



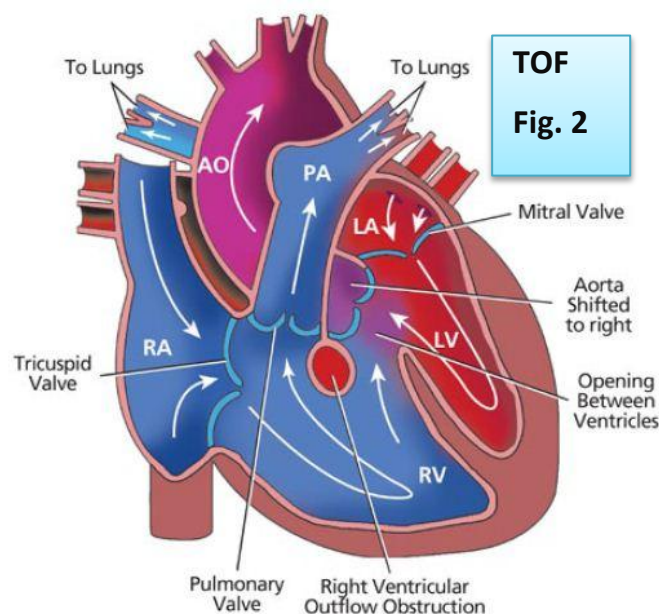
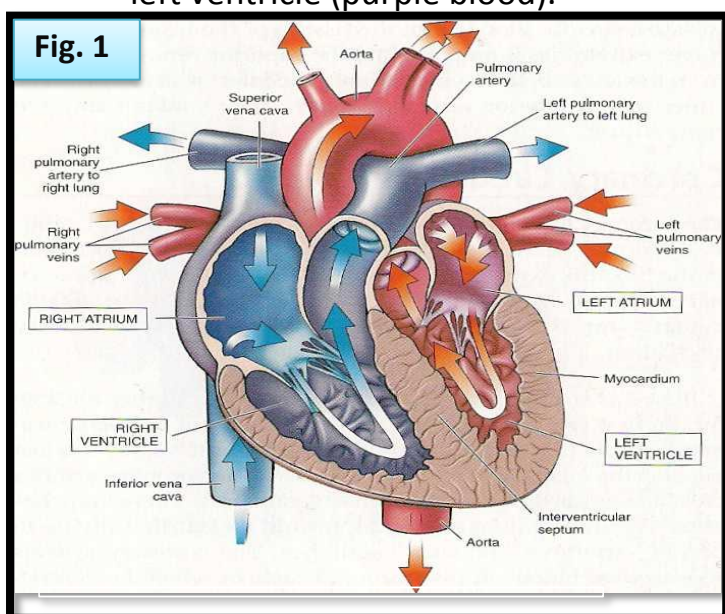
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**Cardiovascular Disease**



### (Tetralogy Of Fallot TOF ):

Tetralogy of Fallot is a combination of four heart irregularities that are present from birth. The Greek word 'Tetra' means four and Fallot was the name of the French physician who first described the condition. TOF is the most common cyanotic defect and accounts for 10–15% of all cases of congenital heart disease. Some infants may be severely cyanosed at birth, but more commonly, affected children suffer increasing cyanosis in the first year of life as pulmonary valve stenosis worsens. Anoxic episodes will occur when the child's oxygen requirements increase, e.g. when crying or feeding. The blue, deoxygenated blood returns to the right side of your heart from your body in the normal way. The blood flow is then disrupted by the following:

1. There is a narrowing in the outflow tract of the right ventricle that takes blood from the heart to the lungs. This is called pulmonary stenosis. This narrowing can range from mild to severe and may involve the pulmonary artery and its branches and could also restrict the pulmonary valve.
2. The muscle of the right ventricle becomes thicker than normal. This due to your right ventricle working harder (because of the pulmonary stenosis) to push deoxygenated blood through the narrow pulmonary valve and up to your lungs (see Fig. 2).
3. There is a hole between the left and right ventricles (LV & RV) of your heart. This is called a ventricular septal defect (VSD). Some of the deoxygenated blood will pass across the VSD and mix with the pink oxygenated blood in the left ventricle (purple blood).



4. The aorta that takes red oxygenated blood around your body straddles the VSD (hole). This causes a mixture of oxygenated and deoxygenated blood to enter the aorta and flow around the body. This is known as an overriding aorta.

**Symptoms:**

1. Decrease in exercise tolerance
2. Increase in breathlessness, hypoxemia, and finger clipping
3. Dizziness, Fainting, tachycardia, Dyspnea.
4. increase of cyanosis with exertion
5. seizures
6. auscultation systolic murmur caused by PS intensity inversely correlated with severity of PS, and VSD no murmur sound.
7. weak femoral pulses.
8. Chest pain.

