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VALVULAR DISORDERS: TYPES AND MANAGEMENT

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ABSTRACT

Valvular heart disease is a rapidly growing cause of global cardiovascular morbidity and mortality with diverse and evolving geographic distribution. The prevalence of rheumatic heart disease, the most common valvular heart disease (affecting approximately 41 million people), has been rising in developing nations, likely due to the expansion of the adult population and the decrease in premature mortality that has resulted from improved access to antibiotics, microbiological testing, and echocardiography.

KEYWORDS: Valvular Disorders, Aortic Valve Stenotic Disease, Aortic Regurgitation, Tricuspid Regurgitation, Infective Endocarditis

INTRODUCTION

Valvular heart disease is a defect in or damage to any of the heart valves, including the aortic, mitral, tricuspid, or pulmonary heart valves. When the valves function normally, they open and close in a coordinated manner, enabling blood to flow across with appropriate force in the proper direction into and away from the heart. Heart valve disease occurs when one or more of the heart valves do not open or close properly. When it affects more than one heart valve, it is called multiple valvular heart disease.

- **Stenosis** is when the valve opening becomes narrow and restricts blood flow.
- **Prolapse** is when a valve slips out of place or the valve flaps (leaflets) do not close properly.
- **Regurgitation** is when blood leaks backward through a valve, sometimes due to prolapse.

Heart valve disease can be classified as mild, moderate or severe. It can lead to an **enlarged heart** or **heart failure**. Heart failure is a serious medical condition where the heart cannot pump enough blood to meet the body's need for oxygen.

Many valvular heart diseases can be treated with **medication**, or **surgery and other procedures** to repair or replace the valve.

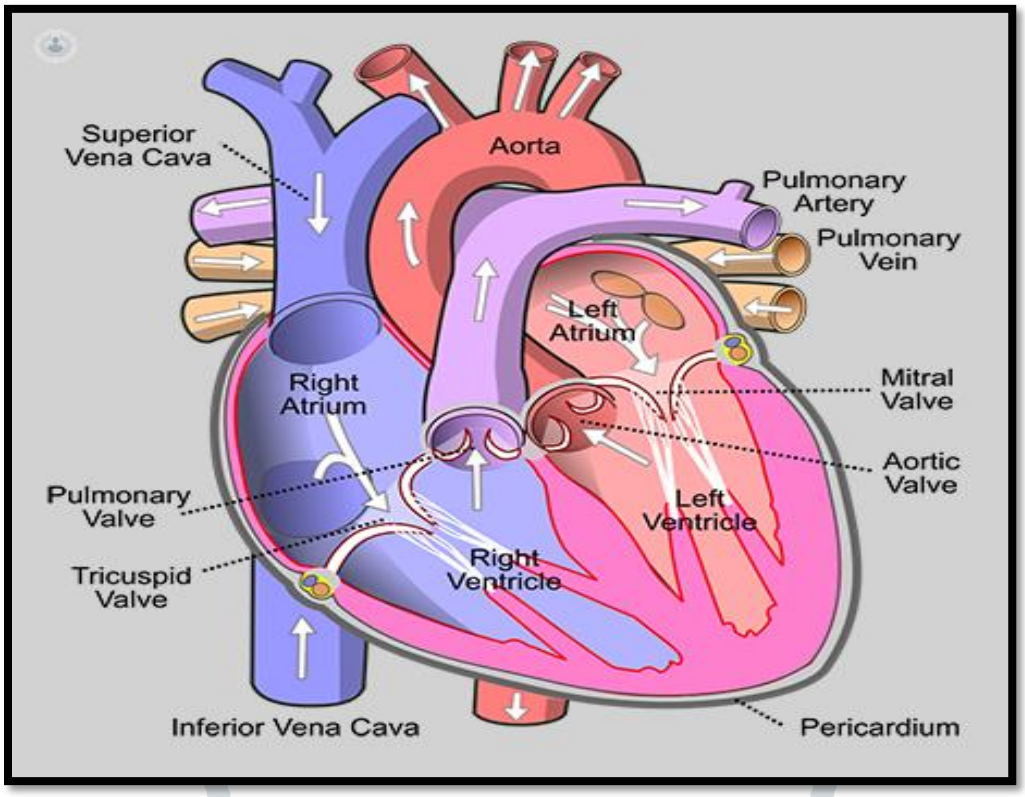

FIGURE NO.1: SHOWING VARIOUS VALVES OF THE HEART

CAUSES OF VALVULAR HEART DISEASE

Valvular heart disease can be congenital or acquired. The main causes include:

- Congenital heart disease – the patient was born with an abnormal valve.
- Rheumatic fever
- Cardiomyopathy – this disease of the heart muscle can damage the valves.
- Heart attack – these can leave damage to the heart muscle and valves.
- Previous infection with endocarditis
- Ageing

TYPES OF VALVULAR DISORDERS

1. Valvular stenosis (narrowing): In the valvular heart disease condition **valvular stenosis,** the tissues forming the valve leaflets become stiffer, narrowing the valve opening and reducing the amount of blood that can flow through it. If the narrowing is mild, the overall functioning of the heart may not be reduced. However, the valve can become so narrow (stenotic) that heart function is reduced, and the rest of the body may not receive adequate blood flow.

