SNS COLLEGE OF ALLIED HEALTH SCIENCES

SNS Kalvi Nagar, Coimbatore - 35

Affiliated to Dr MGR Medical University, Chennai

DEPARTMENT OF CARDIAC TECHNOLOGY

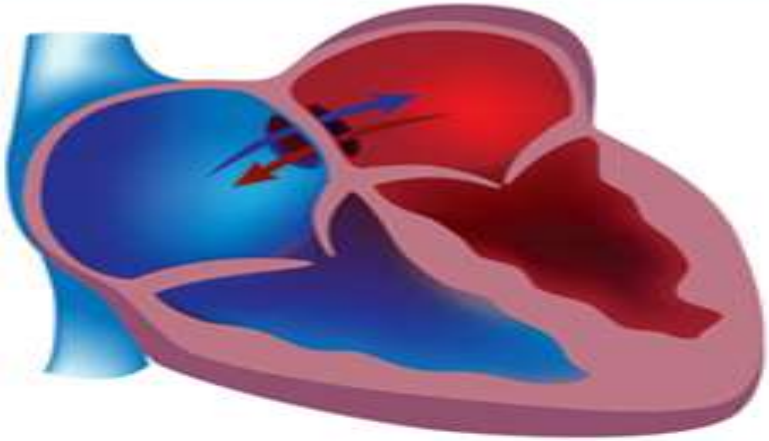
COURSE NAME:CONGENITAL HEART DISEASE

FIRST YEAR

UNIT III SYSTEMIC PATHOLOGY

TOPIC : CONGENITAL HEART DISEASE

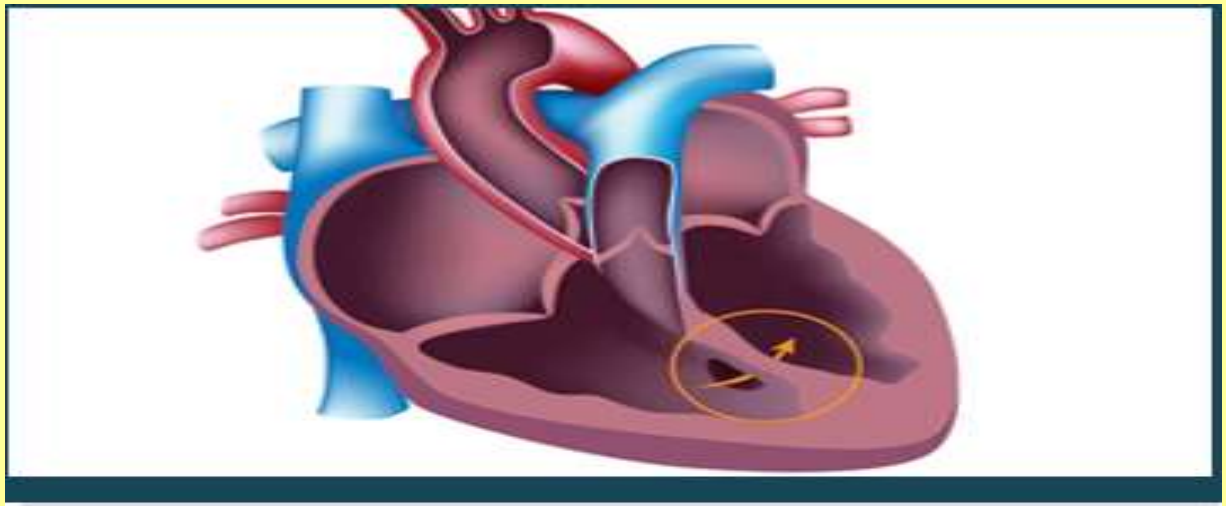
INTRODUCTION



Hole between the top heart chambers

This type of congenital heart disease is called Atrial Septal Defect (ASD). It allows oxygen-rich blood to leak into the oxygen-poor blood chambers in the heart.

INTRODUCTION



Hole between the lower heart chambers

This type of congenital heart disease is called Ventricular Septal Defect (VSD). It causes higher pressure in the heart or reduced oxygen to the body.

