A Case of Unruptured Right Gastroepiploic Artery Aneurysm Successfully Resected by Laparoscopic Surgery

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ABSTRACT

A 50-year-old woman was admitted to our hospital to undergo surgery to remove a pituitary adenoma. Preoperative dynamic computed tomography revealed an incidental right gastroepiploic arterial aneurysm (GEAA). After removal of the pituitary adenoma, we performed a laparoscopic right gastroepiploic aneurysmectomy. The postoperative course was uneventful. Right GEAAs should be treated at diagnosis owing to the high possibility of rupture. Laparoscopic right gastroepiploic aneurysmectomy is feasible and should be considered for the treatment of right GEAAs.

Key words Abdominal visceral artery aneurysm; Gastroepiploic artery aneurysm; Laparoscopic surgery

Abdominal visceral artery aneurysms are relatively rare, especially gastroepiploic arterial aneurysms (GEAAs).[1] The risk of rupture of GEAAs is high and most GEAAs are identified after rupture or as a result of secondary complications. GEAA rupture is associated with a high mortality rate.[2] Here, we report a rare case of a right GEAA that was diagnosed preoperatively without any complications and was treated successfully with laparoscopic surgery.

PATIENT REPORT

A 50-year-old woman was admitted to our hospital to undergo surgery to treat a pituitary adenoma. On physical examination, she showed an acromegaly-like facial appearance. She had never smoked or consumed alcohol. She had mild hypertension that did not require medication. Blood tests revealed elevated growth hormone (25.8 ng/mL) and insulin-like growth factor-1 (853 ng/mL) levels, possibly due to overproduction by the pituitary adenoma. The tumor markers carcinoembryonic antigen (CEA) and carbohydrate antigen 19-9 (CA19-9) were both within normal limits. Preoperative dynamic computed tomography revealed an incidental right GEAA (Fig. 1).

The right GEAA was located in the proximal right gastroepiploic artery and was 23 mm in diameter. Surgery was performed to remove the pituitary adenoma. Sixty days after this operation, the patient was referred to our department for treatment of the right GEAA. Because the aneurysm was not near the root of the right gastroepiploic artery, we considered it possible to ligate the GEAA proximally and distally, and excise it. This right gastroepiploic aneurysmectomy was performed laparoscopically. Under general anesthesia, the patient was placed in the supine position with open spread. After the pneumoperitoneum was established using the open technique at the umbilicus, a flexible electrolaparoscope was introduced through the umbilical port. Four additional ports were placed in the upper abdominal area (three 5-mm ports under the bilateral rib bow and the right side of the umbilicus and a 12-mm port at the left side of the umbilicus). The abdomen was insufflated with carbon dioxide to 8 mmHg. During laparoscopic exploration, a 2-cm spherical mass was seen at the right side of the greater omentum (Fig. 2).

After detaching the greater omentum using laparoscopic coagulation shears (LCS, Ethicon Endosurgery, Cincinnati, OH), the right gastroepiploic artery was exposed proximal and distal to the GEAA and clipped (Fig. 3).

The GEAA was then excised and removed through the umbilical trocar incision. The aneurysm was 2.2 × 1.9 × 1.8 cm (Fig. 4).

Intraoperative blood loss was minimal and the operation took 101 min. Staining with Elastica van Gieson confirmed that the tunica media were present, although disrupted. Thus, the final diagnosis was a pseudoaneurysm. The postoperative course was uneventful, and the patient was discharged on day 6.

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Abbreviations: CA19-9, carbohydrate antigen 19-9; CEA, carcinoembryonic antigen; GEAA, gastroepiploic arterial aneurysm; GDA, gastroduodenal artery; PDA, pancreaticoduodenal artery; SAA, splanchnic artery aneurysm; SMA, superior mesenteric artery

