

# Echocardiography Conference

David Stultz, MD

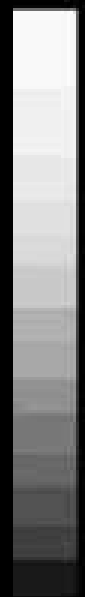
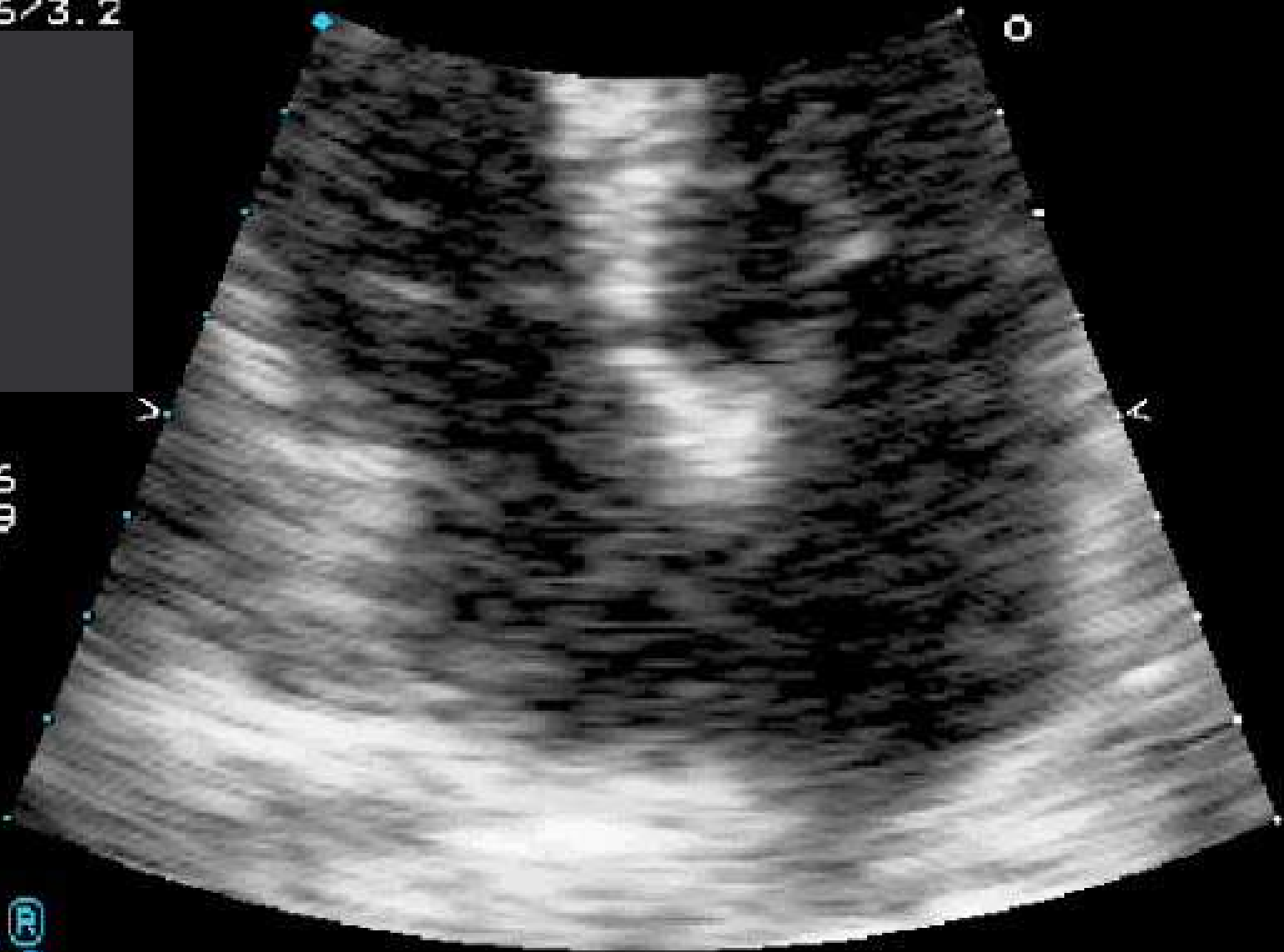
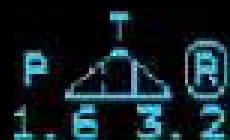
Cardiology Fellow, PGY-6

