

31st Annual ECHO Hawaii

January 21, 2022 | 8:15 – 8:30 AM | 15 min

Multimodality Assessment of Cardiac Masses

Muhamed Sarić MD, PhD, MPA
Director of Noninvasive Cardiology | Echo Lab
Professor of Medicine
New York University



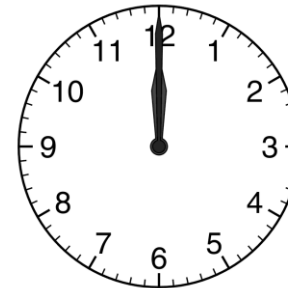
Disclosures

Speakers Bureau (Abbott, Boston Scientific, Medtronic, Philips)
Advisory Board (Siemens)

Question #1

Which of the following is the most common nonvalvular benign cardiac tumor seen on echocardiography in adults?

- A. Fibroma
- B. Myxoma
- C. Papillary fibroelastoma
- D. Rhabdomyoma
- E. Teratoma



Question #1

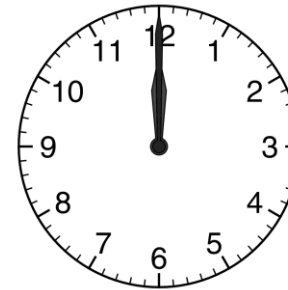
Which of the following is the most common nonvalvular benign cardiac tumor seen on echocardiography in adults?

- A. Fibroma
- B. **Myxoma**
- C. Papillary fibroelastoma
- D. Rhabdomyoma
- E. Teratoma

Question #2

Each of the following tumors are known to invade the heart via the inferior vena cava EXCEPT?

- A. Adrenal carcinoma
- B. Hepatocellular carcinoma
- C. Leiomyoma
- D. Renal cell carcinoma
- E. Rhabdomyoma



Question #2

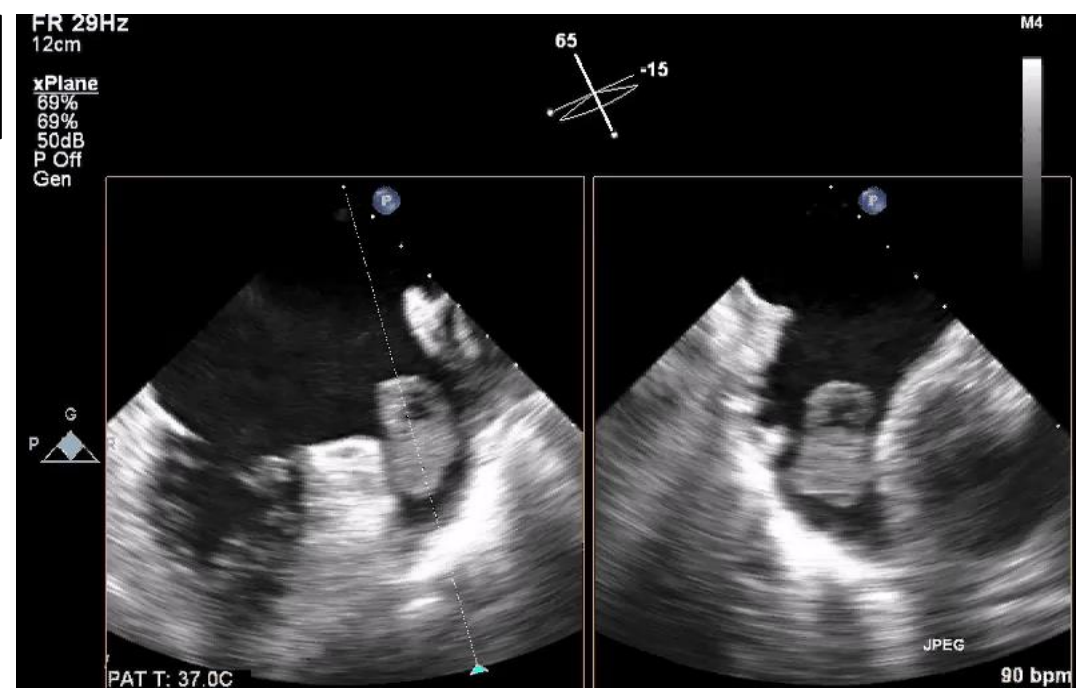
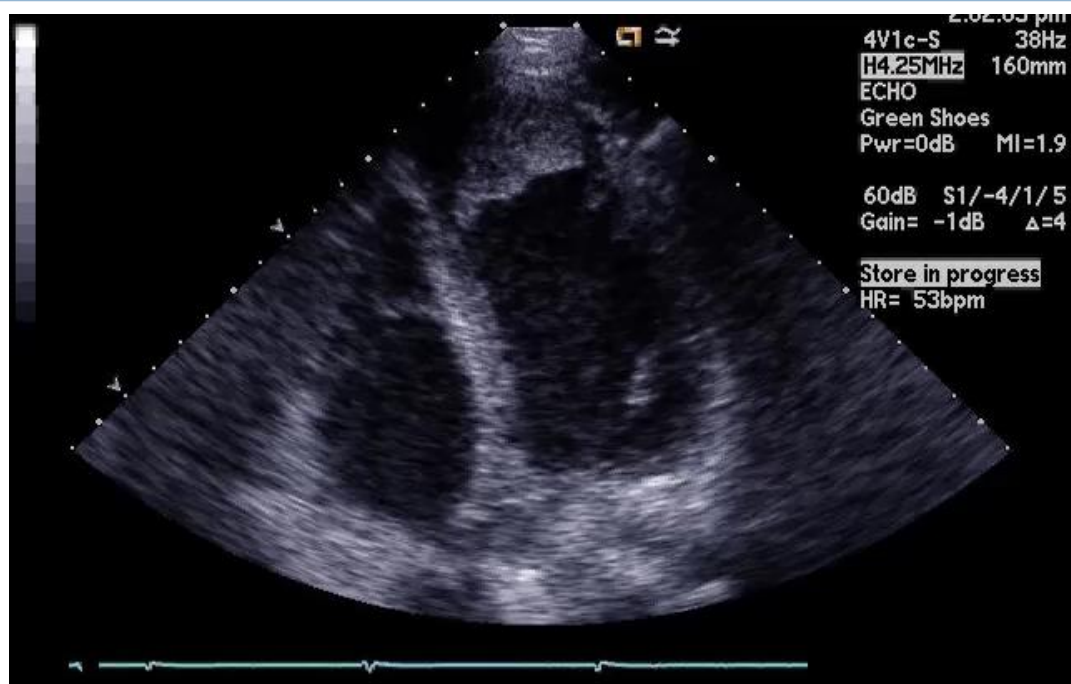
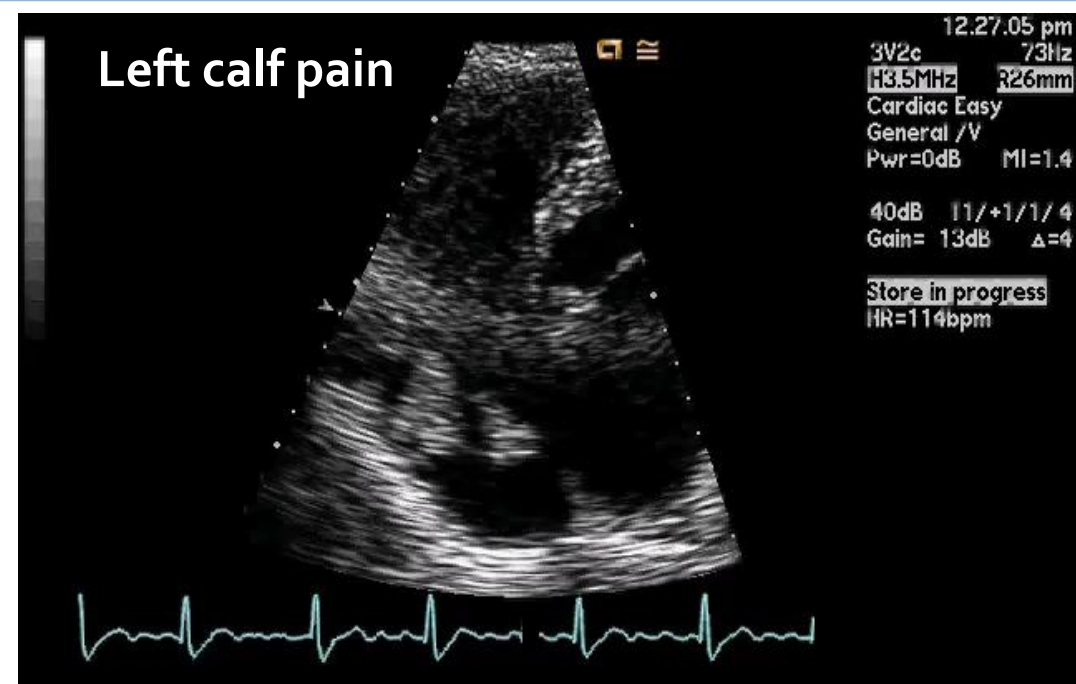
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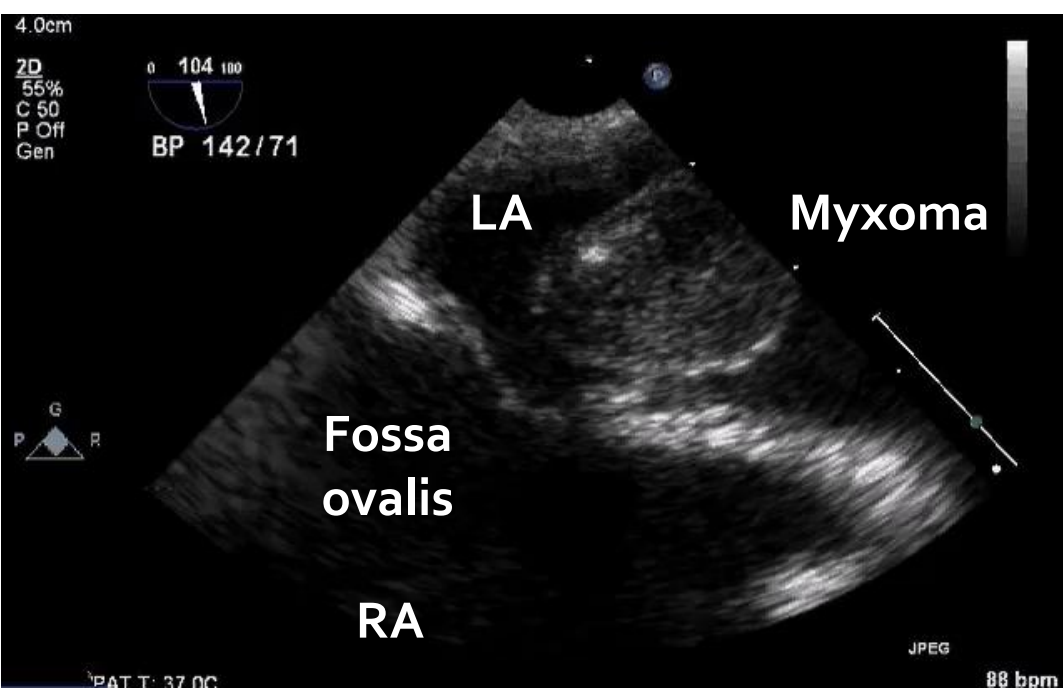


Three-of-a-Kind Game

Which 1 of these 4 images does NOT belong to the set?

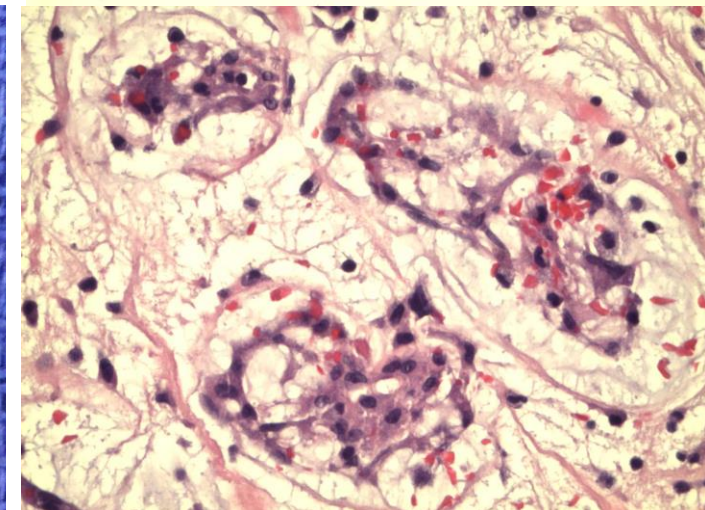
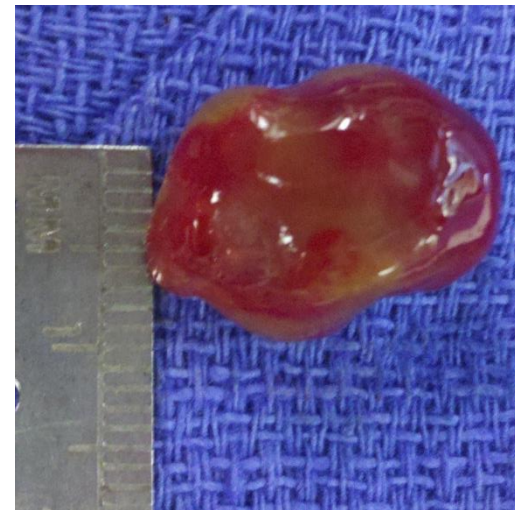
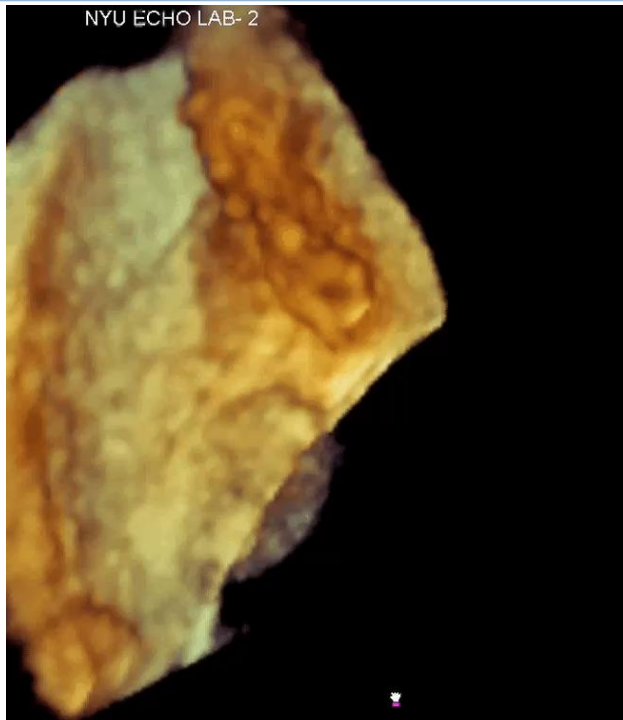
A**B****C****D**

A



Panel A does NOT belong to the set.

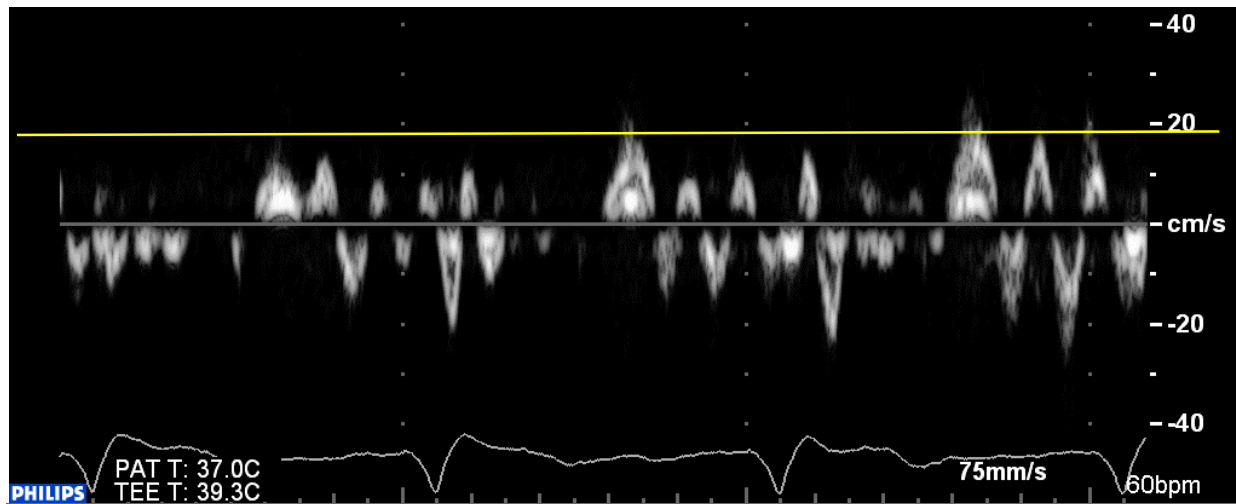
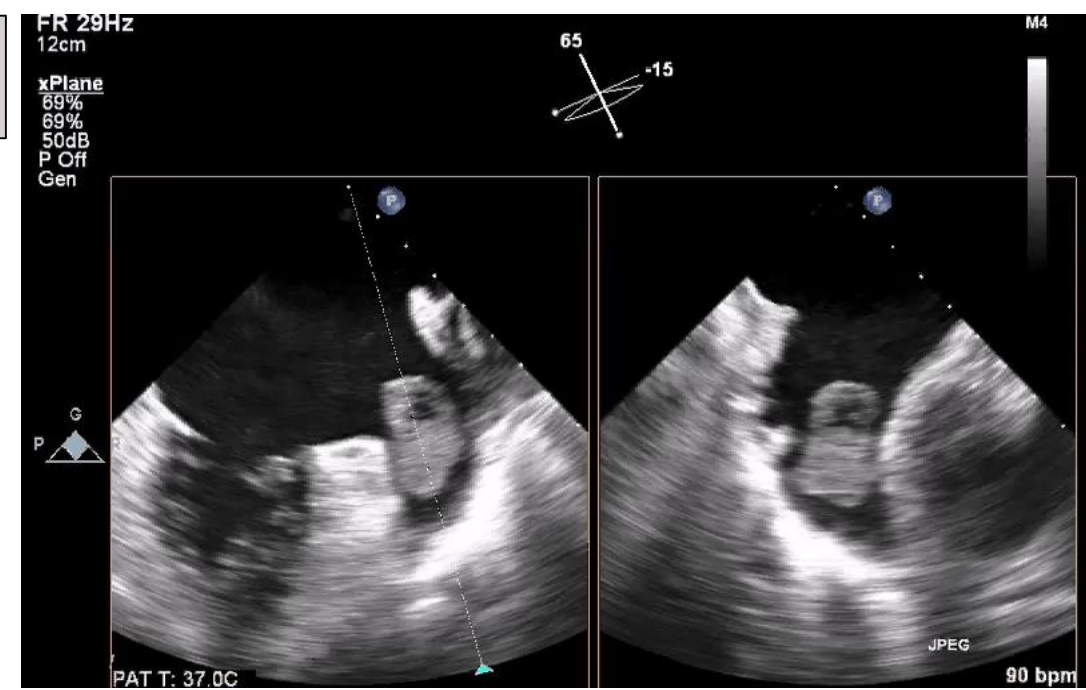
Panel A is the only panel NOT showing a thrombus.



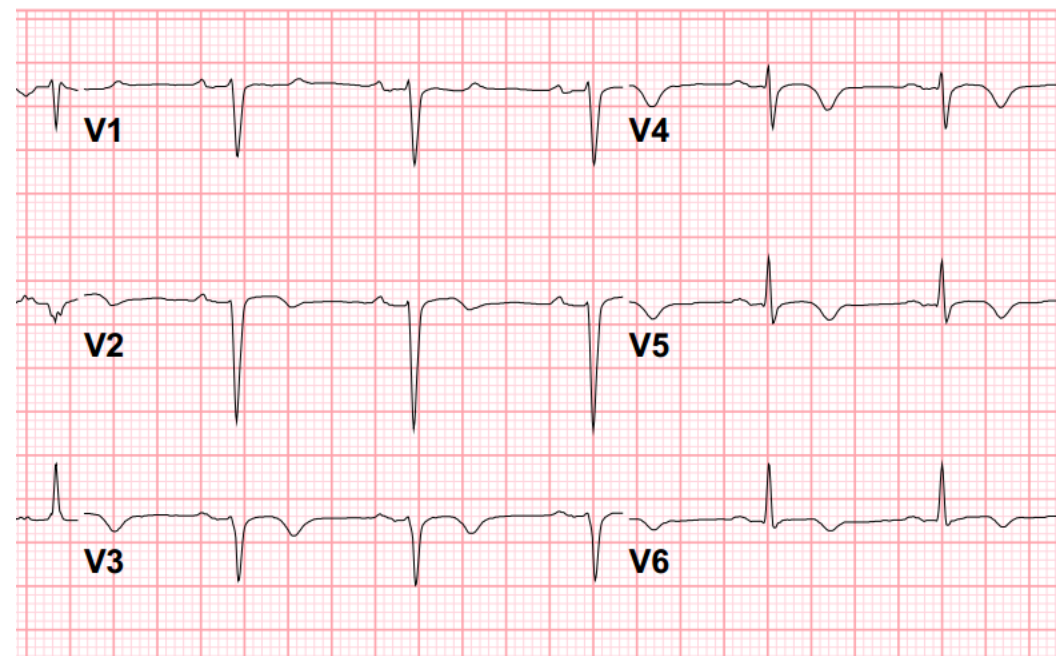
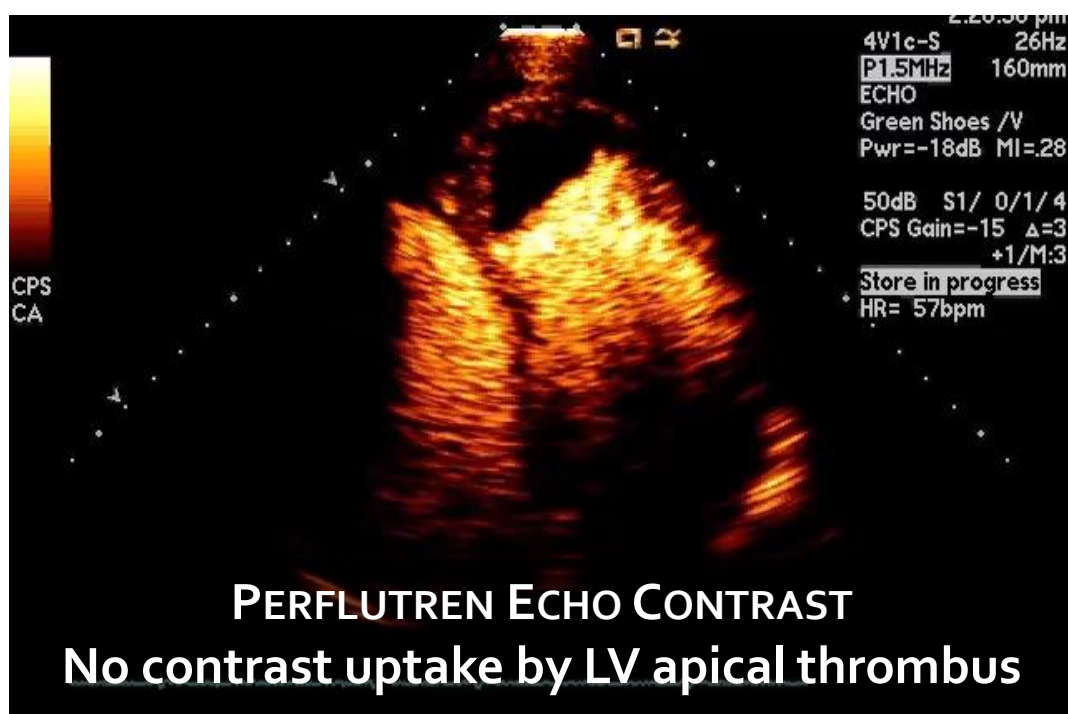
Panel B

Large LA appendage thrombus
in a patient with atrial fibrillation

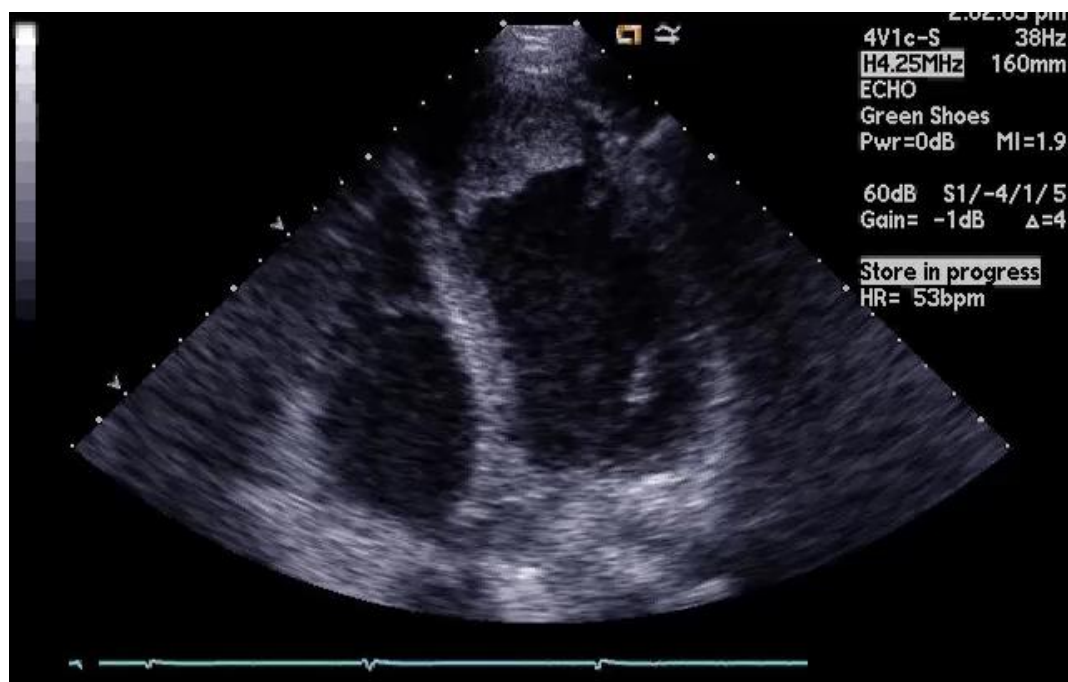
B



LA Appendage | Low Emptying Velocity

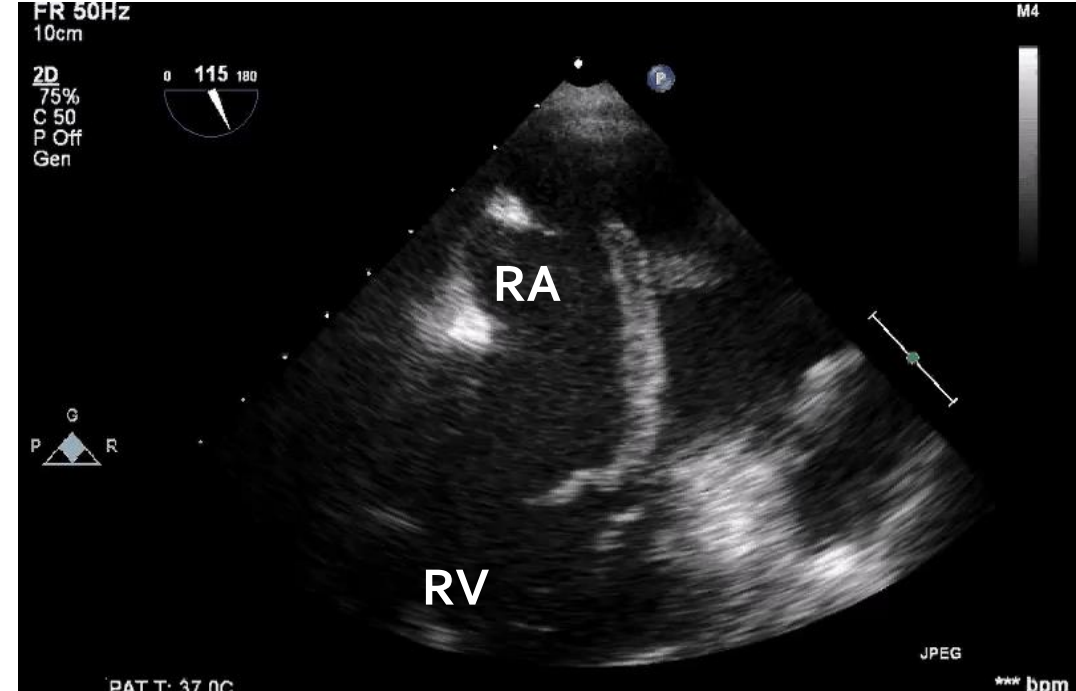
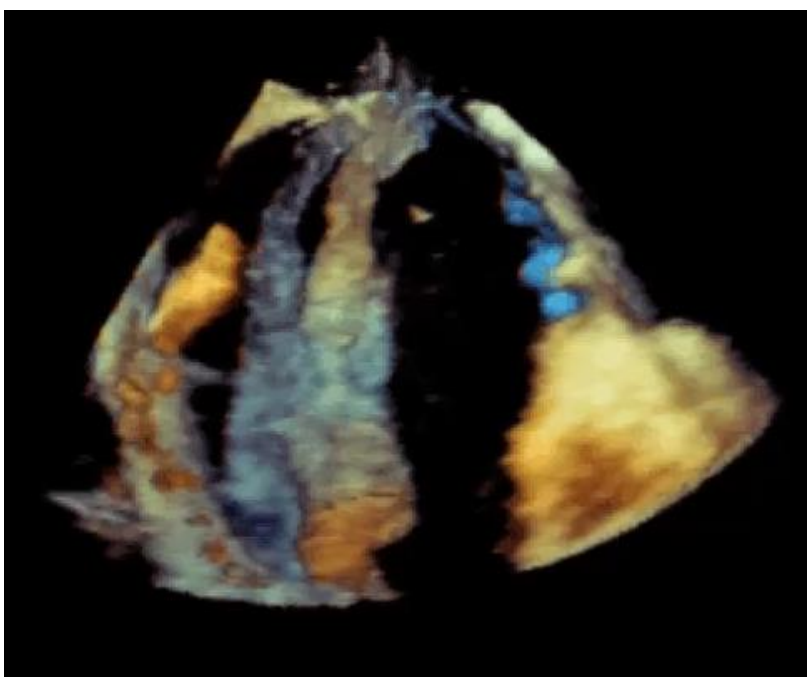


C



Panel C

Apical LV thrombus
in a patient with infarct
in left anterior descending
coronary artery distribution



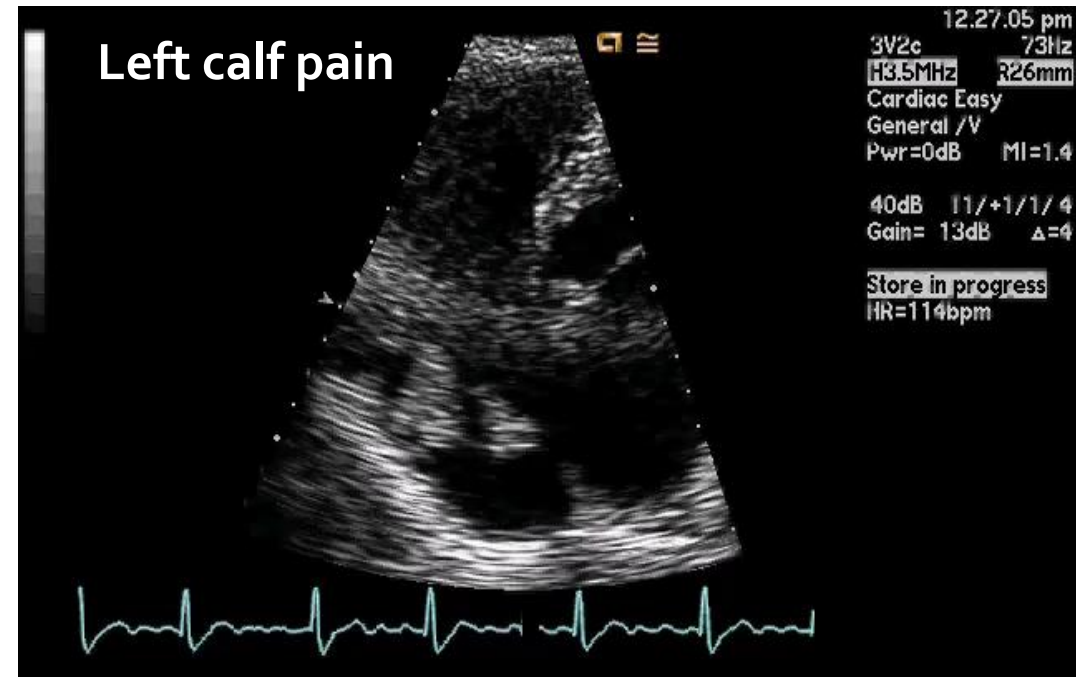
Clot entangled in Chiari network

Panel D

Sausage-like
clot in transit in right atrium

In a patient with left leg deep vein thrombosis

D



Primary & Secondary Cardiac Tumors

In general, cardiac tumors, whether benign or malignant, are rare

PRIMARY CARDIAC TUMORS

SECONDARY CARDIAC TUMORS

Prevalence

- *Very rare (1 in 2,000)*

Prevalence

- *Secondary tumors represent the vast majority of cardiac tumors*
- *At least 30 times more common than primary ones*

Origin

- *Metastases of malignant tumor originating elsewhere*

Primary Cardiac Tumors

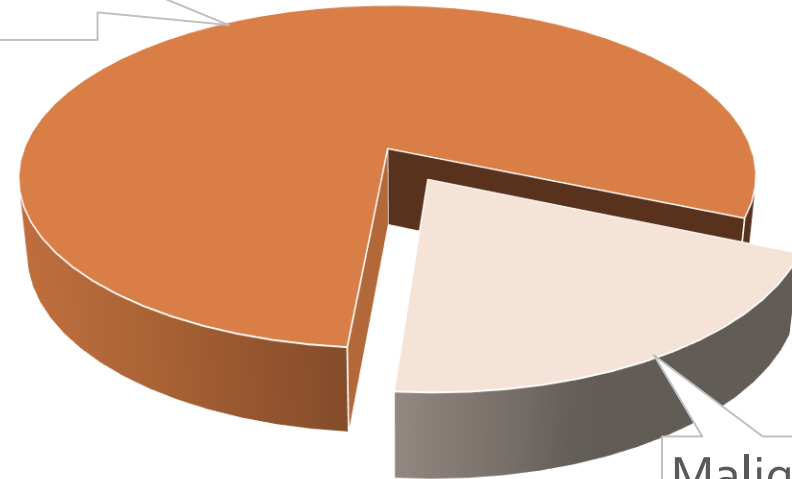
In general, cardiac tumors, whether benign or malignant, are rare

PRIMARY CARDIAC TUMORS

Prevalence

- *Very rare (1 in 2,000)*

Benign
80%



Malignant
20%

Primary Cardiac Tumors

In general, cardiac tumors, whether benign or malignant, are rare

PRIMARY CARDIAC TUMORS

Prevalence

- *Very rare (1 in 2,000)*

BENIGN PRIMARY CARDIAC TUMORS

- MOST COMMON NONVALVULAR TUMORS
 - Myxoma (adults)
 - Rhabdomyoma (kids)
- MOST COMMON VALVULAR TUMOR
 - Papillary fibroelastoma
- OTHER BENIGN TUMORS
 - Lipoma
 - Fibroma

MALIGNANT PRIMARY CARDIAC TUMORS

- VARIOUS SARCOMAS

Primary Cardiac Tumors

In general, cardiac tumors, whether benign or malignant, are rare

PRIMARY CARDIAC TUMORS

Prevalence

- *Very rare (1 in 2,000)*

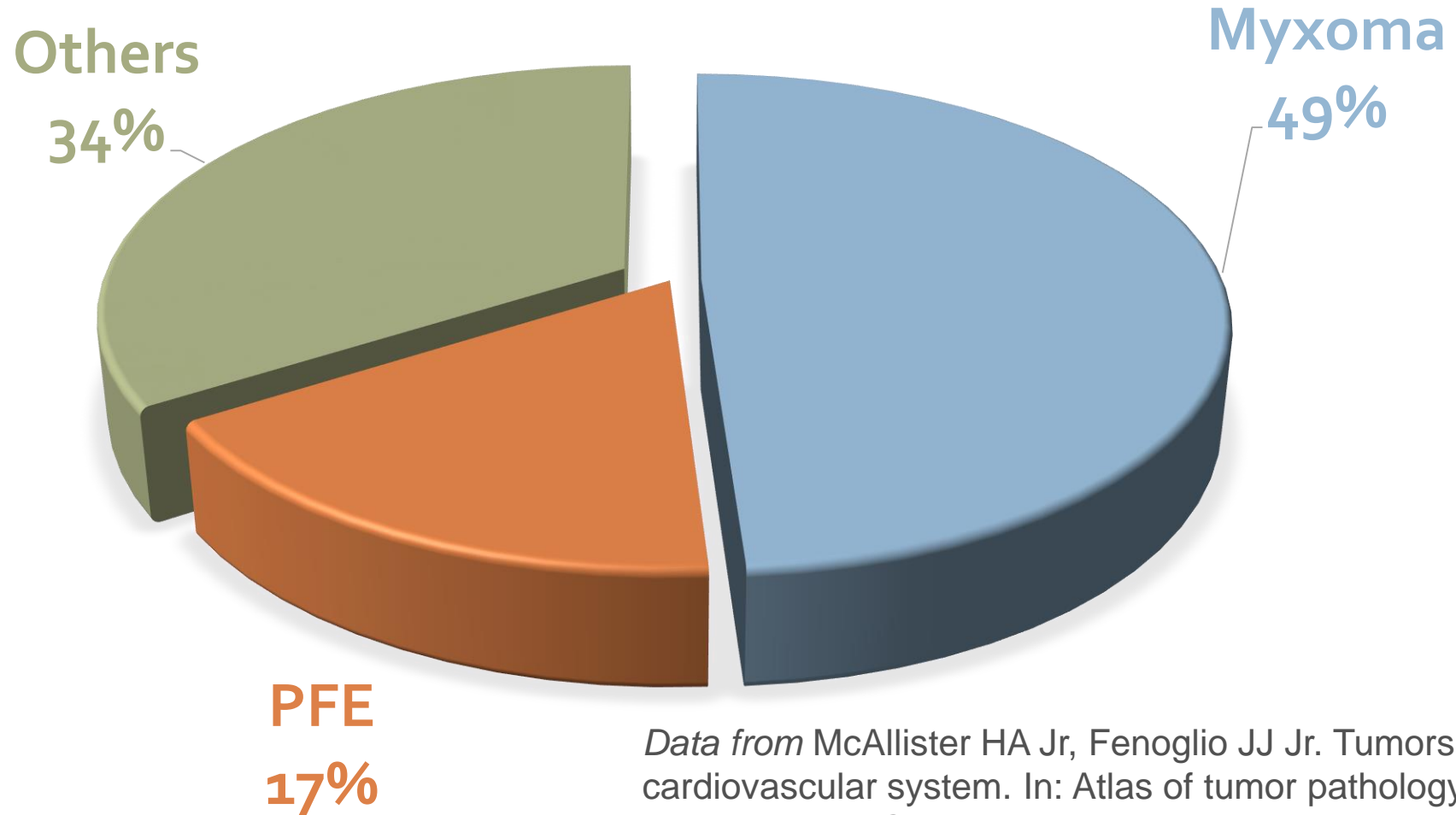
BENIGN PRIMARY CARDIAC TUMORS

- MOST COMMON NONVALVULAR TUMORS
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- OTHER BENIGN TUMORS
 - Lipoma
 - Fibroma

MALIGNANT PRIMARY CARDIAC TUMORS

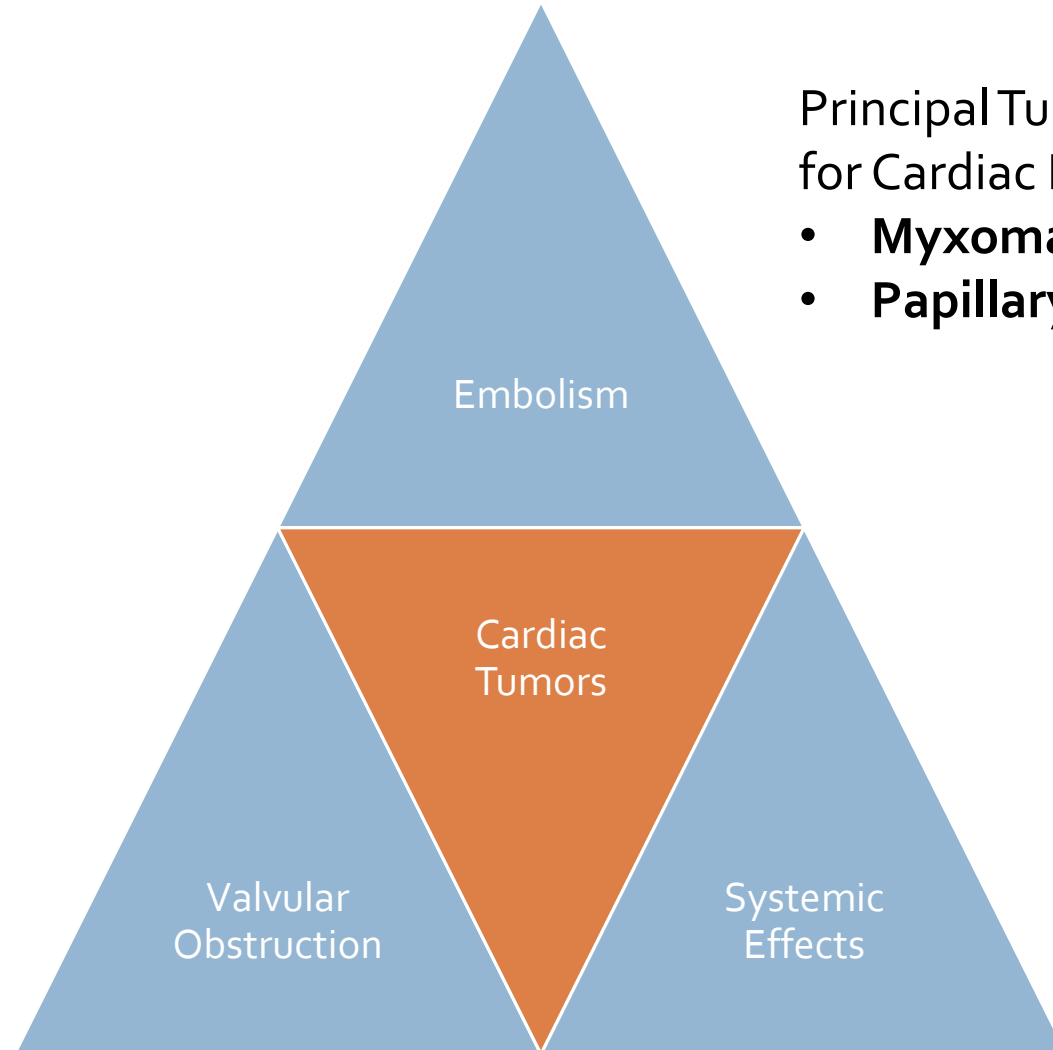
- VARIOUS SARCOMAS

Relative Prevalence of Benign Cardiac Tumors



Data from McAllister HA Jr, Fenoglio JJ Jr. Tumors of the cardiovascular system. In: Atlas of tumor pathology. Washington, DC: Armed Forces Institute of Pathology; 1978.

