

MULTIPLE Splenic Artery Aneurysms with the Double-Rupture Phenomenon. A Case Report

Author's Details:

⁽¹⁾**Dr. Iyad Anabtawi**-General Surgery Consultant, Department of Surgery, King Fahad Hospital Hofuf, Alahsa, Saudi Arabia. ⁽²⁾**Dr. Abdulaziz Aldhafar**-General Surgery resident, Department of Surgery, King Fahad Hospital Hofuf, Alahsa, Saudi Arabia. ⁽³⁾**Dr. Hisham Alabdullah**-General Surgery resident, Department of Surgery, King Fahad Hospital Hofuf, Alahsa, Saudi Arabia. ⁽⁴⁾**Dr. Alaa Mohamadi** - vascular surgery specialist Department of Surgery, King Fahad Hospital Hofuf, Alahsa, Saudi Arabia ⁽⁵⁾**Dr. Rashid Boshosha**-Emergency medicine resident, Department of Emergency, King Fahad Hospital Hofuf, Alahsa, Saudi Arabia.

Abstract:

Splenic artery aneurysm is rare although it is the third most common location of intra-abdominal aneurysms, its diagnosis is challenging due to the nonspecific presentation, the ruptured aneurysm can be life-threatening and sometimes present with the double-rupture phenomenon, in which an aneurysm ruptures into the lesser sac primarily, and blood overflows into the peritoneal. We report a case of a 32-year-old female who presented with moderate left abdominal pain, tachycardia and hypotensive, CT revealed multiple splenic artery aneurysm and significant hemoperitoneum, the patient was operated successfully, splenectomy and proximal ligation of the splenic artery were performed. Early and immediate diagnosis and intervention of splenic artery aneurysm are substantial in preventing the predictable complications and to consider the double rupture phenomenon.

Keywords: *splenic artery, aneurysm, rupture, double ruptured phenomena.*

Introduction:

Splenic artery aneurysm (SAA) is a rare condition although it is the third most common location of intraabdominal aneurysms after the abdominal aorta and iliac arteries (1). The significance of splenic artery aneurysm lies in the potential risk for rupture and life-threatening hemorrhage which occurs in 10% of cases with a mortality rate of 10–25% in non-pregnant patient and up to 70% in pregnancy (2). With a ruptured SAA, delayed intraperitoneal bleeding occasionally occurs 6 to 96 hours later, with blood initially contained within the lesser sac. Approximately 80% of SAAs are asymptomatic and are detected incidentally, however, there might be some symptoms like epigastric or back pain (3). Risk factors for SAA include pregnancy, portal hypertension secondary to liver cirrhosis, collagen vascular diseases, and atherosclerosis (4-6). Early and accurate clinical suspicion and diagnosis is the most important step in the management of patients with SAA. Early and immediate intervention is substantial in preventing the predictable complications. Here is a case of a present who was admitted through the emergency department with multiple splenic artery aneurysms.

Case report:

A 32-years-old female patient was transferred from a peripheral hospital as a case of query perforated acute appendicitis. At presentation, the patient was complaining of mild epigastric and left upper quadrant pain, Associated with dizziness few hours prior to presentation. There was no history of any systemic infections, trauma, family history of an aneurysm or any connective tissue disorders. she did not have any previous surgeries. The patient was three months post-delivery.

On examination, the patient had a pallor look, cold and clammy extremities, pulse rate of 135/min and BP of 80/40 mm Hg. The abdominal examination showed tenderness at left upper quadrant area.

Initial laboratory results showed hemoglobin 8.2 g/dL, hematocrit 25.6%, PT 12.4 sec, INR 1.08, electrolytes, liver and renal functions were within normal limits.

Ultrasonography of the abdomen showed a significant amount of free fluid in the abdomen and pelvis. After resuscitation and stabilization of the patient, an abdominal computed tomography (CT) scan revealed multiple aneurysmal dilatations of splenic artery with largest one measured about 12mm, associated with moderate to marked hemoperitoneum but no active extravasation. (figure 1 and 2).

The patient was shifted to the operating theatre for an emergency exploratory laparotomy, a midline incision was performed, and one and a half litter of blood evacuated intraperitoneal. Another large hematoma evacuated from the lesser sac. Exploration of the lesser sac hematoma revealed a non-ruptured small aneurysm proximally and another ruptured aneurysm involving the distal part of the splenic artery close to the hilum of the spleen. The splenic artery was ligated proximally, followed by a splenectomy. After surgery patient had uneventful postoperative course and discharged home (figure 3 and 4). The histopathology report confirmed the diagnosis of an inter splenic parenchymal hemorrhages and a true splenic artery aneurysm.

