

Valvular Heart Disease

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1. What are Valves and what is the Anatomy of the Human Heart ?

The heart is a marvel of nature. It is a hollow, muscular organ about the size of your fist. It lies in the center of the chest, slightly to the left. It beats almost one lakh times a day, day after day, year after year. It is made of a unique muscle called myocardium, which is the main propelling force of the heart. It pumps blood in the body with each beat of the heart. This happens 60-90 times a minute. Its obvious that for the proper functioning of the heart, the myocardial muscle has to be healthy. Myocardium gets its nutrition and oxygen through blood, which is supplied by coronary arteries.

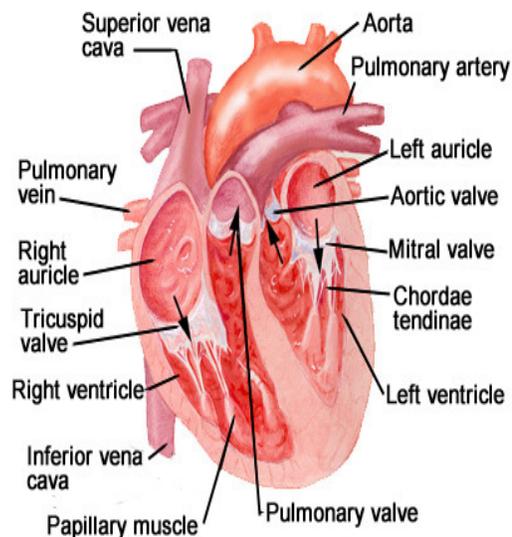


Fig 1: Long Axis Section of the heart showing internal anatomy

The heart is divided into two parts, the right heart and the left heart. Right heart has two chambers, right atrium and right ventricle. Similarly the left side heart has two chambers – left atrium & left ventricle. So in all, there are four chambers in the heart (Ref Fig.1). The right side of the heart receives impure blood from the body and pumps it into the lungs. Blood gets purified in the lungs and returns to the left side of the heart. From here it is pumped back to the entire body for supply of oxygen & nutrition. Four valves, two on the left side of the heart (mitral and aortic) and two on the right side (pulmonary and tricuspid) act as one way doors to direct the flow of blood (Ref Fig.2).

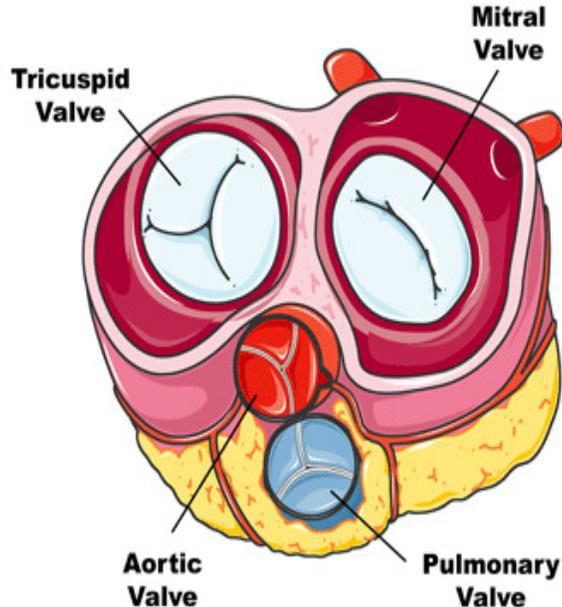


Fig 2: Cross section of the heart showing the relations of the valves

2. What are the diseases of the valves of the heart ?

The valves can be afflicted with a number of diseases like rheumatic fever, birth defects, infection, injury or degenerative disorders. The most common of these in India is rheumatic heart disease, which is caused by an infection of the throat by a special bacteria called beta haemolyticus streptococcus. The sore throat produced by this bacteria is virtually like any other sore throat, but with a difference, that it is associated

with fleeting and migratory pain and swelling in the major joints of the limbs, like knee and ankle. Infact the swelling and pain goes away over a period of time and the patient generally tends to forget these symptoms totally. After a gap of 5-7 years, this infection damages the valves of the heart by an auto immune process thereby producing rheumatic heart disease.

3. What is the effect of rheumatic heart disease on the valves ?

The valves can be affected in two ways - either they get scarred, thickened and fused, thereby producing narrowing of the valves (stenosis), or they can start leaking, due to again scarring or rupture of the supporting system (regurgitation). When the heart valves do not open or close as they should, the heart has to pump harder to get blood to the body. This can weaken the heart and damage the lungs, liver and other parts of the body.

