Acute Abdomen from Spontaneous Splenic Artery Rupture with Coincidental Metastatic Disease: A Case Report

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Patient: Male, 84-year-old
Final Diagnosis: Spontaneous splenic artery rupture with coincidental metastatic disease
Symptoms: Acute abdomen
Medication: —
Clinical Procedure: Splenic artery embolization
Specialty: Oncology

Objective: Rare disease
Background: Splenic artery rupture is a rare surgical occurrence, often with fatal results. The reported prevalence is 0.1-0.2%. Splenic artery rupture can be from atraumatic or traumatic causes. Clinical presentation can vary from being asymptomatic to having an acute abdomen presentation if the splenic artery ruptures. Various imaging studies such as computed tomography, magnetic resonance imaging, and Doppler ultrasound can be used to determine the morphology and location of the aneurysm. Surgical treatment options are aneurysm resection or simple ligation and splenectomy.

Case Report: We present the case of an 84-year-old man who presented to the Emergency Department after having an episode of syncope. Upon admission, the patient had an acute rupture of the splenic artery aneurysm with large-volume hemoperitoneum, with extensive hepatic and periportal nodal metastases. Interventional radiology was immediately consulted for an emergent splenic artery embolization. He then underwent a liver biopsy, showing poorly differentiated carcinoma, with elevated AFP, CA 19-9, and CEA. The patient was discharged, and was scheduled to follow up with gastroenterology for an outpatient colonoscopy and with oncology for further staging and treatment.

Conclusions: This is a rare case where a patient had an acute splenic artery rupture with underlying hepatic and periportal metastasis, with a primary within the gastroenterology tract, specifically the colon. It is imperative to consider splenic artery aneurysm as a differential diagnosis in patients who present with acute abdomen. This case will bring to light a traumatic cause leading to a delayed diagnosis of metastatic malignancy, with the colon as the primary location.

Keywords: Aneurysm, Ruptured • Colonic Neoplasms • Splenic Artery

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Background

Splenic artery aneurysm is the third most frequently reported aneurysm, after aortic and iliac artery aneurysm, in patients with intra-abdominal aneurysms. Spontaneous splenic rupture can be from acute or chronic infections, hematologic malignancies, and inflammatory noninfectious disorders. This can lead to life-threatening hypovolemic shock [1]. Some risk factors associated with developing a splenic artery aneurysm include fibromuscular dysplasia, history of multiple pregnancies, collagen vascular diseases, and male sex. To the best of our knowledge, our patient did not have any of these risk factors.

Case Report

This is a case report of an 84-year-old man with a history of hypertension who presented to the Emergency Department (ED) with an episode of syncope. Upon arrival to the ED, he was hypotensive, with a blood pressure reading of 92/54 mmhg, pulse of 84/min, and saturating at 97% on room air. A physical examination revealed an abrasion on his forehead, with a hematoma, and left upper-quadrant tenderness palpation with rebound. Laboratory testing revealed a basic metabolic panel of creatinine 1.9 (0.5-1.4 mg/dl), hemoglobin 10.5 g/dL (13.0-17.7 g/dL), hematocrit 31.1% (37.5-51.0%), red cell distribution width 15.2% (≤15.0%), platelets 236 (140-400 K/ul), carcinoembryonic antigen 8.9 ng/ml (<5 ng/ml), CA 19-9 1964 (<37 U/ML), and alpha fetoprotein tumor marker 1250.2 (<6.1 ng/mL). A CT scan of the brain with no contrast revealed no discrete acute intracranial hemorrhage; CT of the cervical spine did not reveal any fractures; CT of the chest, abdomen/pelvis exhibited acute rupture of a splenic artery aneurysm with active extravasation and large-volume hemoperitoneum, as well as flattening of the IVC consistent with severe hypovolemia, extensive hepatic and periportal nodal metastases consistent with disseminated cancer of uncertain etiology, and interval progression of L3 vertebral body compression fracture. Angiography revealed an extra-parenchymal aneurysm arising from a distal branch of a short gastric artery, with extravasation present (Figure 1). As soon as the significant findings were known, the patient was blood-typed and cross-typed for 2 additional units for packed red blood cells. The trauma team and interventional radiology were consulted, and a splenic artery embolization was immediately performed. After the patient was stable, he had a liver biopsy, which revealed metastatic poorly differentiated adenocarcinoma, suggestive of gastrointestinal primary (Figure 2). There were a few microscopic foci of poorly differentiated adenocarcinoma showing necrosis. Subsequently, immunostains were performed. The neoplastic cells were positive for AE1/3, CDX2, and SATB2 (focal). CK7, CK20, TTF-1, and NXX3.1 were negative. Further studies revealed BRAF negative, MMR-I, and KRAS/NRAS were unmutated. As the patient’s CDX2 and SATB2 were positive, there was an inclination to believe the colon was primary for the patient’s malignancy. He could not tolerate the colon preparation and outpatient follow-up was suggested. He was stable for discharge, but was readmitted for generalized weakness. He was never able to get the colonoscopy, nor was he able to make it to his oncology appointment for further workup.

Discussion

The first ever documented case of a splenic artery aneurysm was reported by Beaussier in 1770 [2]. When autopsies were conducted, they found the incidence of splenic artery aneurysm...
was about 0.1% to 0.2% [3]. Common risk factors that have been associated with splenic artery aneurysm include pregnancy, liver cirrhosis, portal hypertension, fibrodysplasia, congenital anomalies that can affect arteries of the foregut, and splenomegaly [4]. This case is unique and interesting in that the male patient did not have any predisposing factors.

Most patients with splenic artery aneurysms are asymptomatic, but others present with generalized symptoms such as nausea, vomiting, and abdominal pain [5]. When a splenic artery aneurysm ruptures, an acute abdomen can present with hypotension, tachycardia, syncopal episodes, which can lead to hemorrhagic shock. Angiography is the criterion standard for diagnosing splenic artery aneurysms, but CT scans and MRI scans can also be used for further imaging [6].

Treatment of splenic artery aneurysm ruptures depends on the size, location, and presenting symptoms. In patients who present with an acute abdomen, a resuscitation protocol should be implemented, which includes fluid resuscitation, blood product transfusion, and surgical intervention. Various surgical interventions to consider are excision, ligation, and revascularization, with or without splenectomy [7]. Endovascular treatment can be considered as an option for patients who are not surgical candidates and those in elective settings. Various techniques that have been utilized include coil embolization, placement of covered stents, plug deployment, and injection of endoluminal substances such as thrombin, polyvinyl alcohol, particles, or Gelfoam [8].

Hematologic malignancies of the spleen are becoming more common, with acute leukemia and non-Hodgkin lymphoma being most frequent [9]. Our literature search showed that tumors involving the spleen that can lead to splenic rupture are usually benign. This can include hemangiommas, hamartomas, lymphangiomias [10]. Malignant neoplasms in the spleen are more commonly metastatic, which include primary cancer of the breasts or lungs, melanoma, and colorectal and ovarian cancer [11]. Our patient did not have any splenic metastasis, but did have periportal and hepatic metastasis.

Conclusions

This is a rare case in which the patient had an acute splenic artery rupture with underlying hepatic and periportal metastasis, with primary cancer within the gastroenterology tract, specifically the colon. It is imperative to include splenic artery aneurysm in the differential diagnosis of patients who present with acute abdomen. This case illustrates a traumatic cause leading to a delayed diagnosis of metastatic malignancy, with the colon as the primary site.

Declaration of Figures’ Authenticity

All figures submitted have been created by the authors who confirm that the images are original with no duplication and have not been previously published in whole or in part.

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