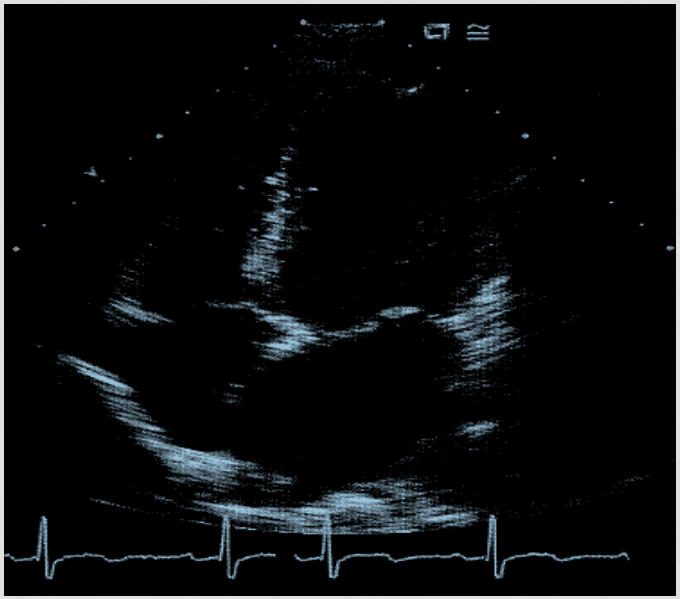
CARDIAC MASSES

QUESTION 1

The apical four chamber view of a patient with an embolic stroke demonstrates:



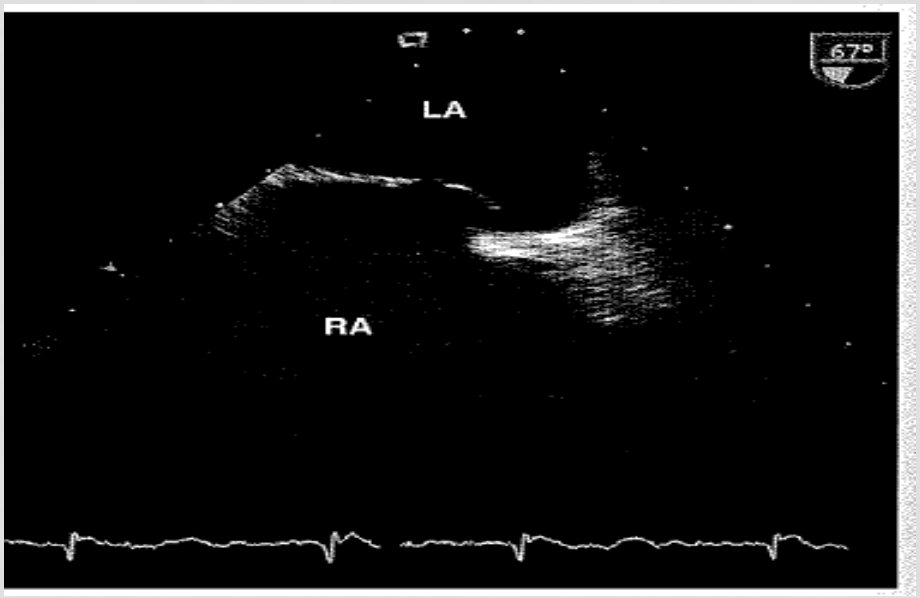
A. No abnormalities
B. Patient foramen ovale
C. Atrial septal aneurysm
D. Atrial septal defect
E. Chiari network

ANSWER 1: A

In this apical four-chamber view, the atrial septum appears intact with slight bowing from left to right consistent with the normal hemodynamics of the left atrial pressure slightly higher than right atrial pressure. The definition of an atrial septal aneurysm is deviation by 1.5 cm or more, which this image does not demonstrate. A patent formen ovale may or may not be present, but diagnosis requires color Doppler and a saline contrast injection. If a secundum or primum atrial septal defect were present, the right heart chambers would be enlarged, and there would be discontinuity in the atrial septum. With a sinus venosus atrial septal defect, the septum might appear intact in this view, but the right heart would still be enlarged. There are no bright echoes in the right atrium to suggest a Chiari network.