Definition

- Congenital heart disease, or a congenital heart defect, is a heart abnormality present at birth. The problem can affect

- the heart walls
- the heart valves
- the blood vessels

Common symptoms

- bluish lips, skin, fingers, and toes
- breathlessness or trouble breathing
- feeding difficulties
- low birth weight
- chest pain
- delayed growth

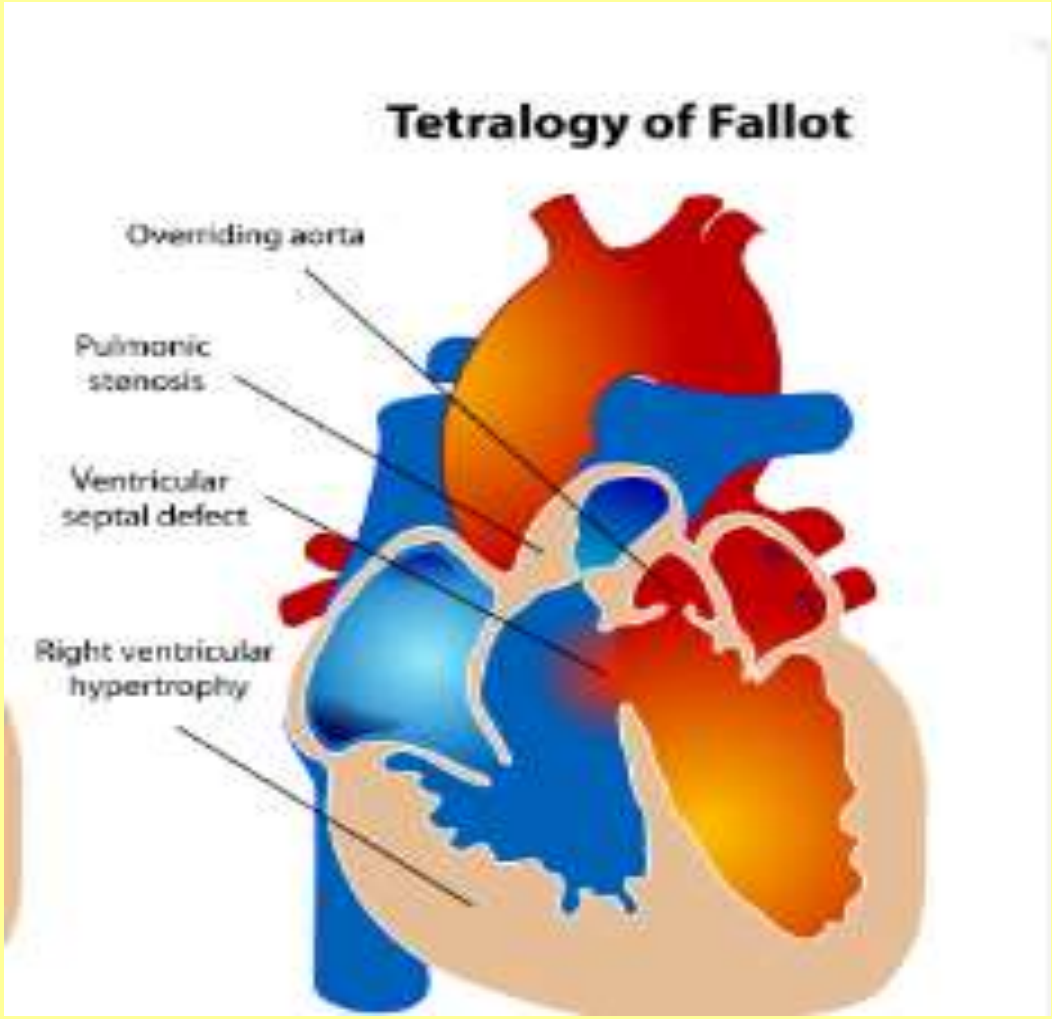
Types

Cyanotic congenital heart disease

Tetralogy of Fallot (TOF)a hole between the right and left ventricles of the heart

- a narrow pulmonary valve
- a thickening of the right ventricle muscles
- a misplaced aortic valve
- The defects lead to blood with and without oxygen getting mixed together and pumped throughout the body.

TOF


Tetralogy of Fallot
Overriding aorta
Pulmonic stenosis
Ventricular septal defect
Right ventricular hypertrophy

symptoms

- low birth weight
- cyanosis
- poor feeding
- clubbed, or rounded, large fingers
- delayed growth
- rapid breathing

TGA

- **Transposition of the great arteries** (TGA)

In infants with TGA, the pulmonary and aortic valves have switched positions with their arteries. This results in low-oxygen blood getting pumped out to the rest of the body through the aorta. This blood should actually go to the lungs through the pulmonary artery.

