

# Atrial Septal Defect

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- o Atrial septal defect (ASD) is one of the more commonly recognized congenital cardiac anomalies presenting in adulthood.
- o Atrial septal defect is characterized by a defect in the interatrial septum allowing pulmonary venous return from the left atrium to pass directly to the right atrium.
- o

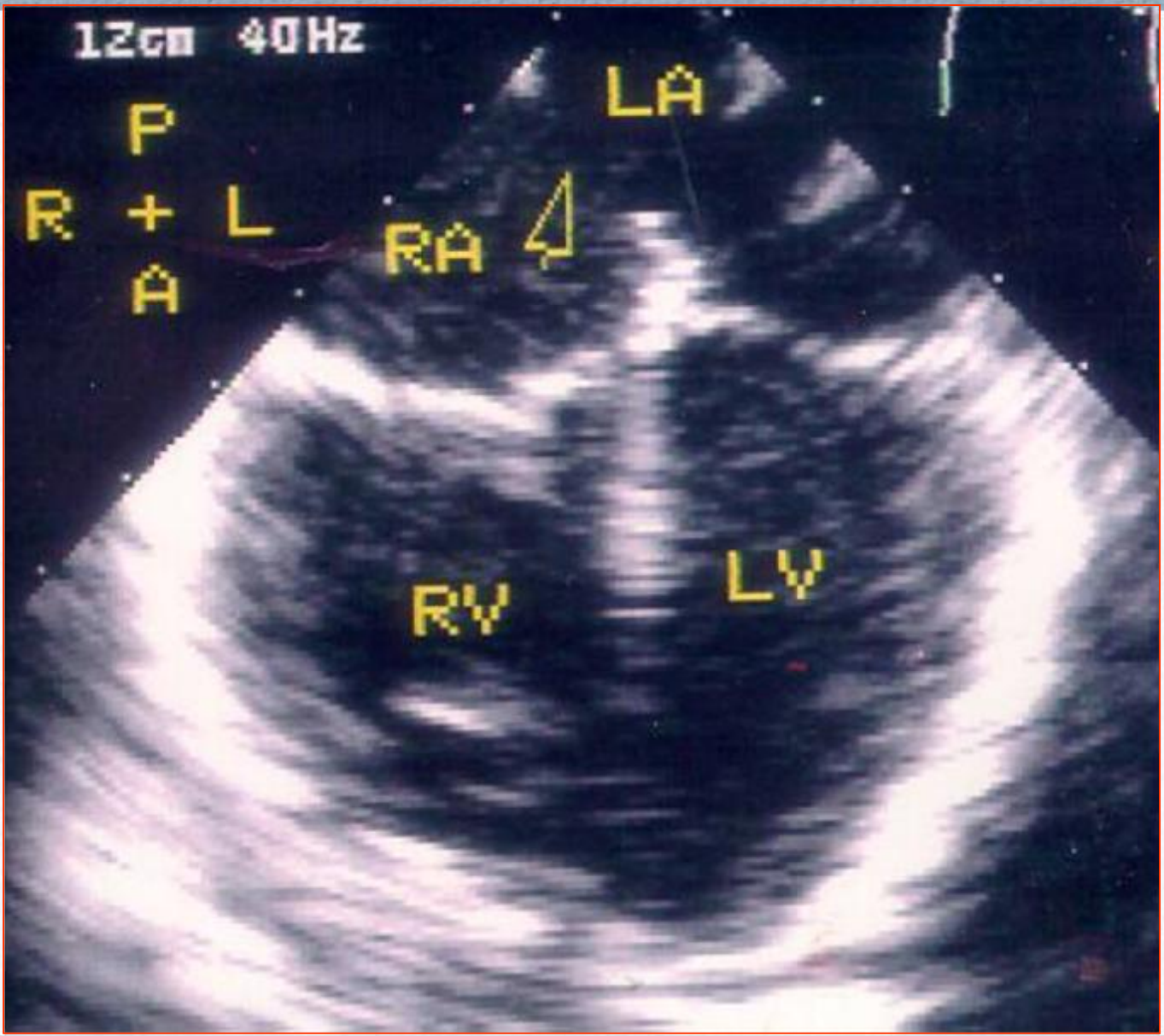
- o Depending on the size of the defect, size of the shunt, and associated anomalies, this can result in a spectrum of disease from
- o no significant cardiac sequelae to
- o right-sided volume overload,
- o arterial hypertension, and
- o atrial arrhythmias.

