Hemorrhagic shock secondary to rupture of a right gastroepiploic artery aneurysm: Case report and brief review of splanchnic artery aneurysms

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A case of a 78-year-old woman who presented with hemorrhagic shock and abdominal pain, and who was subsequently found to have

a ruptured aneurysm of the right gastroepiploic artery, is presented. She underwent open surgical resection of the aneurysm without any significant postoperative complication. A brief review of splanchnic artery aneurysms with regard to their incidence, presentation and approaches for repair is also presented.

Key Words: *Gastroepiploic artery; Splanchnic aneurysm*

CASE PRESENTATION

A case of a 78-year-old woman who was transported to the emergency room with mental status deterioration associated with hypotension and abdominal pain is presented. Her medical history was significant for hypertension, atrial fibrillation, dementia and a previous aortic valve replacement. She was being anticoagulated with coumadin for both her valve replacement and her atrial fibrillation. Physical examination showed the patient to have a pulse rate of 110 beats/min, blood pressure of 80/40 mmHg and normal temperature. She was alert, but lethargic and confused. Her abdominal examination showed a nondistended abdomen with diffuse tenderness. She did not have melanic stool or bright red blood per rectum, and there was no history of nausea or hematemesis. Laboratory evaluations were significant for hemoglobin of 7 g/L, a hematocrit of 22%, white blood cell count of $8 \times 10^9/L$, and normal blood urea nitrogen and creatinine. Resuscitation measures were instituted, and the patient underwent a computed tomography scan of the abdomen and pelvis with oral and intravenous contrast (Figure 1). The images demonstrated a large (5.2 cm) ruptured aneurysm extending off the right greater curvature of the stomach with moderate hemoperitoneum. The patient was then taken to the operating room for an exploratory celiotomy. Approximately 2 L of blood were aspirated from the peritoneal cavity upon entry. The source of bleeding was found to be a ruptured aneurysm of the right gastroepiploic artery (GEA). The aneurysm was then resected following proximal and distal arterial control. Upon completion, the patient was noted to have a tear on the medial surface of the spleen with subsequent mild bleeding. Due to the need for postoperative anticoagulation for the patient's prosthetic valve, it was decided to perform a splenectomy. The patient was transferred to the surgical intensive care unit where she remained intubated for

three days. She was transferred to the ward where she recovered without any postoperative complications until the time of discharge to a rehabilitation facility. A repeat computed tomography scan was performed (Figure 1D) for a leukocytosis that showed complete resection of the aneurysm and no other pathology.

DISCUSSION

The present case warranted report because of its overall rarity. Splanchnic artery aneurysms are the rarest of all aneurysms of the arterial system, and aneurysms of the GEA are one of the least common subtypes. Ten separate institutional reviews identified in the literature reported a total of 197 splanchnic aneurysm cases (1-10). The predominant locations were splenic (35%), hepatic (23%), superior mesenteric (19%), pancreaticoduodenal/gastric (8.6%), celiac (7.6%) and renal (7%) arteries. GEA aneurysms accounted for only 3.5% (7) of the cases. Splenic aneurysms are likely the most common because of their association with pancreatitis. Generally, however, the etiology is most frequently atherosclerotic disease (1,8).

The rarity of these aneurysms makes it difficult to accurately predict their natural history. Most frequently, the diagnosis is not made until complications arise. Although thrombosis of a GEA aneurysm has been reported (11), splanchnic aneurysms are typically complicated by rupture with subsequent pain and hemorrhagic shock. However, aneurysms of the pancreaticoduodenal and gastroduodenal arteries have also presented with hematemesis or hemobilia secondary to localized erosion into neighbouring structures, as well as obstructive jaundice (10,12). Mortality after rupture of these aneurysms has been reported to be as high as 70%, so the

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Figure 1) Computed tomography scan images of the aneurysm extending off the greater curvature of the stomach (A, B and C). D Postoperative computed tomography scan showing resolution of the aneurysm

traditional standard has been to repair these aneurysms when they are identified (13).

There are various reported approaches to splanchnic artery aneurysms. An open surgical approach has been reported most frequently. This generally includes either aneurysmectomy or exclusion. Depending on the location, such as the superior mesenteric artery, simultaneous revascularization to maintain arterial inflow is required. For non-emergent aneurysms, a laparoscopic approach has been reported with good success (14-16). These have included repairs of aneurysms of the splenic arteries and GEAs. Additionally, endovascular approaches using arterioembolization are frequently used. Kramman et al (17) reported

their experience of endovascular embolization of 13 splanchnic aneurysms. Eleven of the 13 (85%) were successful without any complication; however, two were complicated by aneurysmal bleeding.

In summary, splanchnic artery aneurysms are extremely rare entities, and are often diagnosed after rupture or other secondary complications. If diagnosed incidentally, the general recommendation is elective repair of these aneurysms, due to the likelihood of future rupture and subsequent high mortality rate. While open operative repair is the strategy of choice, particularly in emergent cases, endovascular and laparoscopic approaches are suitable options in certain aneurysms.

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