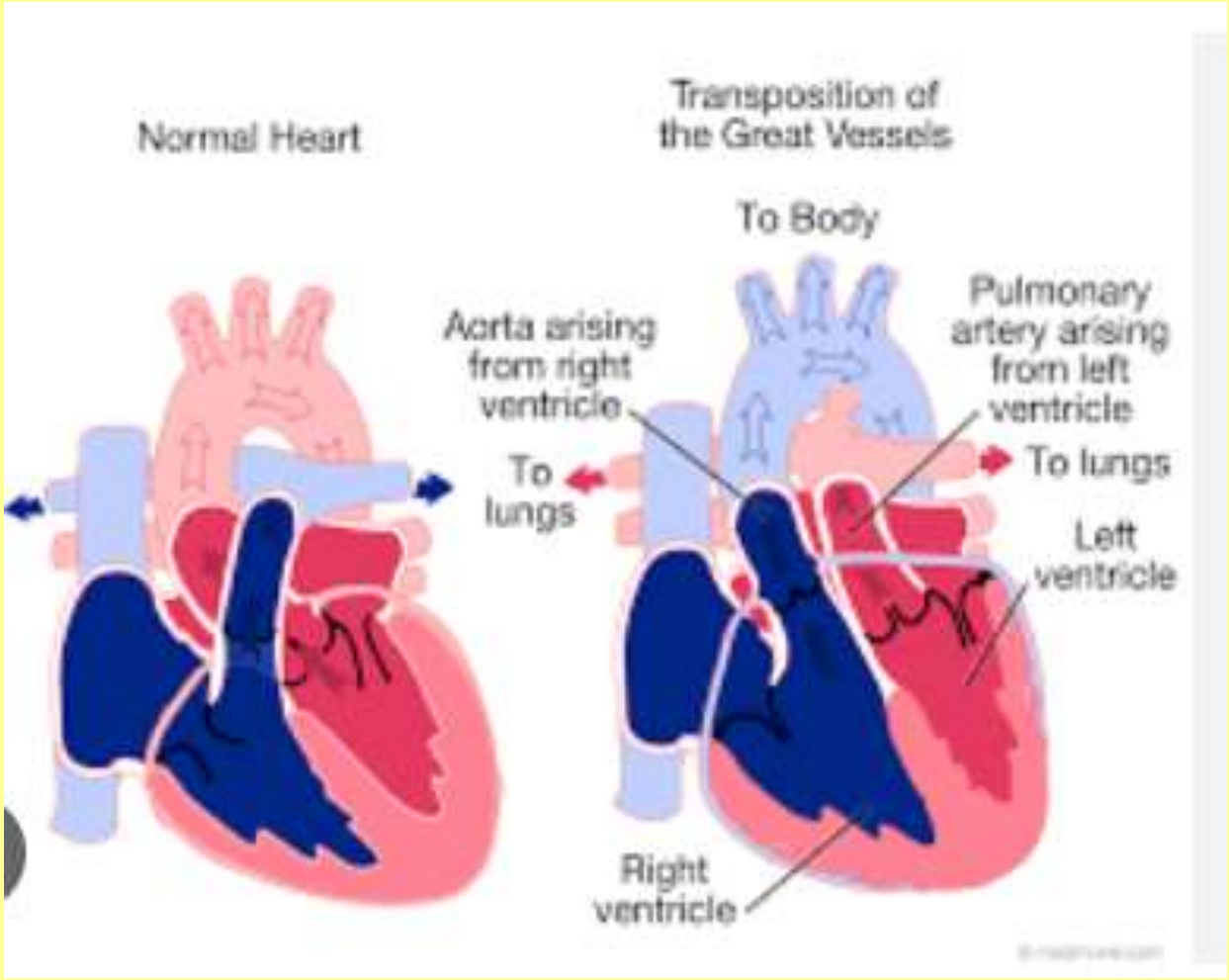
Symptoms

rapid heartbeat

rapid breathing

slow weight gain

heavy sweating


Normal Heart
Transposition of the Great Vessels
To Body
Aorta arising from right ventricle
To lungs
Pulmonary artery arising from left ventricle
To lungs
Left ventricle
Right ventricle

Procedure

The immediate management of an infant with transposition focuses on getting safe oxygen levels. Stable cardiac and pulmonary function is important.

