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Massive bleeding from upper gastrointestinal tract as a symptom of rupture of splenic artery aneurysm to stomach

Authors' Contribution:

- A** Study Design
- B** Data Collection
- C** Statistical Analysis
- D** Data Interpretation
- E** Manuscript Preparation
- F** Literature Search
- G** Funds Collection

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Summary

Background:

Splenic artery aneurysm is the most common aneurysm of visceral vessels. Their rupture usually leads to massive bleeding, being a direct life threat. Splenic artery aneurysms usually rupture into the free peritoneal cavity, and much less frequently into the lumen of the gastrointestinal tract.

Case Report:

We describe the case of a 38-year-old male patient, who, as a result of chronic pancreatitis, developed a false aneurysm of the splenic artery, which initially caused necrosis of the large intestine and bleeding into its lumen, and subsequently necrosis of the posterior stomach wall with the aneurysm rupture to the stomach lumen with a dramatic course.

Conclusions:

The case described confirms that splenic artery aneurysm can be a cause of bleeding to both upper and lower parts of the gastrointestinal tract, and the aneurysm rupture is usually of a dramatic and life-threatening course.

key words:

splenic artery aneurysm • gastrointestinal tract bleeding • hemorrhagic shock

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BACKGROUND

An aneurysm is a pathological widening of the lumen of the artery, developed usually as a result of pathological changes taking place in its wall. Most often the pathology concerns elastic fibre and smooth muscle cells of the middle part of the vessel. There are true, false and dissecting aneurysms. In a true aneurysm the vessel wall thins and bulges as a result of the damage done to elastic and muscle elements, which are substituted with non-elastic connective tissue bulging under the pressure of blood. A false aneurysm is caused most often after a trauma – when the vessel is damaged, blood spills and new walls of the vessel create near-artery structures, which are gradually walled-up with endothelium. A dissecting aneurysm is an intramural haematoma, developed as a result of bleeding into the middle layer of the artery, creating a multi-fissure intramural canal, which gradually lengthens under the blood pressure.

Splenic artery aneurysm (SAA) is the most common visceral vessel aneurysm, and is the third most common abdominal cavity aneurysm [1,2]. In recent years there has been a rise in the frequency of SAA [3], which may be connected with an increased availability of imaging examinations. Currently, SAA is estimated at 0.01% among young people, growing to 10.4% in elderly patients [4].

Among the factors leading to SAA, the most common is hypertension in the portal system and the adhering inflammation process, most frequently acute or chronic pancreatitis [5,6]. Much less frequent, but still important causative factors, are fibromuscular dysplasia, collagenopathy and atherosclerosis [7]. Specialist literature also describes aneurysms connected with trauma and even mycotic infection [8,9].

In the initial stage, SAA is asymptomatic, as a result of which, in spite of significant development of imaging techniques (e.g., abdominal angiography, ultrasound, magnetic resonance or computed tomography) which has taken place in the past 25 years, splenic artery aneurysms are rarely diagnosed. Since their rupture leads to sudden deterioration of the patient's condition due to massive bleeding, fatal in most cases, a proper diagnosis is usually made in the course of post-mortem examination [10]. Most often SAAs rupture to the free visceral cavity, but 30% of them perforate to the lumen of intra-abdominal visceral organs [4]. A serious diagnostic problem is the rupture of asymptomatic and undiagnosed SAA in a pregnant patient in labour [10–15].

CASE REPORT

A 38-year old male patient in very serious condition was admitted to a regional hospital because of massive bleeding from the lower part of the gastrointestinal tract. He had not been operated on previously. For the last 2 years he had been suffering from chronic pancreatitis. During emergency laparotomy, a large tumour was detected in the area of the tail of the pancreas, retracting the transverse colon and the splenic flexure of the colon. Resection of the colon by the Hartmann method with stoma created on the ascending colon and partial resection of the inflammatory tumour were performed. During the next 2 days the patient underwent another 2 laparotomies due to the bleeding into the peritoneal cavity, during which bleeding areas near the pancreas and spleen