September 20, 2005

MI: 1.6  
S3 1.6/3.2

GAIN 66  
COMP 59  
79BPM

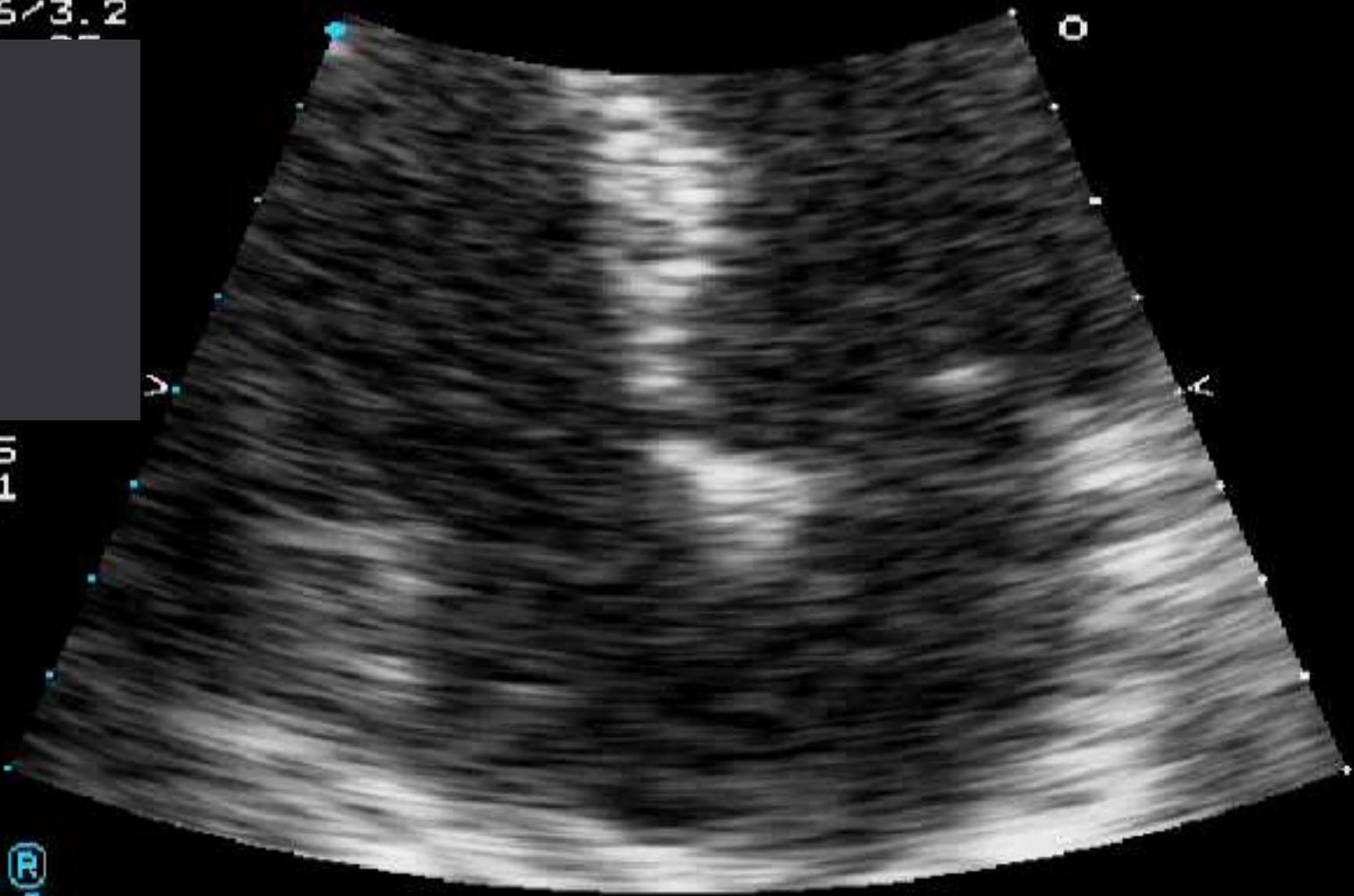
16CM  
111HZ



MI: 1.6  
S3 1.6/3.2

GAIN 75  
COMP 61  
36BPM

16CM  
111HZ



# Atrial Septal Aneurysm

- Bulging of Fossa Ovalis
- Associated commonly with Atrial septal defect or small perforations
  - Left to Right or Right to Left shunt

# Diagnostic criteria for ASA

- Diameter of base of atrial septal aneurysm  $\geq 15\text{mm}$
- Bulging of atrial septum  $\geq 15\text{mm}$
- Motion of the septum during respiration  $\geq 15\text{mm}$

# Associated abnormalities

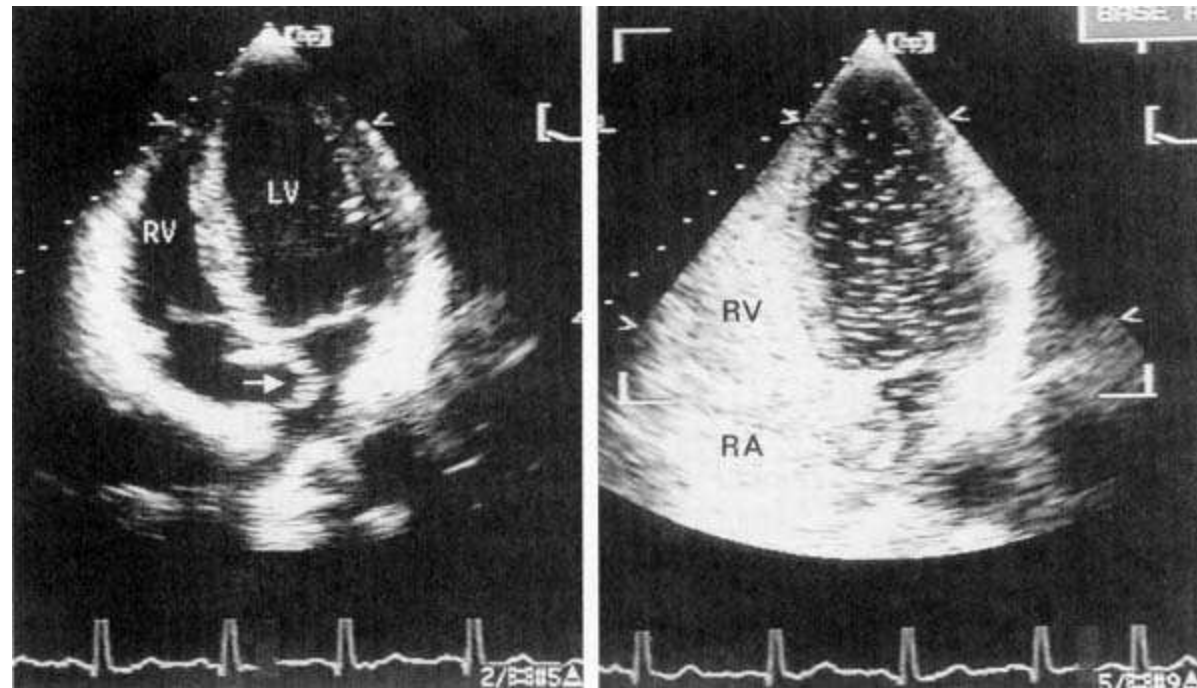
- Cardiac
  - Ascending aorta aneurysm
  - Elongated thoracic aorta
  - Pericardial effusion
  - Constrictive pericarditis
  - Tricuspid regurgitation
  - Redundant Eustacian Valve
- Pulmonary
  - Pulmonary embolism
  - Right pneumonectomy
  - COPD
  - ARDS
  - OSA

# SPARC Study

- Prevalence of ASA is 2.9% in general population
  - 7.9% in patients with cerebral ischemic events
- 56% of pts with ASA have a Patent Foramen Ovale (with Right-Left shunt)
- Paradoxical embolism is major mechanism of vascular events

