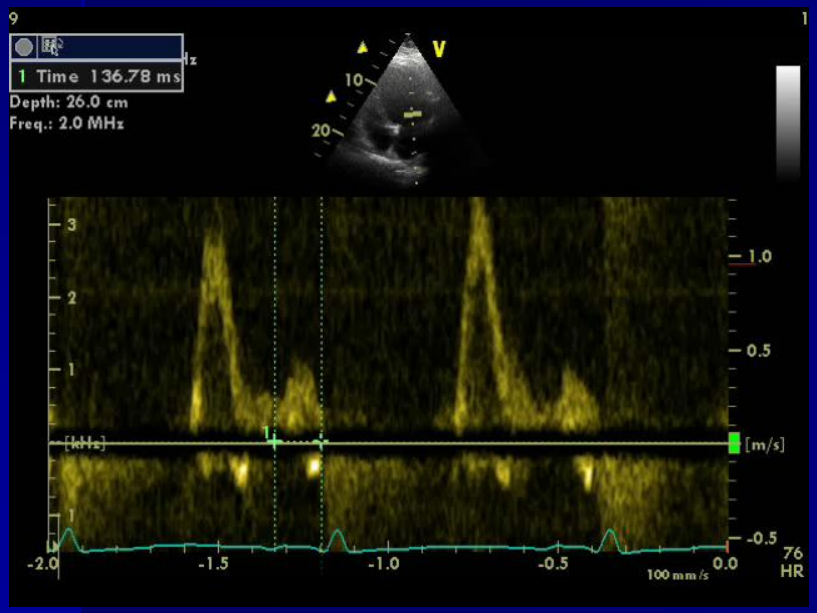


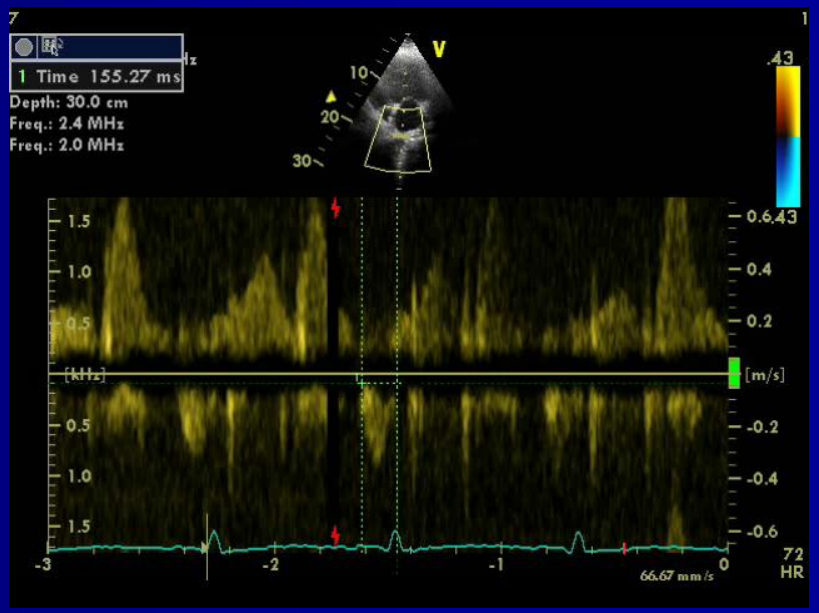
Hemodynamic assessment



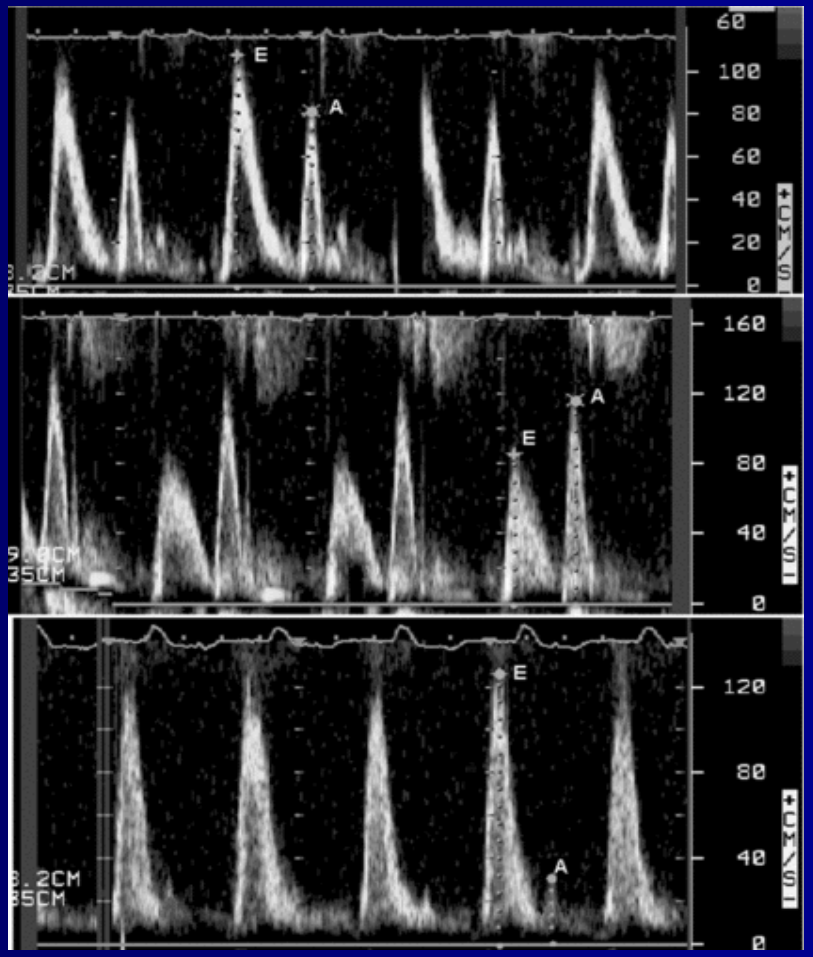








E/E´rate



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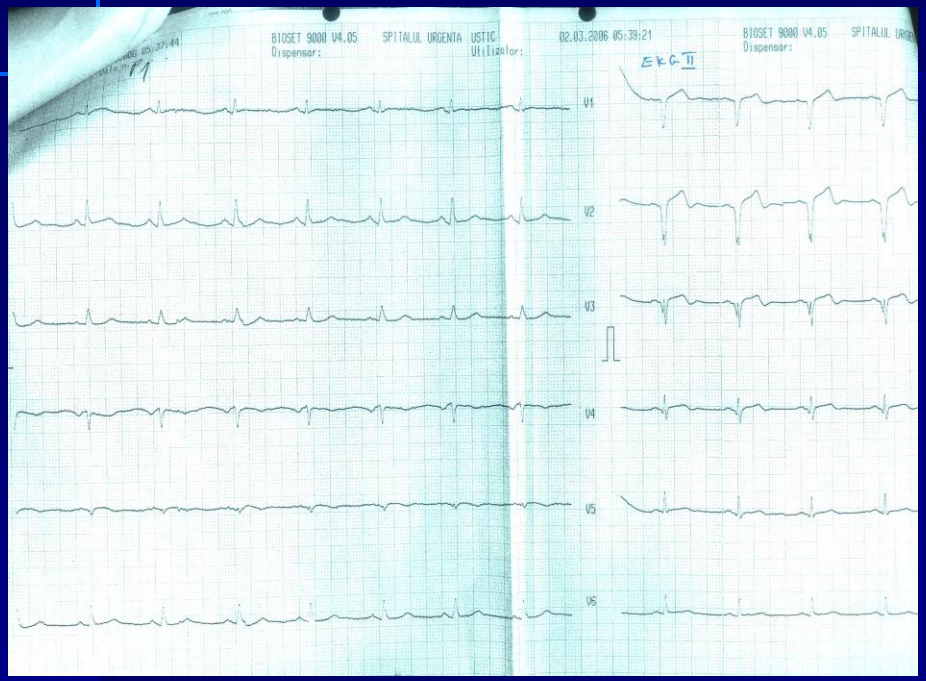
- MCGOWAN JH, CLELAND GF: *Reliability of reporting left ventricular systolic function by echocardiography:a systematic review of 3 methods.* Am Heart J 2003; 146: 388-397.

Ecocardiographic assessment

- Positive diagnosis
- Differential diagnosis
- Hemodynamic assessment
- Reperfusion treatment efficacy
- Complications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SPITALUL URGENTA USTIC
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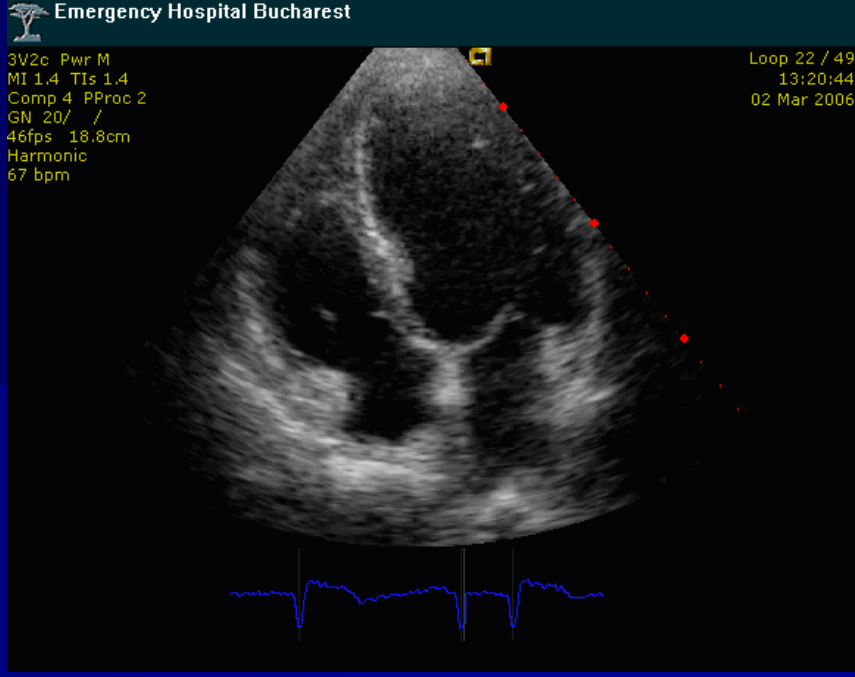
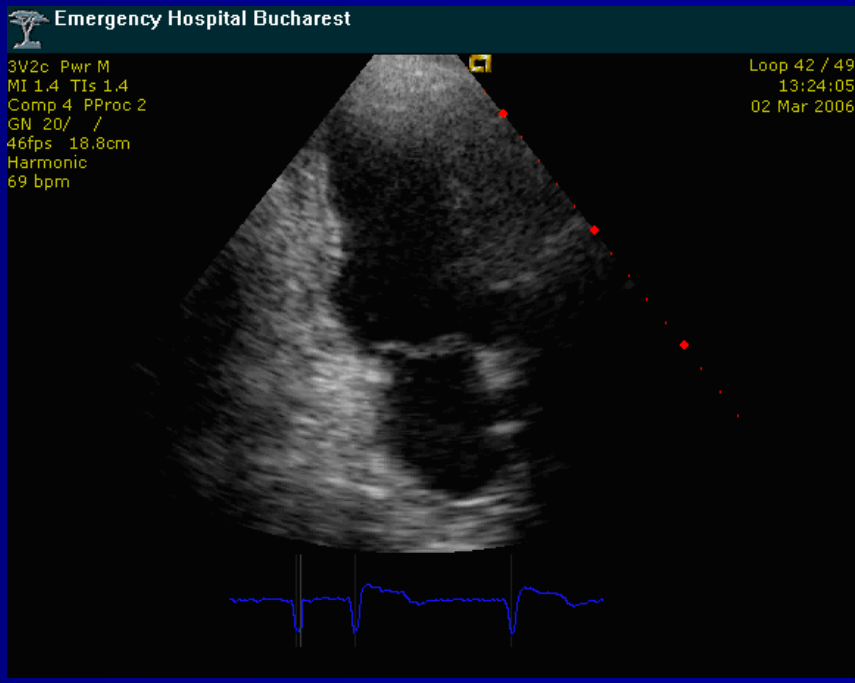
EKG II
V1
V2
V3
V4
V5
V6


