

41 yr-old man with new-onset dyspnea

Yoram Agmon MD

Echocardiography Laboratory and Heart Valves Clinic

Rambam Health Care Campus

Haifa

41 yo man

- PMH
 - Heavy smoking (30 py)
 - Otherwise – healthy
- Recent-onset symptoms (2 weeks duration; acute onset)
 - Dyspnea
 - Palpitations
- Echocardiography (elsewhere)
 - LVE / LAE; normal LV function
 - Moderate MR (> moderate ??) → hospitalization
 - Mild pulmonary hypertension

Hospitalization

- Physical examination
 - No respiratory distress; O₂ sat = 97% (room air)
 - BP = 130/65 mmHg; HR = 88 bpm (regular)
 - Heart – “apical systolic murmur – 2/6”
 - Lungs – small bilateral pleural effusions; mild congestion
 - No jugular venous distention / hepatomegaly / periph. edema
- CXR
 - Small bilateral pleural effusions
 - Pulmonary venous congestion
- Lab – normal CBC / routine chemistry
- Repeat echocardiographic exam

TTE + TEE

- Mild LVE
 - Hyperdynamic LV (LVEF 70-75%)
- Moderate LAE
- Normal RV size / function
- Mild MR
- PA pressure – not measurable
- Moderate systemic venous congestion
 - Estimated RAP ~ 15 mmHg
- Bilateral pleural effusions

11/10/2012 11:59:26AM TISO.1 MI 0.5

X7-2t/3DTEE

FR 52Hz
13cm

M4

2D
67%
C 50
P Off
Gen



JPEG

84 bpm

PAT T: 37.0C

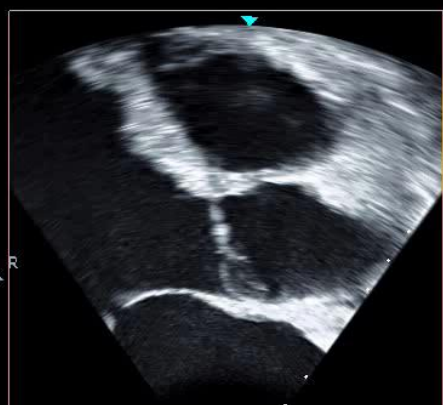
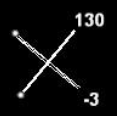
11/10/2012 12:05:23PM TISO.1 MI 0.5