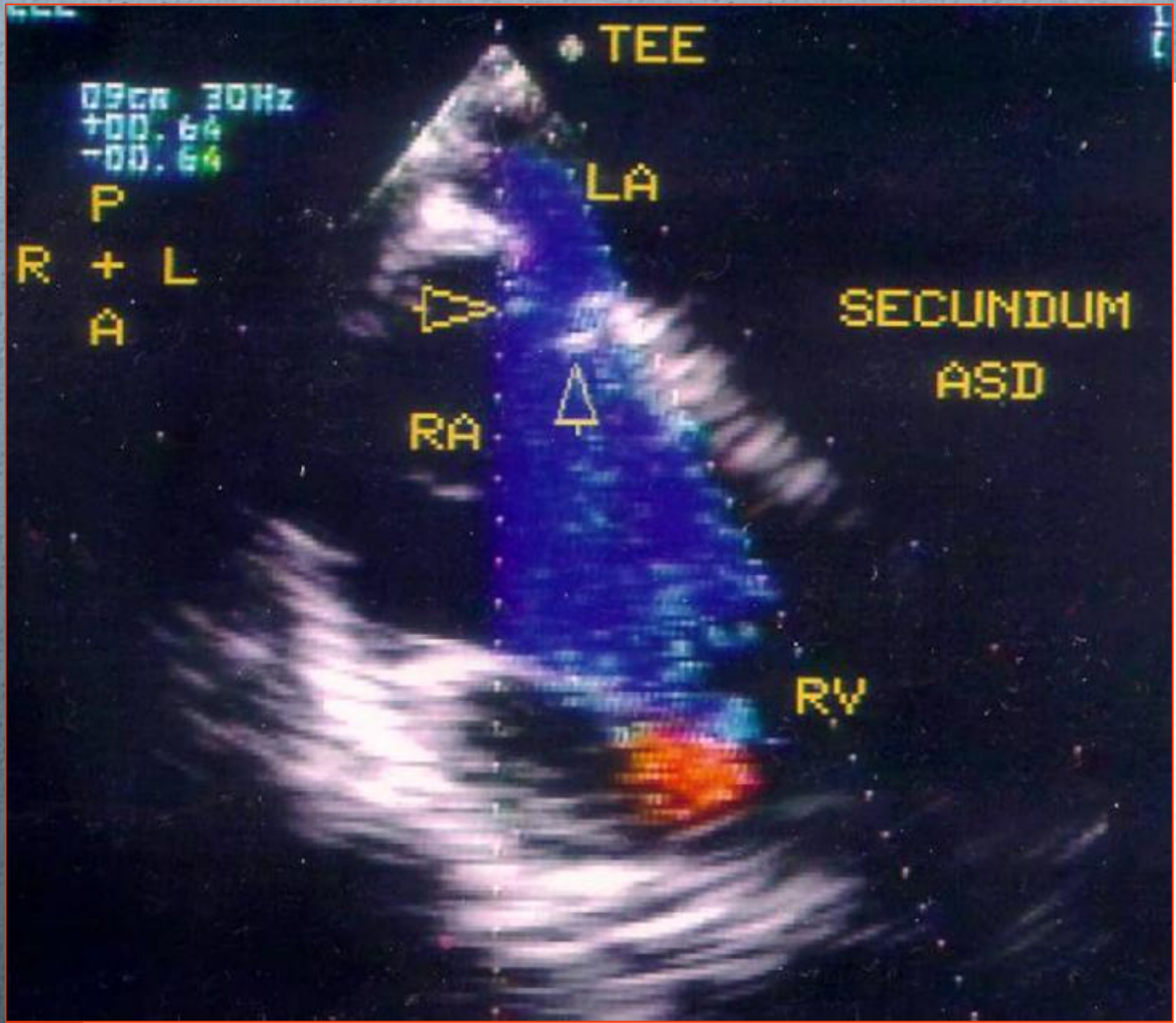
# Type of ASD

- o The 3 major types of atrial septal defect (ASD) account for 10% of all congenital heart disease and as much as
- o 20-40% of congenital heart disease presenting in adulthood.
- o The most common types of ASD include the following:

# Ostium secundum:

- o The most common type of ASD accounting for 75% of all ASD cases,
- o representing approximately 7% of all congenital cardiac defects and
- o 30-40% of all congenital heart disease in patients older than 40 years.

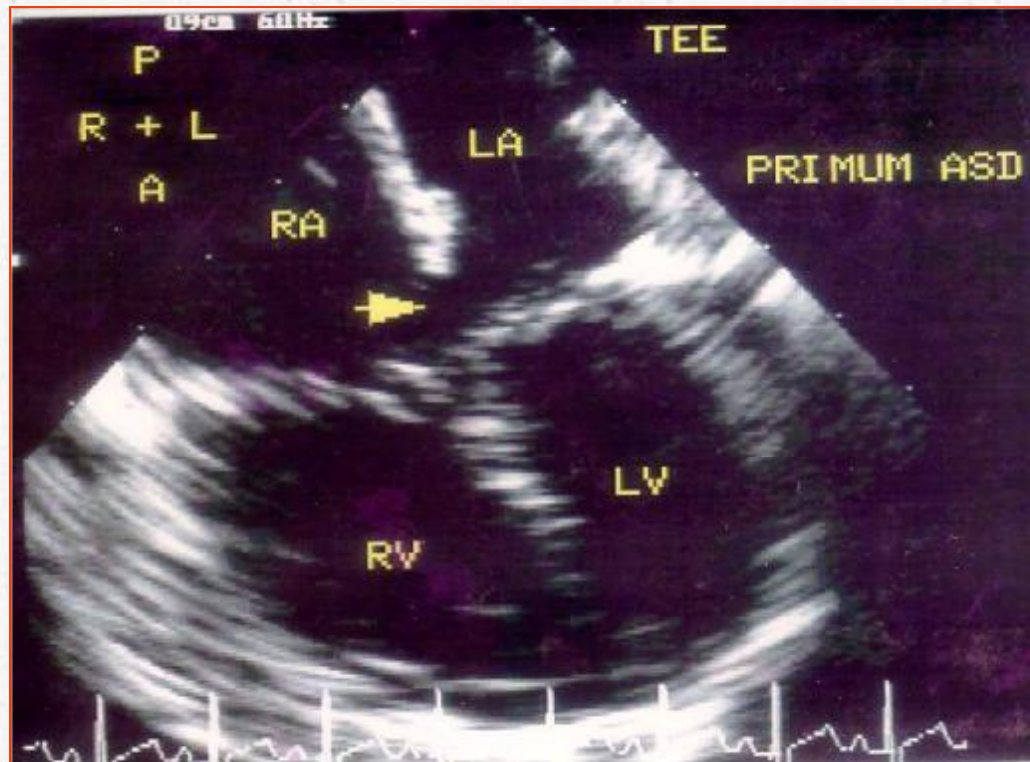


