Successful and Complete Removal of Asymptomatic Splenic Artery Aneurysm without Splenectomy

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Citation

M Ito, T Todoroki, T Saito, Y Yamamoto, Y Moon, K Mori. *Successful and Complete Removal of Asymptomatic Splenic Artery Aneurysm without Splenectomy*. The Internet Journal of Surgery. 2008 Volume 20 Number 2.

Abstract

Recent advances in diagnostic imaging technology have made coincident detection of asymptomatic aneurysms during other investigations easier. They are treated by various modalities because of the high rupture risk (up to 25%) and the even higher mortality rate resulting from rupture ranging from 25 to 70%. There are many treatment modalities including simple ligation of the splenic artery with splenectomy, resection of the aneurysm followed by vascular anastomosis by open or laparoscopic surgery, coil embolization and graft-stent by radiologic intervention. The size and location, surgeon's or radiologist's experience, and the urgency of the intervention (emergency or elective) direct the choice of treatment procedure. There is a general consensus for the need to treat all asymptomatic visceral artery aneurysms with a size greater than 2cm. Here, we report a case of asymptomatic SAA originating on the splenic hilum, completely removed without recourse to splenectomy and vascular reconstruction.

INTRODUCTION

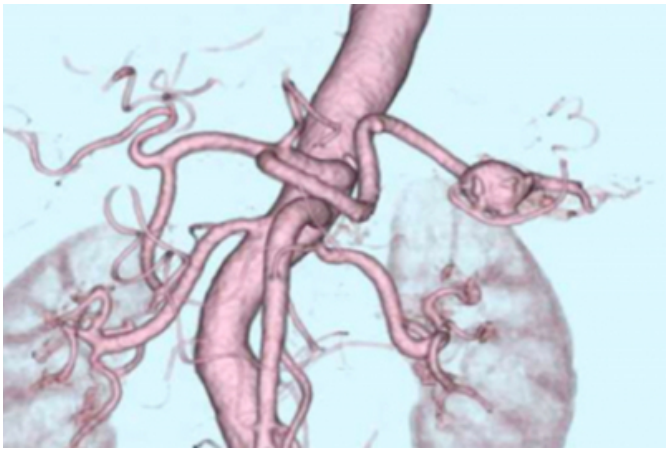
Recent advances in diagnostic imaging technology have made the detection of an asymptomatic splenic artery aneurysm (SAA) easier. Asymptomatic aneurysms are often detected by chance during other investigations. They are treated by various modalities because of the high rupture risk (up to 25%) and the even higher mortality rate resulting from rupture, which ranges from 25 to 70% [1]. There are many treatment modalities including simple ligation of the splenic artery with splenectomy, resection of the aneurysm followed by vascular anastomosis by open or laparoscopic surgery, or coil embolization and graft-stent by radiologic intervention. The size and location, surgeon's or radiologist's experience, and the urgency of the intervention (emergency or elective) direct the choice of treatment procedure. For an asymptomatic visceral artery aneurysm there is a general consensus for the need to treat all those with a size greater than 2cm [2]. On the other hand, despite the frequent discovery of asymptomatic SAA in autopsy studies, little is known about the etiology and natural history of asymptomatic SAA.

Here, we report a case of asymptomatic SAA completely removed without recourse to splenectomy and vascular reconstruction. We discuss the treatment procedures and optimal treatment indications of asymptomatic SAA.

CASE PRESENTATION

A 66-year-old woman presented at our department with an asymptomatic splenic aneurysm. There were no laboratory abnormalities; however, a preoperative 3D-computed tomography (CT) angiography (Fig. 1) showed the presence of a saccular, partly calcified aneurysm of the splenic artery (22mm in diameter) in close proximity to the primary bifurcation of the splenic hilum; there was no evidence of any other vascular abnormality in the body.

Figure 1

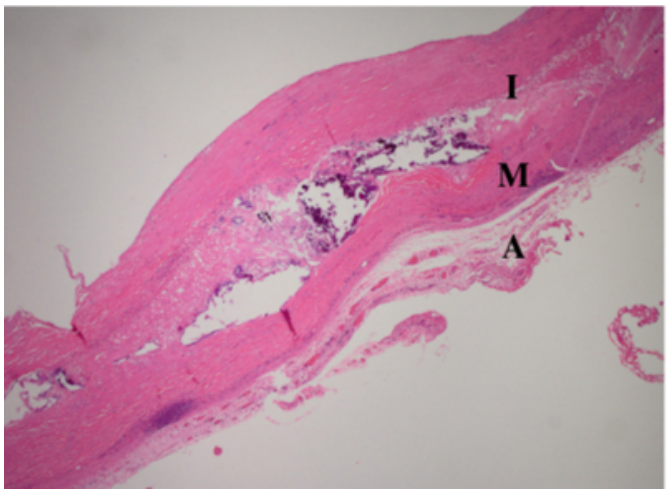


The patient was informed of the risks associated with various treatment options, namely radiological intervention, laparoscopic procedures and open surgery. These risks

included: incomplete exclusion of the aneurysm by coil embolization, postoperative pancreatitis following stent-graft repair, and our own in-house lack of experience with laparoscopic procedures. As a result, the patient elected for open surgery. In addition, because she was a Jehovah's Witness, she insisted not only that we would preserve her spleen, but also that she would not receive a transfusion of any blood products.