Discussion:

SAA is the most common visceral aneurysm (7). The incidence of SAA is quoted as being 0.7% of the population, The peak age of detection is the sixth decade, it is four times more in females than males (8-9). The cause is not completely clear. However, there are many contributing factors have been described include atherosclerosis, focal arterial inflammation, pancreatitis, hypersplenism, portal hypertension, trauma, and hormonal and hemodynamic changes due to pregnancy, liver transplant, and splenomegaly (10). Patients are often asymptomatic, only 20% have symptoms such as vague left upper quadrant, epigastric or back pain(11). Splenic artery aneurysm can be complicated by rupture resulting in hypovolemic shock, which could be fatal if not detected early treated properly. The mortality rate in patients with a ruptured aneurysm was 20% in the study at Mayo Clinic (12). The rupture might direct to the peritoneal cavity, or to the gastrointestinal tract causing GI hemorrhage or eroding into surrounding structures such as the splenic vein resulting in splenic arteriovenous fistula (13).

Rarely, a ruptured aneurysm can present with the double-rupture phenomenon, in which an aneurysm ruptures into the lesser omental sac primarily, and blood overflows into the peritoneal cavity after 6 to 96 hours. The patient remains stable during the primary rupture, and rapid diagnosis and treatment during this time interval can be lifesaving and may improve outcomes. Therefore, physicians should be reminded of this phenomenon when managing SAA patients, even if they are stable. This should always be considered if an abrupt shock occurs.

In addition, fluid resuscitation with appropriate and immediate shock management should be performed, and surgical treatment should be considered (14-16). Arteriography is the gold standard for diagnosis in suspected unruptured aneurysms (17) However, angiography still remains the most valuable investigative modality to localize the source of bleeding.[18] Ultrasonography with pulsed Doppler and CT scans are also useful (19). Surgical treatment includes excision, ligation, or revascularization, with or without splenectomy by open or laparoscopic methods is the conventional option of treatment in most centers especially in case of rupture. Other options include percutaneous endovascular methods by coil embolization of splenic aneurysms, or stent-graft placement depend on the size, shape, and location of the aneurysms (20).

Conclusion:

Splenic artery aneurysm is a rare condition, delay in diagnosis and management carries a high risk for mortality in ruptured aneurysms and should be considered in pregnant patients presenting with signs of hypovolemic shock.

Ethical approval:

The authors confirm that a written informed consent was obtained from the patient for publication of this case report and accompanying images.

Conflict of interest:

None.

References:

- 1- A. Abdulrahman, A. Shabkah, M. Hassanain, and M. Aljiffry. Ruptured spontaneous splenic artery aneurysm: A case report and review of the literature. *International Journal of Surgery Case Reports*. 2014;10(5)754–757.
- 2 - Manian U., Badri H., Coyne P., Nice C., Ashour H., Bhattacharya V. Endovascular treatment of a ruptured splenic artery aneurysm using amplatzer ((R)) vascular plug. *Int J Biomed Sci: IJBS*. 2009;5(1):81–84.

- 3 - Betal D, Khangura JS, Swan PJ, Mehmet V. Spontaneous ruptured splenic artery aneurysm: a case report. *Cases Journal*. 2009;2:7150.
- 4 - Abad C, Montesdeoca-Cabrera D, Saez-Guzman T. Splenic artery aneurysm. Review of two surgically operated cases. *Ann Med Interna*. 2006;23:130–132.
- 5 - Selo-Ojeme DO, Welch CC. Review: spontaneous rupture of splenic artery aneurysm in pregnancy. *Eur J Obstet Gynecol Reprod Biol*. 2003;109:124–127.
- 6 - Sunagozaka H, Tsuji H, Mizukoshi E, Arai K, Kagaya T, Yamashita T, Sakai A, Nakamoto Y, Honda M, Kaneko S. The development and clinical features of splenic aneurysm associated with liver cirrhosis. *Liver Int*. 2006;26:291–297.
- 7- Rodríguez-Cordero M, González-Quintela A, Díaz-Peromingo JA. Splenic artery aneurysm presenting with abdominal discomfort and weight loss. *Acta Clin Belg* 2014; 69:386–388.
- 8- Matsumoto K, Ohgami M, Shirasingi N, Nohga K, Kitajima M. A first case report of the successful laparoscopic repair of a splenic artery aneurysm. *Surg*. 1997;121:462-4.
- 9- R Kenningham, M J Hershman, R G McWilliams, F Campbell. Incidental splenic artery aneurysm. *J R Soc Med*. 2002 Sep; 95(9): 460–461.
- 10- Abbas MA, Stone WM, Fowl RJ, et al. Splenic artery aneurysms: two decades experience at Mayo Clinic. *Annals of Vascular Surgery*. 2002;16(4):442–449.
- 11- Dolar E, Uslusoy H, Kiyici M, Gurel S, Nak SG, Gulten M, Zorluoglu A, Sarcaoglu H, Memik F: Rupture of the splenic arterial aneurysm due to Behcet's disease. *Rheumatology*. 2005, 44: 1327-28.
- 12- S. F. Pasha, P. Gloviczki, A. W. Stanson, and P. S. Kamath, “Splanchnic artery aneurysms,” *Mayo Clinic Proceedings*, vol. 82, no. 4, pp. 472–479, 2007.
- 13- Al-Habbal Y, Christophi C, Muralidharan V. Aneurysms of the splenic artery: a review. *Surgeon*. 2010;8:223–31.
- 14- Jung Ho Kim, Han Sol Chung, Jong Ha Kim, et al. Splenic artery aneurysm with the double-rupture phenomenon. *Clin Exp Emerg Med*. 2017 Jun; 4(2): 113–116.
- 15- Davis T, Minardi J, Knight J, Larrabee H, Schaefer G. Ruptured splenic artery aneurysm: rare cause of shock diagnosed with bedside ultrasound. *West J Emerg Med*. 2015;16:762–5.
- 16- Aisha Abdulrahman, Alaa Shabkah, Mazen Hassanain, Murad Aljiffry. Ruptured spontaneous splenic artery aneurysm: A case report and review of the literature. *Int J Surg Case Rep*. 2014; 5(10): 754–757.
- 17- Wagner WH, Allins AD, Treiman RL, Cohen JL, Foran RF, Levin PM, Cossman DV. *Ann Vasc Surg*. 1997 Jul; 11(4):342-7.
- 18- de PM, Buhler L, Deleaval J, Borisch B, Mentha G, Morel P. Management of true aneurysms of the splenic artery. *Am J Surg*. 1998;175:466–8.
- 19- Mattar SG, Lumsden AB. The management of splenic artery aneurysms: experience with 23 cases. *Am J Surg*. 1995;169:580–4.
- 20- Kim Y., Johna S. Laparoscopic excision of splenic artery aneurysm. *J Soc Laparoendosc Surg/Soc Laparoendosc Surg: JSLS*. 2013;17(1):132–134.