Manifestations of Cardiac Tumors



Principal Tumors Responsible
for Cardiac Embolism

- **Myxoma**
- **Papillary Fibroelastoma (PFE)**

Rhetorical Question

What's the embolic potential
of an **incidentally found** intracardiac mass?

Embolitic Potential of Incidental Cardiac Masses

JOURNAL OF THE AMERICAN COLLEGE OF CARDIOLOGY

VOL. 73, NO. 17, 2019

Letters

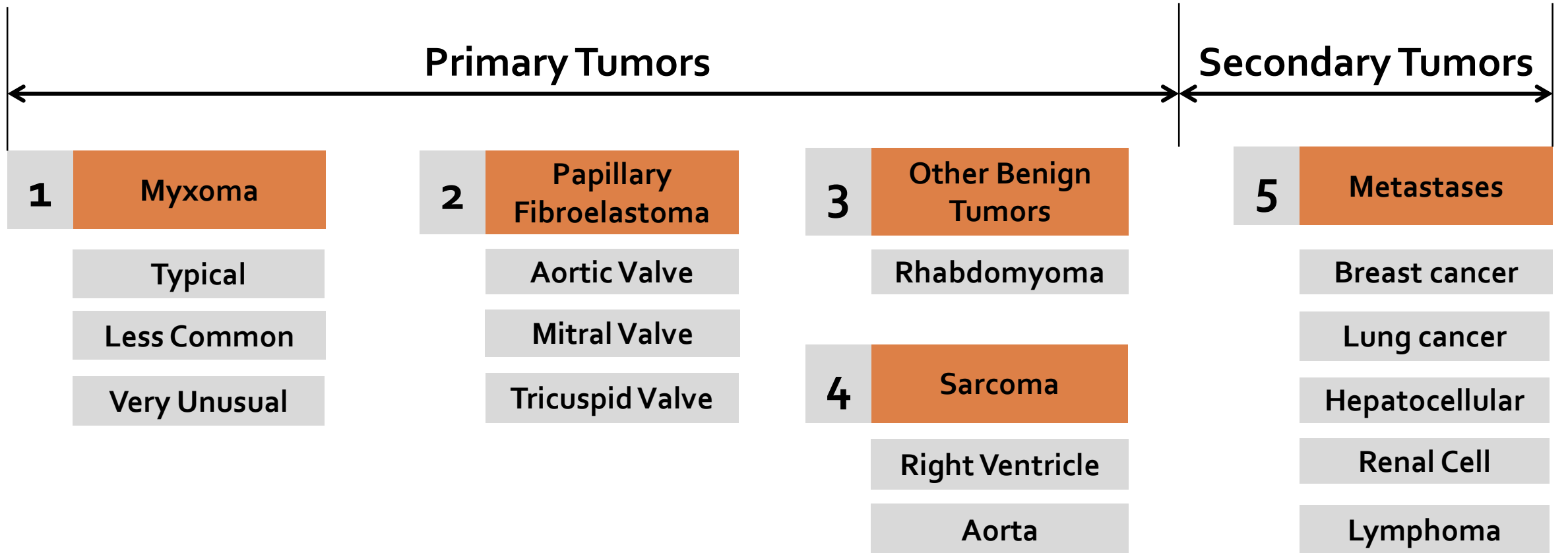
High Prevalence of Subclinical Infarction in Asymptomatic Patients With Silent Left-Sided Cardiac Masses

	Silent Embolism on Brain Imaging
Myxoma	63%
PFE	73%
LV Thrombus	33%



of silent ischemic lesions. To exclude other possible sources of systemic embolism, we then performed 48-h Holter monitoring, duplex carotid ultrasound, and contrast enhanced transthoracic echocardiography on all patients. Coronary imaging with CT angiography or invasive angiography was subsequently performed to exclude concomitant obstructive coronary artery disease. Thereafter, all patients underwent

Cardiac Masses



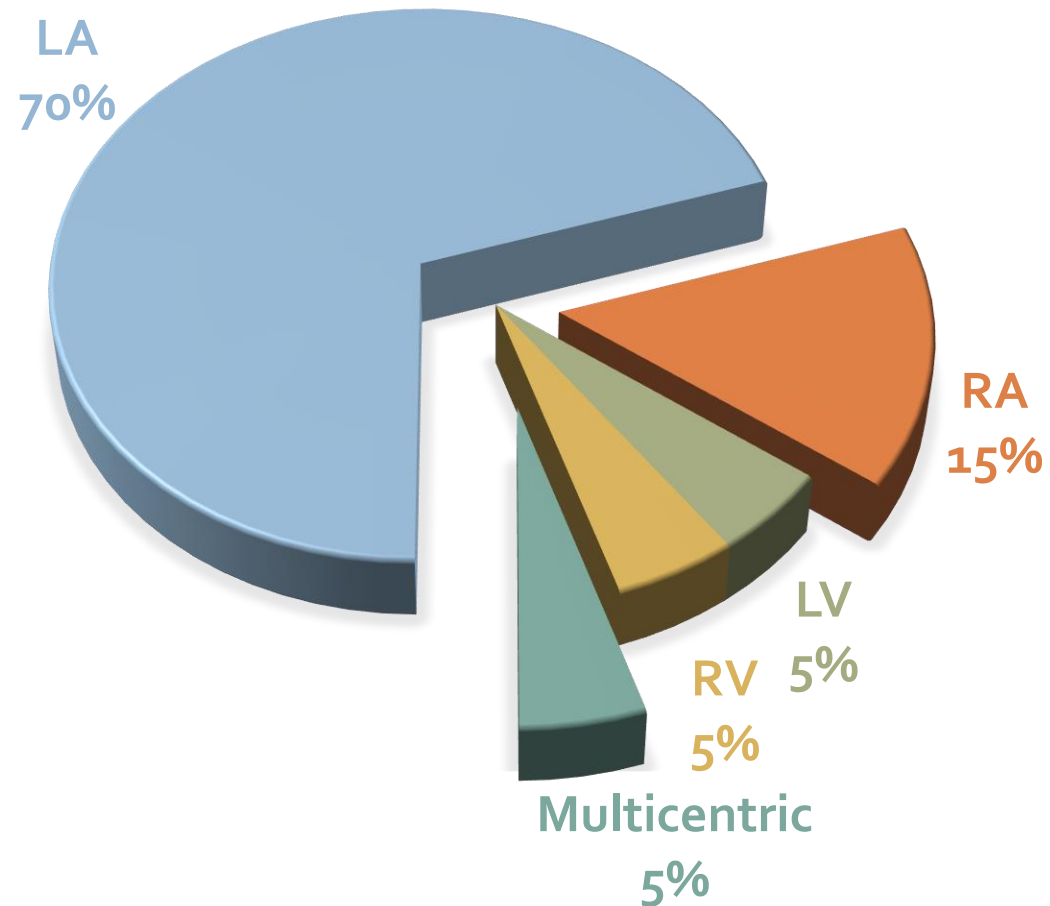
Myxomas



Embolic Potential of Myxomas

- In at least **1/3** of cases of myxomas, there is evidence of distant embolism, including to the brain
- Embolism may be silent or cause neurologic symptoms
- Neurologic deficits may be the **first** presenting symptom of a myxoma

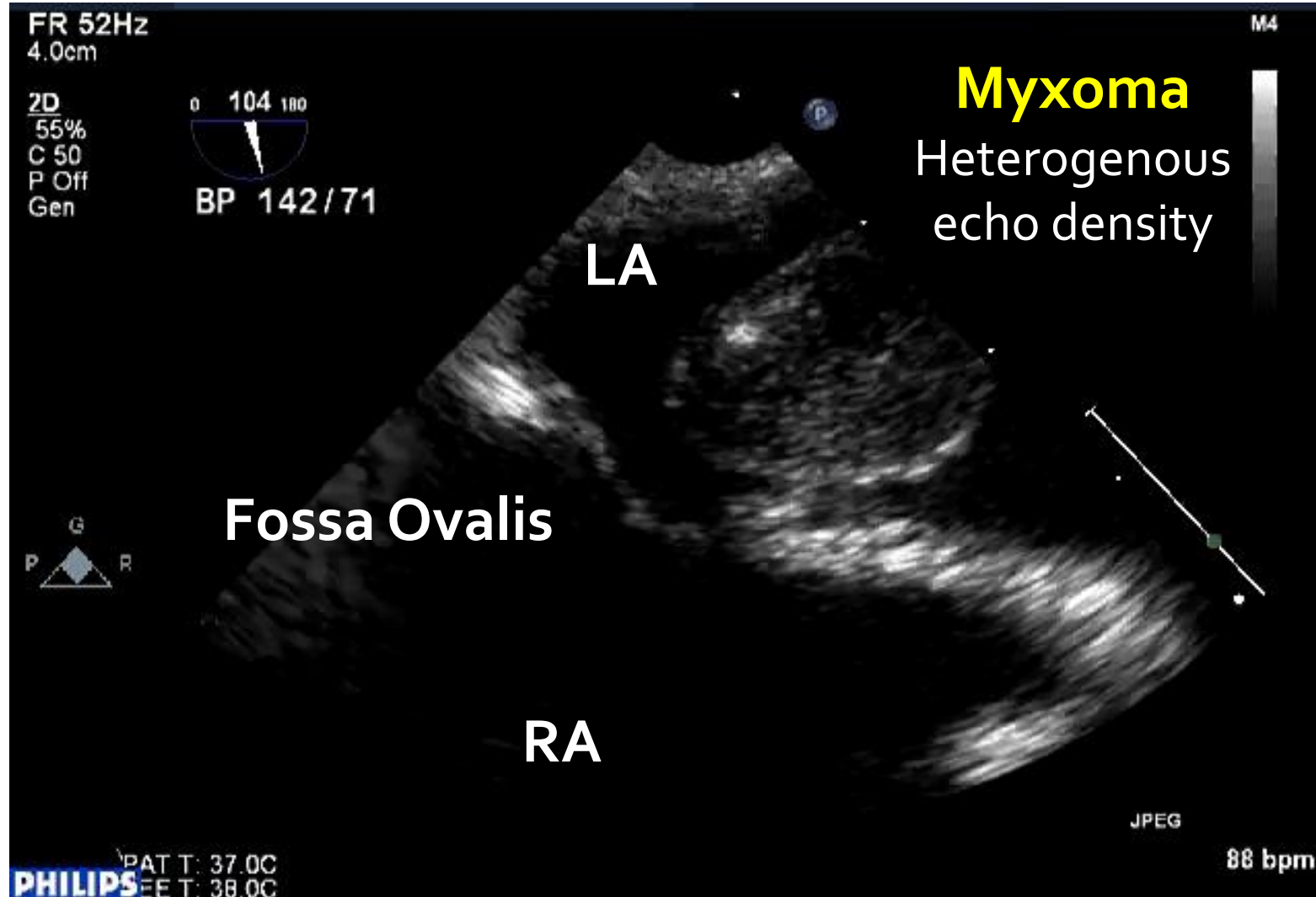
Location of Cardiac Myxomas



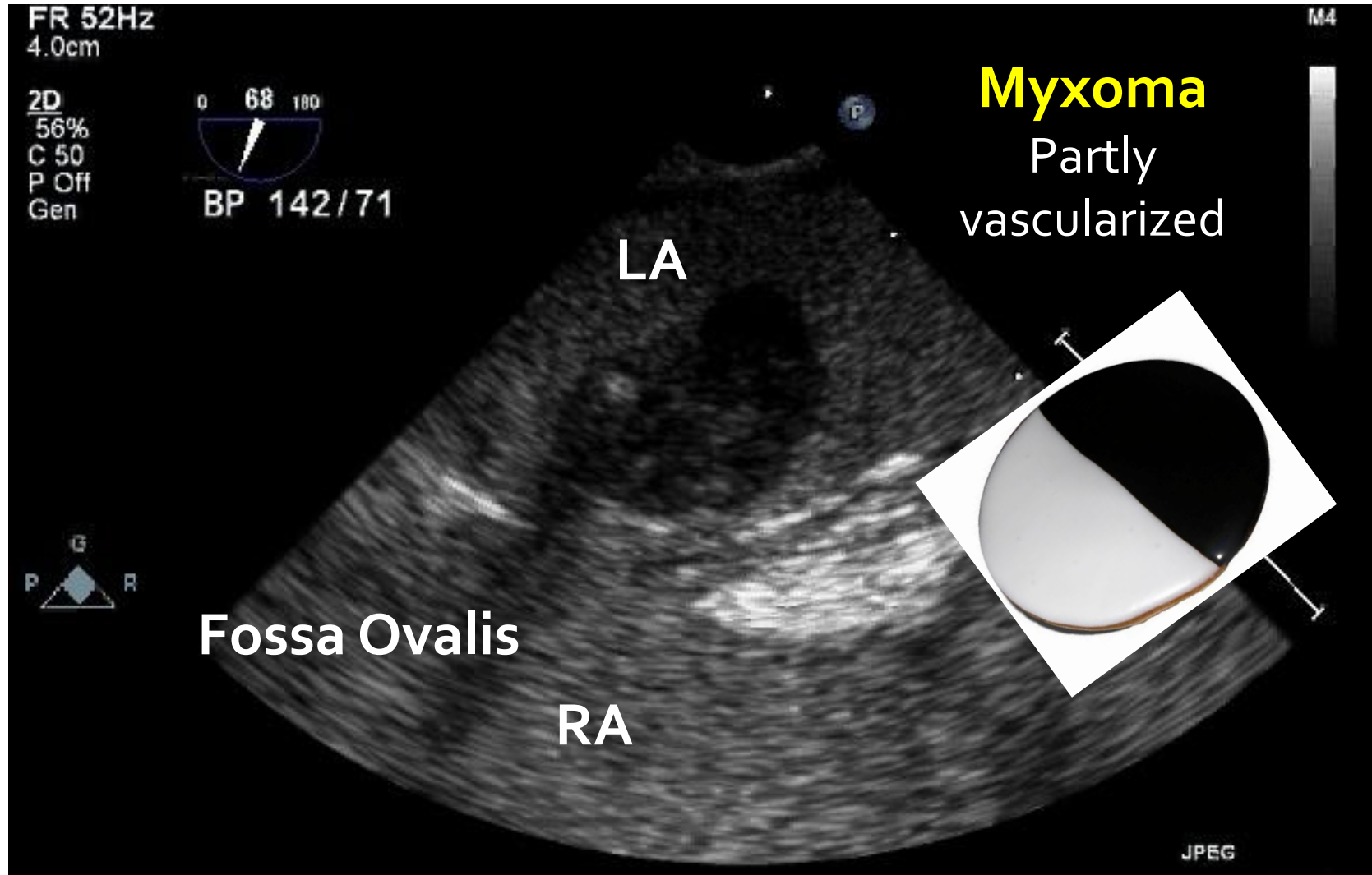
Most Typical LA Myxoma Location



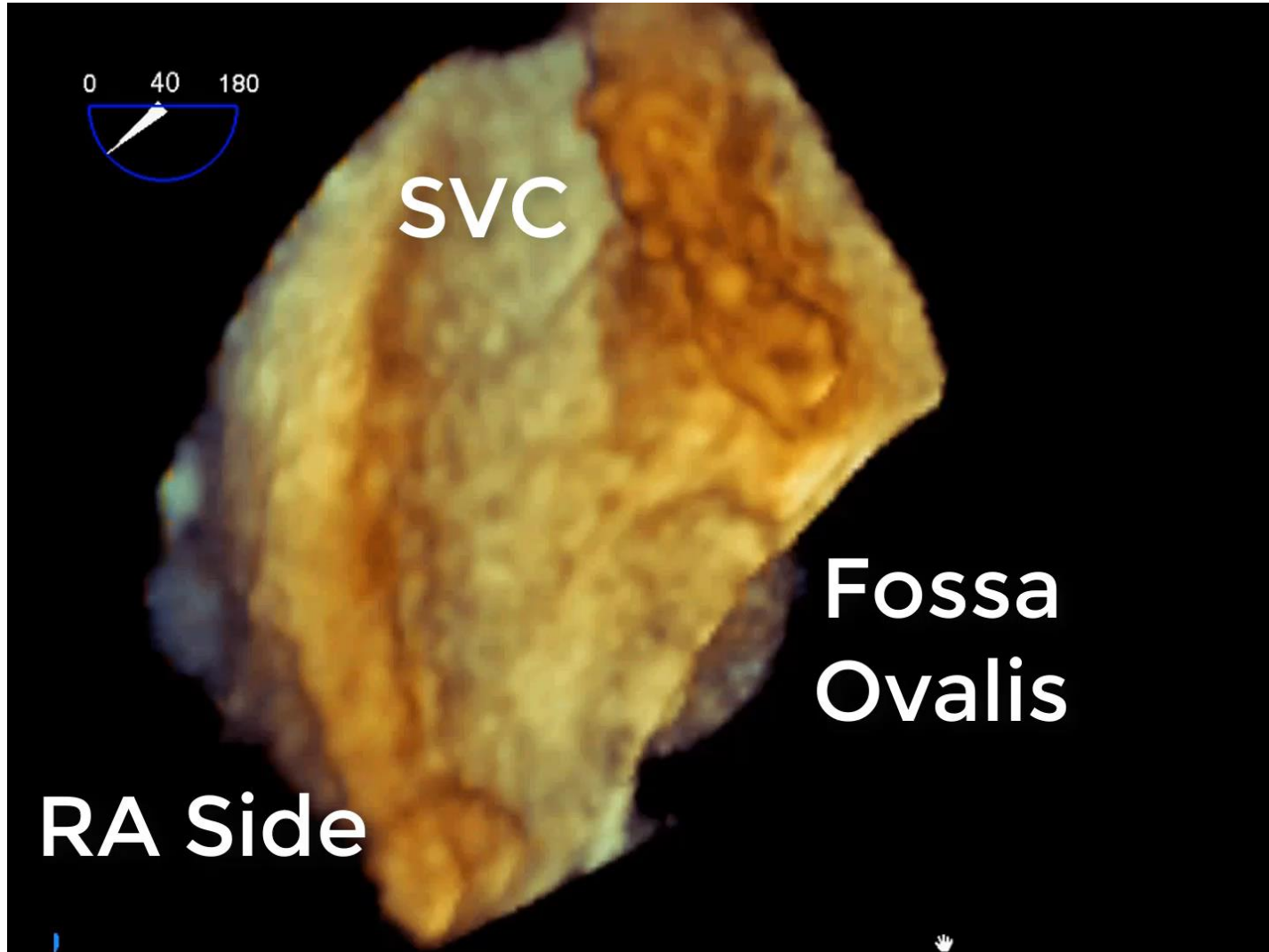
Typical Left Atrial Myxoma



Left Atrial Myxoma: Microbubble Contrast



LA Myxoma: 3D TEE



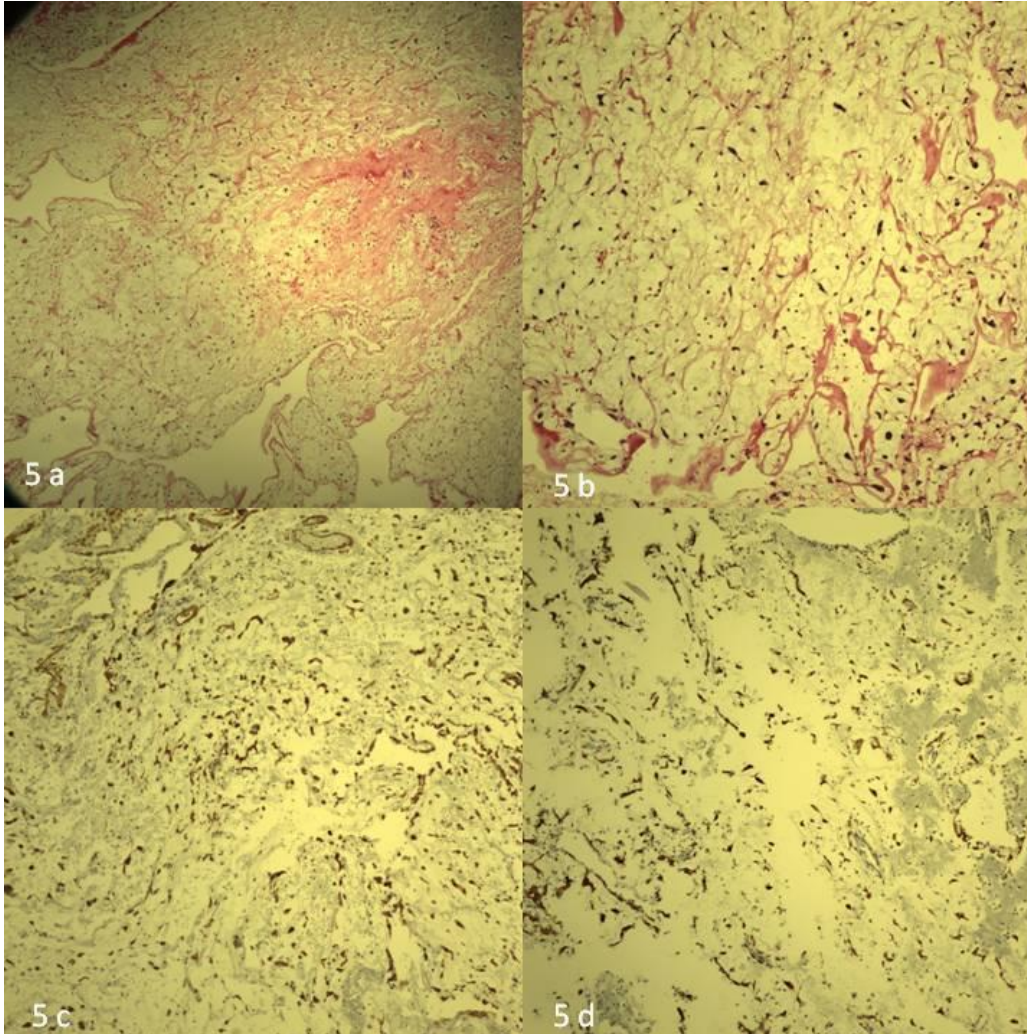
Myxoma Gross Specimen



Myxomas often feature
thrombus formation
on its surface

J Am Soc Echocardiogr
2011;24:110.e1-110.e4.

Myxoma Histology



Panel A: Microscopic appearance under 4x power shows abundant **amorphous extracellular matrix** and scanty cellular elements

Panel B: Microscopic appearance under 10x power reveals scattered **stellate or myxoma cells**, endothelial and smooth muscle cells in abundant **matrix with poorly formed vessels**. No areas of hemorrhage are seen

Panels C & D: Lesion was **CD 34 and calretinin positive**, respectively, which is consistent with diagnosis of myxoma

Myxoma History



Rudolph Carl Virchow
(1821 – 1902)
German pathologist

The term 'myxoma' was coined in **1857**
by Rudolph Virchow

Greek **μύξωμα** : myxoma
(< **μύξα** : myxa - mucus)
'Mucus Containing Tumor'

Myxoma History



Rudolph Carl Virchow
(1821 – 1902)
German Pathologist

3.

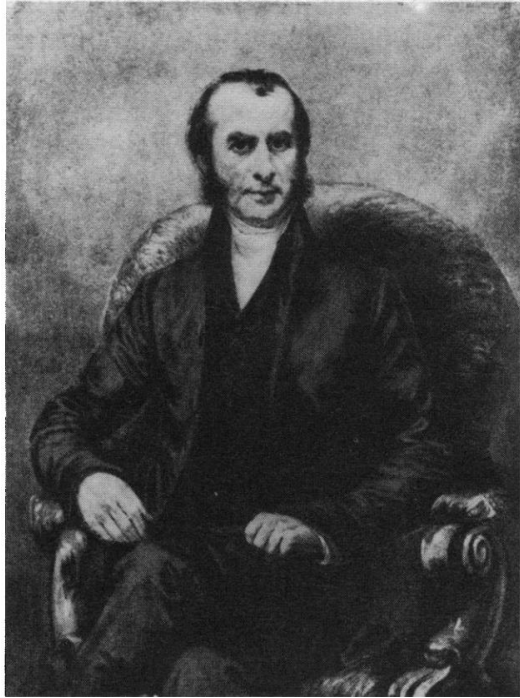
Ein Fall von bösartigen, zum Theil in der Form des Neuroms auftretenden Fettgeschwülsten.

Von Rud. Virchow.

Am 3. Januar d. J. kam die Leiche eines 53jährigen Schneiders zur Section, der seit etwa 11 Wochen von heftigen, dem Anscheine nach rheumatischen Schmerzen heimgesucht war, gegen welche er sowohl in Bethanien, als in der Charité vergeblich Hülfe gesucht hatte. Insbesondere hatte er über einen gürtelartigen Schmerz in der Lendengegend und über Reissen in den Hüften geklagt. Schon

Virchow, R. Ein Fall von bösartigen, zum Theil in der Form des Neuroms auftretenden Fettgeschwülsten [**A case of malignant fatty tumors, occurring partly in the form of neuroma**]. *Archiv für pathologische Anatomie und Physiologie und für klinische Medicin* 1857;11(3):281-288.

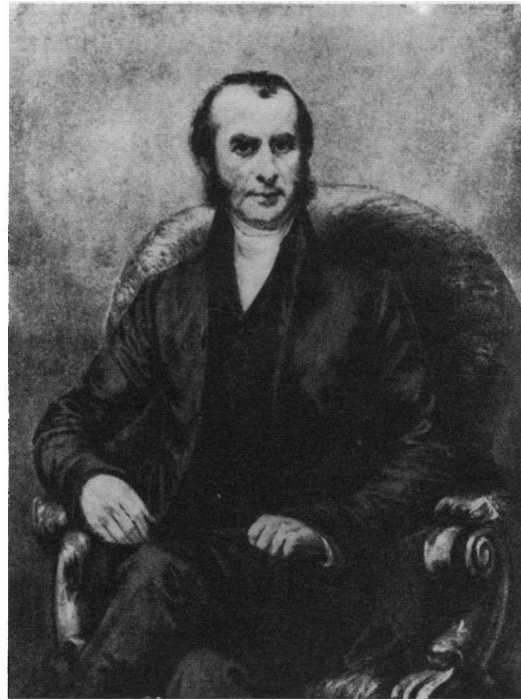
Myxoma History



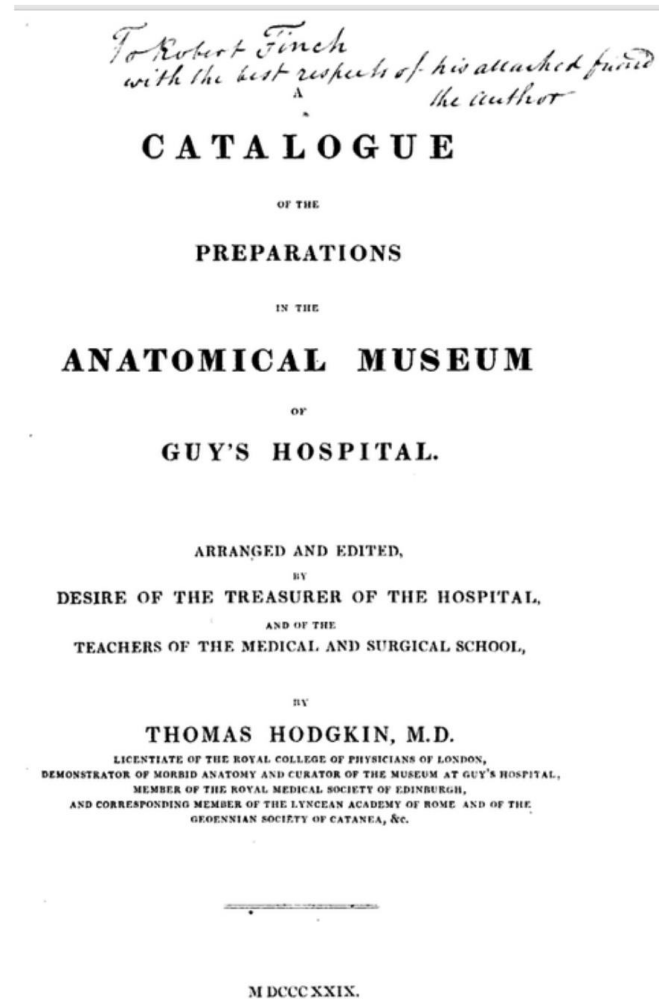
Thomas Hodgkin
(1798 – 1866)
English Physician

The first description of an apparent left atrial myxoma was made in London by Thomas Hodgkin in **1829**

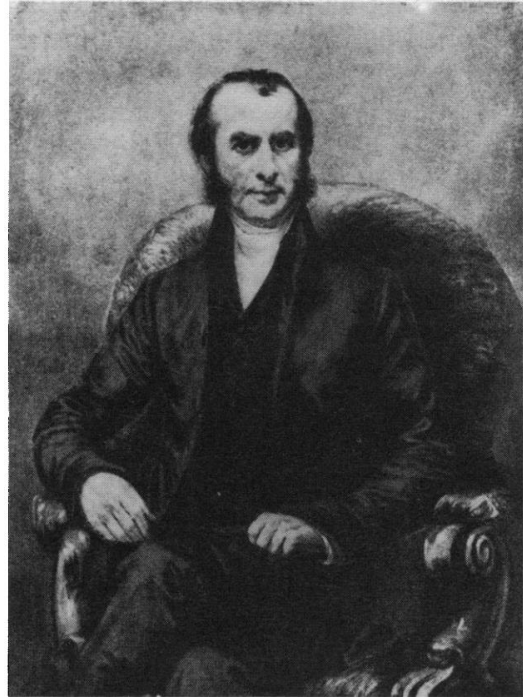
Myxoma History



Thomas Hodgkin
(1798 – 1866)
English Physician



Myxoma History



Thomas Hodgkin
(1798 – 1866)
English Physician

The case was that of a female, ætat. 55, with general dropsy and thoracic obstruction. Dr. Hodgkin's *post-mortem* history is quite satisfactory (Green, *Inspn.-book*, 3, p. 157):—

“In the left auricle, close to the margin of the foramen ovale, was attached a large polypiform body of about the size of a pullet's egg. The surface by which it was attached was nearly the size of a shilling. Though rather dark and discoloured in some parts, it was generally of a light-yellow, and semi-transparent, with some opaque white specks dispersed through it, having some resemblance to the opaque points in soft soap, but rarer and smaller. It was firmer than the ordinary fibrinous concretions which are found in the heart, and was especially so about its root. On fine injection being thrown into the coronary arteries, minute vessels were seen beautifully ramifying through the transparent substance. This polypiform concretion was covered by a thin membrane continuous with that of the lining membrane of the auricle. Though its substance was not disposed in layers, some appearances in it, (as, for instance, darkish points of a brownish colour) had a trace of arrangement equi-distant from the surface.”—The museum catalogue is less distinct about the nature of this body. Allan Burns is amongst the authorities for the term *concretion*.