X7-2t/3DTEE

M4

FR 52Hz
13cm

xPlane
67%
67%
50dB
P Off
Gen



JPEG

82 bpm

PAT T: 37.0C
TEE T: 39.7C

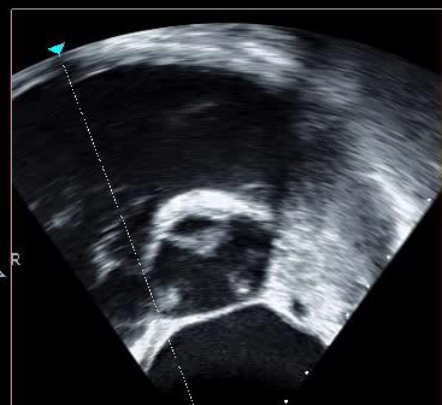
11/10/2012 11:59:20AM TISO.1 MI 0.5

X7-2t/3DTEE

M4

FR 36Hz
13cm

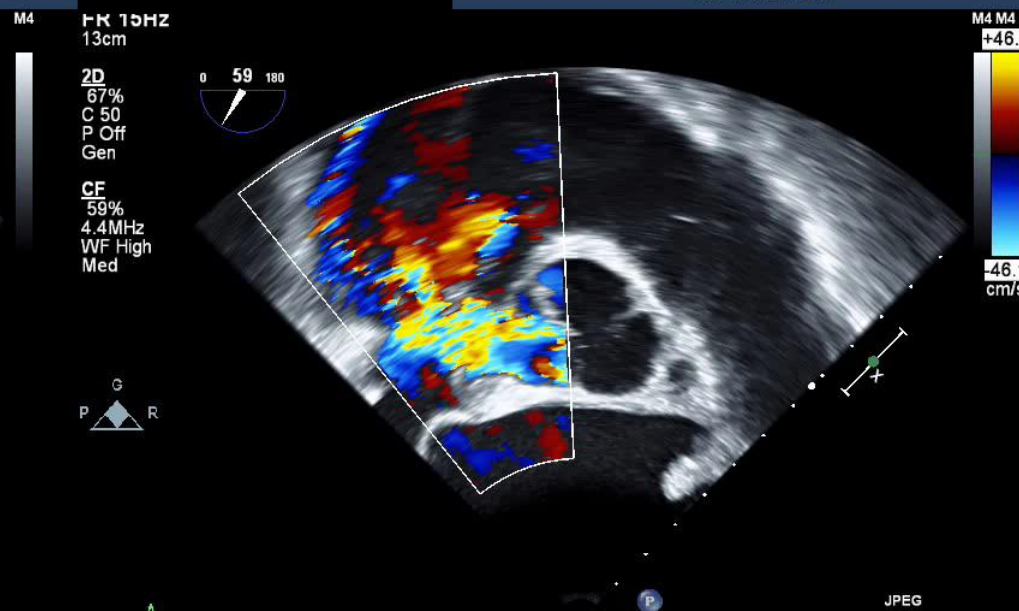
xPlane
67%
67%
50dB
P Off
Gen



JPEG

84 bpm

PAT T: 37.0C
TEE T: 39.6C

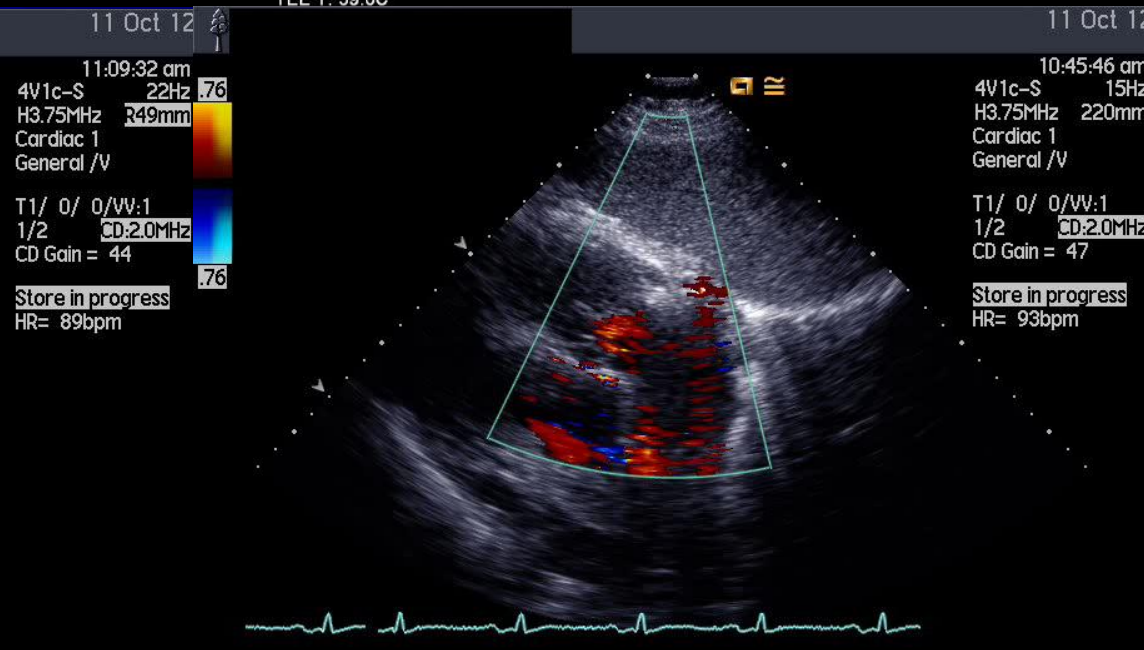
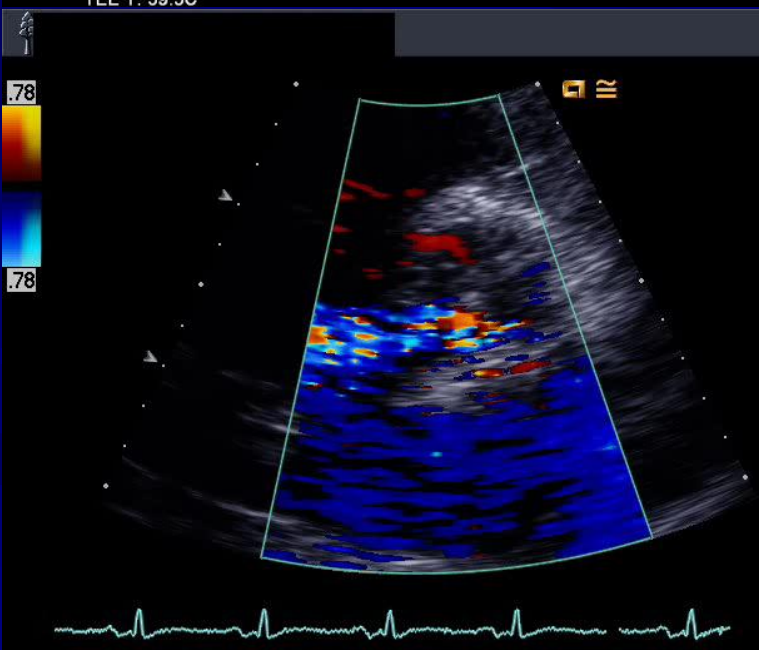


