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**Dissecting aortic aneurysm type B. Review of the literature and an analysis of our own observations. The modern view of the management and treatment.**

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Despite considerable progress in diagnosis and treatment of patients with dissecting aortic aneurysms type B, mortality and morbidity is still significant. Distal aortic dissection that starts below the left subclavian artery extends to descending aorta and in most cases reaches the bifurcation of the abdominal aorta, occurs in about 20% of all aneurysms.

Keywords: dissecting aortic aneurysm, malperfusion, treatment strategy.

Aortic rupture is one of the causes of death in patients with aortic dissection type B. The second leading cause of death in these patients - malperusion that leads to ischemia and dysfunction of internal organs [1,2].

Purpose - analysis of the current understanding of aortic dissection type B with an emphasis on methods of surgical treatment.

The clinical picture of acute aortic dissection type B usually involves three permanent signs: sudden intense pain, hypertension and tachycardia. "Stabbing" pain as the primary and often the only symptom, occurs in almost 90% of cases of acute distal aortic dissection, which begins in the interscapular space, usually during physical exertion, radiating to the left arm, the left half of the chest, the abdomen and back (L. Svensson, S. Crawford, 1997). Painless form is rare (Marfan syndrome and others.). Chronic stage is asymptomatic, usually causes no complaints and the patient can be diagnosed with prophylactic examination (X-ray, echocardiography).

The most important etiological factor is hypertension, which occurs in 70-90% of patients who develop aortic aneurysm dissection. Congenital diseases that lead to this condition include Marfan syndrome, Ehlers - Danlos syndrome, congenital bicuspid aortic valve, coarctation of the aorta, Turner's syndrome, giant cell aortitis, recurrent polichondritis and others.

There is also a relationship with pregnancy. Half of all cases of aortic wall dissection in women under 40 occur during pregnancy, often in III trimester. Similar to acute myocardial infarction, sudden cardiac death and heart failure, aneurysm dissection is prone to circadian and seasonal rhythms. It often develops in the morning and in the winter months of the year [4]. These changes correlate with physiological fluctuations in blood pressure.

Also described cases of aortic aneurysm dissection after therapeutic or surgical procedures, including those when different devices are injected into the aorta such as intraaortic balloon contrapulsation and after cannulation of aorta or its major branches. It is believed that iatrogenic dissection of aortic aneurysm is a rare complication. For example, in a retrospective analysis found that after surgery for heart aneurysm develops at 0,12-0,16% of cases. Unlike the spontaneous iatrogenic separation that occurs in people over age group (71,4 ± 4,8 year versus 62,4 ± 13,8 years, p <0.001) and often accompanied by atherosclerosis [1,2]. Trauma rarely causes aneurysms layering.

Pathophysiologically dissection of aortic aneurysm is accompanied by cystic necrosis of media. This disease is diagnosed more often in men than women (ratio 3: 1).

Dissecting aneurysm develops after intimal tear. Blood under pressure goes through the tear and defoliates the middle membrane of the aorta. Hematoma may develop along the aorta and clog one of its branches, from the branches of the aortic arch and ending in mesenteric arteries. Retrograde dissection can affect the coronary arteries. Most often the right coronary artery is involved. Retrograde dissection may affect the strength of one or several cusps of the aortic valve and may lead to valve insufficiency [5].

False lumen is located in the outer half of the middle membrane of the aorta. Its external wall is only a quarter of the initial thickness of the wall of the aorta. This is causing frequent ruptures in patients with aortic aneurysm dissection. Rupture of an aneurysm of the aortic arch is often into the cavity of the mediastinum, rupture of the descending aorta into the left pleural cavity, the abdominal aorta – into the retroperitoneal space. Because the parietal pericardium is attached to the ascending part of the aorta the rupture of ascending aorta can lead to pericardial tamponade.

Approximately in 70% of patients the tear, which is the beginning of the dissection is found in the ascending part of the aorta. In 10% of cases it is located in the aortic arch, 20% - in the descending part of the thoracic aorta. In some cases the intimal tear is in the abdominal aorta [3,4,5].

Under our supervision there were 24 patients in the chronic phase of dissection, and in all cases they were successfully treated in the acute stage using the scheme: the first month in the intensive care unit with a strict control of blood pressure (a combination of receiving β-blockers and antihypertensive drugs), second and third month hospital treatment in the cardiology hospital. Aneurysm rupture occurred in 3 cases with severe hypertension where drug therapy was ineffective.

In the acute period 5 patients were operated, including 3 with aortic rupture and 2 - with the threat of aortic rupture. Surgeries were performed under artificial circulation of primary cannulation of the femoral artery. Thoracotomy in IV intercostal space. Hemolyzed blood was removed from the pleural cavity, although the use of devices such as cell saver made it possible to return 'laundered' red blood cells to the patient. Further surgery was performed in 2 versions: left-atrial-femoral bypass by cannulation of left atrium and parallel perfusion of lower torso with a volume of 1500-2000 ml / min or,which is more reliable, complete perfusion with cannulation of the right atrium and secondary of the ascending aorta that is more reliable from point of view of possible arrhythmia or unstable cardiovascular activity. Aorta was crossclamped between the left carotid and subclavian artery at the level of V intercostal space and the left subclavian artery. Longitudinal section of the aorta with the following prosthesis implantation and restoration of blood flow to the true lumen. Dissected layers of the aorta were sutured using Teflon strips from inside and outside. Aortography, that was made in the late period after 2.5 and 12 years, confirmed the adequate restoration of blood flow in the aorta.

