

Spontaneous Rupture of a Hepatic Hemangioma: A Serious and Rare Complication

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Abstract

Hepatic hemangiomas are congenital vascular malformations considered the most common benign mesenchymal tumors of the liver. Typically categorized into capillary and cavernous hemangiomas, hemangiomas are usually asymptomatic. However, some may present with a range of symptoms, with spontaneous or traumatic rupture being the most severe complication. Rupture often leads to sudden abdominal pain, anemia, and potentially disseminated intravascular coagulopathy and hypovolemic shock. The risk of rupture increases with the size of the hemangioma, and diagnostic imaging includes ultrasound, CT, MRI, hepatic arteriography, and other studies. We report the case of a spontaneous rupture of a hepatic hemangioma in a 50-year-old woman with its imaging aspects.

Keywords: Hemangioma; Liver; Rupture; Imaging

Introduction

Hepatic haemangiomas, called hepatic venous malformations, are considered the most common benign mesenchymal hepatic tumors [1]. Those lesions are composed of masses of blood vessels and are usually diagnosed incidentally on imaging since most patients are asymptomatic. Its incidence reaches up to 20% in the general population to 7.3% on autopsy and the prevalence in autopsy studies ranges between 0.4% - 7.4%. These vascular tumors are typically seen in females with a female-to-male ratio that may reach 5:1 with a mean age of 50 years [2].

It should be mentioned that the more recent terminology refers to these lesions as venous malformations (ISSVA classification of vascular anomalies) [3]. Nonetheless, the term "haemangioma" is more often used in the literature and is more known to doctors.

When smaller than 4 cm, hemangiomas are usually asymptomatic but a few patients may present variable symptoms with spontaneous or traumatic rupture being the most severe complication. If left untreated, this can have disastrous consequences, which is why accurate diagnosis and treatment are crucial [4]. According to research by Jain., *et al.* the surgical mortality rate of ruptured lesions is approximately 36.5% [5].

We report the case of a patient referred for pain in his right hypochondrium, with the ultrasound revealing multiple hepatic hemangiomas complicated by spontaneous rupture of one lesion. Our work aims to highlight the role of radiologists in diagnosing this rare yet deadly complication.

Case Report

A 40-year-old woman presented to the emergency department for sudden onset of abdominal pain in her right hypochondrium without vomiting. She had no constipation or history of recent trauma. At admission, her hemodynamic parameters were normal. Physical examination revealed upper abdominal sensitivity without peritoneal irritation. The patient was referred to our department for an abdominal ultrasound. It showed a heterogenous complex mass-like lesion in the left lobe of the liver, associated with other hepatic lesions, well-defined and hyperechoic lesions with peripheral feeding vessels on color doppler, which is a typical aspect of hemangiomas (Figure 1). A CT scan was then realized, which showed a large heterogeneous mass in the left lobe of the liver. On pre-contrast CT scan, the mass appeared hyperdense with a slightly hyperdense portion. After IV contrast, the hyperdense structures are not well enhanced suggestive of haematoma but the middle part of the mass shows faint enhancement. The findings are in keeping with ruptured hepatic mass. The patient underwent surgery and histopathology confirmed the diagnosis of a ruptured hemangioma (Figure 2).

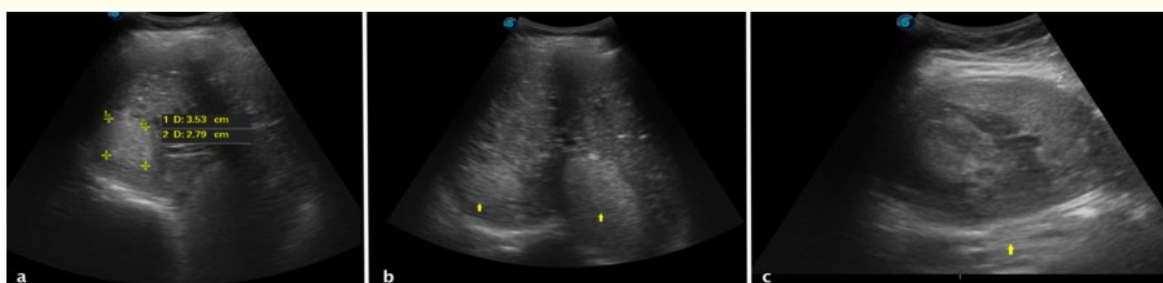


Figure 1: Abdominal ultrasound showing hepatic hemangiomas (a and b), and a heterogenous complex mass-like lesion in the left lobe (c).