**Diagnosis:**

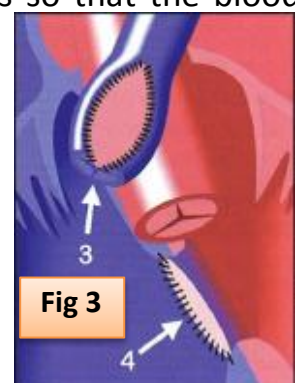
- 1- echocardiogram (ECHO) and electrocardiogram (ECG)
- 2- Right and left heart catheterization
- 3- Cardiac Magnetic Resonance Imaging Scan
- 4- 24hr ECG test
- 5- Cardio-pulmonary exercise test
- 6- Specialized electrophysiology studies to examine the electrical pathways of the heart

**Surgical treatment:**

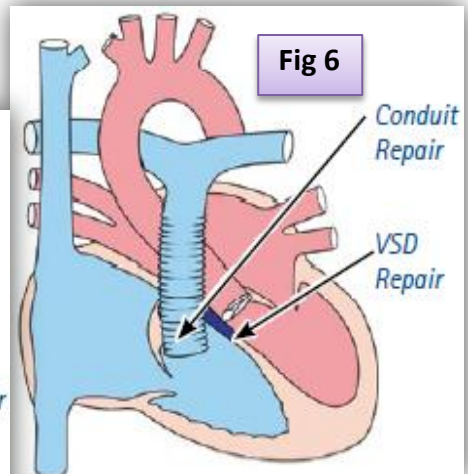
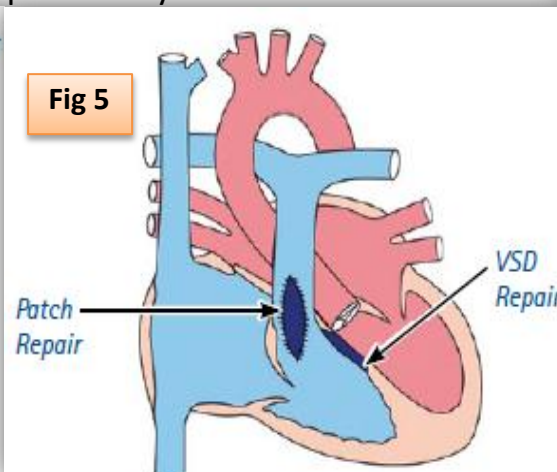
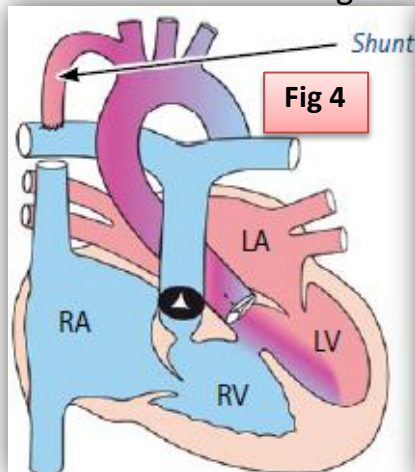
- 1- **shunt operation** to increase the flow of blood to your lungs. A shunt is a palliative operation which means that it helped to relieve symptoms of chest pain and dyspnea, rather than correcting the irregularity.(fig 4)

**corrective procedure.** The corrective operation to repair Tetralogy of Fallot has two main parts:

- 2- Close the VSD (hole) between the left and right ventricles so that the blood from the left ventricle is directed to the aorta.
- 3- Widen the narrowing of the pulmonary valve between the right ventricle and the pulmonary artery so that blood can flow more freely to the lungs. This was probably repaired in one of the following ways.



- A. Widening the narrow area by removing some thickened muscle that may have developed below the pulmonary valve
- B. Widening the narrow area (i.e. the outflow tract or the pulmonary valve) with a Transannular patch (see diagram below) (fig 3)
- C. Inserting a conduit, which is a new tube that contains a pulmonary valve to replace the narrowed vessel (see diagram below)
- D. Replacing the pulmonary valve. (similar to aortic valve Replacement in previous )
- E. Stretching the pulmonary valve.



### long term follow-up after surgical treatment:

It is important that are followed up for life by a Cardiologist who specializes in Congenital Heart Disease as the patients may develop issues that could need medical intervention. These include:

#### 1- Pulmonary valve incompetence:

- A. If patient had a widening procedure to pulmonary valve may not work as efficiently as you get older, allowing deoxygenated blood to flow back through the valve. This is sometimes referred to as a 'leaky valve'.
- B. If patient had a conduit inserted it can become narrowed or hardened with calcium over time, reducing the flow of blood to the lungs.

#### 2- Further narrowing of the pulmonary arteries:

Problems may develop in the smaller blood vessels in the lungs called the distal pulmonary arteries. These may become narrowed in adulthood.

#### 3- An irregular heartbeat:(arrhythmia)

- A. Patient may develop palpitations or abnormal heart rhythms.
- B. The right ventricle may become stretched over time as it has to work harder to pump deoxygenated blood to the lungs.
- C. The aorta may also show signs of stretching. This is not very common.



Some treatments may be possible via a cardiac catheterization procedure;

1. It may be possible to replace the pulmonary valve through keyhole surgery, but this is not suitable for everybody.
2. It may be possible to expand the narrowed area within an artificial covering by inserting a small metal cage, called a stent, to keep the area open.
3. It may also be possible to expand smaller lung arteries and keep them open by inserting a small stent.
4. Treatment (medication) of cardiac arrhythmia.
5. May require a pacemaker to speed up your heart rate.

