Spontaneous Hemoperitoneum

George Kasotakis, MD, MPH

Spontaneous hemoperitoneum (SH) is a rare, but life-threatening condition that is defined as blood within the peritoneal cavity of nontraumatic etiology.\textsuperscript{1,2} Given the rarity of SH, its diagnosis is almost always unsuspected until the time of imaging, which is undertaken in patients who present with acute abdominal pain and/or distention and anemia. Implicit in making this diagnosis is a nontraumatic cause, and high quality imaging is of paramount importance in identifying the underlying cause.

SH most commonly arises from hepatic, splenic, vascular or gynecologic pathology (the latter will not be discussed here, as it is outside the scope of this text), and usually in anticoagulated or coagulopathic subjects (Box 1).\textsuperscript{3,4} It requires the emergent attention of the treating clinician, as it can prove rapidly fatal, even if managed appropriately. It typically presents with signs of acute intraperitoneal bleeding, namely abdominal pain and distention, tachycardia, and even hypotension and abdominal compartment syndrome in severe cases.

Imaging is essential in cases of nontraumatic hemoperitoneum in that it establishes the diagnosis of SH and helps identify its primary etiology. Although computed tomography (CT) is the most commonly used modality in patients with acute abdominal pain, ultrasound may be used when gynecologic conditions are considered, or, less commonly, if the patient is too unstable to be transferred to the CT suite and the treating clinician is attempting to grossly localize the hemorrhage. CT, however, is superior in that it can point to a specific organ as the source of the bleeding; detect active hemorrhage (active contrast extravasation or blush in contrasted studies); and provide information on how long ago the hemorrhagic episode took place (varying Hounsfield units of fresh, clotted, and lysed blood).\textsuperscript{2,5}
Box 1
Nongynecologic causes of spontaneous hemoperitoneum

1. Hepatic
   - Benign
     - Adenomas
     - Focal nodular hyperplasias
     - Hemangiomas
     - Infiltrative diseases (amyloidosis)
   - Malignant
     - Primary hepatocellular carcinoma
     - Metastatic disease
     - Angiosarcomas
     - Infiltrative diseases
     - Amyloidosis

2. Splenic
   - Infections
     - Cytomegalovirus
     - EBV
     - HIV
     - Malaria
     - *Bartonella*
   - Malignancies
     - Lymphomas
     - Leukemias
     - Angiosarcomas
     - Infiltrative diseases
     - Amyloidosis
     - Gaucher disease

3. Vascular
   - Arterial
     - Aneurysms
     - Pseudoaneurysms
     - Mycotic aneurysms
     - Dissection
   - Venous
     - Pelvic veins during labor
     - Abdominal varices
LIVER

The liver is considered as the most common cause of SH, when gynecologic causes are not considered, with anticoagulation, pregnancy, and minor (usually unreported) trauma being the most common triggering factors. In most cases, liver masses, typically undiagnosed, rupture spontaneously and present as SH. These can be benign or malignant. The former include hepatic adenomas, focal nodular hyperplasias, large hemangiomas, or rarely infiltrative hepatic diseases such as amyloidosis. Hepatic adenomas are typically seen in pregnant or oral steroid contraceptive-using women, or less commonly in anabolic steroid-taking males. Less frequently, multiple hormone-independent hepatic adenomas may outgrow their vascular supply, necrose, and eventually rupture, leading to SH. Large hemangiomas may also rupture during pregnancy, likely because of the large intravascular volume associated with gestation. Malignant hepatic lesions, either primary or metastatic, may also rupture spontaneously. In fact, hepatocellular carcinoma (HCC) constitutes the most commonly identified pathology in SH arising from the liver, and when nontraumatic hemoperitoneum is seen on CT, HCC should be considered the most likely etiology, especially when an irregular mass is seen within the hepatic parenchyma. Primary hepatic angiosarcomas and metastatic disease are far less frequent causes of SH.

SPLEEN

Even though the spleen is the second most common solid organ to give rise to SH, spontaneous splenic rupture (SSR) is exceedingly rare. Unlike the liver, SSR is typically not associated with parenchymal masses, but with infectious (most notably cytomegalovirus, Epstein-Barr virus [EBV], human immunodeficiency virus [HIV], malaria, and bartonellosis) or inflammatory processes. Less commonly, infiltrative diseases (Gaucher disease, splenic amyloidosis) or hematologic malignancies (lymphomas, leukemias, angiosarcomas) may be the underlying pathology.

VASCULAR CAUSES

Vascular causes of SH include aneurysms, pseudoaneurysms, and mycotic aneurysms or arterial dissection complicated with rupture. The celiac, superior mesenteric, and renal arteries are most commonly affected, with extensive atherosclerotic disease and vasculitis being the most commonly cited predisposing factors. Spontaneous arterial rupture is a catastrophic event, with mortality rates that exceed 30%. Presence of hemoperitoneum on imaging without associated hepatic or splenic pathology typically alerts radiologists to closely evaluate the abdominal vasculature; however, pathology may not always be easily identifiable. Less commonly, venous rupture may be the cause of SH. Common clinical scenarios include those of rupture of enlarged pelvic veins during labor or abdominal varices that have developed over time secondary to cirrhosis and portal hypertension. Contrary to what one might expect, prognosis after spontaneous venous bleeding is much worse compared with that of arterial etiology.

MANAGEMENT

Regardless of the underlying etiology of SH, angiography and embolization almost always constitute first-line therapy in the hemodynamically stable patient. Surgery should be considered in persistently hypotensive patients, or in those in whom interventional techniques have failed to control the bleeding. Options for hemorrhage control during surgery include, but are not limited to, repair (either primary or reinforced
with native tissue or biologic prosthetics), partial (or complete in the case of the spleen) resection, electro- and Argon beam coagulation, tissue sealants, local hemostatics, and vascular ligation.36

REFERENCES


