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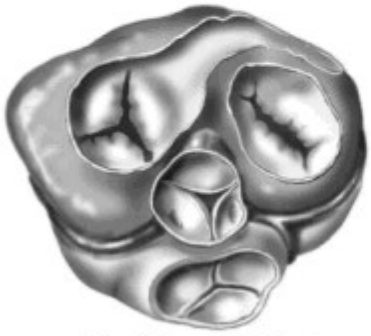
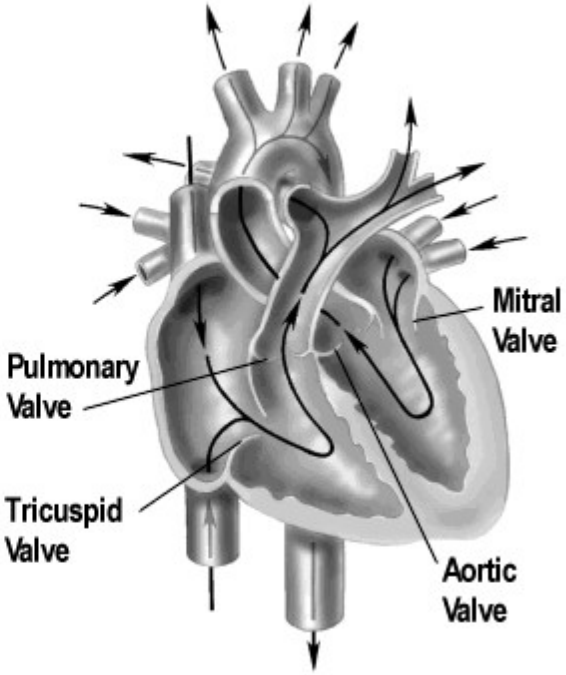
FACTS ABOUT AORTIC STENOSIS

What is the aortic valve?

The aortic valve is located between the main pumping chamber of the heart, the left ventricle, and the aorta, the blood vessel that carries blood full of oxygen to the rest of the body. The aortic valve normally has three thin leaflets that open widely as the left ventricle pumps the blood out of the heart. When the left ventricle has finished ejecting the blood, the backflow of blood against the valve leaflets closes the aortic valve, preventing blood from leaking back into the left ventricle.



The Valves of the Heart



What is aortic stenosis?

Aortic stenosis refers to a narrowing of the aortic valve opening. This is often due to an age-related thickening and calcification of the valve leaflets. There are also inflammatory conditions involving the aortic valve that lead to thickening of the leaflets and fusion along the margins of the valve cusps. Rheumatic heart disease may cause these changes. Some aortic valves are imperfectly formed at birth, having two rather than the usual three leaflets. These two leaflet or bicuspid valves tend to wear out sooner than normal by becoming thickened, fused and non-pliable.

The end result of aortic stenosis is a progressive narrowing of the valve to the point where blood flow across the valve becomes limited. When this happens, patients have a decline in the ability

to exert, increased shortness of breath, heart failure, chest pain and fainting episodes. Once the aortic valve becomes narrowed to the point where symptoms are present, there is a significant increase in the chances of dying suddenly.

What causes aortic stenosis?
Aortic stenosis is caused by many disorders. One cause is rheumatic fever that is becoming very uncommon in industrialized nations, but is still prevalent in third-world countries. Other causes include calcification of the valve and congenital abnormalities (problems present at birth). There may be a history of other valve diseases, coronary artery disease, or heart murmur.

Aortic stenosis occurs in approximately 5 out of 10,000 people. It is more common among men. Symptoms often do not appear until middle age or older.

How is aortic valve disease diagnosed?
Both narrowed and leaking aortic valves cause the blood flow across the valve to become turbulent. This turbulence creates a sound that can be heard with a stethoscope. This is called a heart murmur. The diagnosis of aortic valvular disease starts with a physical examination in which a heart murmur is heard. Heart murmurs due to the aortic valve have a characteristic sound and location. Not all murmurs are due to aortic stenosis.

An echocardiogram, an ultrasound examination of the heart, is a useful way to look at the aortic valve to see if there is significant disease present. The appearance of the leaflets can provide important information as to thickening, mobility and whether there are two or three leaflets. The amount of leakage and narrowing can be determined by Doppler ultrasound. The effect of the aortic valve disease on the heart function can also be assessed.

If the echocardiogram suggests that the aortic valve is significantly diseased to warrant surgical replacement, a cardiac catheterization is performed. This is a hospital test that involves measuring pressures in various heart chambers using small tubes or catheters inserted into an artery and a vein of the groin or arm and directed into the heart. Motion picture X-rays are also obtained to assess the heart function and the appearance of the valve and the aorta. X-ray pictures are usually obtained of the coronary arteries at the same time. If there is coexisting coronary artery disease, those arteries are usually bypassed at the time of the aortic valve surgery.

What are the symptoms of aortic stenosis?
Aortic stenosis might show no symptoms until late in the disease process. Symptoms can include:

- fainting or weakness with activity
- breathlessness with activity
- chest pain, angina-type
- blackout spells

How is aortic stenosis diagnosed?
Examination shows vibration or movement felt by holding the hand over the heart. There is almost always a heart murmur, click, or other abnormal sounds when examining the chest with a

stethoscope. There may be faint pulses or changes in the quality of the pulse of the arteries of the neck. Blood pressure may be low.

Certain diagnostic imaging tests can reveal aortic stenosis. They include:

- an echocardiogram
- a chest X-ray
- a cardiac catheterization

An ECG may show left ventricle thickening or enlargement and arrhythmias (unusual pattern of heart beats).

How is aortic stenosis treated?
Mild to moderate aortic valvular disease requires no specific treatment. Your physician will want to see you periodically to be certain the disease is not progressing. Your physician will also obtain periodic echocardiograms to follow the status of your aortic valve.

Because diseased heart valve are more susceptible to infection when bacteria are present in the blood stream, antibiotics should be given before any procedures that are likely to cause bacteria in your blood stream. This would include dental work (including dental cleaning), genitourinary procedures, colonoscopy, sigmoidoscopy and the like. If you have aortic valvular disease, please ask your doctor about antibiotic prophylaxis (antibiotic drugs given in advance to help make sure that you don't get an infection during a procedure).

Medications may include diuretics, digoxin, and other medications to control heart failure. Symptomatic people may be advised to avoid strenuous physical activity. People who have symptoms (difficulty breathing, chest pain, syncope) and documented aortic stenosis should consider early surgery if the valve is tight enough. There is a 50% mortality in the next 2-5 years if the valvular problem is not corrected.

Surgery involves replacement of the aortic valve. There are a variety of heart valves available. There are man made mechanical valves that have great durability but which require life long blood thinners (Coumadin®) to prevent clots from forming. There are valves constructed from animal tissue. These include pig aortic valves and valves made from pericardium. Aortic valves from human cadavers may also be used. In general the tissue valves do not require treatment with blood thinners but they have a limited life of around ten years. Percutaneously delivered (by catheterization) aortic valve replacement is currently under development. If aortic valve replacement is recommended, Dr. Stratienko will discuss the various options with you.