Case Report

Journal of Emergency Medicine Case Reports

Spontaneous Rupture of Splenic Artery Aneurysm: A Case Report and Review of the Literature

Fatma Zehra Özer[1], Hasan Kara[1], Ahmet Ak[1], Aysegül Bayir[1]
[1]Department of Emergency Medicine, Selçuk University, Konya, Türkiye

Abstract

Splenic artery aneurysms are uncommon and typically asymptomatic. However, they pose a high risk of mortality if they rupture. This case report describes the occurrence of a spontaneous rupture of a splenic artery aneurysm in a 55-year-old man with no known previous diseases, no trauma history, and no risk factors for developing an aneurysm who applied to the emergency department with abdominal pain. The diagnosis was determined with an urgent abdominal computed tomography angiography scan. The patient received urgent surgical intervention consisting of splenectomy and excision of the splenic artery aneurysm. The rupture of a spontaneous splenic artery aneurysm is a rare and fatal disease that necessitates urgent diagnosis and treatment. Spontaneous splenic artery aneurysm usually develops without any noticeable symptoms and is frequently discovered by chance. In the event of a rupture, it can lead to abrupt abdominal pain and hypovolemic shock and the mortality rate is high. Ultrasound, Computed Tomography, Magnetic Resonance Imaging, and abdominal aortic arteriography are the methods of imaging that are used to diagnose splenic artery aneurysms. The key elements in patient management include prompt resuscitation, diagnostic imaging, surgical consultation, and subsequently performing a laparotomy.

Keywords: Aneurysm, emergency medicine, rupture, splenic artery

Introduction

Splanchnic artery aneurysms are a rare but potentially life-threatening condition. Splenic artery aneurysms (SAA) are the third most prevalent intra-abdominal aneurysm, following aortic and iliac artery aneurysms, and account for 60% of all splanchnic artery aneurysms. SAA is described as an abnormal dilatation of the splenic artery, with a diameter above 1 cm. The prevalence of SAA in the whole population ranges from 0.1% to 10.4%. SAAs have a 4:1 female to male ratio, yet men are at greater risk than women to rupture (1). The exact cause of this condition is not completely known, but factors that increase the risk include trauma, hormonal and local hemodynamic events during pregnancy, portal hypertension, arterial degeneration and atherosclerosis (2,3). The majority of SAAs do not exhibit any symptoms before rupture and are typically discovered by chance during medical imaging procedures. Nevertheless, patients may exhibit many nonspecific gastrointestinal symptoms, with the most prevalent being indistinct or sharp epigastric or left upper quadrant pain that may radiate to the left shoulder (4). SAA is an uncommon and potentially life-threatening condition that is associated with a certain risk of rupture, particularly when it exceeds 2 cm in diameter. The symptoms consist of acute presentation with hypovolemic shock and acute abdomen as a result of intra-abdominal hemorrhage caused by rupture. The imaging methods used to diagnose splenic artery aneurysm include ultrasound, pulsed Doppler, Computed Tomography (CT), Magnetic Resonance Imaging (MRI), and the gold standard, abdominal aortic arteriography. There are multiple treatment options for splenic artery aneurysms, such as open, laparoscopic, and endovascular surgery. Surgeons will assess the most secure approach based on the urgency of the case (5, 6). This article discusses a case of spontaneous rupture of a splenic artery aneurysm (SAA) without any known risk factors.

Case Report

A 55-year-old male patient presented to the emergency room with a one-day history of abdominal pain. The patient reported no history of trauma and claimed to be in good overall health. The patient reported no known medical conditions or regular medication use in his medical history. The patient's vital signs

Corresponding Author: Fatma Zehra Özer
e-mail: fatmazehraozer013@gmail.com
Received: 14.07.2024 • **Revision:** 27.09.2024 • **Accepted:** 18.11.2024
DOI: 10.33706/jemcr.1515651

Cite this article as: Özer FZ, Kara H, Ak A, Bayir A. Spontaneous Rupture of Splenic Artery Aneurysm: A Case Report and Review of the Literature. Journal of Emergency Medicine Case Reports. 2024;15(4): 114-116

