

Tranesophageal Echo

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Objectives

- Understand appropriate indications for TEE
- Understand and recognize standard views of transesophageal echocardiogram (TEE)
- Understand limitations and pitfalls of TEE

History

- First performed by Franzin et al in 1976
- Multiplane probe in 1985
 - Allowed the clinical utility to expand
 - Ultrasound crystals are located in a multiplane array, either square or circular probe
 - Allows the phased array technology to be steered in a 180 degree arc
- Introduced clinically in the United States in 1987
- Now estimated that 5-10% of those undergoing transthoracic echo will need additional exam with TEE

Indications

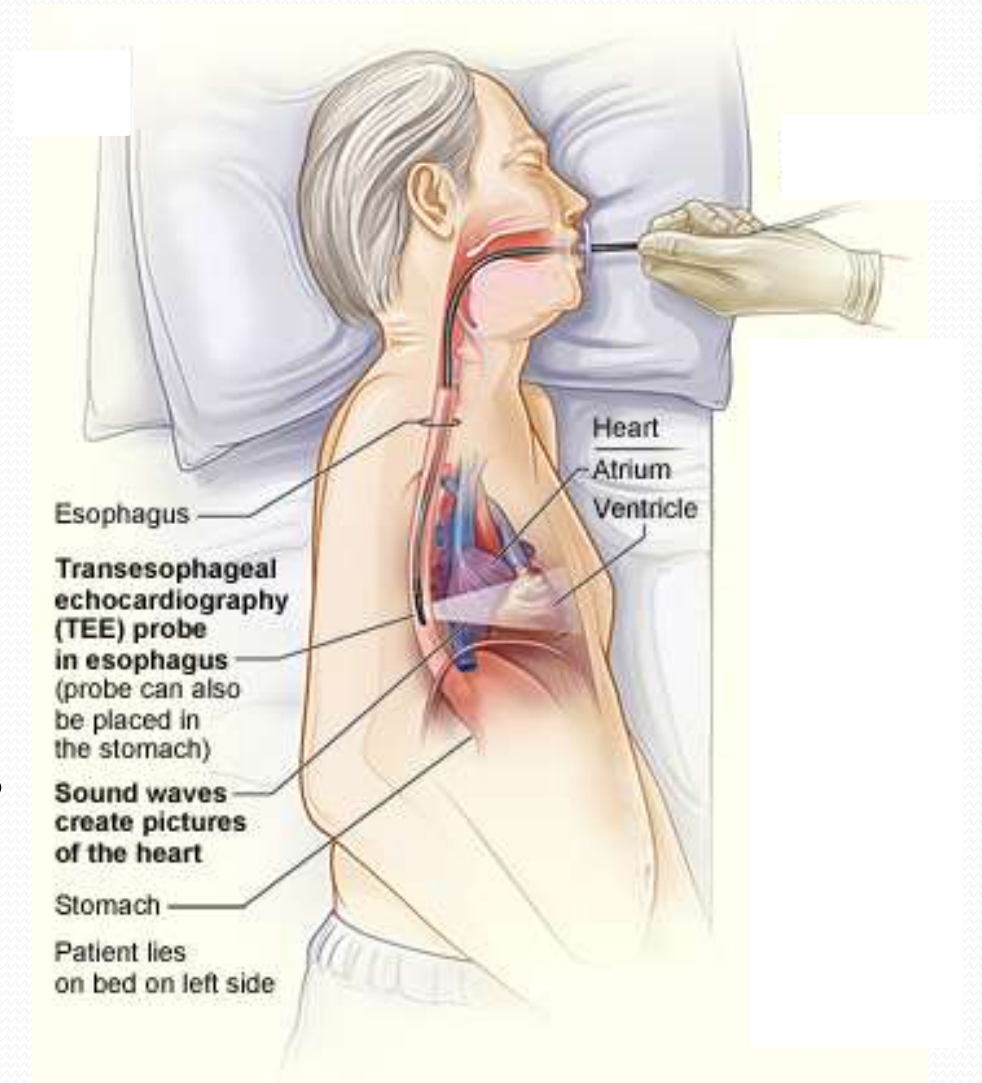
- Evaluation of cardiac source of embolism
 - Left atrial appendage
 - Pre-cardioversion
 - Patent foramen ovale
- Evaluation for endocarditis
 - Sensitivity of TTE ~ 62%
 - Sensitivity of TEE 92-94%
- Aortic dissection
- Congenital heart disease
- Critically Ill patients
- Imaging Guidance for Percutaneous cardiac interventions

Preparation

- Fasting for 4 hours
- Explanation of procedure to patient
- Baseline vital signs
- Removal of dentures and/or oral prostheses
- Oral suction
- Patient position
 - Left lateral decubitus position
- Medications
 - Topical lidocaine
 - Viscous lidocaine
 - IV sedation

Procedure

- Hemodynamic monitoring
- Local anesthetic
- Scope lubricant
- Bite block
- Conscious sedation
- Intubation of esophagus
- Oral suction

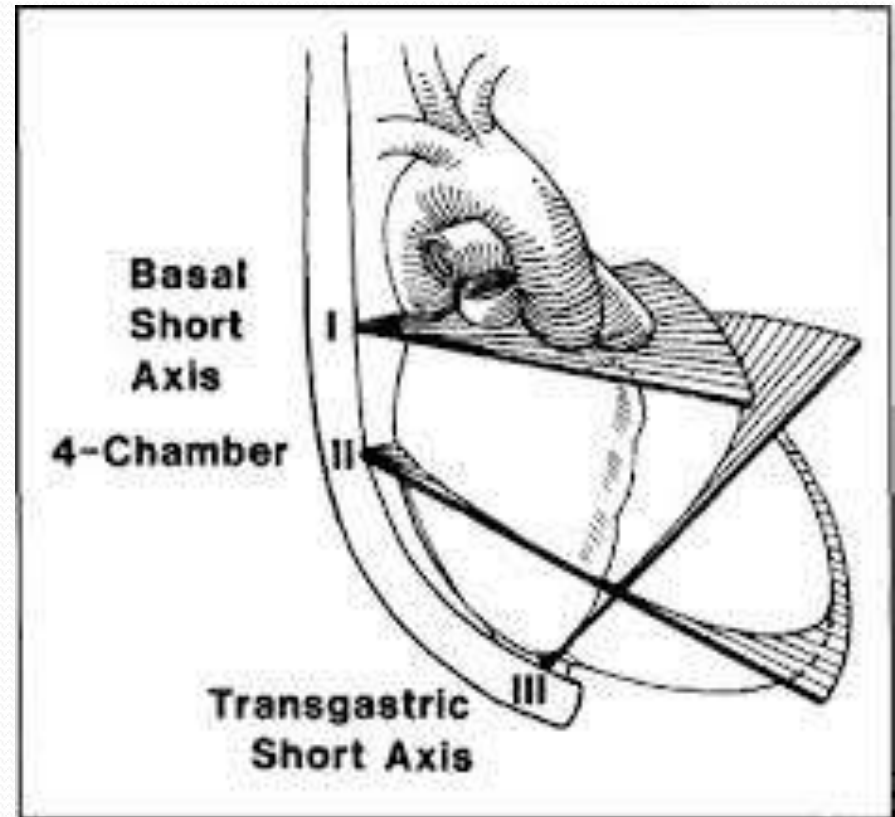


Procedural complications

- Uncomfortable more than risky
- Risk of conscious sedation
- Risks of topical lidocaine
 - Methemoglobinemia
- Laryngospasm and throat pain
- Aspiration
- Serious complications are less than 1 in 5000
 - Esophageal rupture
 - GI bleeding
 - Pharyngeal hematoma

Views

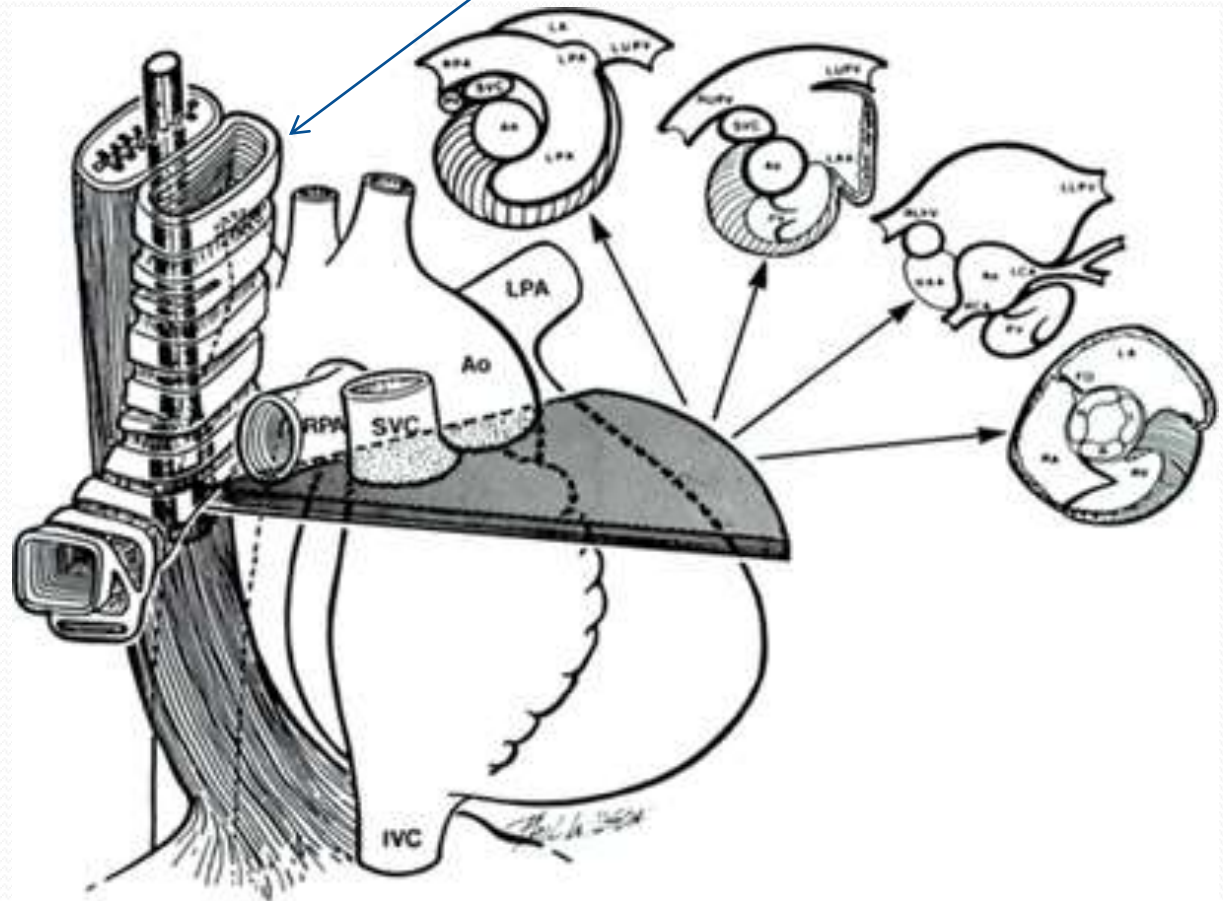
- Three main locations
- Horizontal (transverse) plane
 - Multi-planar imaging
 - 0 – 180 degree arc
- Vertical plane
 - Physical rotation of probe from posterior to anterior