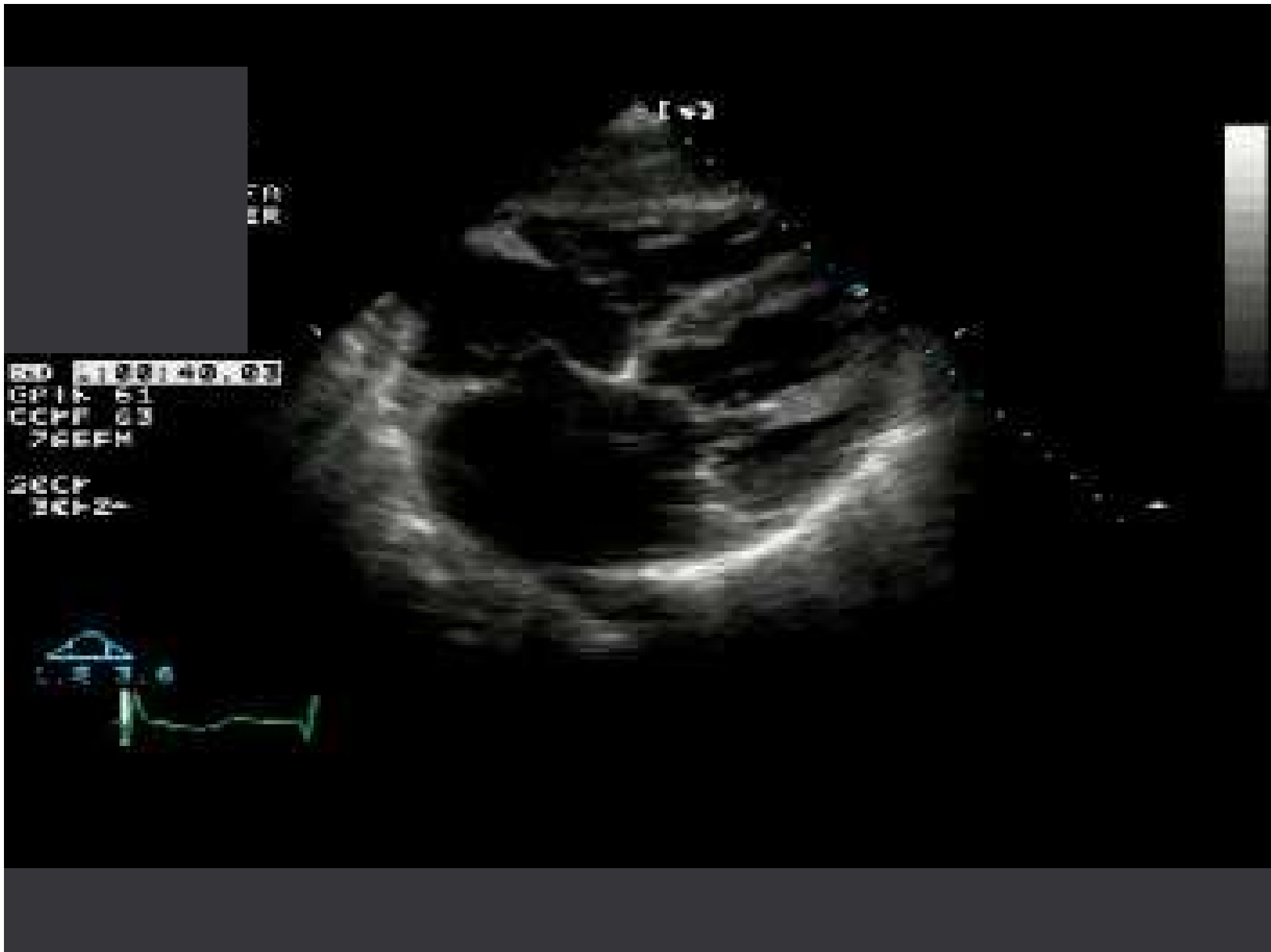
# Chest Guidelines

- 1% prevalence of ASA in autopsy studies
- 3-4% prevalence in TEE studies of non-stroke patients
- High incidence of PFO with ASA (70-83%)
- Anecdotal reports of thrombus in aneurysm



**FIGURE 7–83.** Apical four-chamber view recorded in a patient with an atrial septal aneurysm. Note the marked bulging of the atrial septum into the cavity of the left atrium (arrow). The right-hand panel is recorded after injection of saline contrast medium. Note the contrast medium has filled the right ventricular cavity, and there are numerous individual microbubbles seen in the cavity of both the left atrium and left ventricle, consistent with a right-to-left shunt through fenestrations in the atrial septal aneurysm. Abbreviations are as per previous figures.





PAT T: 37.30 [143]  
TCC T: 39.20

SUPINE



00 0:23:14.22  
GAIN 55  
COMP 75  
REF 1  
12CM  
48HZ





# Chest Guidelines

- Aspirin useful for primary prevention of CVA in patients with atrial septal aneurysm and/or PFO
- In patients with CVA and documented embolic source (DVT) + ASA/PFO with R-L shunt, coumadin recommended long term

MI: 1.6  
S3 1.6/3.2

GAIN 63  
COMP 58  
91BPM

24CM  
23HZ



Next case...  
Apical 4 Chamber

MI: 1.6  
S3 1.6/3.2

GAIN 62  
COMP 60  
95BPM

19CM  
27HZ



Parasternal Long Axis

MI: 1.6  
S3 1.6/3.2

GAIN 64  
COMP 65  
94BPM

19CM  
27HZ



Basal Short Axis

MI: 1.6  
S3 1.6/3.2

GAIN 70  
COMP 59  
94BPM

24CM  
23HZ

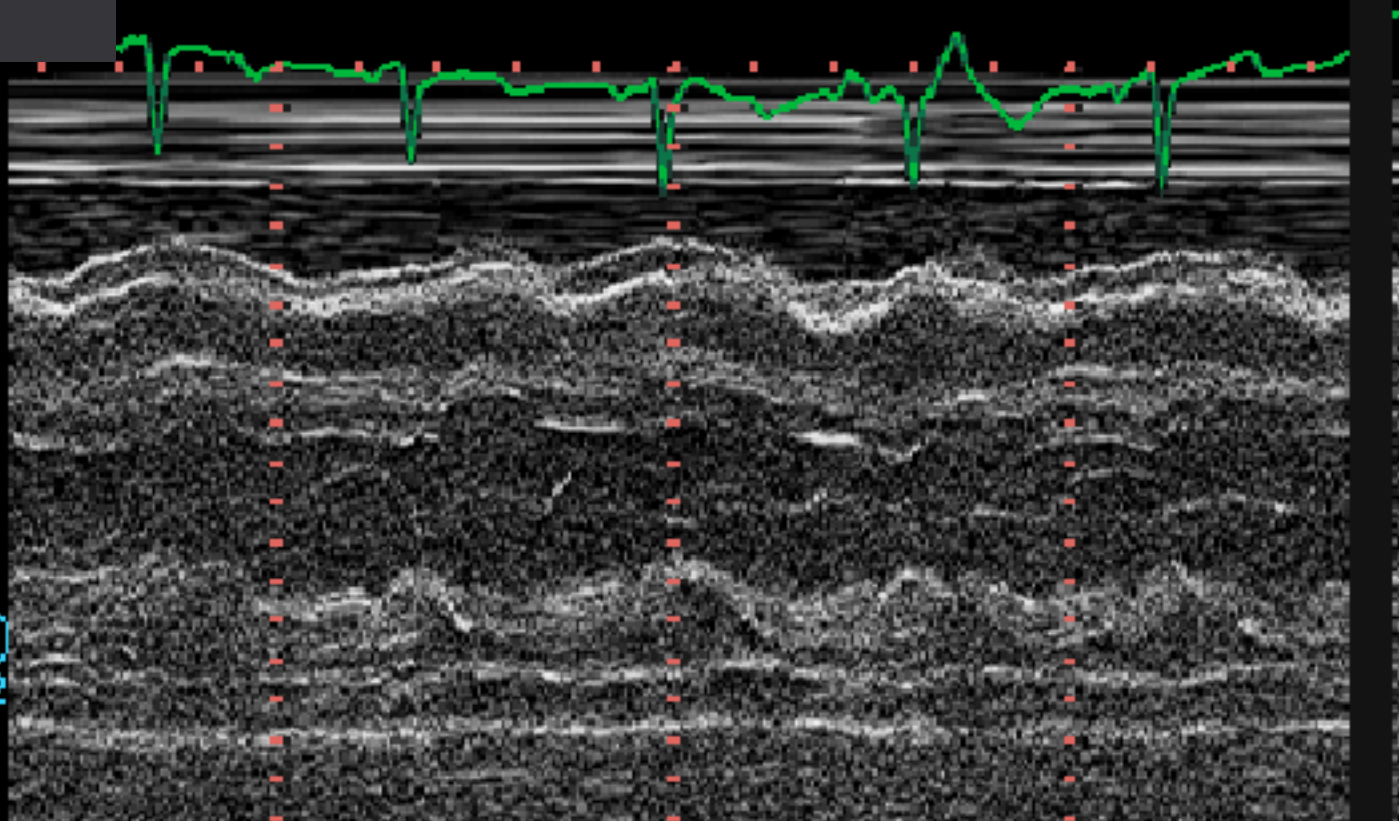
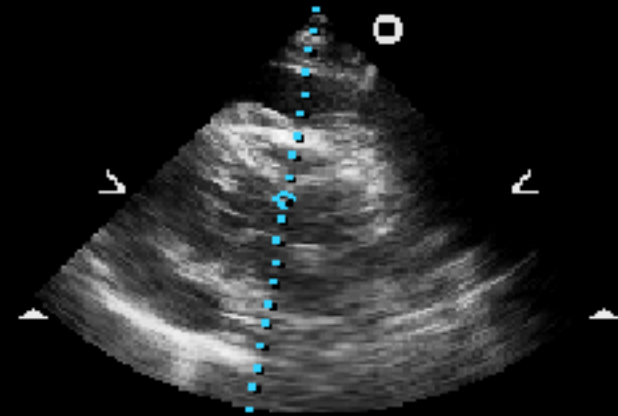


