

Successful Surgical Treatment for Aneurysm of Splenic Artery with Anomalous Origin

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The splenic artery is the third common site of an infrarenal abdominal arterial aneurysm after the abdominal aorta and iliac arteries, and the most common site of a visceral artery aneurysm. It is a rare, but clinically important form of vascular disease with the potential for life-threatening rupture. We report a 64-year-old woman with a splenic artery aneurysm. Though she was asymptomatic, calcification around the left upper quadrant was incidentally detected. A saccular aneurysm with calcification located in the proximal portion of the splenic artery was detected by computed tomography (CT). Anomalous origin of the splenic artery, from the superior mesenteric artery (SMA), was also detected. Aneurysmal resection without splenectomy was carried out successfully. A suitable approach to aneurysms must be selected in each case, because the splenic artery exhibits congenital anomaly in 10% of all the people. (Ann Thorac Cardiovasc Surg 2005; 11: 346–9)

Key words: splenic artery aneurysm, surgical treatment, anomalous origin of the splenic artery

Introduction

Visceral artery aneurysms are a rare but potentially life-threatening form of vascular disease. Their clinical importance is their potential for rupture into adjacent viscera, resulting in life-threatening hemorrhage. Splenic artery aneurysm accounts for about 60% of visceral artery aneurysms. It is usually asymptomatic, although about 20% of patients are symptomatic. According to previous reports, rupture occurs in 3.0 to 9.6% of patients, with a mortality rate of 25% for patients with a ruptured aneurysm but no greater than 0.5% for non-ruptured patients treated surgically. This case had a very rare pattern of splenic artery anomaly, with its origin from the superior mesenteric artery (SMA) separate from the celiac artery. The splenic artery exhibits congenital anomaly in 10% of all the people. A suitable approach to the aneurysms must

therefore be selected on a case-by-case basis.

Case Presentation

The patient was a 64-year-old woman. On barium enema performed as part of a medical check, calcification around the upper quadrant was incidentally detected. Three dimensional computed tomography (3D-CT) demonstrated a saccular calcified aneurysm (22×27 mm) in the proximal portion of the splenic artery (Fig. 1). The aneurysm was located just behind the pancreas. Anomalous origin of the splenic artery, from the SMA, was also detected.

We approached the aneurysm through a median laparotomy and transverse mesocolon. The aneurysm was located in the proximal portion of the splenic artery just as it took off from the proximal portion of SMA (Fig. 2). We incised the aneurysm after clamping three portions; the splenic artery, proximal and distal portion of the SMA. The splenic artery had sufficient backflow, and was approximately 20 mm away from the SMA. Therefore we did not reconstruct the splenic artery in order to avoid distortion to the SMA, but simply ligated the cut off portion of the splenic artery. The lateral portion of the SMA was closed with running suture.

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Fig. 1. CT scan demonstrated a saccular calcified aneurysm in the proximal portion of the splenic artery. Its maximum size was 22×27 mm.

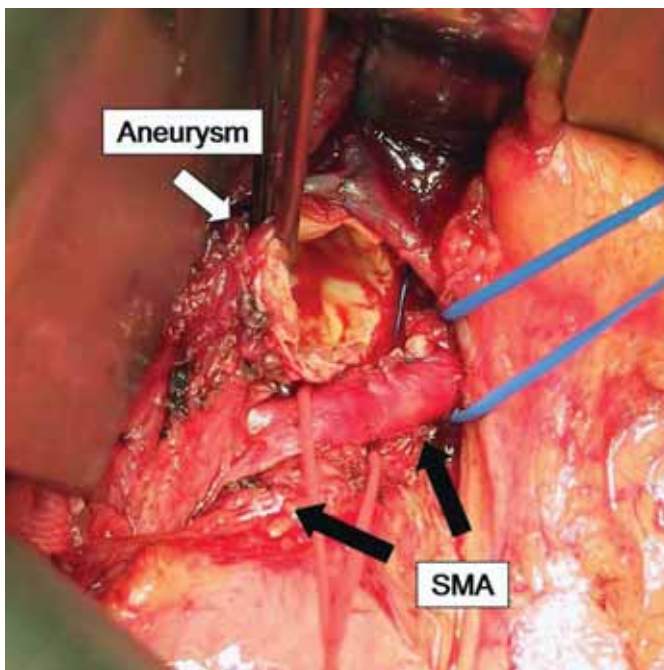


Fig. 2. The aneurysm (↗) was located in the proximal portion of the splenic artery just after take-off from the proximal site of the SMA (↘). Aneurysmal resection was carried out without reconstruction of the splenic artery.

The distal portion of the splenic artery and the SMA were enhanced without stenosis on 3D-CT 10 days post-operatively (Fig. 3). The patient returned home 17 days after surgery.

Discussion

Visceral artery aneurysms are rare but important vascular disease because of their potential for fatal rupture.