indicated a blood pressure of 120/75 mmHg, heart rate of 80 bpm, oxygen saturation of 96% on room air, and body temperature of 36.8°C. Physical examination identified widespread abdominal tenderness, with no signs of guarding or rebound tenderness detected. The rectum was found to be empty during the rectal examination. His additional physical evaluation yielded no notable findings. The electrocardiogram revealed a normal sinus rhythm without any signs of acute ischemia. The results of a complete blood count revealed a hemoglobin level of 11.5 g/dL, a white cell count of 17.3×109/L, and a platelet count of 250×109/L. All other laboratory tests were within the normal range. An abdominal Computed Tomography Angiography (CTA) scan showed an 18X14 mm aneurysm in the distal portion of the splenic artery, located 3.5-4 cm from its origin. The scan also revealed extravasation of intravenous contrast, along with intravenous contrast extravasation consisting of a large amount of free intraperitoneal fluid and intraperitoneal bleeding (Figure-1). The patient was taken for emergency surgery by the general surgery department after obtaining informed consent. A splenectomy was performed involving the excision of the aneurysmal sac. The surgical report indicated a widespread organized hematoma within the abdomen and noted the presence of leakage-type hemorrhage surrounding the splenic artery aneurysm. The surgical pathology results showed a bleeding area adjacent to the capsule in the sections of the splenectomy specimen, with no additional pathological findings observed. On the 6th postoperative day, the patient was discharged without any postoperative complaints.

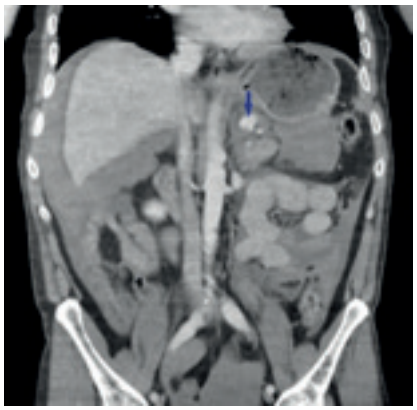

Figure 1. Splenic artery aneurysm rupture is observed at the location indicated by the arrow sign

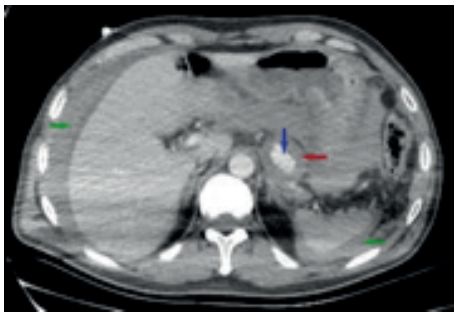

Figure 2. The hyperdense area at the tip of the blue arrow represents a ruptured aneurysmal appearance in the distal segment of the splenic artery, and there is a hypodense hematoma area around it indicated by the red arrow. The areas marked with green arrows represent perihepatic and perisplenic hemorrhagic fluid

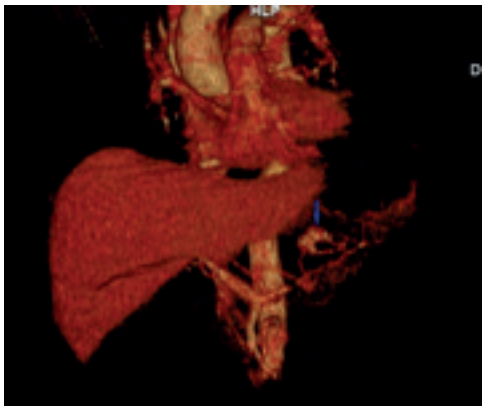

Figure 3. A three-dimensional CT image illustrates the splenic artery aneurysm indicated by the arrow

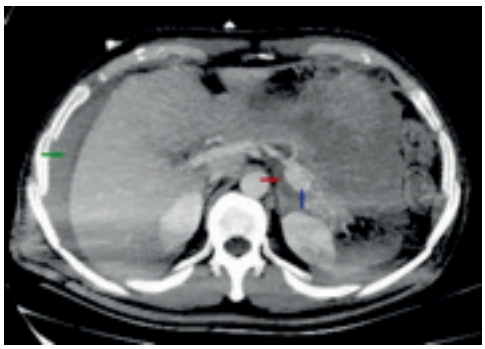

Figure 4. In another horizontal CT section, the blue arrow indicates the splenic artery aneurysm, the red arrow highlights the hematoma surrounding the aneurysm, and the green arrow shows the perihepatic hemorrhagic fluid

Figure 5. A sagittal CT section showing the splenic artery aneurysm, indicated by the arrow

Discussion

SAA is a rare but seriously life-threatening vascular disease due to the potential risk of rupture and bleeding, which occurs in 3-10% of cases. Rupture and bleeding result in sudden abdominal pain and can lead to rapidly progressing hypovolemic shock. The mortality rate might increase up to 75% after an aneurysm rupture in these patients. Therefore,