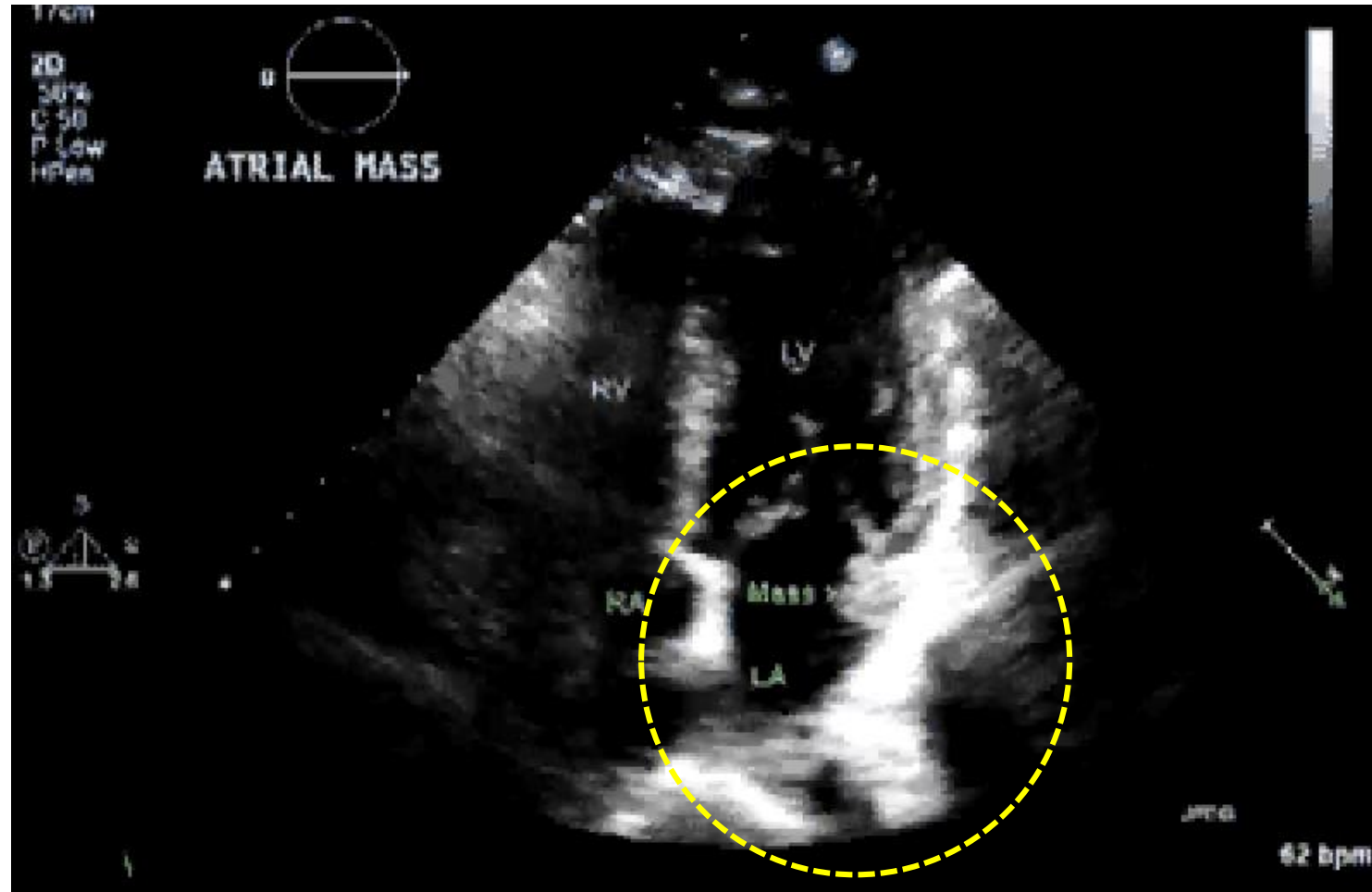
Less Typical LA Myxoma Locations

Case #1



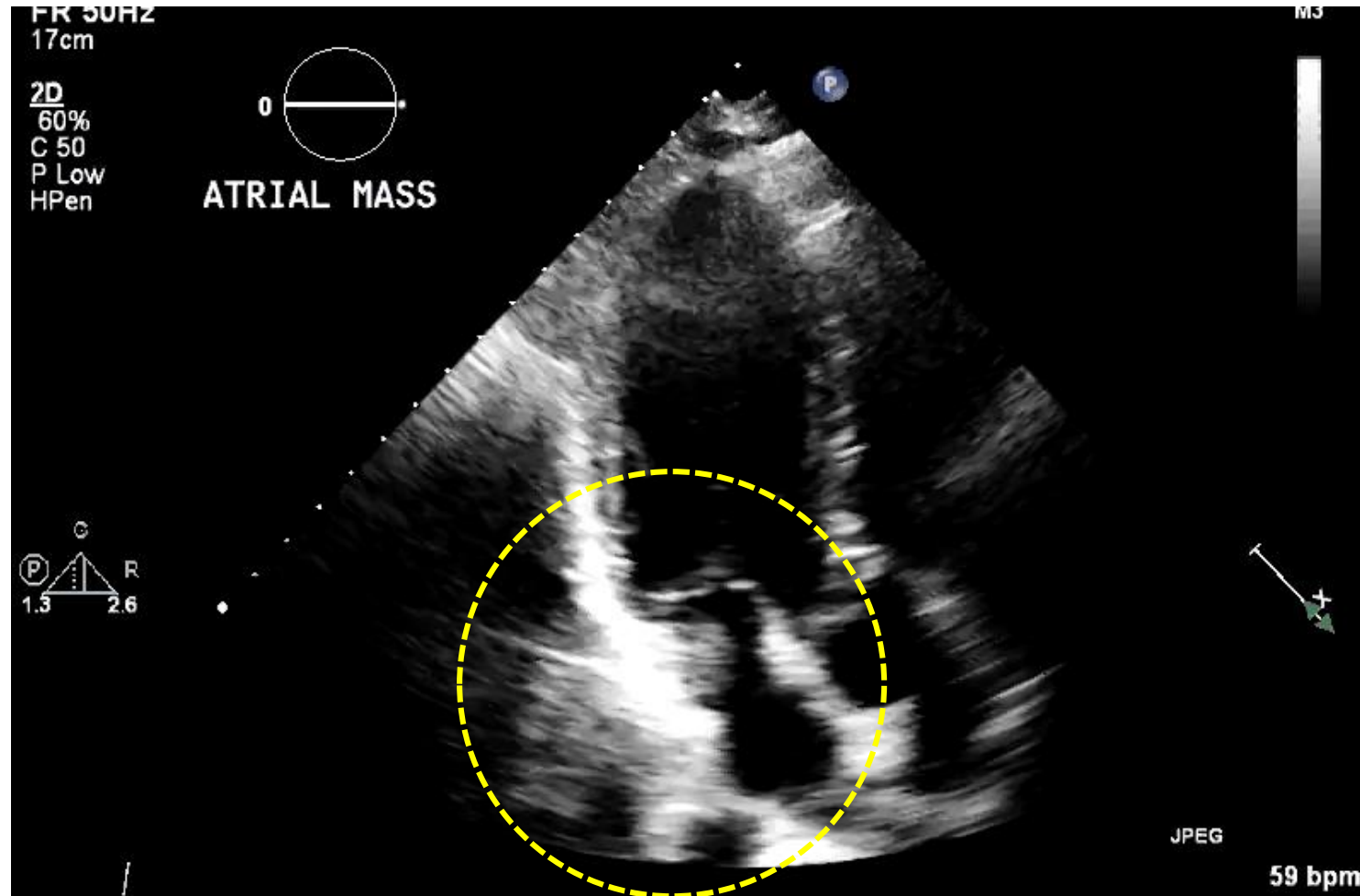
LA Myxoma Away From Fossa Ovalis

68-year-old man with vague neurologic symptoms

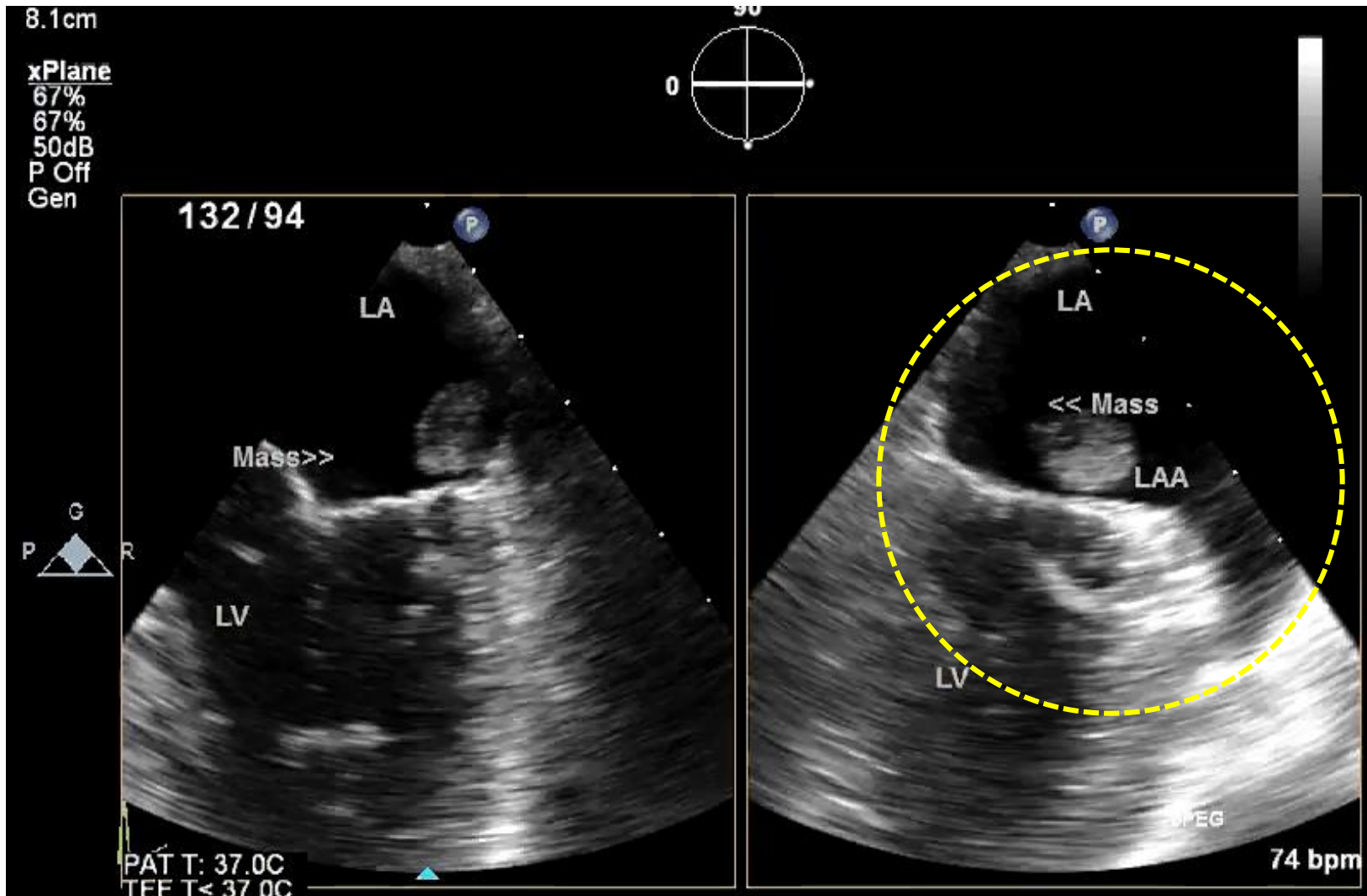


LA Myxoma Away From Fossa Ovalis

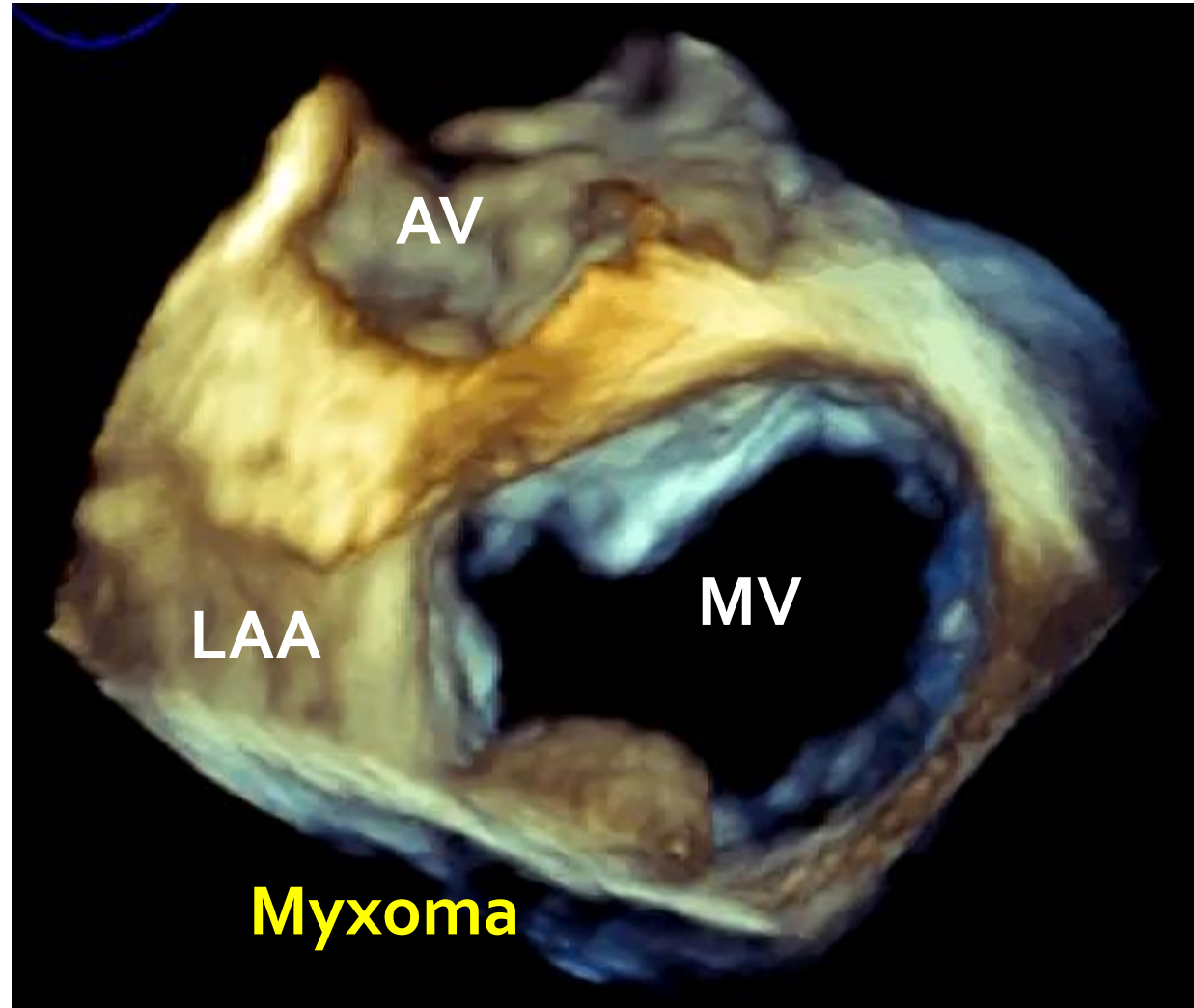
68-year-old man with vague neurologic symptoms



LA Myxoma Away From Fossa Ovalis

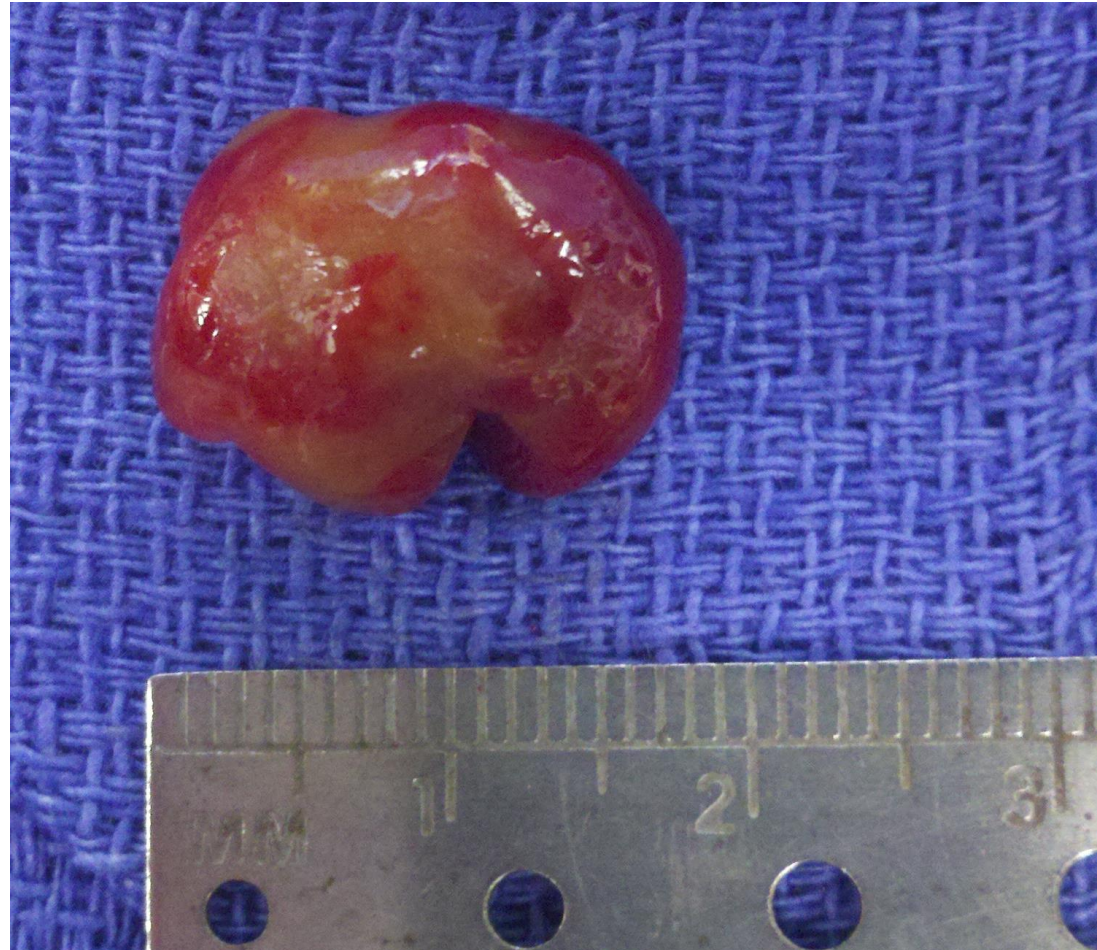


LA Myxoma Away From Fossa Ovalis



LA Myxoma Away From Fossa Ovalis

68-year-old man with vague neurologic symptoms



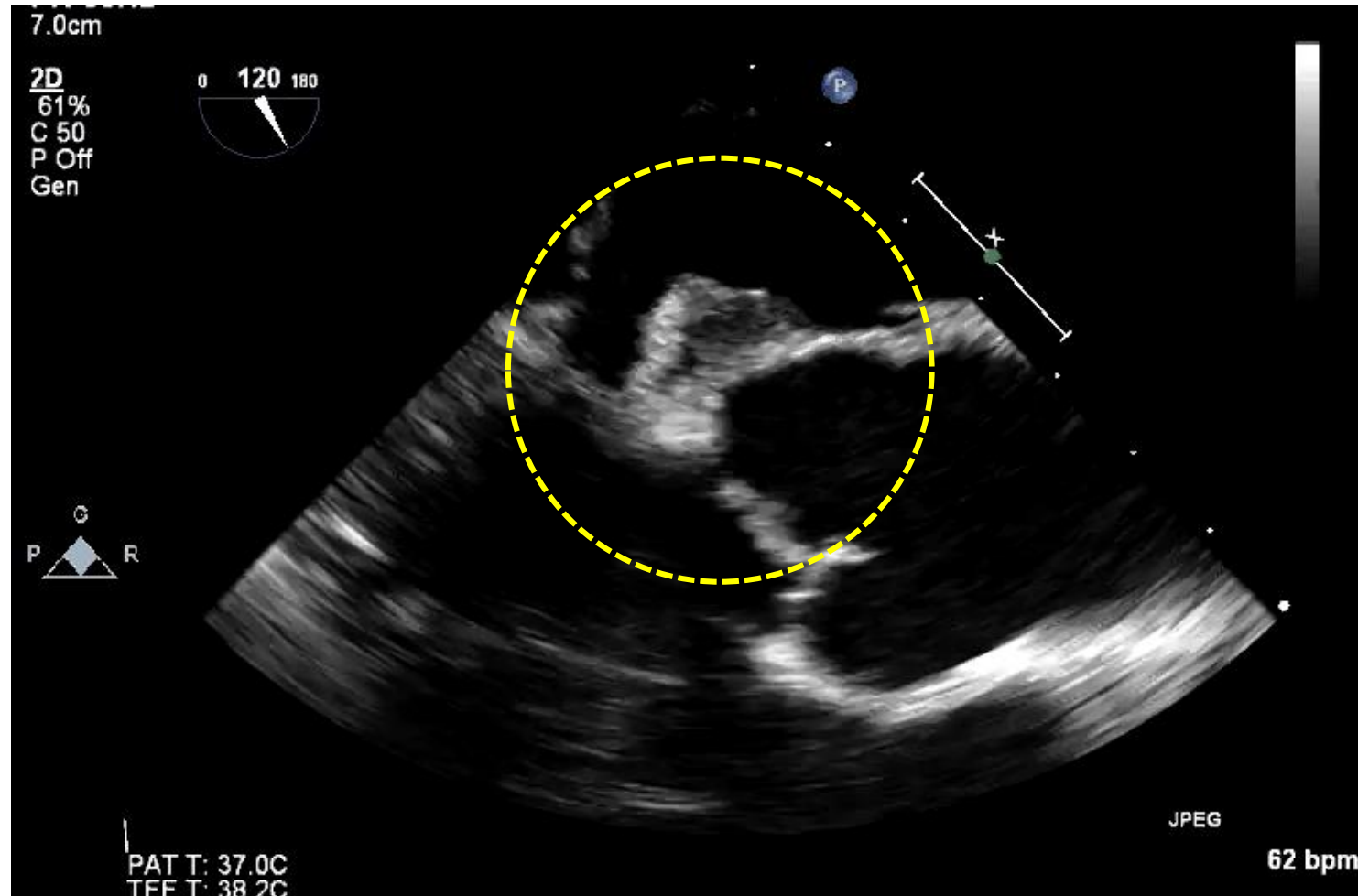
Less Typical LA Myxoma Locations

Case #2

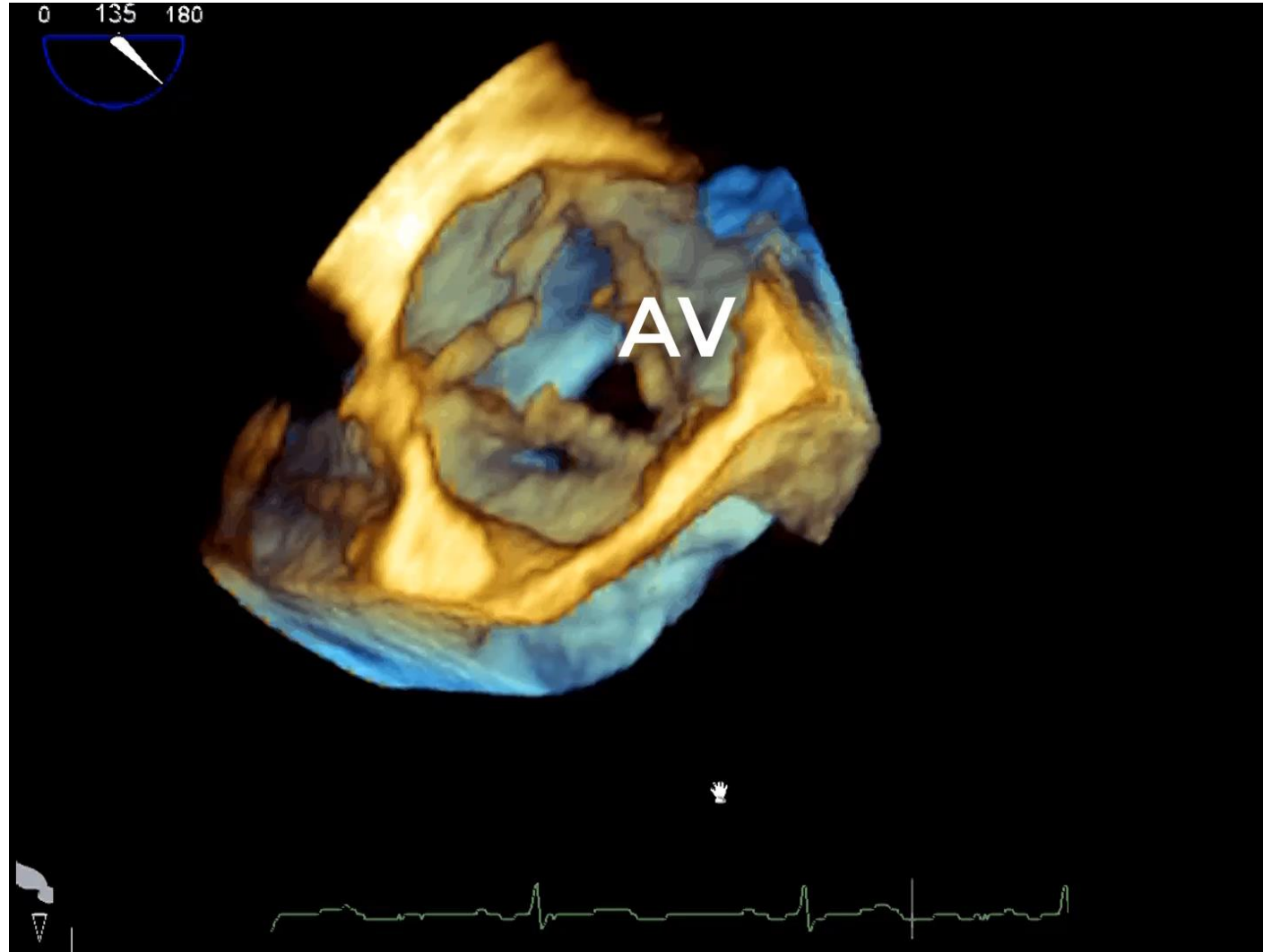


LA Myxoma Behind Aortic Valve

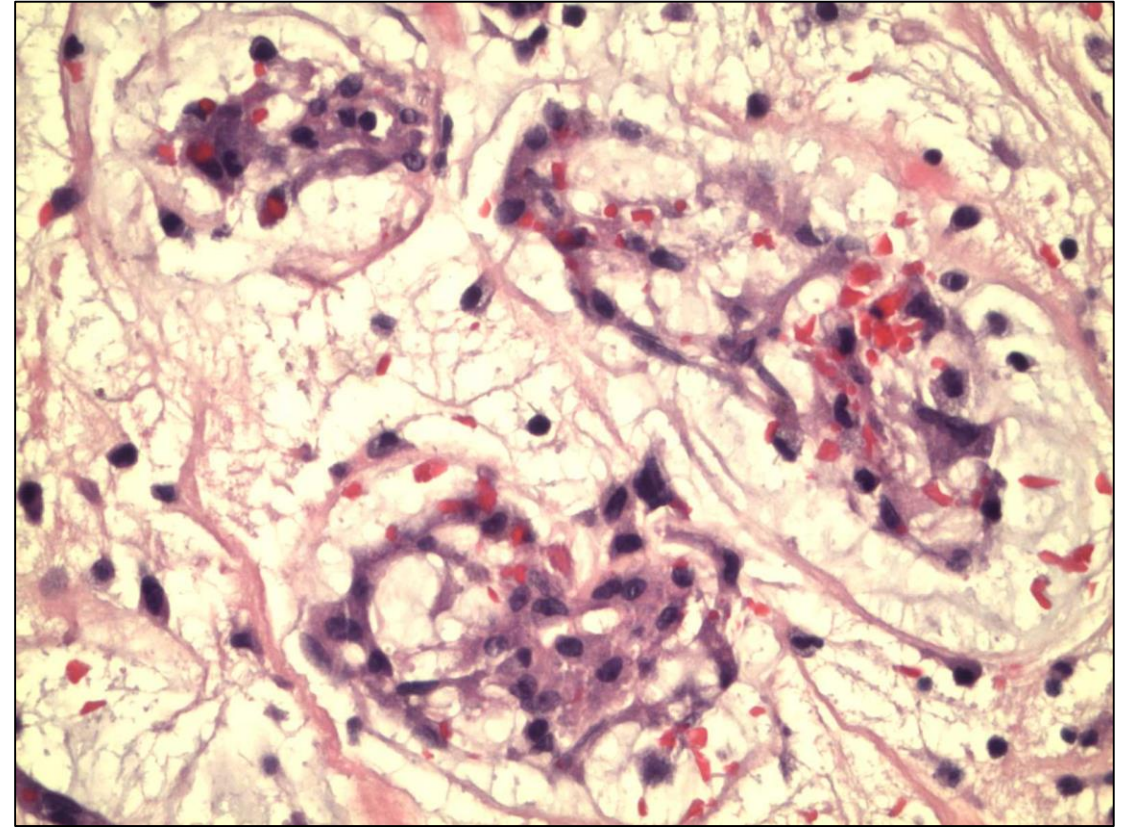
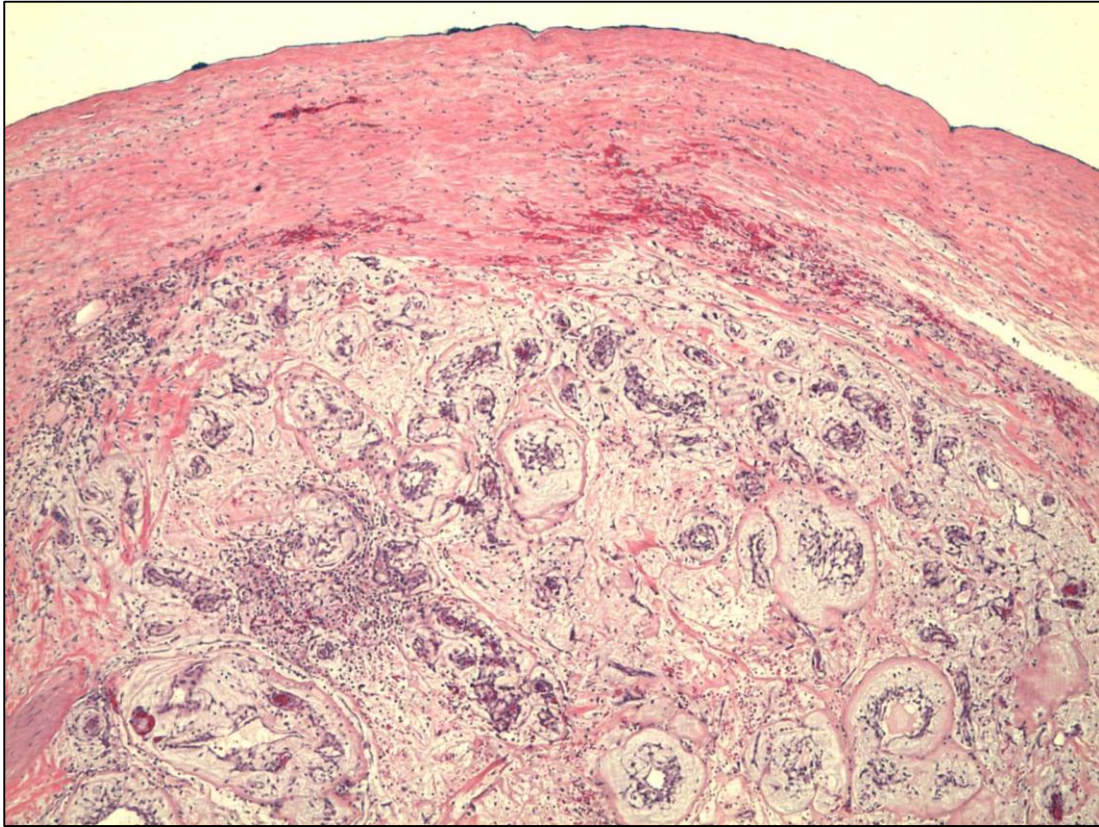
71-year-old woman with transient ischemic attack



LA Myxoma Behind Aortic Valve



LA Myxoma Behind Aortic Valve

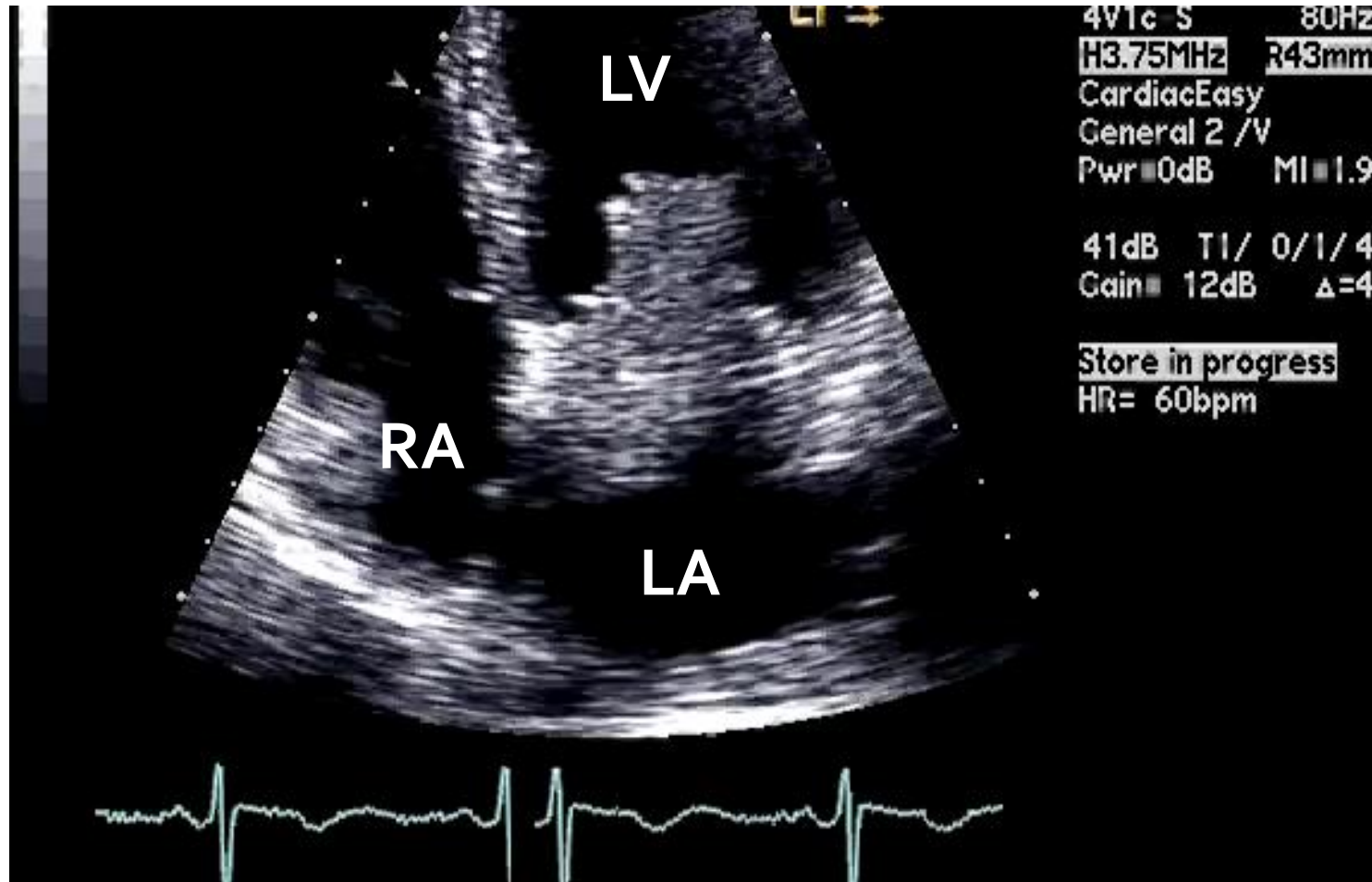


Less Typical LA Myxoma Presentation

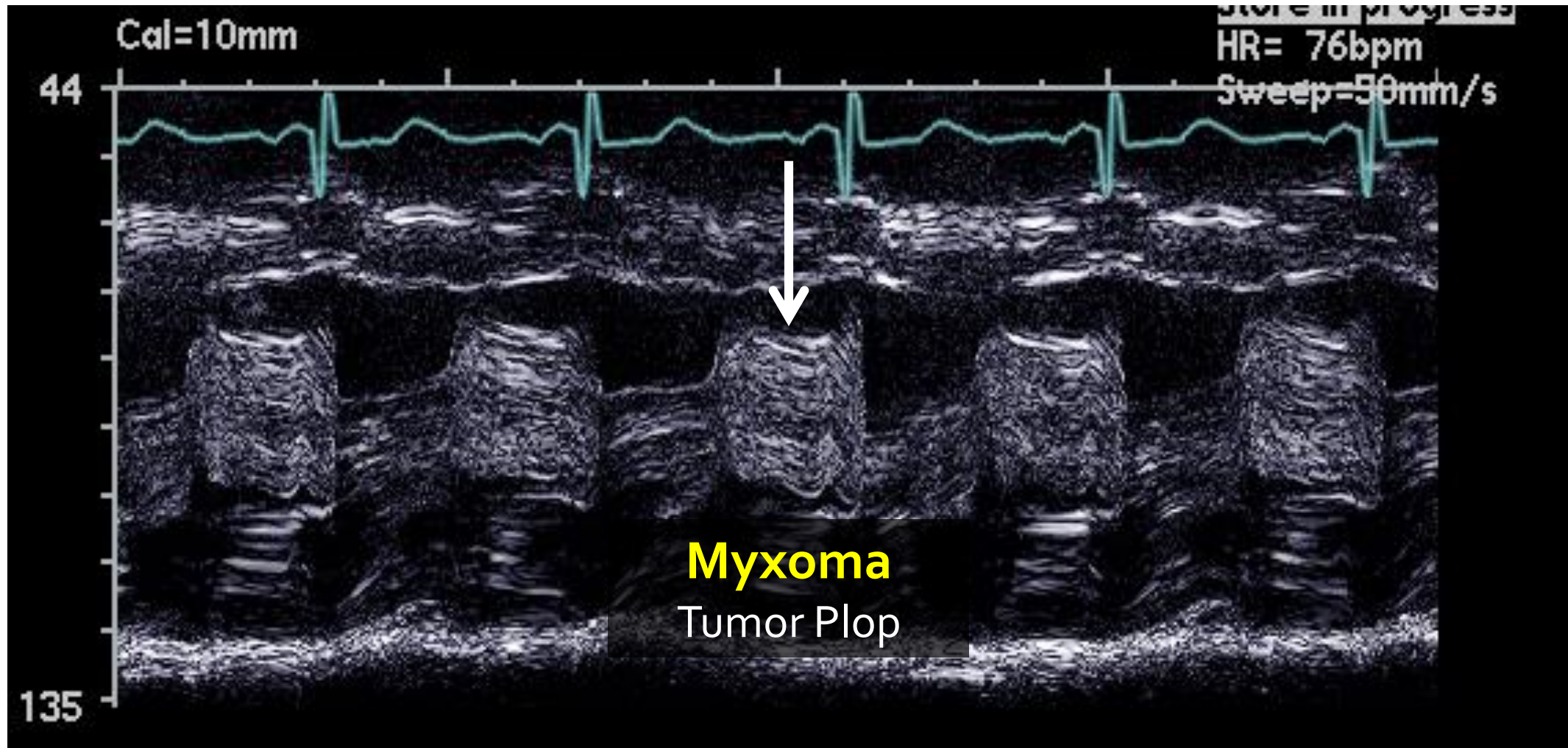


LA Myxoma Across Mitral Valve

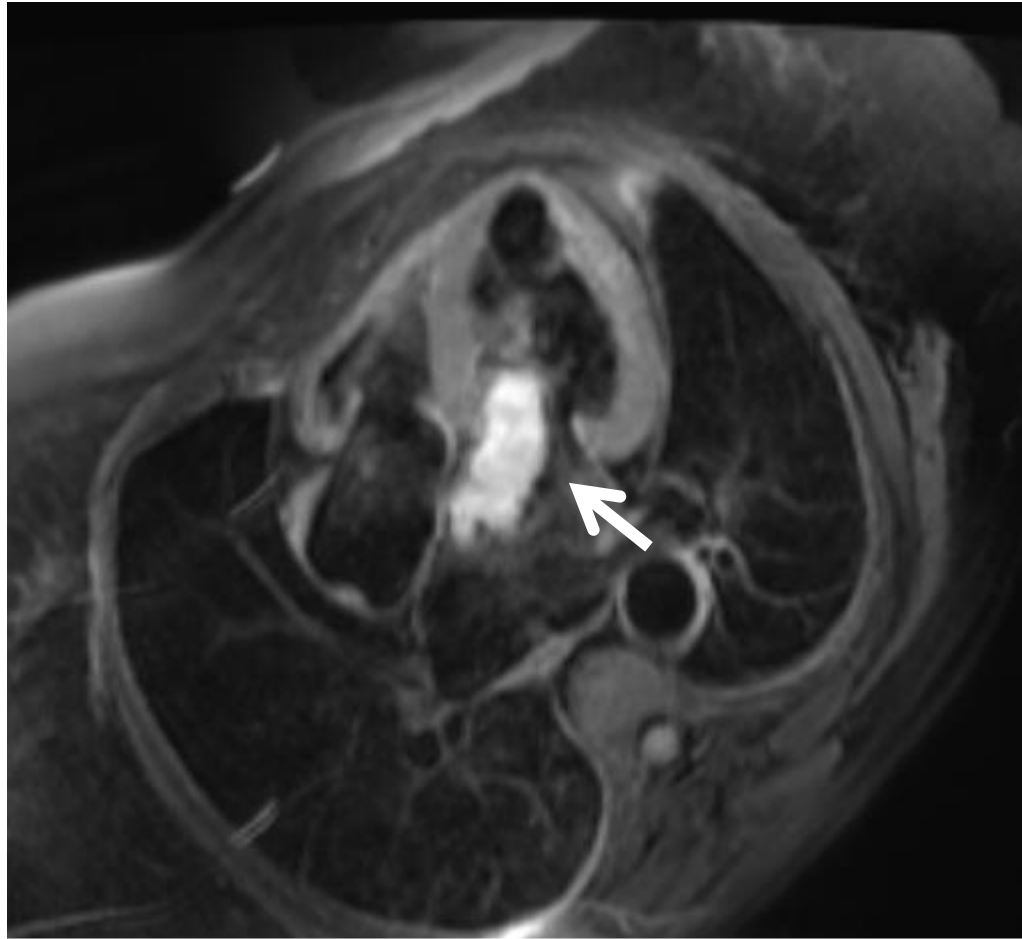
63-year-old woman with left-sided weakness



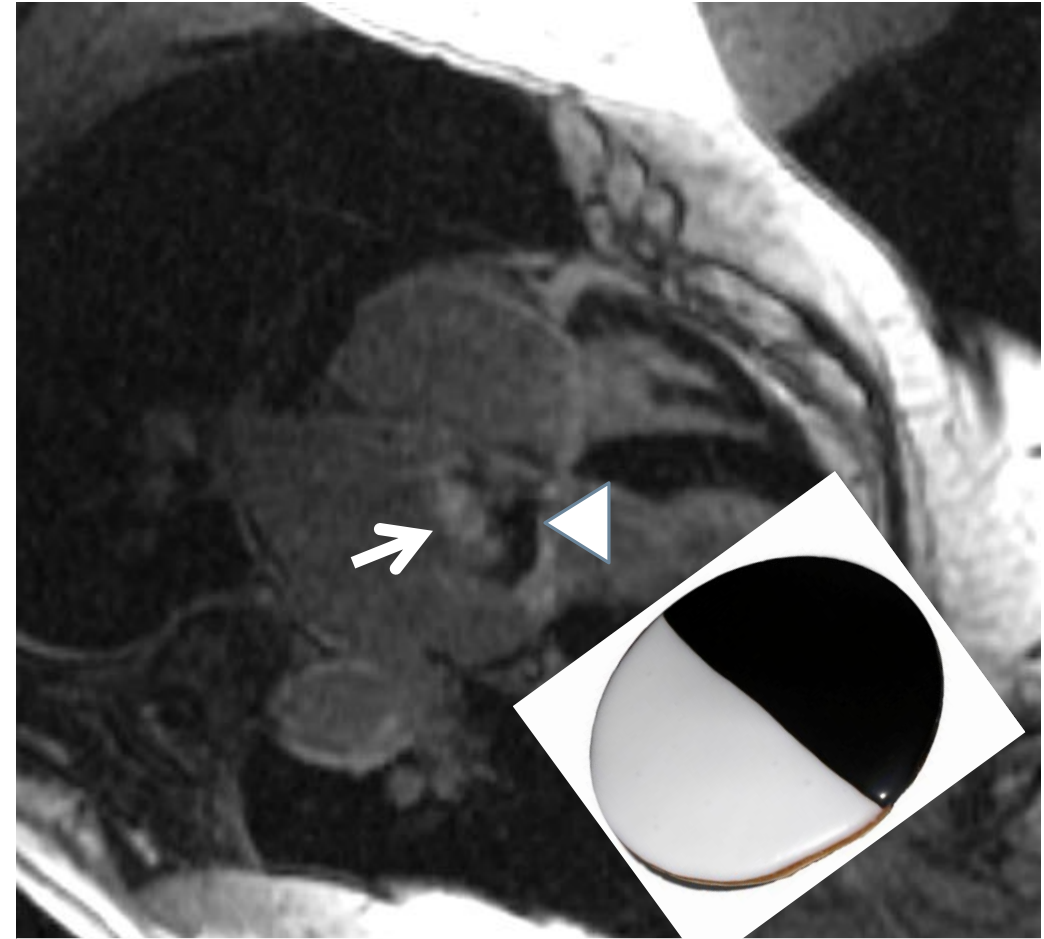
LA Myxoma Across Mitral Valve



LA Myxoma Across Mitral Valve: MRI



FS₂



MDE

An Intriguing Co-Existence: Atrial Myxoma and Cerebral Cavernous Malformations: Case Report and Review of Literature