PAT T: 37.0C
TEE T: 39.5C

JPEG 84 bpm

PAT T: 37.0C
TEE T: 39.6C

JPEG 81 bpm



Dx – Ruptured Sinus of Valsalva Aneurysm

- Non-coronary sinus of Valsalva
- Left-to-right shunt
 - Non-coronary sinus → RA
 - Continuous (systolic & diastolic) shunt

Additional finding?

FR 1024
15cm
2D
78%
C 50
P Off
Pen

FR 1024
13cm
2D
69%
C 50
P Off
Gen

M4 M4
+40.5
-40.5
cm/s

0 106 180

0 130 180

CF
59%
4.4MHz
WF High
Med

CF
59%
4.4MHz
WF High
Med

M4 M4
+49.8
-49.8
cm/s

G
P R

G
P R

PAT T: 37.0C
TEF T: 40.5C

87 bpm

PAT T: 37.0C
TEF T: 40.1C

83 bpm

11 Oct 12

11 Oct 12

.80
.80

.78
.78

11:07:55 arr
4V1c-S 22Hz 78
H3.75MHz R39mm
Cardiac 1
General /V
T1/ 0/ 0/VV:1
1/2 CD:2.0MHz
CD Gain = 44
Store in progress
HR= 91bpm

11:09:32 am
4V1c-S 22Hz
H3.75MHz R49mm
Cardiac 1
General /V
T1/ 0/ 0/VV:1
1/2 CD:2.0MHz
CD Gain = 44
Store in progress
HR= 89bpm



SVA & AR

- AR – relatively common complication of SVA* (\pm rupture)
- Mechanism – distortion of respective aortic cusp by SVA
 - Secondary degenerative changes
- Treatment of AR
 - Surgical Rx of SVA
 - Occasional need for additional aortic valve surgery (AVR)
- AR – indication for early intervention in SVA (?)

AR Severity?