A continuous infusion of prostaglandin, a medication that will keep the ductus arteriosus open, is usually started when the diagnosis is suspected or confirmed. This will allow some mixing of oxygen-rich blood with oxygen-poor blood.

A procedure called a **"balloon atrial septostomy"** is often done once the diagnosis is confirmed. Before birth, all babies have a connection between the right atrium and the left atrium (called a foramen ovale). After birth, this normal connection may allow some mixing of blood. It may not provide enough mixing. The foramen ovale may be made bigger or stretched with a balloon, which will improve mixing. This balloon atrial septostomy procedure is done by passing a special balloon-tipped catheter into the heart from either a vessel in the umbilicus or a vessel in the groin. Often, the procedure is done at the bedside, with guidance from an echocardiogram. Occasionally, the procedure will be done in the catheterization laboratory.

Surgical management

A large atrial septal defect is created and allows excellent mixing of oxygen-rich and oxygen-poor blood. The body's oxygen saturation will stay in a safe range. After this procedure, the ductus arteriosus is no longer necessary. The prostaglandin infusion can be discontinued.

Babies can be stabilized for the short term. Surgical correction of the defect is always needed. In most cases, corrective surgery is done in the first week of life. In more complex cases, such as those with narrowing below the pulmonary valve (pulmonary stenosis), the time for surgery can vary.

In most cases of transposition, an arterial switch surgery is done. The arterial switch surgery involves cutting off the aorta and pulmonary arteries just above the point where they leave the heart. Part of this surgery is reconnecting them to the proper ventricle. The valve stays attached to the ventricle, so what was once the pulmonary valve is now the aortic valve. The aortic valve becomes the pulmonary valve.

TA

- **Tricuspid atresia**

the tricuspid heart valve has developed abnormally or is missing entirely. This causes disruption to the normal flow of blood. Low-oxygen blood is pumped out to the body as a result.