Splenic artery aneurysm accounts for about 60% of visceral artery aneurysms, and is the third most common site of infrarenal abdominal arterial aneurysm following the abdominal aorta and iliac arteries, and the most common site of visceral artery aneurysm.^{1,2)} It occurs most often in the distal portion of the splenic artery, and is multiple in approximately 20% of cases. It usually is saccular in form, and has a female-to-male ratio of 4:1.²⁻⁵⁾

Patients with a splenic artery aneurysm are often as-

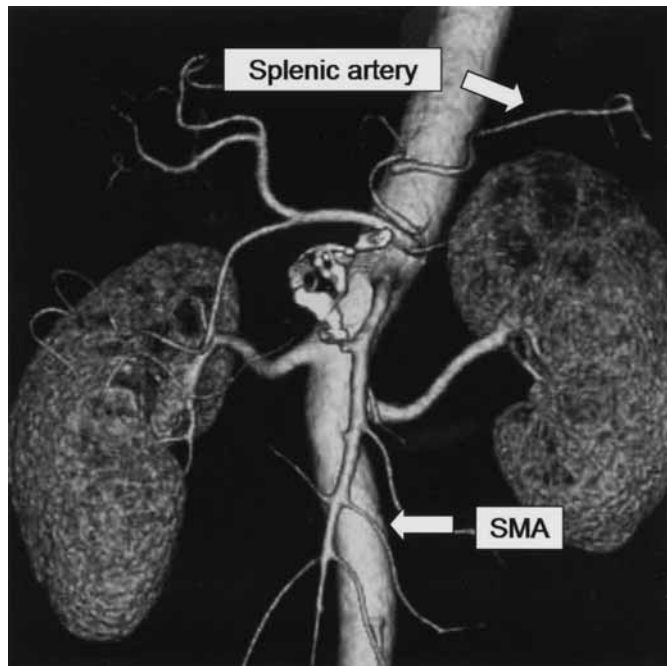


Fig. 3. The distal portion of the splenic artery and the SMA were enhanced without stenosis and obstruction on 3D-CT 10 days postoperatively.

ymptomatic, and only 20% have symptoms such as vague left upper quadrant or epigastric discomfort.^{2,3)} Whether surgical treatment is needed for splenic artery aneurysm is determined based on the natural history of the aneurysm. Rupture is the most fatal clinical presentation of the splenic artery aneurysm. Life-threatening rupture occurs in 3.0% to 9.6% of bland splenic artery aneurysms, with a 25% mortality rate, but the mortality rate is no greater than 0.5% of non-ruptured patients treated surgically.^{1-4,6)} The highest incidence of rupture is in young pregnant women. More than 95% of splenic artery aneurysms detected during pregnancy undergo rupture. Maternal mortality after aneurysmal rupture during pregnancy is approximately 70%, and fetal mortality exceeds 75%.^{2-4,7,8)} In nonpregnant patients, mortality rate after surgical treatment for ruptured aneurysms is less than 25%.¹⁾ Therefore, prompt surgical treatment even for asymptomatic splenic artery aneurysms is recommended for all low-risk patients with relatively large aneurysms (larger than 2.0 cm), and for pregnant patients or females of childbearing age. Since the presented patient had a 22 mm saccular aneurysm with calcification, surgical treatment was performed.

We approached the aneurysm through a median laparotomy. The most common approach is through the lesser sac with incision of the gastrocolic ligament.^{2,6)} The others are a superior approach through the minor omentum, and an inferior approach with incision of the gastrocolic

ligament and transverse mesocolon. The splenic artery sometimes exhibits a congenital anomaly, and originates from the celiac trunk in 91% individuals, followed by the abdominal aorta in 8% and other sites in 1% in a previous study of cadavers.⁹⁾ In our case, the aneurysm was located in the proximal portion of the splenic artery arising from the SMA. We therefore incised the gastrocolic ligament and the transverse mesocolon to approach the aneurysm. A suitable approach to the aneurysms must be selected in each case.

The surgical treatment for splenic artery aneurysms has been well-established in the past decade. Aneurysmal resection preserving the spleen with or without reconstruction of the splenic artery and percutaneous catheter intervention took the place of conventional splenectomy in order to preserve host resistance, though conventional splenectomy was performed in most cases in the past.^{2,3,5,6,10)} The treatment of splenic artery aneurysm depends on its location in the splenic artery. The standard treatment of aneurysm of the distal part of the splenic artery is aneurysmectomy with splenectomy, while if the aneurysm is located in the proximal or middle portion of the splenic artery, excision of the aneurysm with or without reconstruction of splenic artery, or simple ligation of the splenic artery proximal and distal to the aneurysm is the preferred technique.¹⁰⁾ Even if the splenic artery is not reconstructed, rich blood supply from the short gastric artery prevents infarction of the spleen. Because the

splenic artery had sufficient backflow from the distal site and was 20 mm away from the SMA, we excised the aneurysm without reconstruction of the splenic artery to avoid distortion to the SMA. On a postoperative CT scan, the patient's spleen was enhanced from the distal site. Nonsurgical treatment with coil embolization may be effective for the high-risk patients, but cannot be used for giant aneurysms and has the possibility of recurrence of aneurysm and complications such as infarction and abscess formation.⁶ We therefore suggest that surgical treatment must be selected for all low-risk patients.

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