FR 1024
15cm
2D
78%
C 50
P Off
Pen
CF
59%
4.4MHz
WF High
Med



M4 M4
+40.5
-40.5
cm/s

FR 1024
13cm
2D
69%
C 50
P Off
Gen
CF
59%
4.4MHz
WF High
Med



M4 M4
+49.8
-49.8
cm/s



PAT T: 37.0C
TEF T: 40.5C

87 bpm

PAT T: 37.0C
TEF T: 40.1C

83 bpm

11 Oct 12

11 Oct 12

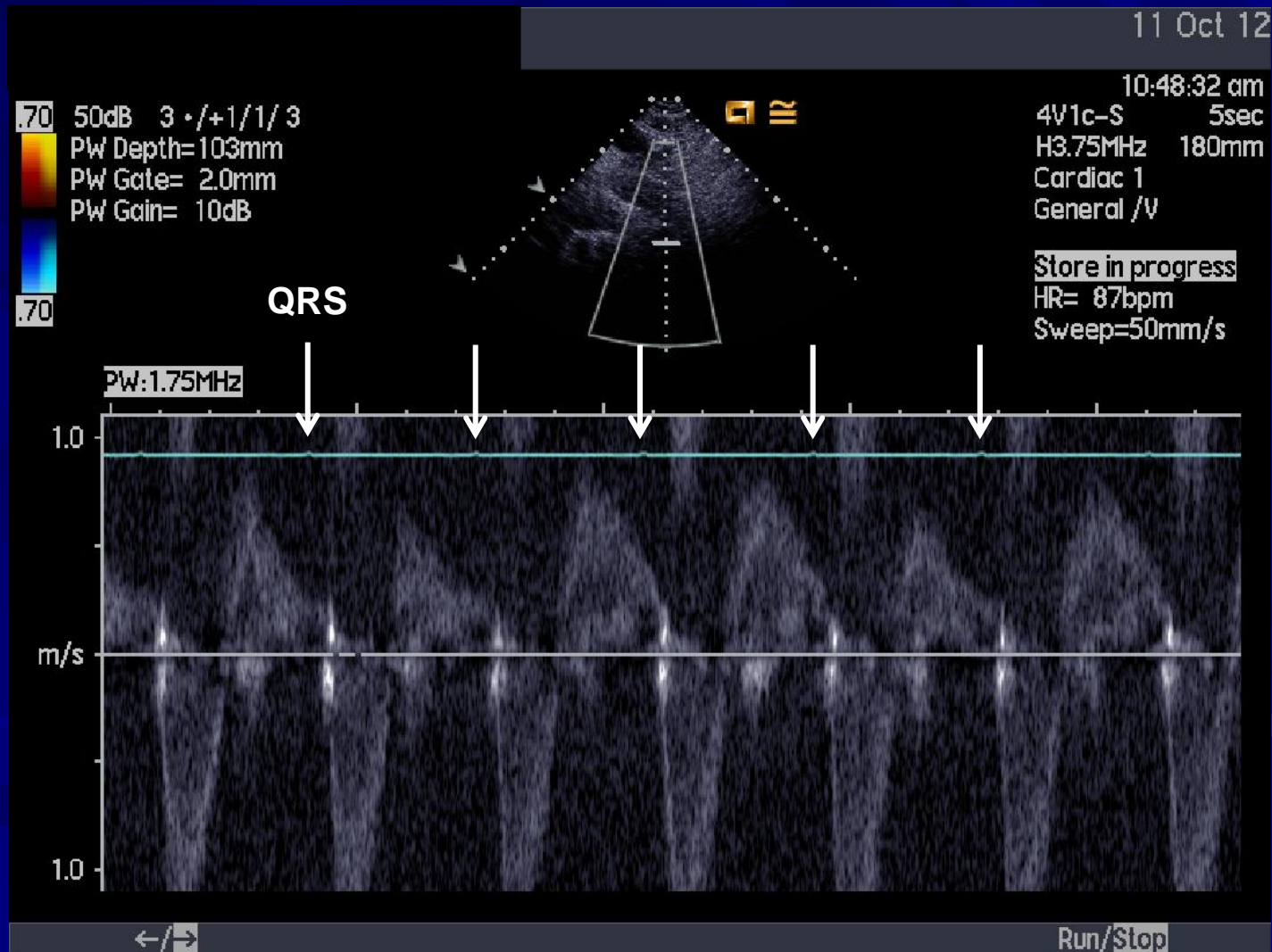
.80
.80

11:07:55 arr
4V1c-S 22Hz 78
H3.75MHz R39mm
Cardiac 1
General /V
T1/ 0/ 0/VV:1
1/2 CD:2.0MHz
CD Gain = 44
Store in progress
HR= 91bpm

11:09:32 am
4V1c-S 22Hz
H3.75MHz R49mm
Cardiac 1
General /V
T1/ 0/ 0/VV:1
1/2 CD:2.0MHz
CD Gain = 44
Store in progress
HR= 89bpm