4. What are the clinical symptoms of valvular damage ?

The patient may present with shortness of breath, palpitation, chest pain, swelling of the body specially feet, weakness, lethargy and some times blackouts and dizziness/giddiness. In the initial stages the patient may be totally asymptomatic and may have just subtle reduction in effort tolerance.

5. What is the best test for evaluating the valves of the heart ?

Echocardiography (2D or 3D) currently is the gold standard for diagnosis of valvular heart disease and in most cases is able to give definitive answer to all the queries and doubts about the disease process. Some times cardiac catheterization may be required, if echocardiography is not confirmatory in its findings/diagnosis.

6. What is the treatment for rheumatic fever ?

Rheumatic fever is essentially treated with antibiotics in form of injectable Penicillin or oral erythromycin, if the patient is sensitive to penicillin. For swelling and pain in the joints, any one of the non steroidal anti inflammatory agents can be used, but Aspirin is the most specific. Most patients need no further treatment but in a small percentage of patients, steroids may be needed. Penicillin treatment should be continued for as long as the doctor prescribes it for and should never be stopped in between, as this disease has chance of recurrence and some times penicillin is prescribed as 3 weekly injection till the age of 35 or even beyond as per the clinical demands.

7. What is the treatment for rheumatic heart disease ?

Rheumatic heart disease essentially consists of either narrowing of the valve or leak in the valve. If the valve is narrowed then it can be opened by balloon valvotomy, which is a procedure requiring no cuts and no anaesthesia and is done just like an angiography in the cardiac cath lab, and involves a stay of around 3 days in the hospital. However, if the valve is damaged beyond a particular point then it can not be opened either by balloon valvotomy or even by an operation and the valve has to be changed by an open heart surgery. If the valve is leaking, then every attempt is made to repair the valve surgically. However, if the valve is heavily scarred and the supporting structure is damaged beyond repair, then the valve has to be replaced.

8. What are the types of artificial valves ?

There are essentially two types of valves:

- a) Tissue valves, which are made from the tissues derived from the pigs and cows (Ref Fig.3). These valves have the advantage that they do not need life long blood thinning tablets, but they have the disadvantage that their life is limited and usually a tissue valve lasts from 10-15 years.

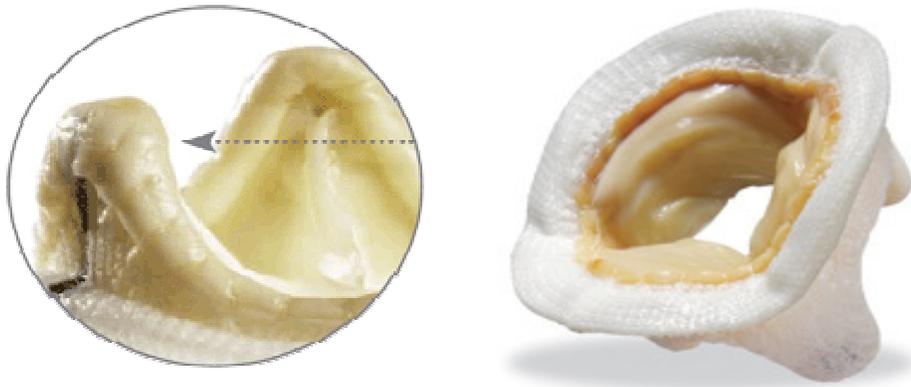


Fig.3: Tissue Valves

b) Mechanical Valve. It is made of a special kind of metal (Ref Fig.4) and has the advantage of being long lasting, but the biggest disadvantage with mechanical valve is that blood clots tend to form on them and therefore one has to take blood thinning tablets for life time.