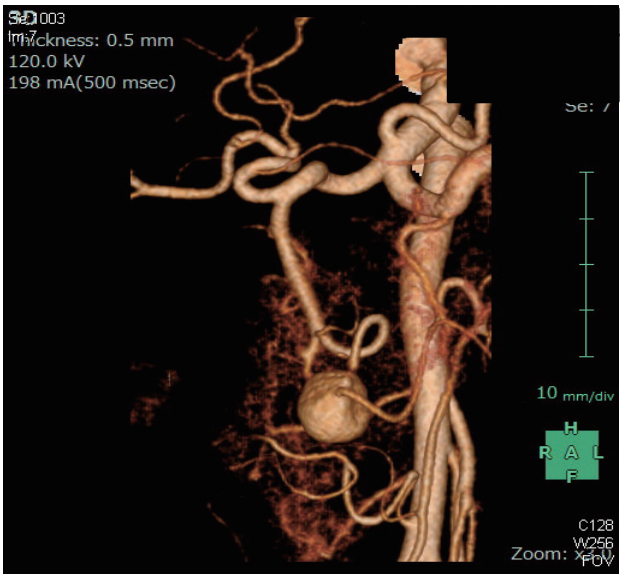

Fig. 1. 3D computed tomography angiography shows the 17-mm aneurysm in the right gastroepiploic artery.

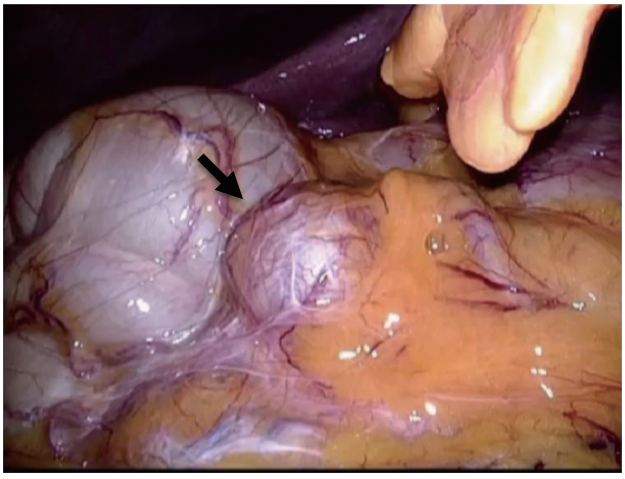

Fig. 2. Operative findings revealed a 2-cm round mass (arrow) at the right side of the greater omentum.

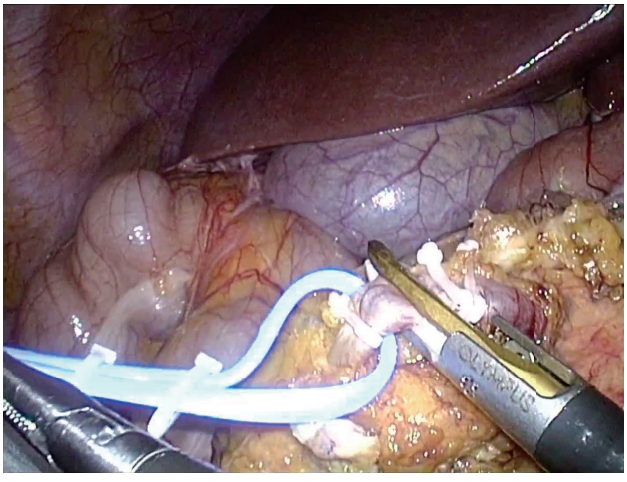

Fig. 3. The right gastroepiploic artery was clipped and divided at the proximal site of the right gastroepiploic arterial aneurysm.

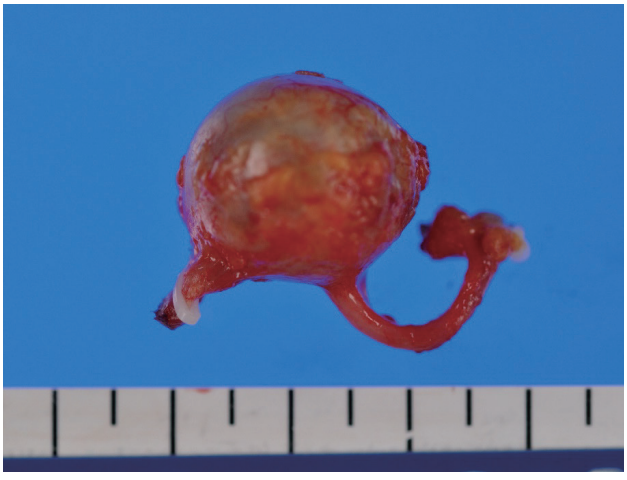

Fig. 4. Surgical specimen shows an aneurysm of 2.2 × 1.9 × 1.8 cm.