QUESTION 2

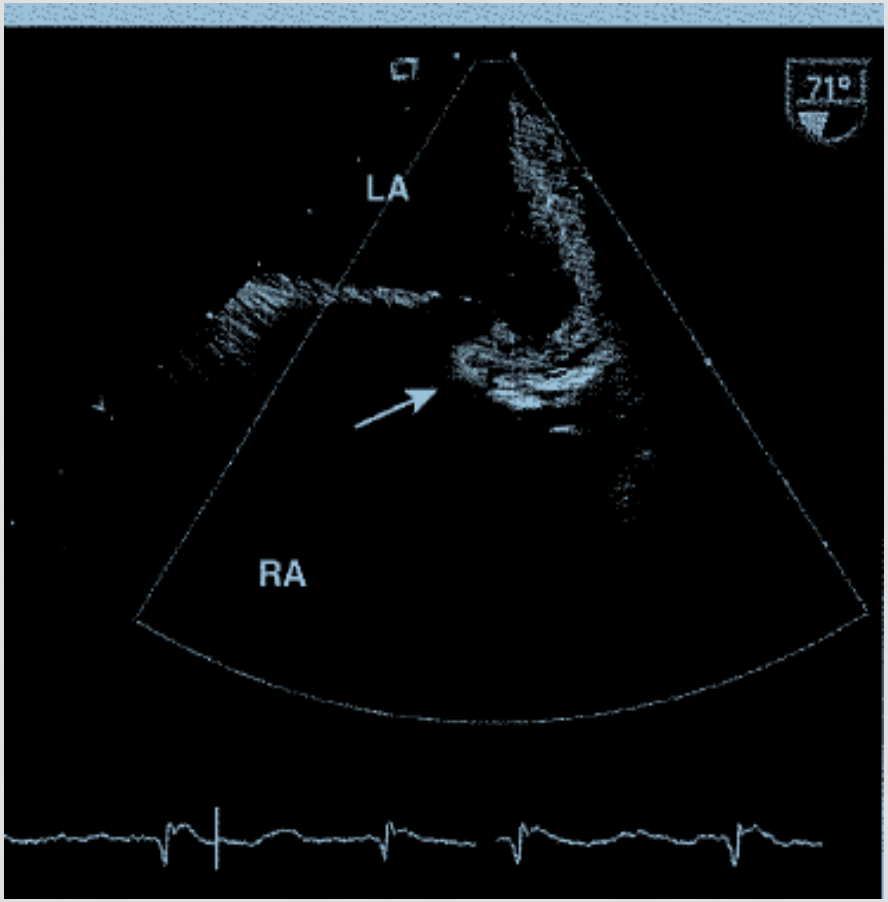
The transeophageal image was obtained for a 54-year-old man with cryptogenic stroke, This image is consistent with:



A. Left Atrial appendage thrombus
B. Papillary fibroelestoma
C. Patient formen ovale
D. Aortic atheroma
E. Mitral valve prolapse