Emergency Hospital Bucharest
3V2c Pwr M
MI 1.4 TIs 1.4
Comp 4 PProc 2
GN 20/ /
46fps 18.8cm
Harmonic
67 bpm
Loop 22 / 49
13:20:44
02 Mar 2006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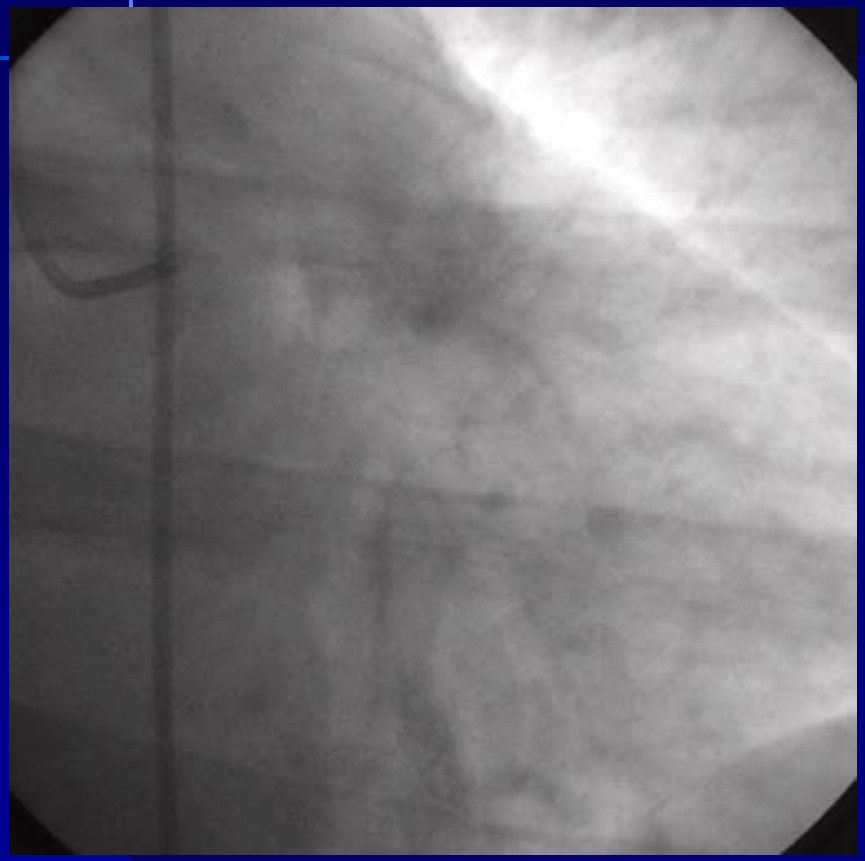
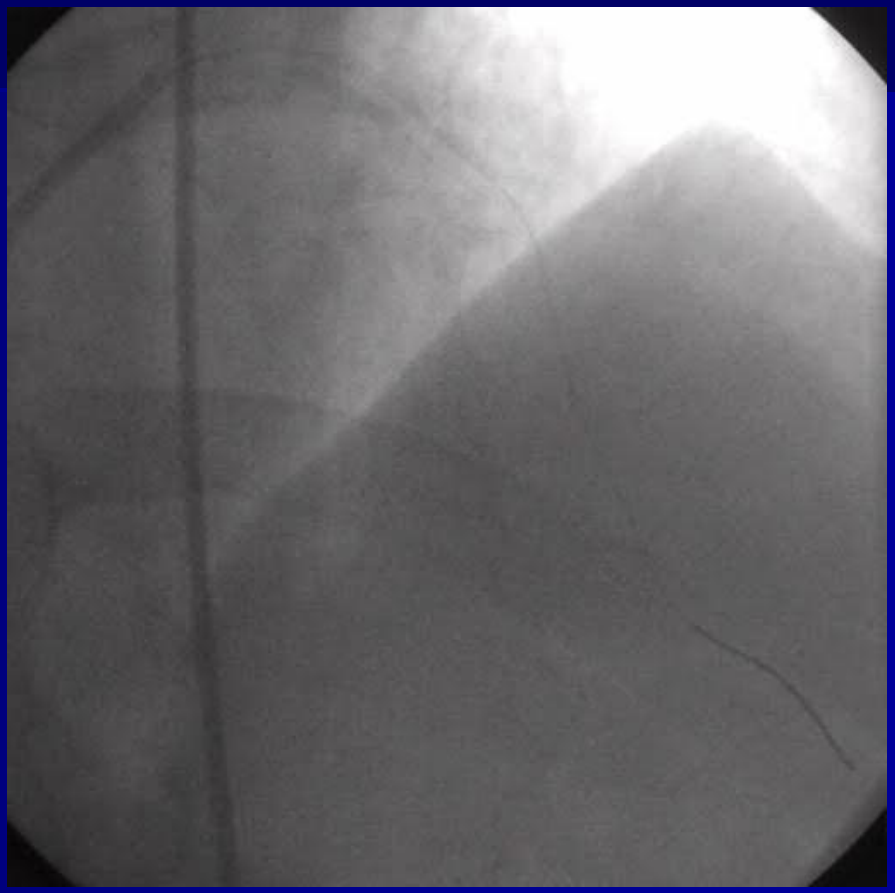
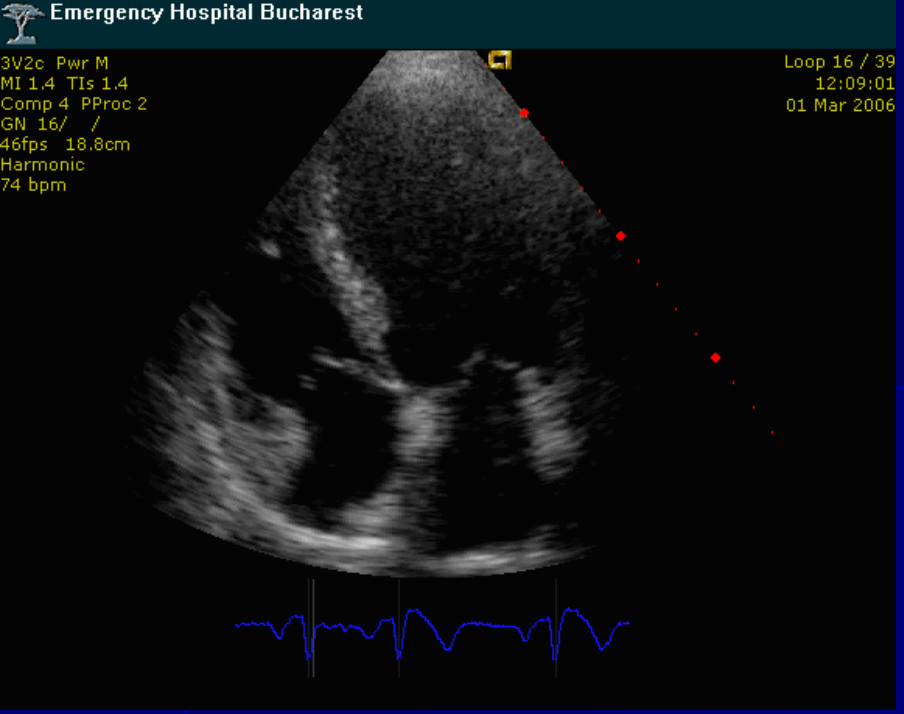
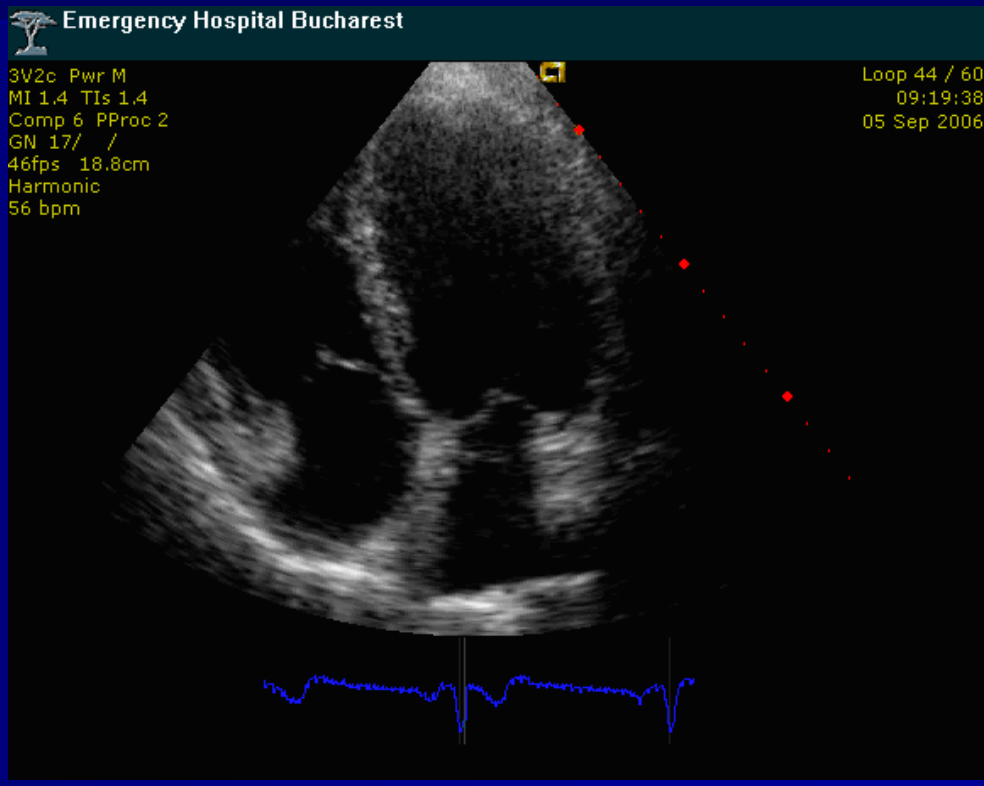
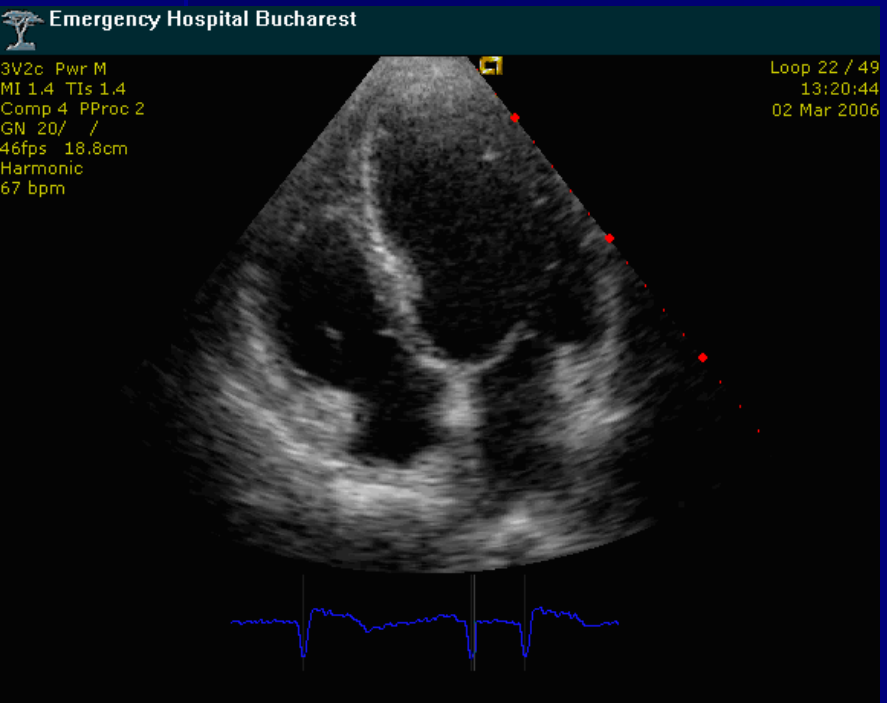