Upper esophagus

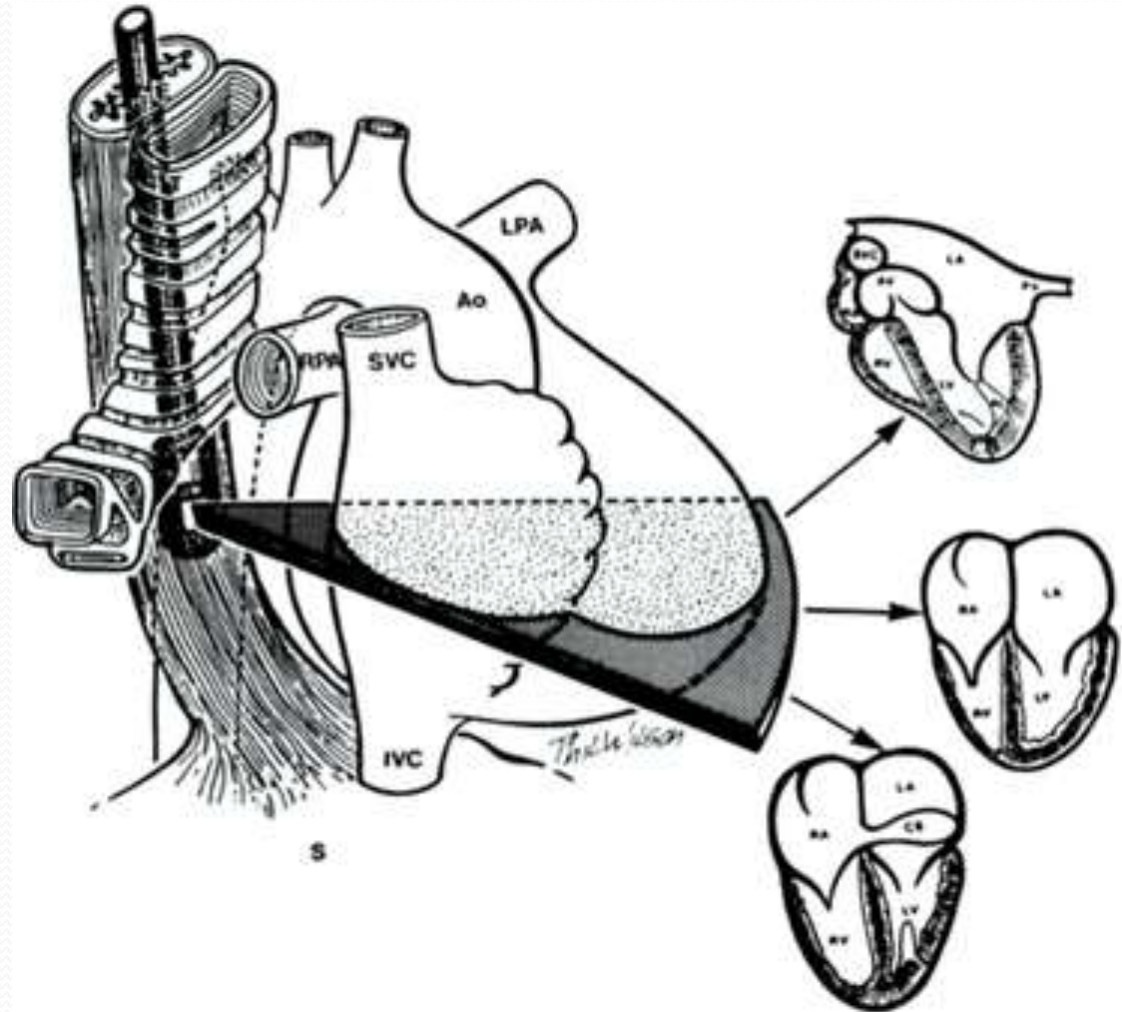
- Left ventricular outflow tract
- Left atrial appendage
- Pulmonary valve
- Aortic valve
- Pulmonary artery

Trachea



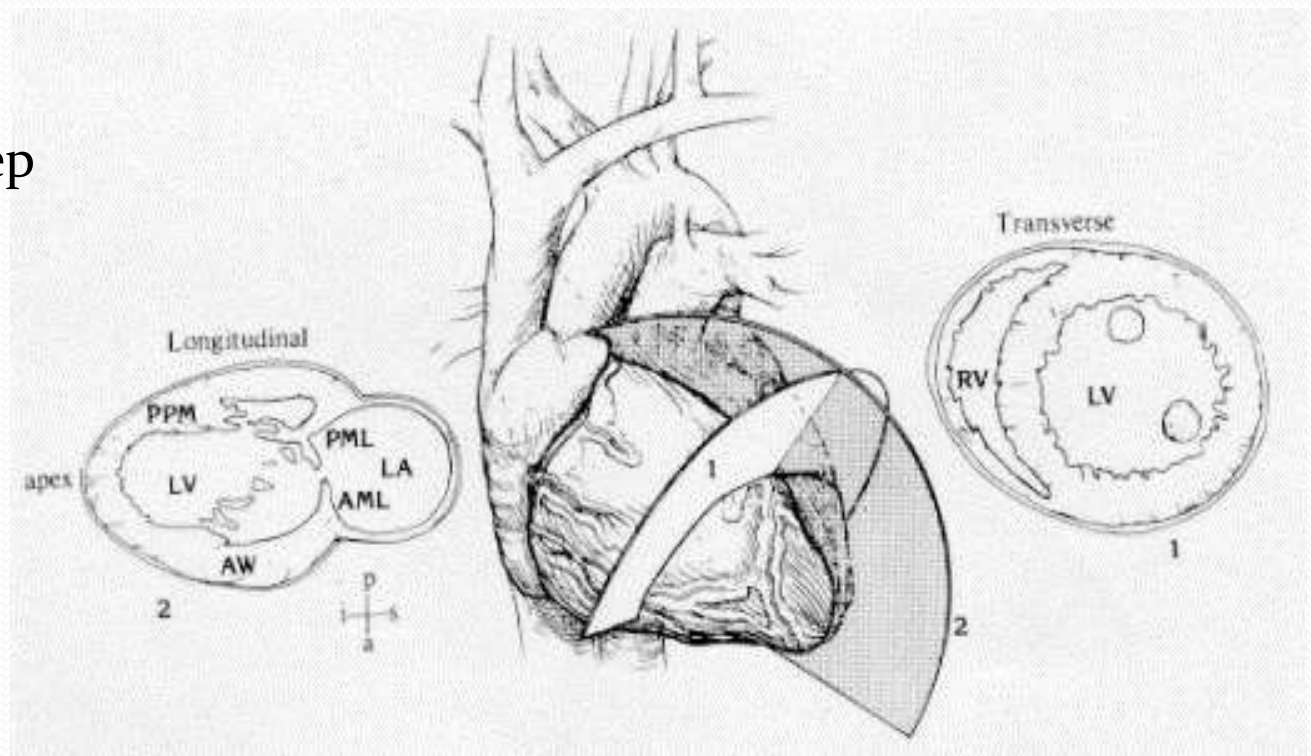
Mid esophagus

- Left ventricle
- Mitral valve
- Tricuspid valve

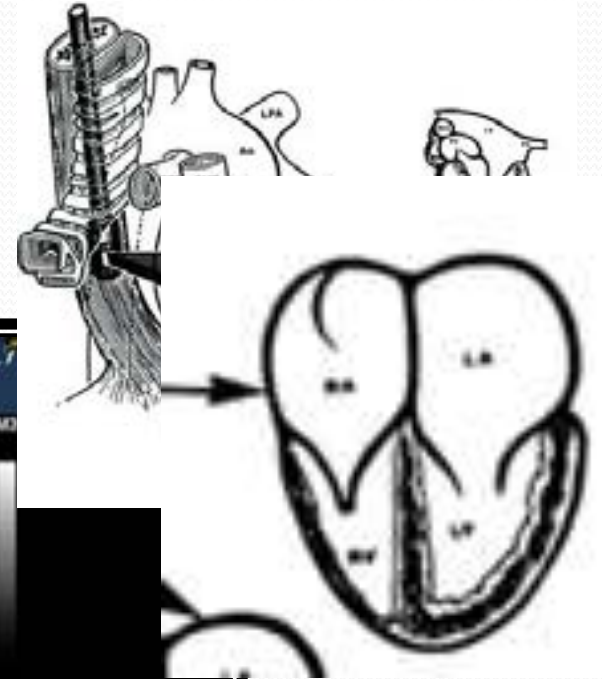


Transgastric

- Left ventricle
- Tricuspid valve
- Mitral valve
- Aortic valve (deep gastric)