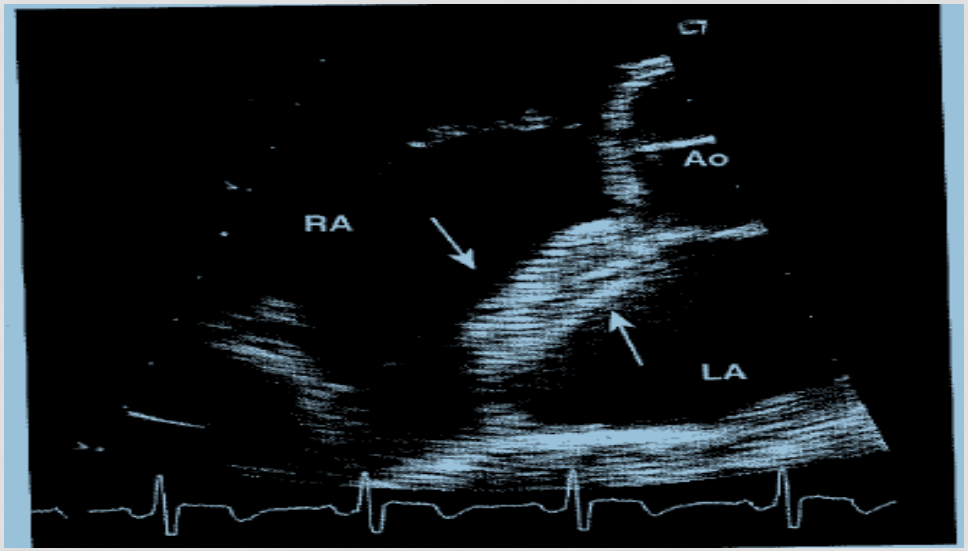
ANSWER 2: D

These images show the interatrial septum with a slight discontinuity in the region of the foramen ovale. Color Flow demonstrates right to left flow through this defect. A systematic and comprehensive TEE examination in this patient also would include imaging to exclude aortic atheroma, left atrial thrombus, papillary fibroelastoma, and mitral valve prolapse, because these cardiac findings also are associated with increased risk of embolic events



QUESTION 3

The figure below show:



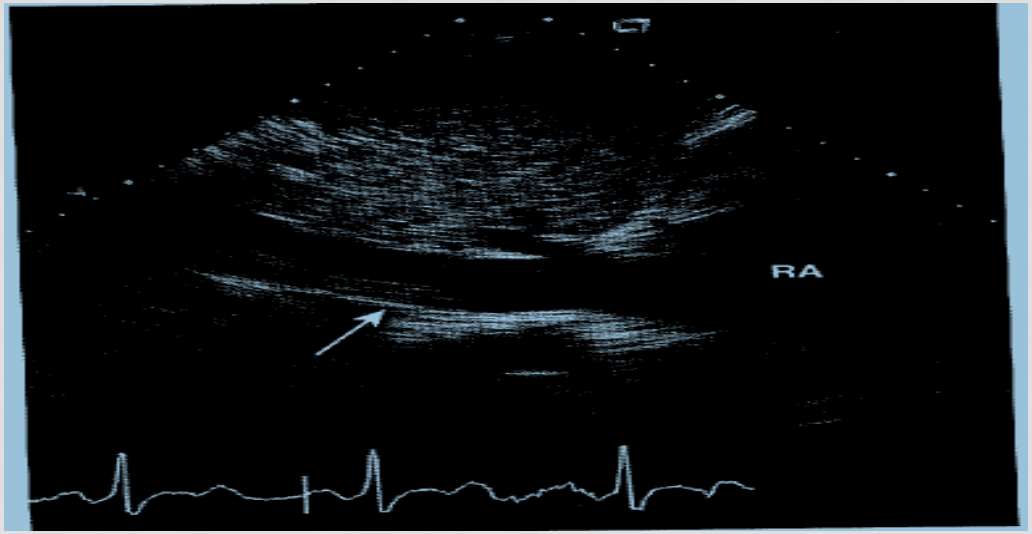
A. Lipomatous hypertrophy of the interatrial septum
B. Eustachian valve
C. Atrial thrombus
D. Atrial myxoma
E. Atrial septal occluder device

ANSWER 3: E

This transthoracic short axis view at the aortic valve level shows thickening and increased echogenicity in the interatrial septum. The bright parallel line with regularly spaced echoes are consistent with artificial material, in this case, an atrial septal occulder device. The device is in the expected position. An atrial myxoma would be less echodense and protrude into the cardiac chamber, Lipomatous hypertrophy can be very echogenic but typically spares the fossa ovalis. An atrial thrombus could form along the atrial septum but would be less echogenic.

QUESTION 4

The echocardiographic image below was recorded from a 63 year old obese women who presented with acute shortness of breath. The rest of her echocardiographic images were unremarkable. The most likely cause of her shortness of breathe is:



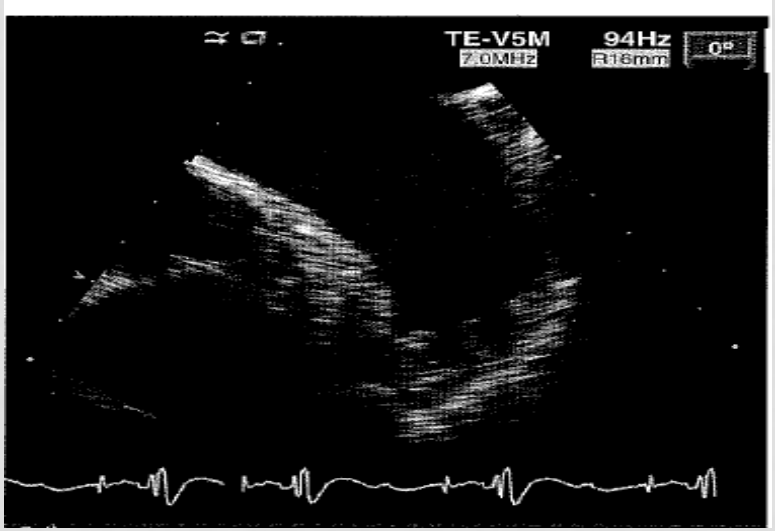
A. Cardiac tamponade
B. Left ventricular systolic dysfunction
C. Primary pulmonary disease
D. Aortic Dissection
E. Pulmonary embolus

ANSWER 4: A

- The subcostal view of the inferior vena cava(note the hepatic vein and entrance into the right atrium) shows a tubular echodensity in the lumen, suggestive of thrombus. Given this finding, it is likely that pulmonary embolism is the cause of acute shortness of breath. Cardiac tamponade occurs with a pericardial effusion, which should be visible in this view. Left ventricular systolic dysfunction would be evident on other 2D images. Primary pulmonary disease is not associated with deep venous thrombosis, as seen here. Aortic dissection typically presents with pain, rather than shortness of breath. On subcostal views, the aorta is posterior to the inferior vena cava and takes a more posterior course at the superior aspect of the image.

QUESTION 5

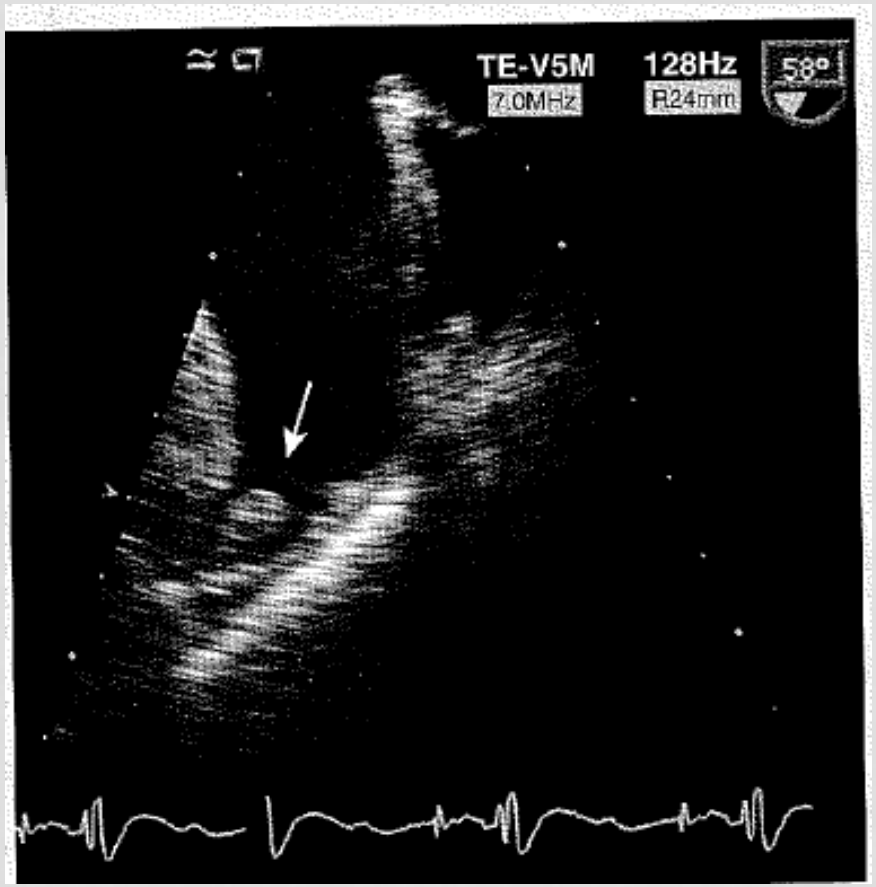
Transesophageal echocardiography was requested before an atrial flutter ablation procedure in this 62 year old woman with a restrictive cardiomyopathy. The transesophageal view of the left atrial appendage is shown. The most appropriate next step in management of this patient is:



A. Proceed with atrial flutter ablation
B. Repeat TEE after 24 hours of intravenous heparin
C. Repeat TEE after 4 weeks of warfarin
D. Obtain other views of the atrial appendage
E. Record images using a higher transducer frequency

ANSWER : 5

This view of the atrial appendage was correctly obtained with a 7-MHz transducer frequency and using a magnified view with the appendage centered in the image. The images show ridges in the tip of the triangular-shaped appendage that may be trabeculations, but it is difficult to exclude thrombus. Because 7 MHz already is the highest transducer frequency available with most TEE probes, the most useful maneuver is to obtain another view of the atrial appendage to see if the ridges connect to the wall or if there are areas more suggestive of thrombus. In the figure below, a view at 58-degrees rotation in this patient shows a globular mass in the tip of the appendage suggestive of thrombus. In addition this patient had prominent spontaneous contrast in the atrial appendage and body of the left atrium, and the atrial flow velocity in the appendage was only 0.1 m/s (normal is more than 0.4 m/s).

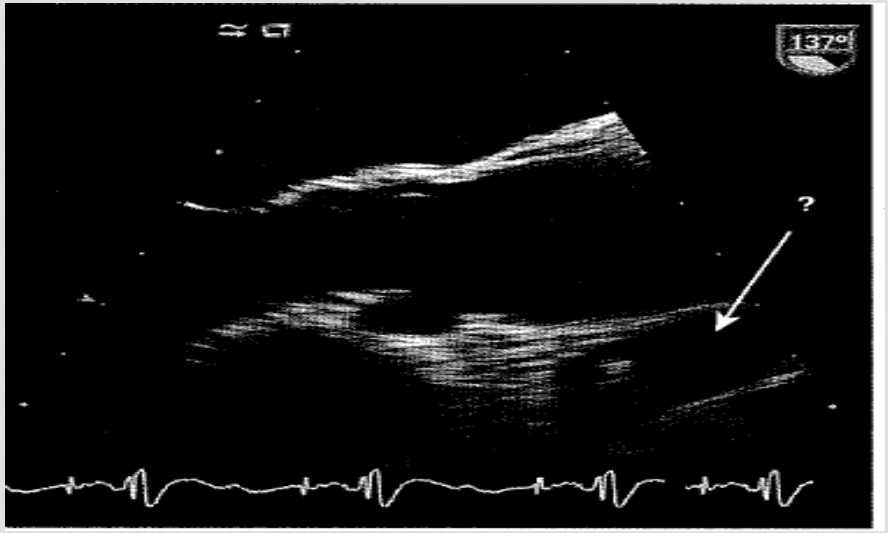


ANSWER 5: D

- This view of the atrial appendage was correctly obtained with a 7-MHz transducer frequency and using a magnified view with the appendage centered in the image. The images show ridges in the tip of the triangular-shaped appendage that may be trabeculations, but it is difficult to exclude thrombus. Because 7 MHz already is the highest tranducer frequency available with most TEE probes, the most useful maneuver is to obtain another view of the atrial appendage to see if the ridges connect to the wall or if there are areas more suggestive of thrombus.

