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Case Report / Olgu Sunumu

Spontaneous rupture of an isolated splenic artery aneurysm: an unusual cause of an acute abdomen

İzole splenik arter anevrizmasının spontan rüptürü: Nadir bir akut karın nedeni

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ABSTRACT

A 65-year-old female patient who had a history of hypertension was admitted to the hospital with a diffuse abdominal pain. The physical examination revealed an acute abdomen. Abdominal ultrasonography showed free fluid in the abdominal cavity and the computed tomography revealed an isolated splenic artery aneurysm. Laparotomy, ligation of the splenic artery, splenectomy and cholecystectomy was carried out. Case reports regarding spontaneous rupture of the isolated splenic artery aneurysm are rare in the literature. In this article, we report an unusual cause of acute abdomen.

Keywords: Acute abdomen; laparotomy; splenectomy; splenic artery aneurysm; splenic artery ligation.

ÖZ

Hipertansiyon öyküsü olan 65 yaşındaki kadın hasta yaygın karın ağrısı ile hastaneye başvurdu. Fizik muayenede akut karın bulguları saptandı. Abdominal ultrasonografide karın içerisinde serbest sıvı görüldü ve bilgisayarlı tomografide izole bir splenik arter anevrizması saptandı. Laparotomi, splenik arter ligasyonu, splenektomi ve kolesistektomi yapıldı. Literatürde izole splenik arter anevrizmasının spontan rüptürüne ilişkin olgu sunumları nadirdir. Bu yazıda, alışılmışın dışında bir akut karın nedeni sunuldu.

Anahtar sözcükler: Akut karın; laparotomi; splenektomi; splenik arter anevrizması; splenik arter ligasyonu.

Splenic artery aneurysms (SAAs) are relatively rare, even though they are the most common of the visceral aneurysms and the third most common intraabdominal aneurysms after aortic and iliac.[1,2] They may result from a congenital weakness of the arterial wall, pregnancy, portal hypertension (HT), or atherosclerosis.[3]

The great majority of SAAs are asymptomatic and are diagnosed incidentally on imaging studies. However, they can be symptomatic when abdominal pain and either intraabdominal or gastrointestinal bleeding are present. The rupture of an SAA may lead to an acute abdomen, hemoperitoneum, and eventually hemorrhagic shock, which can be fatal.[2,3] On auscultation, a bruit may be heard, but palpation of the aneurysmatic mass is usually not possible.[3] The mortality rate after intraperitoneal rupture is high enough that it should not be underestimated; thus, treatment either via a surgical or endovascular approach is recommended for all diagnosed SAAs and other splanchnic AAs.

CASE REPORT

A 65-year-old female patient was admitted to the hospital with diffuse abdominal pain, and her past medical history did not reveal any abnormalities