Shikha Sharma, MD, Daniel Tsyvine, MD, Pierre D. Maldjian, MD, Justin T. Sambol, MD, Constantinos J. Lovoulos, MD, Gal Levy, MD, Amin Maghari, MD, Marc Klapholz, MD, and Muhamed Saric, MD, PhD, *Newark, New Jersey*



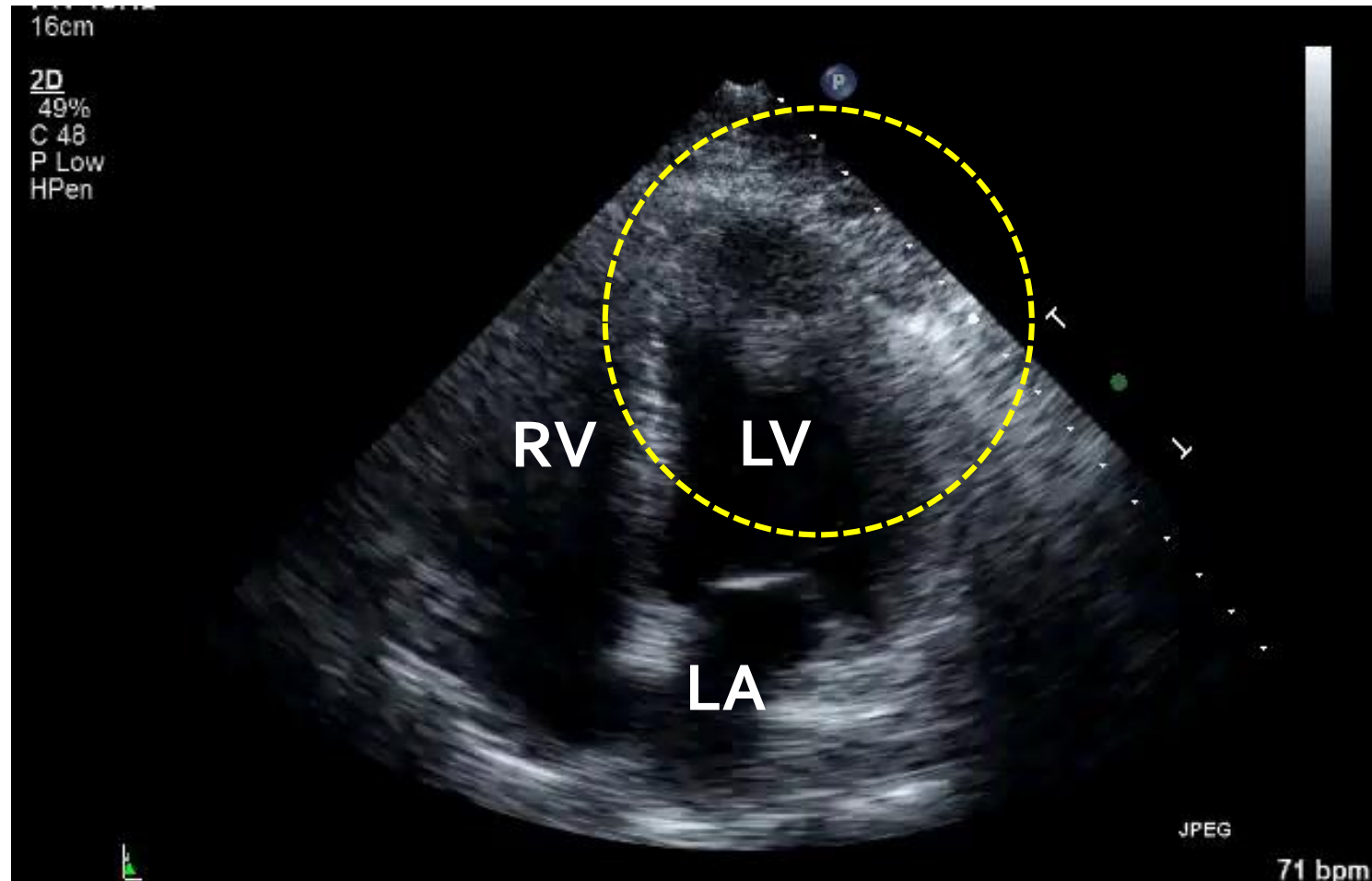
It is commonly postulated that neurologic complications of atrial myxomas are due to either direct tumor embolization or mycotic aneurysm of cerebral vasculature or rupture of mycotic aneurysms of cerebral arteries. However, the authors report the case of 63-year-old woman with a large left atrial myxoma whose progressive left-sided weakness was due to a different neurologic mechanism, namely, multiple bleeding cavernous malformations, which were visualized by magnetic resonance imaging of the brain. Cerebral cavernous malformations coexist with mesenchymal anomalies of other organs, including the liver, kidneys, and retinas. To the best of the authors' knowledge, this is only the second reported case of coexistent cerebral cavernous malformations and atrial myxoma. (J Am Soc Echocardiogr 2011;24:110.e1-110.e4.)

Left Ventricular Myxoma

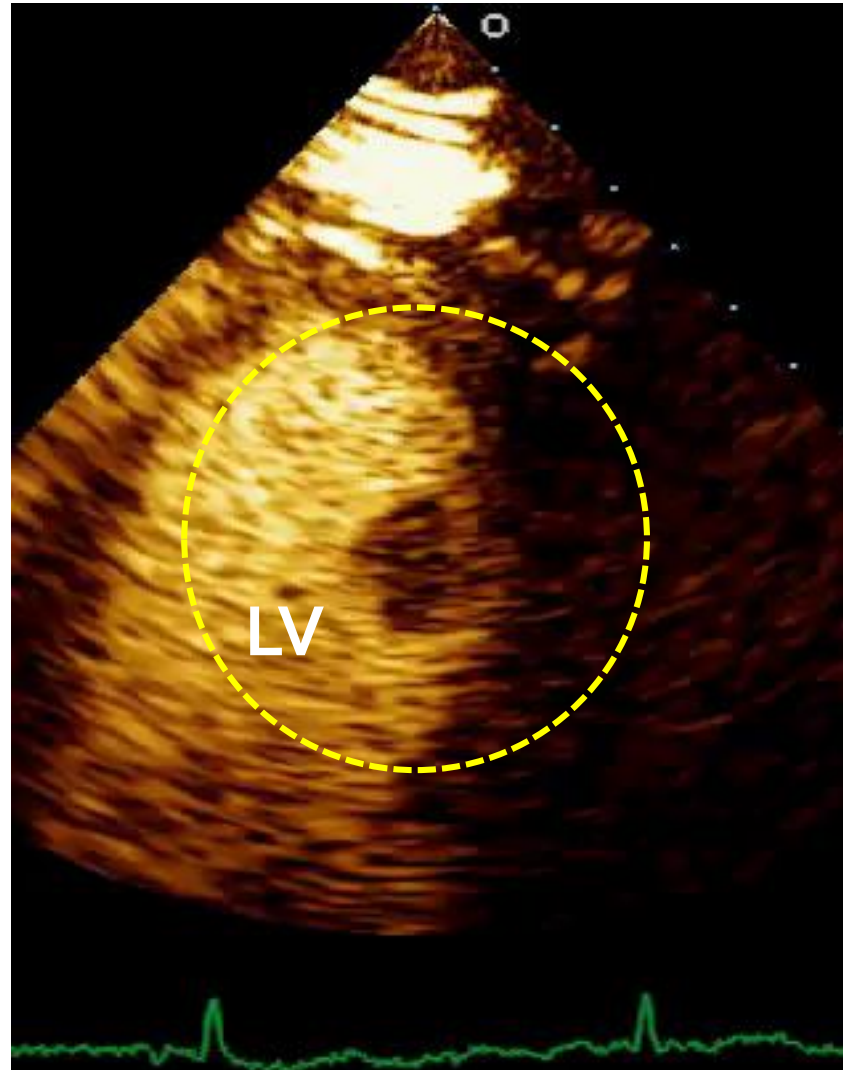


Left Ventricular Myxoma

50-year-old man fevers & night sweats for 1 month



Left Ventricular Myxoma: Microbubble Contrast



Right Heart Myxoma

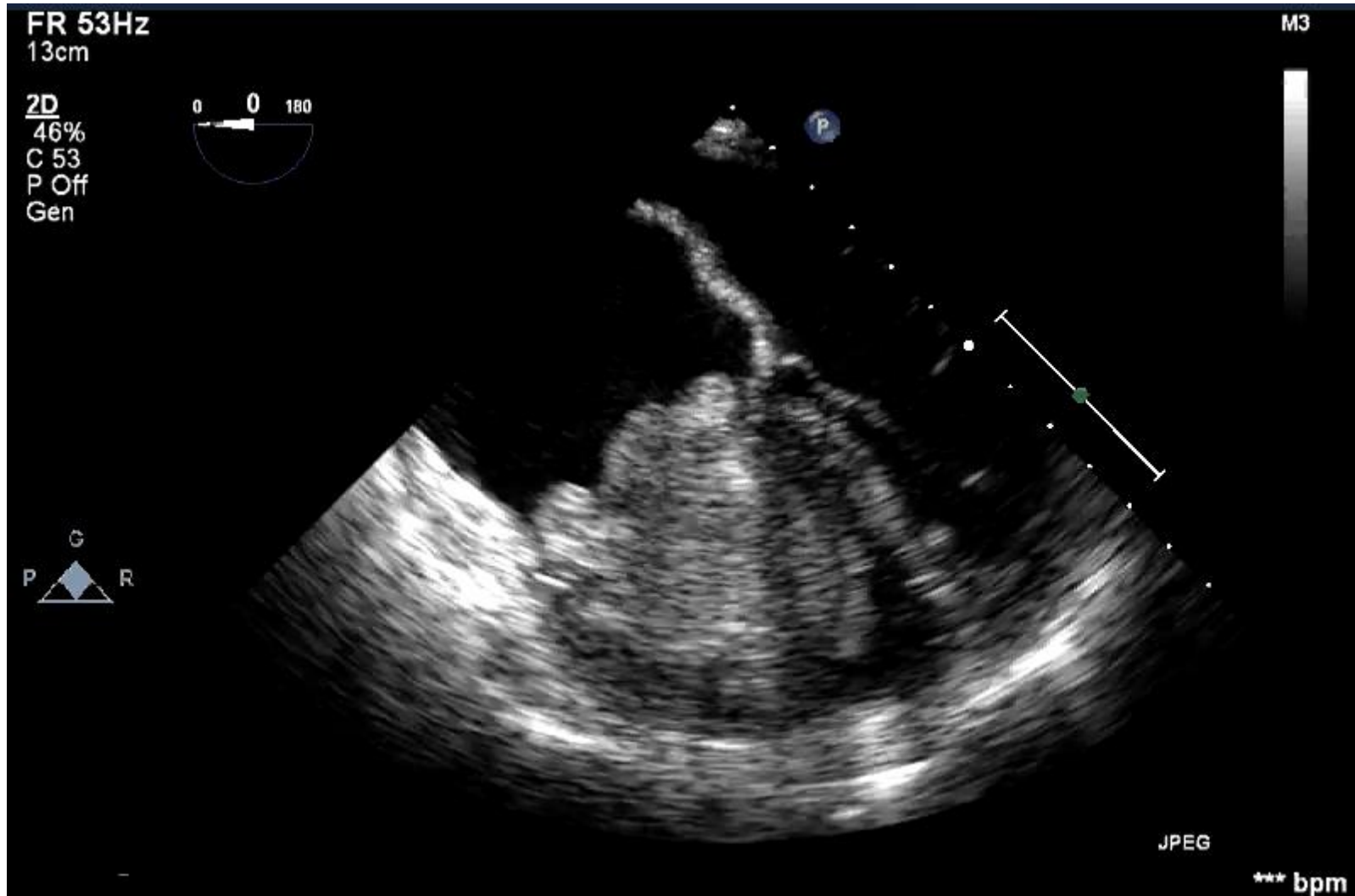


Right Heart Myxoma

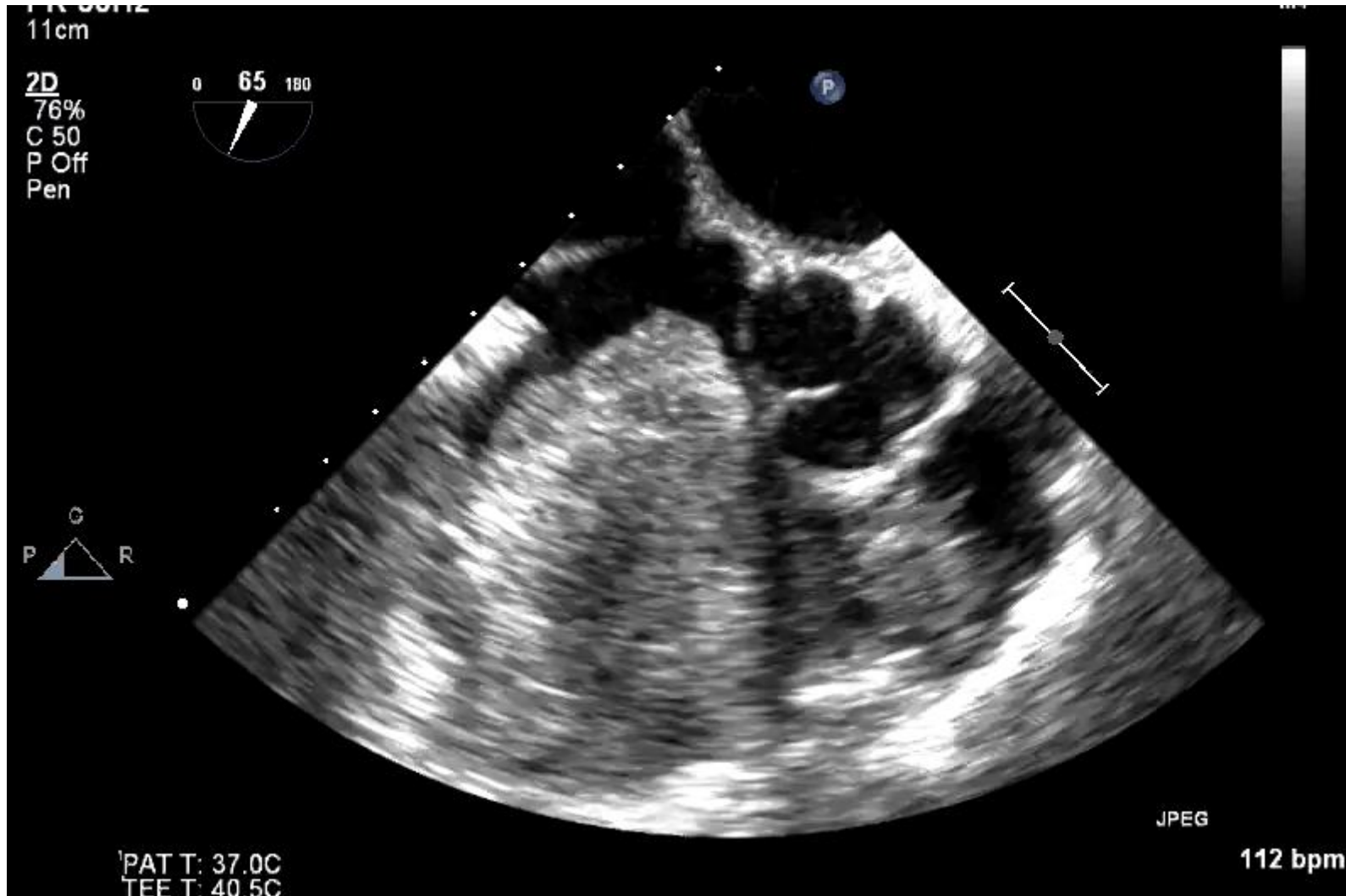
63-year-old man with
hypotension and **suspected pulmonary embolism**

- **Premature puberty** due to pigmented nodular **adrenal hyperplasia**
- He underwent excision of a benign myxoid **neurofibroma** of the cervical spine with radiculopathy ~ 10 years ago.
- He has plane **lentigenes** (epithelioid blue nevi)
- **Prior surgical removal of 2 left atrial myxomas**

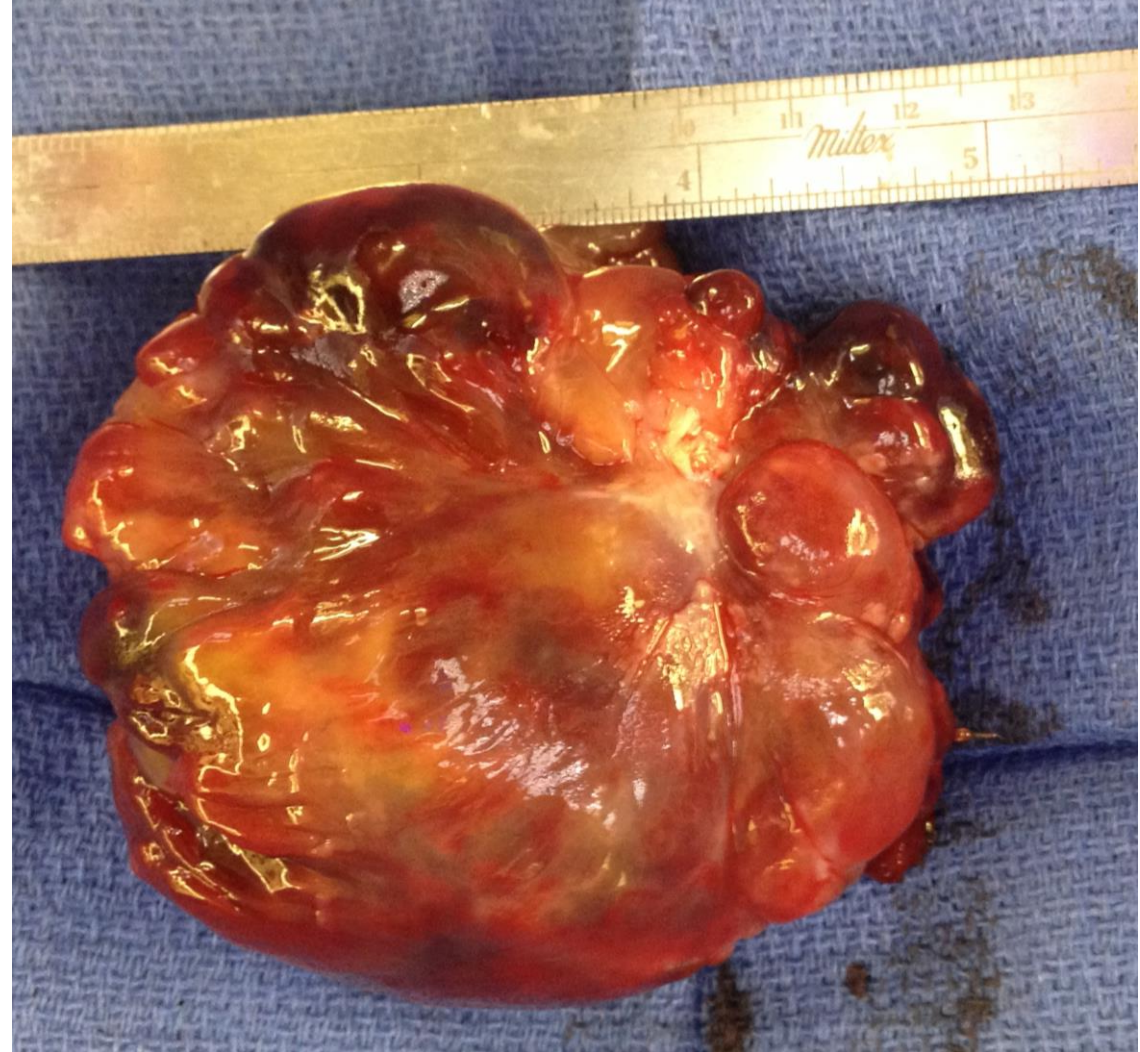
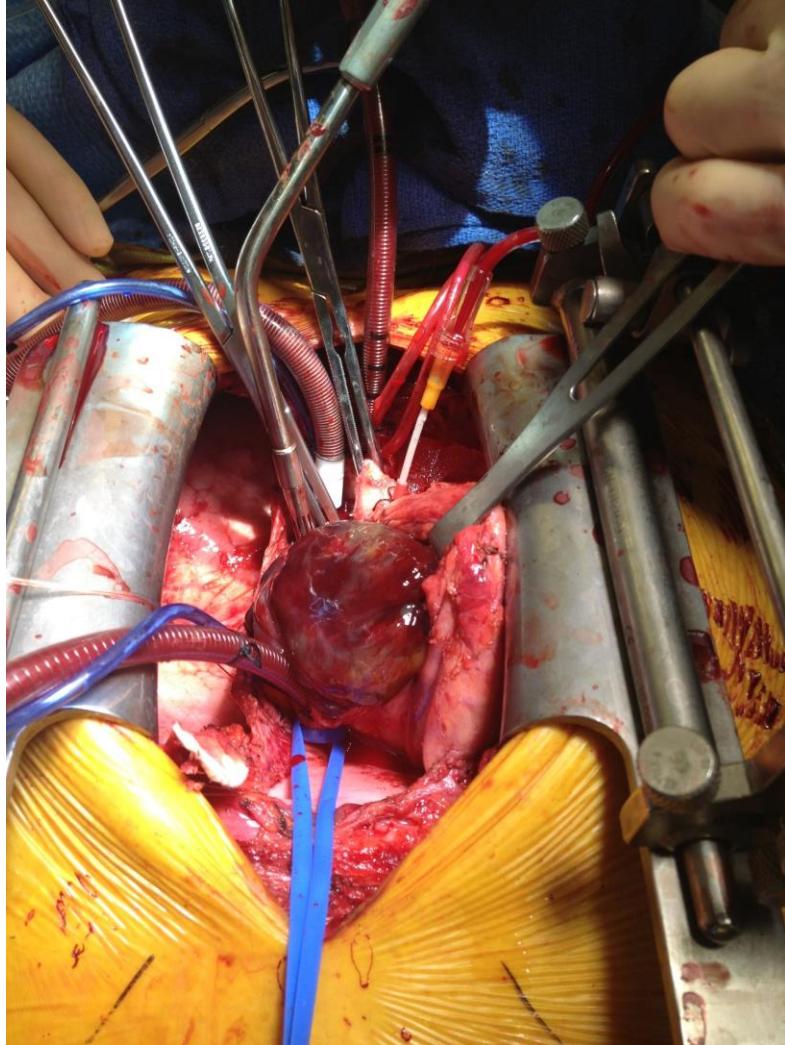
Right Heart Myxoma



Right Heart Myxoma



Right Heart Myxoma



Carney Complex



J. Aidan Carney
Mayo Clinic
Pathologist

The Complex of Myxomas, Spotty Pigmentation, and Endocrine Overactivity

J. AIDAN CARNEY, M.D., PH.D., F.R.C.P.I., HYMIE GORDON, M.D., F.R.C.P.,
PAUL C. CARPENTER, M.D., B. VITTAL SHENOY, M.D., AND VAY LIANG W. GO, M.D.

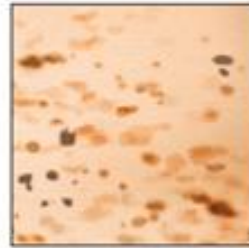
Medicine **1985**;64(4):270-83

Carney Complex



Approximately
7% of all cardiac myxomas
are associated with
Carney complex

N Engl J Med. **1995**
Dec 14;333(24):1610-7



Spotty skin pigmentation, 65%



Cutaneous myxomas, 45%



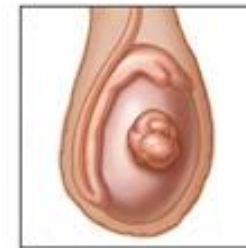
Cardiac myxomas, 72%



CARNEY COMPLEX



Mammary myxomas, 42%



Testicular tumors, 56%



PPNAD, 45%



GH-secreting pituitary tumor, 10%



Schwannomas, 5%

Very Unusual Form of Myxoma



Clinical History

64-year-old businessman living in an affluent New York City suburb

1948

Born in New York City

1974

At age 26, treated for testicular cancer
(left orchiectomy + chemo)

Sep 2011

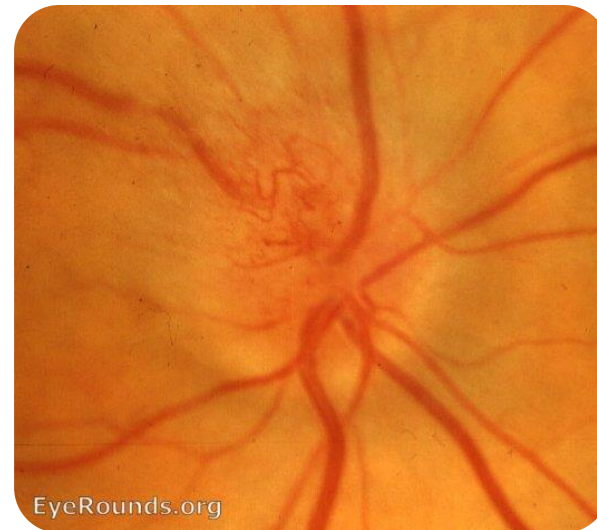
Sudden onset of partial vision loss in left eye

>> Extensive workup but no echocardiogram

>> 'Nonarteritic anterior ischemic optic neuropathy (ION) of left eye'

ION

- *Loss of structure and function of a portion of the optic nerve due to **obstruction of blood flow** to the nerve*
- *No accepted treatment to reverse the damage*



Teaching Points Thus Far...

- **Ophthalmic artery**, the first branch of the **internal carotid artery** distal to the cavernous sinus, is part of cerebral arterial circulation
- Vascular events in the eye may be stroke equivalents

Suggestive of cardioembolic source

Clinical History

Sep 2011

Sudden onset of partial vision loss in left eye

- >> Extensive workup but no echocardiogram
- >> 'Nonarteritic anterior ischemic optic neuropathy (ION) of left eye'

Dec 2012

Saw a dentist for 'tooth cleaning'

Jan 2013

New-onset malaise, fatigue and excessive sleepiness

- >> Given oral cephalosporin for 'respiratory infection'

Feb 2013

Traveled to Dubai, United Arab Emirates; recurrent fevers

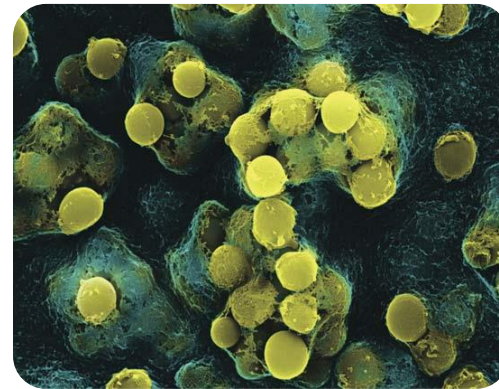
- >> Given oral azithromycin for 'respiratory infection'
- >> 'Mitral valve prolapse' on physical exam

Mar 2013

Positive blood culture

- >> *Streptococcus sanguinis*

- A **viridans** group organism
- Normal inhabitant of the human mouth, especially in dental plaque



Transthoracic Echocardiogram

Transthoracic echocardiogram at an outside hospital reportedly revealed **a large mobile mass associated with the mitral valve**

Clinical Diagnosis

Infectious disease consult stated:

Subacute bacterial endocarditis due to *Streptococcus sanguinis*

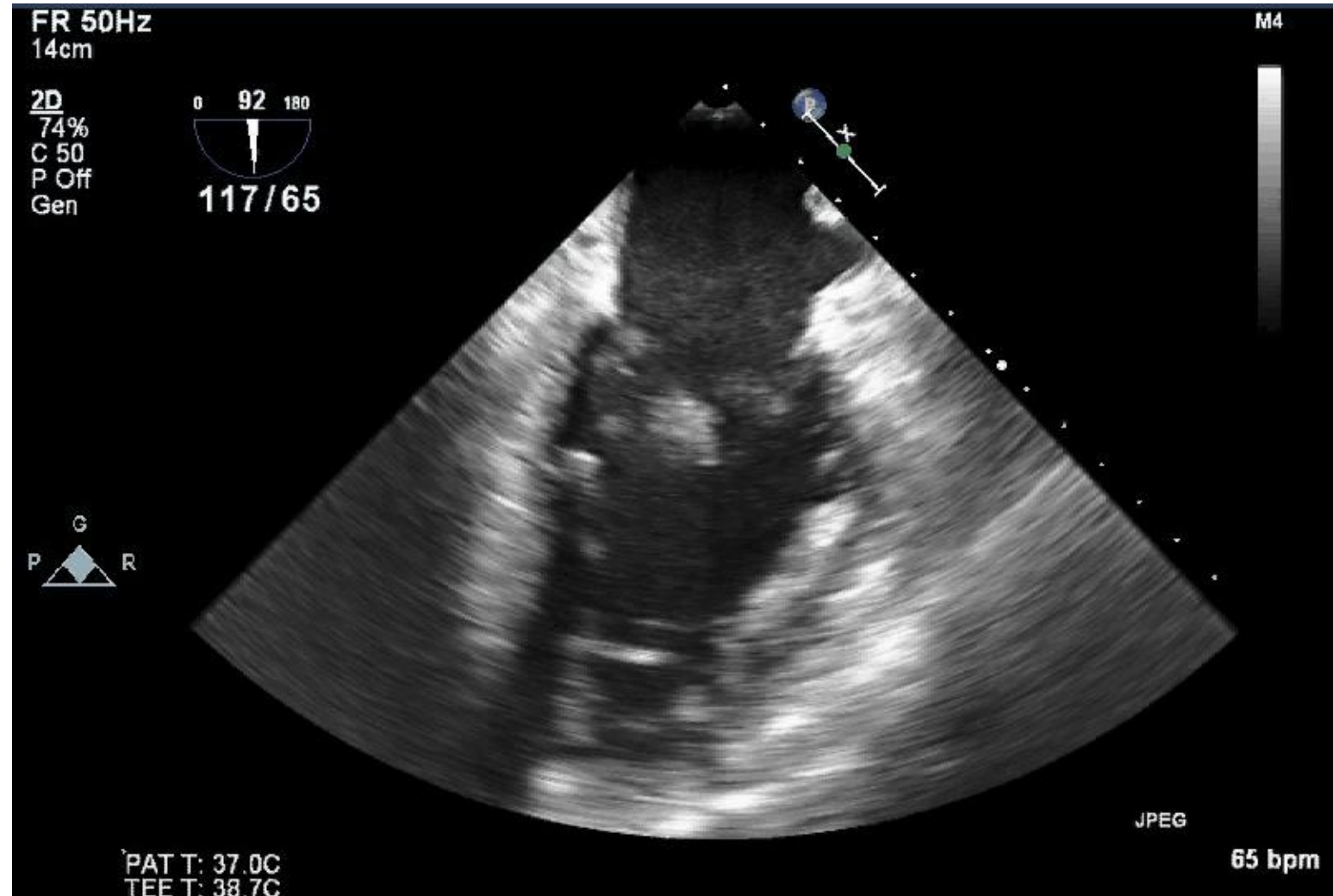
'Large mobile mass on echo + positive blood cultures;
patient meets Duke criteria for infective endocarditis'



Duke criteria first published
Am J Med. 1994 Mar;96(3):200-9.

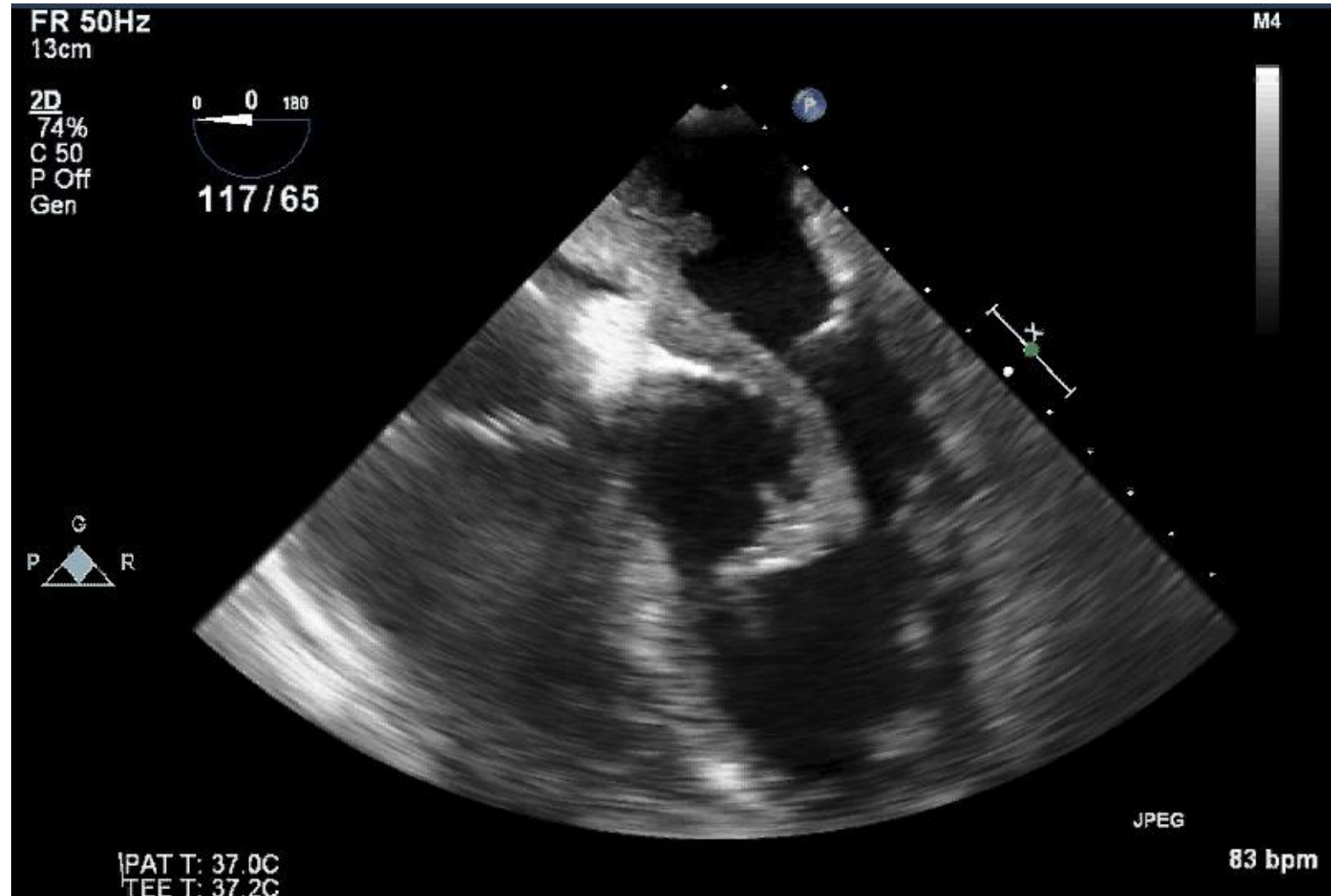
2D Transesophageal Echocardiogram

Mass in LA and LV
(? Free floating)



2D Transesophageal Echocardiogram

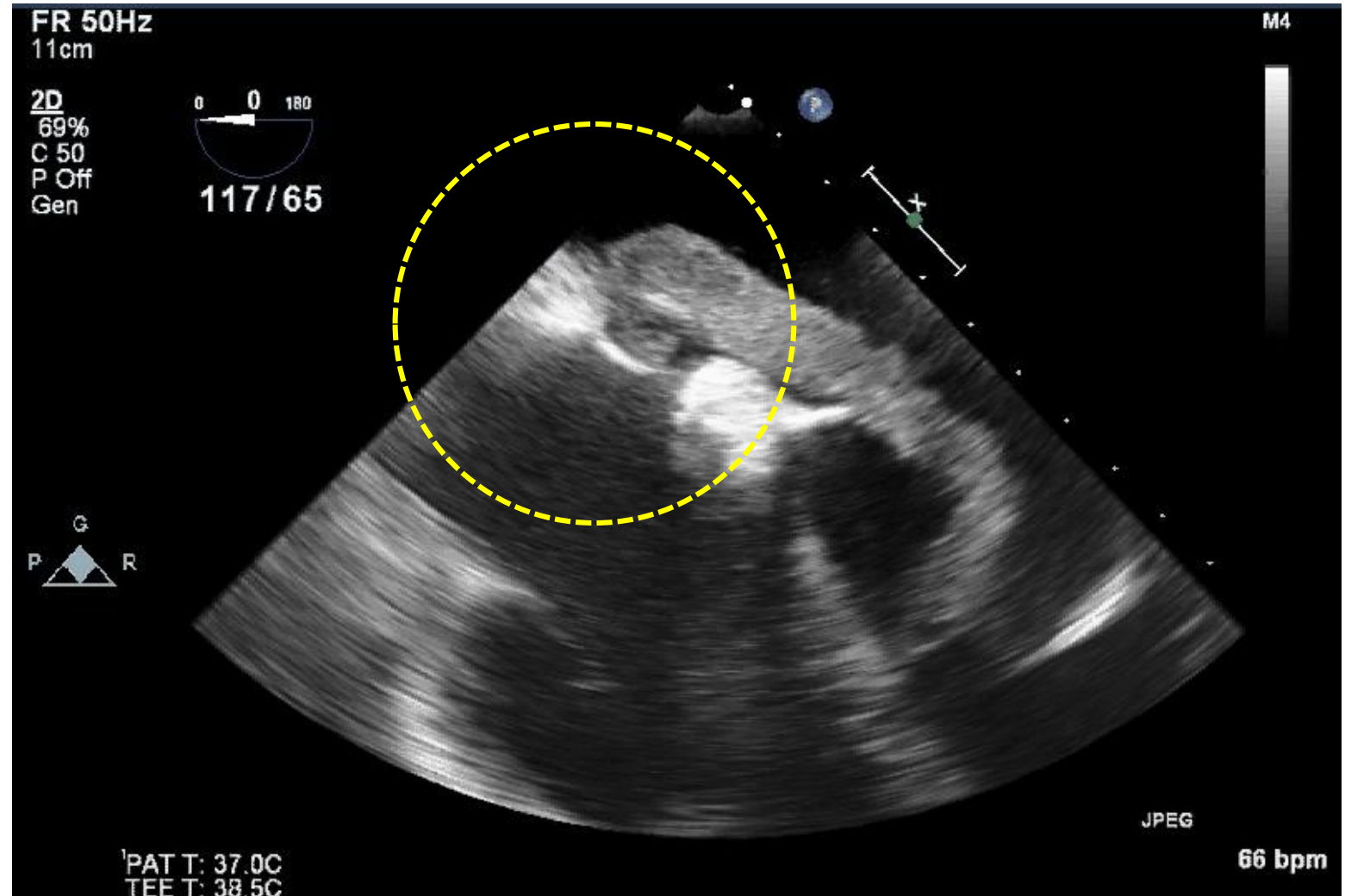
MIDESOPHAGEAL 4-CHAMBER VIEW
13.0 x 1.5 cm mass tethered in LA
& prolapses through MV into LV



