

Atrial Septal Defect: Definition, Diagnosis, & Treatment

Introduction:

There are many types and forms of birth defects and one of the most common types of birth defects are congenital heart defects. Atrial septal defect (ASD) is a type of congenital heart defect. "Atrial and ventricular septal defects are the most common congenital heart defects. Atrial septal defect accounts for 4–10 percent of all cases of congenital heart disease in the United States. Abnormal openings in the atrial septum are twice as common in females as in males.¹" Atrial septal defect is also sometimes referred to as a "hole in the heart" because of the hole in the septal wall that divides the left and right atriums. The problem with an ASD is that it allows for oxygenated blood to flow from the left atrium to the right atrium and mix with deoxygenated blood. This mixed blood is then pumped to the lungs even though it has already been oxygenated, refer to Image 1. If the defect is large and left untreated, the extra blood volume being pumped to the lungs causes them to overfill and overwork the heart. This can eventually lead to an increase in blood pressure in the lungs causing pulmonary hypertension.²

Background:

The signs and symptoms associated with ASD in adulthood are: shortness of breath, fatigue, swelling of legs feet and abdomen, heart palpitations, frequent lung infections, stroke, and heart murmur. These signs and symptoms are not noticeable in infants but are noticeable in adulthood and usually begin showing around the age of 30. This is one of the major problems with this defect is the fact that children usually are asymptomatic. Doctors must also take into account the size of the ASD. If the ASD is 8 mm or larger it will more than likely not close on its own and require medical intervention in order to repair the ASD. It is also important to classify the ASD properly based on size and location

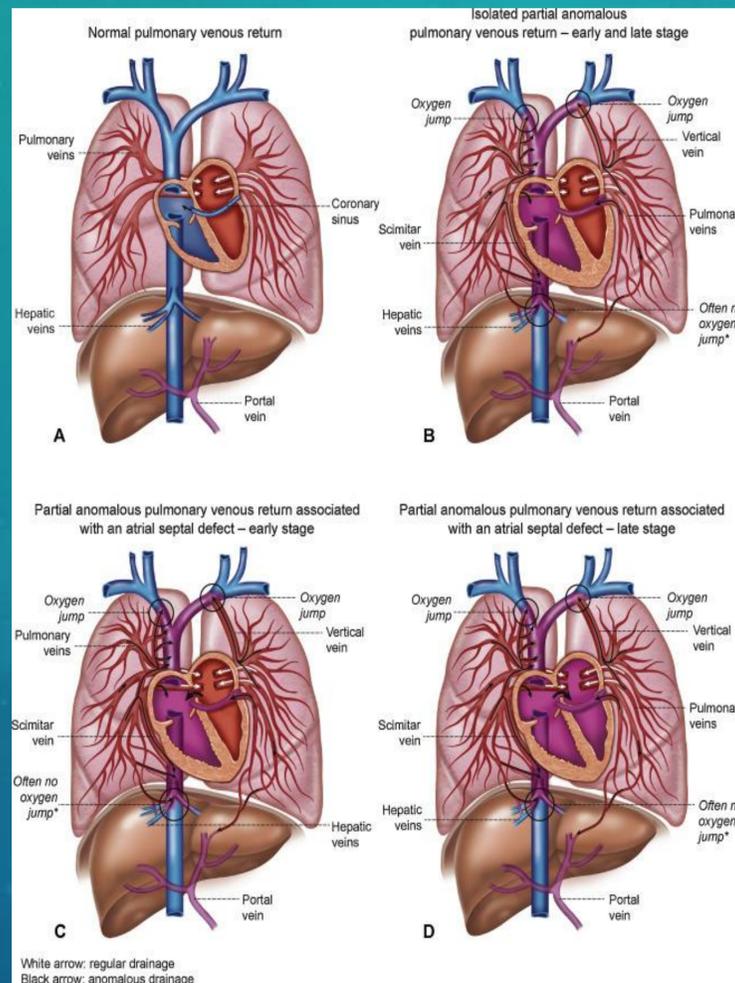


Image #1

A: Normal pulmonary venous return.