Emergency Hospital Bucharest
3V2c Pwr M
MI 1.4 TIs 1.4
Comp 4 PProc 2
GN 16/ /
46fps 18.8cm
Harmonic
74 bpm
Loop 16 / 39
12:09:01
01 Mar 2006

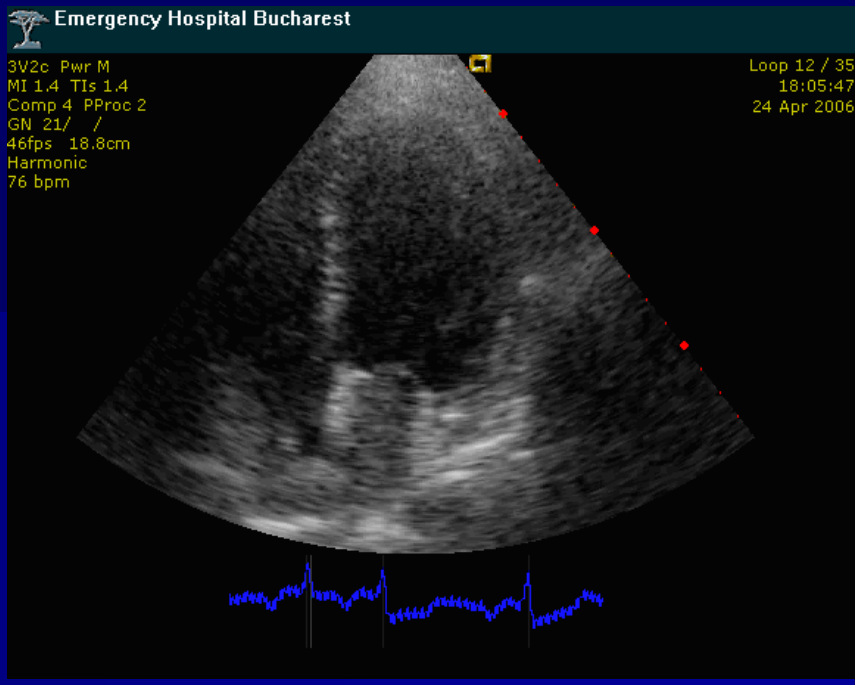
6 M

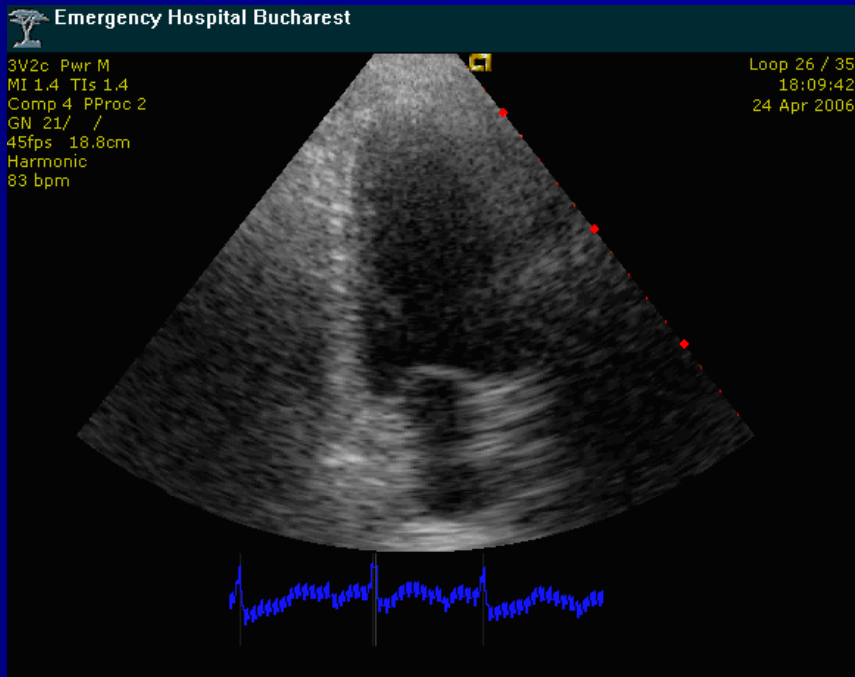

Emergency Hospital Bucharest
3V2c Pwr M
MI 1.4 TIs 1.4
Comp 6 PProc 2
GN 17/ /
46fps 18.8cm
Harmonic
56 bpm
Loop 44 / 60
09:19:38
05 Sep 2006

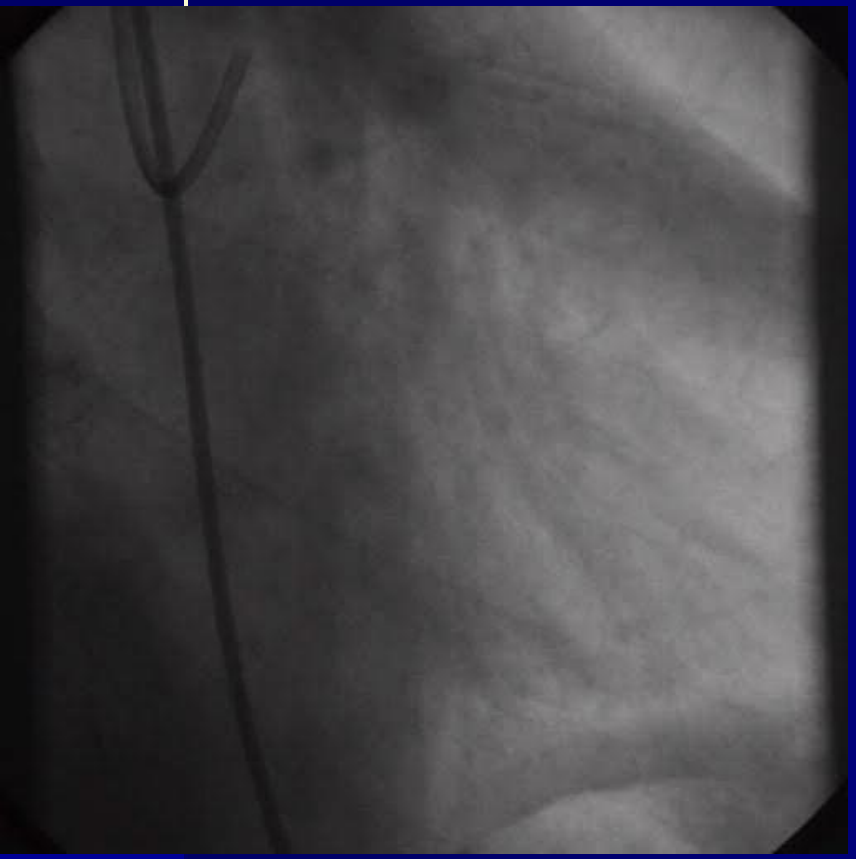

Emergency Hospital Bucharest
3V2c Pwr M
MI 1.4 TIs 1.4
Comp 4 PProc 2
GN 20/ /
46fps 18.8cm
Harmonic
67 bpm
Loop 22 / 49
13:20:44
02 Mar 2006

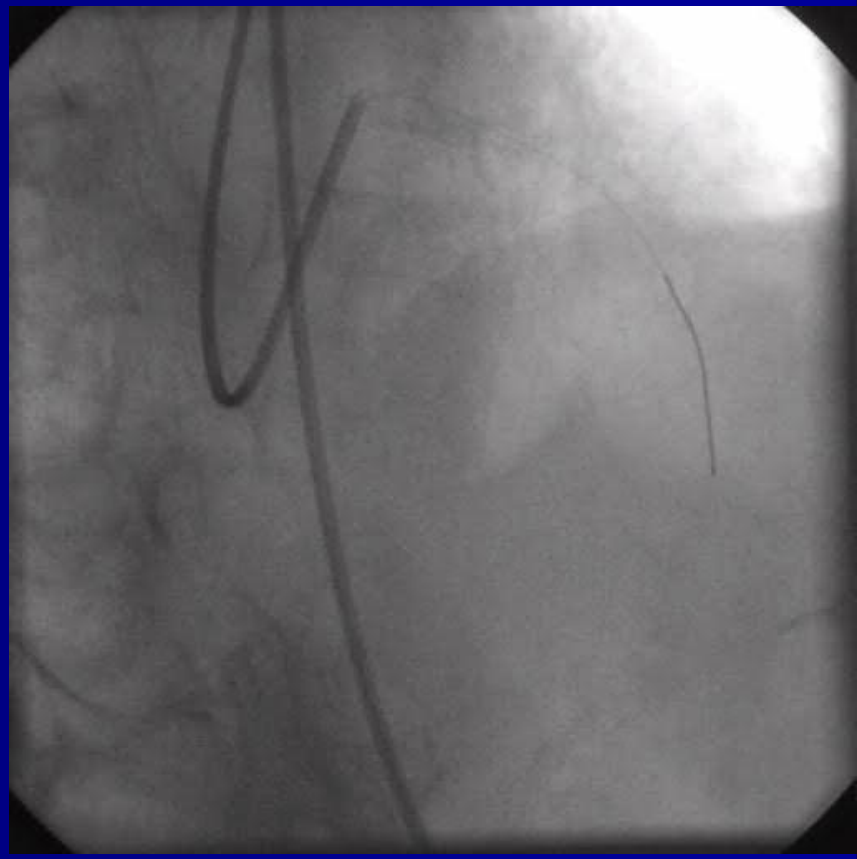
24 H

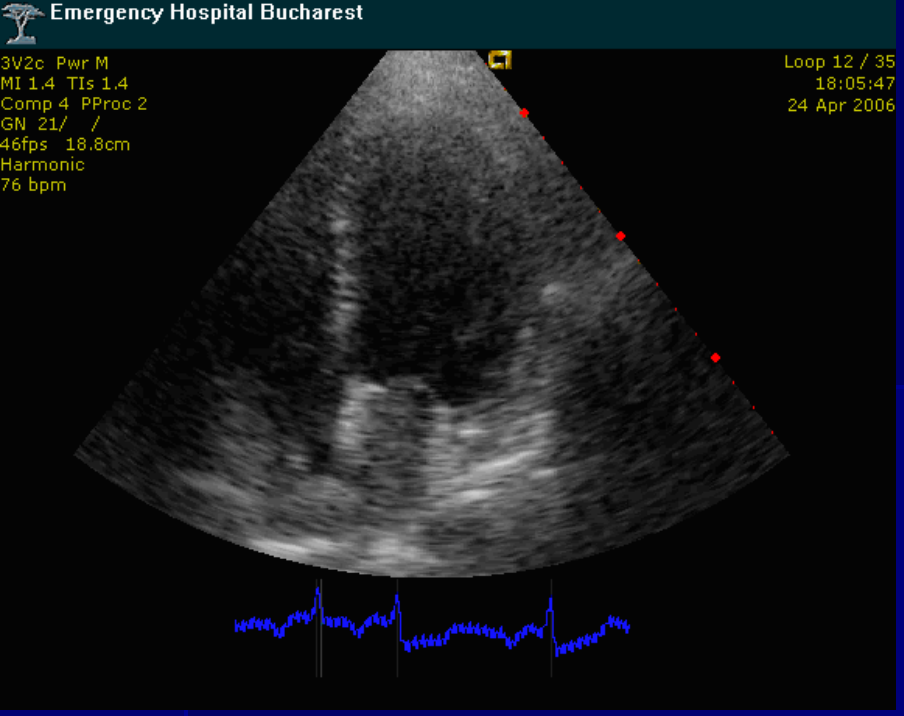

9000 V4.03 SPITALUL CLINIC DE URGENTA U.P.U 24.04.2006 18:28:31
Dumitrodu Petru
BIOSET 9000 V4.03 SPITALUL CLINIC DE URGENTA U.P.U 24.04.2006 18:28:37
Dispensar:
Utilizator:
25mm/s 10mm/mV D E M 89/min
Manual PR1 25mm/s D E M 95/min