Appendix:

Figure 1
CT abdomen revealed multiple SAA.

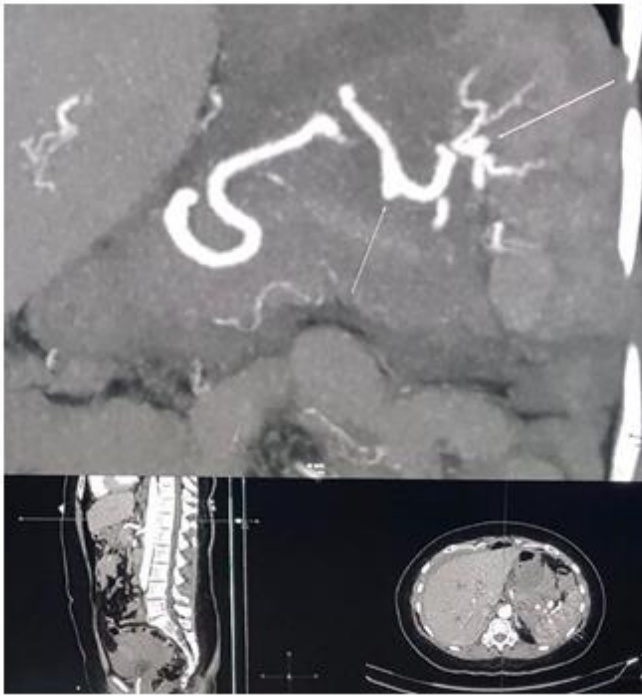


Figure 3

Figure 2

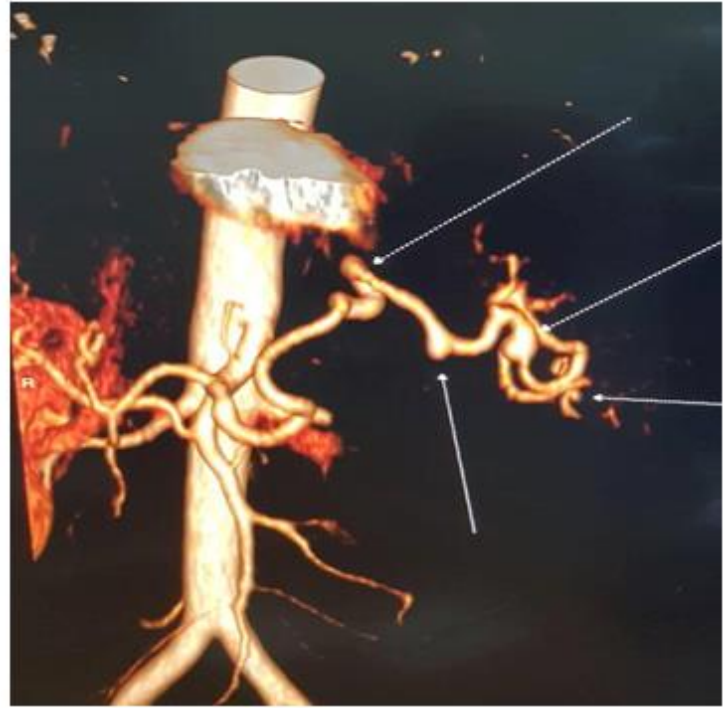


Figure 4



Post-operative CT abdomen.