QUESTION 6

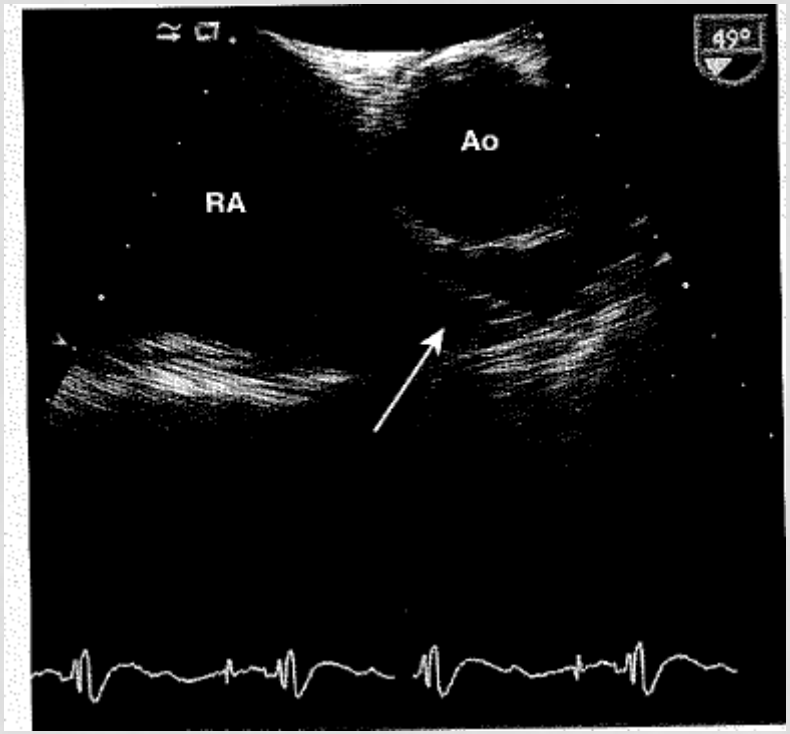
What is the structure indicated by the arrow in the transesophageal long axis view shown below



A. Right pulmonary artery
B. Pericardial effusion
C. Paravalvular abcess
D. Right atrial appendage
E. Superior vena cava

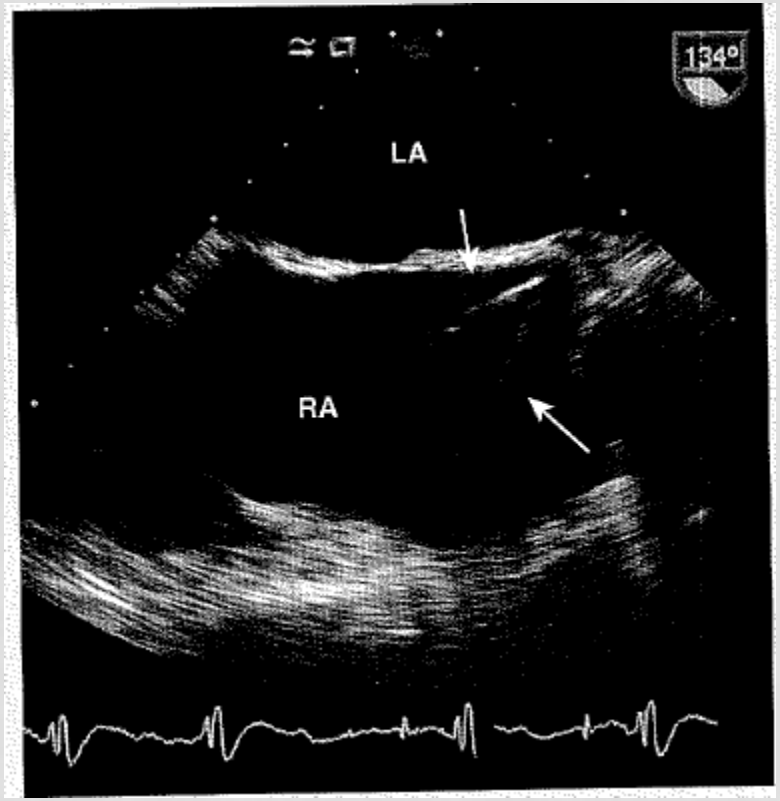
ANSWER 6: D

This image shows(from posterior to anterior) the left atrium ascending aorta and right atrial appendage, Although it is unusual to recognize the atrial appendage in this view, the right atrial appendage is positioned just anterior to the aorta. Recognition was facilitated in this patient by the presence of right atrial pacer leads (the bright echo in the echolucent cavity). The pacer lead could be followed by rotating the image place to 49 degrees, showing the typical repetitive parallel echoes(arrow) of a pacer lead extending into the right atrial appendage.