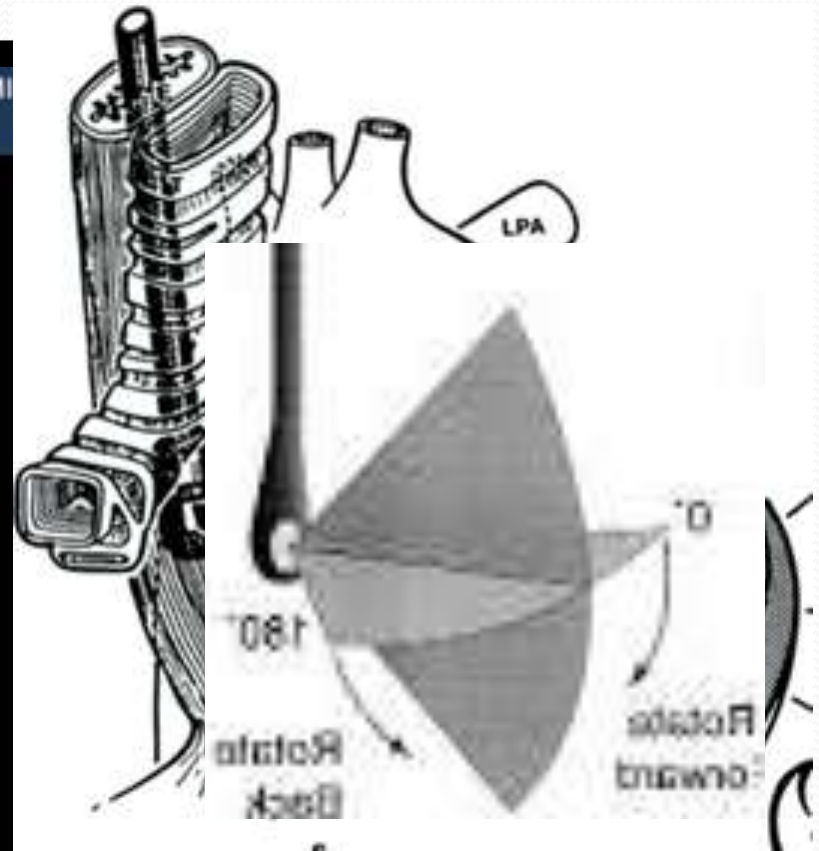
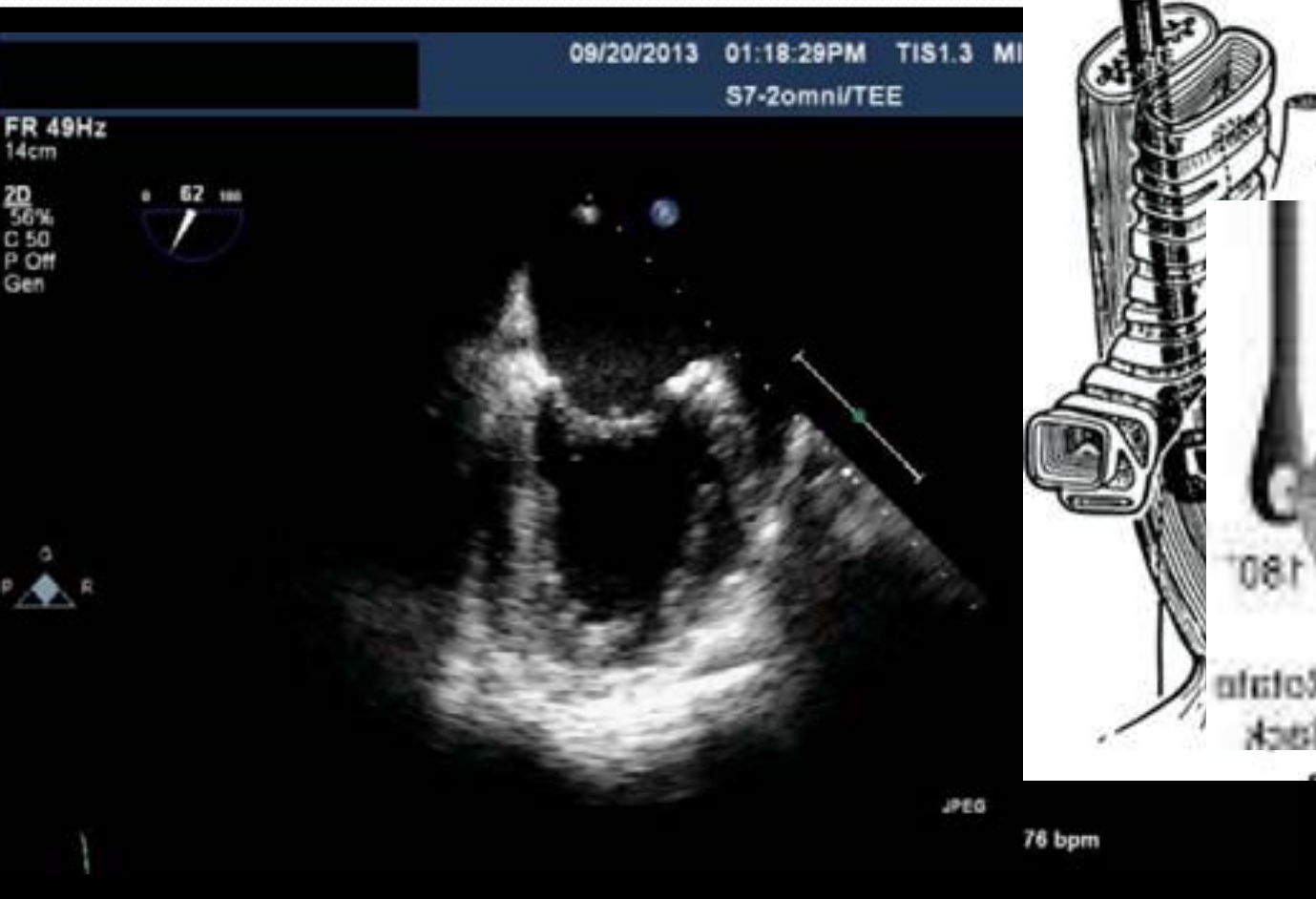
Mid Esophagus