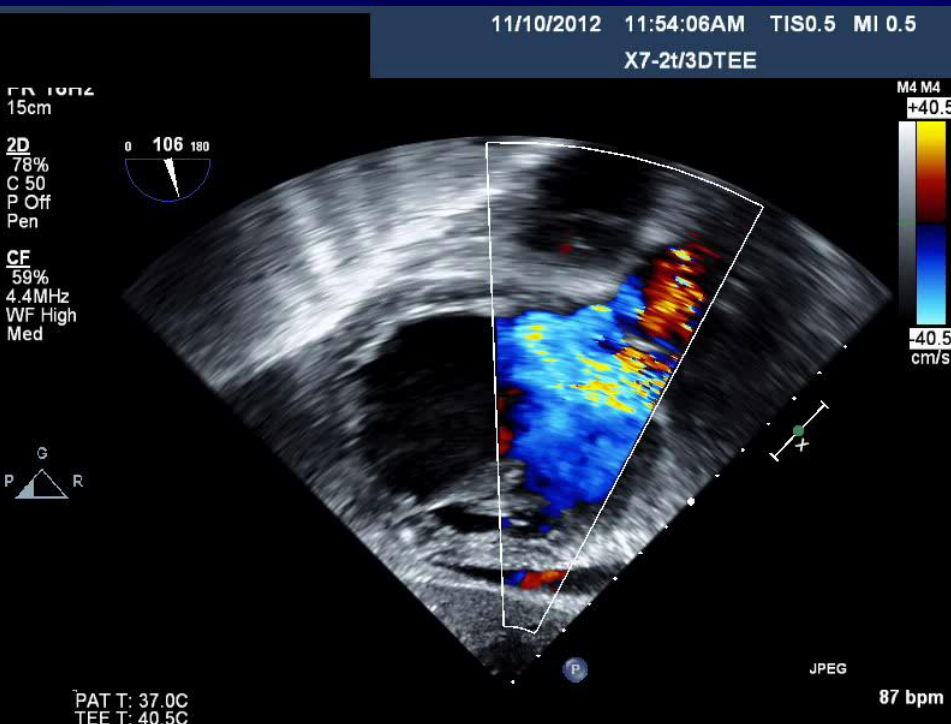
PW Doppler – Supra-sternal



AR Severity?

