Visceral arterial ischemia

Visceral arterial ischemia is caused by a sudden or gradual closure of the *a. mesenterica sup.* and at the same time by stenosis or closure of the *a. coeliaca* or *a. mesenterica inferior*. This acute closure causes severe intestinal ischemia. If the artery closure arises slowly, sufficient **collateral circulation** develops due to the anatomical arrangement of the vessels of the gastrointestinal tract.

Chronic occlusion of the mesenteric artery

Causes

The main causes include atherosclerosis, rarely arteritis, and fibromuscular dysplasia (congenital anomalies). Anatomical causes may be atherosclerosis, fibromuscular dysplasia or external compression. The main functional cause is iliofemoral (aorto-iliac) steal syndrome (closure of the lower aorta or common pelvic artery); blood goes the inferior mesenteric artery – a. rectalis sup. - a. rectalis media - a. iliaca interna - a. iliaca communis - a. iliaca externa - a. femoralis.

Clinical picture

The main symptoms are abdominal pain occurring 10-60 minutes after a meal (angina abdominis), diarrhea or constipation, progressive cachexia, and sometimes a murmur is heard. The diagnostic methods can be used to test the patient orally – the patient is given cream and then his pH is monitored in the jejunum - a steal phenomenon is created with reversal of blood flow to the stomach, in patients with intestinal ischemia the pH in the jejunum decreases.

The differential diagnosis is pancreatic cancer, stomach cancer or peptic ulcer.

Therapy

In severe abdominal angina with cachexia, the therapy is surgical. Another therapy is transaortic endarterectomy. A significant proportion of patients are generally at risk, which is why bypass - from the infrarenal aorta is preferred. If this part of the aorta is sclerotic, the supraceliac section of the aorta is used, thus the bypass is behind the pancreas. In PTA (percutaneous transluminal angioplasty), there is a risk of acute thrombotic closure with a fatal outcome.

Acute mesenteric ischemia

It is most often caused by **embolism** in the a. mesenterica superior, less by plaque thrombosis, aneurysm or aortic dissection. Another cause may be venous thrombosis.

Mesenteric artery embolism

Clinical picture

Sudden severe abdominal pain with poor physical findings. It may cause vomiting and blood in the stool. After a few hours, the pain eases a bit, peristalsis ceases, vascular ileus develops until diffuse peritonitis.

The progress

1. up to 6 hours - initial stage with pain and shock, early intervention can preserve the intestine
2. 6–12 hours - pain calms down, overall condition worsens, paralytic ileus with wall gangrene develops
3. after 12 hours - intestinal perforation and peritonitis

- laboratory - leukocytosis, lactate and amylase may be increased

Diagnosis – angiography, but usually the fastest possible laparotomy is more effective

The time factor is very important - the ischemic intestine is necrotic within 8 hours.

Therapy

With early surgery - **embolectomy with a Fogarty catheter**, after 24 hours it is appropriate to perform a second laparotomy and revise the intestine, resect any necrosis. In case of clear necrosis, resection after small emboli - segmental resection and trunk closure - up to the colon is necessary. Previously, it was considered incompatible with life, today it is possible to maintain with parenteral nutrition.

Closure of the a. mesenterica inferior

Thrombosis on the atherosclerotic plaque most often occurs. Clinically there is pain in the left lower quadrant, the stool is usually mixed with blood and detached mucosa, and there are later signs of low ileus. Surgical treatment is resection of the affected segment.

Mesenteric artery thrombosis

It manifests itself similarly to embolism, but the symptoms may begin slower. There may be a history of abdominal angina . Thrombectomy is usually insufficient, a bypass should be established.

Non-occlusive mesenteric ischemia

Causes

The causes can be insufficient perfusion - in case of the cardiac failure, arrhythmia, acute myocardial infarction, hypovolemia, after burns, and polytrauma. Arteriography shows spastic segments of the a. mesenterica.

Therapy

Already during angiography, we apply a vasodilator locally (eg 30 mg papaverine). Then, we continue infusing the substance. It is necessary to address the causes.

Mesenteric venous thrombosis

Causes

The cause is a coagulation disorder, which often occurs after infections (viral and bacterial) - such as salmonellosis.

Clinical picture

It is manifested by abdominal pain, nausea, vomiting, fever. There are progressive signs of peritoneal irritation.

Diagnostics

It is usually diagnosed during a laparotomy. The problem can be detected even without surgery - duplex ultrasound and CT with contrast.

Therapy

The therapy is complete heparinization.

Renovascular hypertension

Pathogenesis

It can be either an atherosclerotic slice at the place of artery separation (in 2/3 of patients) or fibromuscular dysplasia (especially young women). Insufficient perfusion pressure leads to activation of the renin-angiotensin-aldosterone system. It is the cause of about 5-10% of all hypertensions (in large hypertension they account for 30-40%).

Examination

Examinations include renal duplex sonography, arteriography, isotope renography or renin vein sampling (RIA).

Therapy

The therapy is preferably surgical - we reduce the pressure and prevent the progression of kidney damage. Today, much of the stenoses can be treated with PTA.

Surgical therapies can be:

1. aortorenal bypass by autologous vein
2. renal artery endarterectomy
3. in case of severe changes (mainly fibromuscular) - ex vivo reconstruction on the kidney, perfused with preservative solution
4. in the worst case - nephrectomy

Links

Related articles

- Artery reconstruction
- Ischemic heart disease
- Chronic ischemic disease of the lower limbs
- Large vein closures

Bibliography

- ZEMAN, Miroslav. *Speciální chirurgie.* 2. edition. Praha : Galén, 2006. 575 pp. ISBN 80-7262-260-9.

External link

- BENEŠ, Jiří. *Studijní materiály* [online]. [cit. 17.5.2010]. <http://jirben.wz.cz>.