Mid Esophagus



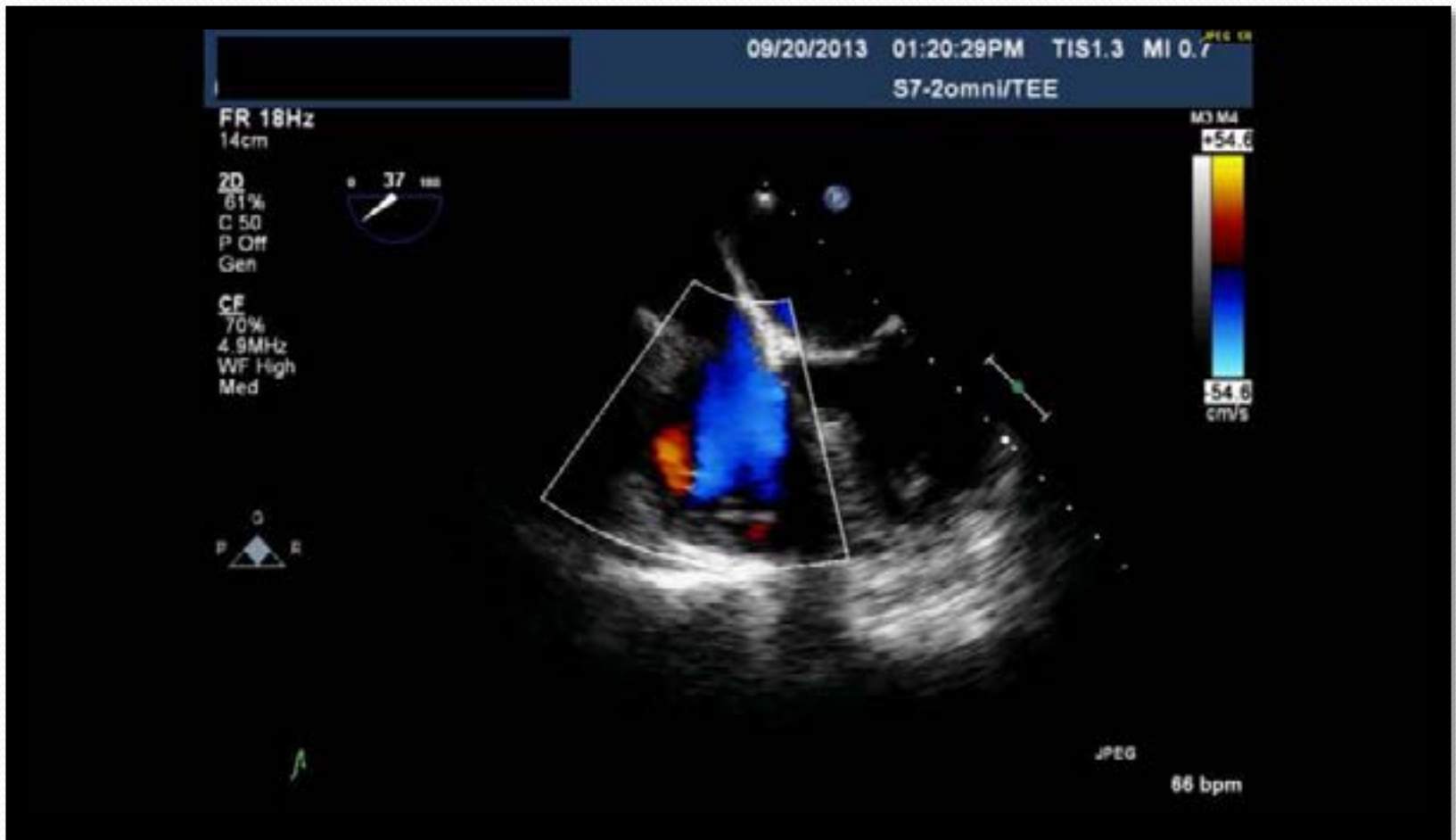
Mid Esophagus



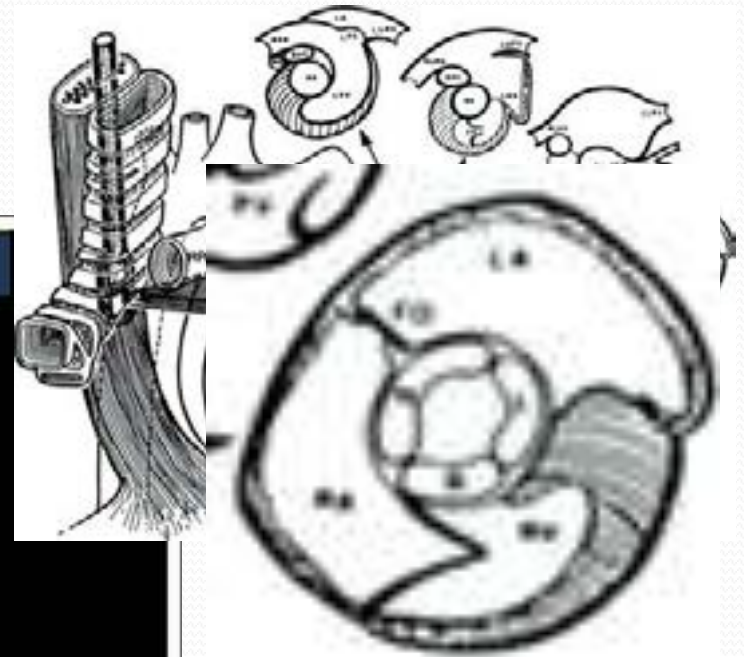
Mid esophagus



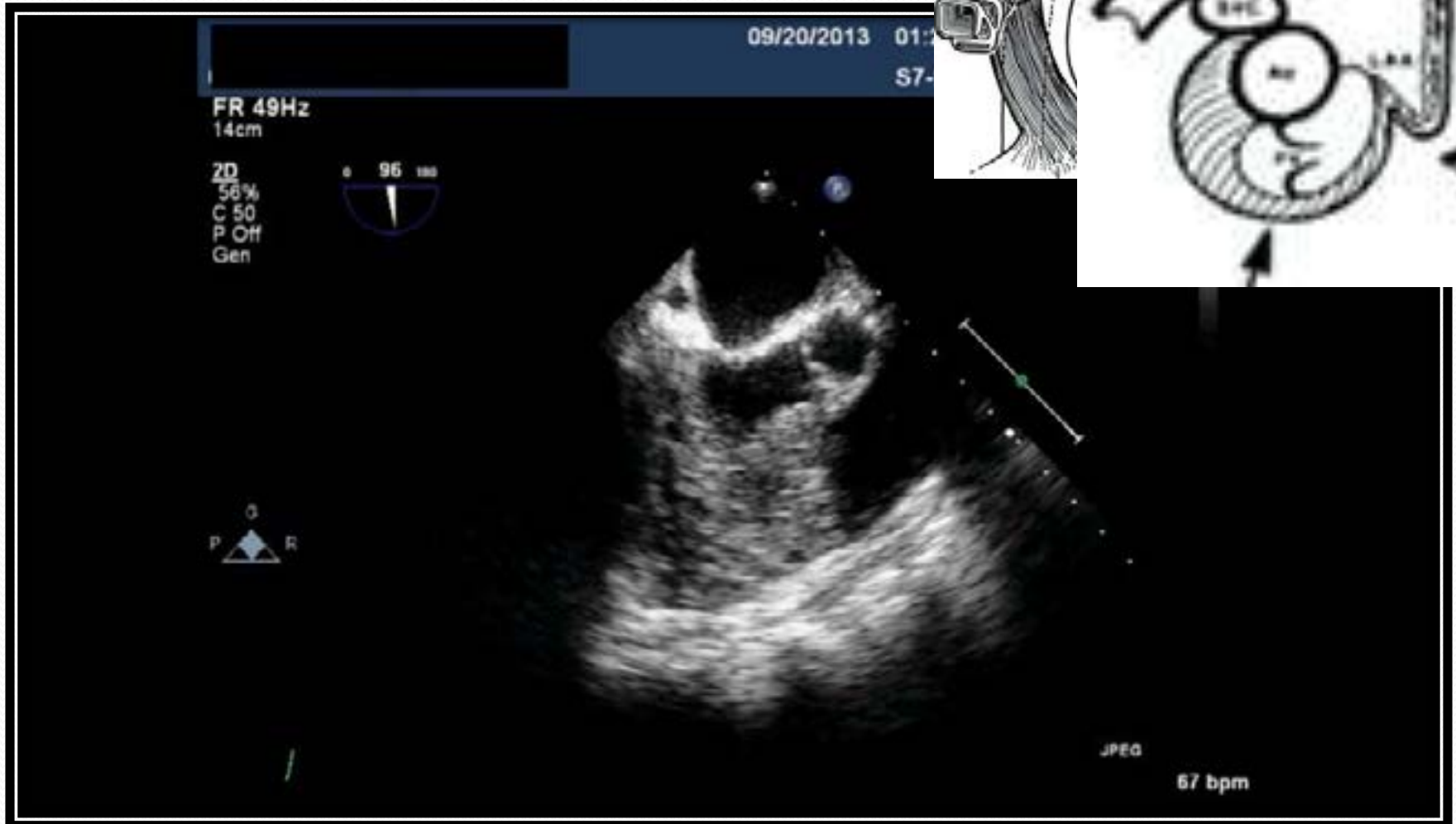
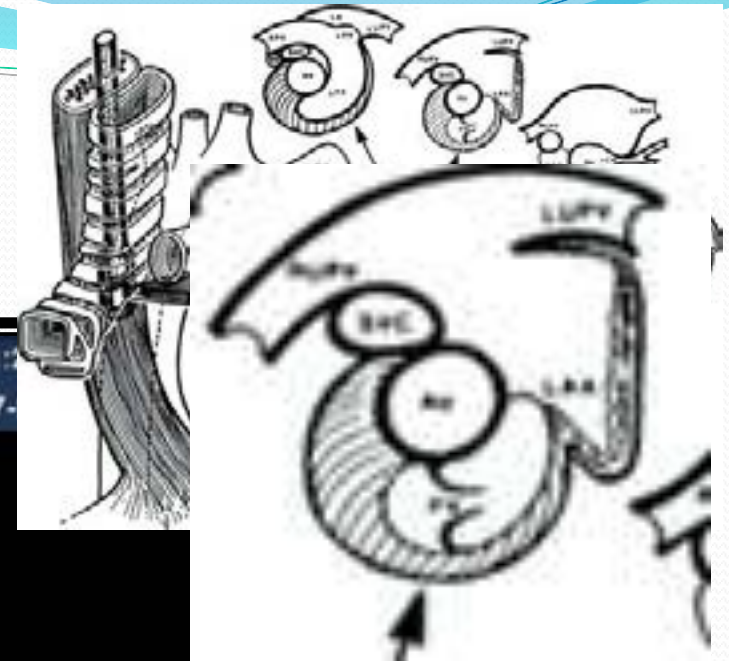
Mid Esophagus



Upper Esophagus



Upper esophagus



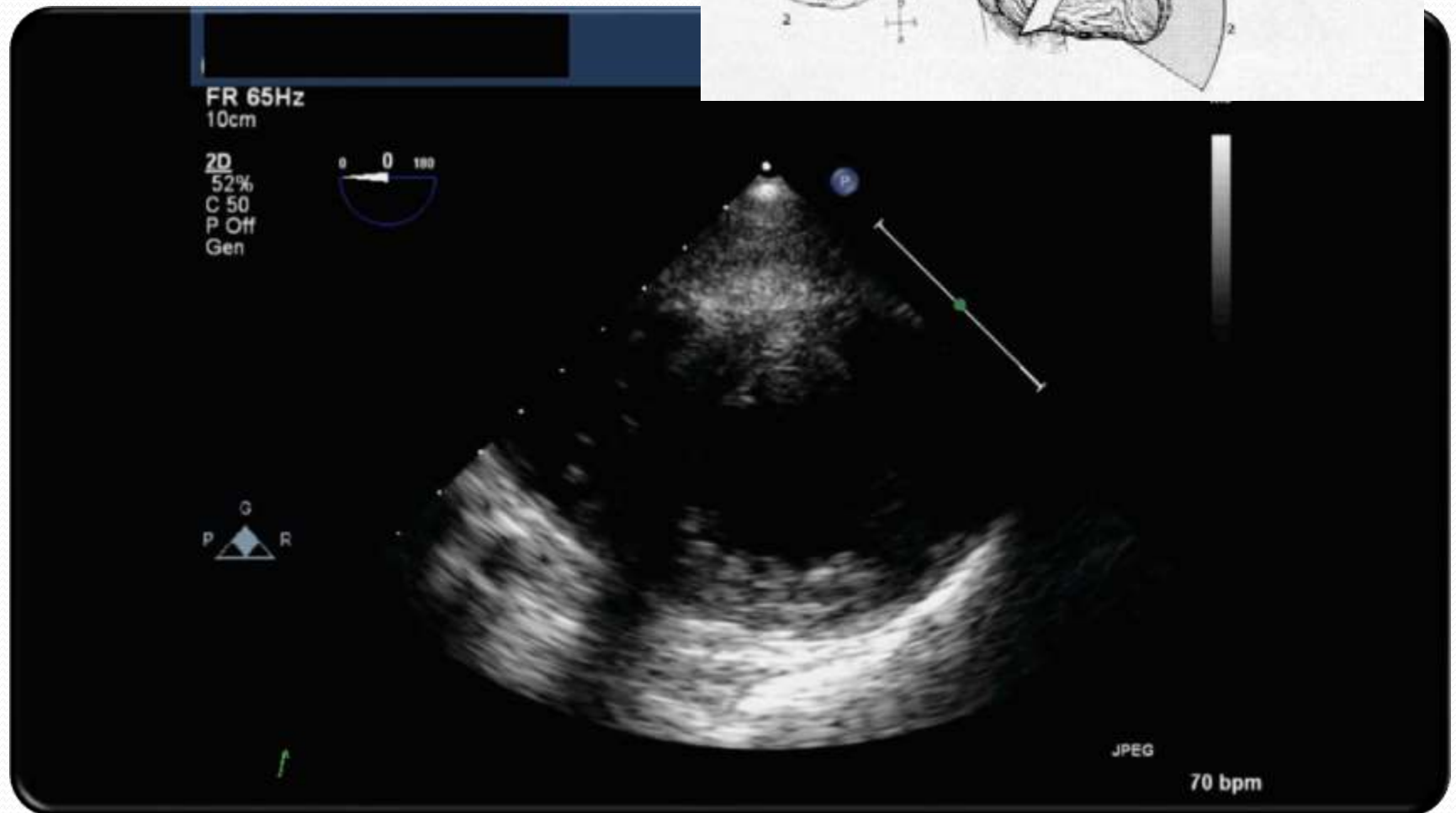
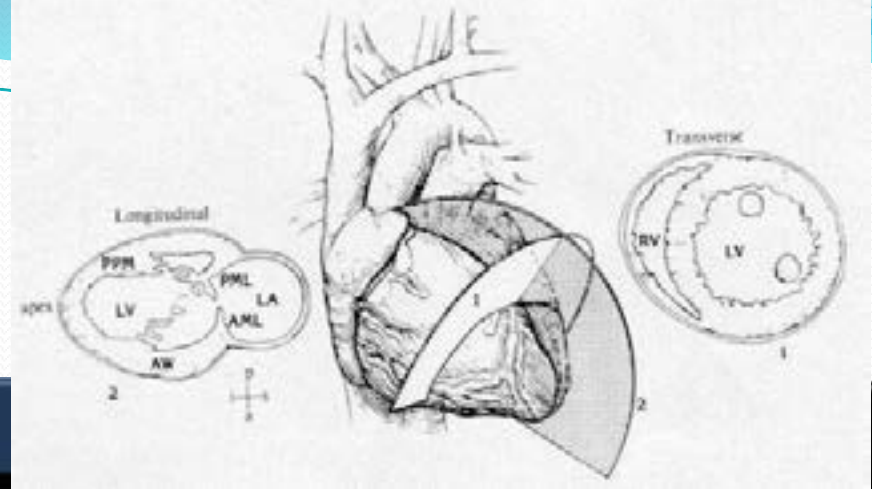
Anterior Rotation



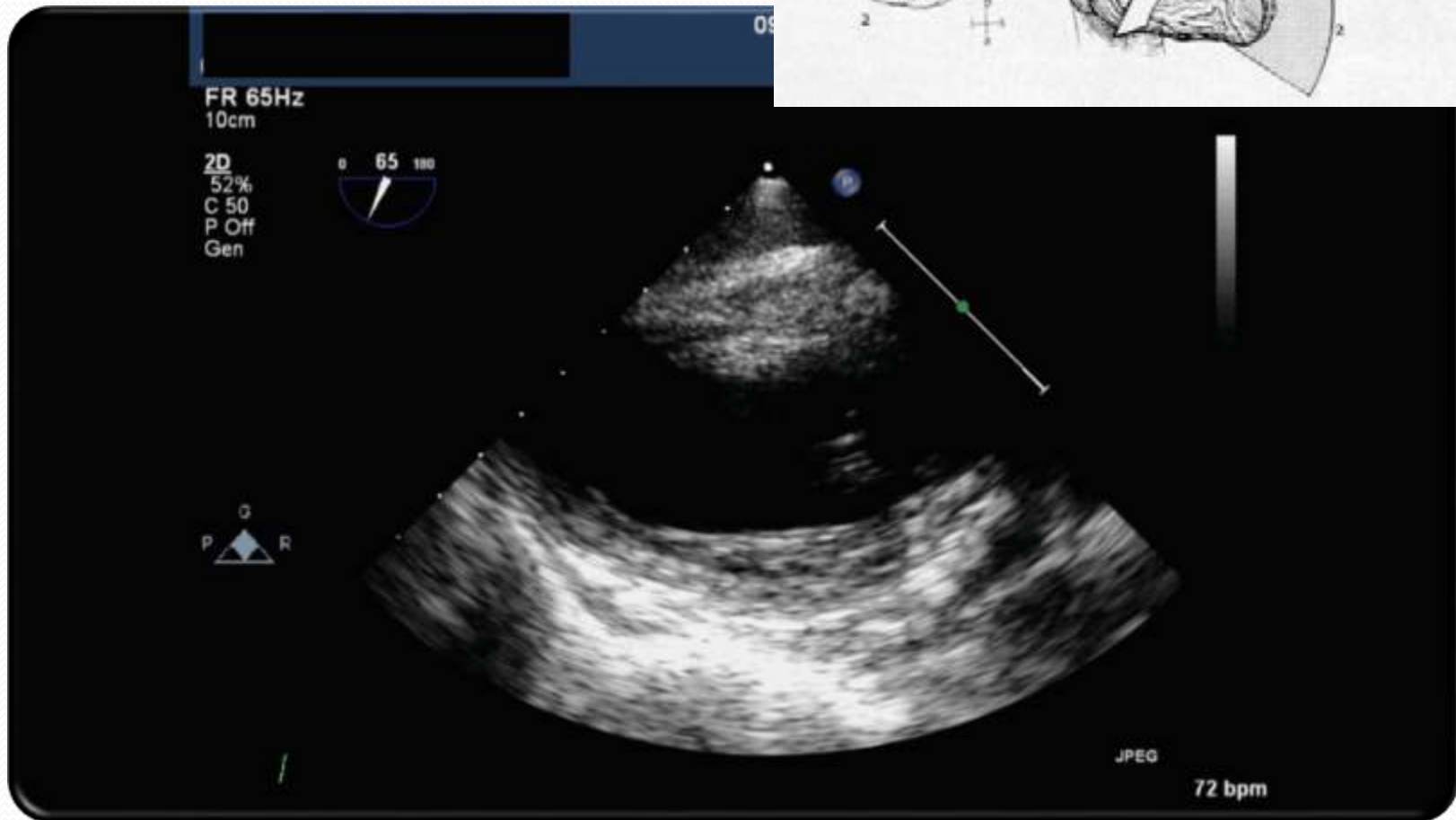
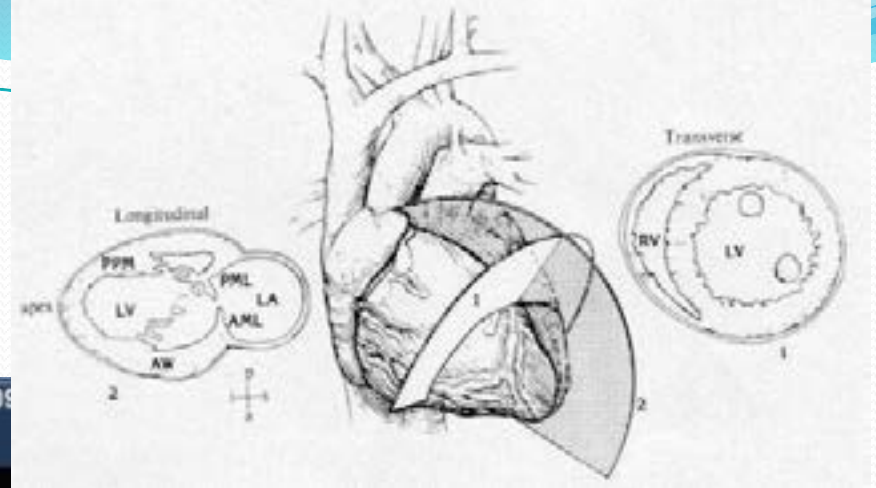
Bicaval View