Subcostal view

MI: 1.6  
Car VAECHO M 01:

GAIN 62 COMP 60  
40HZ 19CM  
2/0/A/H5  
94BPM

13 SEP 05  
07:54:50



P T  
1.6 3.2

Parasternal Long M-Mode

# Diagnostic Features of Tamponade

- RA diastolic collapse
  - Occurs when intrapericardial pressure  $\geq 4$
  - Common and early finding
  - High sensitivity, low specificity
  - Best seen on apical and subcostal view
- RV diastolic collapse
  - Occurs when intrapericardial pressure  $\geq 6-8$
  - Occurs after RA compression
  - Lower sensitivity, but high specificity and negative predictive values
  - Best seen on parasternal long, short axis, and subcostal view

# Doppler inflow patterns

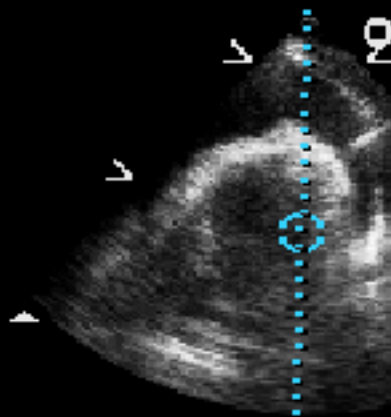
- Mitral
  - During inspiration, decline of 30-50% of E and A velocities
- Tricuspid
  - During inspiration, increase of E wave (>35-80%) and A wave (>25-50%)
    - Normal variation is 10-25%

MI: 1.6  
Car VAECHO PW2

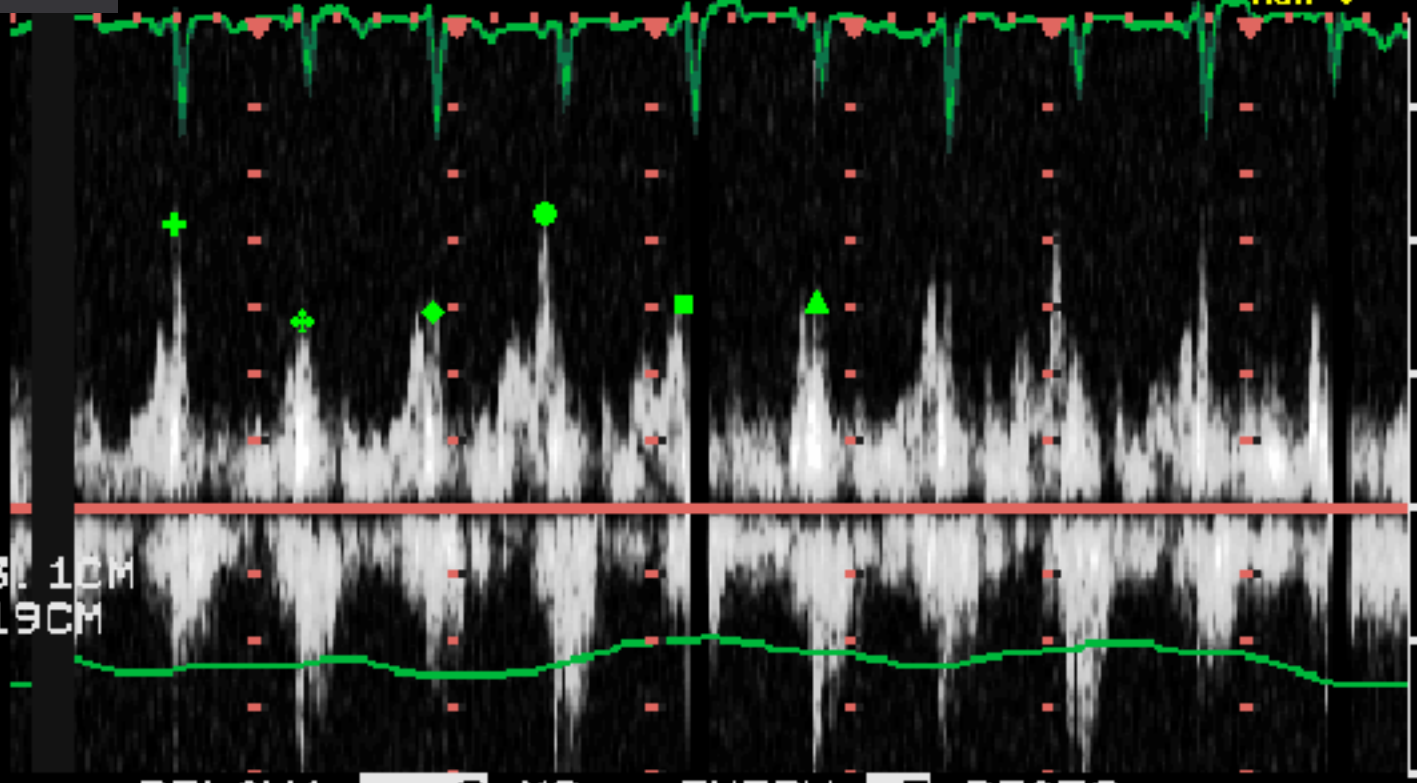
GAIN 63 COMP 58  
24CM  
2/0/C/H5  
92BPM

