Left-to-Right Heart Shunts

Shunts are one category of congenital heart disease, and they are sorted by the primary direction of blood flow through the shunt. This Picmonic describes the left-sided shunts, also known as the non-cyanotic heart defects. Congenital heart defects occur at a higher rate in premature births.



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The 3 Ds
3D-glasses
There are three left-to-right heart shunts; all of the names include the letter “D” and can be remembered as “The 3 D’s”; VSD, ASD, and PDA.

Ventricular Septal Defect (VSD)
V-ventricle Scepter-heart Defect
When the interventricular septum fails to form properly, a ventricular septal defect (VSD) is the result. If the VSD is small, it may close spontaneously, but larger VSDs require surgical intervention. On auscultation, a harsh holosystolic murmur is heard. VSDs are a strong risk factor for development of infective endocarditis.

Atrial Septal Defect (ASD)
A-atrium Scepter-heart Defect
If there is a problem with interatrial septum formation, an atrial septal defect (ASD) occurs. Most common ASD sub-type is a ostium secundum defects. On auscultation, a soft systolic murmur may be heard along with fixed splitting of S2. ASDs raise the risk for a paradoxical embolism.

PDA
Patent Duck Archer
During fetal development, blood bypasses the nonfunctioning lungs via the ductus arteriosus. This fetal shunt normally closes within days following birth, but may remain patent and result in a patent ductus arteriosus (PDA). A distinct machine-like murmur is heard on auscultation. Congenital rubella is commonly associated with PDAs.

Associations

Later Cyanosis
Late-moon with Cyan-crayon
Unlike right-to-left heart shunts in which there is insufficient oxygenated blood being circulated and the neonate is immediately cyanotic post-birth, left-to-right shunts only manifest with cyanosis after shunt reversal.

Clubbing
Club causing clubbing
Although its pathophysiology is debated, fingernail clubbing can be seen with congenital heart disease. If identified on physical exam, further investigation to identify disease associations is warranted.

Eisenmenger's Syndrome
Ice-man
After a long duration of high pressure left-sided blood being pushed into the low pressure right heart via a shunt, pulmonary hypertension develops. As right heart afterload increases, the right ventricle hypertrophies to compensate, and will continue to do so until right ventricular pressure becomes greater than left ventricular pressure, and the shunt is reversed. Deoxygenated blood will now flow right-to-left resulting in tardive cyanosis along with other complications like fingernail clubbing.

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