Portal hypertension caused by postoperative superior mesenteric arteriovenous fistula

Portna hipertenzija prouzrokovana gornjom mezenteričnom arteriovenskom fistulom


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Abstract

Introduction. Arteriovenous fistula of the superior mesenteric blood vessels is a rare complication in abdominal surgery.

Case report. We presented a 49-year-old man with cramp-like abdominal pain, abdominal distension and weight loss symptoms, with a history of previous small bowel resection and right colectomy, due to Crohn disease, 16 years ago. Clinical examination revealed a paraumbilical pulsation with systolic murmur and thrill. Ultrasonography and computed tomography revealed cystic dilatation of the superior mesenteric vein, hepatomegaly and ascites. Upper endoscopy revealed grade I esophageal varices with portal hypertensive gastropathy. The diagnosis of arteriovenous fistula between superior mesenteric artery and vein was confirmed by angiogram of the superior mesenteric vessels and resection of the fistula was performed. Control examination after nine months showed no signs of portal hypertension.

Conclusion. Early diagnosis and treatment of mesenteric blood vessel arteriovenous fistula prevents portal hypertension development and its complications.

Key words: arteriovenous fistula; mesenteric arteries; mesenteric veins; diagnosis; surgical procedures, operative; prognosis; hypertension, portal.

Apstrakt


Zaključak. Ranim otkrivanjem i lečenjem arteriovenskih fistula mezenteričnih krvnih sudova sprečava se razvoj portne hipertenzije i njenih komplikacija.

Ključne reči: arteriovena fistula; aa. mesentericae; vv. mesentericae; dijagnoza; hirurška, operativna procedure; prognoza; hipertenzija, portna.
years ago, the patient had small bowel resection and right colectomy for ileus caused by ileitis terminalis (Morbus Crohn). He had no complains until the present illness. At physical examination, the patients was subicteric. Abdominal examination revealed a soft, mobile, pulsating mass in the paraumbilical region. The abdominal, systolic murmur was heard and thrill was palpated. Laboratory tests showed elevated leucocyte count 12 × 10^9/L (4.0–10.0 × 10^9/L), erythrocyte sedimentation rate 32 mm/h (2–10 mm/h), fibrinogen 7.9 g/L (2–4 g/L), total bilirubin 28.7 μmol/L (3–22 μmol/L), conjugated bilirubin 15.5 μmol/L (0–7 μmol/L), aspartate aminotransferase 155 U/L (14–50 U/L), alanine aminotransferase 477 U/L (21–72 U/L), alkaline phosphatase 310 U/L (38–126 U/L) and gamma-glutamyl transpeptidase 287 U/L (8–78 U/L). Other biochemical parameters were within the reference range. Other causes of liver diseases were excluded (no history of alcohol consumption, negative viral markers, autoantibodies and laboratory tests for metabolic diseases). Ultrasonography and computed tomography (CT) of the abdomen showed hepatomegaly, ascites around the liver and a small polyp in the gallbladder. The superior mesenteric vein (VMS) was dilated, aneurismatic (8 × 5 × 12 cm) (Figure 1). Doppler ultrasonography revealed dilatation of portal vein (28 mm) with hyperkinetic flow (v = 31 cm/s). The lienal vein was considered normal, as well as diameter and its flow. Upper endoscopy revealed grade I esophageal varices without „red cherry spots“. Portal hypertensive gastropathy also often described as snake-skin appearance was detected in the fornix and corpus of the stomach. Colonoscopy did not detect recidive of Crohn’s disease. Selective arteriography of the superior mesenteric artery (AMS) demonstrated dilatation of AMS, aneurismatic dilatation of VMS and its early filling directly from the AMS (Figure 2). Midline laparotomy was performed. Fistulous communication between the AMS and VMS was demonstrated (Figure 3). An AVF had a thick wall and external appearance of the large artery and vein. After occlusion of the AMS and VMS proximally and distally, transverse incision was made into the artery aspect of the AVF. Communication between AMS and VMS, was about 15 mm in diameter. After closure of the AVF with continuous suture, partial resection of arteriovenous aneurysm has been performed followed by venous closure. After release of clamps, the veins in the mesentery of the small bowel decreased in size. The postoperative course was uneventful. The patient was discharged on the 10th postoperative day. On control examination after nine months the patient had no complains. He gained 13 kg weight, biochemical parameters were within the reference range. Doppler ultrasonography and upper endoscopy were without sign of portal hypertension.
**Discussion**

Portal hypertension is characterized by an increase in portal vein pressure as a result of impediment to portal flow. According to the level of impediment it may be pre-hepatic, intrahepatic and posthepatic. AVF is a pathological, direct communication between an artery and a vein, when blood bypasses a capillary bed. An AVF may be congenital or acquired: congenital one is a result of persistent embryonic blood vessels that fail to differentiate into arteries and veins, while an acquired occurs as a consequence of surgery or injuries. AVF of the superior mesenteric blood vessels is a rare complication of abdominal surgery. The first case was described in 1960 by Movitz and Finne. Delays in diagnosis after surgery have been reported up to 20 years. In case of our patient, the AVF became symptomatic 16 years after the surgery. Clinical presentation varies from asymptomatic to manifest, most commonly as cramping abdominal pain with or without diarrhea. Pain is a result of ischemic bowel, as blood is "stolen" by the portal system leaving the segment distal to the fistula with a compromised arterial circulation. Diarrhea is probably related to impaired perfusion of the mucosa. Portal hypertension, congestive heart failure, or gastrointestinal tract hemorrhage have also been reported. In the presented patient, the first symptoms were abdominal dystension and cramp-like abdominal pain, as a result of portal hypertension. Clinical examination is performed to detect paraumbilical pulsation and systolic murmurs with thrill, such was in our patient. Abdominal ultrasoundography and CT indicate the presence of AVF between AMS and VMS, with portal dilatation vein. However, selective arteriography AMS, allows the determination of exact location and extensiveness of AVF. In the presented patient, AVF was diagnosed by ultrasoundography and CT of the abdomen, and the diagnosis was confirmed by selective arteriography of AMS. There are two modalities of the therapy: surgery and interventional radiology methods (percutaneous catheter embolisation). Surgery has traditionally been the method of choice for treating AVF involving superior mesenterial vessels, but significant morbidity and mortality associated with surgical treatment has made interventional radiology methods prioritiy, except in patients with relative or absolute contraindications for surgery. The presented patient had achieved complete recovery after operative treatment. Early diagnosis and treatment of mesenteric blood vessel AVF prevents the development of portal hypertension and liver damages with its sequelae of variceal bleeding and ascites.

**Conclusion**

AVF of the superior mesenteric blood vessels is a rare complication of abdominal surgery. This disease should be kept in mind in patients who present with cramping abdominal pain, diarrhea and signs of portal hypertension, who in the past had abdominal surgery or trauma. Early diagnosis and treatment prevents the development of liver and heart damages, with all eventual complications.

**REFERENCES**


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