13 SEP 05  
07:58:49

1.6MHZ



- Max PG = 3.2 mmHg  
Max U = 90 cm/sec
- + Max PG = 2.9 mmHg  
Max U = 86 cm/sec
- Max PG = 1.5 mmHg  
Max U = 62 cm/sec
- ▲ Max PG = 1.6 mmHg  
Max U = 63 cm/sec
- ✦ Max PG = 1.3 mmHg  
Max U = 57 cm/sec
- ◆ Max PG = 1.4 mmHg  
Max U = 60 cm/sec



GATE: 13.1CM  
LEN: 0.19CM  
θ: 0  
▽= 20

DELAY1 0 MS EVERY 5 BEATS

120  
80  
40  
0  
40  
20  
100%  
1 of 1

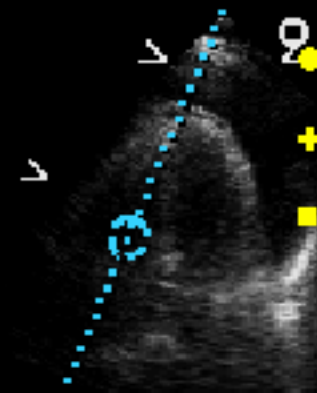
Mitral Valve Inflow Doppler

MI: 1.6  
Car VAECHO PW 03

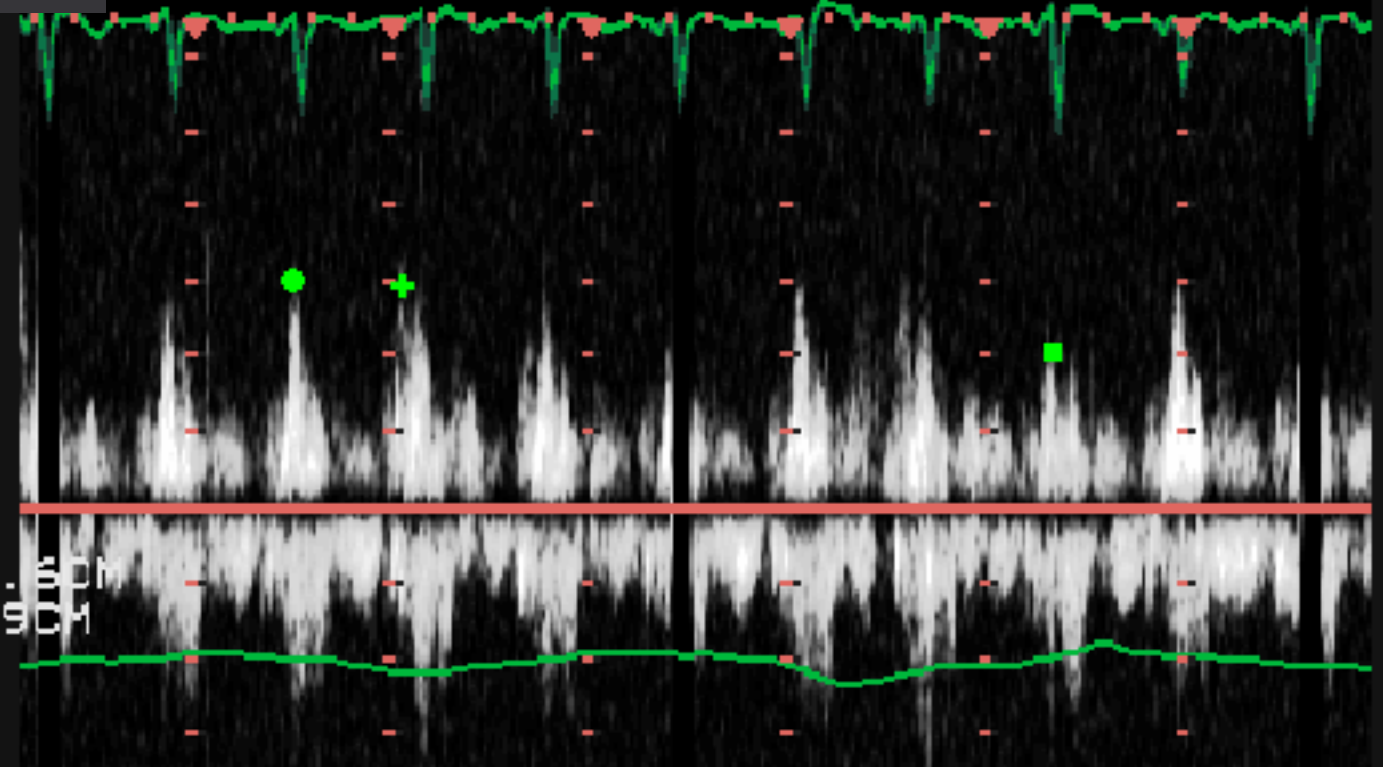
GAIN 63 COMP 58  
24CM  
2/0/C/H5  
93BPM

13 SEP 05  
07:59:42

1.6MHZ



● Max PG = 1.5 mmHg  
Max U = 61 cm/sec  
+ Max PG = 1.4 mmHg  
Max U = 60 cm/sec  
■ Max PG = 0.70 mmHg  
Max U = 42 cm/sec