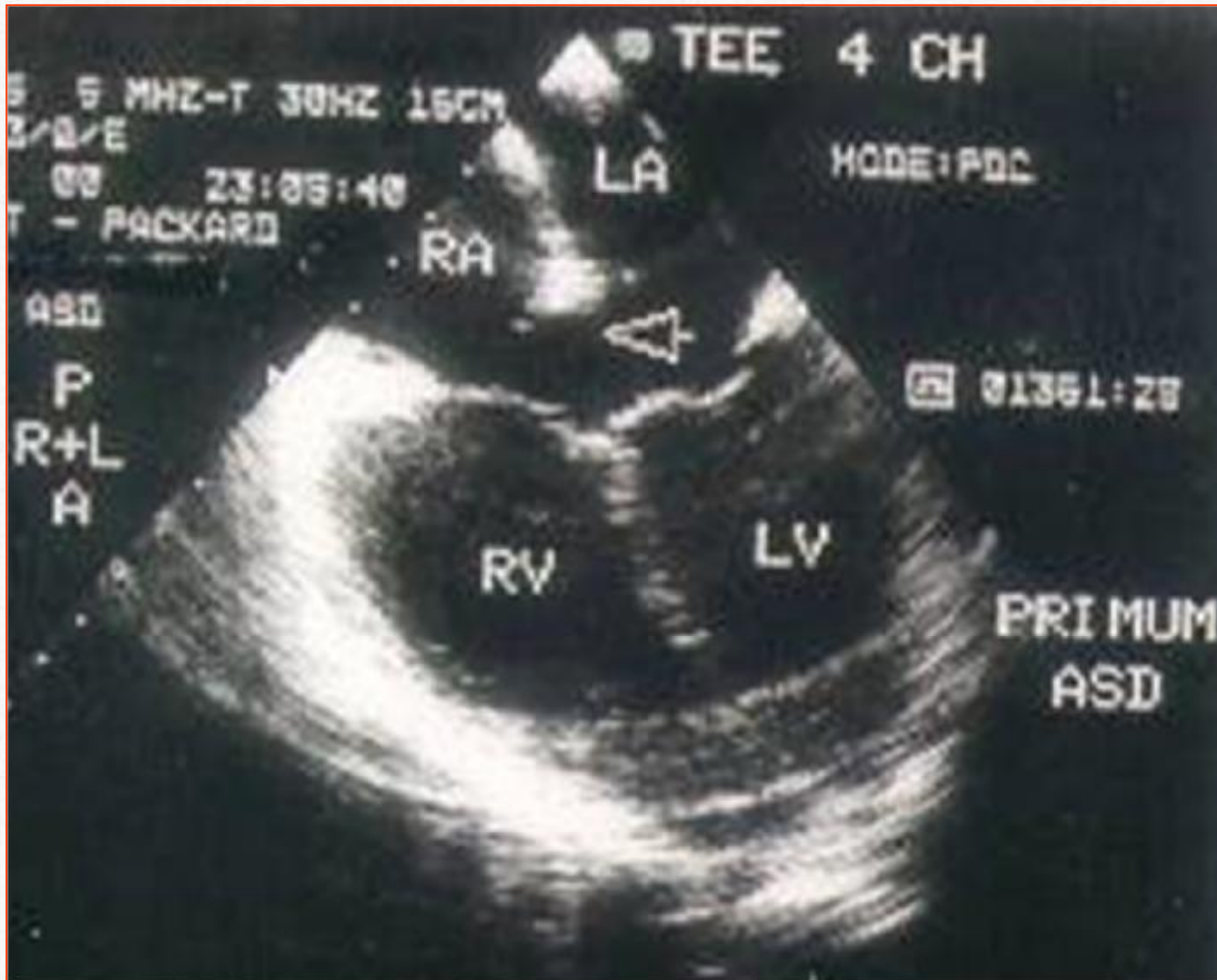


# Ostium primum

- o* : The second most common type of ASD accounts for 15-20% of all ASDs.
- o* Primum ASD is a form of atrioventricular septal defect and
- o* is commonly associated with mitral valve abnormalities.

