

## Modern Solutions of Open Heart Surgery

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**Abstract:** Coronary artery disease (CHD) is a disease caused by partial or complete cessation of blood flow due to narrowing or blockage of the arteries, called "coronary arteries", that supply the heart muscle.

Ischemic heart disease is the main cause of death in our country. About 200,000 people die from cardiovascular diseases in our country every year. The fatal feature of this disease is that it can lead to a life-threatening myocardial infarction in the later stages.

**Key words:** Coronary heart disease symptoms, Coronary artery bypass surgery, Coronary heart disease treatment

Coronary heart disease often occurs after the age of 40. It is about four times more common in men than in women. In women, the hormone estrogen protects. Therefore, the incidence in women increases in the postmenopausal period, when the level of this hormone decreases. Most often, the disease occurs in men at the age of 50-60 and in women at the age of 60-70.

Knowing the risk factors that lead to the development of this disease and taking preventive measures is no less important than treating the disease.

The most common cause is atherosclerosis of the coronary arteries, that is, arteriosclerosis. A fat called "cholesterol", which is present in animal products and when consumed in excess, sticks to the inner surface of the artery, reduces the flexibility of our normally elastic arteries and accumulates in the walls of the arteries, narrowing the vascular space. . Hardening of blood vessel walls or their blockage is called "atherosclerosis".

Risk factors for coronary heart disease

**Non-modifiable risk factors (cannot be prevented);**

- Old age (45 years for men, 55 years for women and post-menopause, i.e. post-menstrual period)
- Gender (more common in men)
- Heredity (the presence of this disease in the family)

**Modifiable (preventable) risk factors**

- Smoking
- Hypertension (blood pressure above 140/90 mmHg)

- Diabetes
- Stress
- High blood cholesterol

**Other risk factors;**

- Obesity, obesity
- Sedentary lifestyle
- Gout
- Excessive consumption of alcohol and coffee
- Hypercalcemia (increased calcium in the blood)
- Use of oral contraceptives for women (birth control pills)

**What are the ways to prevent ischemic heart disease?**

Smoking should be avoided as it is one of the most important risk factors.

- It is necessary to reduce the consumption of alcohol and coffee.
- High cholesterol levels should be reduced to normal levels through diet or medication.
- Regular walking and exercise.
- Avoid excess weight and choose a suitable weight according to your height.
- If you have high blood pressure or diabetes, it is important to control it with diet and medication.
- You should also avoid stress.

**What are the symptoms of coronary heart disease?**

In the initial stage of the disease, when the coronary arteries do not have severe stenosis, there may be no symptoms.

- Chest pain (may radiate to left shoulder and left arm): This pain is often associated with physical activity. This is a throbbing pain over the sternum, often radiating to the left arm and jaw, especially when walking up a hill, climbing stairs, or after eating. In addition, it can appear in different ways. 5-10 minutes will pass after rest.

- limited ability to exercise, fatigue;
- Shortness of breath during exercise,
- fainting (fainting),
- Sudden death,

It should also be noted that sometimes coronary heart disease may be asymptomatic or the first symptom may be a myocardial infarction.

**How is coronary heart disease diagnosed?**

With the exception of emergency situations (heart attack, etc.), information about the patient's complaints and general condition is mainly obtained during the physical examination. Electrocardiography (ECG), echocardiography (EchoCG) and exercise tests are performed to determine the presence of coronary artery disease. If necessary, computed tomography (CT) and myocardial perfusion scintigraphy are also used for diagnosis. As a result of the tests and examinations, coronary angiography (cardioangiography) is necessary for a detailed examination and diagnosis of patients at risk of coronary heart disease and at risk of blockage of blood vessels.

**Treatment of coronary heart disease**

Treatment includes medication, coronary artery bypass surgery, and percutaneous intervention (balloon, stent). The decision to choose a treatment method is made by specialist doctors based on many variables

(the number of affected vessels, the degree of vessel stenosis, the force of contraction of the heart muscle, the patient's response to drug treatment, the severity of blood vessels, the weight of blood vessels, the weight of blood vessels, the degree of narrowing of blood vessels) is taken into account. age of the patient, etc.) after examinations. Therefore, the treatment of each patient is selected taking into account its characteristics.

Medicines used for coronary heart disease aim to prevent angina attacks by widening the coronary arteries or reducing the heart's need for oxygen. In addition, drugs that thin the blood and prevent the formation of blood clots (aspirin, etc.) reduce the risk of developing a heart attack. Sublingual vasodilators taken 5 minutes before an activity that may trigger chest pain can prevent it from occurring or relieve an attack of pain that has already occurred.

### **What is a myocardial infarction (heart attack)?**

Myocardial infarction occurs when the narrowing of the coronary artery is completely blocked by a blood clot, resulting in the death of heart muscle tissue (myocardium) due to lack of nutrition in the area supplied by this vessel. The pain of myocardial infarction is stronger and lasts longer. It is not related to physical activity. As the dead tissue affects the heart's pumping function, it cannot pump enough blood and heart failure can occur. Myocardial infarction can also threaten the patient's life. In order to prevent this, it is necessary to diagnose and treat cardiovascular diseases in time.

### **What is coronary artery bypass surgery?**

Coronary artery bypass grafting is the process of creating vascular bridges using blood vessels taken from other parts of the body to relieve narrowing of the heart's own blood vessels (coronary arteries).

Common vessels used in coronary artery bypass grafting

Leg vein (saphenous vein)

The artery that supplies the front wall of the chest (internal mammary artery, IMA).

It can be the artery of the arm (radial artery).

The choice of these arteries depends on the individual patient. In general, arteries are more likely to remain open in the long term than veins. Coronary artery bypass surgery can be performed using different techniques.

Thanks to modern surgical techniques and technologies, patients can be discharged from the hospital within 5 days after open heart surgery. They can calmly do housework and work at a desk. In 4-6 weeks, they can return to their normal life without any restrictions (including driving and sex life).

Long-term results of coronary artery bypass surgery are also successful. Many patients note that complaints of pain and shortness of breath have completely disappeared, and their performance has increased both in their professional and personal lives. A small proportion of patients may require repeat surgery after 10 years or more.

Coronary artery bypass grafting is a procedure that focuses on outcomes, not causes. A patient's modifiable risk factors are kept under control and the likelihood of recurrence of problems is reduced. Eliminating risk factors such as smoking, high cholesterol, high blood pressure, stressful life, and uncontrolled diabetes, along with proper diet and medication are important in prolonging the life of new blood vessels. These measures improve the long-term results of the operation and increase its success.

### **How is bypass surgery performed?**

The "coronary artery bypass graft" operation is used in blocking the cardiovascular system. This operation can be performed on both a "working" and a "stopped" heart. "Bypass pumping" has not been widely used for a very long time, but today it is the preferred method in some special cases. The more common "cardiopulmonary bypass" involves using a heart-lung pump to maintain blood circulation in the body and "bypass" (turn off) the blocked vessels of the heart after the heart has stopped completely.

For this purpose, the veins taken from the body are used, for example leg vein (USM), forearm artery (RA), thoracic artery (ITA) and others. A sufficiently long length of these vessels is used to ligate the large artery (aorta) leading from the heart and the vessels outside the coronary artery occlusion to ensure adequate blood flow to the infarcted areas supplied by these vessels.

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