B: Isolated anomalous pulmonary venous return with merely systemic-to-pulmonary shunt.

C: Partial anomalous pulmonary venous return associated with an atrial septal defect, in the early clinical course with primarily systemic-to-pulmonary shunt.

D: Shunt reversal with pulmonary-to-systemic shunt in the late clinical course.³

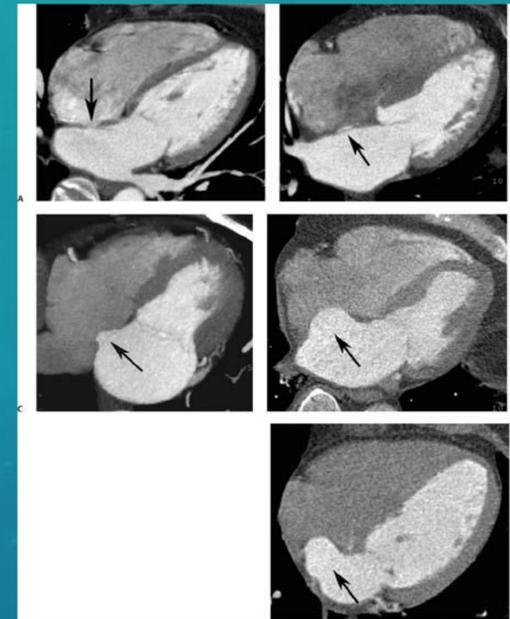


Image #2

Image 2 shows fluroscopy images of a heart that has a atrial septal defect.⁴

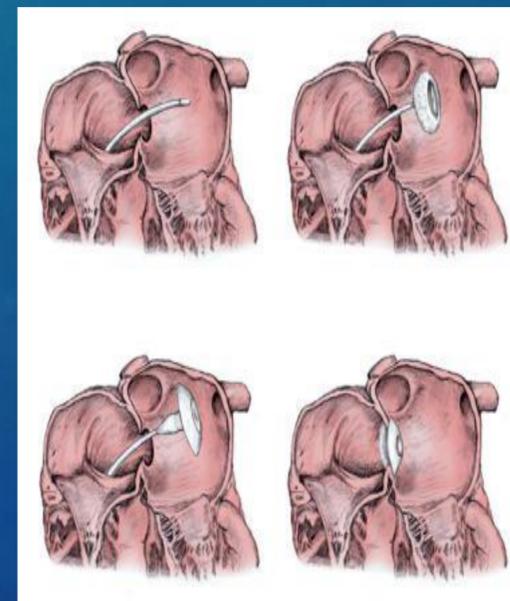


Image #3

Image 3 shows the closure device used in fixing an atrial septal defect and how it is placed in the heart.⁵

Discussion:

In order to find, diagnosis, and treat ASD many different kinds of imaging technologies are used. Everything from x-rays, computed tomography scan (CT), magnetic resonance imaging (MRI), ultrasound, and fluoroscopy are all used when imaging, diagnosing, and treating ASD. During the research it was found that the two main imaging technologies used were ultrasound and fluoroscopy. These technologies were used together to image the heart and to also see the flow of blood within the heart in order to know if there was indeed a hole in the heart or some kind of defect, refer to Image 2.

Results:

For the most part patients both children and adults undergo successful surgery in order to have their ASD and other defects fixed or closed off without any real serious side effects. Depending on the size and location of the defect different occlusion devices were used to close off the hole. Preoperative computed tomography scans and 3D echocardiography studies are used to diagnose the different characteristics of defects and to determine the proper operation strategy. Technically, different occlusion devices including amplatzer vascular plug (AVP) AVP II, AVP III devices and ASD or ventricular septal defect (VSD) closure devices have been used with various clinical and technical experiences for braun-catheter closure to date, see Image 3. Therefore, they had to adapt the devices to the size and shape of the defects

Conclusion:

Today ASD's are found and diagnosed much earlier than they used to be, most the time they were not found tell adulthood. Now ASD's are even detected in infancy so we are able to treat them and repair before the patient starts to suffer from signs and symptoms later in life.

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