

D-Transposition of the Great Arteries

Definition:

In transposition of the great arteries, the locations of the aorta and the pulmonary artery are reversed. The aorta will receive low oxygen blood from the right ventricle and pump it into the body and back to the heart without receiving more oxygen. Similarly, the pulmonary artery will receive high oxygen blood from the left ventricle and pump it back to the lungs for further and unneeded oxygenation.

What causes it?

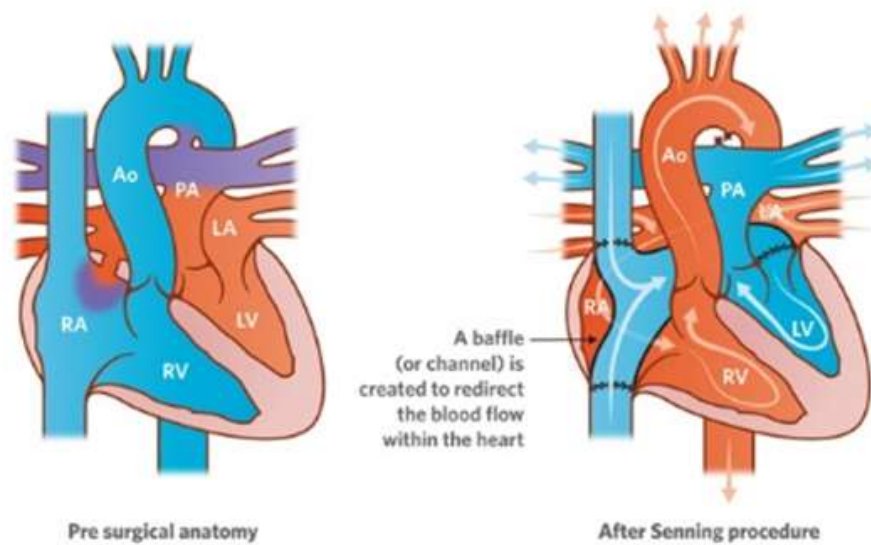
The cause of TGA is unknown.

How does it affect the heart?

TGA is a condition that is incompatible with life, as the body is not receiving oxygen due to the aorta pumping low oxygen blood to the body. The patients survive due to a connection between the right side and the left side of the heart (either between the vessels like a PDA, or between the chambers like a VSD or ASD). When the diagnosis is made in a newborn, sometimes a life saving procedure known as an atrial septostomy can be done. This is when a catheter is introduced into the upper chamber and pierces and makes a hole between the upper chambers to allow for mixing of blood. The diagnosis is suspected as the baby will be born with a blueish color (cyanosis) as the body is not adequately oxygenated.

Management Options:

