TEE ESSENTIALS

Assessment of the interatrial septum: Anatomy of the interatrial septum

The interatrial septum is seen well on TEE imaging due to its proximity to the transducer in the mid-esophageal position. This makes TEE a sensitive technique for examining the anatomy of the septum.

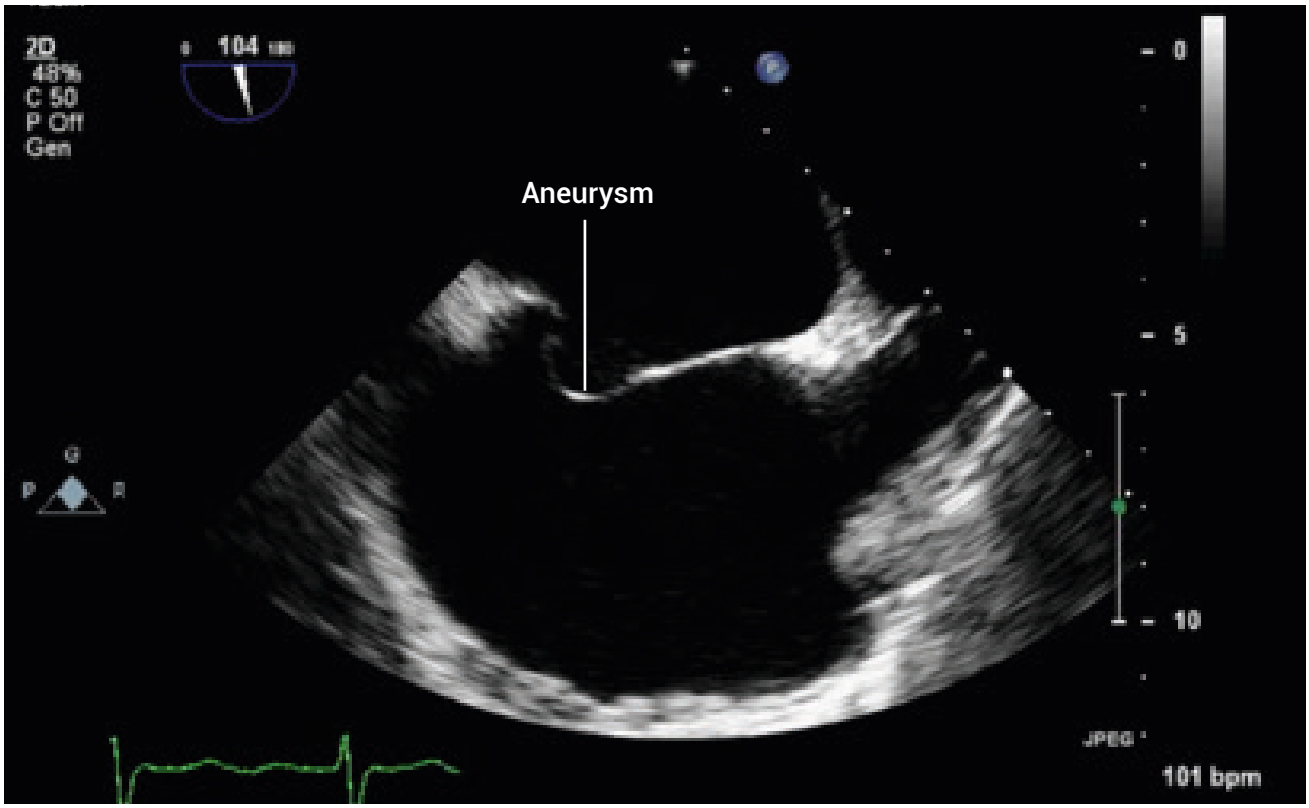
Fetal development

The interatrial septum develops in stages during fetal life. The septum primum forms first, originating posteriorly, and this septum leaves a hole that connects the two atria, known as the ostium primum. This is followed by the development of a second hole in the septum primum, known as the ostium secundum. Next, the septum secundum develops anteriorly and to the right of the septum primum. The septum secundum leaves a hole known as the foramen ovale. The septum primum ends up as a small flap covering the foramen ovale—the foramen ovale usually completely seals after birth.

Atrial septal aneurysm

An atrial septal aneurysm is commonly defined as having a diameter (measured at its base) of at least 1.5 cm, and a displacement (into the right or left atrium) of >1.0 cm.

The presence of an atrial septal aneurysm is associated with a higher likelihood of an interatrial shunt such as a patent foramen ovale (PFO) or an atrial septal defect (ASD).



Patent foramen ovale

The foramen ovale fails to seal in around 25% of individuals, and remains patent into adult life—this is known as a PFO. In most cases a PFO is harmless, but it can act as a substrate for paradoxical embolism.

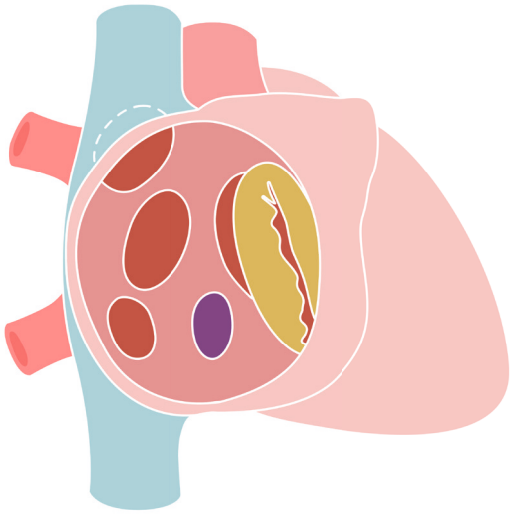
Atrial septal defect

Various types of ASD can occur and are named according to their anatomy:

- Ostium primum ASD—usually located in the inferior septum and is commonly associated with a cleft anterior mitral valve leaflet
- Ostium secundum ASD—located more centrally in the septum and is the commonest form of ASD
- Sinus venosus ASD—involves the junction of the superior or inferior vena cava
- Coronary sinus ASD—involves the coronary sinus orifice

Pulmonary veins

Any assessment of the interatrial septum should also include a careful assessment of the connections of the pulmonary veins, as associated anomalous pulmonary venous drainage may be present.



Further reading
Silvestry FE, Cohen MS, Armsby LB, et al. 2015. Guidelines for the echocardiographic assessment of atrial septal defect and patent foramen ovale: From the American Society of Echocardiography and Society for Cardiac Angiography and Interventions. *J Am Soc Echocardiogr*. **28**: 910–958.