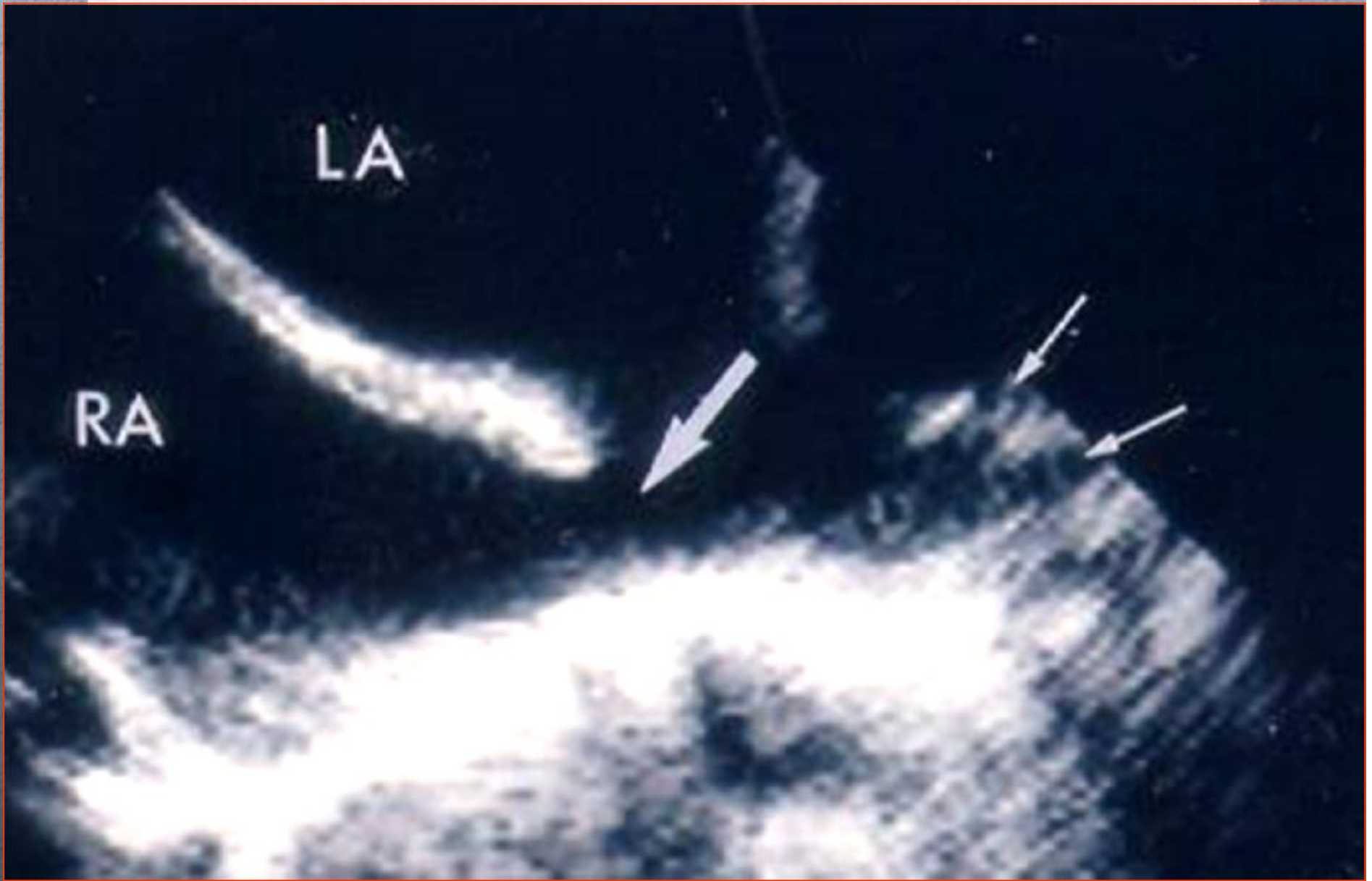






# Sinus venosus

- : The least common of the three, sinus venosus (SV) ASD is seen in 5-10% of all ASDs.
- The defect is located along the superior aspect of the atrial septum.
- Anomalous connection of the right-sided pulmonary veins is common and should be expected. Alternate imaging is generally required.



# Symptoms

- ASD occurs with a female-to-male ratio of approximately 2:1.
- Patients with ASD can be asymptomatic through infancy and childhood.

the timing of clinical presentation depends on the degree of left-to-right shunt.

Symptoms become more common with advancing age.

By age 40 years, 90% of untreated patients have symptoms

# The presenting symptoms

- o* dyspnea,
- o* easy fatigability,
- o* palpitations,
- o* sustained atrial arrhythmia,
- o* syncope, stroke,
- o* and/or heart failure.
- o* In adults, one of the most common symptoms is the development of palpitations related to atrial arrhythmias.
- o*

# Physical examination

- findings on physical examination depend on the degree of left-to-right shunt and its hemodynamic consequences, which, in turn, depends on the size of the defect, the diastolic properties of both ventricles, and the relative resistance of the pulmonary and systemic circulations.