Intermittent AR

Respiration-dependent



Intermittent AR

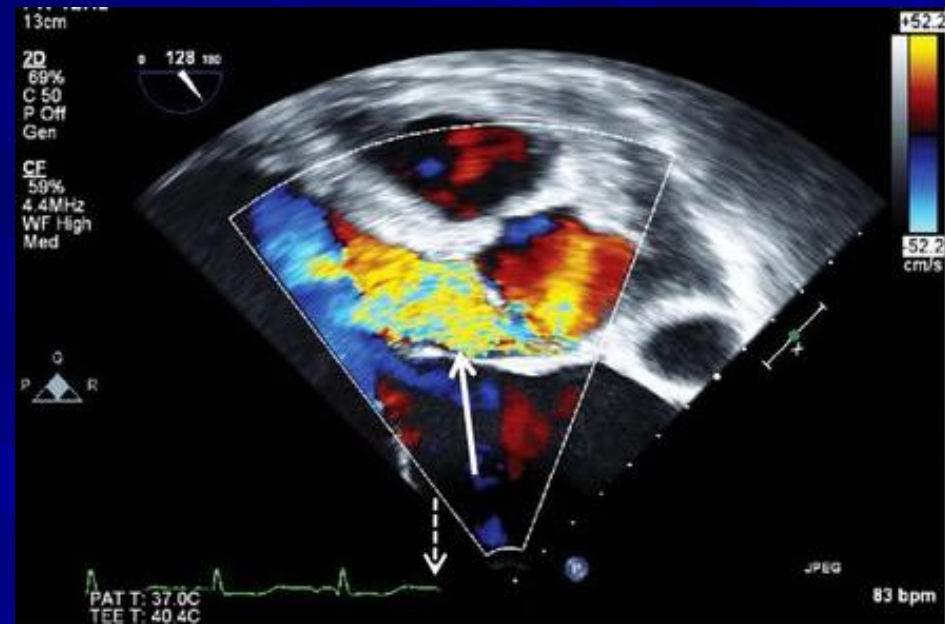
Respiration-dependent

Mid-diastolic frames



Expiration

- Flow via SVA
- No AR

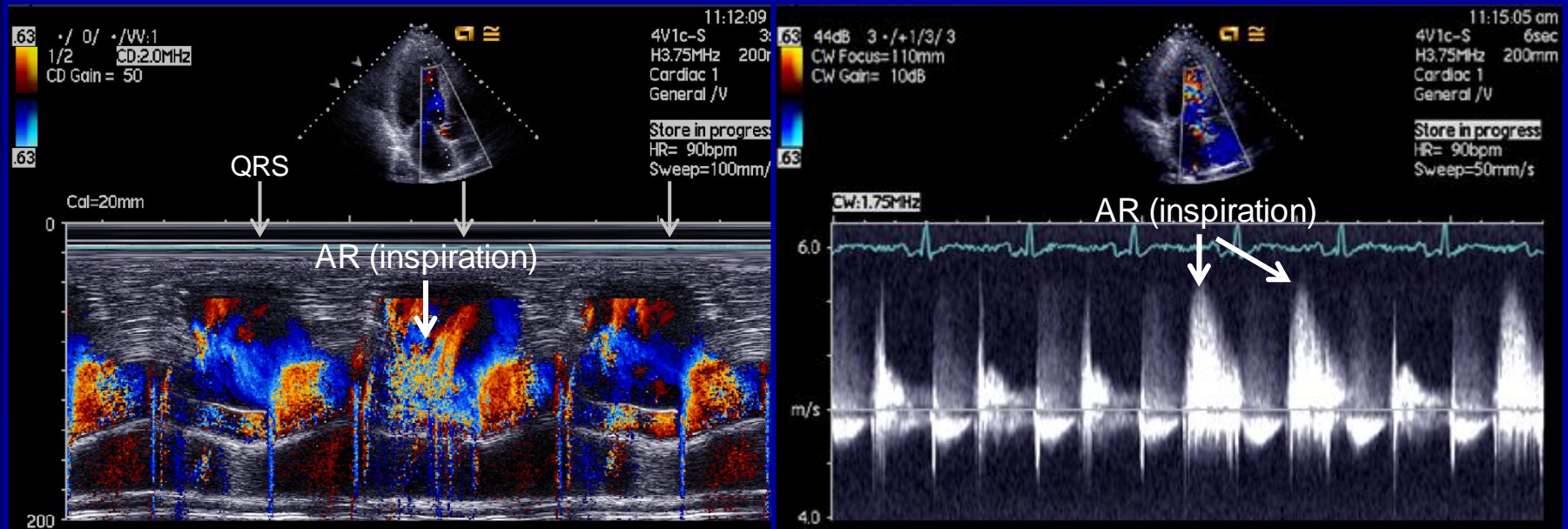


Inspiration

- Flow via SVA (Δ ?)