2D Transesophageal Echocardiogram

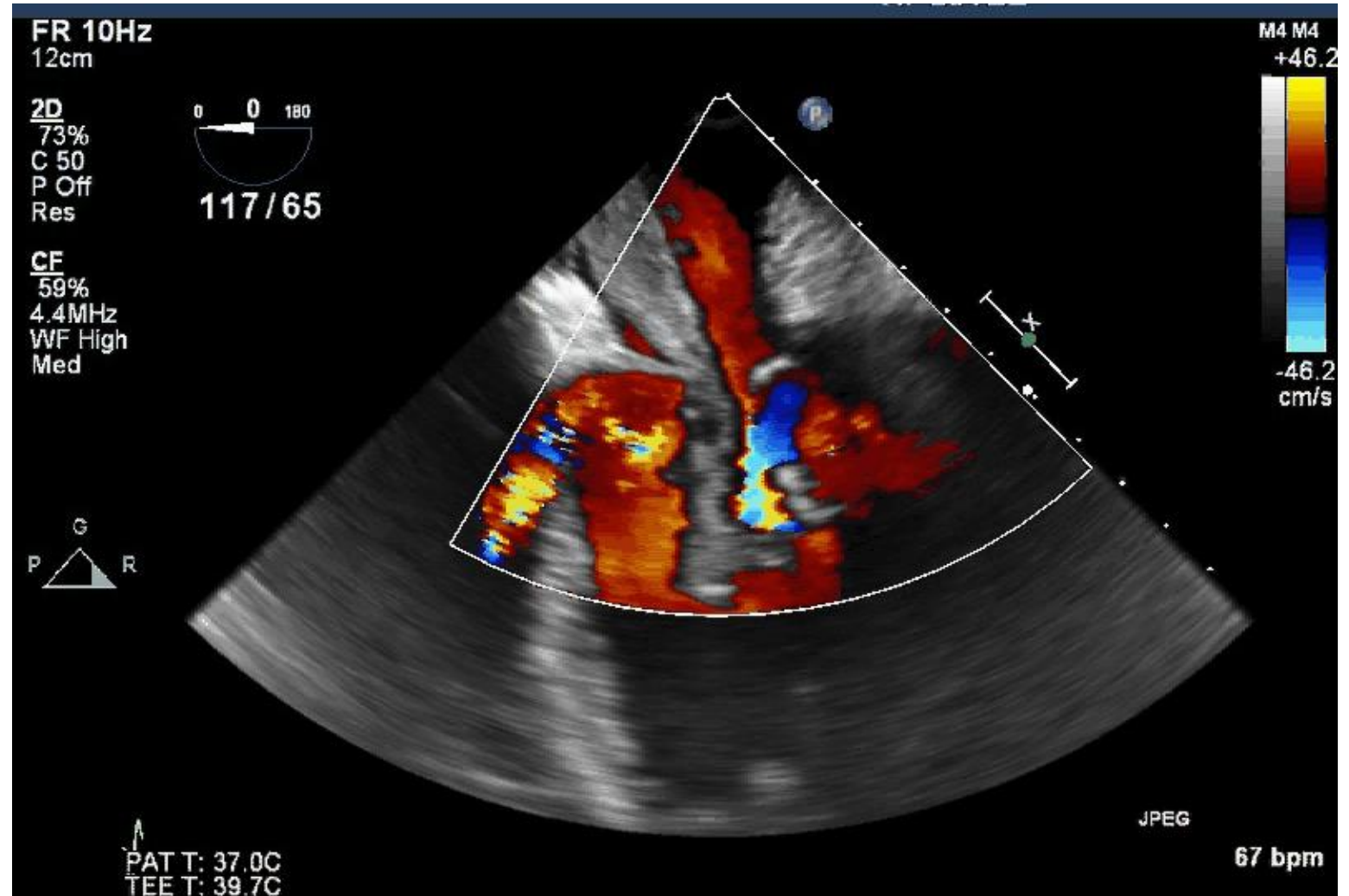
MIDESOPHAGEAL 4-CHAMBER VIEW

Mass attached to the interatrial septum near fossa ovalis

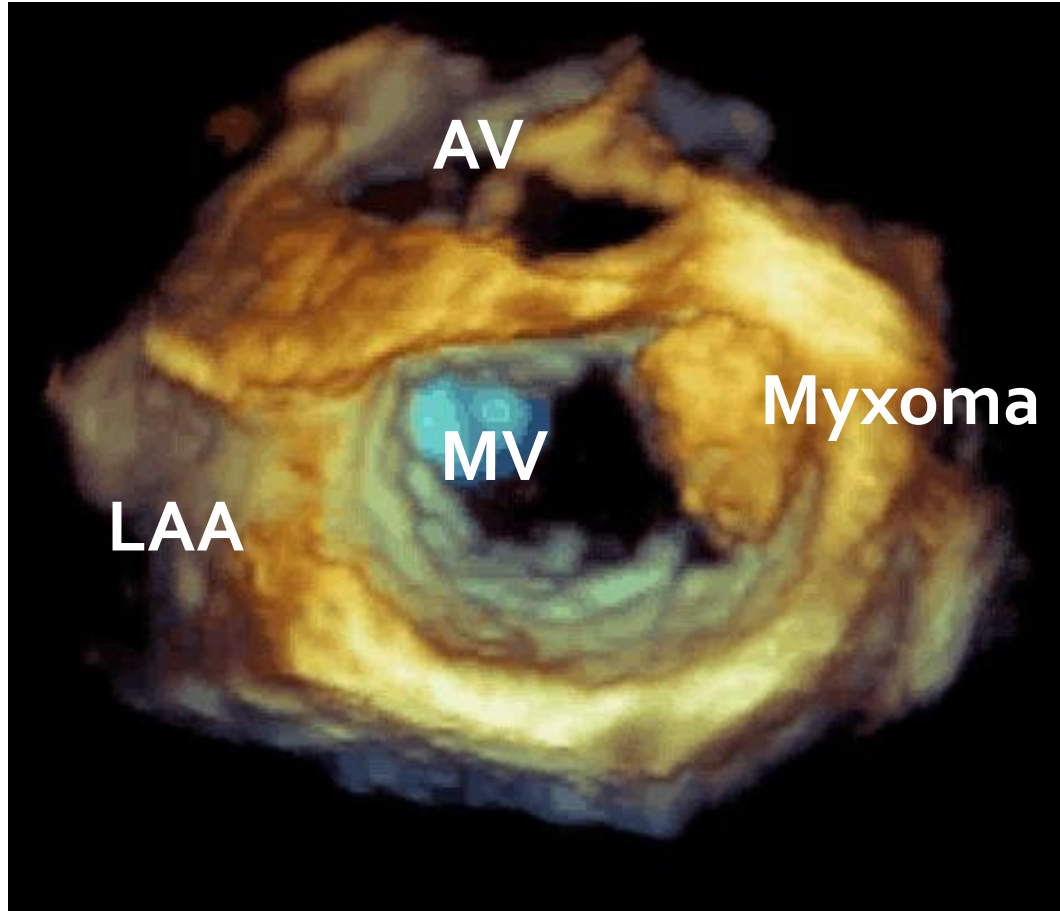


2D Transesophageal Echocardiogram

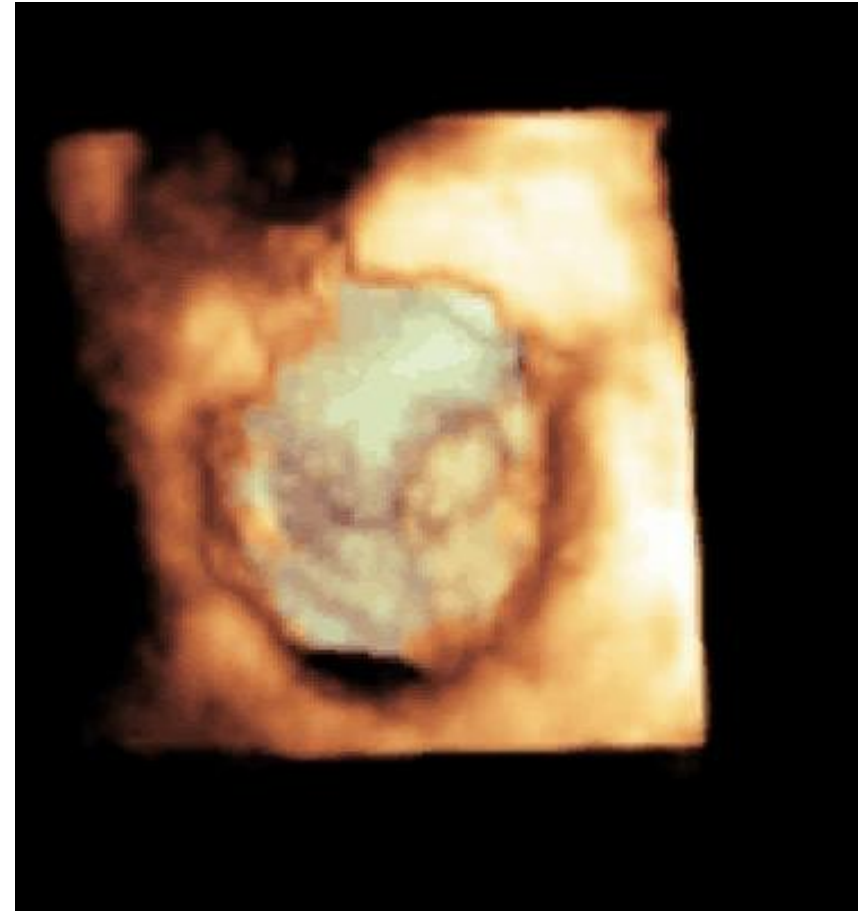
MIDESOPHAGEAL VIEW
Neither significant mitral regurgitation nor mitral stenosis observed



3D TEE

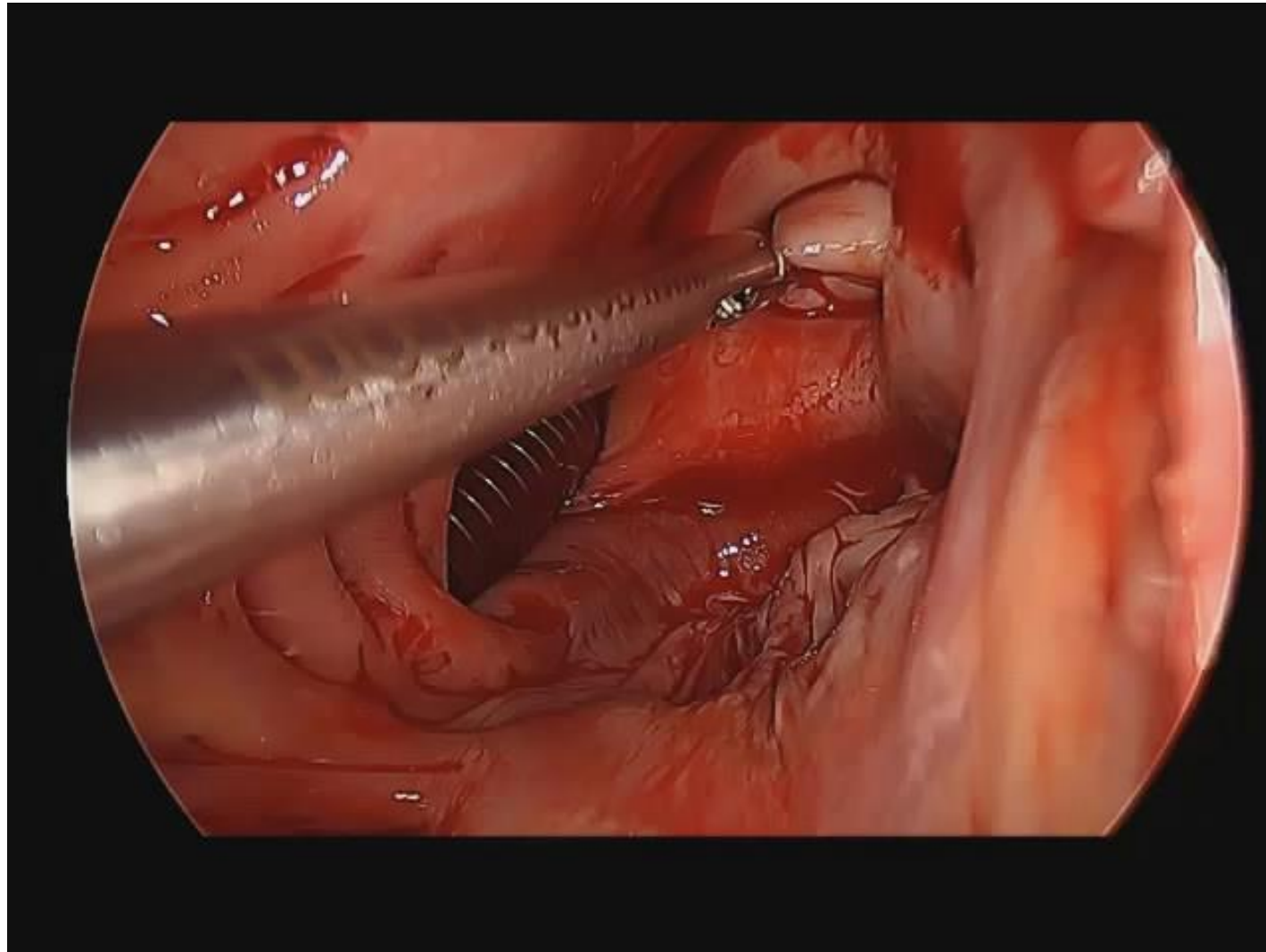


3D TEE: LA SIDE OF MITRAL VALVE
Mass attached to the interatrial septum



3D TEE: LV SIDE OF MITRAL VALVE
Mass plugging through mitral valve

Intraoperative Video



Surgical Specimen



Attachment to fossa ovalis

Histopathology

Cardiac myxoma

with extensive fibrin deposition,
compatible with superimposed infection

Final Diagnosis

**Nonfamilial left atrial myxoma
superinfected with *Streptococcus sanguinis***

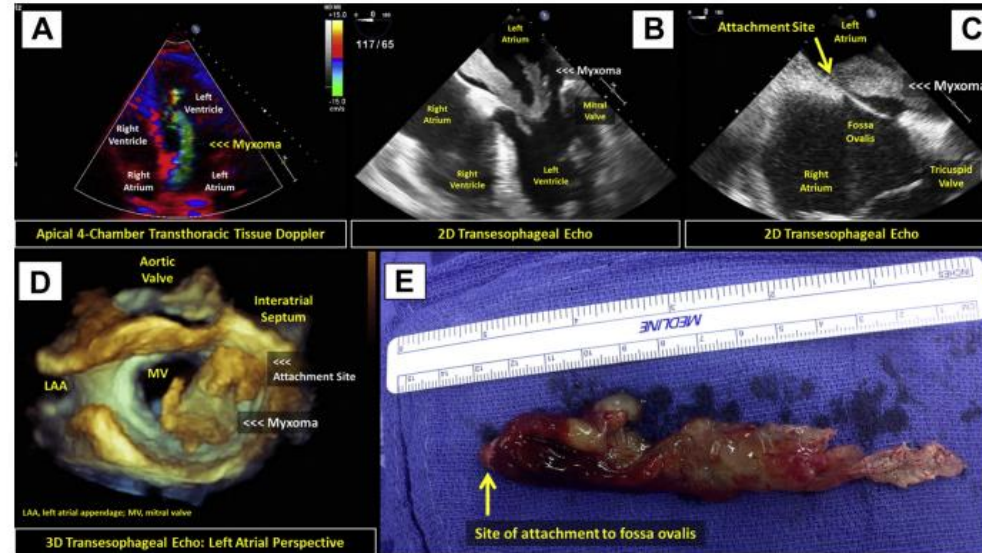
Leading to subacute infective endocarditis
and earlier to systemic embolism to left eye

IMAGES IN CARDIOLOGY

Giant Nonfamilial Left Atrial Myxoma Presenting With Eye Embolism and Nonvalvular *Streptococcus sanguinis* Endocarditis



Diana M. Laura, BA, Adriana Quiñones, MD, Ricardo Benenstein, MD, Didier F. Loulmet, MD,
William J. Cole, MD, Dellis A. Galloway, MD, James H. Suh, MD, Muhamed Saric, MD, PhD
New York, New York

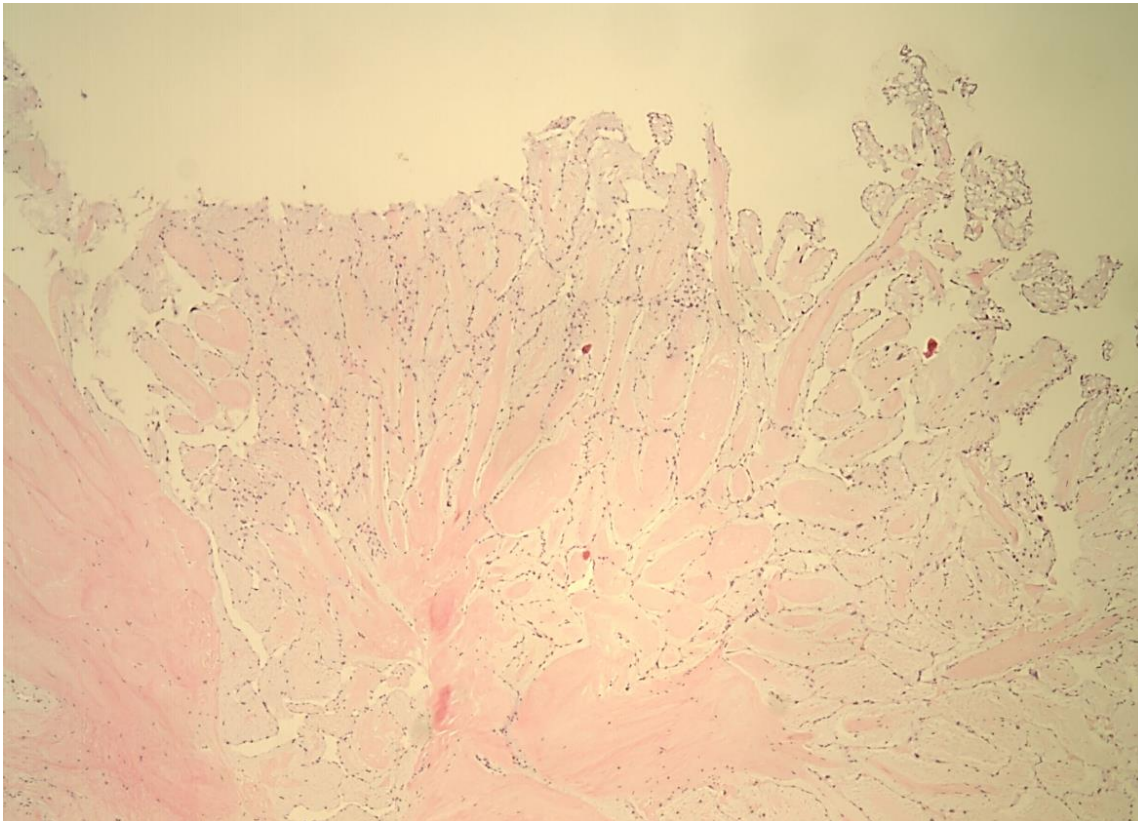


Papillary Fibroelastoma

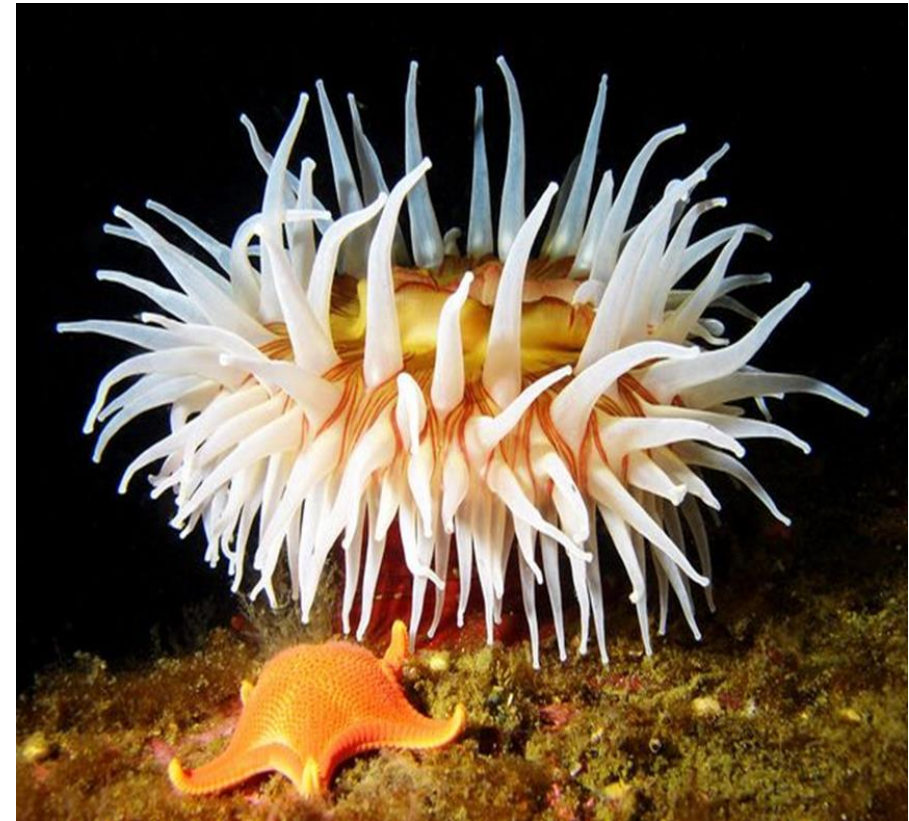
*Most Common Valvular Tumor
with Significant Embolic Potential*



Papillary Fibroelastoma



Branching **avascular papillae** containing collagen and covered with endothelium



PFEs commonly resemble **sea anemone**

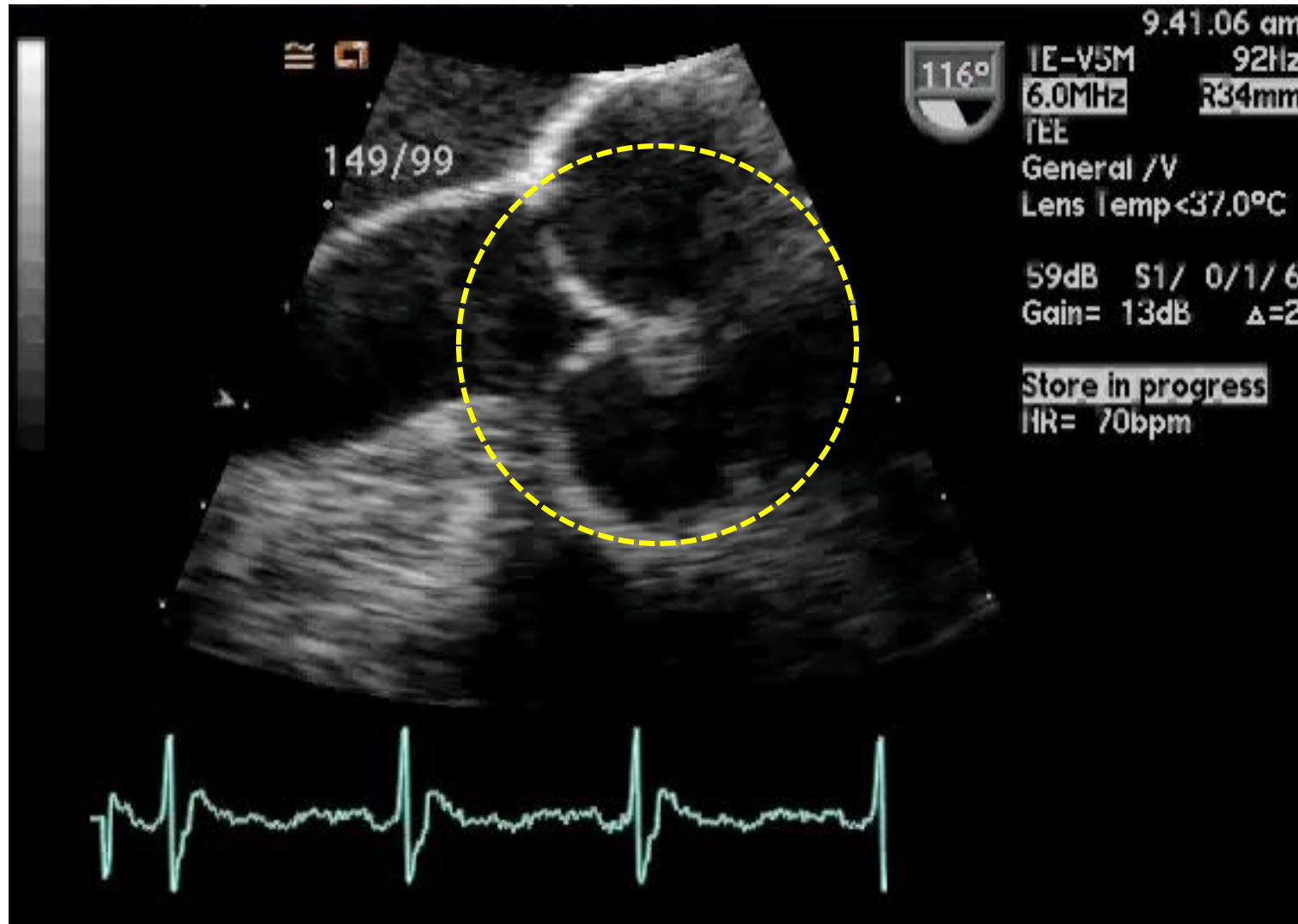
άνεμώνη (anemōnē), from άνεμος (ánemos, "wind") + matronymic suffix -ώνη (-ōnē, "daughter of the wind")

Aortic Valve Papillary Fibroelastoma

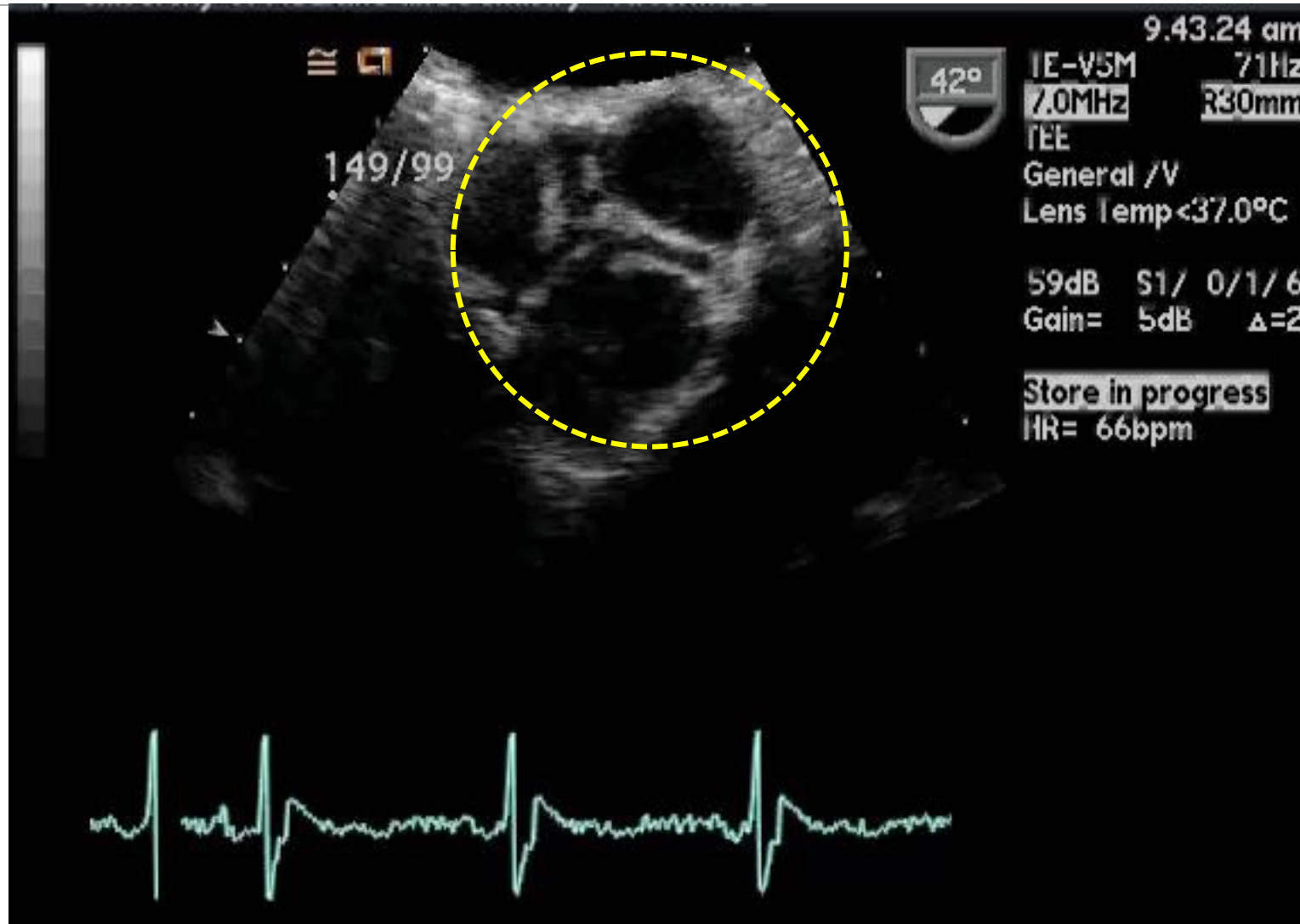
*Typically on the **aortic side** of the valve*



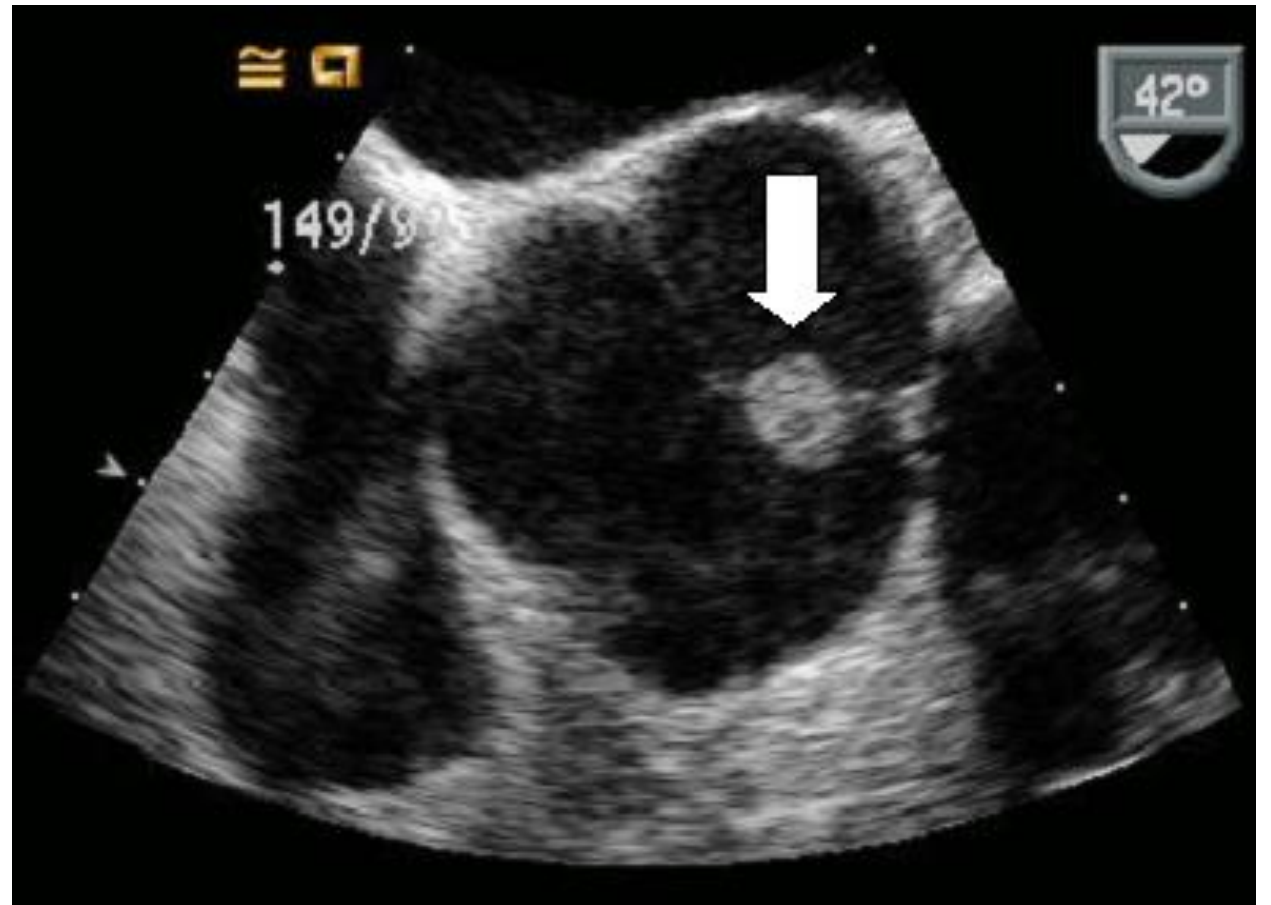
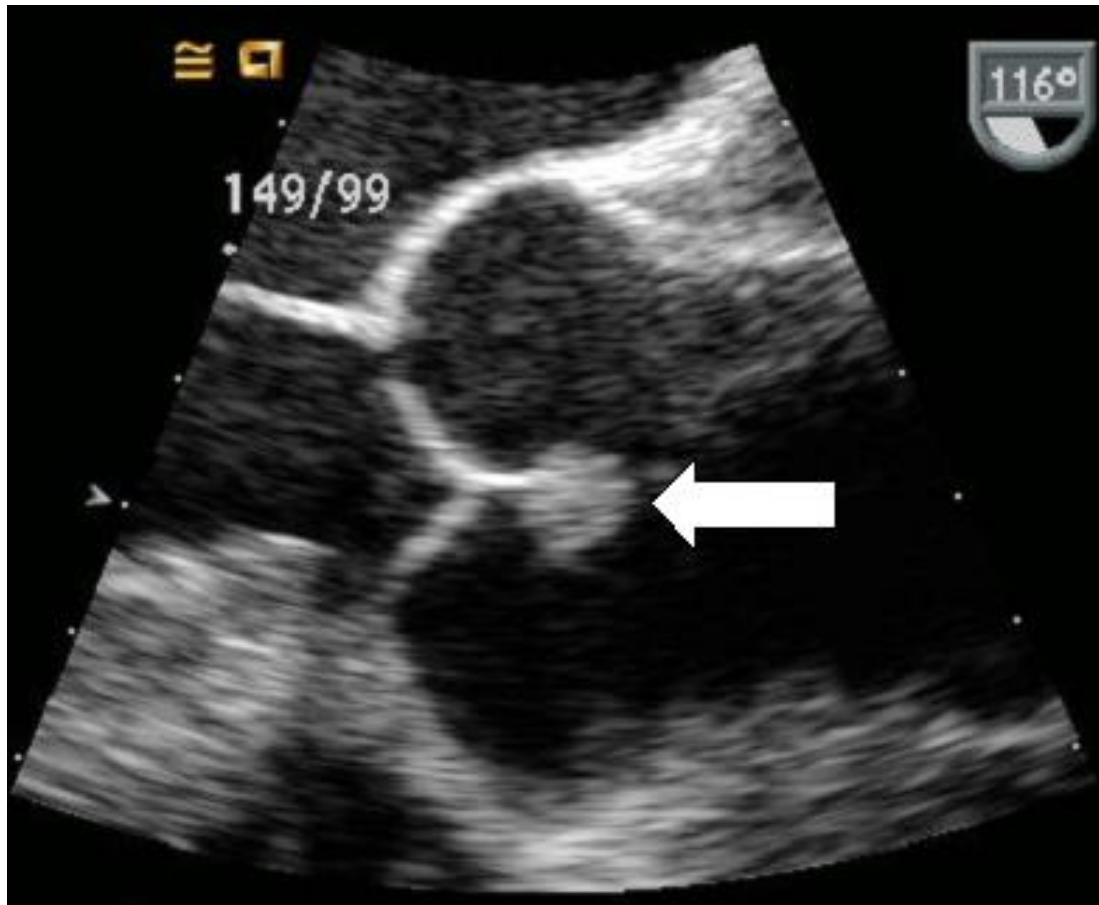
Aortic Papillary Fibroelastoma



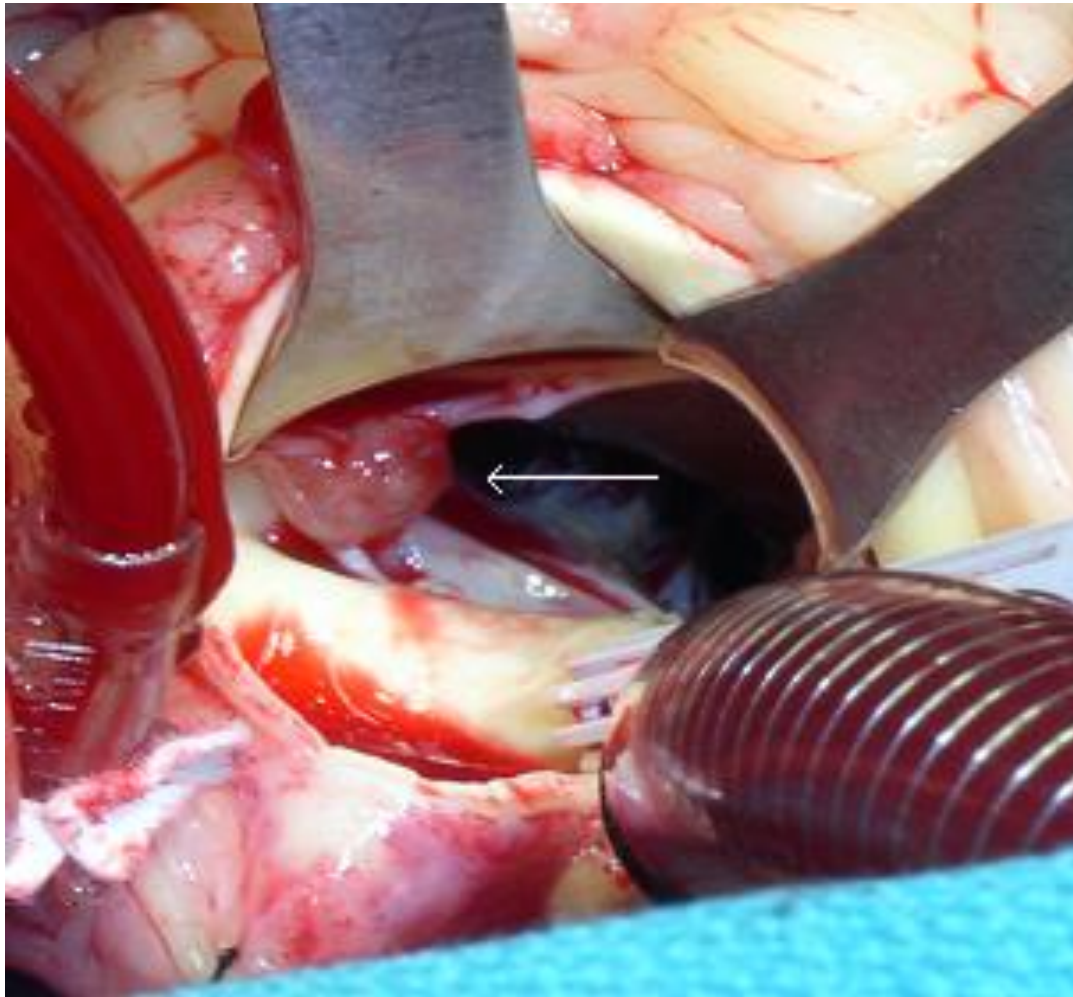
Aortic Papillary Fibroelastoma



Aortic Papillary Fibroelastoma



Aortic Papillary Fibroelastoma



Images in Geriatric Cardiology

Navin C. Nanda, MD, Section Editor

The University of Alabama at Birmingham, Birmingham, AL

Papillary Fibroelastoma: An Uncommon Cause for a Transient Ischemic Attack

Ather Anis, MD;¹ Jennifer Brady, MD;¹ David Sedaghat, MD;¹
Mark Klapholz, MD;¹ Barry C. Esrig, MD;² Muhamed Saric, MD, PhD¹

From the Departments of Medicine¹ and Surgery,² New Jersey Medical School, Newark, NJ

Address for correspondence: Muhamed Saric, MD, PhD, Director, Echocardiography Lab, Division of Cardiovascular Diseases, New Jersey Medical School, 185 South Orange Avenue, I-538, University Heights, Newark, NJ 07103

E-mail: saricmu@umdnj.edu

Am J Geriatr Cardiol 2005;14(5):269-70.