DOI: 10.33706/jemcr.1515651
Journal of emergency medicine case reports. 2024;15(4): 114-116

it is crucial to make every effort to diagnose and treat it early (5, 7). CTA is the preferred initial diagnostic method for SAAs. Alternatively, magnetic resonance angiography can be employed to confirm the diagnosis in individuals with suspected SAA and renal insufficiency that limits the utilization of iodinated contrast medium. Its pathogenesis is not completely known, however factors that increase the risk include fibromuscular dysplasia, collagen vascular diseases, being female, having a history of multiple pregnancies, and having portal hypertension (2). The natural process of SAA is similar to other intra-abdominal aneurysms. Ultimately, rupture may occur as a consequence of a progressive increase in size. Approximately 80% of splenic artery aneurysms are asymptomatic and are typically discovered by chance during medical imaging examinations. Patients with symptomatic SAA (20%) may have abdominal pain in the epigastrium or left upper quadrant. Other symptoms may include anorexia, nausea, or vomiting and are often attributed to concomitant hiatal hernia or other pathologies such as gallstones and peptic ulcer disease. Rarely, a pulsatile or other mass may be identified during a clinical examination. The choice of treatment typically relies on the etiology, anatomical location, and sizes of the aneurysm. The conventional treatment method for treating SAA involves either open or laparoscopic surgery. Typically, when dealing with proximal SAAs, the preferred approach is aneurysmectomy and reconstruction while preservation of the spleen. On the other hand, for distal SAAs, aneurysmectomy with splenectomy is required (1, 2, 8). The main intervention for ruptured SAAs primarily consists of fluid resuscitation and hemodynamic support, however, urgent surgical intervention is necessary irrespective of the stability of the patient's hemodynamics. Furthermore, it is advised that all symptomatic SAAs be treated urgently (9,10). The literature contains a few cases of splenic artery aneurysm rupture in patients who did not have substantial risk factors or an identifiable etiology. In our clinical case, a splenic artery aneurysm ruptured spontaneously in a healthy male patient who had no history of trauma, pregnancy, or other known risk factors. In our case, aneurysmectomy was performed along with splenectomy as surgical treatment. In our case, the urgent radiological diagnosis, prompt fluid resuscitation, and timely surgical intervention played a very crucial role in his survival.

Conclusion

In conclusion, even in the absence of identifiable risk factors or in patients considered to be at low risk, the possibility of a spontaneous rupture of a splenic artery aneurysm should be considered in the differential diagnosis of abdominal pain. Advanced imaging techniques and rapid and appropriate life-saving interventions are crucial for the early diagnosis of life-threatening SAA rupture.

Ethics and approval to participate: Since this is a case report, there is no requirement for approval from the local ethics committee.

Consent for publication: The patient has provided signed consent for the release of their data, which includes personal details and images.

Conflict of interest: There are no conflicts of interest to declare.

References

1. Tani R, Hori T, Yamamoto H, Harada H, Yamamoto M, Yamada M, et al. Severely Calcified True Aneurysm: A Thought-Provoking Case of Solitary Origin and Postoperative Management. Am J Case Rep. 2019;20: 620-627.
2. Al-Habbal Y, Christophi C, Muralidharan V. Aneurysms of the splenic artery - a review. Surgeon. 2010;8(4): 223-231.
3. Mandal S, Das PM, Mandal AK. Caroli's syndrome leading to splenic artery aneurysm: A rare presentation. Int J Surg Pathol, 2009; 17: 78–80.
4. Selim M, Awad Albayomy A, Almuhaish LA, Alraddadi SA, Alharbi WM. Multiple incidental unruptured splenic artery aneurysms following severe trauma. Cureus. (2020) 12: e11136.
5. Abbas MA, Stone WM, Fowl RJ, Gloviczki P, Oldenburg WA, Pairolero PC, et al. Splenic artery aneurysms: two decades experience at Mayo Clinic. Ann Vasc Surg 2002;16:442-449.
6. Telfah MM. Splenic artery aneurysm: pre-rupture diagnosis is life saving. BMJ Case Rep. 2014;26:2014:bcr2014205115.
7. EffraemidouE, Souftas V, Kofina K, Karanikas M, Lyratzopoulos N. Spontaneous rupture of a splenic artery aneurysm treated with a spleen-preserving procedure: A case report. J Surg Case Rep.2020;12;2020:rjz412.
8. Selo-Ojeme DO, Welch CC. Review: spontaneous rupture of splenic artery aneurysm in pregnancy. Eur J ObstetGynecolReprod Biol 2003;109:124–27
9. Akbulut S, Otan E. Management of giant splenic artery aneurysm comprehensive literature review. Medicine. 2015;94(27):e1016.
10. Abdulrahman A, Shabkah A, Hassanain M, Aljiffry M.Ruptured spontaneous splenic artery aneurysm: A case report and review of the literature. Int J Surg Case Rep. 2014; 5(10):754–757.