A particular danger occurs in rare cases when dissection spreads in the proximal direction into the vessels of aortic arch and ascending aorta. Diagnosis of these cases is very difficult and the result of the operation depends on the intraoperative assessment of the specific anatomical changes.

In one case, a similar dissectin (in the acute phase), according to aortography was misdiagnosed with Type I by M. DeBakey and surgery began with median thoracotomy. Moderate expansion of the ascending aorta and it’s arch during surgery did not bring any doubts to the surgeons regarding the results of aortography, but only after opening the ascending aorta and arch there was an urgent need to expand the access by left-sided lateral thoracotomy and found that the dissection started below the left subclavian artery, spread distally and partially proximally in aortic arch without compression or rupture of blood vessels in the area of ​​the aortic arch. Thus there were unexpected considerable difficulties in carrying out the reconstruction of the ascending, arch and descending thoracic aortic by extension of hypothermic (up to 16-18 °) perfusion, organ failure and coagulopathy postoperative adverse results of operations. In this case, the diameter of the descending thoracic aorta significantly (1.5-2 times) dominated the diameter of the ascending thoracic aorta, which should be a warning diagnostic and tactical mistakes.

Information characteristics of different diagnostic methods can complement each other and determine the presence of dissecting aortic aneurysm.

Chest X-ray helps to determine the signs of aneurysm, aortic enlargement, pleural effusion, absence of pulsation, distortion of circuits of aorta.

Echocardiography - more informative and accessible method to detect detachment of the intima, identify true and false channels, evaluate atherosclerotic lesions, aortic valve condition, the condition of the aortic arch, thoracic aorta condition.

Aortography makes it possible to determine the location of the initial tear, length and location of the dissection, the state of the aortic valve, the branches of the aorta, coronary arteries.

For the magnetic resonance imaging and computed tomography, it is necessary that the patient is stable, which is important during transportation and during the procedure itself. MRI makes it possible to find out the location of the tear and the direction of dissection6 assess the state branches of the aorta and the valve.

 Given our experience in treating patients with aortic aneurysm вшииусешщт type B should follow this treatment strategy.

 Emergency hospitalization in the intense care unit , strict bed rest. Sedative and pain relief therapy aimed at the removal of emotional stress. Constant monitoring of blood pressure with identifying opportunities of pulse assymetry and pressure on the upper and lower extremities with a focus on maximum performance with further regulation and treatment. Blood pressure support with nitroglycerin or izoket infusion through the dispenser under the control of central venous pressure. The level of controlled arterial hypotension (patients are usually high blood pressure!) is maintained at the required level for renal filtration and the rate of urination is not lower than 50 ml per 1 hour for an adult of average weight, 1 ml / kg for 1 hour (typically about 100mm Hg. in.). Thus, bladder catheterization, X-ray, ECG, echocardiographic monitoring are required during diagnosis and treatment. After stabilization of the patient the coronary aortography is conducted. For the prevention of negative influence of radio-opaque drugs the patient was administered saline and mannitol controlled by CVP and urine. Particular attention was paid to the elucidation of the general condition of the patient, anamnesis, possible changes of the vital organs and systems (heart, lungs, liver, kidneys, brain and spinal cord, intestine). Particular attention and caution is required in cases of bloating, which can be a reflex as well as ischemic, enemas and effort during defecation may trigger rupture of the aorta. If there are signs of peritoneal irritation ischemia of visceral organs should be suspected and bring attention to the angiographic confirmation of a possible disturbance of blood supply to the visceral organs, as in such cases, stenting of aortic branches, fenestration or urgent surgery can lead to the elimination of ischemia.

Indications for urgent surgical intervention are threat for dissection and aortic aneurysm rupture (hemothorax), uncontrolled hypertension and pain, and the impossibility of elimination of acute ischemia and lower visceral organs (rare upper) limb. Remember that contraindications to surgery are acute condition (myocardial infarction, stroke). In addition, high risk patients in the older group, those with severe cardiovascular, pulmonary and multiple organ failure who are patients for palliative procedures as fenestration, stenting and medication.

To summarize our observations of patients with distal aortic dissection should be noted the dependence of its origin and clinical course from one of the main reasons - hypertension. In the acute phase urgent surgery is extremely dangerous and is associated with the "problem" of the tissues the were dissected, as well as underlying age-related changes in older patients, and therefore the preferred treatment is conservative therapy or such methods as fenestration and stenting. Surgery is lifesaving in cases of rupture of the aneurysm, uncontrolled hypertension with medication agents and in cases with ischemia of visceral organs or limbs. Adequate hypotensive therapy in cases of chronic dissection is the method of choice except for the threat of rupture of the aneurysm with dynamic clinical observation.

Stenting and fenestration, in our view, with significant improvements will take a leading role in the treatment of these difficult and high-risk patients [1].

Conclusions:

1. Acute aortic aneurysm dissection type B is a lifethreatening state.

2. Open surgery is indicated in cases of rupture of the aneurysm, acute malperfusion of internal organs and with uncontrolled hypertension.

3. Drug treatment of thoracic aorta dissection with following endoprostethis implantation at present time becomes more prevalant in the treatment of acute aortic aneurysms dissection

 type B.

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