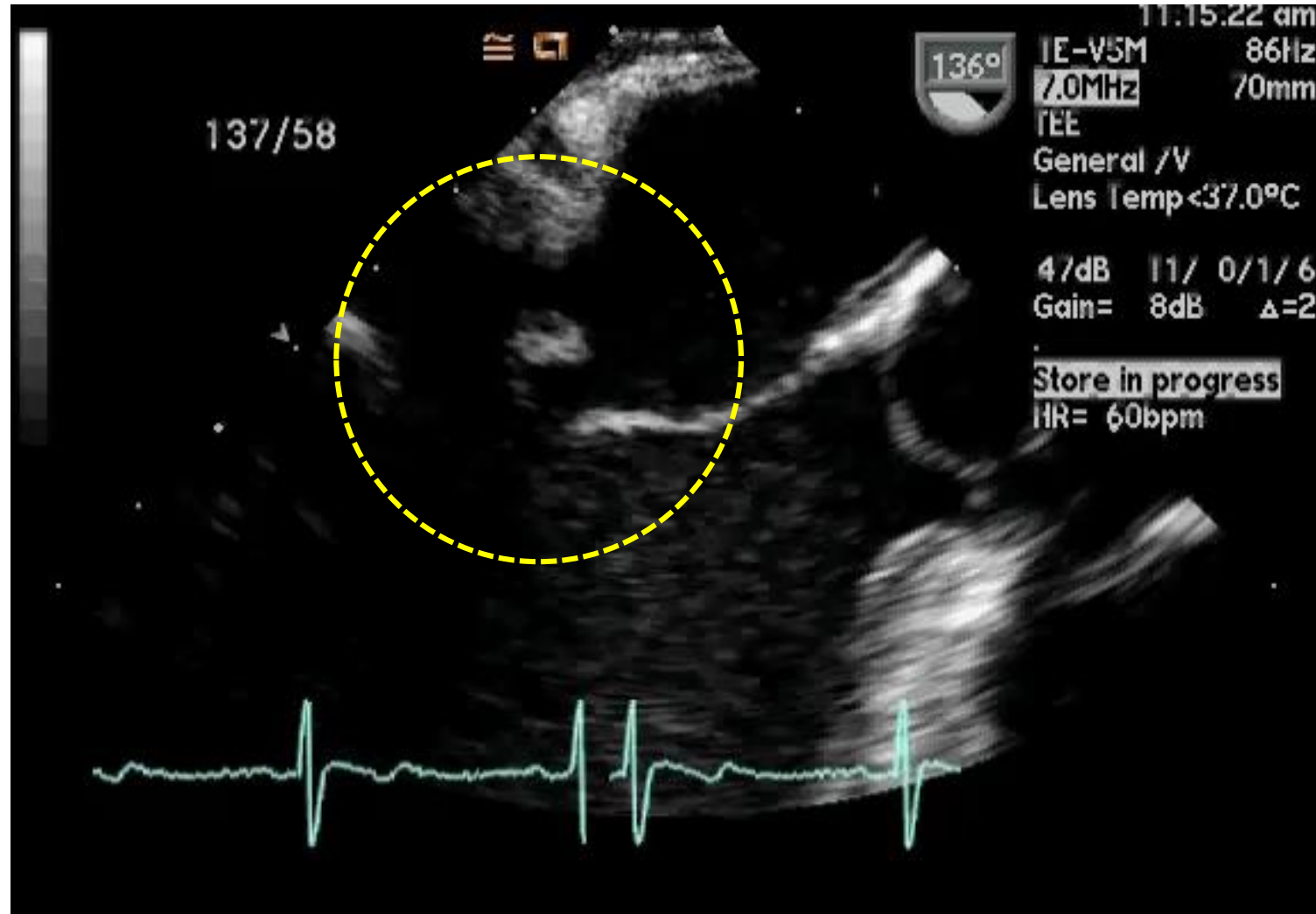


Mitral Valve Papillary Fibroelastoma

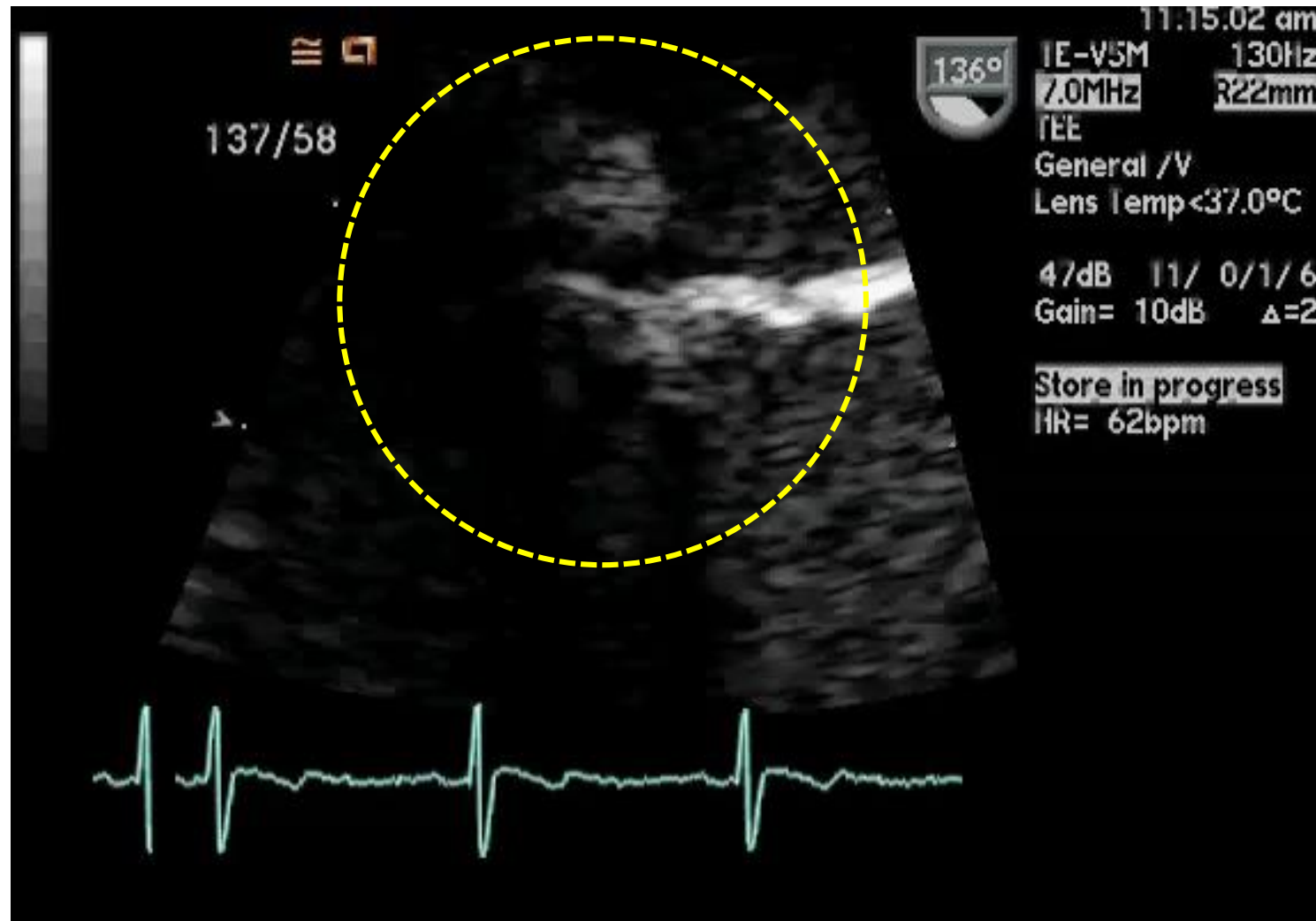
*Typically on the **left atrial side** of the valve*



Mitral Valve Papillary Fibroelastoma



Mitral Valve Papillary Fibroelastoma

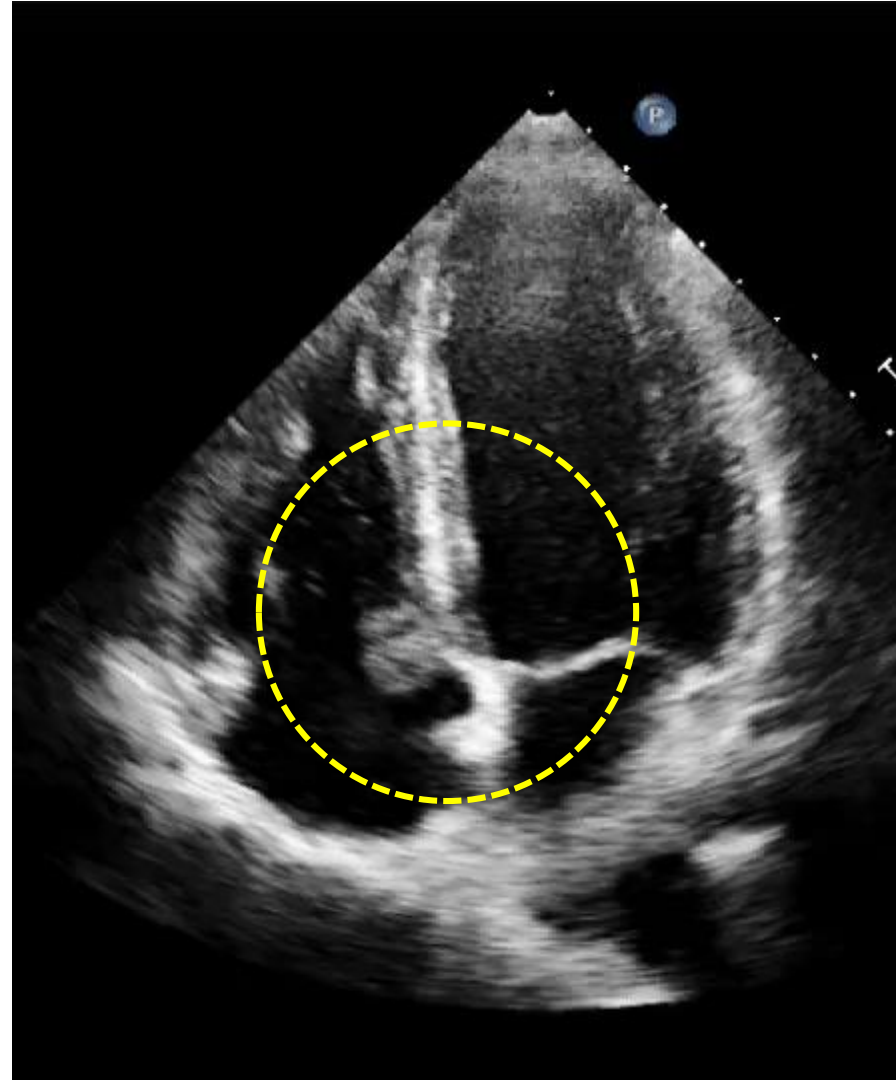


Tricuspid Valve Papillary Fibroelastoma

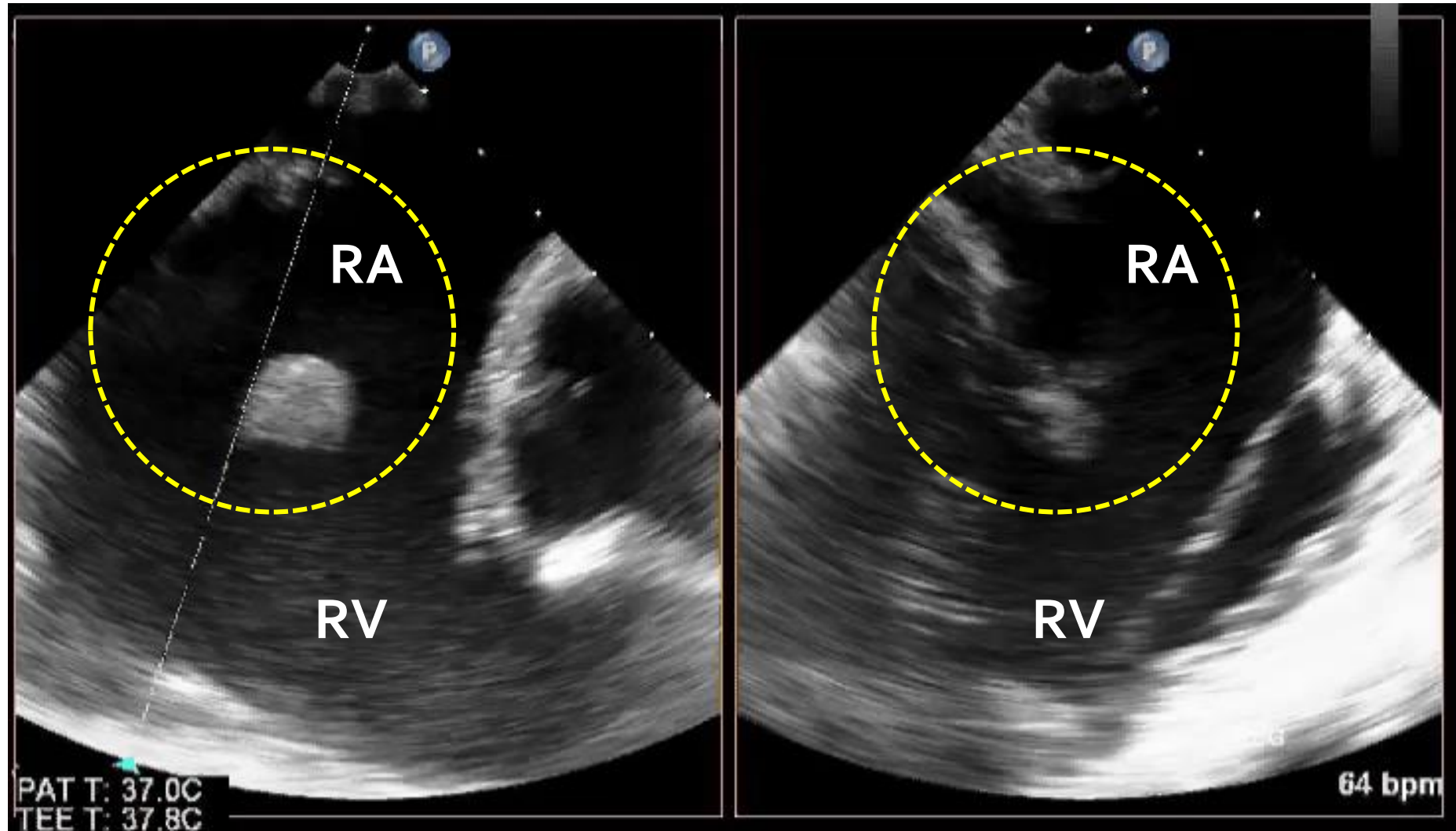
*Typically on the **right atrial side** of the valve*



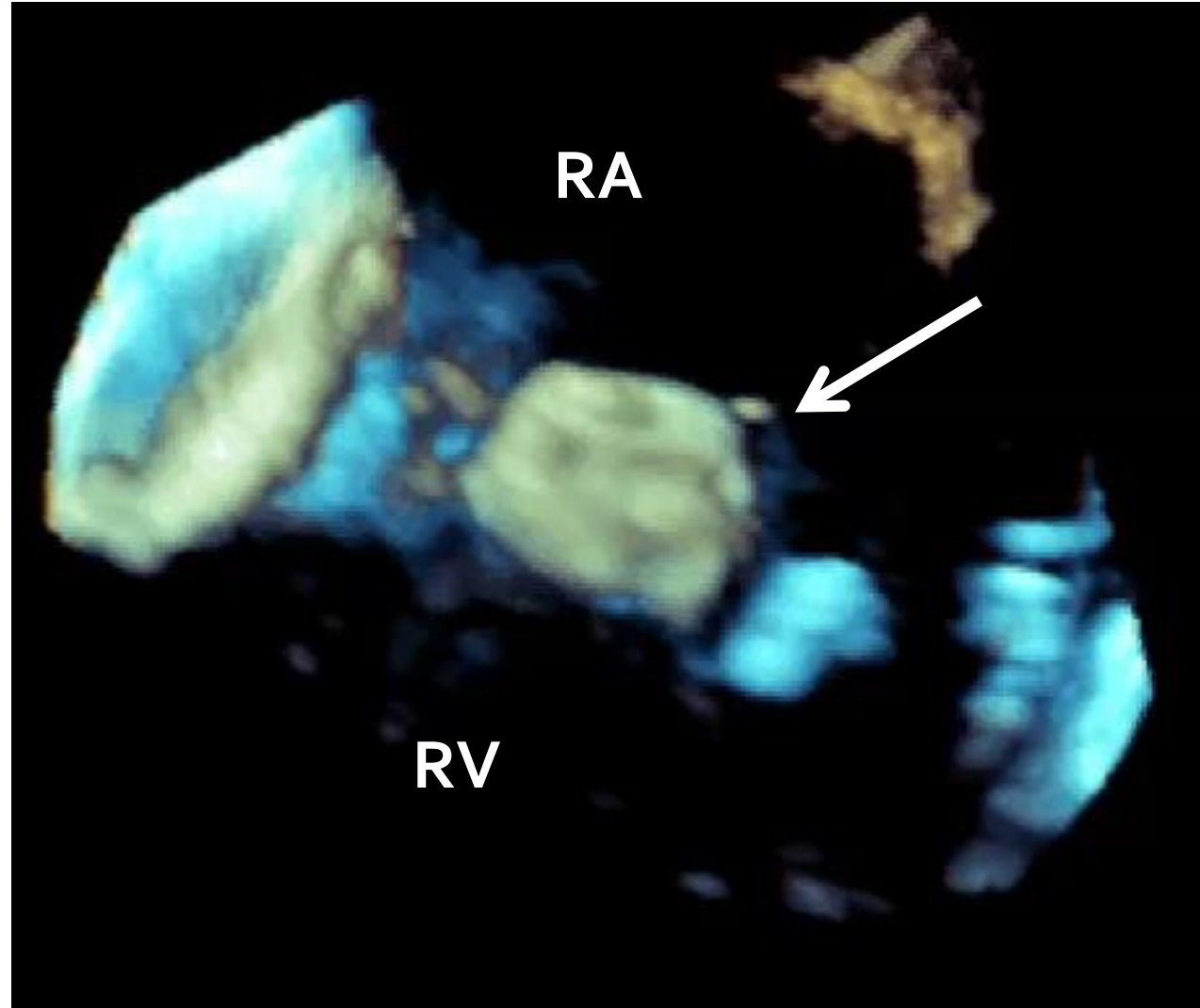
Tricuspid Valve Papillary Fibroelastoma



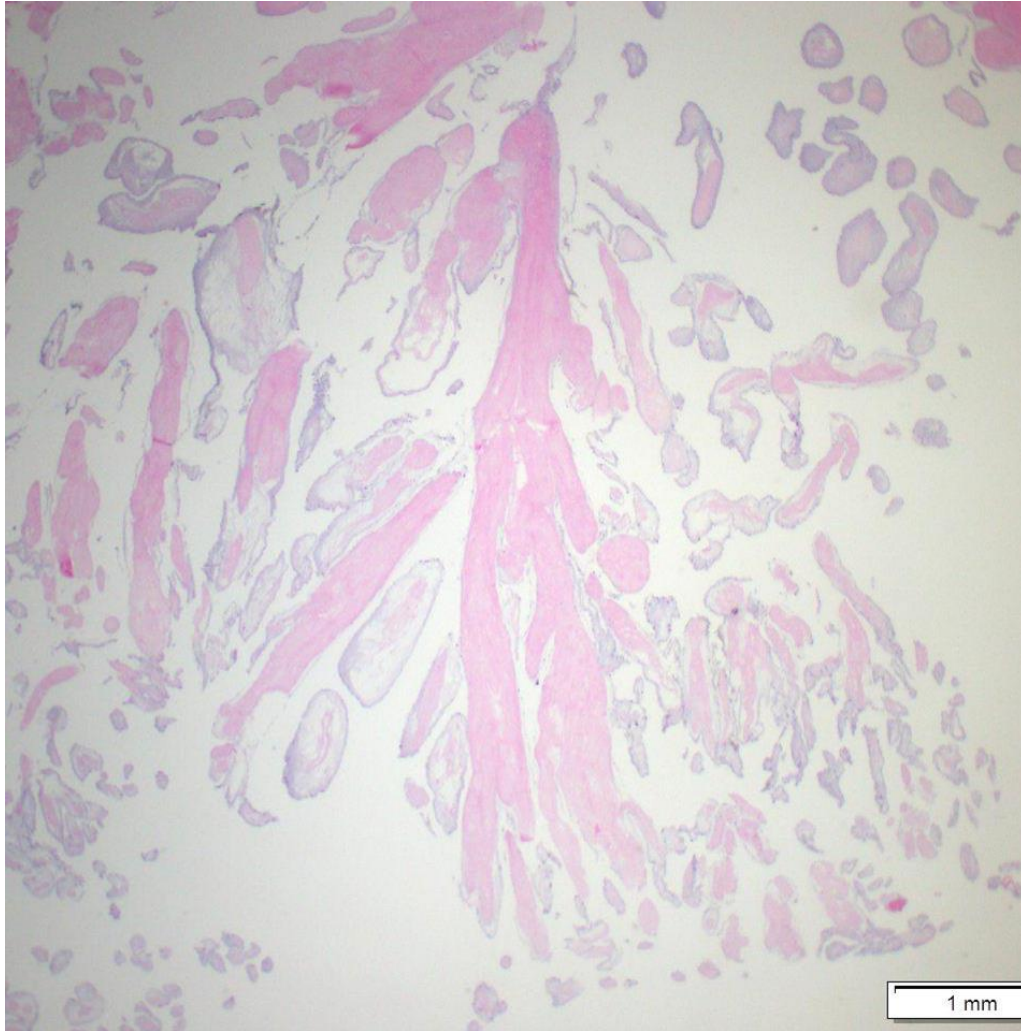
Tricuspid Valve Papillary Fibroelastoma



Tricuspid Valve Papillary Fibroelastoma



Tricuspid Valve Papillary Fibroelastoma



Branching **avascular papillae** containing collagen and covered with endothelium



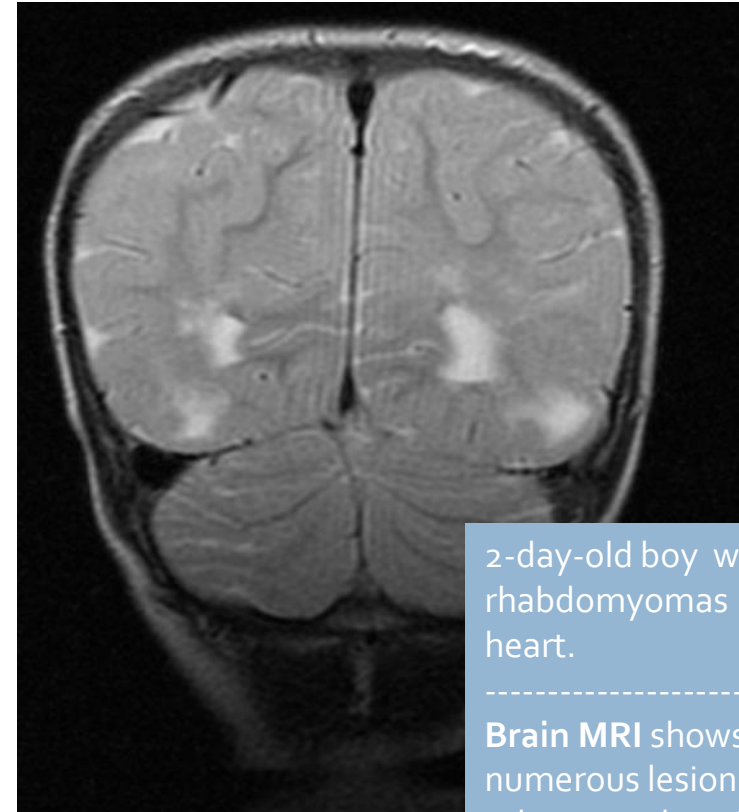
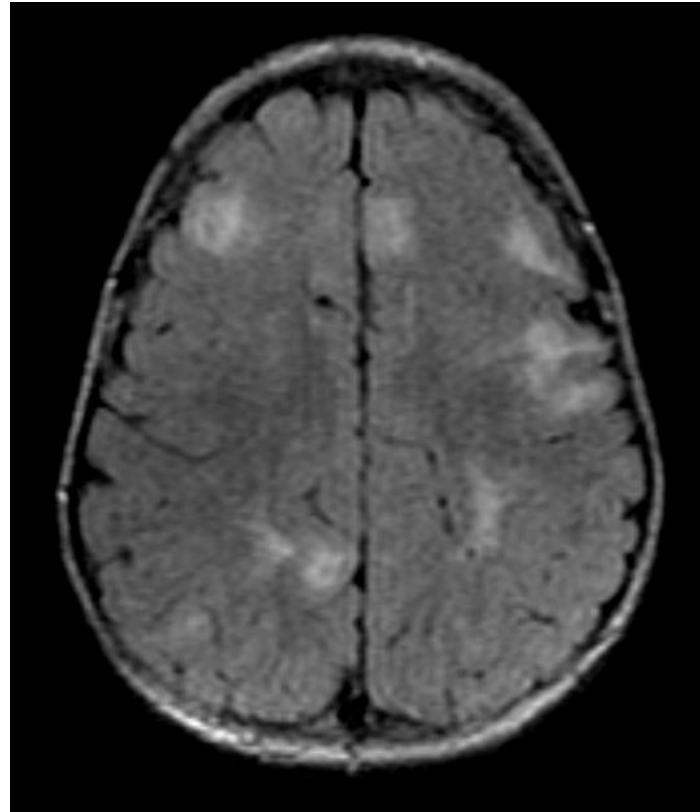
Rhabdomyoma



Rabdomyoma

The most common primary **benign** cardiac tumor in children.

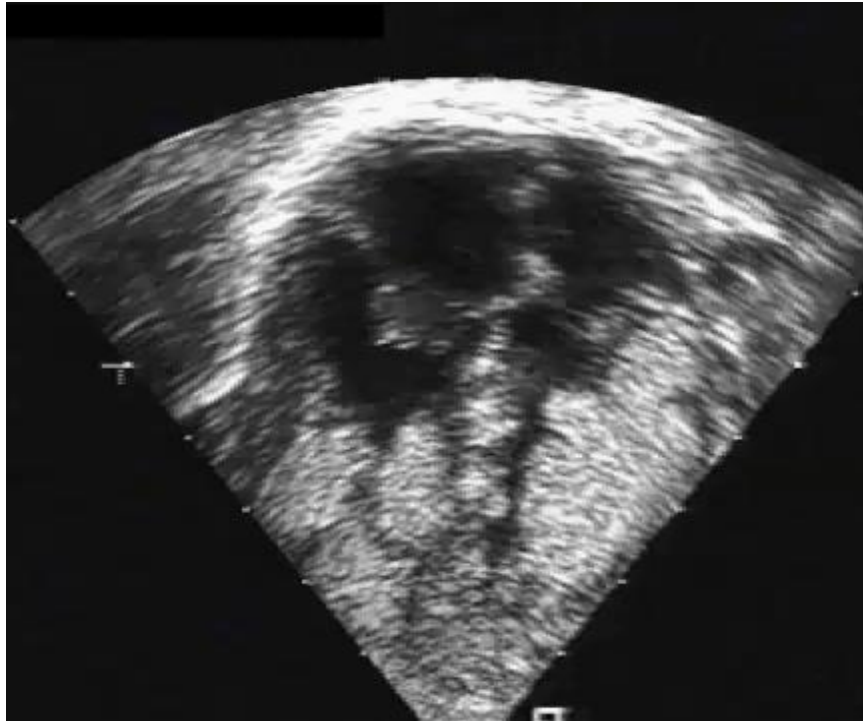
Often associated with **tuberous sclerosis**, a brain anomaly that leads to seizures.



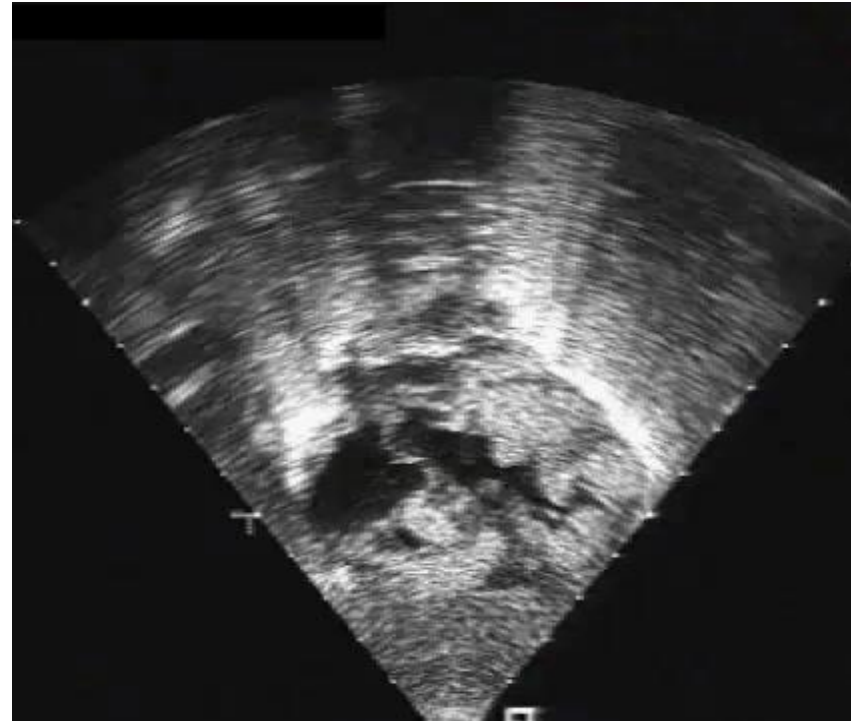
2-day-old boy with
rhabdomyomas of the
heart.

Brain MRI shows
numerous lesions of
tuberous sclerosis.

Rhabdomyoma



4-Chamber View



Subcostal View

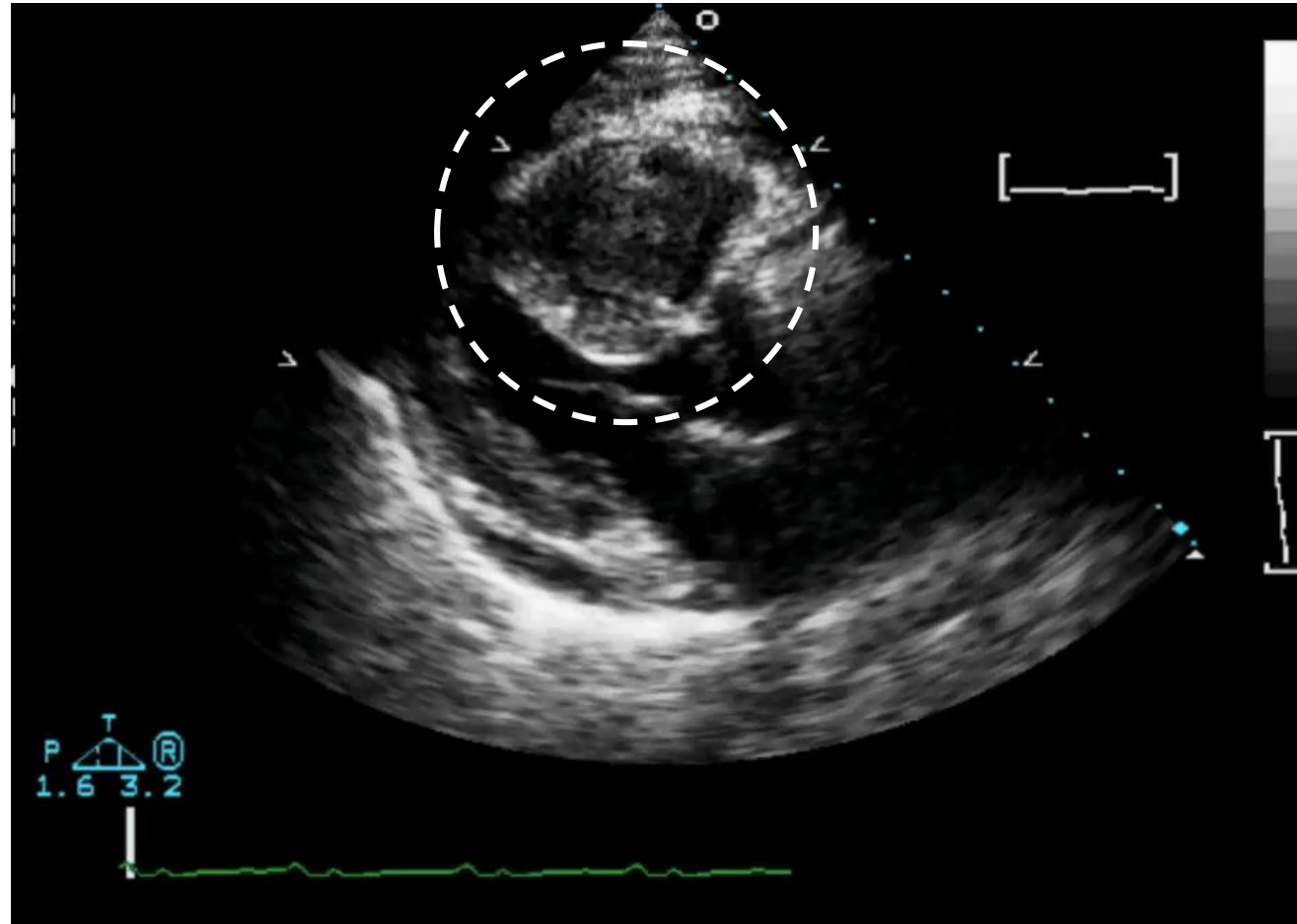


Primary Cardiac Sarcoma



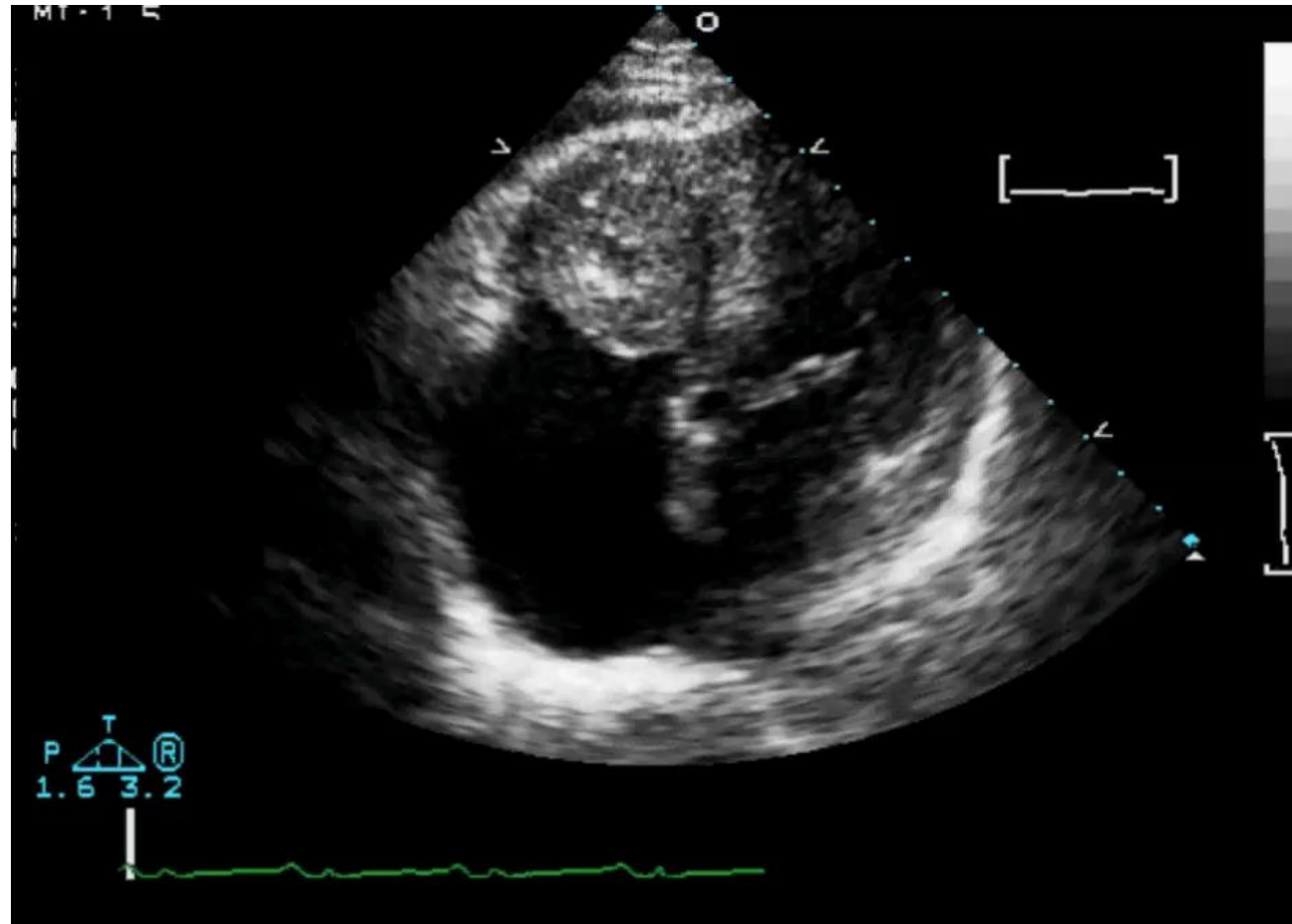
Right Ventricular Sarcoma

57-year-old woman admitted for weight gain and lower extremity edema



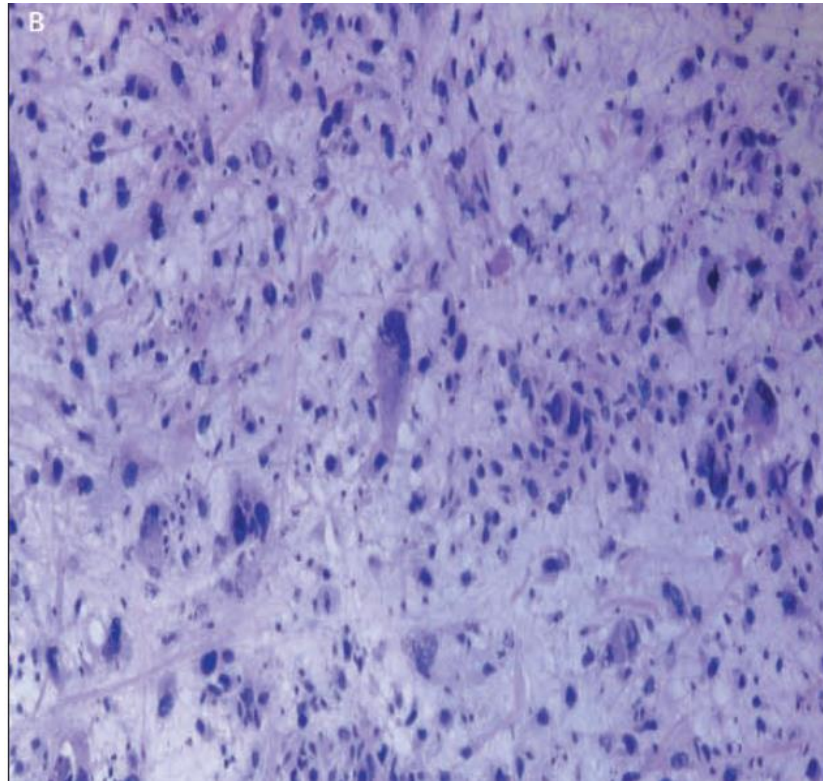
Right Ventricular Sarcoma

57-year-old woman admitted for weight gain and lower extremity edema



Right Ventricular Sarcoma

57-year-old woman admitted for weight gain and lower extremity edema



Undifferentiated pleomorphic cardiac sarcoma
(formally called malignant fibrous histiocytoma)

CARDIAC SARCOMAS

- Angiosarcoma
- Rhabdomyosarcoma
- Leiomyosarcoma
- Undifferentiated pleomorphic



Embolism From Aortic Tumors

*Typically from a **malignant** tumor*



Aortic Intimal Sarcoma

56-year-old, previously healthy woman presented with a 2-week history of **headache** and **progressive right-sided weakness**

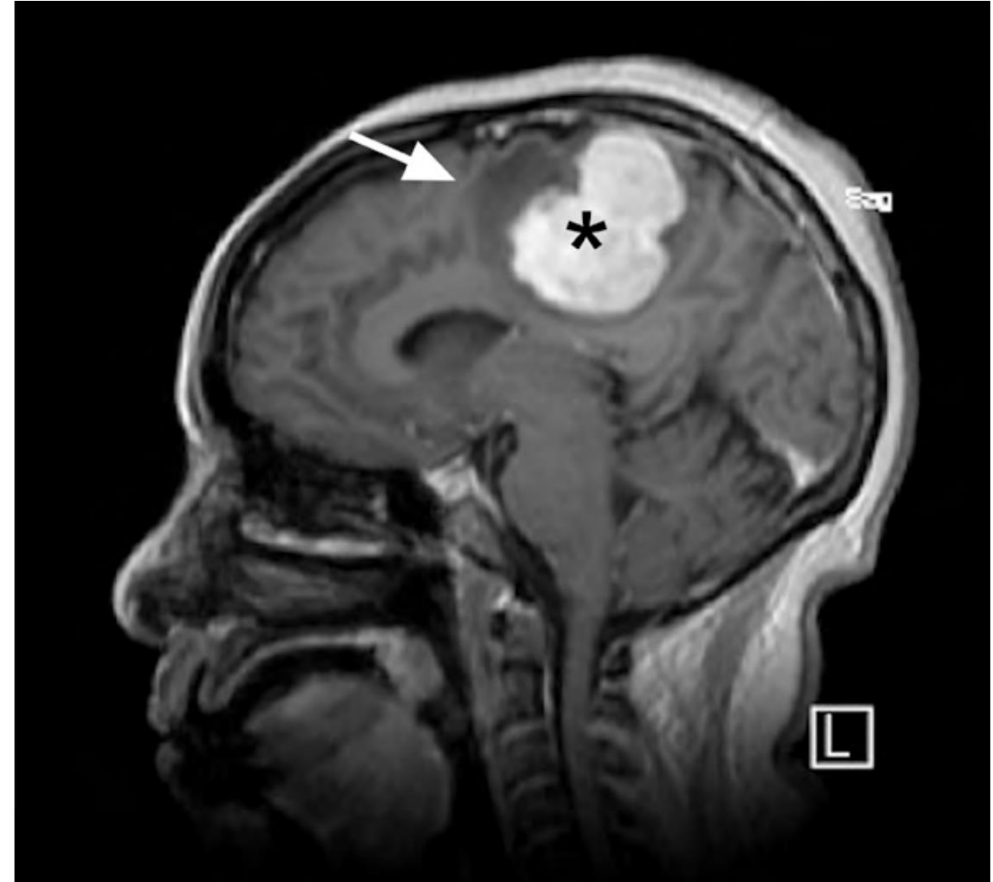


Fig. 1 Magnetic resonance image shows a 4.3 × 3.8 × 4.3-cm, dural-based, left parafalx gadolinium-enhanced mass (asterisk) with surrounding edema (arrow) and mass effect.