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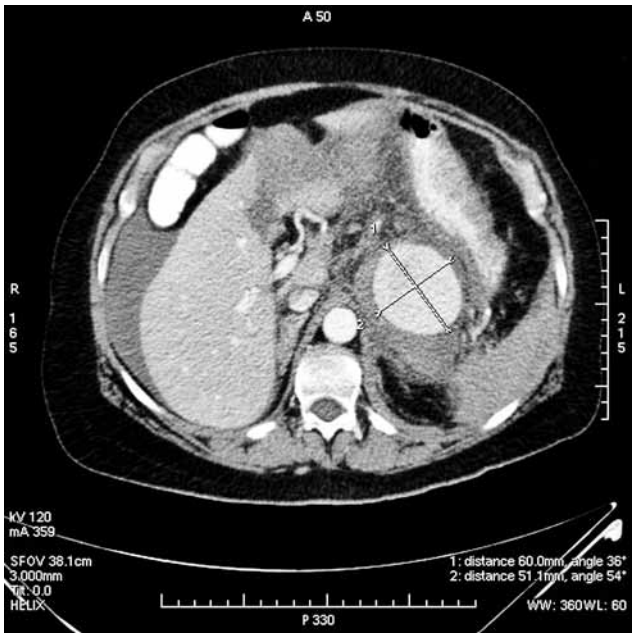
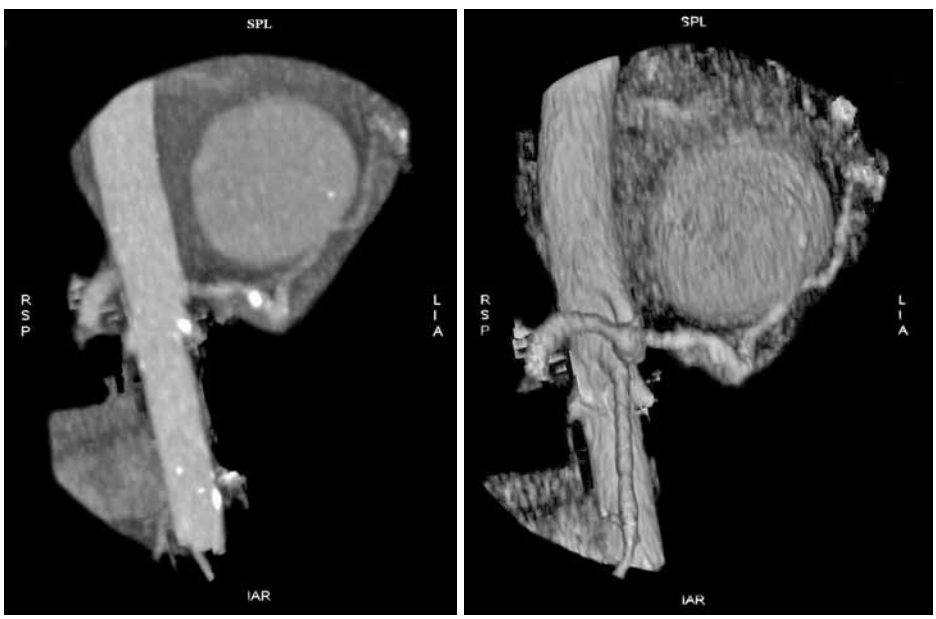


Figure 1. In the early arterial phase, computed tomography revealed a 5x6 cm mass in the abdominal area that had an isodense appearance when viewed with the contrast agent. In addition, an intraperitoneal hematoma filling the gap between the spleen and stomach can also be seen.

except for HT. Her arterial blood pressure was 100/70 mmHg, her heart rate was 106/minute, and her body temperature was 36.7 ºC. In addition, a physical examination revealed an acute abdomen. Laboratory tests revealed the following: hematocrit: 28%, hemoglobin: 9.5 g/dL, white blood cell: 11,000/µL, platelet: 220,000/µL, blood urea nitrogen: 21 mg/dL, creatinine: 1.4 mg/dL, and blood glucose: 97 mg/dL as well as a prothrombine time of 14.2 seconds, an activated partial tromboplastine time of 27 seconds, and an international normalized ratio of 1.14. The pulmonary and abdominal radiography did not reveal any pathology. However, abdominal ultrasonography showed cholelithiasis and free fluid in the abdominal cavity, and computed axial tomography revealed a 5.5x6 cm SAA and massive intraabdominal free fluid that was diagnosed as a hemorrhage (Figures 1, 2). After aggressive intravascular resuscitation, an immediate laparotomy was performed, which revealed a hemoperitoneum along with a ruptured isolated SAA. Proximal ligation of the splenic artery was carried out, and an aneurysmectomy, splenectomy, and cholecystectomy were performed. Furthermore, a histopathological examination showed a saccular aneurysmatic dilatation due to atherosclerosis that was similar to others that have been reported in the literature.

DISCUSSION

Aneurysms of the visceral arteries are rare, but they are potentially lethal. Currently, they are also being detected in an asymptomatic state with increasing frequency in the elderly more often than in the past because of the extended availability and clinical use of computed tomography (CT) and angiography.[4] Splenic artery aneurysms make up 60-71% of all visceral



Figures 2. Volume rendering and maximum intensity projection images showing a saccular splenic artery aneurysm.

arterial aneurysms, and Vlychou et al.[1] found that they had an incidence rate of between 0.02 and 2% in a large autopsy series that included all age groups. Moreover, the third most common abdominal aneurysm is an SAA.[5] Seventy-two percent of them are true aneurysms, with most being saccular in nature,[4] and they occur predominantly in multiparous women.[2]

The etiology of SAAs may be associated with a congenital weakness of the arterial wall, such as fibromuscular dysplasia or Ehlers-Danlos syndrome, hormonal and hemodynamic changes during the pregnancy, portal HT, systemic vasculitis, or atherosclerosis.[3,4] Histopathological examinations have revealed that atherosclerotic changes occur in up to 99% of SAAs, but in our case, the only etiology was a history of HT.