- o The patient can have a hyperdynamic right ventricular
- o  $S_2$  is often widely split and fixed
- o This characteristic abnormality is found in almost all patients with large left-to-right shunts.
- o crescendo-decrescendo systolic ejection murmur. This murmur is heard in the second intercostal space at the upper left sternal border.

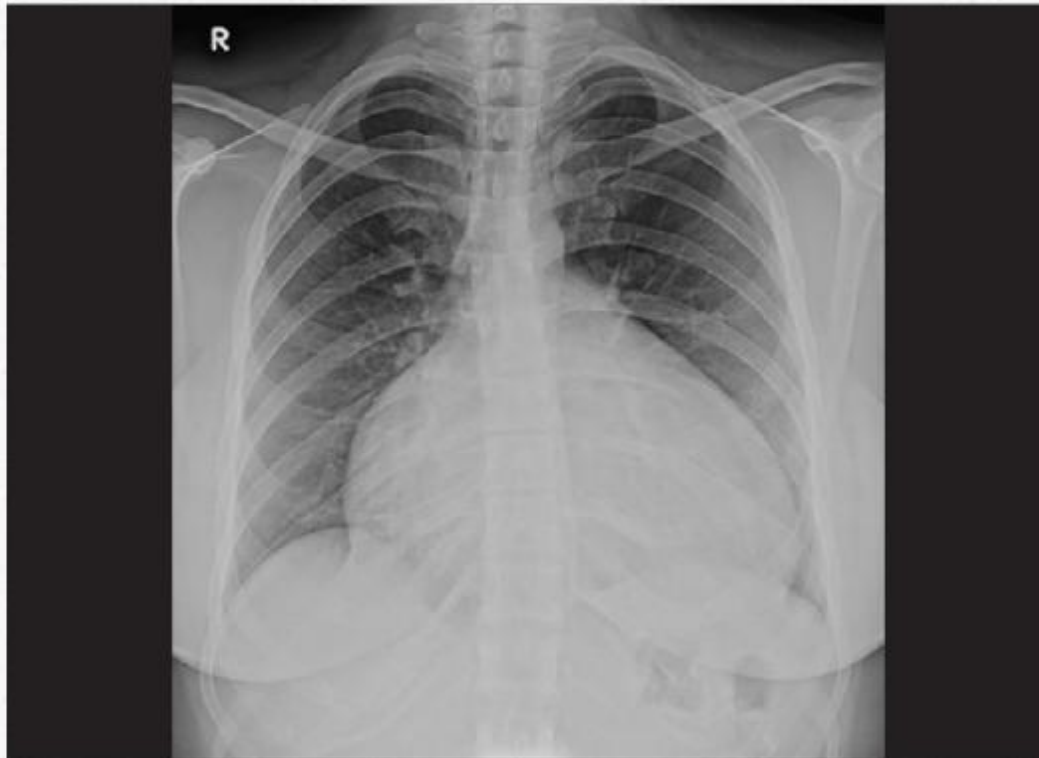


- o In patients with an ostium primum defect and an associated cleft of the mitral valve,
- o an apical pansystolic murmur of mitral regurgitation may be present.
- o ASD is an acyanotic lesion.
- o In the rare case of severe pulmonary arterial hypertension, atrial shunt reversal (Eisenmenger syndrome) may occur, leading to cyanosis and clubbing

# Chest radiography

- o* In the presence of a clinically significant left-to-right shunt, chest radiographs most often show cardiomegaly because of dilatation of the right atrium and right ventricular chamber.
- o* The pulmonary artery is prominent, and pulmonary vascular markings are increased in the lung fields.