GATE: 14.5CM  
LEN: 0.19CM  
θ: 0  
▽= 20

DELAY1 0 MS EVERY 5 BEATS

1 of 1

Tricuspid Valve Inflow Doppler

MI: 1.6  
S3 1.6/3.2

GAIN 72  
COMP 71  
81BPM

18CM  
30HZ



Next Case

MI: 1.6  
S3 1.6/3.2

GAIN 75  
COMP 72  
30BPM

18CM  
30HZ



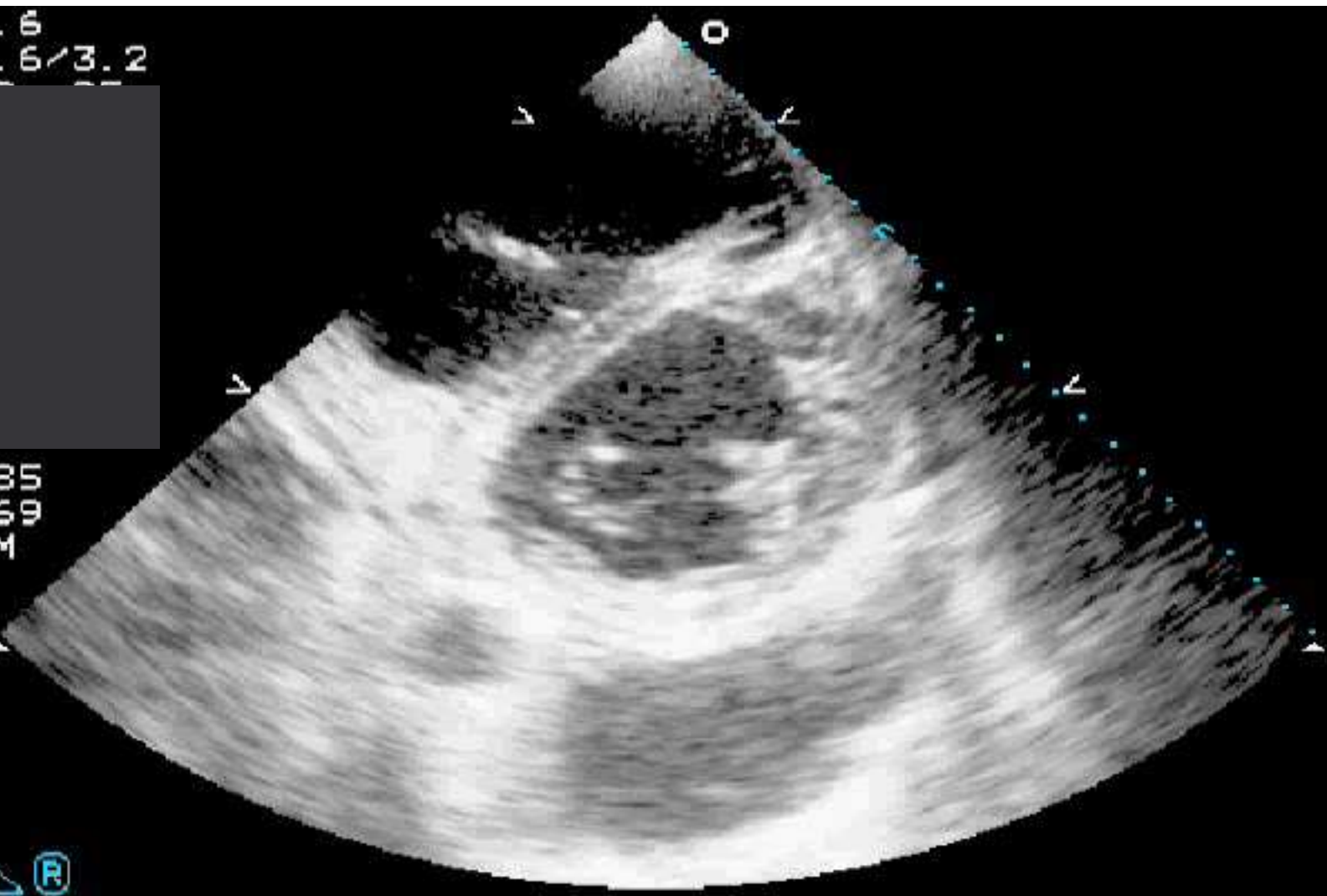
# Pulmonary Hypertension

- RV Pressure overload
  - Flattened or curved septum during late systole and early diastole (D-shaped LV)
- RV Volume overload
  - D-shape LV seen during mid-diastole; during systole normal contour is seen

MI: 1.6  
S3 1.6/3.2

GAIN 85  
COMP 69  
106BPM

23CM  
23HZ



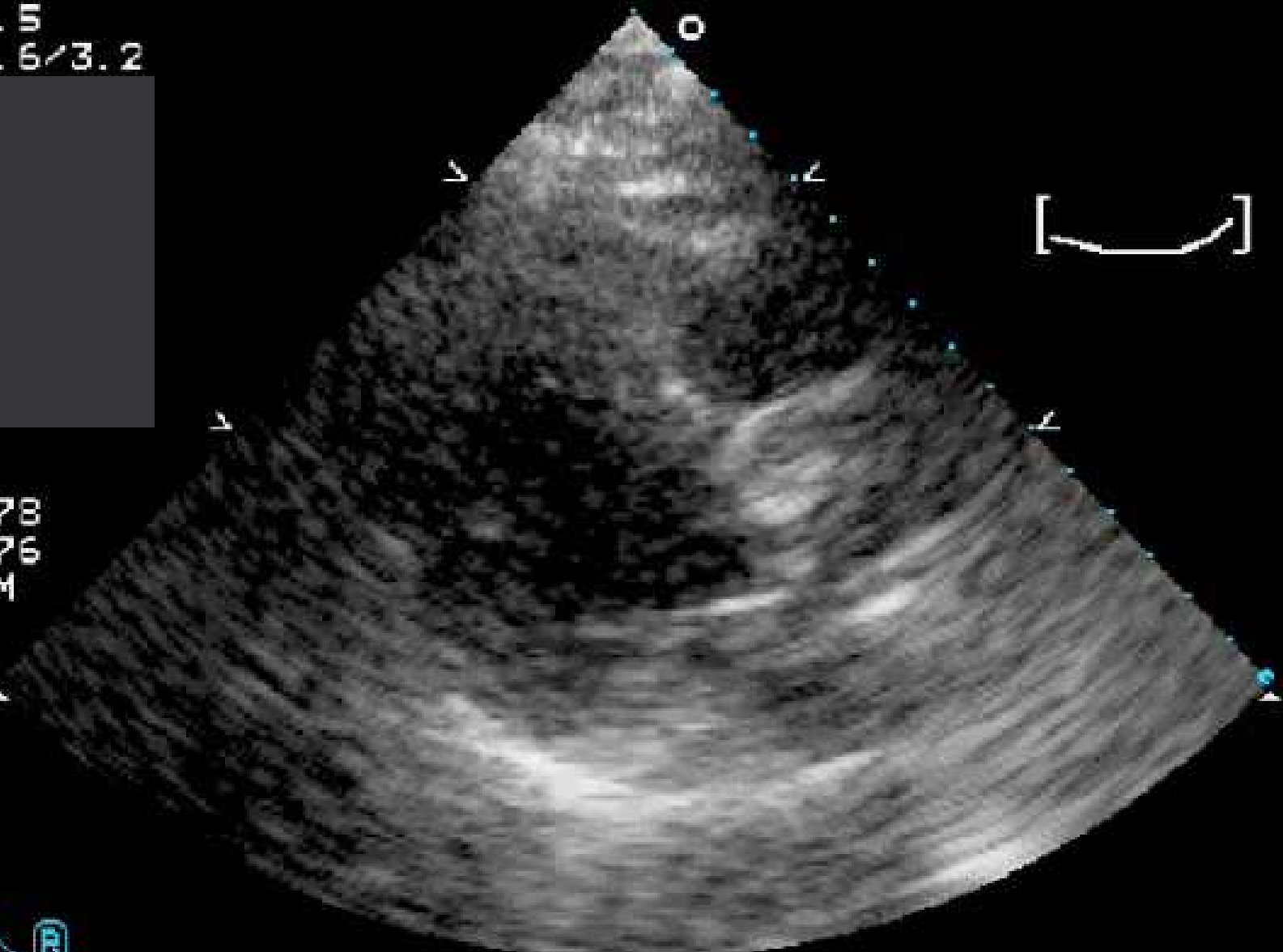
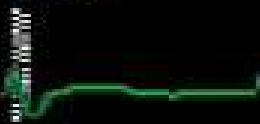
# Next Case