Emergency Hospital Bucharest
3V2c Pwr M
MI 1.4 TIs 1.4
Comp 4 PProc 2
GN 21/ /
46fps 18.8cm
Harmonic
76 bpm
Loop 12 / 35
18:05:47
24 Apr 2006

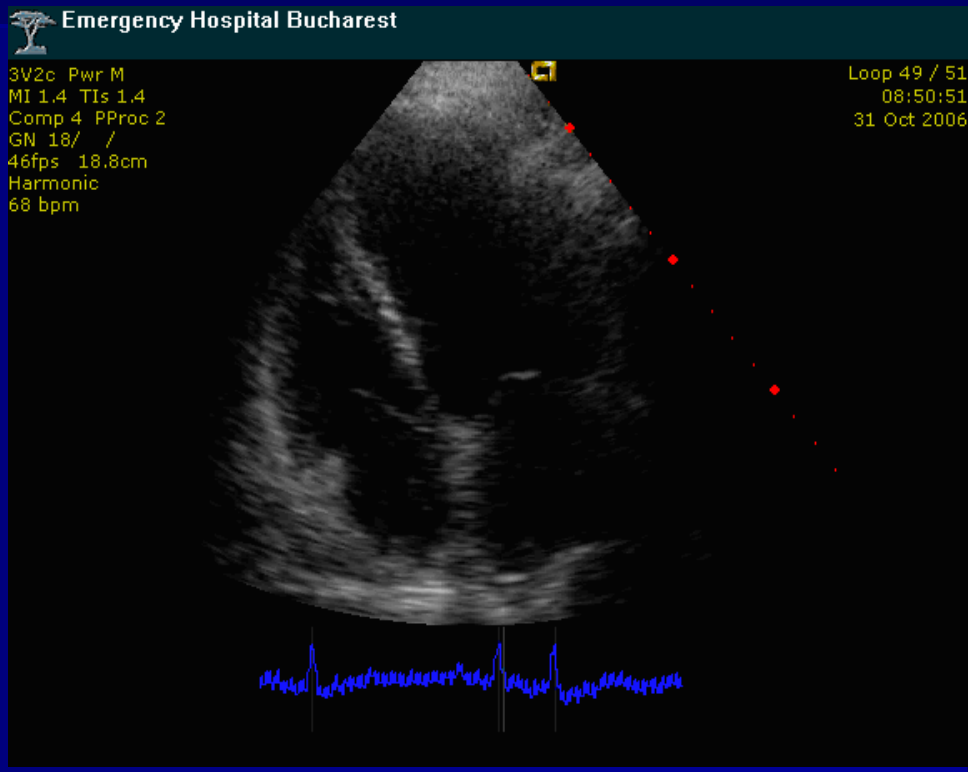

Emergency Hospital Bucharest
3V2c Pwr M
MI 1.4 TIs 1.4
Comp 4 PProc 2
GN 21/ /
45fps 18.8cm
Harmonic
83 bpm
Loop 26 / 35
18:09:42
24 Apr 2006

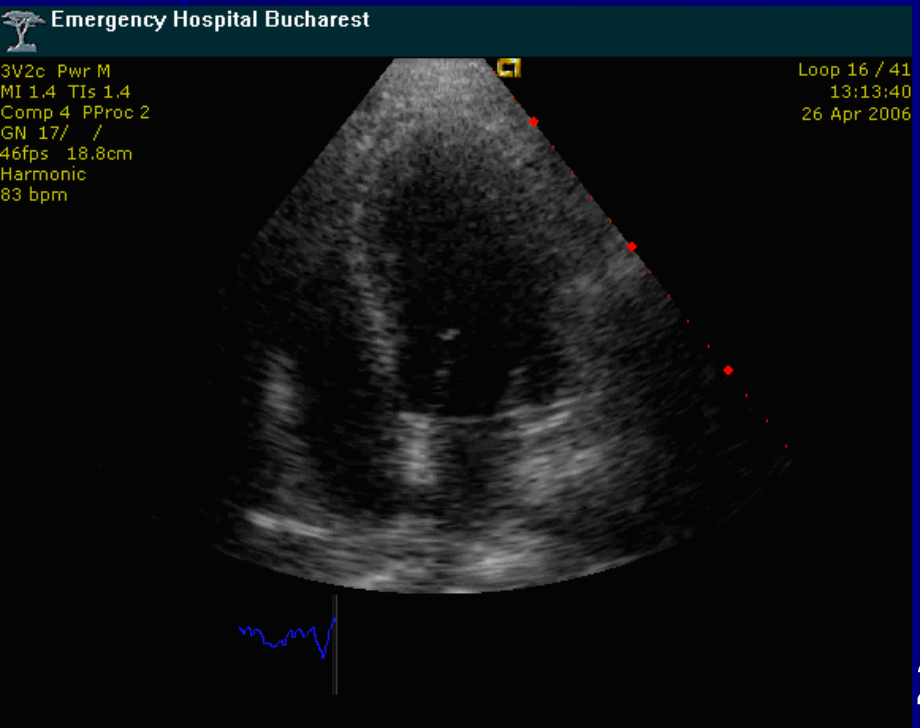





Emergency Hospital Bucharest
3V2c Pwr M
MI 1.4 TIs 1.4
Comp 4 PProc 2
GN 21/ /
46fps 18.8cm
Harmonic
76 bpm
Loop 12 / 35
18:05:47
24 Apr 2006

6 M


Emergency Hospital Bucharest
3V2c Pwr M
MI 1.4 TIs 1.4
Comp 4 PProc 2
GN 18/ /
46fps 18.8cm
Harmonic
68 bpm
Loop 49 / 51
08:50:51
31 Oct 2006


Emergency Hospital Bucharest
3V2c Pwr M
MI 1.4 TIs 1.4
Comp 4 PProc 2
GN 17/ /
46fps 18.8cm
Harmonic
83 bpm
Loop 16 / 41
13:13:40
26 Apr 2006

24 H

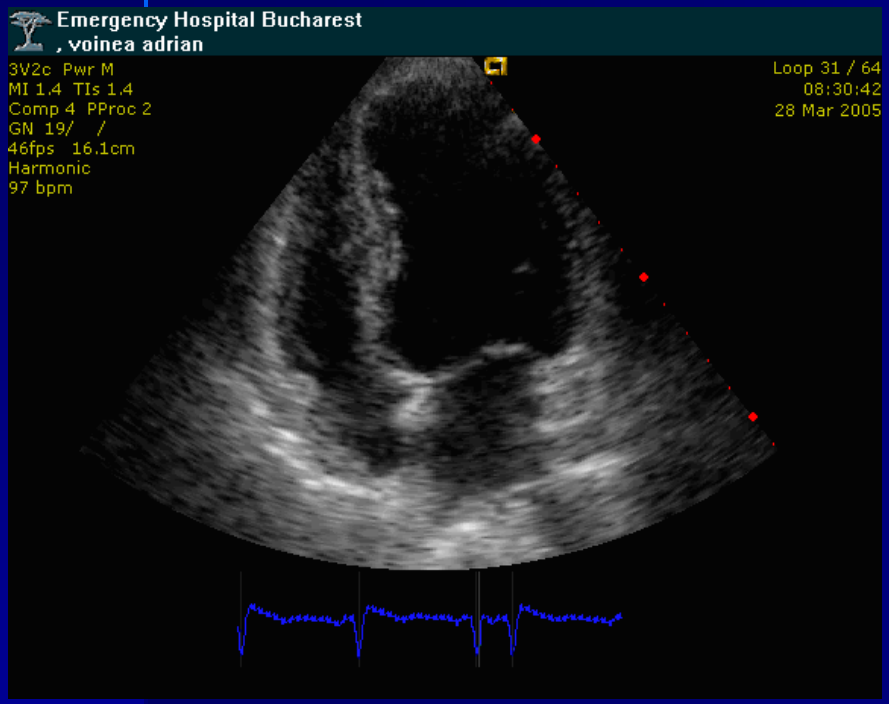
- Larson DM, Menssen KM, Johnson RK, et al. False positive ST elevation in patients undergoing direct percutaneous coronary intervention. *Circulation* 2006;114:II-346.

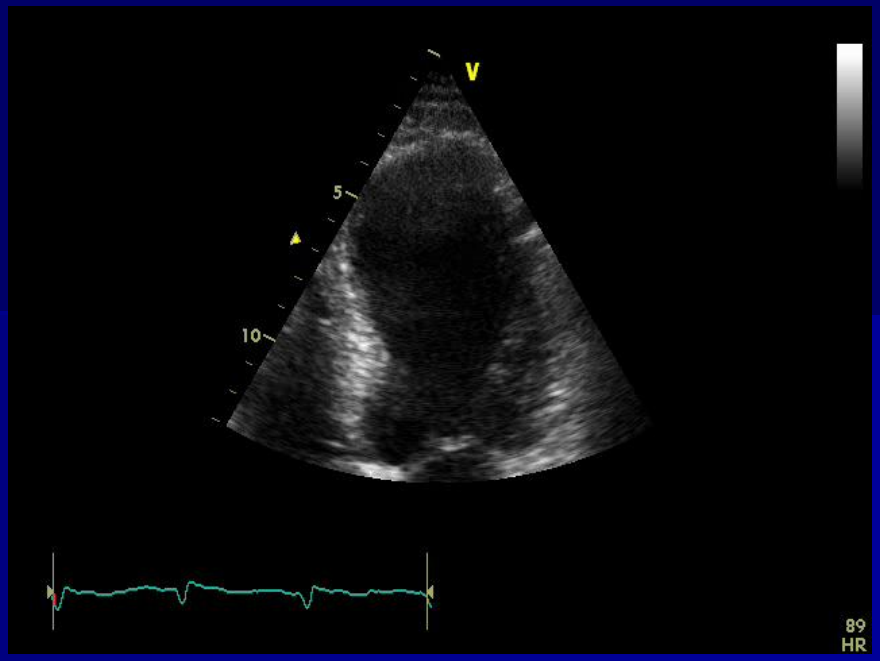
- Van T' Hof AWJ, Zijlstra F, The success of primary angioplasty: Beyond TIMI flow, Acute Card Care 2009, 11(2): 66-68