- o Left atrial enlargement is rare only if clinically significant mitral regurgitation.
- o On occasion, proximal dilatation of the superior vena cava can be seen in sinus venosus defect





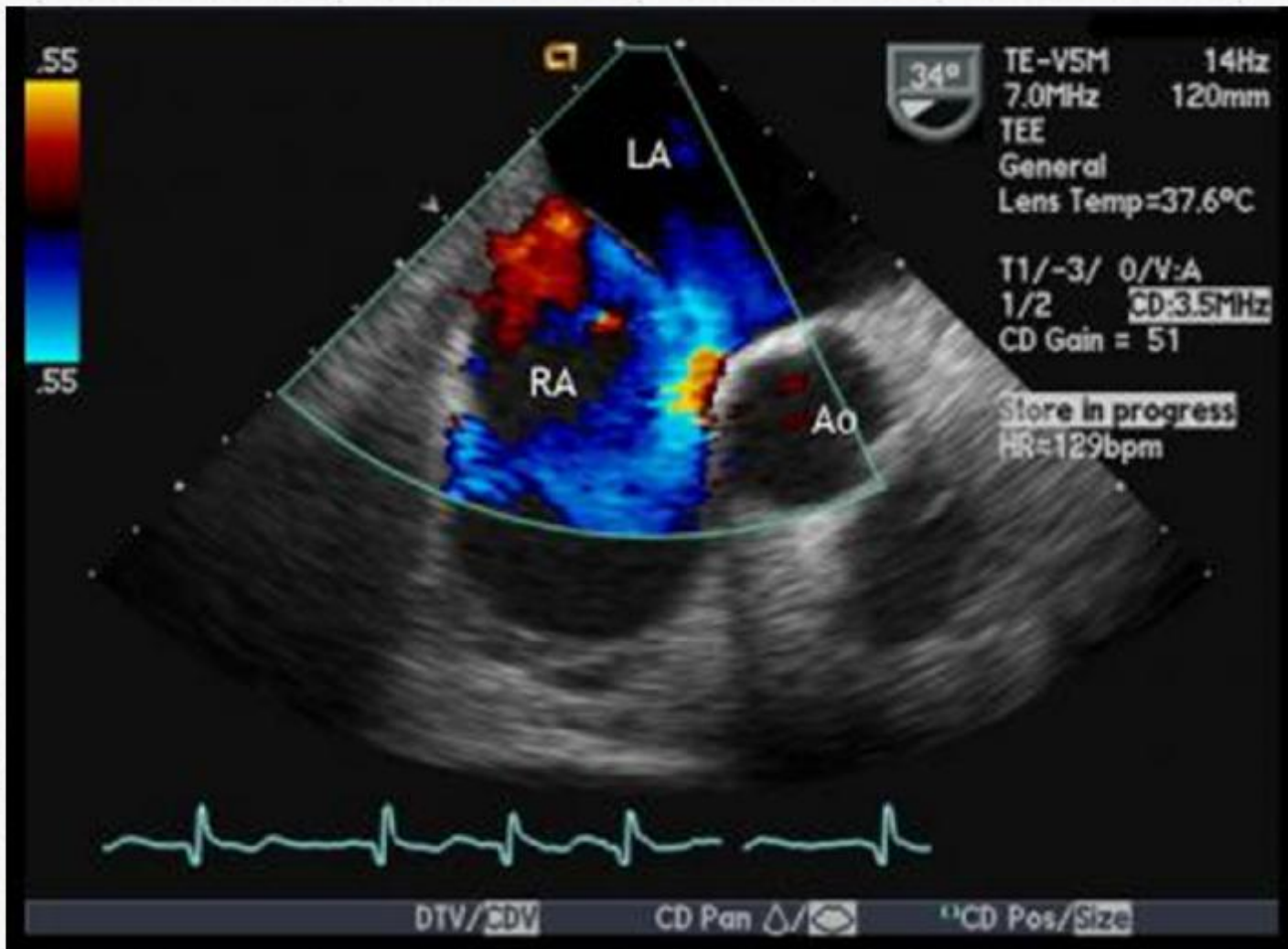


# Transthoracic echocardiography

- o It provides direct noninvasive visualization of most types of ASDs,
- o including evaluation of the right atrium,
- o right ventricle, and
- o pulmonary arteries,
- o as well as other associated abnormalities.