MI: 1.5  
S3 1.6/3.2

GAIN 78  
COMP 76  
97BPM

16CM  
32HZ

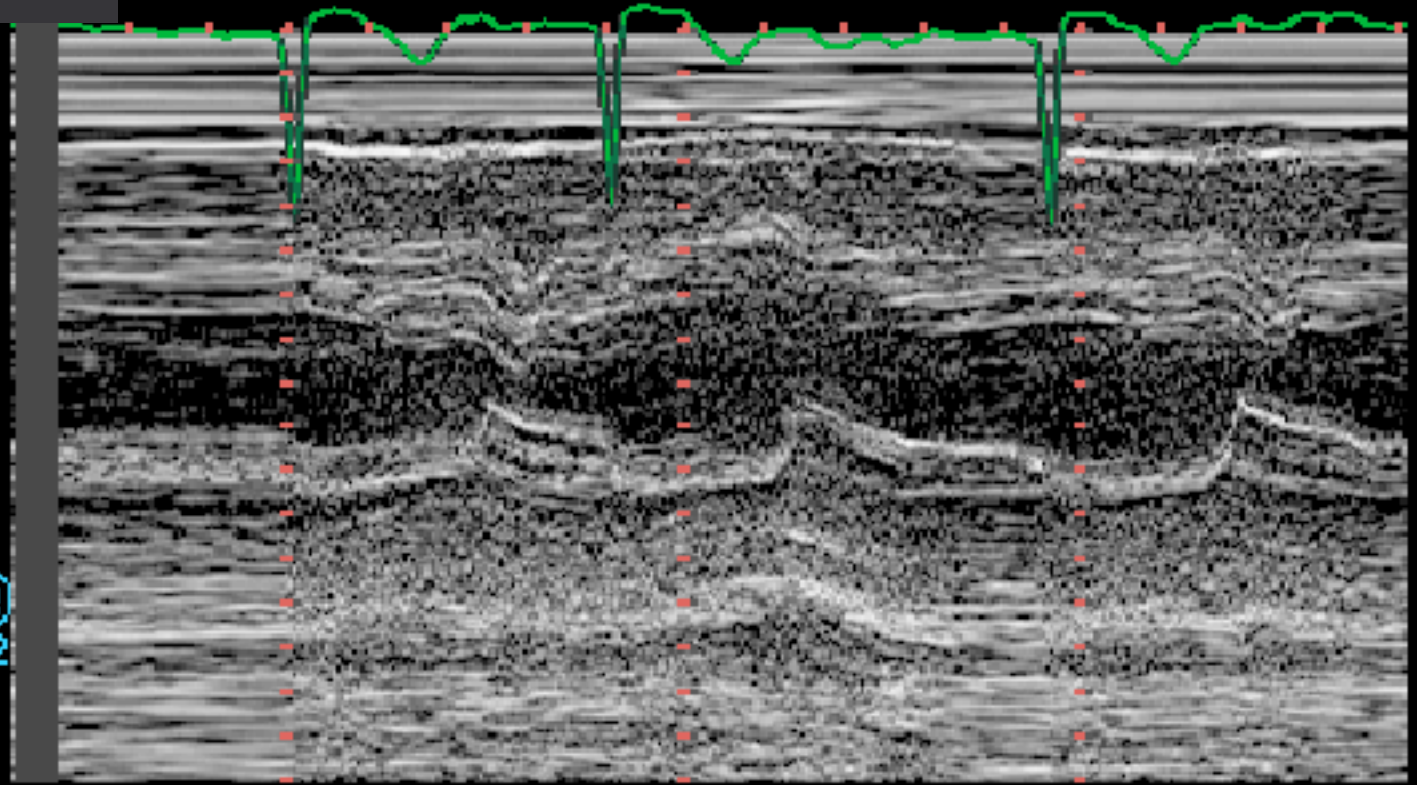
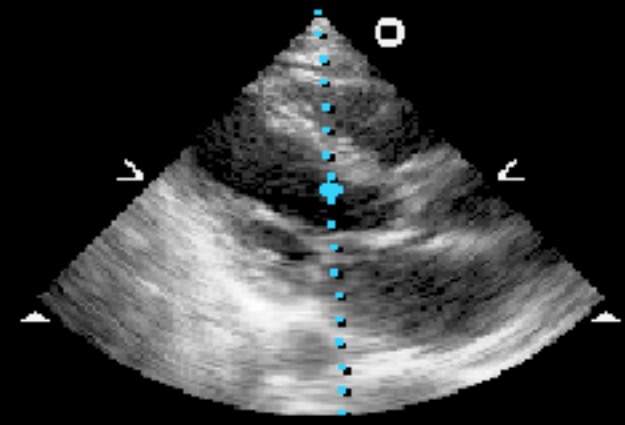
P T R  
1.6 3.2