Symptoms

cyanosis

tiredness

shortness of breath

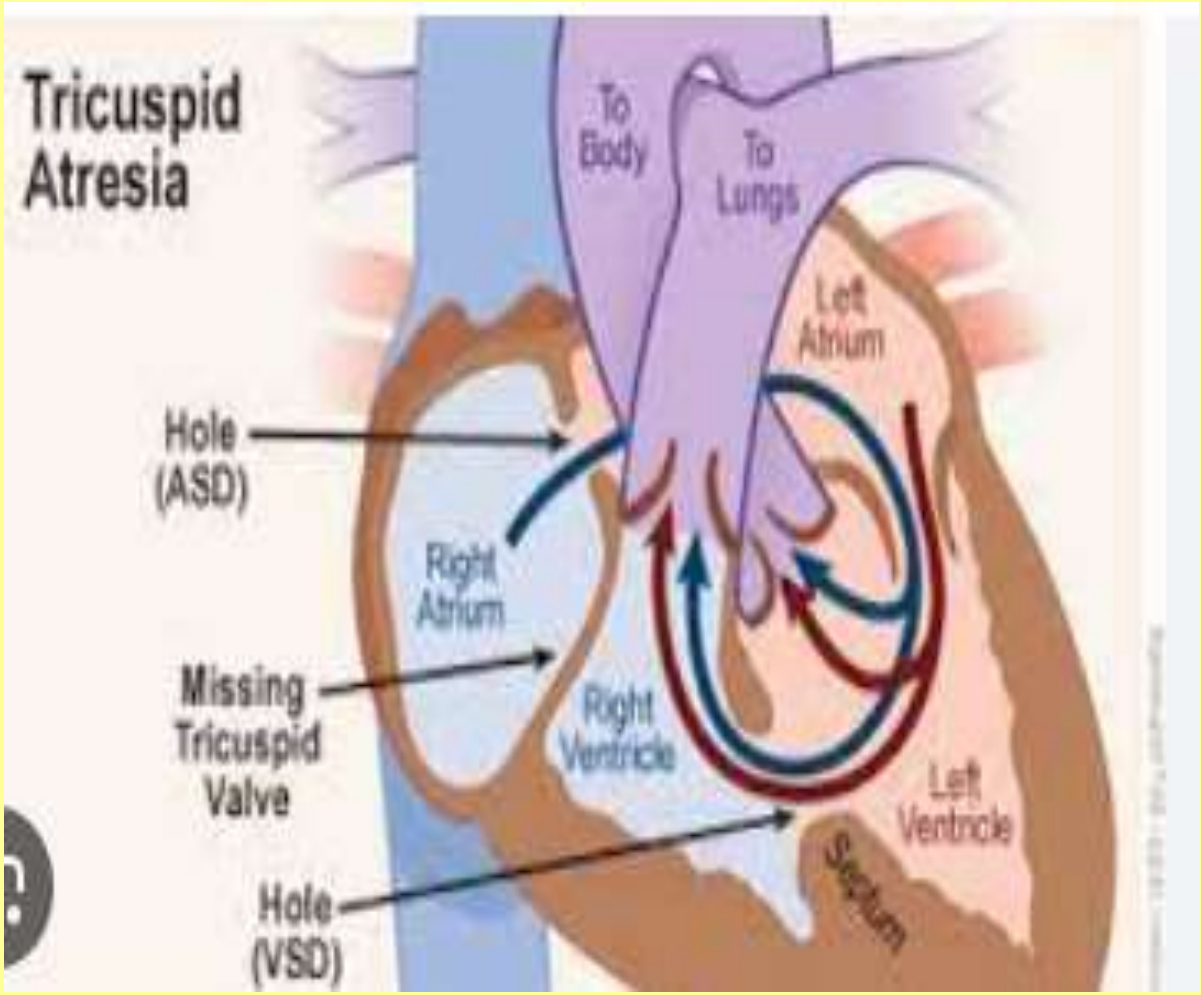
difficulty feeding

heavy sweating

slow growth

chronic respiratory infections

TA


Tricuspid Atresia
To Body
To Lungs
Left Atrium
Hole (ASD)
Right Atrium
Missing Tricuspid Valve
Right Ventricle
Left Ventricle
Hole (VSD)
Septum

Surgical management

Shunting. This procedure creates a new pathway (shunt) for blood to flow. In tricuspid atresia, the shunt redirects blood from a main blood vessel leading out of the heart to the lungs. Shunting increases the amount of blood flow to the lungs. It helps improves oxygen levels.

Surgeons generally place a shunt during the first two weeks of life. However, babies usually outgrow the shunt. They may need another surgery to replace it.

Glenn procedure. In the Glenn procedure, the surgeon removes the first shunt. Then one of the large veins that typically returns blood to the heart is connected directly to the lung artery instead. The Glenn procedure reduces the strain on the heart's lower left chamber, decreasing the risk of damage to it. The procedure can be done when the pressures in the baby's lung have lowered, which happens as the baby gets older.

The Glenn procedure sets the stage for a more permanent corrective surgery called the Fontan procedure.

Surgical management

Fontan procedure. This type of heart surgery is typically done when a child is 2 to 5 years old. It creates a pathway so that most, if not all, of the blood that would have gone to the right heart can instead flow directly into the pulmonary artery.

The short- and intermediate-term outlook for babies who have a Fontan procedure is generally promising. But regular checkups are necessary to monitor for complications, including heart failure.

Pulmonary artery band placement. This procedure may be done if a baby with tricuspid atresia has a ventricular septal defect. The surgeon places a band around the main lung artery to reduce the amount of blood moving from the heart into the lungs.