• **Tricuspid valve stenosis**: If the tricuspid valve narrows, blood is not able to fully move from the right atrium to the right ventricle. This can cause the atrium to enlarge, affecting pressure and blood flow in the surrounding chambers and veins. It can also cause the right ventricle to become smaller, so less blood circulates to the lungs to pick up oxygen.

• **Pulmonary valve stenosis:** If the pulmonary valve narrows, the flow of oxygen-poor blood from the right ventricle through the pulmonary arteries to the lungs is restricted. This affects the blood's ability to pick up oxygen and deliver oxygen-rich blood to the rest of the body. With pulmonary valve stenosis, the right ventricle has to work harder to pump blood through the narrowed pulmonary valve and the pressure in the heart is often increased.
• **Mitral valve stenosis:** When the mitral valve narrows, blood flow from the left atrium to the left ventricle is reduced. This can cause fatigue and shortness of breath because the volume of blood carrying oxygen from the lungs is reduced. Pressure from the blood that has stayed in the left atrium can cause the atrium to enlarge and fluid to build up in the lungs.
• **Aortic valve stenosis:** When the aortic valve narrows, blood flow from the heart to the aorta (the main artery to the body) and onwards to the rest of the body is restricted. As a result, the left ventricle has to contract harder to try push blood across the aortic valve. This can often lead to thickening of the left ventricle (left vernacular hypertrophy) which eventually makes the heart less efficient.

2. **Valvular Insufficiency**: Another valvular heart disease condition, called **valvular insufficiency** (or regurgitation, incompetence, "leaky valve"), occurs when the leaflets do not close completely, letting blood leak backward across the valve. This backward flow is referred to as "regurgitant flow."

2. Valvular prolapse (slipping out of place)

Prolapse is a condition when the valve flaps (leaflets) slip out of place or form a bulge. This can lead to improper or uneven closure of the heart valve. As a result of the prolapsed valve, blood may leak backwards through the valve and one-way blood flow may be disrupted.

• **Mitral valve prolapse**: In mitral valve prolapse, the valve fails to close evenly. Part or all of the mitral valve bulges upward into the atrium when the two ventricles contracts. This can allow a small amount of blood to leak backward through the valve (regurgitation). Mitral valve prolapse is also called click-murmur syndrome, Barlow's syndrome or floppy valve syndrome.

• **Tricuspid, pulmonary and aortic valve prolapse**: These prolapses are less common than mitral valve prolapse. Similar to mitral valve prolapse, the leaflets of the valve do not close completely and fail to form a tight seal.

3. Regurgitation (leaking)

Regurgitation can happen when the valve doesn't close properly and allows blood to flow backwards. This disruption of the one-way blood flow in the heart puts a strain on the heart, reduces its pumping efficiency and limits its ability to supply the body with oxygen-rich blood.

• **Tricuspid valve regurgitation**: When the tricuspid valve does not close properly, blood that is being pumped forward from the right ventricle to the lungs can leak backward into the right atrium, and the atrium may become enlarged.
• **Pulmonary valve regurgitation**: This results when the pulmonary valve doesn't close properly. The lower right chamber (right ventricle) of the heart pushes blood through the pulmonary artery into the lungs for blood to pick up oxygen. When the pulmonary valve does not close completely, blood can leak back from the lungs into the heart. This backward blood flow mixes oxygen-poor and oxygen-rich blood, and reduces the availability of oxygen-rich blood to fuel the rest of the body.
• **Mitral valve regurgitation:** In mitral valve regurgitation, some blood leaks backward into the left atrium through the mitral valve from the lower chamber as it contracts. This reduces the amount of blood that flows to the rest of the

body. As a result of regurgitation, the blood volume and pressure are increased in the left atrium. In severe cases, the increase in volume and pressure may lead to enlargement of the atrium and build-up of fluid (congestion) in the lungs.

- **Aortic valve regurgitation**: This results when oxygen-rich blood leaks backward from the aorta into the left ventricle with each heartbeat. The body does not get enough blood and the heart has to work harder to make up for it. Over time the walls of the ventricle may thicken (hypertrophy). This can increase the risk of heart failure.

Some patients may have both valvular stenosis and valvular insufficiency in one or more valves. Valve disease causes the heart muscle to work harder to circulate the right amount of blood through the body.

Symptoms of valvular heart disease

Heart valve disease can develop quickly or over a long period. When valve disease develops more slowly, there may be no symptoms until the condition is quite advanced. When it develops more suddenly, people may experience the following symptoms:

- Shortness of breath
- Chest pain
- Fatigue
- Dizziness or fainting
- Fever
- Rapid weight gain
- Irregular heartbeat

CONCLUSION:

Valvular heart disease is any cardiovascular disease process involving one or more of the four valves of the heart (the aortic and mitral valves on the left side of heart and the pulmonic and tricuspid valves on the right side of heart). These conditions occur largely as a consequence of aging, but may also be the result of congenital (inborn) abnormalities or specific disease or physiologic processes including rheumatic heart disease and pregnancy.

Anatomically, the valves are part of the dense connective tissue of the heart known as the cardiac skeleton and are responsible for the regulation of blood flow through the heart and great vessels. Valve failure or dysfunction can result in diminished heart functionality, though the particular consequences are dependent on the type and severity of valvular disease. Treatment of damaged valves may involve medication alone, but often involves surgical valve repair or valve replacement.

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