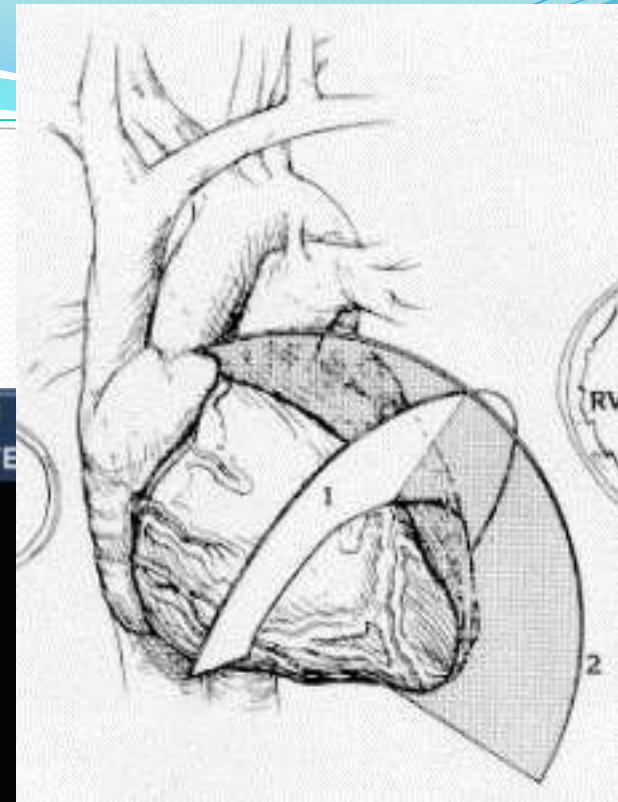
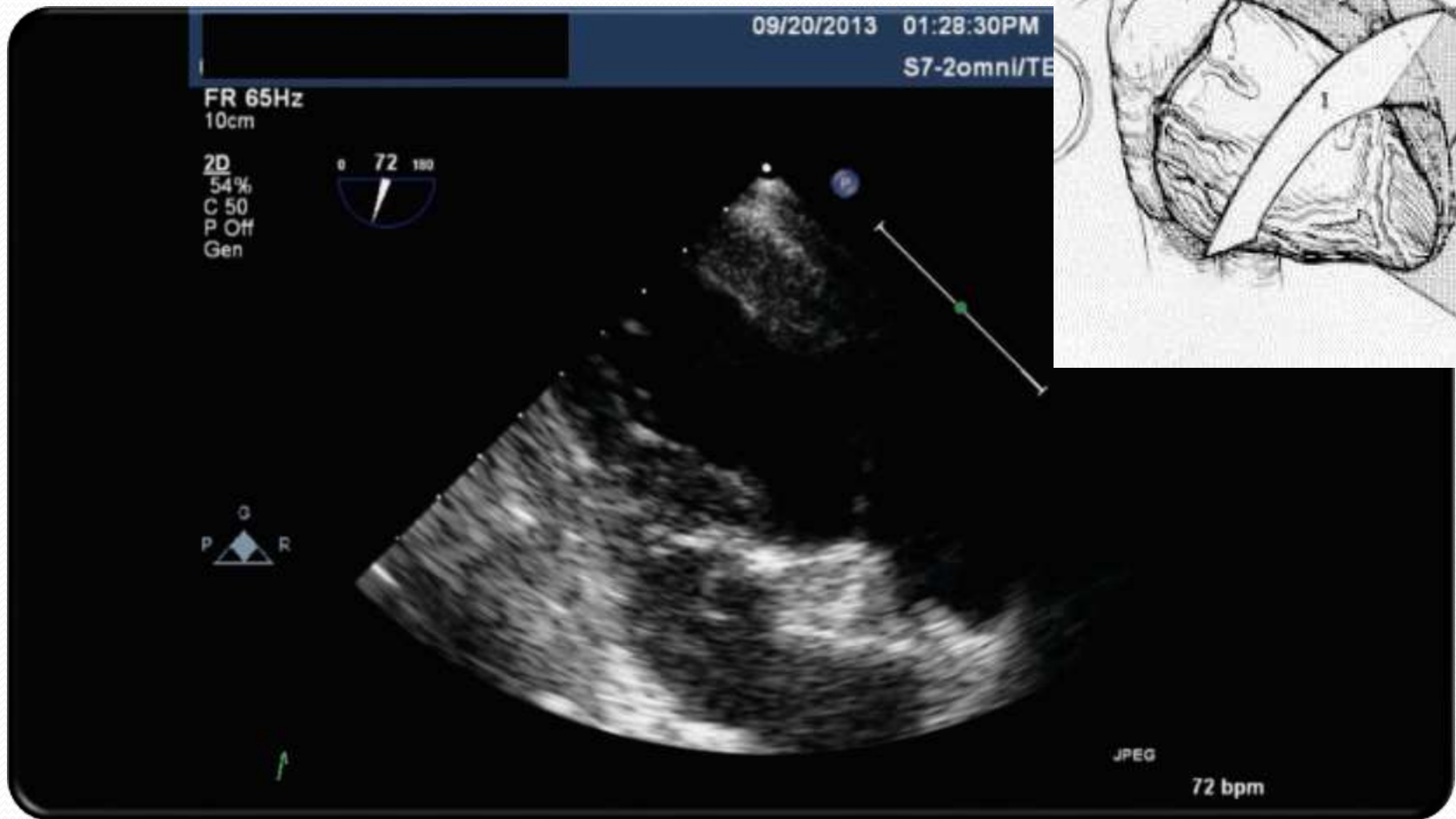
Transgastric