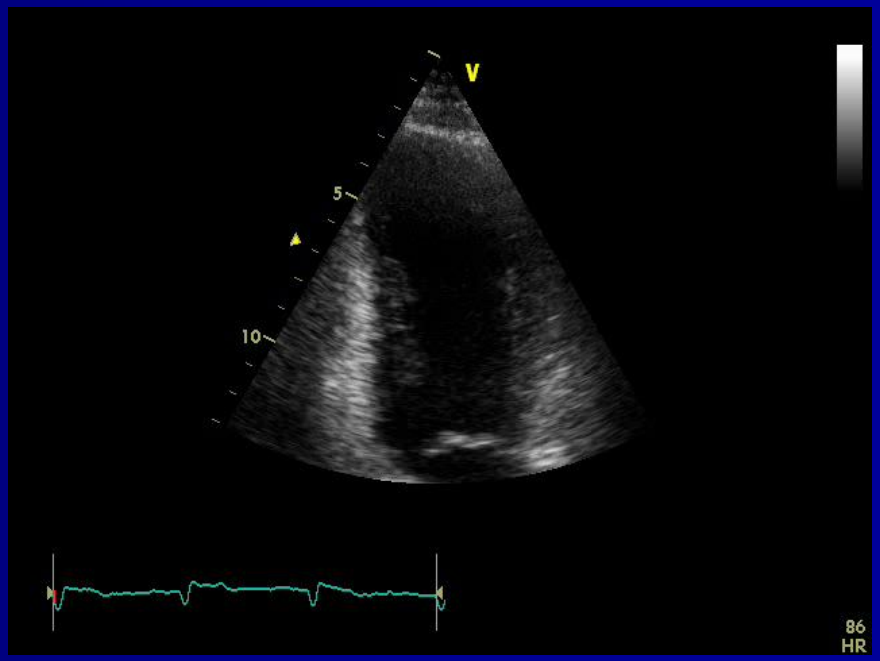
Ecocardiographic assessment

- Positive diagnosis
- Differential diagnosis
- Hemodynamic assessment
- Reperfusion treatment efficacy
- Complications