Aortic Intimal Sarcoma

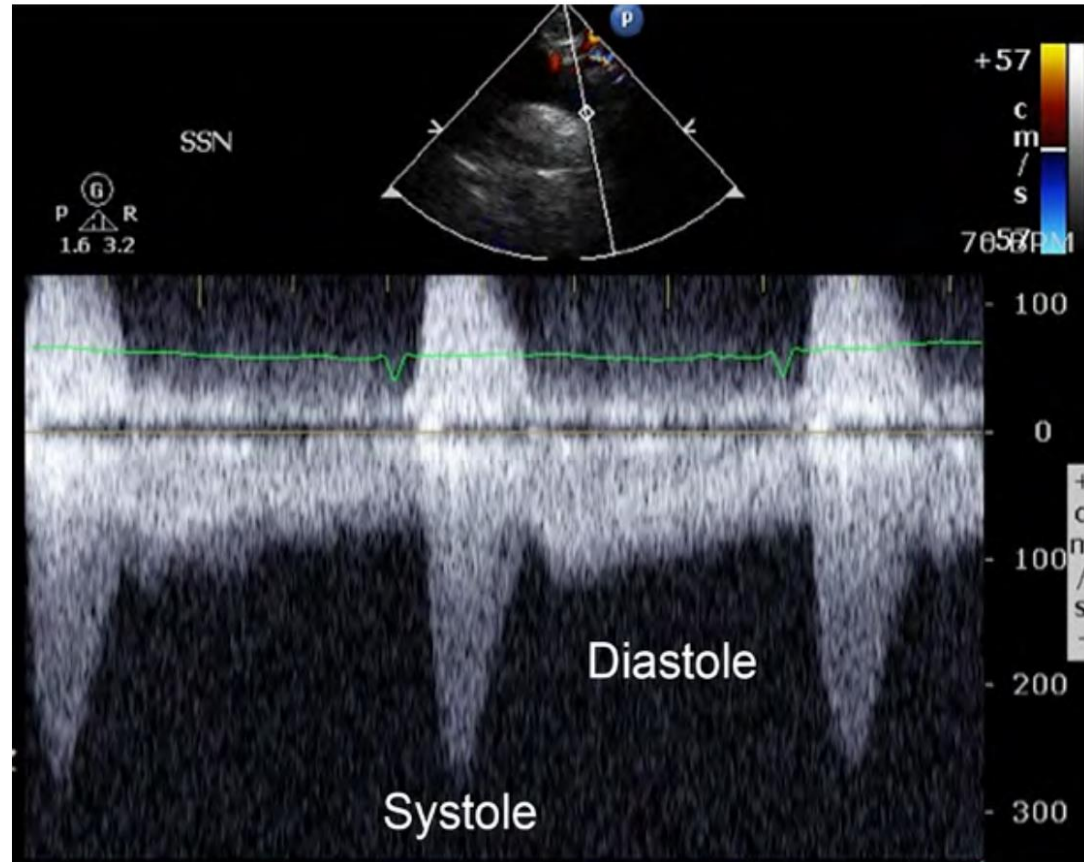
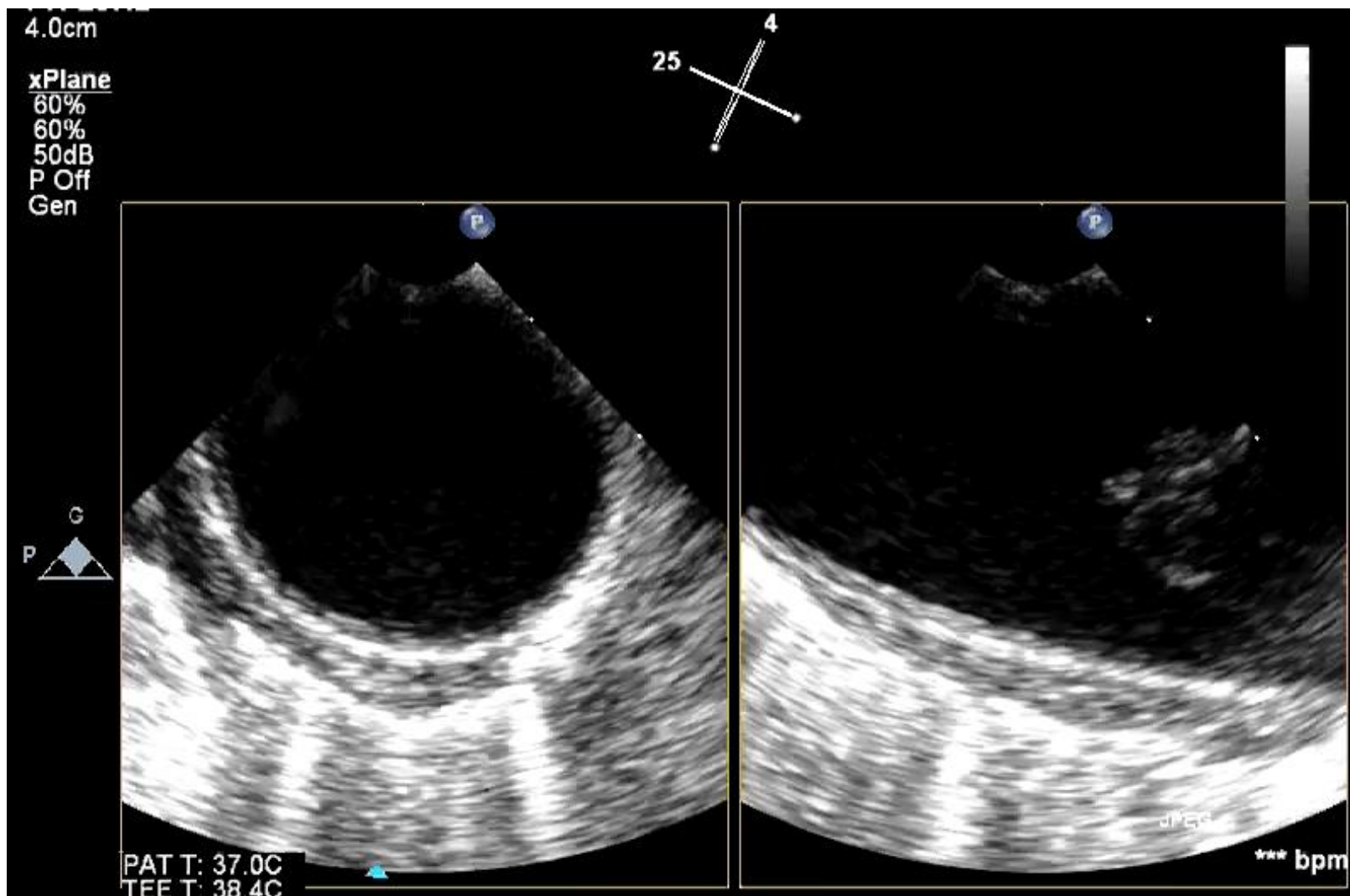
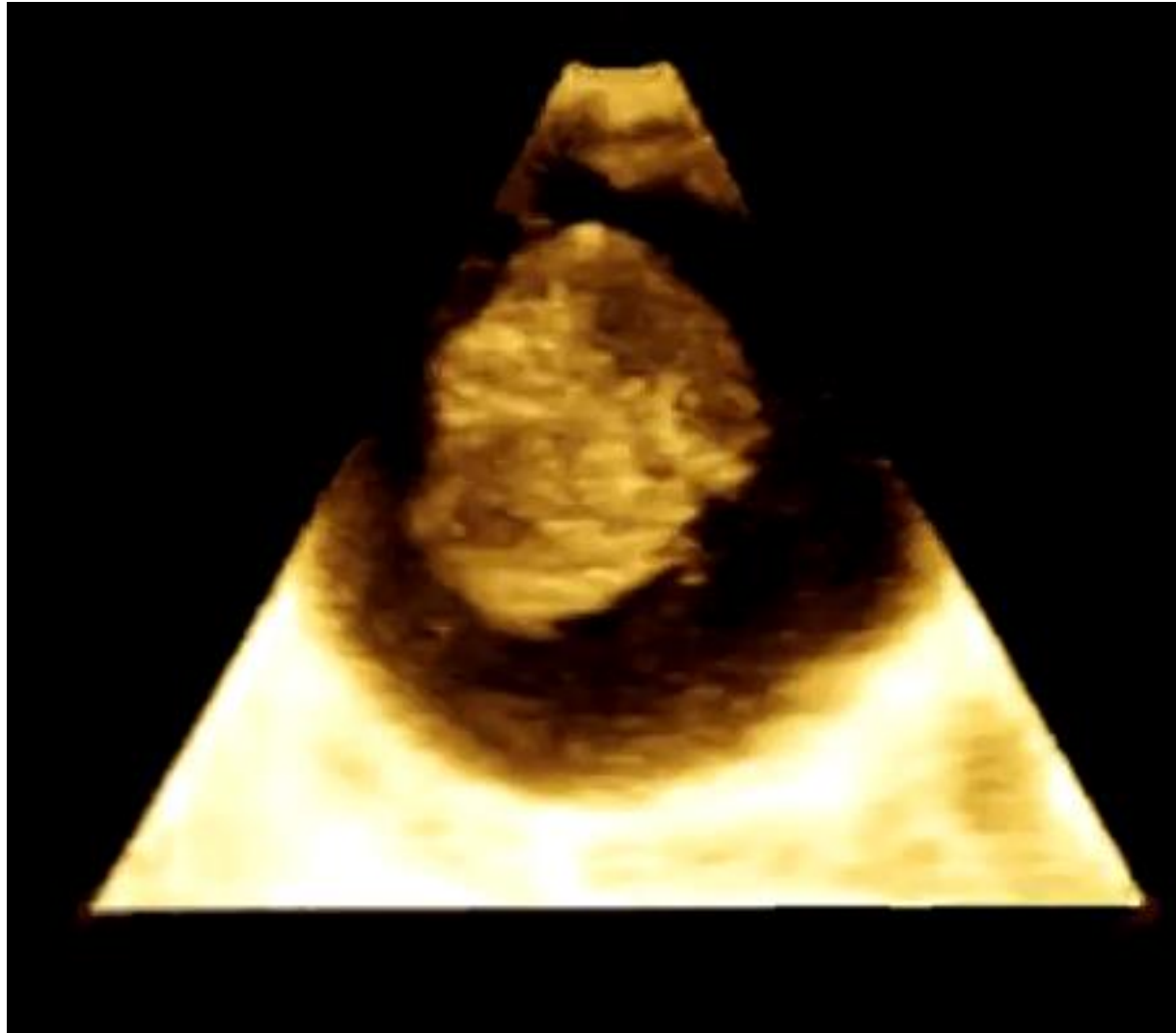


Fig. 4 Continuous-wave spectral Doppler image from the suprasternal notch shows abnormal coarctation-like flow in the descending thoracic aorta during systole and diastole.

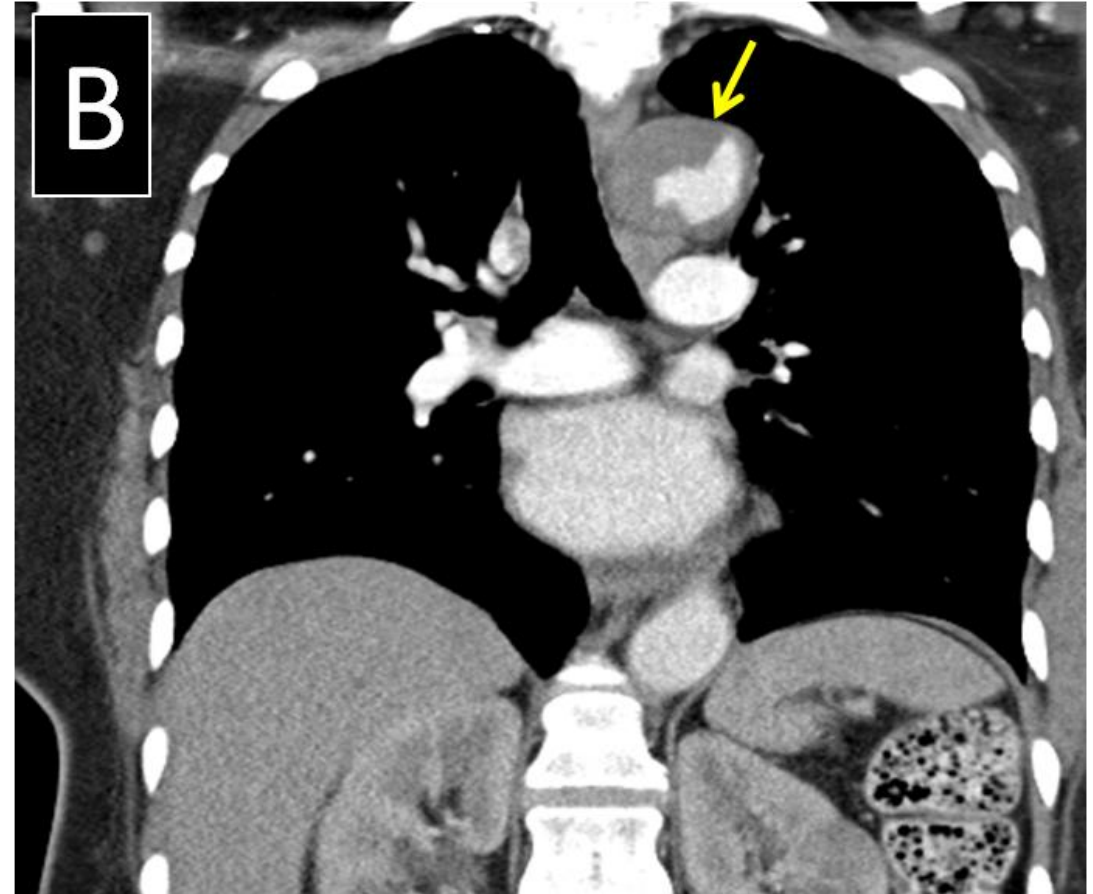
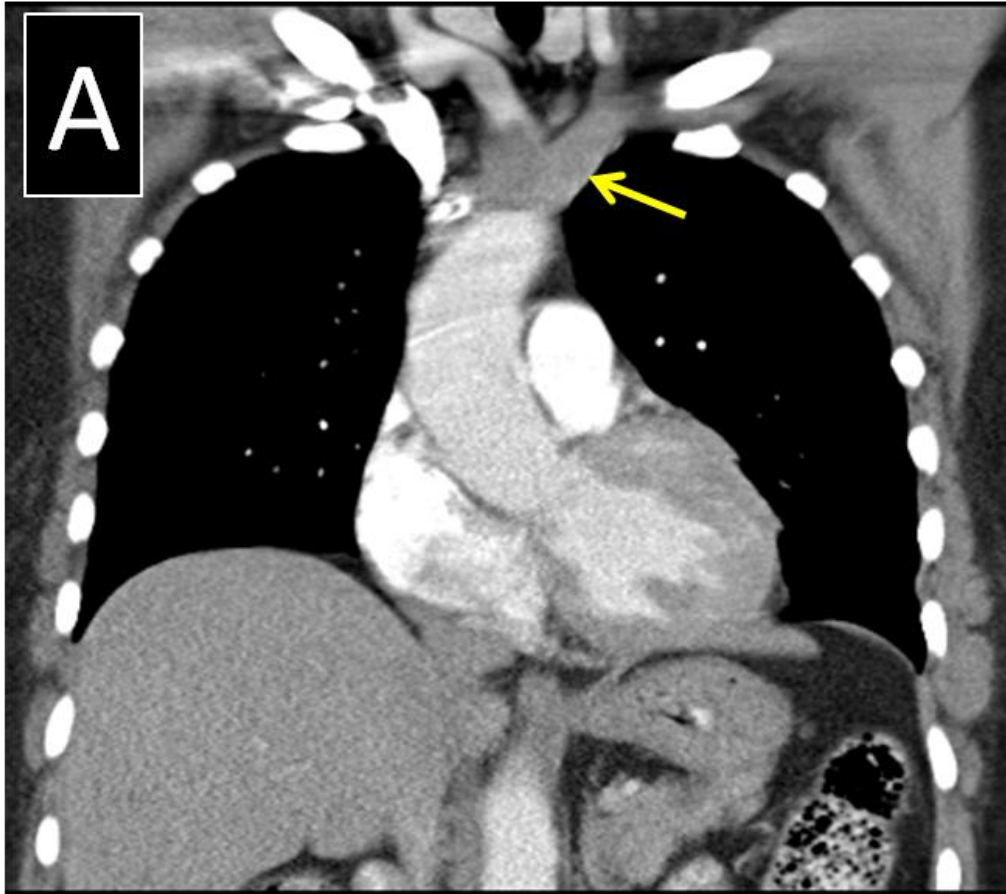
Aortic Intimal Sarcoma



Aortic Intimal Sarcoma



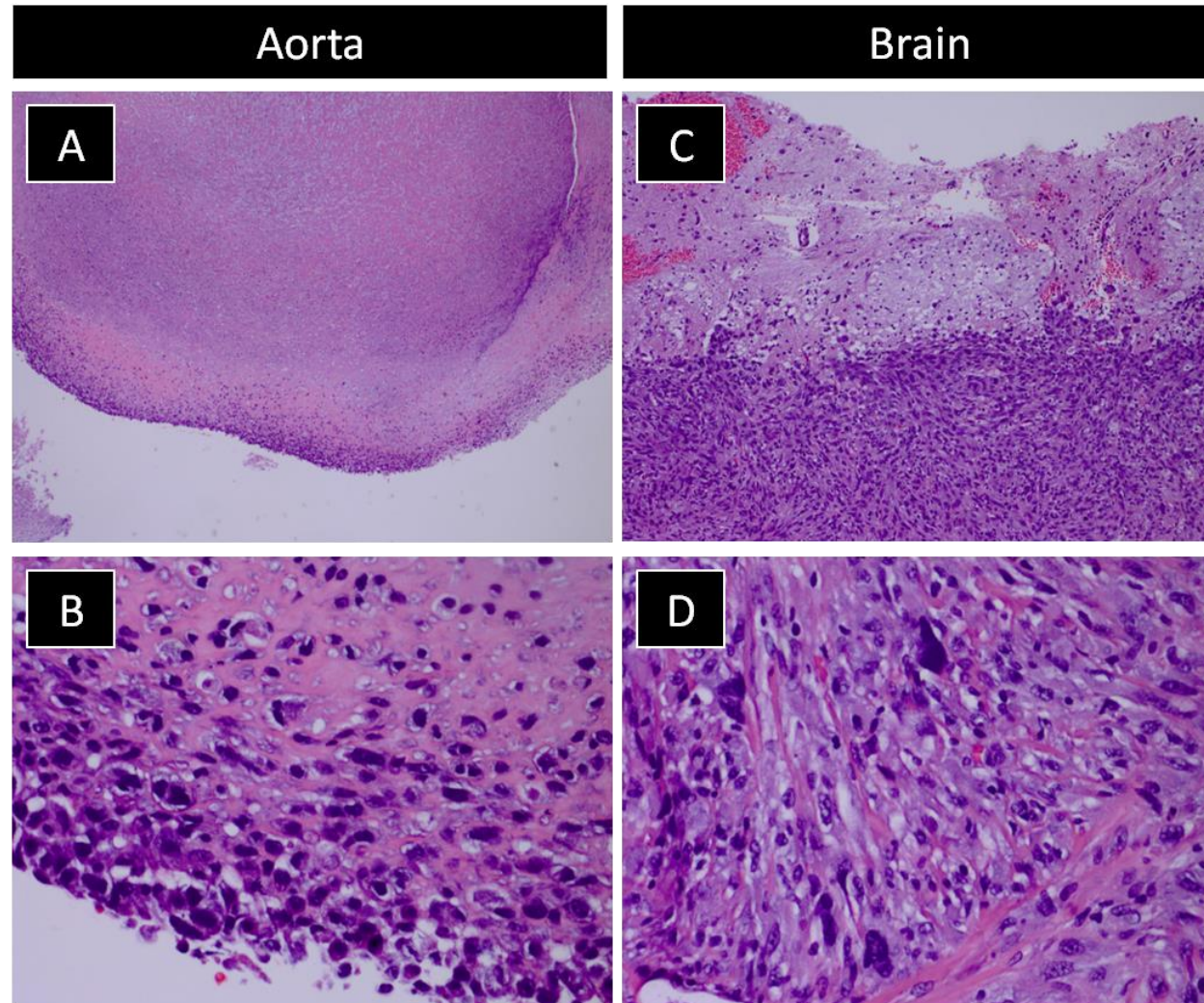
Aortic Intimal Sarcoma: CT



Aortic Intimal Sarcoma: MRI



Aortic Intimal Sarcoma



*Case
Reports*

Intimal Sarcoma in the Aortic Arch

Partially Obstructing the
Aorta with Metastasis to the Brain

Alicia Mecklai, MD
Barry Rosenzweig, MD
Robert Applebaum, MD
Leon Axel, MD, PhD
Eugene Grossi, MD
Alexander Chan, MD
Muhamed Saric, MD, PhD

*Primary tumors of the aorta are rare entities. We report the unusual manifestation of an aortic intimal sarcoma that presented as a brain metastasis in a 56-year-old, otherwise healthy woman. After the brain mass had been resected, multiple imaging methods revealed pseudocoarctation and the primary tumor in the aortic arch. To our knowledge, this is the first report of the diagnosis of an aortic intimal sarcoma with use of real-time, 3-dimensional transesophageal echocardiography. (**Tex Heart Inst J 2014;41(4):433-6**)*



Secondary Cardiac Malignancies

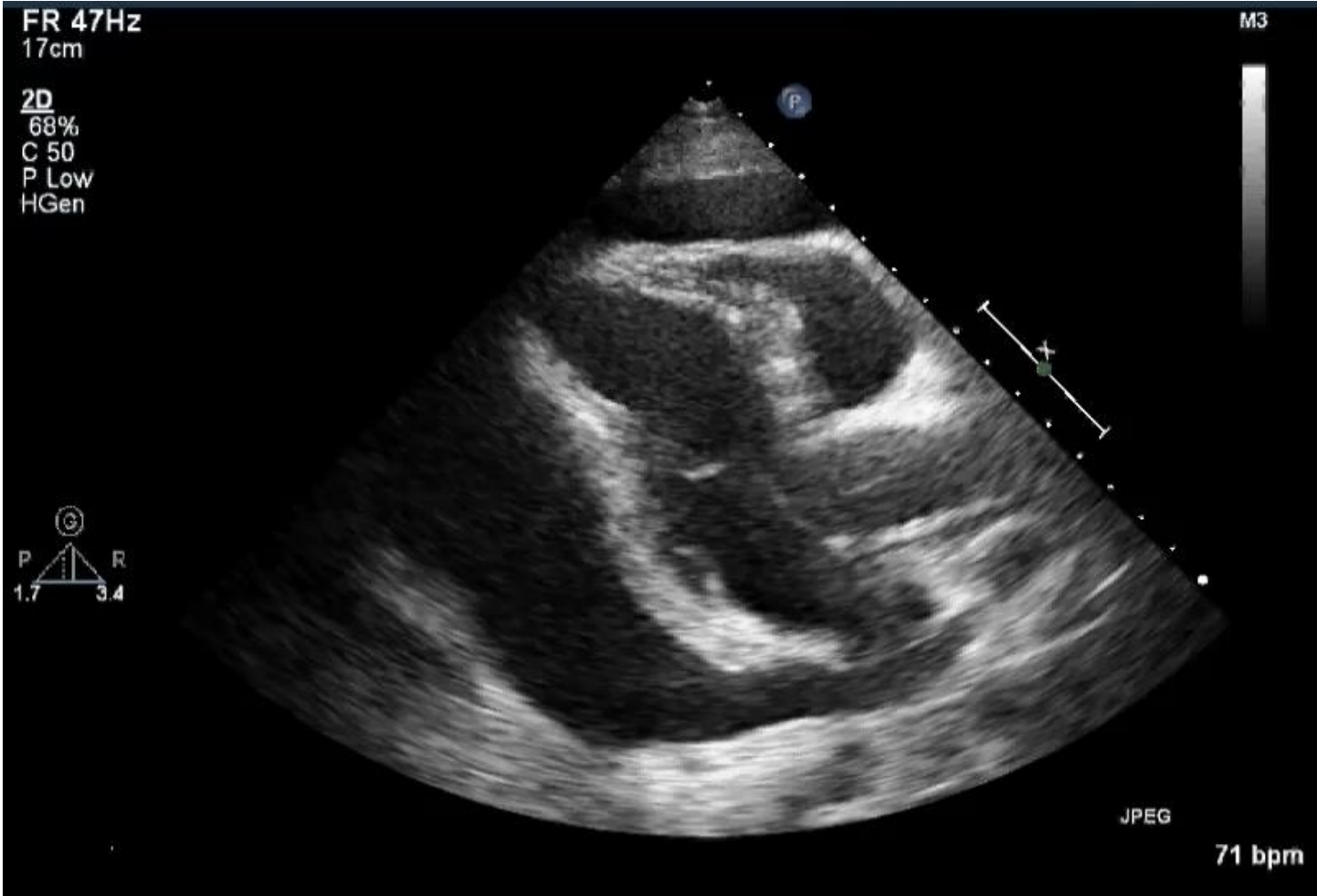


Breast Cancer



Breast Cancer

47-year-old woman with breast cancer and malignant pericardial effusion



Breast Cancer

47-year-old woman with breast cancer and malignant pericardial effusion

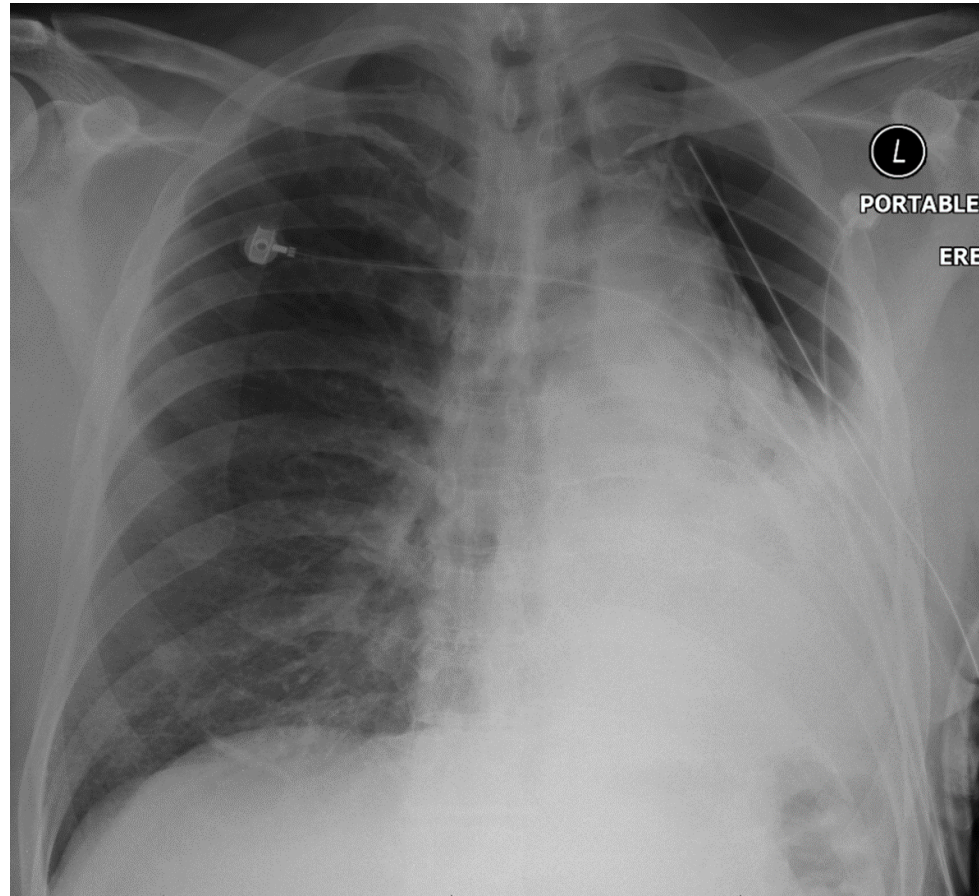


Lung Cancer



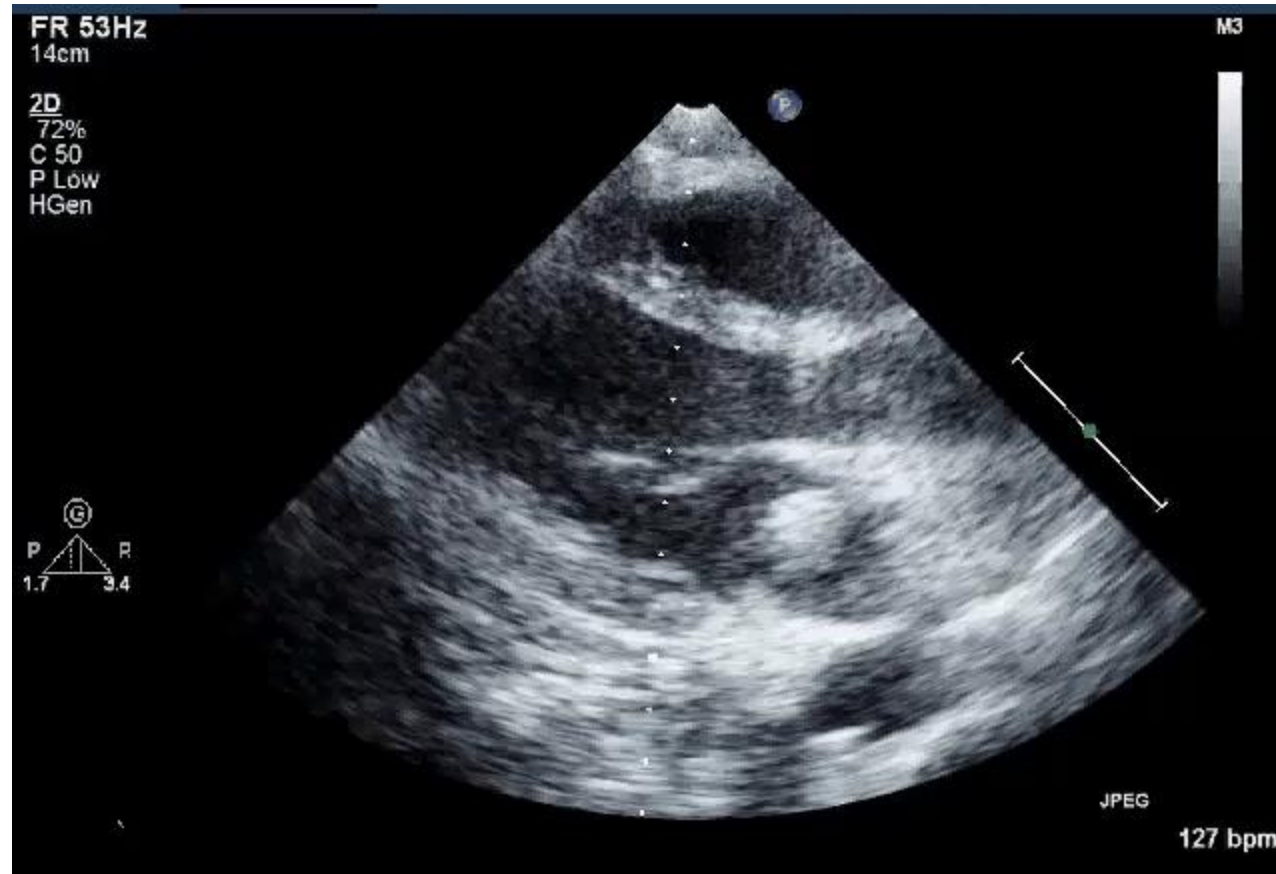
Lung Cancer

59-year-old man; active tobacco smoker,
with lung cancer extending into the heart through left-sided pulmonary veins



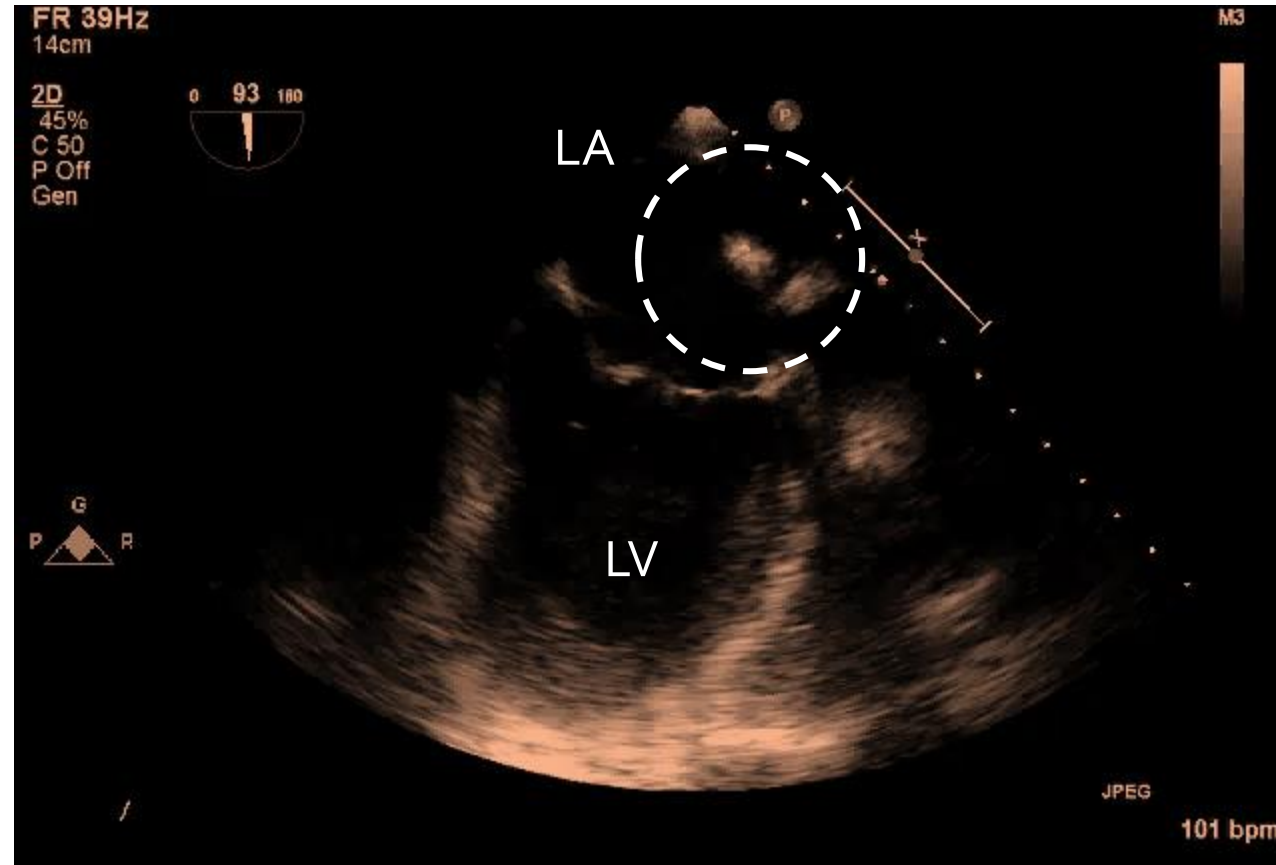
Lung Cancer

59-year-old man; active tobacco smoker
with lung cancer extending into the heart through left-sided pulmonary veins



Lung Cancer

59-year-old man; active tobacco smoker
with lung cancer extending into the heart through left-sided pulmonary veins