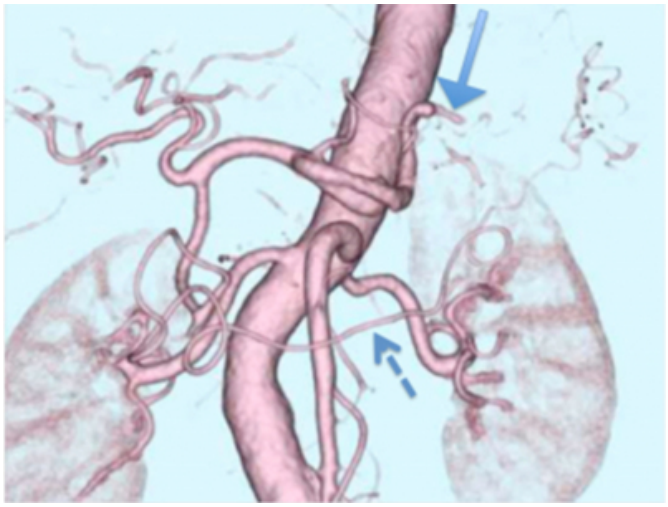
A laparotomy was performed and no abdominal adhesions or ascites were found. No ischemic color change was observed on the spleen after clamping the splenic artery between the proximal and distal portions of the aneurysm, and therefore we simply removed the aneurysm by using Ligasure® and preserved the spleen with a total blood loss of less than 50ml. Pathologic examination revealed that the wall of the aneurysm consisted of three layers (Fig. 2; I; intima, M; media and A; adventitia), and that the thickened intima contained a wide calcified area, foamy histiocyte aggregations, and numerous cholesterin clefts.

Figure 2



The patient was discharged on the eleventh postoperative day, following an uneventful postoperative course. Postoperative 3D-CT angiography (Fig. 3; solid arrow points to the proximal stump of the splenic artery and dotted arrow points to a slightly dilated epigastric artery) showed good blood supply to the spleen via the gastroepiploic artery and that the diameter of the epigastric artery was dilated slightly compared with the findings of the preoperative angiography.

Figure 3



DISCUSSION

An SAA is the third most common of the splanchnic artery aneurysms, after those of the abdominal aorta and iliac artery. [2] Based on the evidence from an autopsy study series [3], the prevalence of splenic aneurysms is placed at about 10%, with a female-to-male ratio of 4:1. Hallet et al. has reported that 20% of splenic artery aneurysms have symptoms such as vague left upper quadrant or epigastric pain [4]. However, recent advances in non-invasive image diagnosis have made the early detection of asymptomatic SAA more frequent, reducing the risk of rupture and leading to the individualized selection of suitable treatment procedures. Rupture is the most frequent and life-threatening complication. This is of particular concern in pregnancy, as over 95% of SAAs detected during pregnancy will rupture, with the consequence that maternal mortality is approximately 75%, and fetal mortality exceeds 95% [5]. On the other hand, the mortality rate after surgical treatment for non-ruptured aneurysms is less than 0.5% [6].

Concerning the necessity and modality of treatment of SAAs, the size and location, surgeon's or radiologist's experience, and the urgency of the intervention (emergency or elective) all combine to direct the choice of treatment procedure. There is a current consensus on the need to treat asymptomatic visceral artery aneurysms greater than 2cm, and symptomatic ones regardless of size [1]. In recent years, aneurysmectomy with end-to-end anastomosis has been frequently performed and can preserve the spleen, since SAAs are often saccular and located in the proximal or middle third of the splenic artery [7]. However, with SAAs located on the splenic hilum or on the distal portion, splenectomy has been commonly performed in combination

with simple ligation of the splenic artery [2]. On the other hand, great emphasis is placed upon the importance of splenic preservation whenever possible, in order to prevent perioperative infectious complications [8]. Nowadays, the endovascular approach with transcatheter coil embolization [9] or stent-graft repair [10] and laparoscopic treatment by arterial ligation with/without splenectomy have been performed [11]. We discussed the endovascular approach with our patient, but due to her faith (she was a Jehovah's Witness) she would not agree to the catheter or to the laparoscopic procedures because of the possibility of emergency bleeding due to these treatments, which would have necessitated a blood transfusion. We respected her wishes, and chose to perform a complete resection despite the close proximity of the aneurysm to the splenic hilum. We based our decision on the possibility of maintaining a blood supply through the short gastric arteries, which was based in turn on the preoperative 64-channel 3D-CT angiography findings (Fig. 1). Intraoperatively we confirmed the non-ischemic state of the spleen after clamping the splenic artery between the proximal and distal portion of the aneurysm. Postoperative course and 3D-CT angiography verified the successfully preserved spleen with the blood supply via the short gastric arteries (Fig. 3).

The pathophysiology of SAA has not been fully understood and many authors advocate that atherosclerosis seems to play a secondary role in the development, but that it is not the primary cause [1]. Idiopathic dissection, septic emboli, essential hypertension, polyarteritis nodosa, systemic lupus erythematosus, Ehlers-Danlos syndrome, fibromuscular dysplasia, and trauma are less common causes [1]. The present patient had been taking medication for about one year to control hypertension and hypercholesterolemia; however, atherosclerosis was recognized only on the wall of the aneurysm (Fig. 2). This fact might suggest a possible secondary role of atherosclerosis in the development of true aneurysms. Since the operation 3 months ago, our patient has felt well and free of any health concerns.

In conclusion, we would like to advocate spleen-preserving aneurysmectomy, using Ligasure®, as a potentially safe operative procedure that does not require vascular reconstruction, as treatment for an asymptomatic SAA originating on the splenic hilum.

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