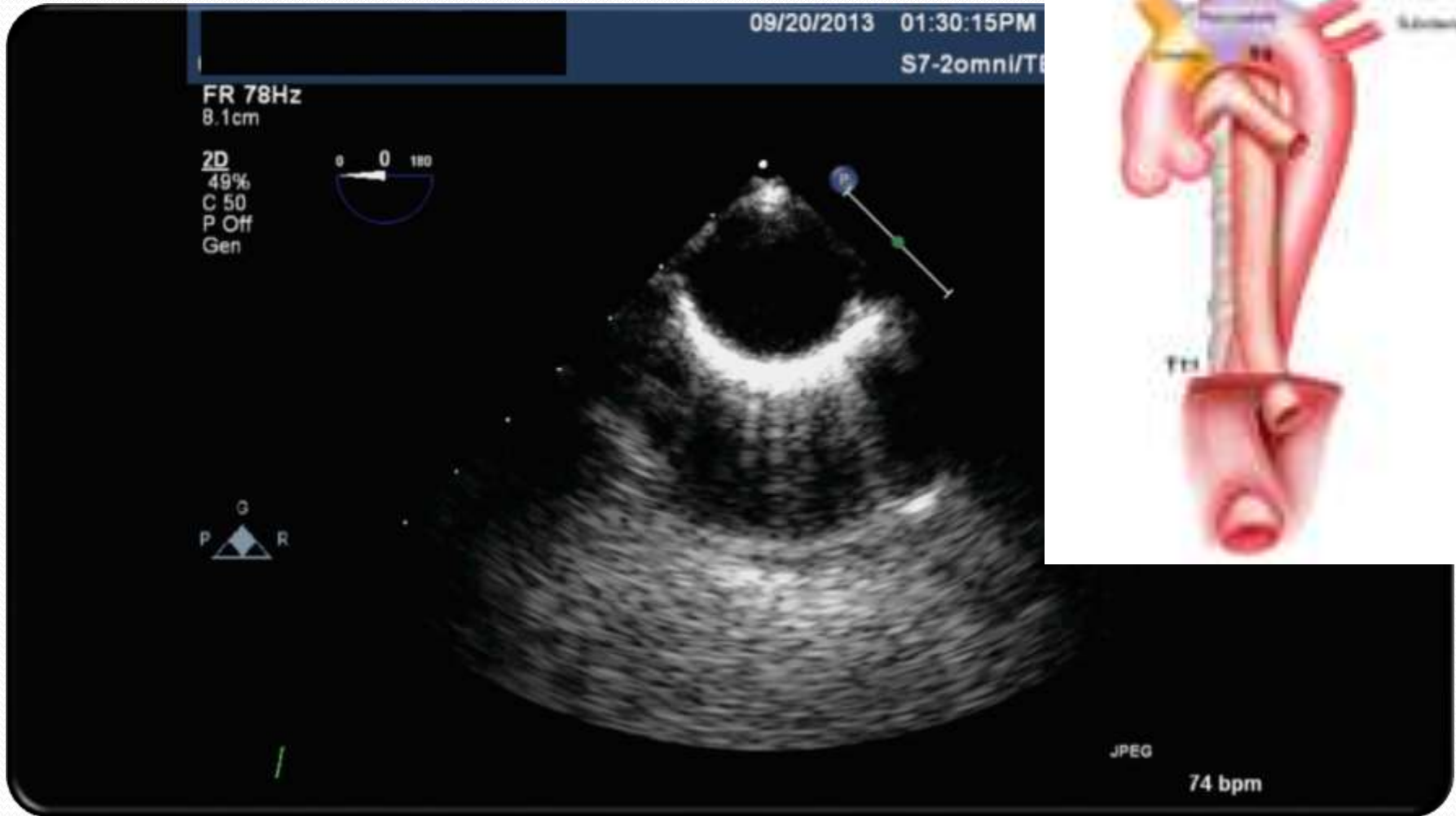
Transgastric



Deep Gastric



Aorta



Aorta



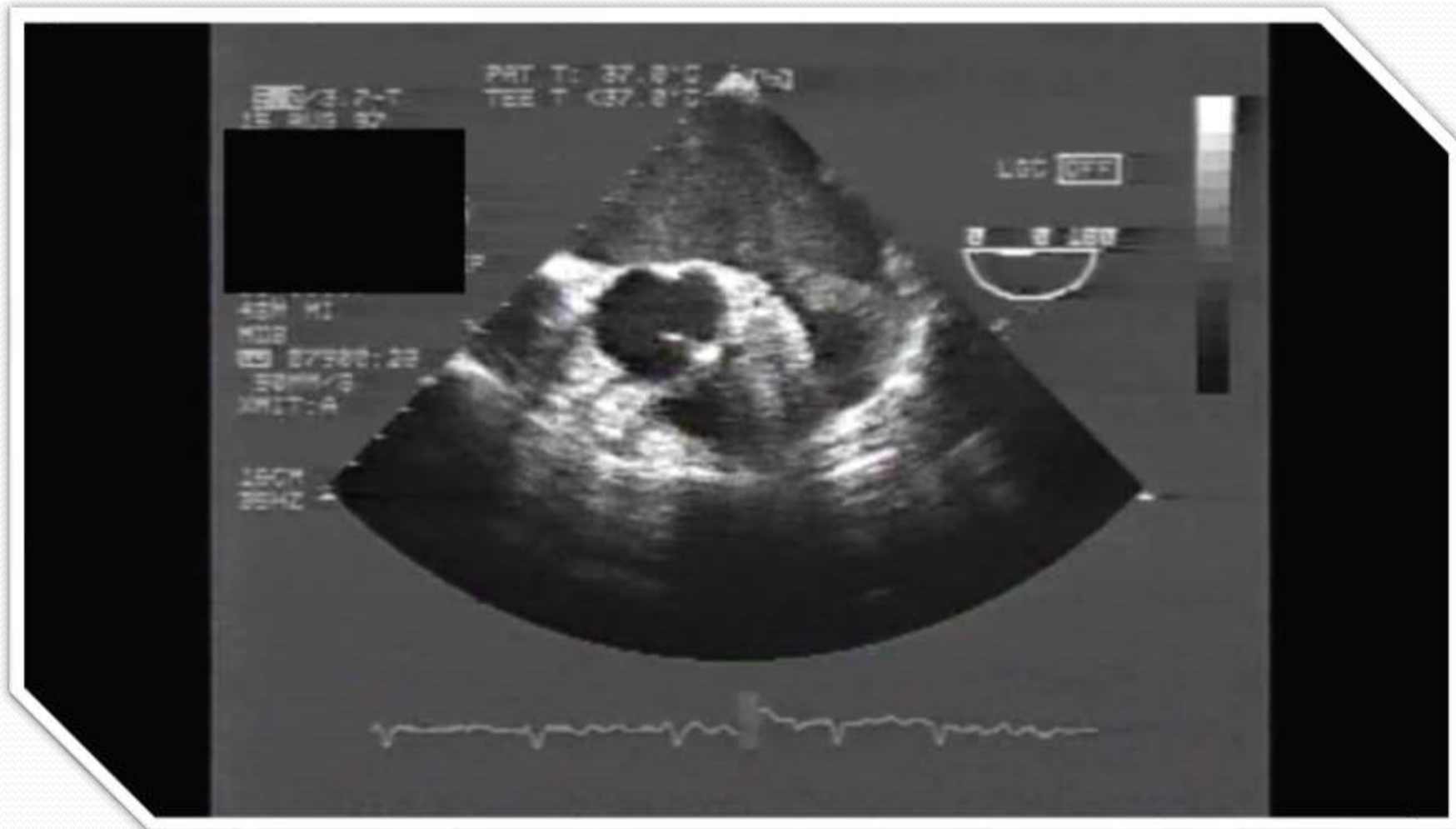
Abnormal Findings

- Left atrial appendage thrombus
- Aortic dissection
- Valvular vegetations

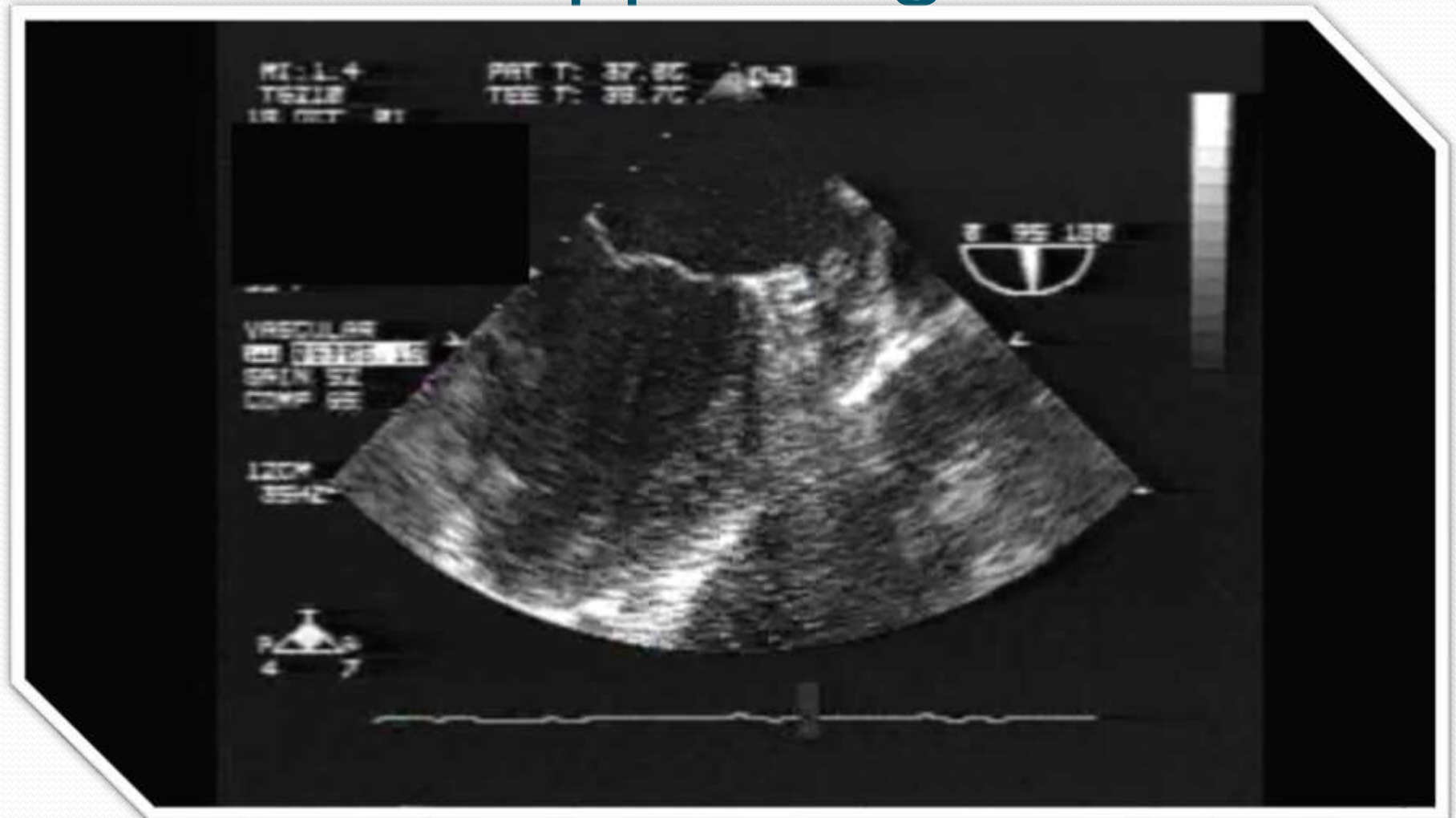
Left Atrial Appendage



Left Atrial Appendage



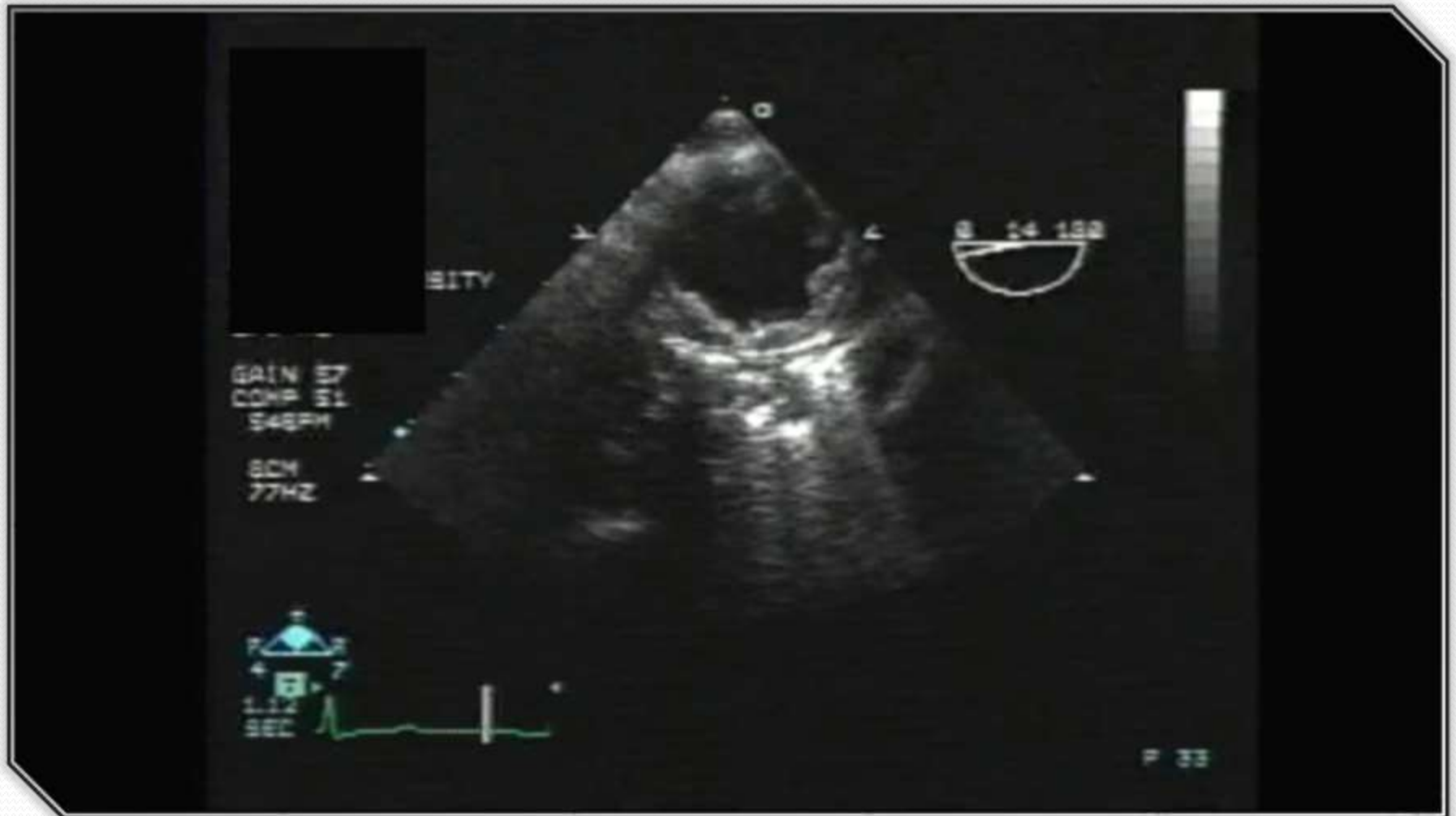
Left Atrial Appendage



Left Atrial Appendage



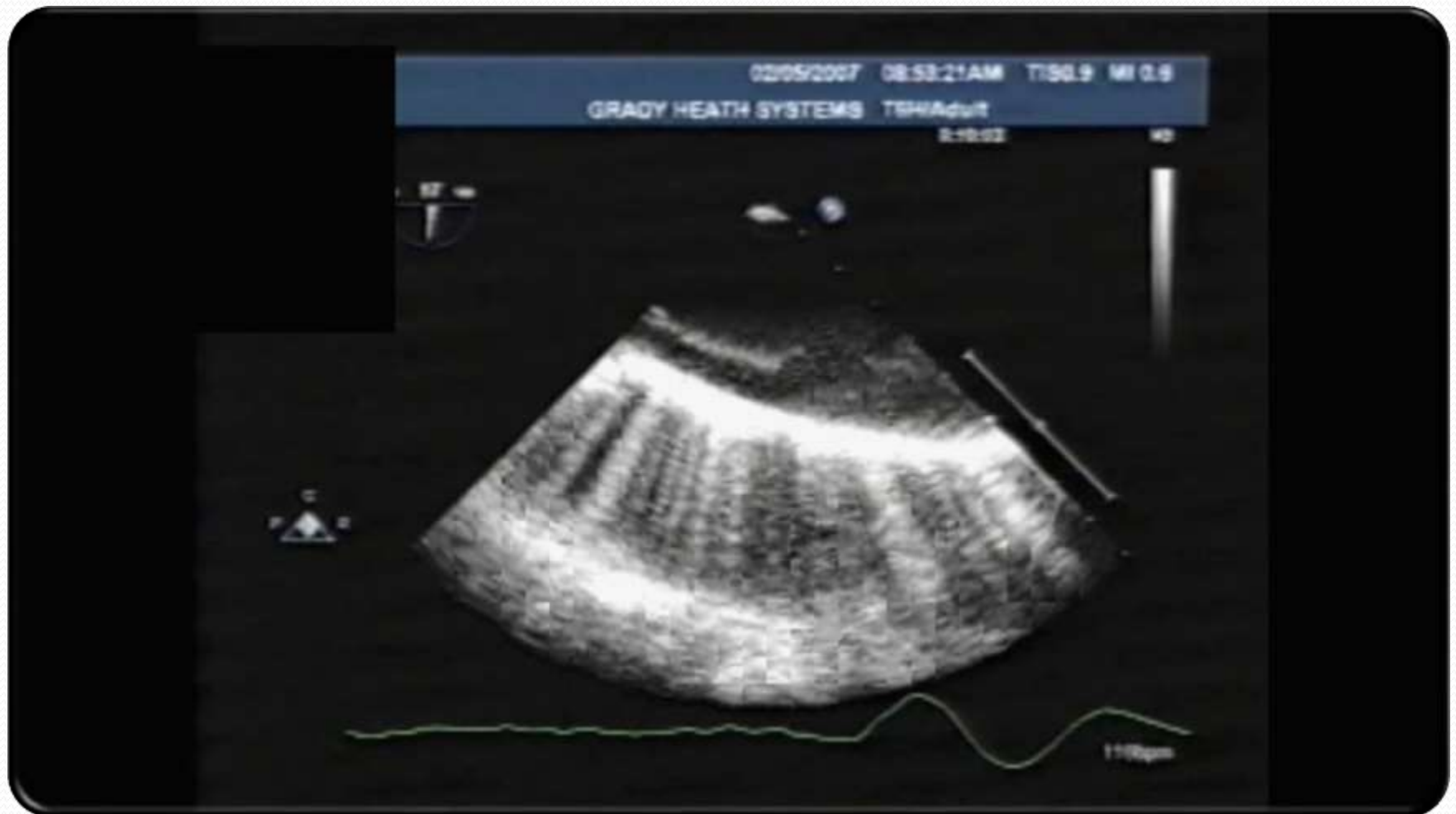