Hepatocellular Carcinoma



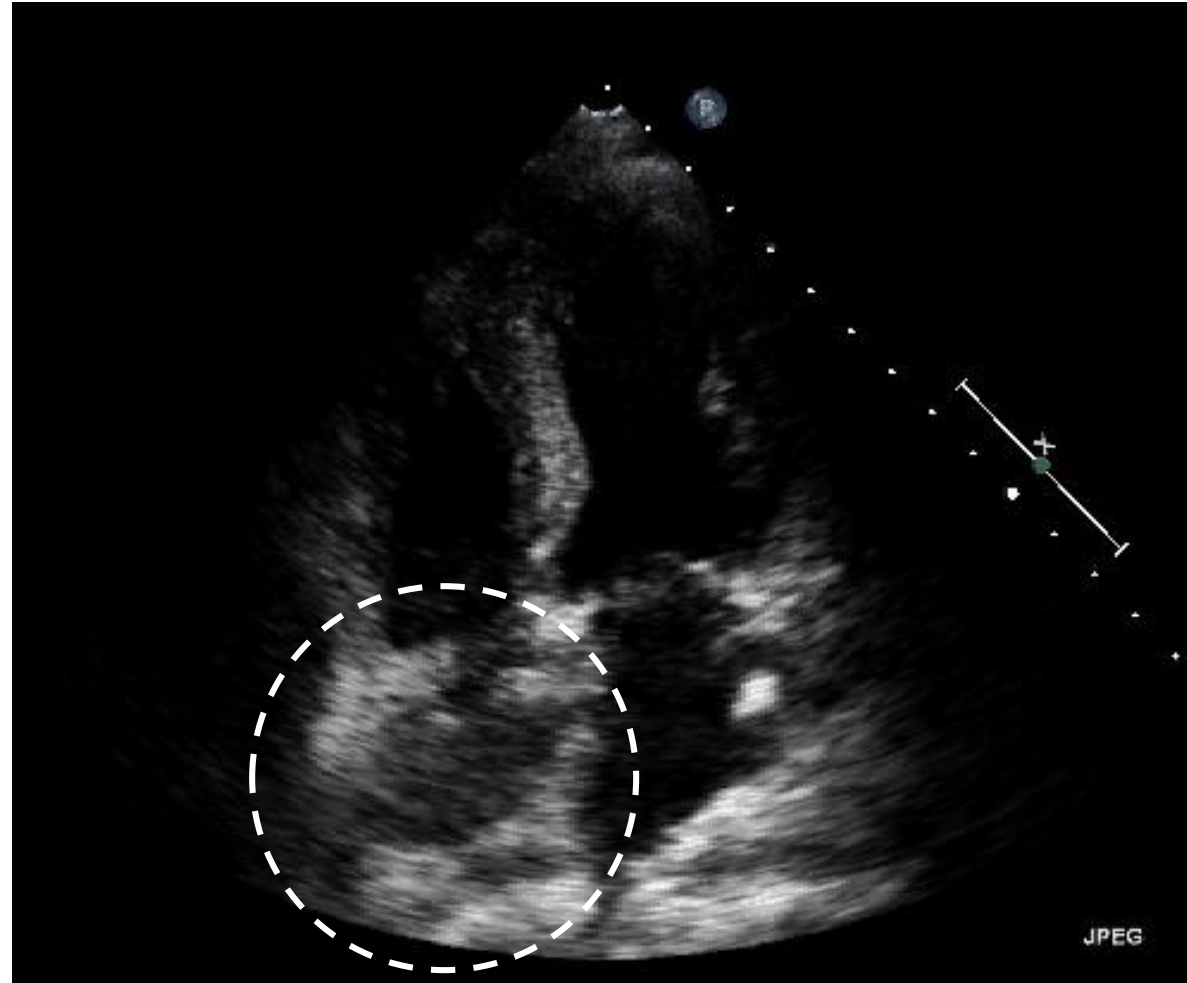
Case Presentation

61-year-old man

: Chronic ethanol abuser

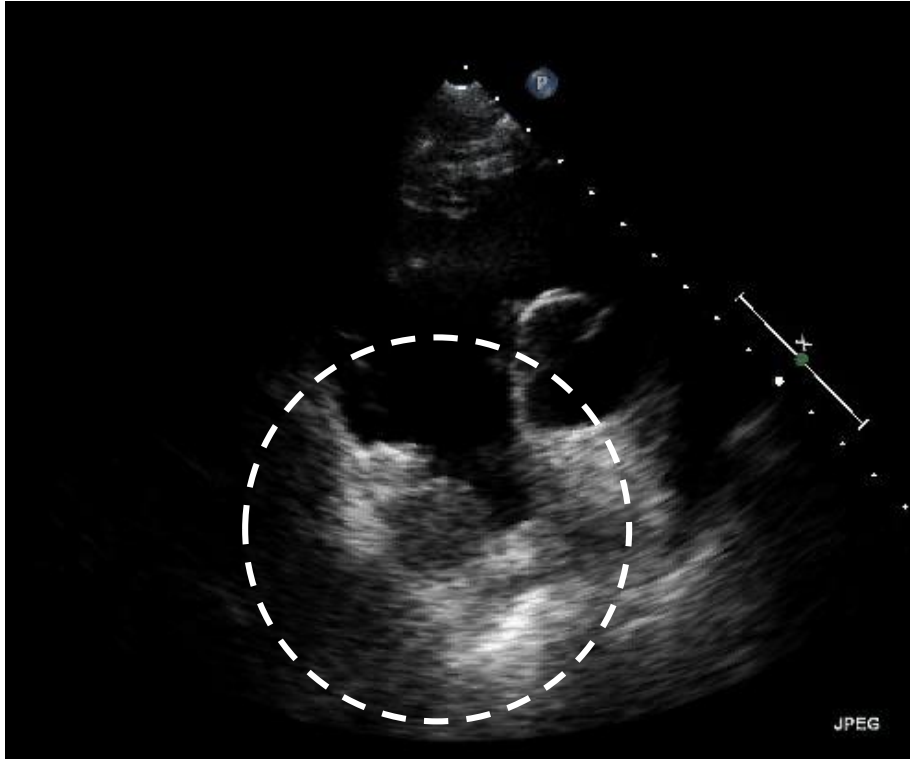
: Brought in by his wife
because of altered mental
status

: TTE order to evaluate for
murmur

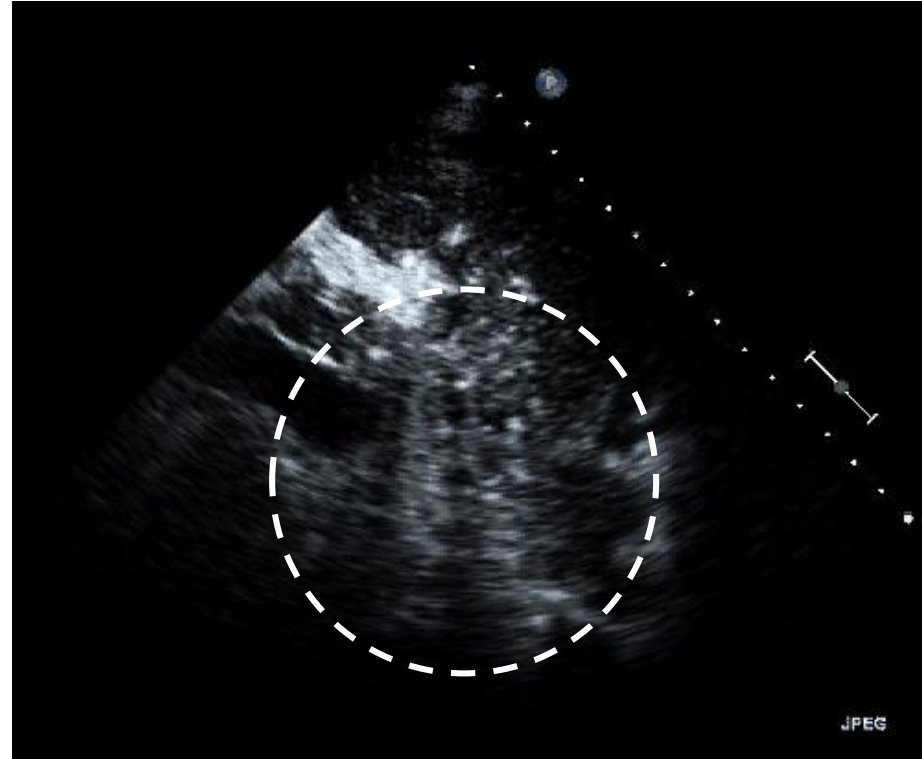


2D TEE
Apical 4-Chamber View

RA Mass | Hepatocellular Carcinoma



TTE: Short-Axis View at AV Level
Mass in RA originating in IVC

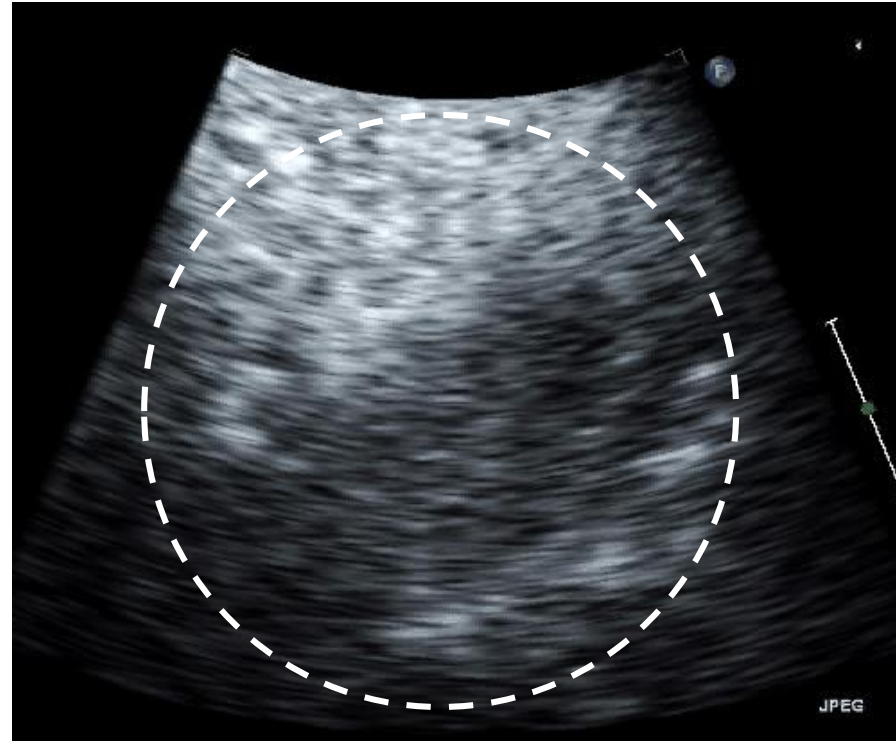


TTE: Subcostal View
Mass in the liver extending into IVC

RA Mass | Hepatocellular Carcinoma



Immediately Post Definity
No significant contrast uptake by RA mass



Delayed Imaging
Contrast uptake by RA mass
indicative of a vascularized tumor

Final Diagnosis

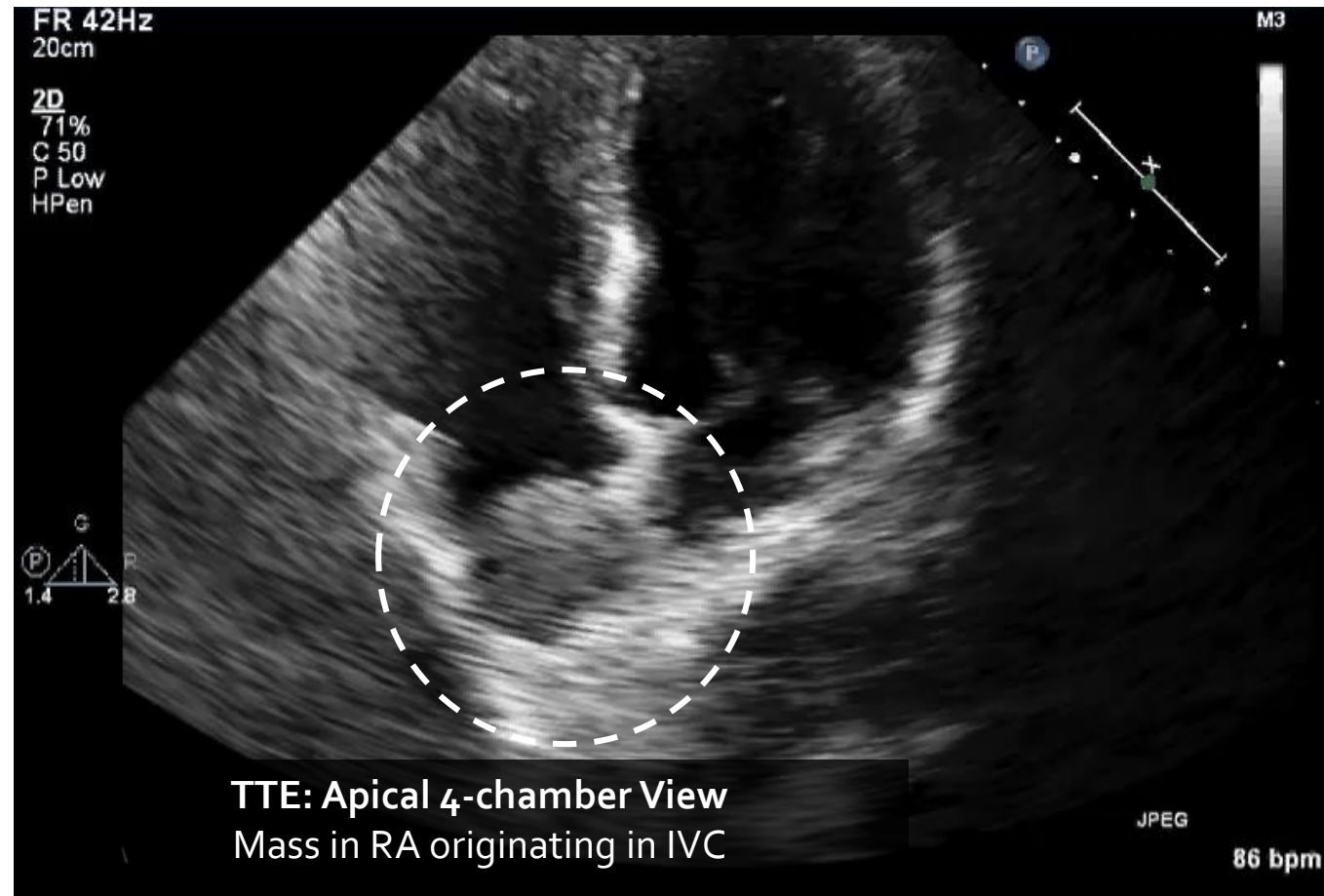
Hepatocellular carcinoma

Renal Cell Carcinoma



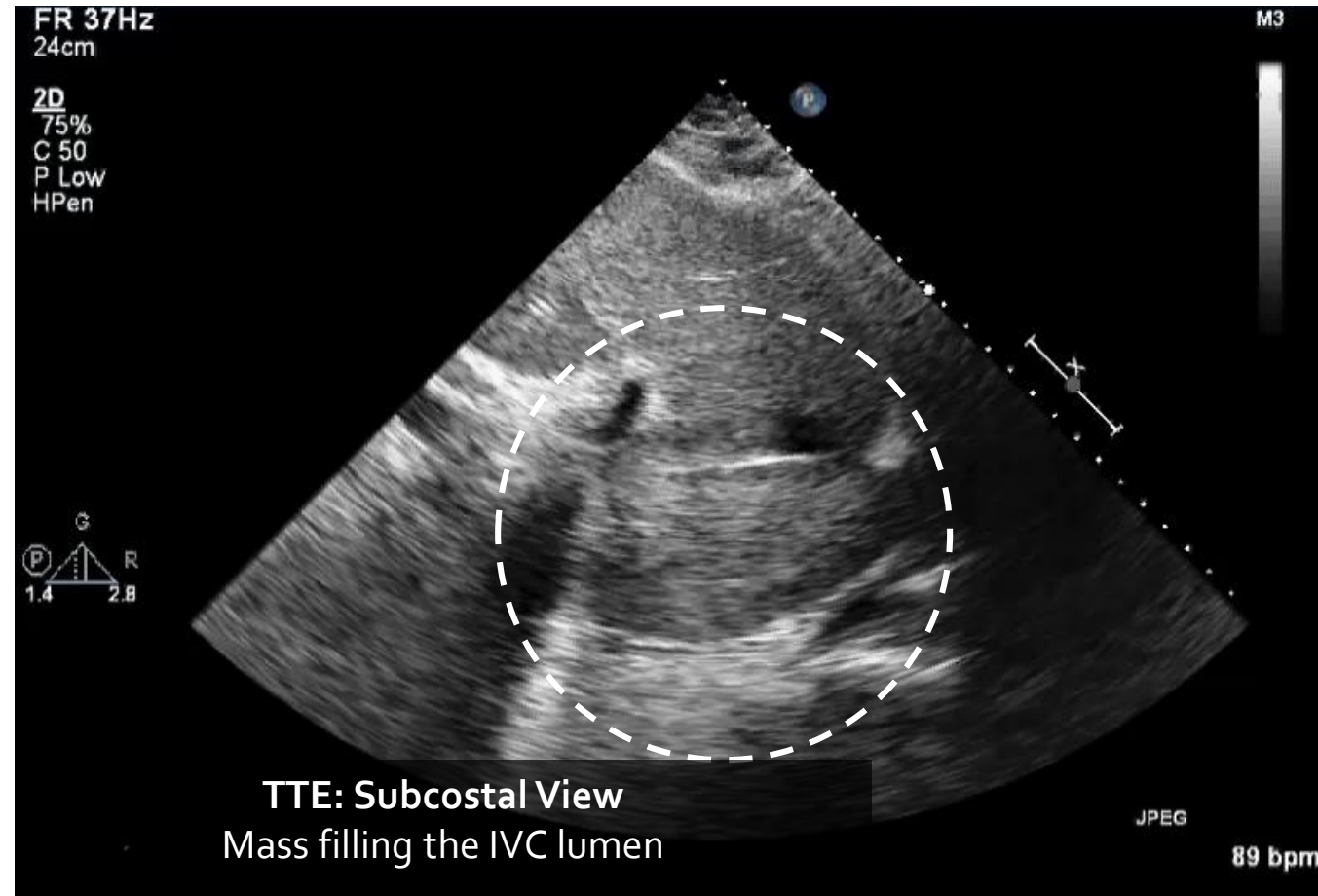
Renal Cell Carcinoma

45-year-old man present with hematuria and lower extremity edema



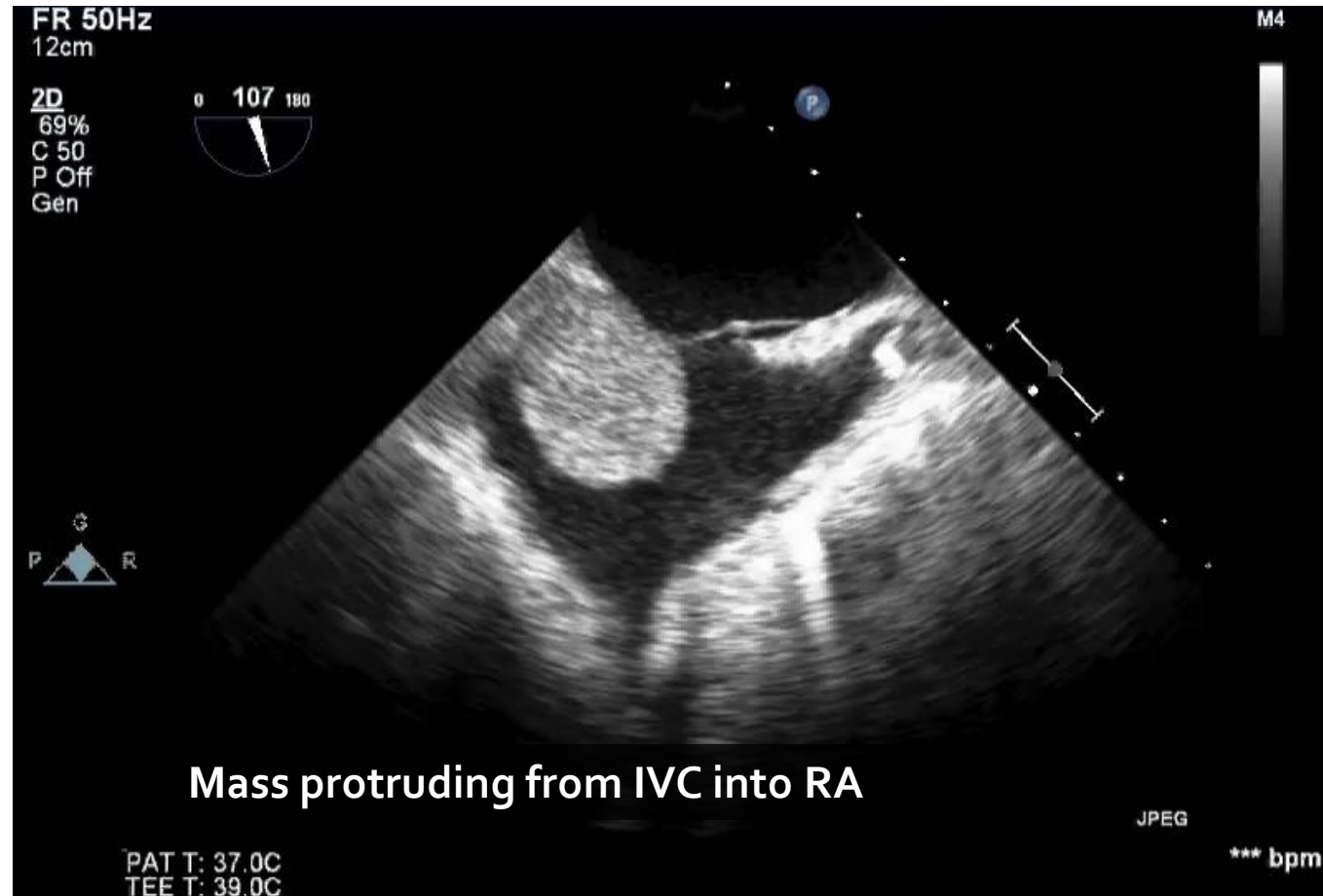
Renal Cell Carcinoma

45-year-old man present with hematuria and lower extremity edema



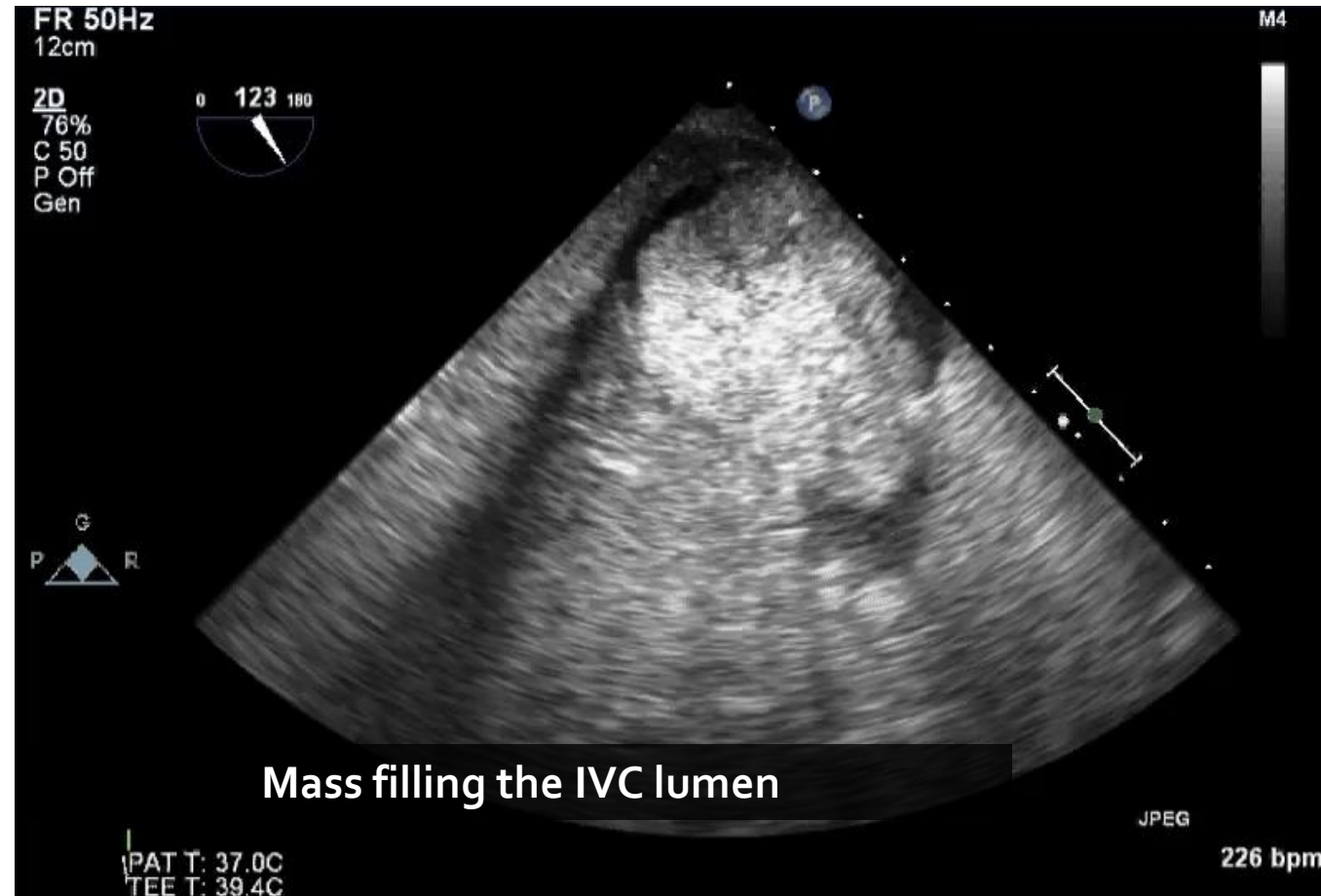
Renal Cell Carcinoma

45-year-old man present with hematuria and lower extremity edema

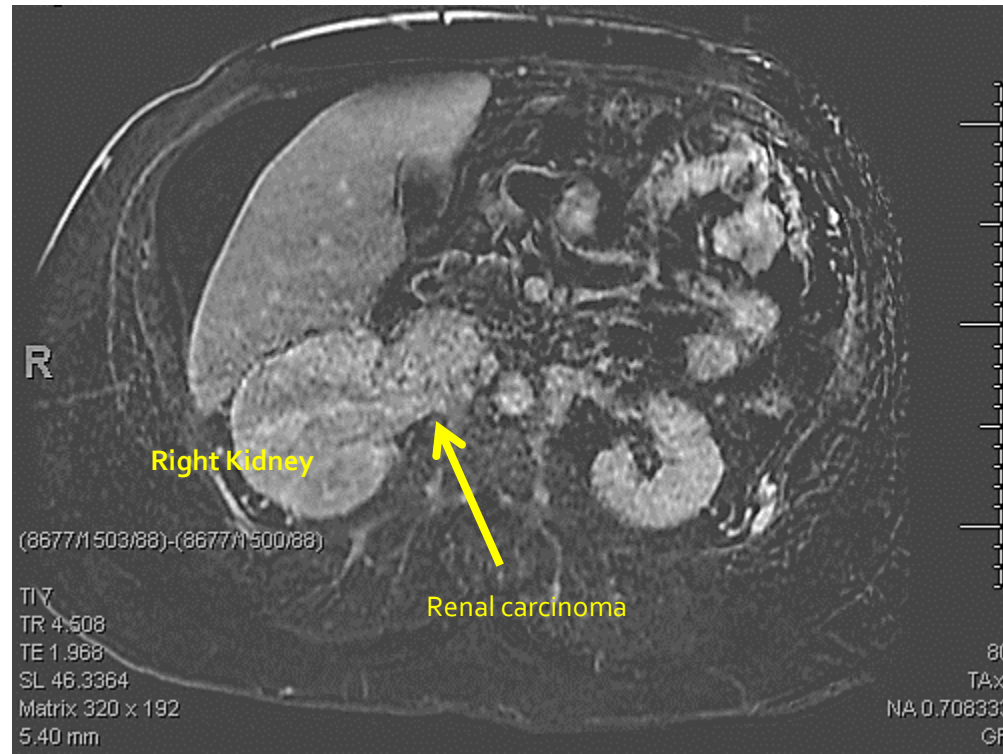


Renal Cell Carcinoma

45-year-old man present with hematuria and lower extremity edema



Renal Cell Carcinoma



Renal cell carcinoma with extension to the heart

Ather Anis MD¹, Pierre Maldjian MD², Marc Klapholz MD¹, Muhamed Saric MD PhD¹

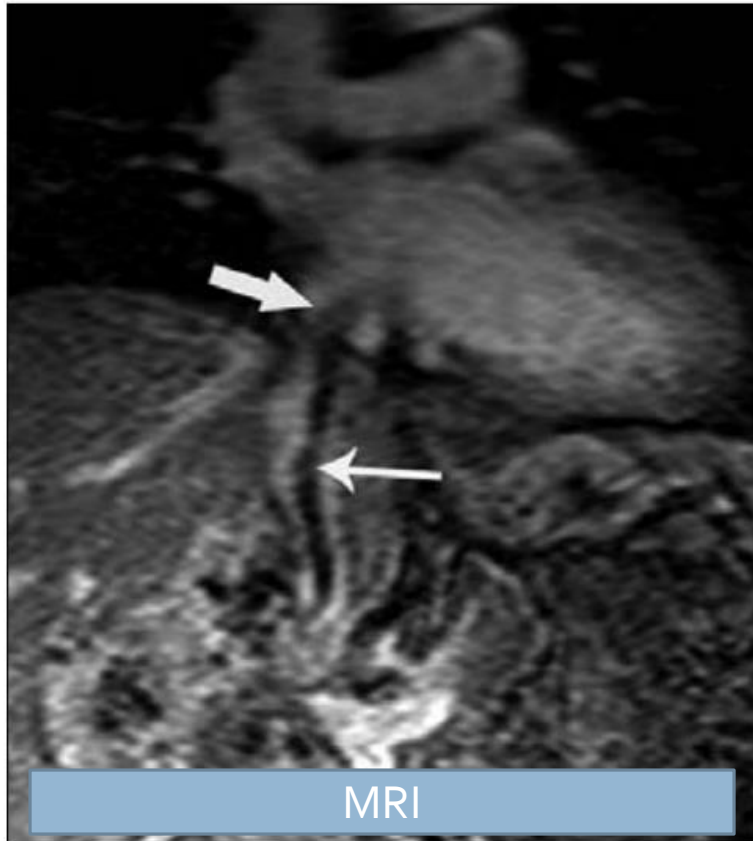


Figure 1) Magnetic resonance imaging of the abdomen showing a 9 cm × 8 cm right renal mass and a filling defect (tumour extension) in the inferior vena cava (thin arrow) with protrusion into the right atrium (thick arrow)



Figure 2) Transthoracic echocardiogram showing a large mobile mass (arrow) protruding from the inferior vena cava (IVC) into the right atrium. Ao Ascending aorta; RV Right ventricle



Cardiac Lymphoma vs. Thrombus



Case Presentation

47-year-old man

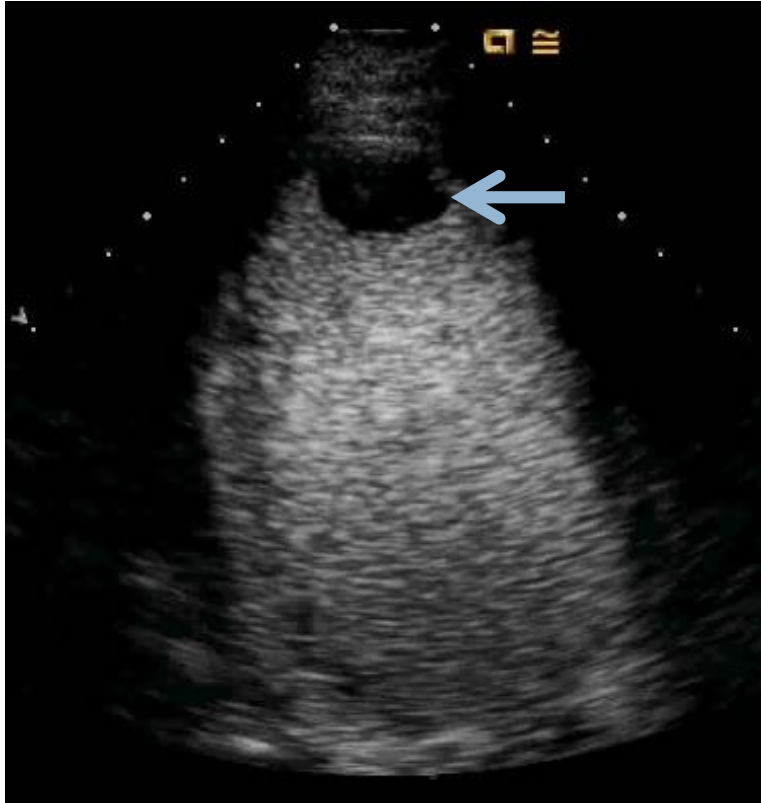
: Presents with acute stroke

: Several months ago had acute LAD infarct; not revascularized due to late presentation

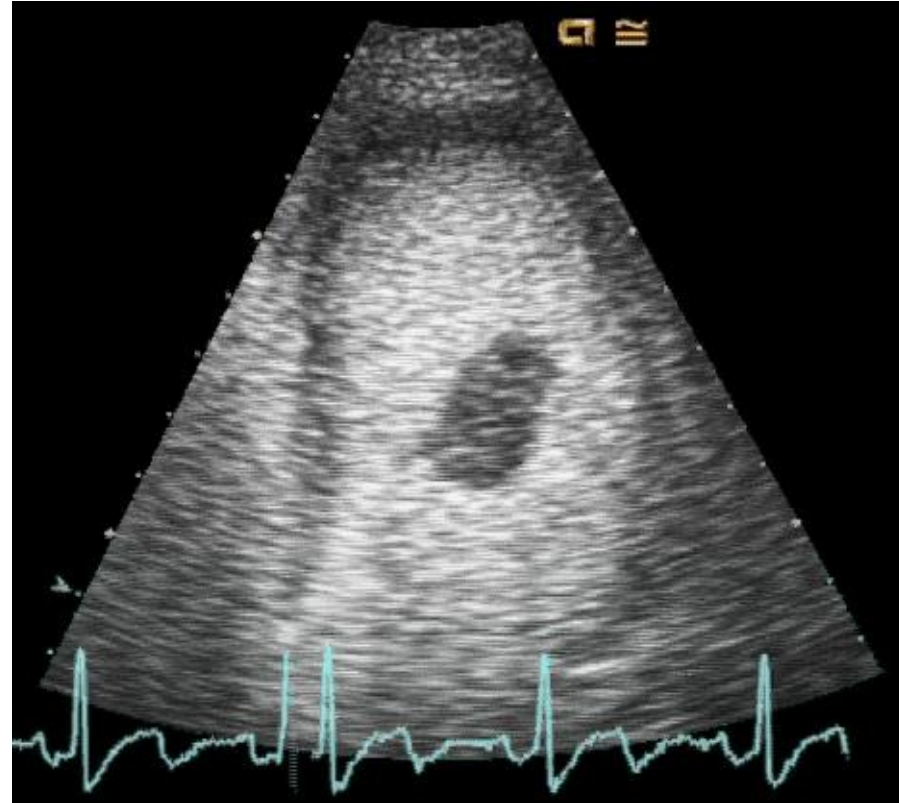


2D TEE
Apical 2-Chamber View

2 Patient with LV Mass: Microbubble Injection



Patient #1
LV thrombus post LAD infarct



Patient #2
LV lymphoma in an AIDS patient

TEACHING POINTS

Differential diagnosis of an LV mass

LV THROMBUS

1. Adjacent to akinetic/hypokinetic LV segment
2. Does NOT take up microbubble contrast

LV TUMOR

1. Typically no primary LV wall motion abnormalities
2. Typically DOES take up microbubble contrast

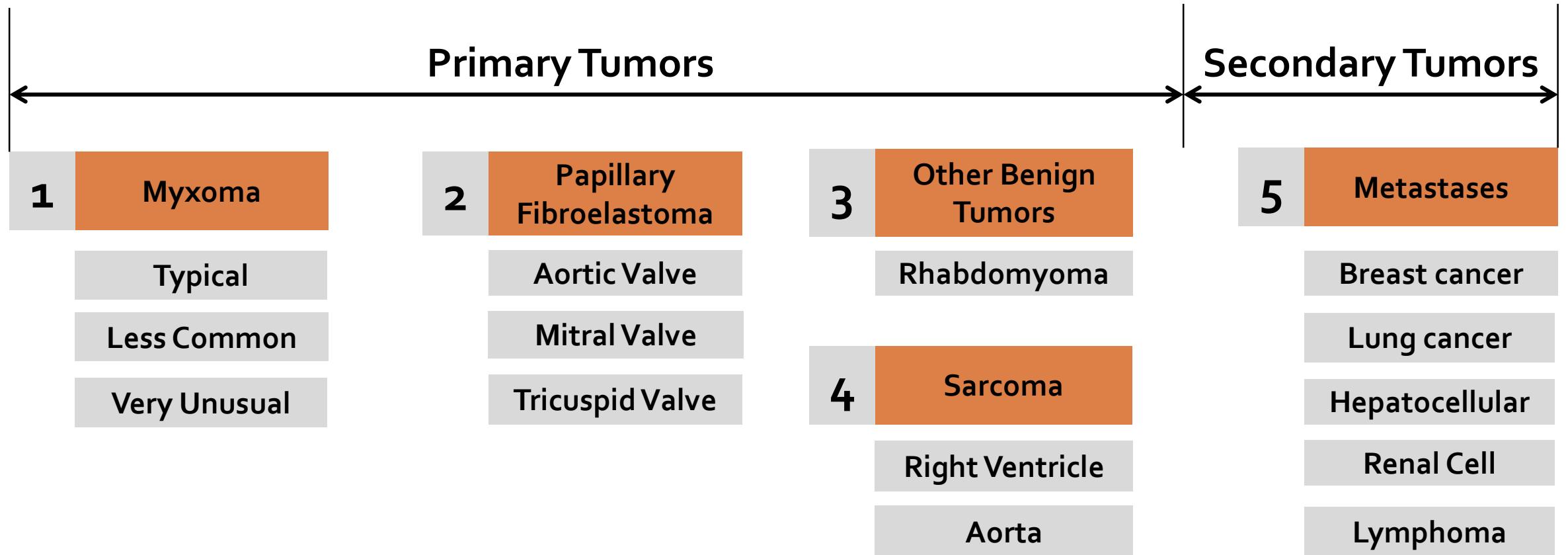


Thank You



New York University Langone Medical Center

Cardiac Masses



Short Biography



Muhamed Sarić
MD, PhD, MPA

- Born in Sarajevo, Bosnia-Herzegovina
- Director of Noninvasive Cardiology and Professor of Medicine at NYU
- Primary interest is the use of 3D echocardiography in guiding percutaneous repairs of structural heart disease. At NYU my colleagues and I performed the first transseptal transcatheter mitral valve replacement in the world on June 15, 2016 using Caisson valve system.
- First to describe the tilt-up-then-left or TUPLE maneuver, which improves the diagnosis of atrial septal defects (ASDs), and facilitates its repair.
- Published numerous articles and book chapters in the field of cardiology, biochemistry and history of medicine.
- Chairman of the American Society of Echocardiography (ASE) guidelines committee for the use of echocardiography in the evaluation of a cardiac source of embolism
- Recipient of multiple teaching awards including the 2017 Richard Popp Excellence in Teaching Award from the American Society of Echocardiography