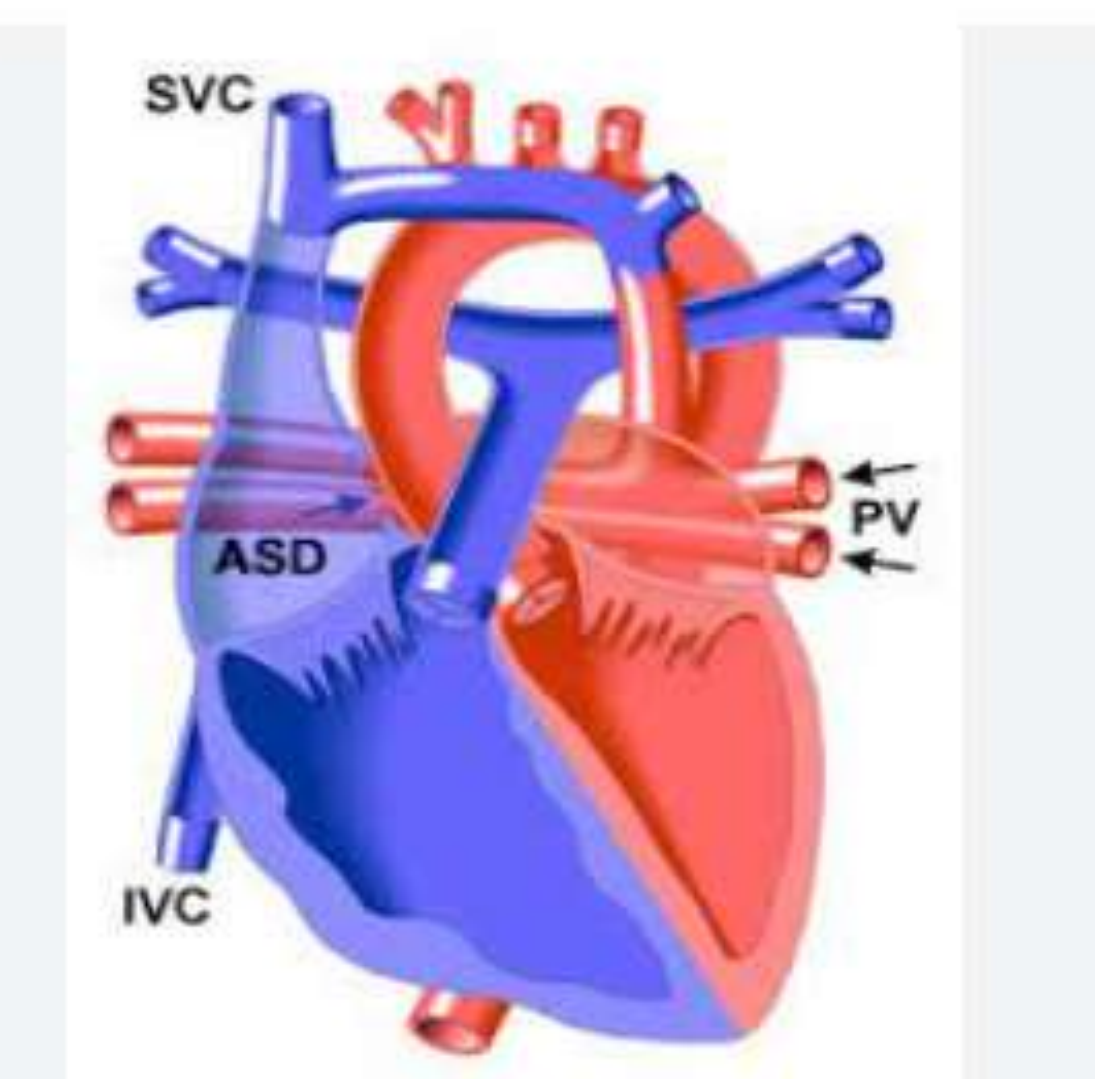
Atrial septostomy. Rarely, a balloon is used to create or enlarge the opening between the heart's upper chambers. This allows more blood to flow from the right upper chamber to the left upper chamber.

TAPVC

- **Total anomalous pulmonary venous connection** (TAPVC)

TAPVC occurs when veins that bring high-oxygen blood from the lungs to the heart are connected to the right atrium. The veins should be connected to the left atrium. This defect may also be accompanied by a blockage in these veins between the lungs and the heart.

TAPVC



Symptoms

- shortness of breath
- chronic respiratory infections
- slow growth
- cyanosis
- rapid heartbeat
- rapid breathing
- breathing difficulty, becoming very severe with time

Treatment

- Total anomalous pulmonary venous return is a defect that needs surgery to fix. The timing of the surgical repair varies depending on the type of TAPVR present. The condition of the child is considered as well
- Surgery is done right away for newborns with obstructed TAPVR. Some of these children will need extracorporeal life support (ECMO) prior to surgery because of their blood flow instability.
- Children with TAPVR without obstruction have surgery days to weeks after the diagnosis is made.

Treatment

- Rarely, TAPVR is complicated by a restrictive atrial septal defect. This means the hole in the atrial septum is not big enough to let enough blood through to the left side. In these children, a balloon dilation procedure may be done at cardiac catheterization. This will improve the child's condition before surgery.
- The surgical repair connects all of the veins to the back of the left atrium. This leads to a normal connection of pulmonary veins to left atrium. All other routes for pulmonary venous drainage are tied off.
- Finally, the atrial septal defect (ASD) is also closed.