DISCUSSION

Abdominal visceral artery aneurysms are a relatively rare vascular disease. Stanley et al. reported the abdominal viscera aneurysms of 1,118 patients, including splenic aneurysms (656 patients, 58.7%), hepatic artery aneurysms (227 patients, 20.3%), superior mesenteric artery (SMA) aneurysms (89 patients, 8.0%), and gastric and gastroepiploic artery aneurysms (53 patients, 4.9%).[1] Abdominal visceral artery aneurysm has been associated with arteriosclerosis, congenital vascular abnormalities, infection, trauma, inflammation, vasculitis due to collagen disease, and segmental arterial mediolysis.

Because rupture of abdominal visceral artery aneurysms is associated with a high mortality rate, the timing of treatment is extremely important. Despite this, there is no consensus regarding the optimal timing for treating right GEAAs. Corey et al. previously determined the natural history of 138 splanchnic artery aneurysms and concluded that small splanchnic artery aneurysms (SAAs) (25 mm or less) in major arteries, such as the celiac artery, splenic artery, and common hepatic artery, are not prone to significant expansion and do not require frequent surveillance imaging.[2] Conversely, gastroduodenal aneurysms and aneurysms of the pancreaticoduodenal seem to behave in a different manner. It is important to recognize that these aneurysms differ from other types of SAAs in their potential for growth and rupture. It has been reported that size was not predictive

of rupture and that these aneurysms were strongly associated with rupture on univariate analysis.[2] Ducasse et al. also reported that most ruptured pancreaticoduodenal arteries (PDAs) are < 10 mm.[3] Because the right GEAA is a branch of the gastroduodenal artery (GDA), it seems necessary to treat at diagnosis, regardless of aneurysm size.

There are endovascular therapy and surgical therapy options for the treatment of abdominal visceral artery aneurysms. Endovascular therapies include coil embolization and stent graft exclusion, and are effective for the treatment of PDAs and GDAs. It has been reported that more than 90% of patients with either PDAs or GDAs were successfully managed by endovascular therapies, with complete obliteration of the aneurysm sacs on follow-up imaging 30 days after the procedure.[2] Therefore, endovascular therapy is a considerable treatment option for right GEAAs. However, complications sometimes occur after an endovascular repair, including distal thromboembolic events, non-target vessel embolization, coil migration, end-organ infarction, and intra-procedural aneurysm rupture.[4–6] Splenic atrophy or infarct has been reported in 20%–40% of cases following endovascular treatment of distal or hilar splenic artery aneurysms.[7] Furthermore, embolization of the splanchnic vessels is difficult because the anatomy is so variable. Therefore, endovascular therapy should be performed by an experienced radiologist.

Surgical resection of the aneurysm is another option for the treatment of right GEAAs. When possible, the aneurysm should be ligated proximally and distally, and excised. Unlike other abdominal visceral artery aneurysms, the gastroepiploic artery can be divided without any functional disorder. Furthermore, recent advances in laparoscopic surgery make it a viable technique for the treatment of abdominal visceral artery aneurysms. There are accumulating reports showing the successful laparoscopic treatment of splenic artery aneurysms, which is the most common abdominal visceral artery aneurysm.[8–11] On the other hand, to the best of our knowledge, only three cases (including our case) of successful laparoscopic right gastroepiploic aneurysmectomy have been reported.[12, 13] Laparoscopic procedures are not complicated for the treatment of GEAAs and are less invasive compared with open surgery. Furthermore, aneurysmectomy is more effective treatment than endovascular therapy.[6] Therefore, laparoscopic right gastroepiploic aneurysmectomy was performed for the treatment of GEAAs in the current case.

In conclusion, right GEAAs should be treated at diagnosis owing to the high possibility of rupture and associated high mortality rate. Laparoscopic right gastroepiploic aneurysmectomy is feasible and should be considered for the treatment of right GEAAs.

The authors declare no conflict of interest.

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