cavity with inflamed tissue were understitched. In view of the continuously deteriorating condition of the patient, on the third day after the first laparotomy he was sent to the Clinical Ward of Anaesthesiology and Intensive Care in Poznan. On admission the patient was in very serious condition, suffering from respiratory insufficiency, incoherent, with hypotension, oliguria and above-normal kidney parameters, general edema and an infected wound. As a result of intensive treatment including fluids transfusions, pressor amines, substitute ventilation and empiric antibiotic therapy, a gradual improvement in general condition was observed. In computed tomography of the abdomen, a false aneurysm of splenic artery was diagnosed, and aneurysm embolization was planned (Figures 1–3). While awaiting embolization, on the third day of hospitalization, sudden massive bleeding from the gastrointestinal tract took place, manifested with a spill of bright-red blood through the stomach tube, through the mouth next to the tube and through the anus. The patient's condition drastically deteriorated within several minutes. The patient, in critical condition (systolic pressure 20 mmHg), was transferred to the operating theatre, where laparotomy was immediately performed. During the operation, twisted mesentery was diagnosed, which was the reason for mechanical ileus, necrosis of the typhlon and the colon with stoma at its end, and turbid exudates with no traces of blood in the peritoneal cavity. In order to find the bleeding location, the anterior wall of the stomach was cut, and its lumen was found to be filled with arterial blood. The cause of this was bleeding from the false aneurysm of the splenic artery, which led to the necrosis of the posterior wall of the stomach and perforation to its lumen. Resection of the false aneurysm of the splenic artery, together with the spleen, was performed, the twisted mesentery was un-twisted, the necrotic right-hand part of the colon was removed along with stoma and the end part of the ileum, necrotic edges of perforated posterior wall of the stomach were removed and the perforation was stitched, gastrotomy was stitched-up in the anterior wall of the stomach, and the ileostomy was created. The peritoneal cavity was washed out, drained, and in view of infected fluid present and uncertain blood supply of the twisted small intestine, a zipper was stitched in the abdominal integument in order to facilitate a planned relaparotomy, which was performed on the second day, finding little turbid fluid and sufficient blood supply. The peritoneal cavity was washed out, and the zipper was kept. After another 2 days, during another laparotomy, the peritoneal cavity was washed out again and the abdominal integument was finally closed up. During that time the patient was intensively treated in the ICU (respiratory treatment, pressor amines, guided antibiotic therapy, parenteral nutrition, transfusion of 12 units of eritrocit mass, 8 units of frozen plasma and 8 units of thrombocyte mass). Gradual improvement of the hemodynamic condition of the patient was observed. On the 9th day the patient was extubated and on the 14th day he was transferred to the surgical clinic. Post-operation treatment was complicated due to festering of the wound. In the course of laryngological examination due to hoarseness, displacement of the arytenoids cartilage and limitation of movement of the right vocal fold was diagnosed. On the 24th day after the operation, the patient was discharged (Figure 4).

DISCUSSION

The course of splenic artery aneurysm (SAA), until its rupture, is usually asymptomatic [16]. They are most frequently

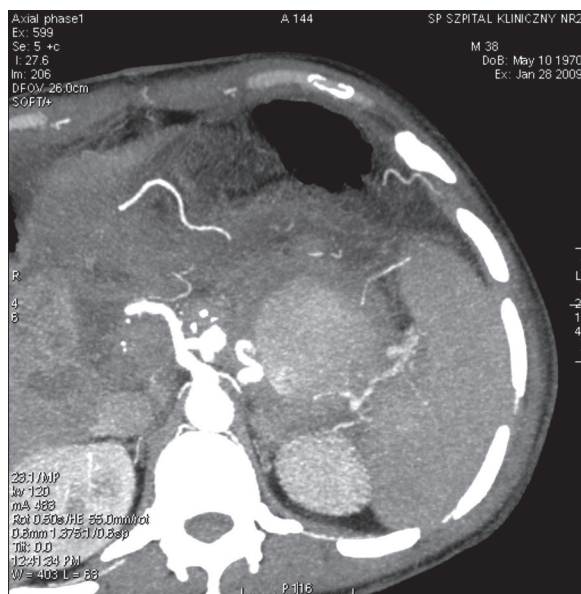


Figure 1. MDCT with intravenous contrast administration – arterial faze.



Figure 3. MDCT with intravenous contrast administration – venous faze. MIP reconstruction with soft tissue window – level settings show pathologic mass up the pancreas, sagittal view.

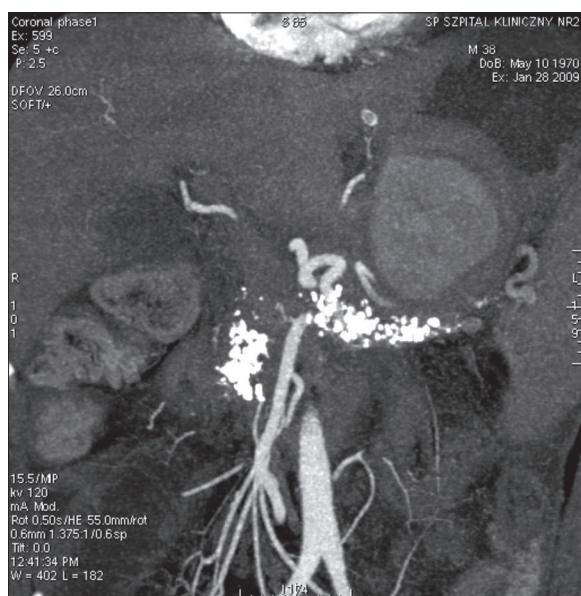


Figure 2. MDCT with intravenous contrast administration – arterial faze, MIP reconstruction 5 mm with soft tissue window – level settings show pathologic mass up the pancreas, coronal view.