- o The view most beneficial is often the subcostal view.
- o One exception is the diagnosis of a sinus venosus defect, for which
- o transesophageal echocardiography (TEE) may be needed to image the defect,





# Electrocardiography Characteristic findings

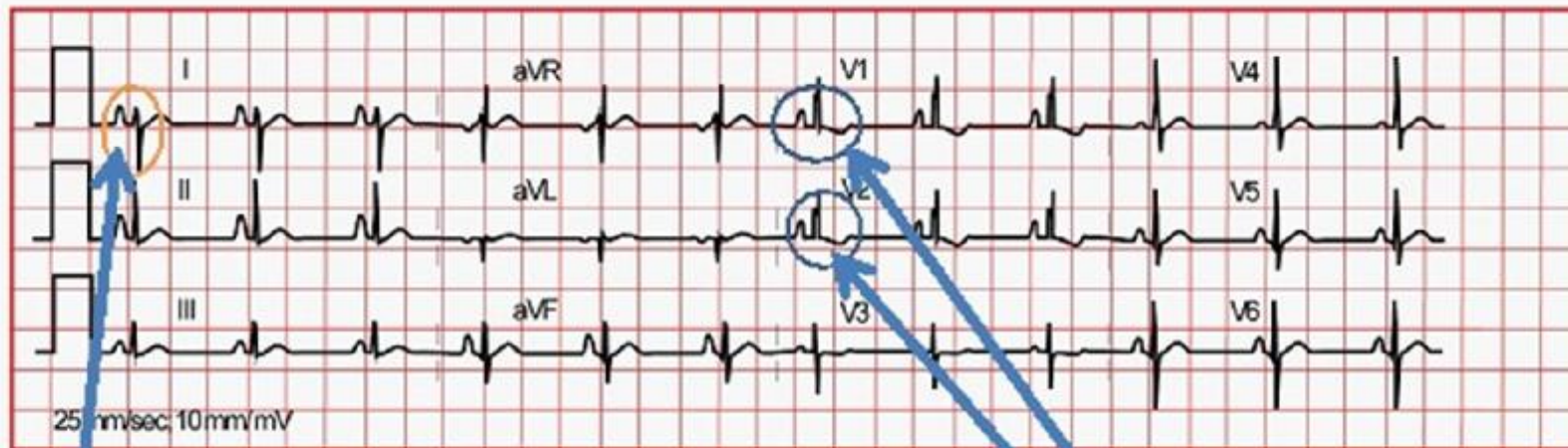
- o* in patients with secundum ASD are a
- o* normal sinus rhythm,
- o* right-axis deviation, and
- o* an rSR' pattern in  $V_1$ , and
- o* interventricular conduction delay or right bundle branch block

*o* Left-axis deviation and an rSR' pattern in  $V_1$ , an interventricular conduction delay or right bundle branch block suggests an ostium primum defect.

*o* Left-axis deviation and negative P wave in lead III suggest sinus venosus defect.

- o Increasing pulmonary hypertension can cause loss of the rSR' pattern in  $V_1$  and a tall monophasic R wave with a deeply inverted T wave.
- o A prolonged P-R interval can be seen in familial ASD or ostium primum secondary to left atrial enlargement and an increased distance for internodal conduction produced by the defect itself.

# ECG



Enlarged 'p' wave indicating Right atrial hypertrophy

Also note that the aVF is predominantly upwards as compared to Lead I indicating Right Axis Deviation

rS' seen and tall R wave Indicating RBBB and RVH

LAD with rS' in V1 is suggestive of Ostium primum defect

# Medical treatment

- o No specific
- o Converting Enzyme inhibitor
- o Treat arrhythmia
- o Treatment of heart failure

# Surgical treatment

- o Midline sternotomy
- o Cardiopulmonary bypass
- o Patch closure of most VSD's
- o Patch closure of SVASD and OPASD
- o Secundum ASD treatment
  - o Patch closure
  - o Primary closure
  - o Device closure



- Physical findings predict the diagnosis
- Echo confirmation of Dx details, cath rarely needed except for intervention
- Very effective treatment available
- Complication rate < 5%
- Survival 99%
- Quality of life & activity level normal