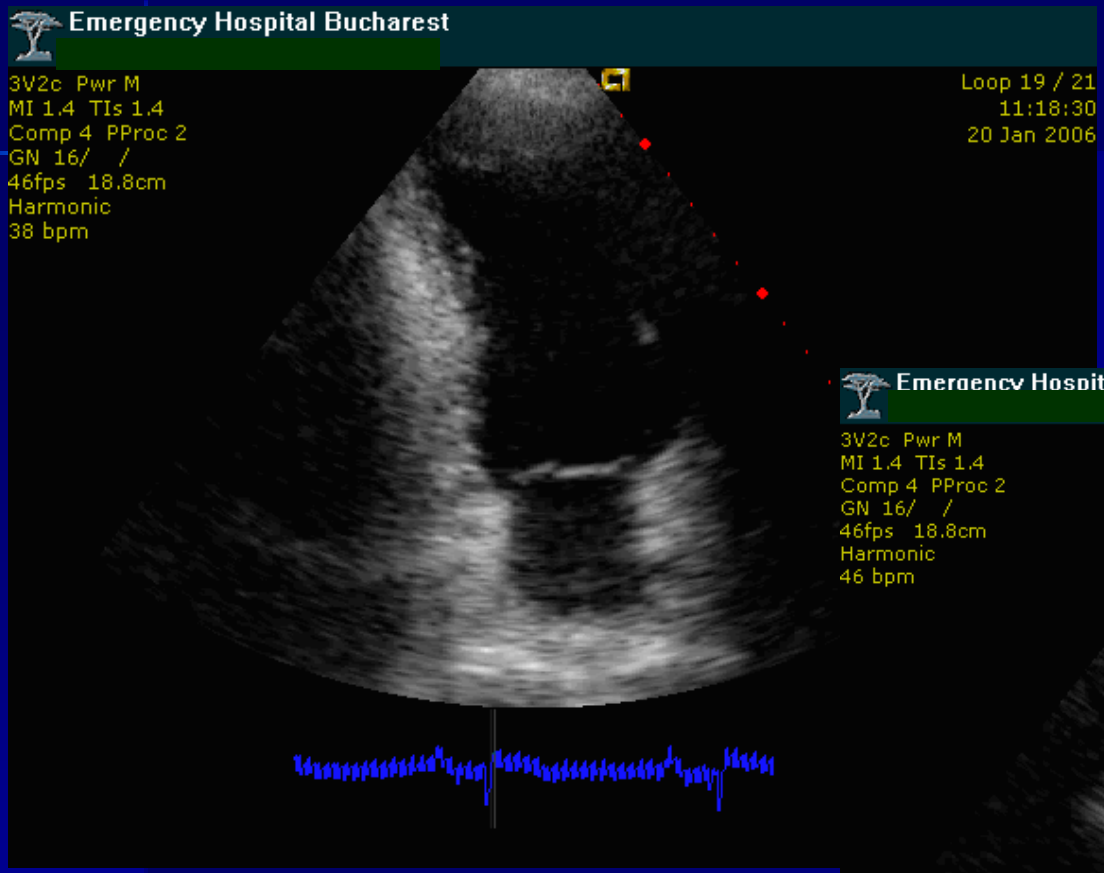
Ventricular remodeling

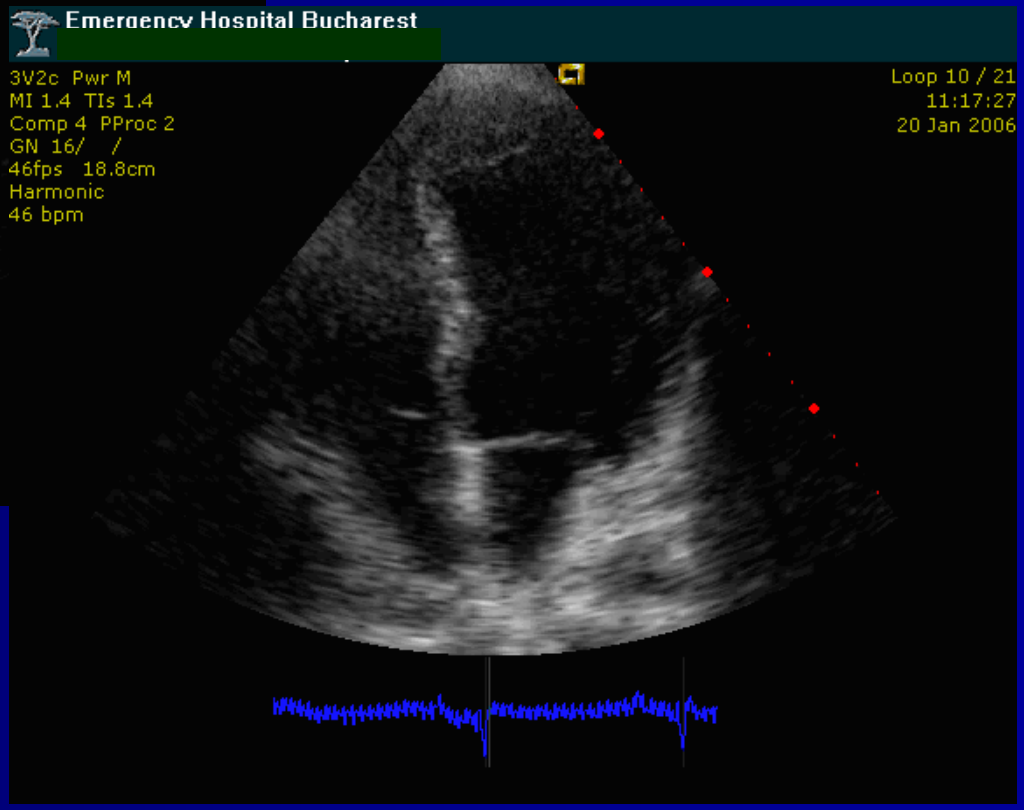




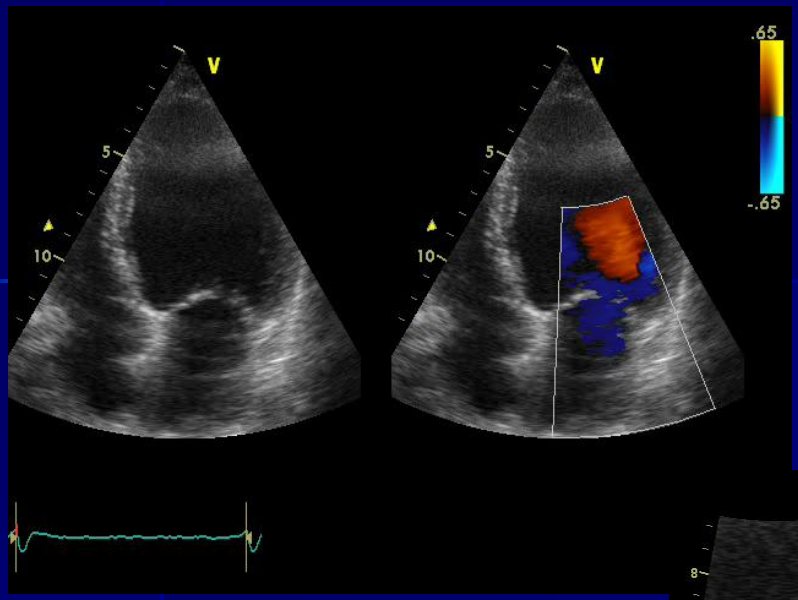


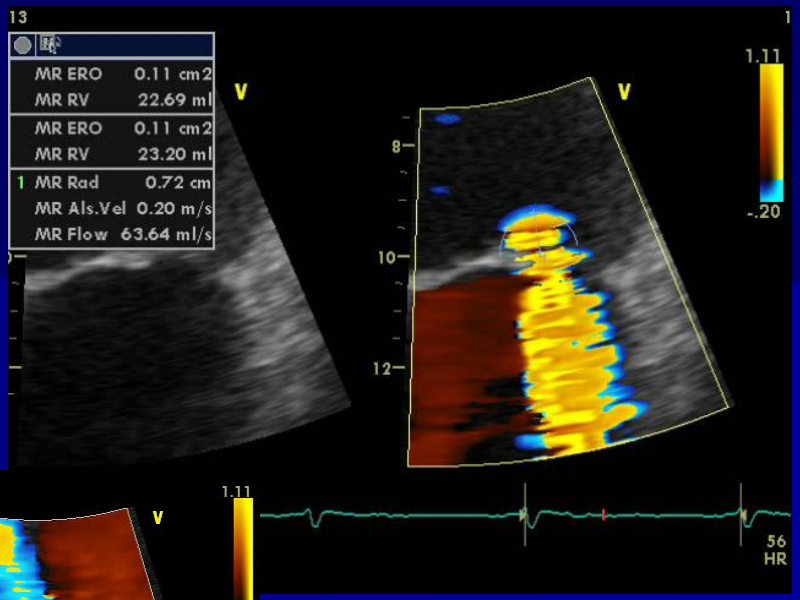
Intracavitary thrombosis

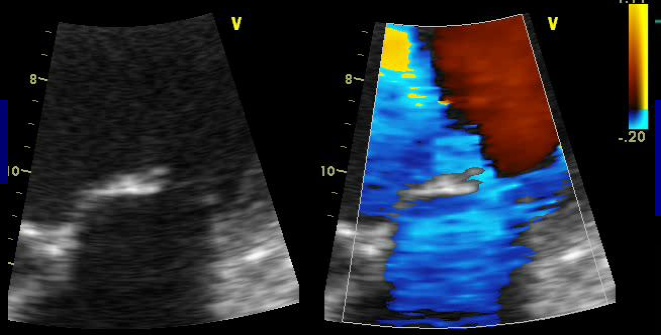


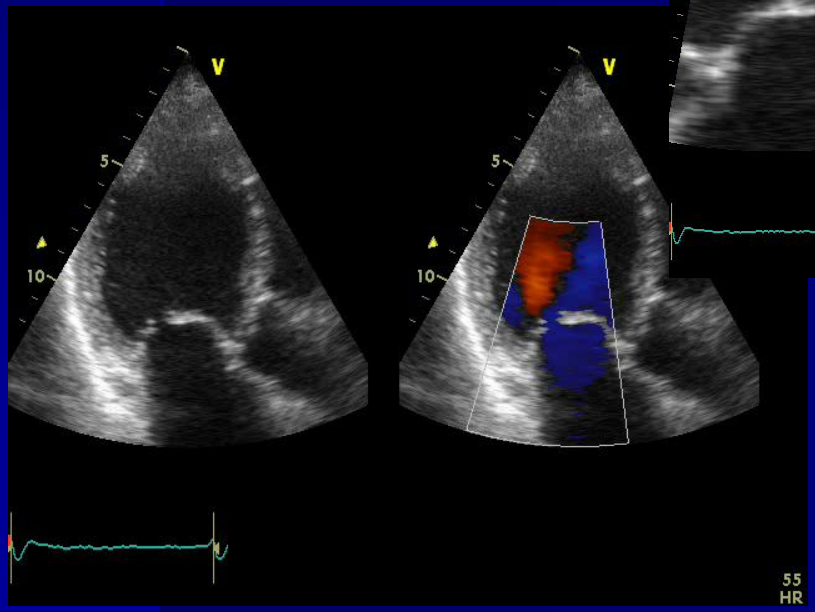


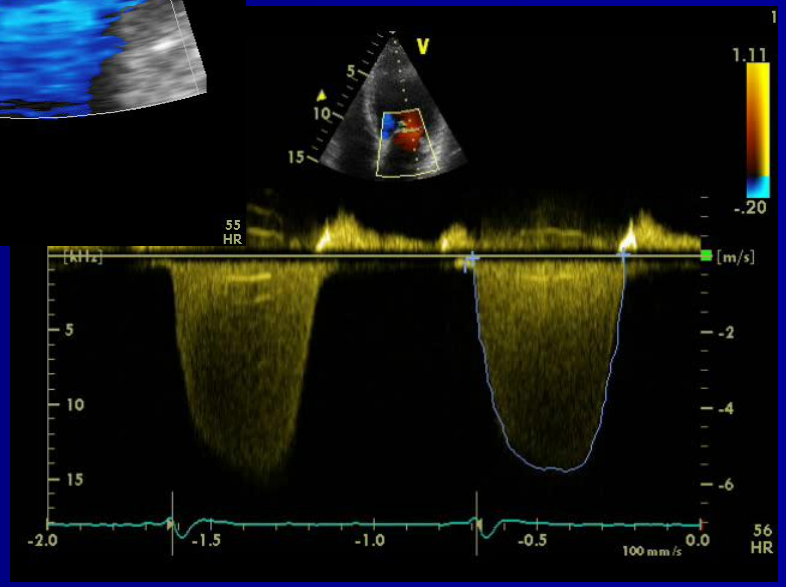
Ischaemic mitral regurgitation



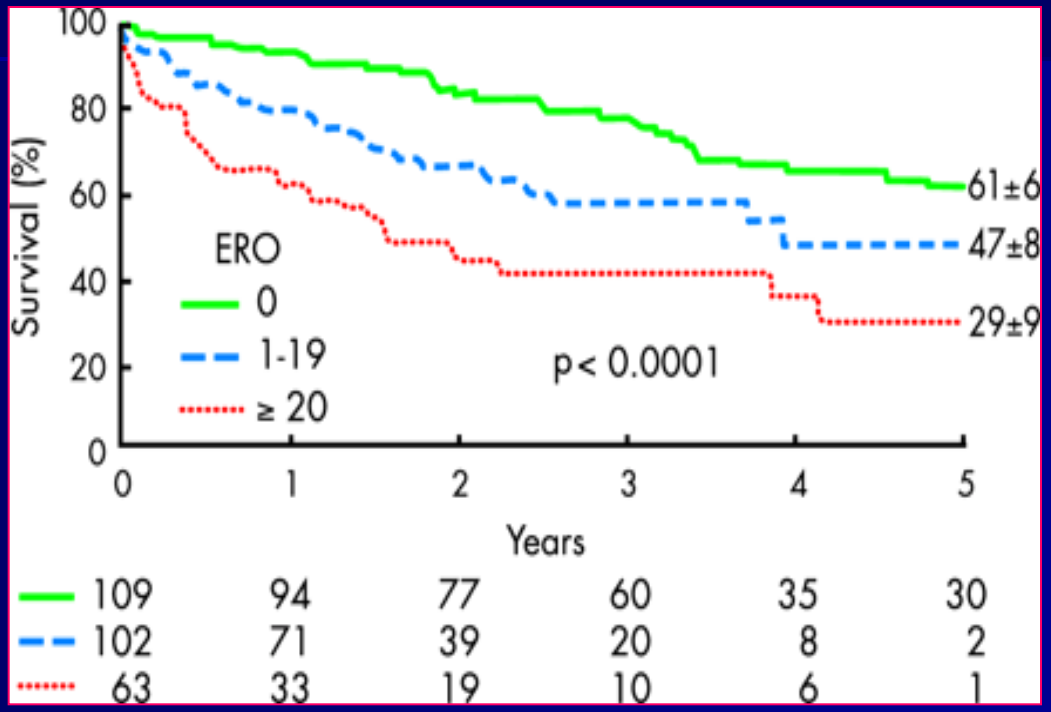








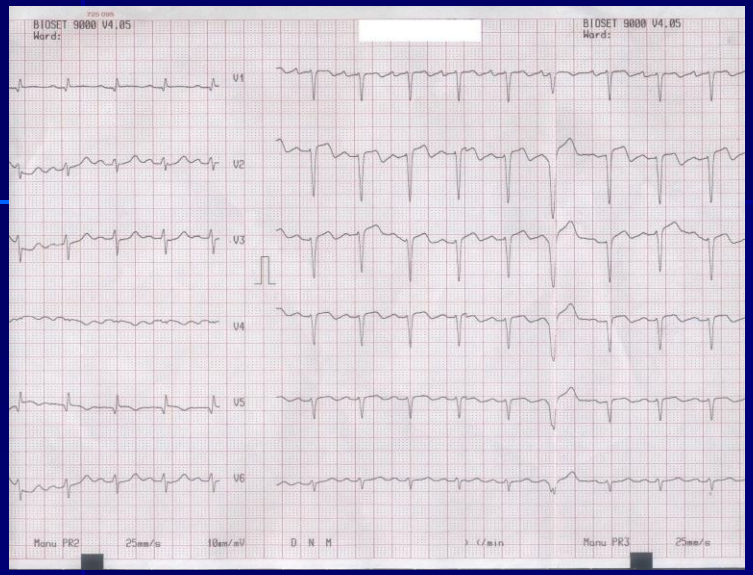
Prognosis in Ischemic MR Quantitative Echocardiography

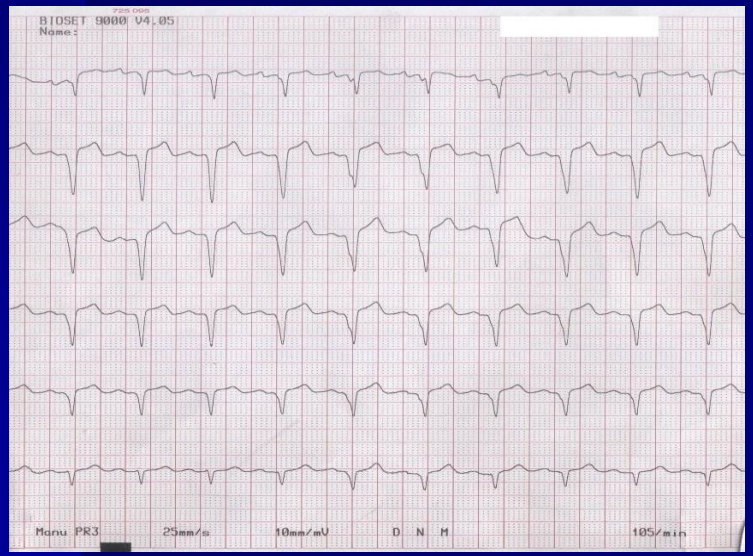


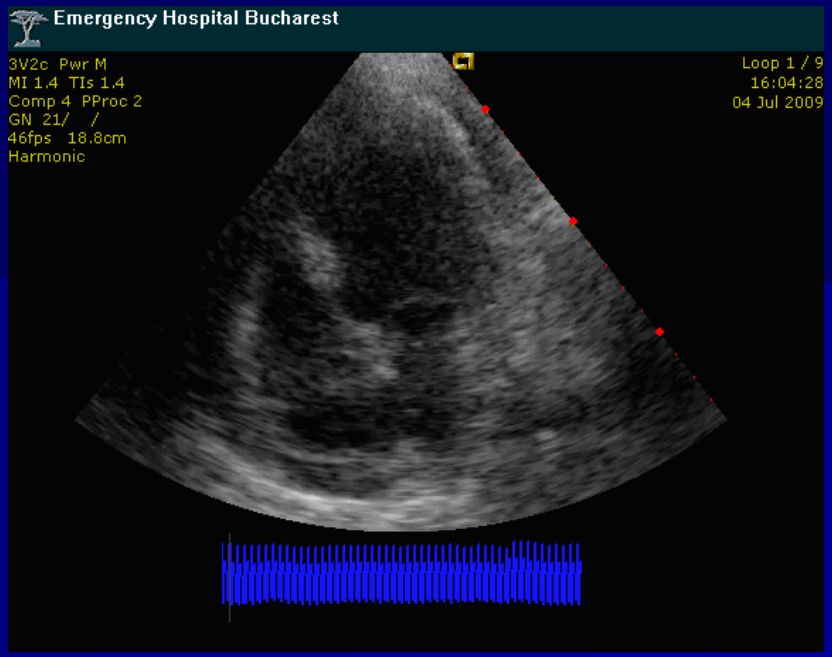
Mayo Clinic 303 pts with AMI & IMR *vs* 191 pts with AMI no IMR 5 y mortality
ERO > 20mm^2 - risc 2,23 (p<0.003) ERO < 20mm^2 - risc 1,65 (p<0.049)