Aortic Disease



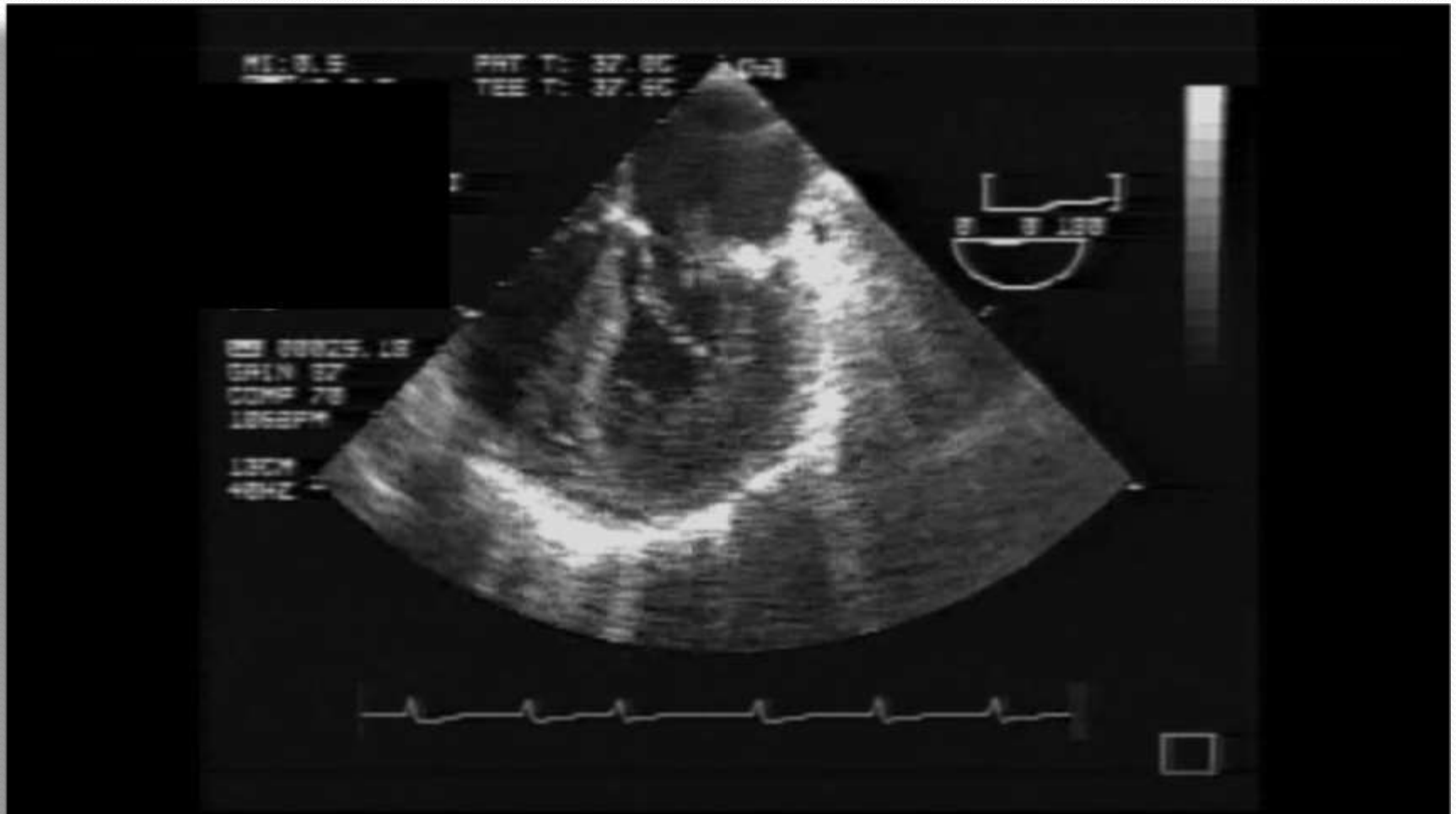
Aortic disease



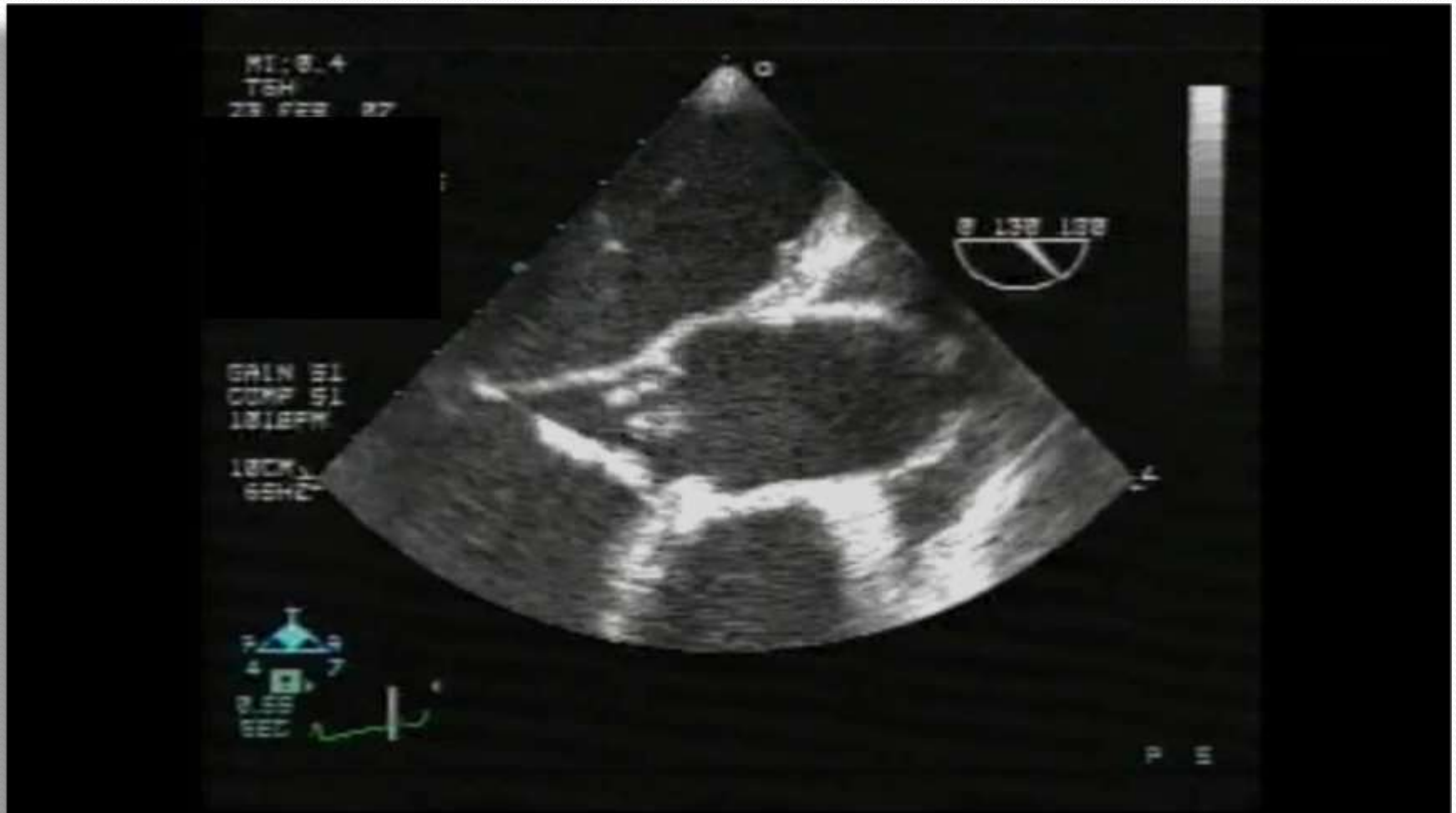
Aortic Dissection



Valvular Vegetation



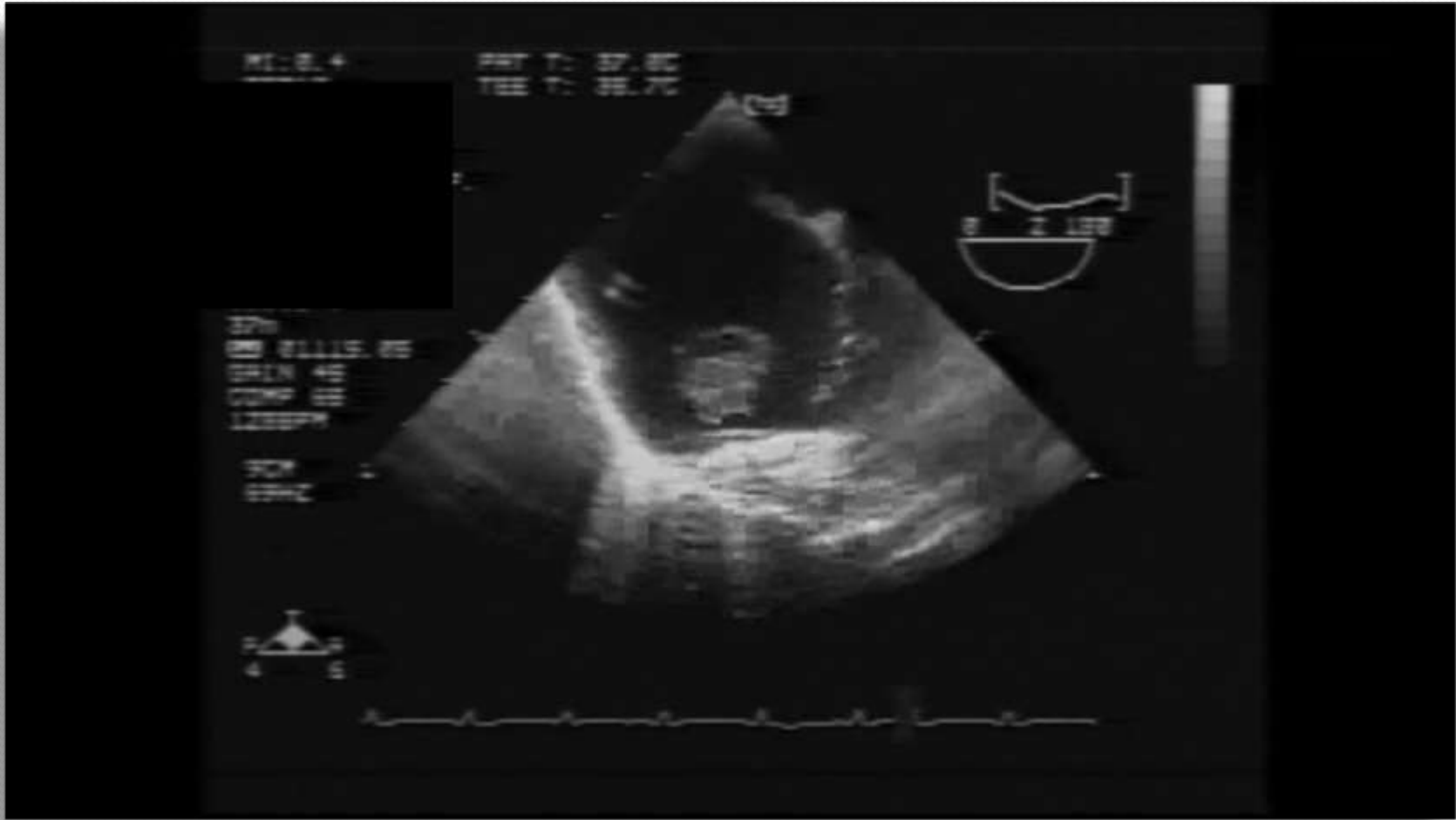
Valvular Vegetation



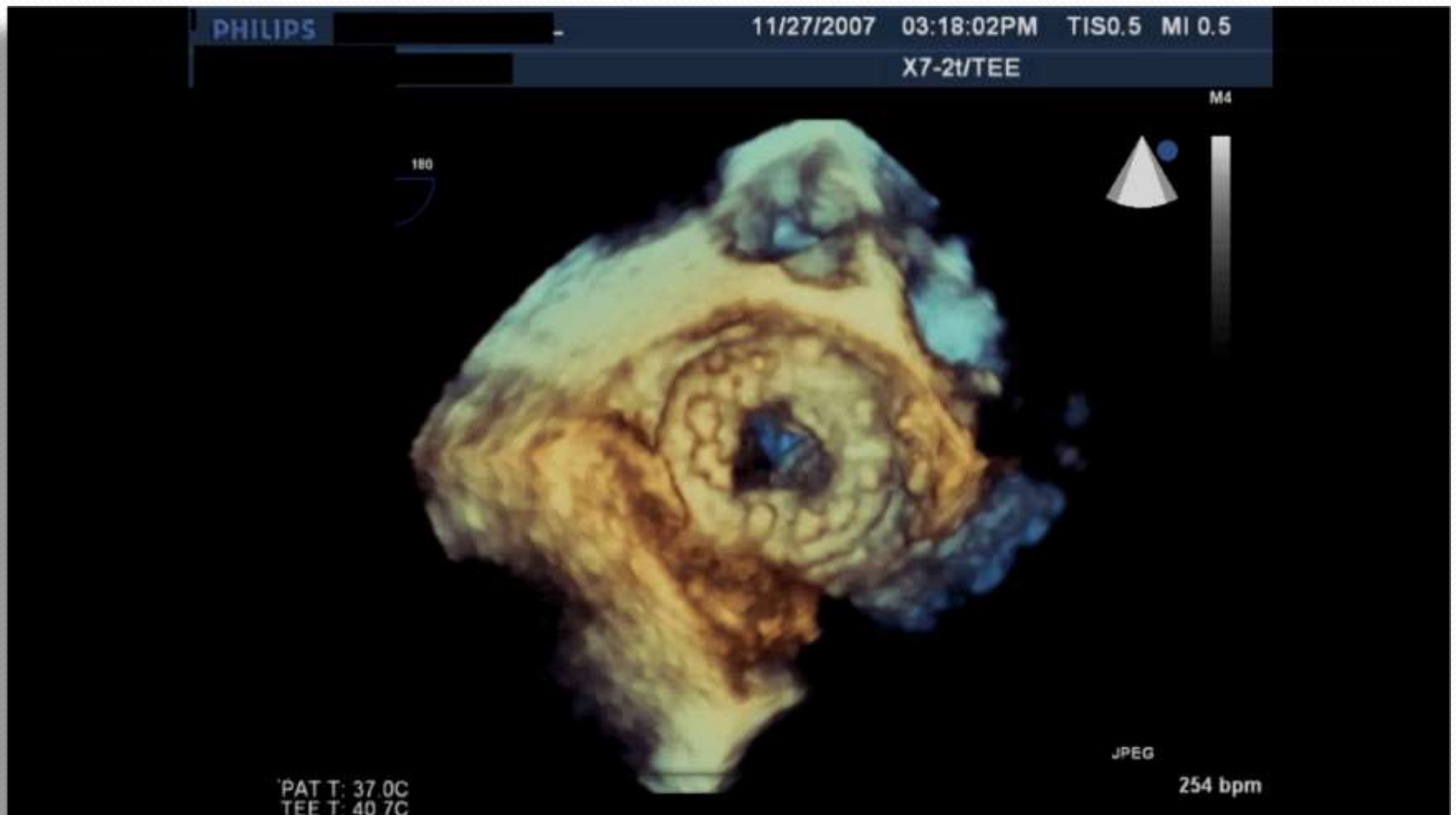
Valvular Vegetation



Clot in right atrium



3D TEE



PHILIPS

IN

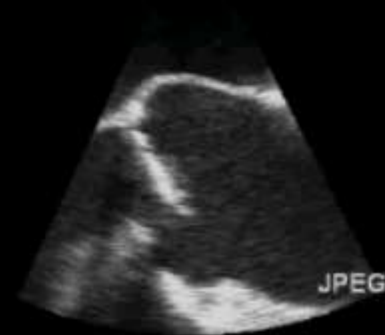
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X7-2t/TEE

FR 10Hz