Surgery for transposition of the great arteries — Senning operation



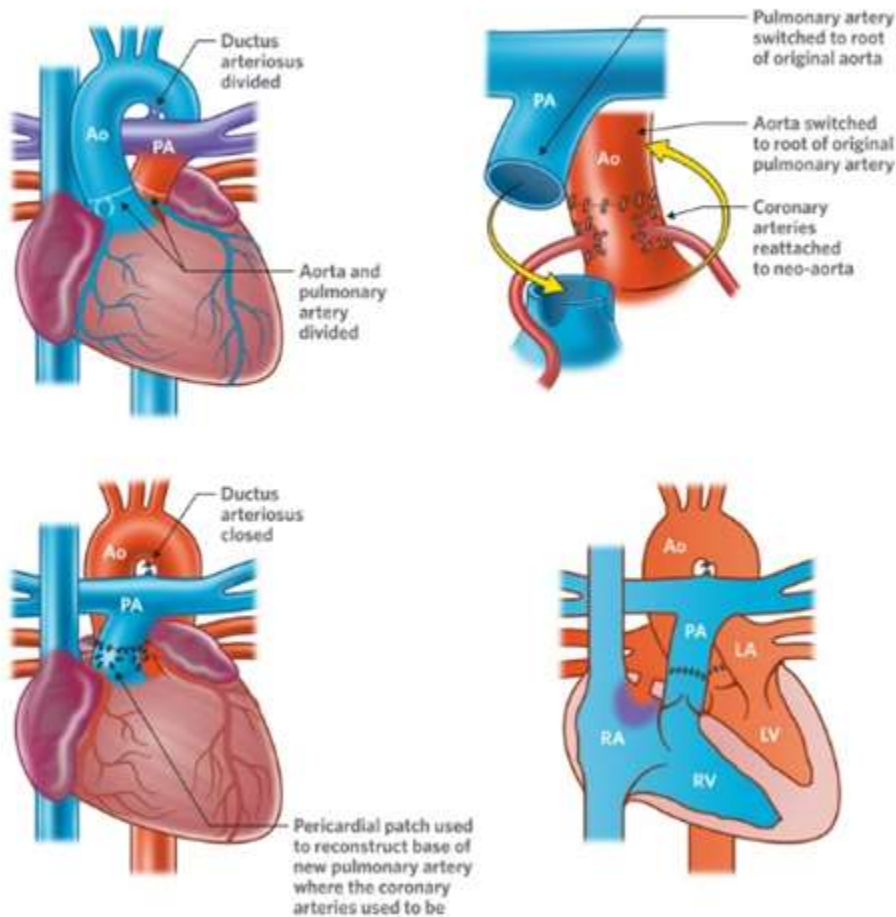
Patients with TGA will require surgery as soon as possible and very early on in their lives (within the first weeks of birth).

Two major types of surgery can correct the transposition and the decision is usually taken by the cardiologist and cardiothoracic surgeon.

The first is known as an atrial switch operation and a long time ago, was the only surgery available. The surgeon creates a tunnel between the two upper chambers (atria). This allows the oxygen rich blood to the right ventricle to be pumped out to the body by the aorta and the oxygen poor blood to the left ventricle to be pumped back into the lungs by the pulmonary artery.

The second surgery is known as arterial switch operation. The surgeon switches the aorta and the pulmonary artery and puts them back in their normal anatomical position. The aorta is now connected to the left ventricle and the pulmonary artery to the right ventricle like a normal heart.

Surgery for transposition of the great arteries — Arterial switch



Problems associated with the surgeries:

With atrial switch, the child will eventually have heart problems, as the right ventricle is simply not built to pump blood to the rest of the body. The muscle will tire and the child will enter heart failure (when the heart cannot compensate for the increased effort and causes increased breathing, increased heart rate, and weakness in the heart) Medication will be needed to relieve the heart of the effort.

With arterial switch, the child should have a normal life as the heart is effectively back to normal. However, the problems that may arise happen post operatively, as it is a more complex operation (the surgeon has to remove the coronary arteries nourishing the heart with oxygen from the aorta and reattach them and sometimes problems can occur during reattachment depriving the heart of an adequate oxygen supply).

Sometimes, there may be heart rate problems, where the heart can beat too fast or too slow, especially with the atrial switch operation. If the heart beats too slow, a pacemaker can be inserted (either via surgery or catheter) and speed up the heart rate. If it's too fast, medication can be used to slow it down.

Sometimes, a second surgery might be needed to correct narrowing problems in the aorta or the pulmonary artery especially with the arterial switch operation.

What activities can your child do?

There will need to be some limitation of physical activity and most doctors will recommend against engagement in competitive sports, but the pediatric cardiologist will inform you of how much restriction will be needed, if any at all.

Follow up in the future:

Due to the complex nature of the surgery, a lifelong follow up will be needed with a cardiologist, especially in the case of atrial switch operation. Medication may need to be prescribed to help relieve the heart of overload and your cardiologist will need to follow up with ECGs and echocardiograms.

Children may need to receive antibiotics before any surgical or dental procedures to prevent infective endocarditis.