Most SAAs are smaller than 3 cm,[4] and a few have been identified on plain radiographs as curvilinear calcifications in the left upper quadrant.[3] Fortunately, as in our case, a definitive diagnosis can be determined by the use of CT, or splanchnic angiography can also be utilized. Up to 80% of patients with SAAs are asymptomatic. The other 20% are admitted to hospitals with a wide range of nonspecific symptoms, including abdominal pain, nausea, and vomiting,[5] with left upper quadrant/epigastric pain radiating to the left shoulder being the most common clinical presentation of symptomatic SAAs. In our case, the definitive diagnosis of a ruptured SAA was revealed by CT.

Rupture is the most lethal complication associated with SAAs, and the chance of this occurring ranges from 2-9% according to Uyar et al.[6] Rupture of the aneurysm, which may manifest as a life-threatening hemorrhage, actually occurs in approximately 2% of the patients.[5] In contrast, there is a 28% chance of a rupture for patients with a giant aneurysm.[2] A mortality rate of approximately 20% has been reported when SAAs rupture,[6] and the rupture and mortality risk is even higher when these aneurysms occur during pregnancy. If the rupture occurs in the lesser sac, the patient may only present with left upper quadrant/epigastric pain without any hemodynamic instability, but when the blood overflows into the greater intraperitoneal sac, as in our case, diffuse abdominal pain and hypovolemic shock may be seen. In this initial state, the bleeding is localized in the lesser sac, which gives the surgeon an opportunity for intervention in 25% of patients.[3] This is known as the "double-rupture phenomenon" in SAAs.

Expanding or symptomatic aneurysms should be treated immediately. Since ruptures take place mostly in aneurysms of ≥2 cm, most authors propose that aneurysms smaller than 2 cm be monitored closely via imaging studies at six-month intervals and that aneurysms over 2 cm in diameter be treated.[3,4] Despite the high mortality rate after emergency surgery for an SAA rupture, the mortality rate for elective repairs is negligible.[7] The aim of elective SAA resection should be to preserve the spleen whenever possible. In fact, ligation of the splenic artery may be performed without a splenectomy if the collateral flow via the short gastric arteries is sufficient. Aneurysms of the proximal splenic artery can be simply ligated, but those located deep within the hilum require a splenectomy.[2] Transcatheter embolization may also be performed for all SAAs. In addition, endovascular techniques offer a safe, feasible, nonsurgical alternative for the management of these aneurysms.[5,7] Moreover, Fotopoulos et al.[5] reported that great success has been achieved with many nonsurgical interventions involving emergency patients with SAAs.

Although uncommon and asymptomatic, it is important to recognize SAAs because of the risk for rupture and associated mortality.[8] With advancements in imaging technology, detection of asymptomatic aneurysms has increased. Asymptomatic small SAAs may be followed up, but for all symptomatic aneurysms and most aneurysms larger than 2 cm in diameter, elective intervention is necessary. Surgical or endovascular treatment is preferable because of the tendency of SAAs to rupture. Furthermore, there is also the risk of organ failure, which can lead to mortality. In our case, the patient's SAA had been asymptomatic for many years, with the first symptom being the acute abdominal pain caused by the aneurysmatic rupture.

Clinically, the rupture of an SAA presents as an acute abdomen along with hypovolemic shock.[8] In such situations, the patient should be stabilized and monitored closely, and the replacement of fluids, electrolytes, and bloods should be performed immediately. The classic surgical approach includes ligation of the splenic artery along with an aneurysmectomy and splenectomy, which is the technique that we used. Although SAAs associated with acute abdominal pain are rare, our case points out that this possibility should not be overlooked in the differential diagnosis of abdominal pain.

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