- Severe AR

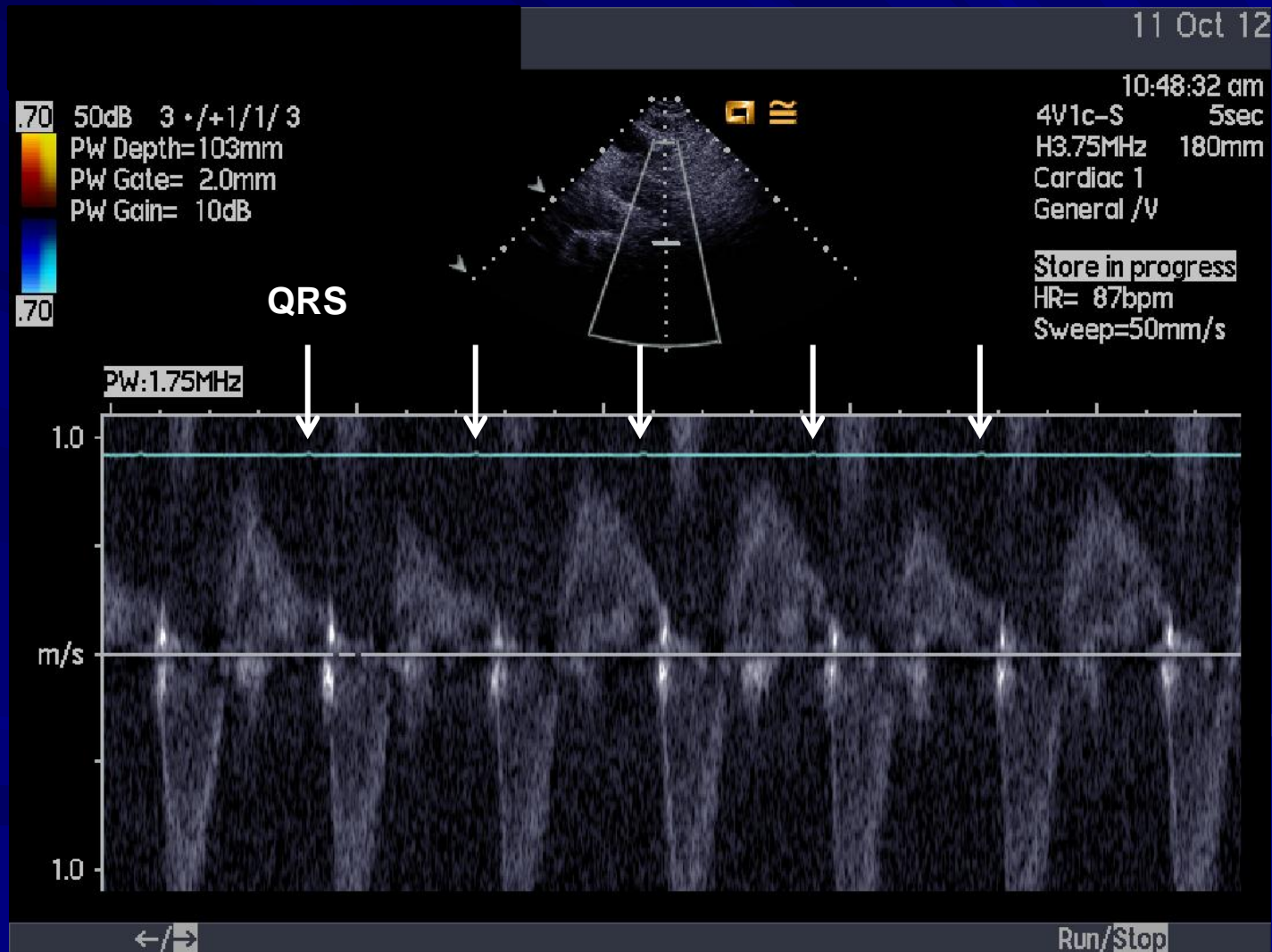
Intermittent AR

Respiration-dependent



Respiratory Δ s in RA pressure / size / intra-cavitary flow
→ Intermittent (inspiratory) SVA distortion
→ Intermittent AR

Why is flow reversal continuous?