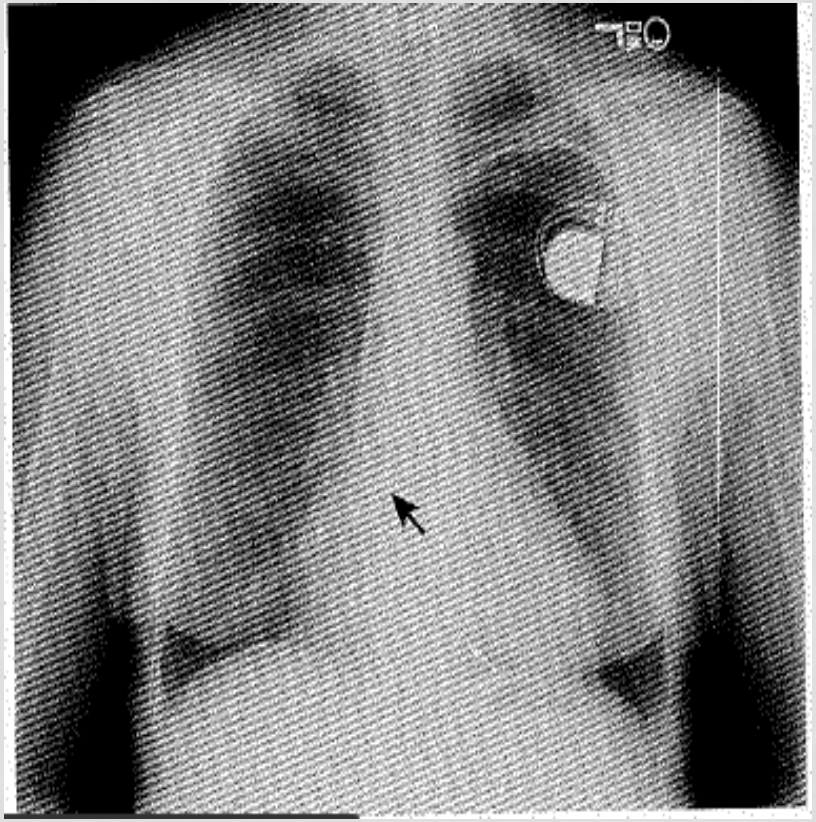
ANSWER: 6

- By turning the probe rightward, while in the long axis view at 134 degrees, to show the lead entering the right atrium via the superior vena cava then curving into the appendage.



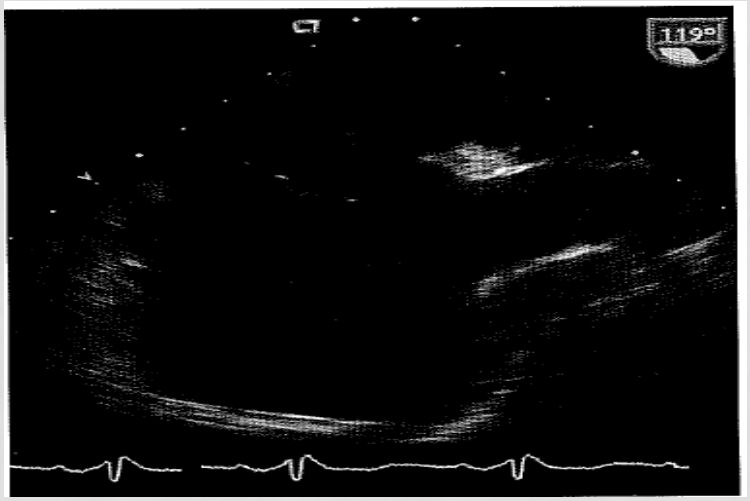
ANSWER: 6

- Chest radiograph shows the position of the lead tip(arrow) in the right atrial appendage.
- The right pulmonary artery would be seen posterior to the aorta and is cephalad to the superior edge of the image in the patient. A pericardial effusion rarely extends posteriorly around the base of the aortic root and pulmonary artery in the transverse sinus of the pericardium. A paravalvular abscess typically is located in the aortic annulus region. The superior vena runs parallel and lateral to the aorta, not anteriorly.