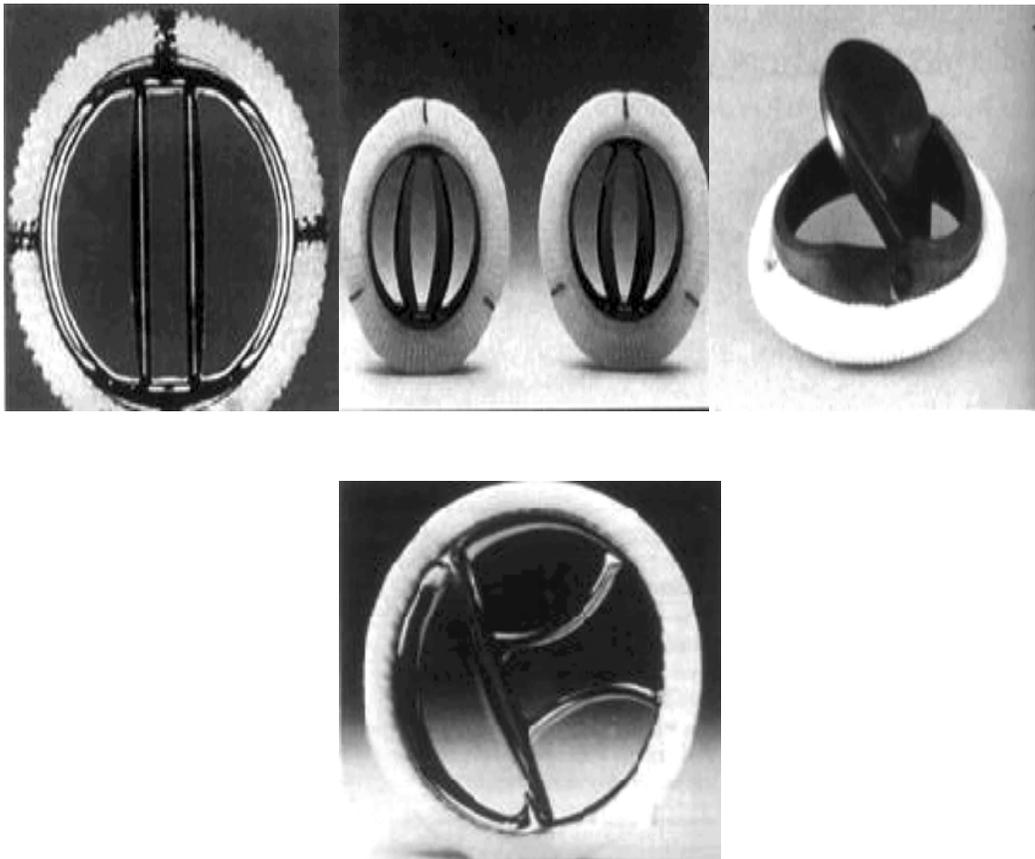


Fig.4: Mechanical Valves

9. What precautions one needs to take after valve surgery ?

After valve surgery, one needs to take blood thinning tablets, specially if it is a mechanical valve, for life long and the levels of blood thinning medicine has to be maintained by doing a test called INR/PT. This test must be done once in a month and the INR level should be maintained around 2.5 – 3.5 times the normal, or as prescribed by the treating physician. In general, low salt and restricted fluid intake are good for healthy life. If there is any problem maintaining the INR level, then one may have to avoid taking green leafy vegetables and tomatoes etc. When ever one has to undergo any form of surgical or gynaecological or dental treatment, then one must inform the doctor that there is an artificial valve in his heart, so that the necessary precautions for preventing infection on the valve can be taken by the treating physician. Also if one is taking anticoagulants or blood thinning tablets, then one must carry a warning card in the pocket or in the purse all the time, so that in case of an emergency, treating doctor gets warned about the blood being thin. One must never walk bare feet and be little careful while trimming nails and while using sharp objects, because one is likely to bleed excessively if any injury takes place. In case there are any symptoms, one must report to the doctor immediately and not delay presenting to the hospital.

Can young ladies conceive after valve surgery ?

Yes, ladies can conceive absolutely normally after valve surgery and they can have a productive and a fruitful life, both as a mother and as a wife. However, whenever one wants to conceive, one must consult the treating doctor and avoid taking blood thinning tablets during the conception period of first three months and substitute it with one injection a day of low molecular weight heparin, but this must be done under medical supervision.

Myths

- a) **Once the rheumatic fever is treated, one need not take penicillin prophylaxis.** This is absolutely wrong. If a rheumatic fever is confirmed then

one must take penicillin injection every three weeks till the minimum age of 21 years or for at least 5 years beyond the last episode of rheumatic fever. If one has a diagnosed valvular heart problem, then one must take penicillin injection till the age of 35 years at least, and according to some doctors, for life long. If one ignores this precaution, then the disease can recur and progress and involve the other valves of the heart also.

- b) **Once one valve is replaced, the other valves do not need caring.** This is absolutely wrong, because the other 3 valves, specially aortic and tricuspid valves, are also prone to involvement by the rheumatic process and even after a valve replacement operation, penicillin injection should be taken to protect the other valves.

- c) **Blood thinning tablets can be stopped after 3-6 months.** Stopping blood thinning tablets in mechanical valves is disastrous and can lead to life threatening complication of valve clotting off and some times even producing sudden cardiac death. Therefore one must be very clear that blood thinning tablets have to be taken for life in mechanical valves.