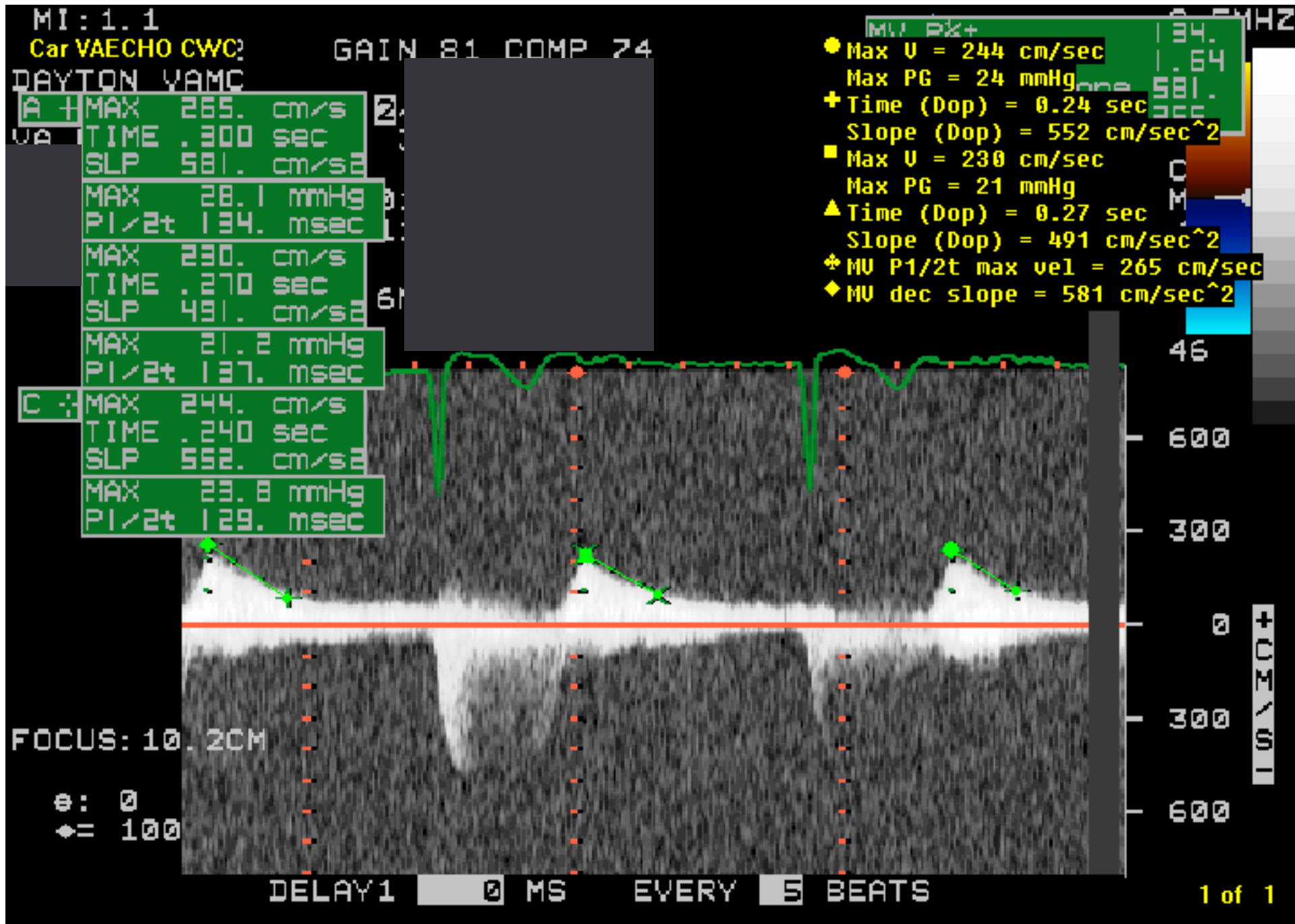
MI: 1.6  
Car VAECHO M 01:

GAIN 82 COMP 69  
44HZ 17CM  
2/0/A/H5  
43BPM

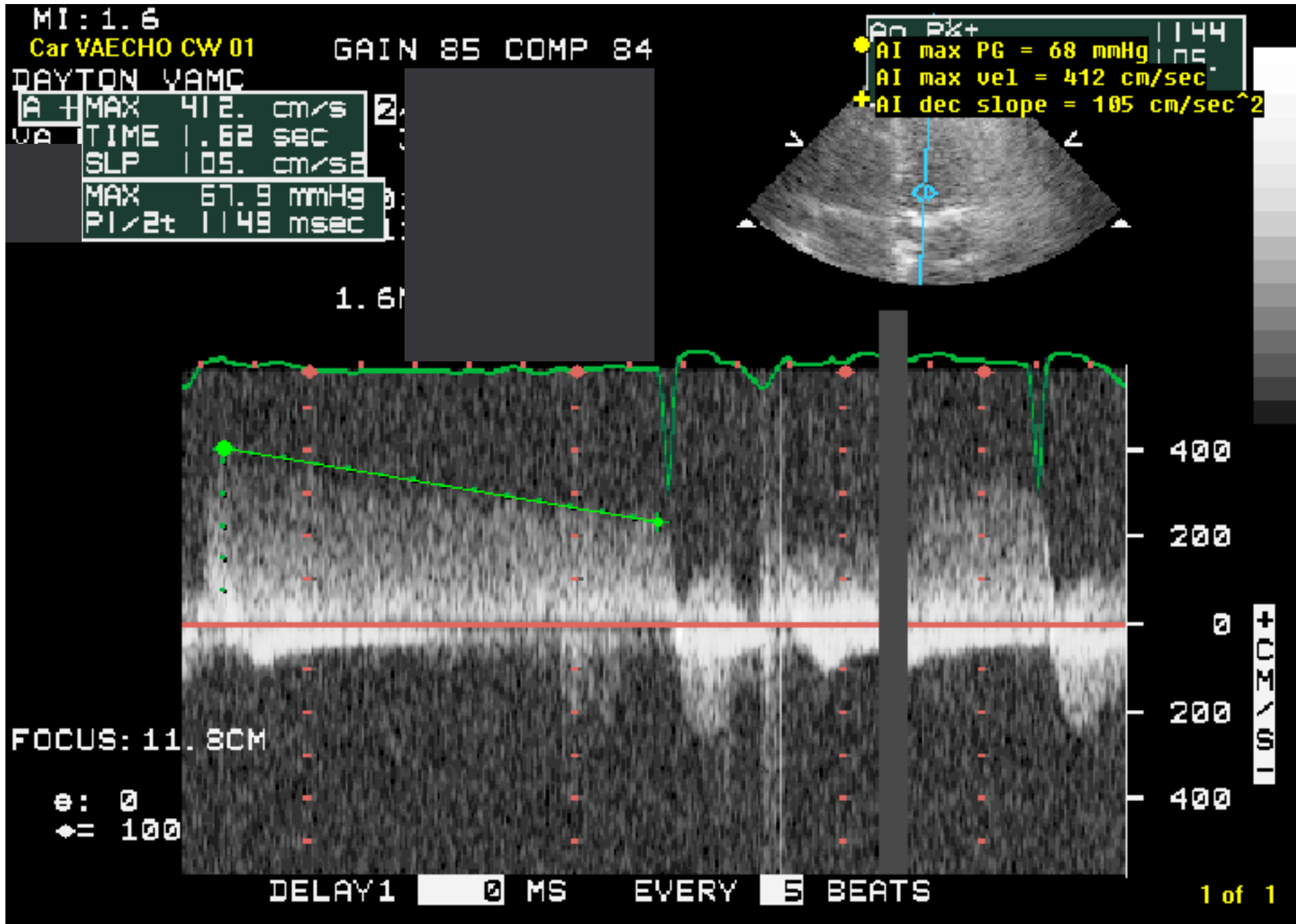
01 SEP 05  
11:10:41



M-Mode of Mitral Valve



Mitral inflow doppler (Pressure Half time)



Aortic Regurgitation doppler (Pressure Half time)

# References

- Deeb N. Salem, MD, FCCP, Chair; Denise Hartnett Daudelin, RN, MPH; Herbert J. Levine, MD; Stephen G. Pauker, MD; Mark H. Eckman, MD and Joshua Riff, BSc. Antithrombotic Therapy in Valvular Heart Disease. *Chest*. 2001;119:207S-219S.
- [Zanchetta M](#), [Rigatelli G](#), [Pedon L](#), [Zennaro M](#), [Maiolino P](#), [Onorato E](#). Role of intracardiac echocardiography in atrial septal abnormalities. *J Interv Cardiol*. 2003 Feb;16(1):63-77.