



# A Rare Cause of Acute Abdomen: Ruptured Splenic Artery Aneurysm

## *Akut Karının Nadir Bir Sebebi: Splenik Arter Anevrizma Rüptürü*

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### Abstract

Ruptured splenic artery aneurysm (SAA), rare in the emergency department (ED), is a cause of hypotension and abdominal pain. Physicians should consider the possibility of this condition especially in patients with abdominal pain and hypotension. In this paper, we report the case of a patient with ruptured SAA presenting to the ED as an intraabdominal catastrophe and review the key features of this entity.

**Keywords:** Splenic artery, aneurysm, rupture

### Öz

Splenik arter anevrizma (SAA) rüptürü, acil serviste (AS) görülen hipotansiyon ve karın ağrısının nadir bir nedenidir. Acil hekimleri, karın ağrısı ve hipotansiyonu olan hastalar için bu tanı olasılığını düşünmelidir. Biz bu olguda AS'ye başvurmış karın içi katastrof olan SAA rüptürü olan bir olguyu ve bunun temel özelliklerini gözden geçirdik.

**Anahtar Sözcükler:** Splenik arter, anevrizma, rüptür

### Introduction

Acute abdominal pain is one of the most common complaints in patients presenting to emergency departments (EDs). The differential diagnosis list of abdominal pain is so long that some pathologies can be ignored because of their rarity. Splenic artery aneurysm (SAA) is the most common aneurysm after aortic and iliac artery aneurysm in patients with intrabdominal aneurysms, although it is a very rare clinical diagnosis in ED. The prevalence of SAA has been reported to be 0.8%; in large autopsy series, this rate was 0.04%-0.1% (1). Congenital and acquired conditions play a role in the development of SAA. Also, some of the risk factors are trauma, septic embolism, cardiovascular diseases, atherosclerosis, and hypertension. The patient may be asymptomatic, however, SAA rupture may cause destructive bleeding with high mortality (2,3). We, here report a patient who was admitted to the ED with abdominal pain and diagnosed as having ruptured SAA.

### Case

A 60-year-old female patient presented to the ED with the complaints of left upper quadrant and flank pain and nausea for about three hours. Physical examination revealed rebound tenderness in the upper quadrant (epigastric and left upper). There was no pulsatile abdominal mass and rectal examination showed no stool in the rectal vault. Her past medical history included essential hypertension. She had no history of abdominal trauma, pancreatitis or cholelithiasis. The patient was pale and sweaty. The patient was mildly hypotensive (100/70 mmHg) and tachycardic (120 beats/min). The other vital parameters were within the normal limits. The patient had hypoactive bowel sounds and costovertebral angle tenderness. The laboratory test results on admission were within the normal limits except slightly elevated white cell count (12.500/mL), C-reactive protein raised to 48 mg/L (normal: 0-3 mg/L), and slightly low hemoglobin level (8.1/dL). Electrocardiogram on admission showed sinus tachycardia. Urine dipstick test and chest X-ray

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were normal without any sign requiring urgent surgery. A bedside ultrasonography was performed and free abdominal fluid was observed. The patient was referred to the radiology department. Computed tomography showed hemoperitoneum due to ruptured SAA (Figures 1, 2). The patient was immediately admitted to the operating room for laparoscopic surgery. The postoperative course was uneventful and the patient was discharged five days after surgery without any complication. Patient's consent to publication was obtained.

### Discussion

SAA is the most common aneurysm after aortic and iliac artery aneurysm in patients with intrabdominal aneurysms, although it is a very rare clinical diagnosis in ED. The prevalence of SAA is less than one percent and it was reported that this rate was below 0.1% in large autopsy series. Although SAA is more common in females than in

males (female/male ratio: 4:1), splenic artery dissection is more common in men (4,5). The most common etiological factor for SAA has been reported to be atherosclerosis, followed by cystic degeneration, trauma, fibromuscular dysplasia, pregnancy, connective tissue diseases and hypertension (6-8). In our case, essential hypertension was the etiologic factor.

When SAA diameter does not exceed 2 cm, clinical signs and symptoms rarely occur. The majority of SAAs are located in the distal and middle parts of the splenic artery (9). In these patients, the presence of abdominal pain in the epigastric region and in the left upper quadrant is not expected. However, some patients suffer from epigastric pain and this pain is often described as chronic and non-specific. In patients with left upper quadrant pain, especially if there is a finding suggestive of hypovolemia, this may be due to aneurysm rupture (10). The reported incidence of SAA rupture varies between 3% and 10%. Approximately 10% of SAAs are ruptured at the time of diagnosis with a reported death rate of 36-75% (3,11). Our patient presented to the ED with similar complaints.

The most common causes of abdominal hemorrhage are of visceral origin, followed by gynecological and vascular causes and coagulopathy. The most common visceral ones are of hepatic, splenic, renal and adrenal origin. The clinical presentation is not specific to the disease, thus, patients are usually diagnosed during surgery (12). When this condition is not taken into consideration, physicians lose a lot of time for diagnosis. This case was an exception and was treated with a prompt diagnosis.

Treatment of SAA should be initiated immediately after diagnosis in patients with high risk of rupture (aneurysm diameter greater than 2 cm), symptomatic patients, transplant patients, those with SAA associated with inflammatory processes, and fertile or pregnant women (13). Physicians generally refer patients with an aneurysm greater than 2 cm to surgery due to the risk of rupture of the aneurysm (6). There are several surgical approaches for SAA: A) resection with or without vascular repair, B) artery ligation with open or laparoscopic surgery, and C) endovascular interventions such as embolization. Classical approach (open or laparoscopy) is a frequently preferred method. Although laparoscopic surgery requires surgical skills, laparoscopy is an excellent and less invasive alternative method. Some difficulties may be encountered in endovascular surgery due to the fact that the anatomical structure of the splenic artery is tortuous (9). Thus, elective surgery can save the spleen in most cases, however, it is almost impossible in emergency cases. Symptomatic splenic cysts larger than 5 cm should be treated surgically due to increased risk of rupture and, during surgery, attention should be paid to protect the



**Figure 1.** Axial computed tomography image shows perihepatic fluid collection and ruptured splenic artery aneurysm (white arrow)



**Figure 2.** Coronal computed tomography image shows perihepatic fluid collection and ruptured splenic artery aneurysm (white arrow)

splenic parenchyma. Splenectomy is recommended due to the risk of bleeding under the following circumstances:

1) The cyst is large and almost completely covered with splenic parenchyma,

2) The cyst is in the splenic hilum (14).

In conclusion, patients with ruptured SAA may present with non-specific symptoms or symptoms mimicking more common emergent conditions. This clinical presentation may result in hemorrhagic shock or cardiovascular collapse leading to death. Ruptured SAA should be considered in high-risk patients admitted to ED.

#### Authorship Contributions

Surgical and Medical Practices: C.B., A.S. Concept: C.B., A.S. Design: C.B., A.S. Data Collection or Processing: C.B., A.S. Analysis or Interpretation: C.B., A.S. Literature Search: C.B. Writing: C.B., A.S.

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