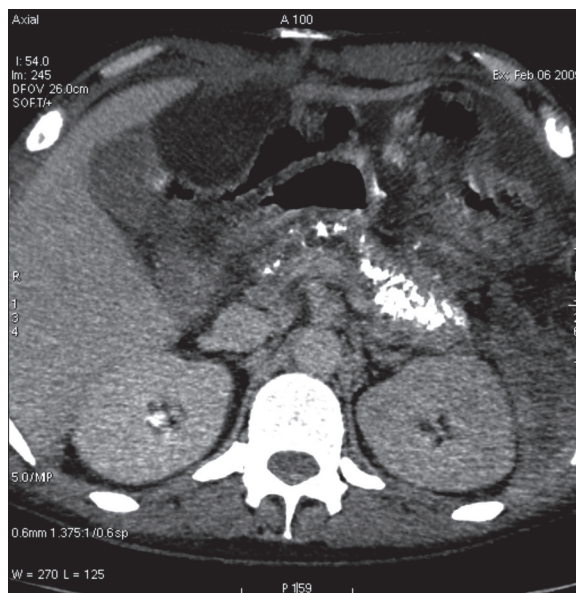


Figure 4. MDCT with intravenous contrast administration – venous faze. Post-operation exam.

diagnosed during examination for other reasons. A recommended therapeutic procedure in such cases is percutaneous, intravascular embolization or laparoscopic ligation of the aneurism [1–3,9,17,18]. These methods give good therapeutic results, have a short convalescence period and beneficial cosmetic effect, as well as creating better operating conditions for subsequent, elective ‘open’ surgery, should need be [3]. In case of non-ruptured SAA, laparotomic surgeries are rare and are performed only in exceptional situations, in case of inefficiency of low-invasive methods or their complications in the form of perforation of aneurism or migration of embolization coils to the lumen of the

gastrointestinal tract [19]. In specific cases it may be necessary to perform circular or subtotal resection of the pancreas and splenectomy [20–22]. In case of acute, sudden rupture of SAA, accompanied by a sudden deterioration of the general condition due to a sudden hypovolemic shock in the course of massive bleeding to the peritoneal cavity or the gastrointestinal tract, the situation is quite different. In our opinion, as well as in the opinion of other authors, in such situations the only effective procedure, in view of the drastically deteriorating condition of the patient, leading to their death within minutes, is immediate laparotomy [7,10,11,13,14,23]. Surgery performed in such conditions

has more complications than in elective surgery, among which the most frequent is iatrogenic fistula of the pancreas. Laparotomy in a patient in bleeding shock caused by massive bleeding from the ruptured aneurism is a life-saving procedure, the success of which depends mainly on the speed of the decision to perform laparotomy, immediate readiness of the operating theatre and the experience of surgeons and anaesthesiologists forming the therapeutic team. However, making a correct diagnosis in a short time is extremely difficult. The course of the disease is dynamic, and symptoms are few. Among them, hypovolemic shock is predominant, and sometimes symptoms are present of massive bleeding from the gastrointestinal tract [4,8,9,24]. In case of aneurism perforation to the colon, massive bleeding from the lower part of the gastrointestinal tract is observed, whereas SAA perforation to the stomach is manifested in fresh blood during rectal examination, and frequently spilling from the anus, as well as hematemesis. SAA rupture to the Wirsung duct is especially difficult to diagnose. This condition has symptoms of bleeding from the upper part of the gastrointestinal tract, and is called 'pseudo-hemophilia' or 'wirsungorrhagia' [6,25]. Taking control of acute bleeding and stabilization of the patient's condition are a priority, but not the final task of the doctors. It is extremely important to treat the patient on subsequent days, requiring proper intensive medical care, as well as further surgical interventions in the form of relaparotomy, clot evacuation, washing out and drainage of the peritoneal cavity, and proper care of the post-surgical wound.

CONCLUSIONS

This case confirms that the relatively rare pancreatitis complications in the form of a false aneurism of the splenic artery may be the cause of necrosis of the walls of the organs adhering to the aneurism, and the cause of bleeding to both the lower and upper parts of the gastrointestinal tract. Aneurism rupture to the stomach is the cause of massive bleeding, being a life-threatening condition, and only immediate surgical intervention can save the patient.

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