QUESTION 7

The transesophageal image in the below figure shows:



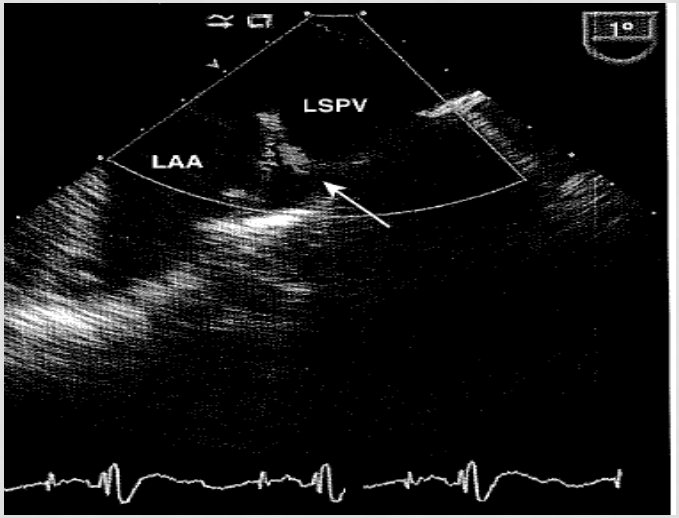
A. Atrial myxoma
B. Atrial septal defect
C. Chiari network
D. Persistent left superior vena cava
E. Cor triatriatum

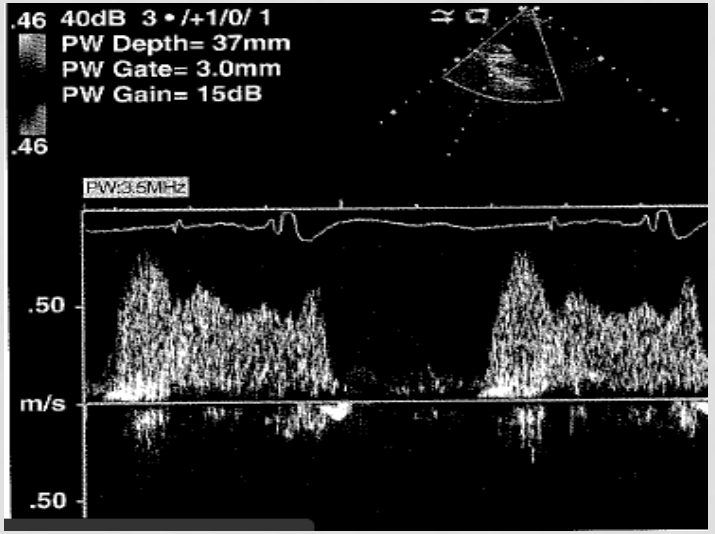
ANSWER 7: C

This a TEE long axis of the superior vena cava and right atrium showing a linear echo that arises from the junction of the inferior vena cava and right atrium, It is most consistent with a Chiari network. The term *Eustachian* valve is used for a small localized membrane at the inferior vena caval junction, and the term *Chiari network* is used when it extends(often with fensetrations) from the inferior vena cava to the superior vena cava. However, there is a range of sized between these two extremes, as seen in this case. An atrial myxoma typically is a rounded mass, and an atrial septal defect would not be seen in this view. A persistent left superior vena cava usually is diagnosed based on a dilated coronary sinus. The atrial membrane with cor triatriatum(which is more common in the left but can occur in the right atrium) typically traverses the atrium from the edge of the fossa ovalis on the septum of the lateral wall.

QUESTION 8

TEE was requested to evaluate for left atrial thrombus in a 61 year old woman with a restrictive cardiomyopathy of unknown etiology. While examining the atrial appendage, a small echolucent structure was seen between the appendage (LAA) and the left superior pulmonary vein (LSPV) with evidence of flow using color Doppler. Based on the pulsed Doppler signal below the echolucent structure most likely represents:





A. Vascular tumor
B. Pulmonary artery branch
C. Coronary Artery
D. Pulmonary vein branch
E. Persistent left superior vena cava

ANSWER 8: C

The Doppler signal shows low velocity (0.6 m/s) diastolic flow, which is most consistent with coronary artery flow, most likely the circumflex coronary artery, which lies in this area. A vascular tumor is unlikely and would have an arterial flow pattern, as would a pulmonary artery branch. A pulmonary vein branch would have the typical systolic and diastolic inflow patterns. A persistent left superior vena cava would have a venous flow pattern with systolic and diastolic inflow. This ase exemplifies the additional value of the Doppler waveform in identification of unknown structures seen during an examination. The electrocardiogram shows an atrial paced rhythm.