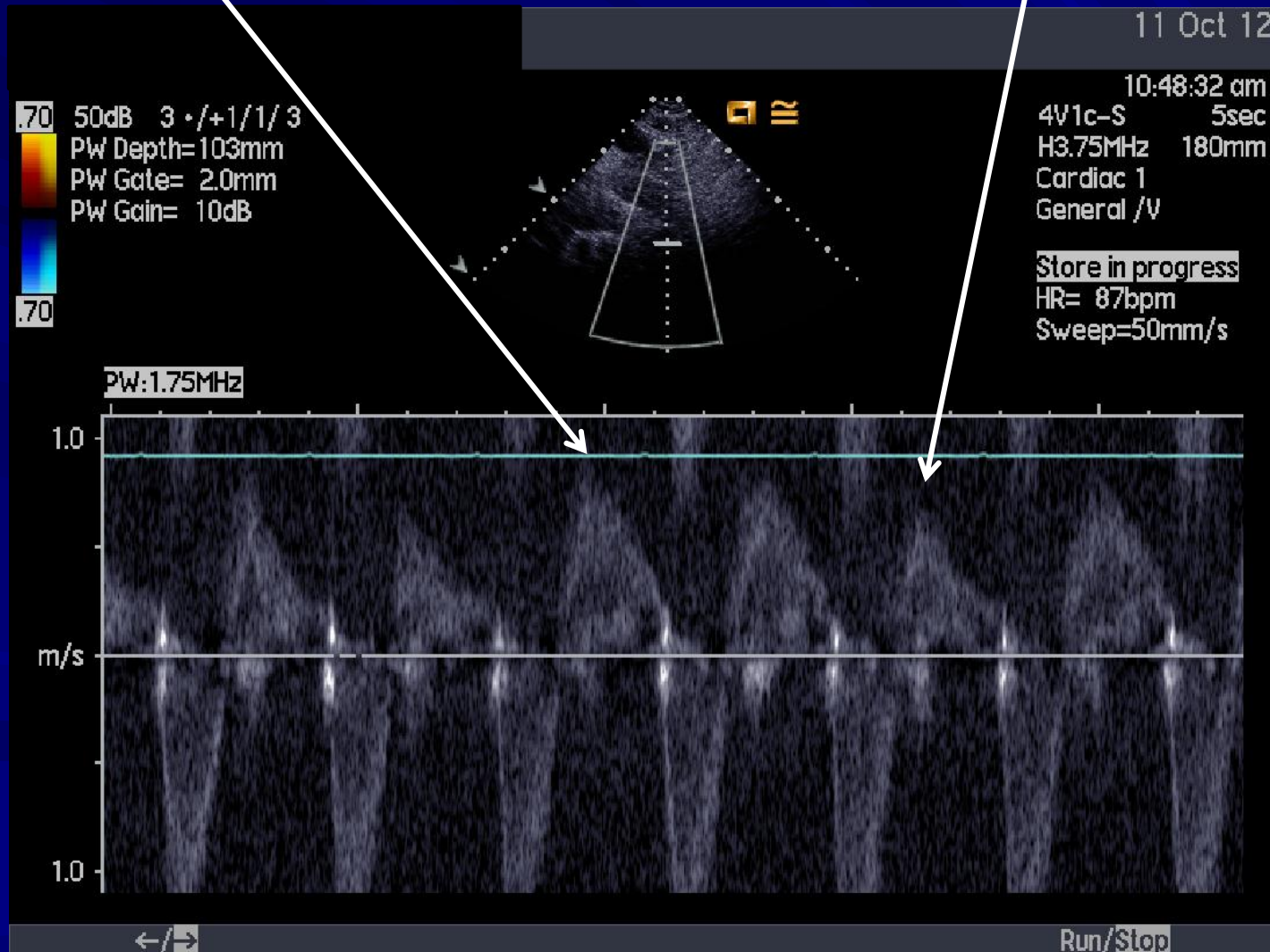


Flow reversal during inspiration

- SVA
- AR

Flow reversal during expiration

- SVA



Follow-up

- **Cardiac surgery**
 - Confirmation of echocardiographic findings
 - Aortotomy → direct sutures & patch closure of defect
 - Right atriotomy → direct sutures
 - **No aortic valve intervention**
- Intra-operative TEE & post-operative TTE
 - **No residual shunt**
 - **No AR**

IMAGE FOCUS

doi:10.1093/ehjci/jet031

Intermittent respiration-dependent aortic valve regurgitation in a patient with a ruptured aneurysm of the non-coronary sinus of Valsalva

Michael Mutlak¹ and **Yoram Agmon^{2,3*}**

¹Department of Internal Medicine E, Rambam Health Care Campus, Haifa, Israel; ²Echocardiography Laboratory and Heart Valves Clinic, Department of Cardiology, Rambam Health Care Campus, Haifa, Israel; ³Department of Cardiology, Rambam Health Care Campus, Haifa, Israel

* Corresponding author. Tel: +972 4 612 3434