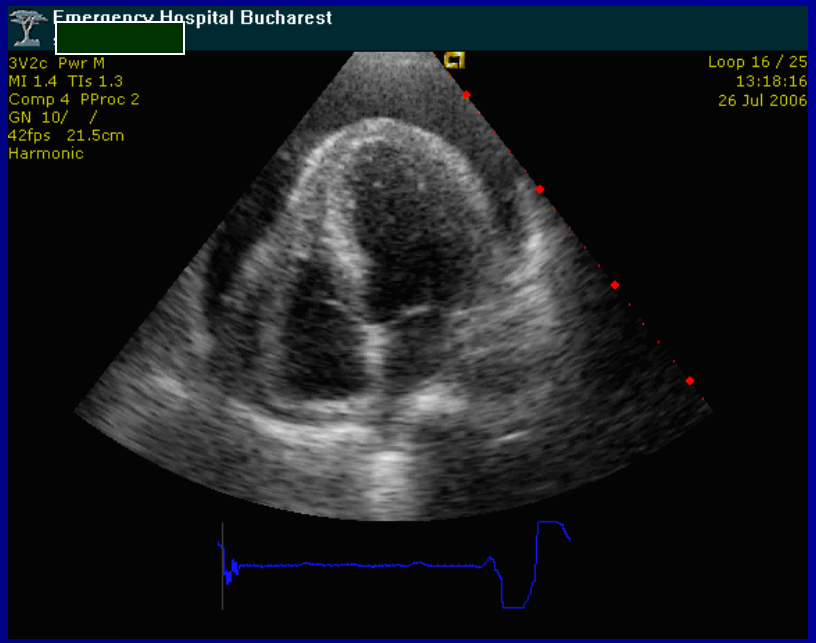
Grigioni &c Circ 2001 103

Pericardial effusion

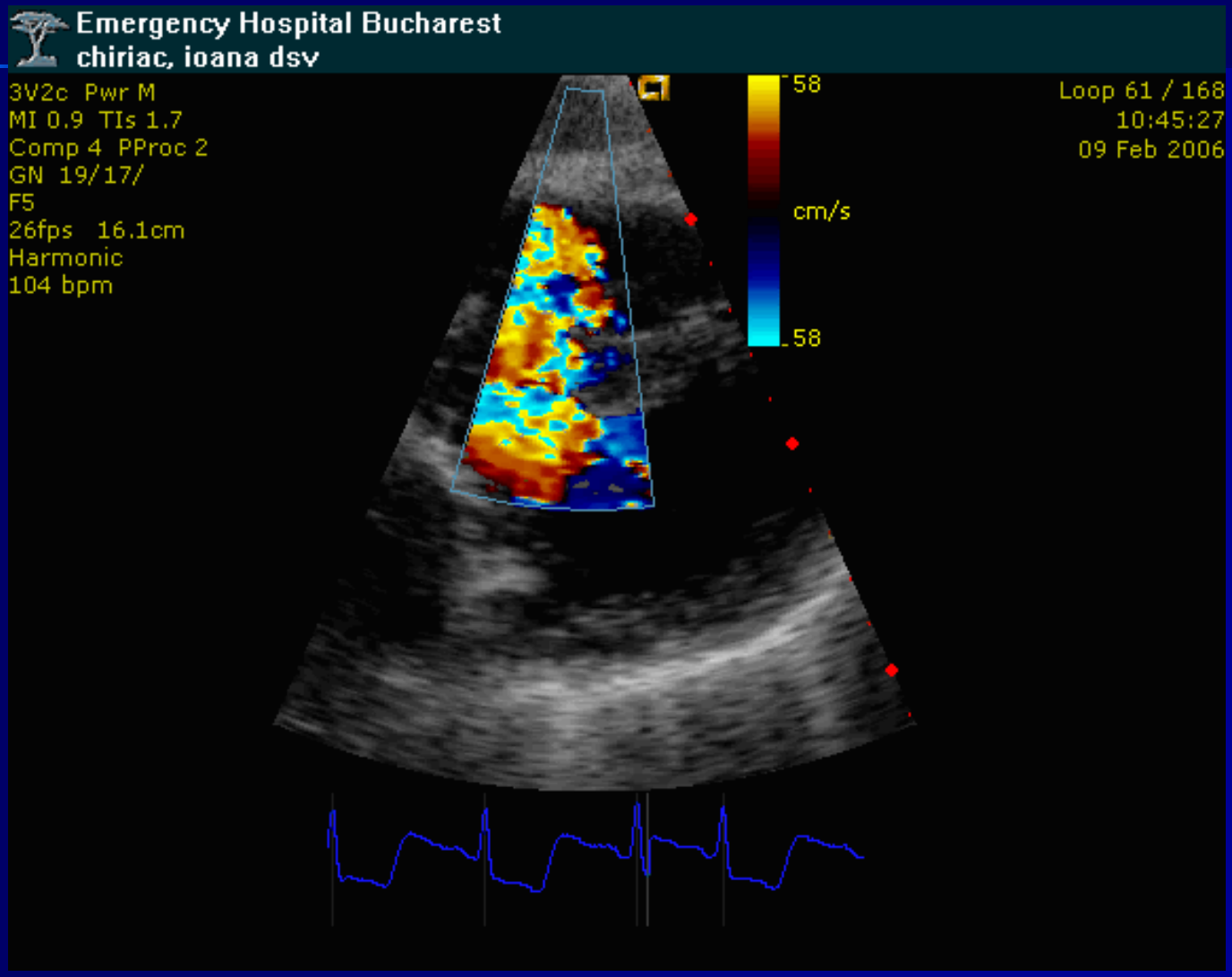


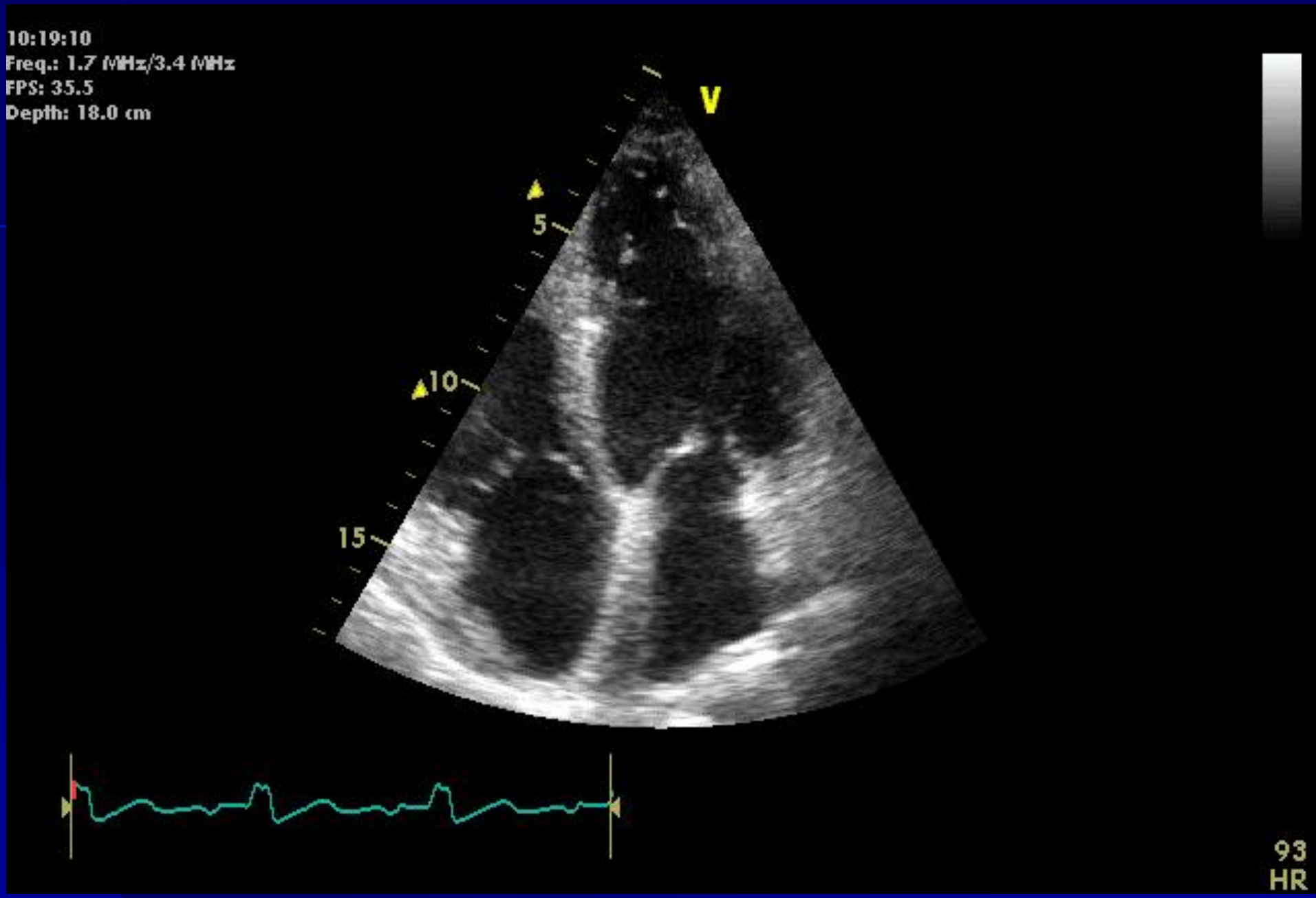


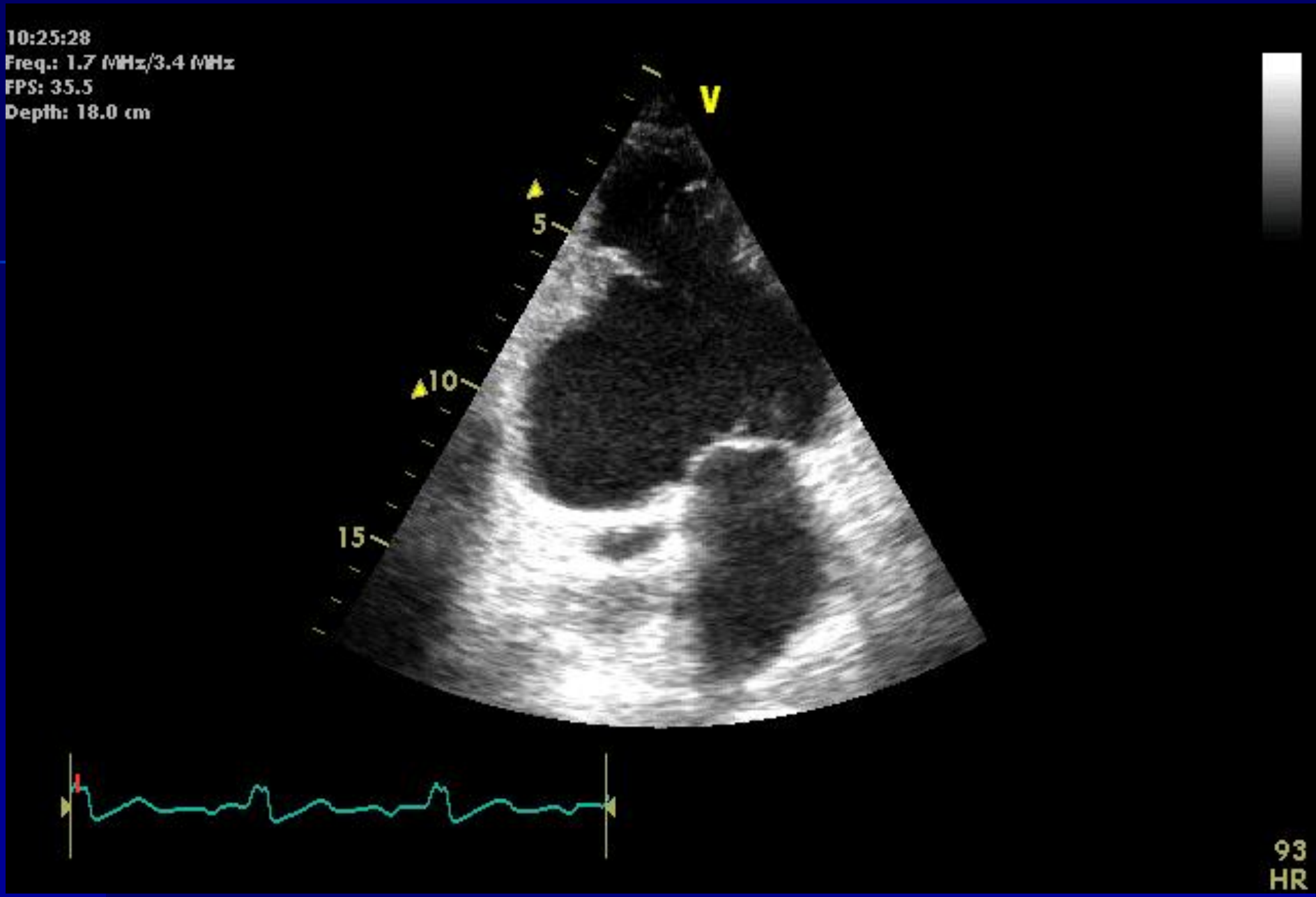


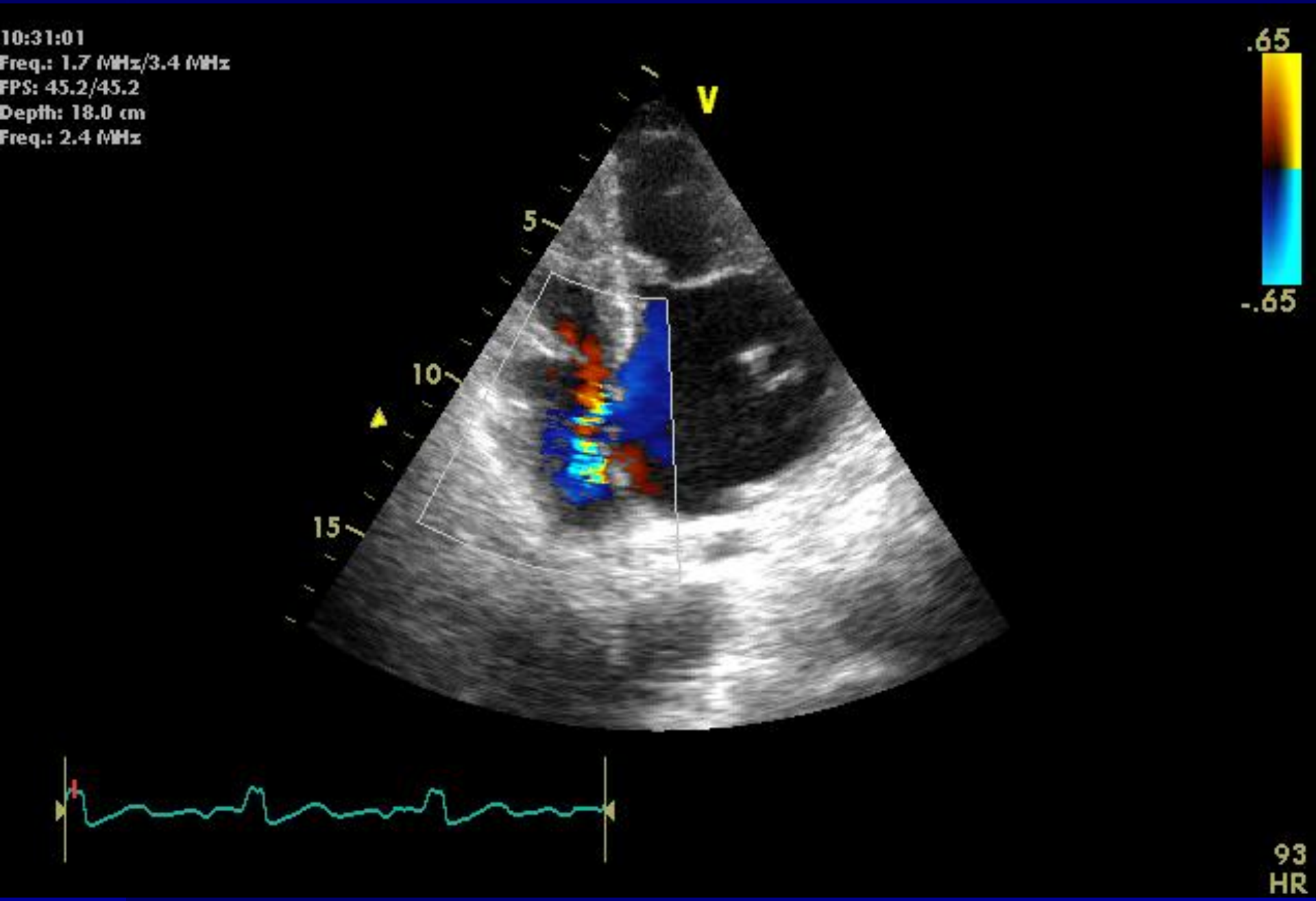


Mechanical complications
Rupture of IVS

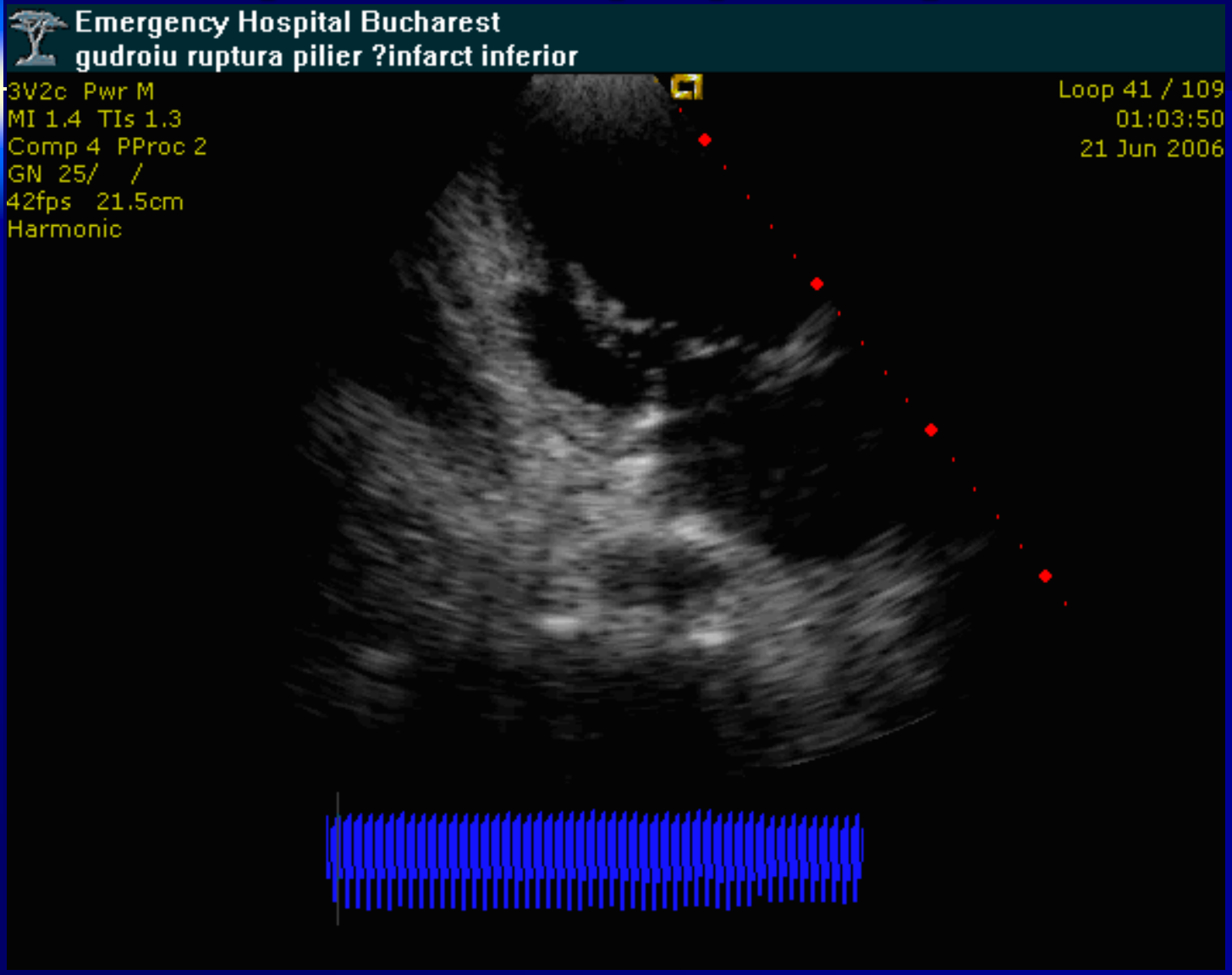



10:19:10
Freq.: 1.7 MHz/3.4 MHz
FPS: 35.5
Depth: 18.0 cm
V
5
10
15
93
HR

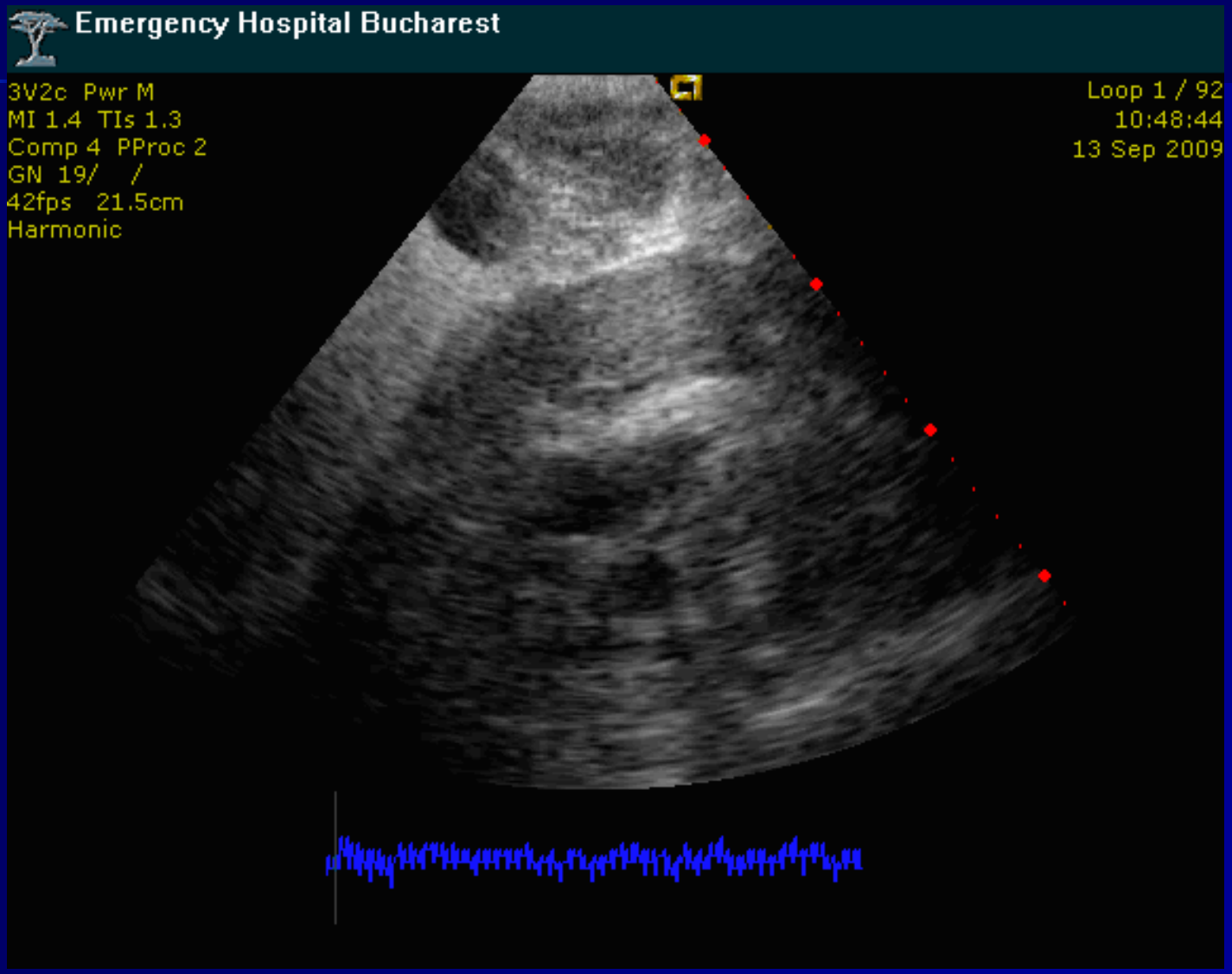

10:25:28
Freq.: 1.7 MHz/3.4 MHz
FPS: 35.5
Depth: 18.0 cm
V
5
10
15
93
HR


10:31:01
Freq.: 1.7 MHz/3.4 MHz
FPS: 45.2/45.2
Depth: 18.0 cm
Freq.: 2.4 MHz
.65
-.65
V
5
10
15
93
HR

Mechanical complications
Rupture of papillary muscle



Mechanical complications
Rupture of free wall



Conclusions

- Echocardiography is a safe and easy to perform non-invasive method for patients with STEMI, to be used at bedside.
- Echocardiography represents a very important diagnostic tool in difficult cases.
- All patients with acute myocardial infarction must be evaluated by echocardiography for hemodynamic and complications' assessment.