8.5cm

M4

Live 3D
3D 1%
3D 32dB
Gen



JPEG

PAT T: 37.0C
TEE T: 39.9C

136 bpm

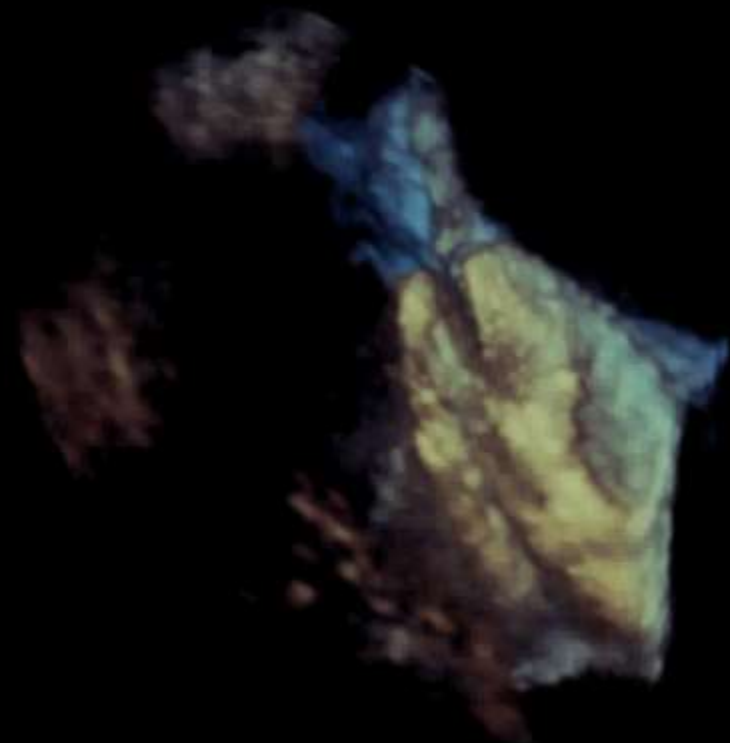
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X7-2t/TEE

FR 6Hz
4.5cm

Live 3D
3D 0%
3D 54dB
Gen



M4



JPEG

PAT T: 37.0C
TEE T: 38.5C

49 bpm

Take Home Points

- Indications
- Views
 - Multiple planes
 - Positions in the esophagus and stomach
 - Anterior/Posterior
- Limitations
- Remember to clip



Questions?