Figure 2: Axial abdominal CT-scan (a and b) and coronal reconstruction (c), showing the mass in the left lobe, with a spontaneous hyperdense portion.

Discussion

Spontaneous rupture of hepatic hemangiomas is an uncommon complication and was first reported in 1898 by Van Haefen in an autopsy [6].

Yamamoto, *et al.* researched 28 cases of spontaneous rupture of hepatic hemangiomas and reported that their size ranged from 3 to 25 cm [7].

Corigliano, *et al.* reviewed 27 of 32 cases published up to 2003 and stated that of 19 tumors, 16 (84.2%) of 19 tumors were giant hemangiomas [8].

Hepatic hemangiomas are mainly asymptomatic but may induce intermittent right upper quadrant pain due to focal necrosis or secondary to capsular irritation as the tumor grows. Other possible causes of pain include thrombosis, infarction, hemorrhage into the lesion, or compression of adjacent structures [9]. Rarely, giant hemangiomas can also cause gastric outlet obstruction, biliary colic, and obstructive jaundice [10].

Spontaneous hemorrhage in hepatic lesions is an uncommon condition. In the absence of anticoagulant therapy or trauma, it frequently occurs as a consequence of hepatocellular carcinoma, hepatic adenoma, or in rarer cases, cavernous hemangiomas [11]. In those spontaneous hemorrhage cases, clinical manifestations can consist of sudden abdominal pain and anemia secondary to a hemoperitoneum. Disseminated intravascular coagulopathy can also occur; associated with hemodynamic instability, and signs of hypovolemic shock [6].

Diagnosing hepatic hemangiomas in imaging is usually based on ultrasonography, dynamic contrast-enhanced computed tomography (CT) scanning, and magnetic resonance imaging (MRI). Hepatic arteriography, digital subtraction angiography, and nuclear medicine studies can also be of use in some cases [9].

Ultrasonography (US) is commonly used as the first diagnostic tool for hemangiomas due to its accessibility and low cost. Hemangiomas typically appear as well-defined, hyperechoic lesions on US, though their appearance may vary in cases involving hemorrhage, fibrosis, or necrosis. Adding color Doppler enhances the test's sensitivity and specificity by providing more detailed data. To confirm a hemangioma diagnosis, ultrasound findings should be correlated with a CT scan or MRI [12]. Triple-phase contrast-enhanced CT is preferred, where hemangiomas appear hypodense before contrast. In the late arterial phase, it typically shows discontinuous, nodular, peripheral enhancement, while in the portal venous phase, a progressive peripheral enhancement with more centripetal fill-in is seen. Further irregular fill-in, therefore becoming iso- or hyper-attenuating to liver parenchyma, is seen in the delayed phase. MRI, with its higher sensitivity, can offer more specific diagnostic features, including high signal intensity on T2-weighted images and low intensity on T1-weighted images. Giant cavernous hemangiomas may show internal fluid levels due to slow blood flow. In cases of rupture, imaging reveals hemoperitoneum, a heterogeneous mass, and possible intraperitoneal clots [13].

When hemangiomas are ruptured, imaging may find hemoperitoneum and heterogeneous hepatic mass. Intraperitoneal clots may also be identified near the site of the bleeding [11].

The treatment of hepatic hemangiomas depends on the tumor's size and location. Small hemangiomas (< 4 cm), usually asymptomatic, can be managed with observation and periodic radiological monitoring. Surgery is generally reserved for specific situations, including spontaneous or traumatic rupture with hemoperitoneum, intratumoral bleeding, or consumptive coagulopathy (Kassabach-Merritt syndrome). A ruptured hemangioma with hemoperitoneum is a serious and potentially fatal condition that requires immediate intervention [9].

Conclusion

Spontaneous rupture of hepatic hemangiomas is rare but can be life-threatening, often leading to massive hemorrhage and rapid death if not promptly managed. Spontaneous rupture should be considered as a rare but important differential diagnosis in patients presenting with acute abdominal pain. The incidence of spontaneous rupture is between 1% and 4%, primarily in large hemangiomas (6 - 25 cm), with a mortality rate of up to 75%.

Informed Consent

Written informed consent was obtained from the patient for publication of this article, including accompanying images.

Conflict of Interest

The authors do not declare any conflict of interest.

Author's Contributions

All authors contributed to this work. All authors have read and approved the final version of the manuscript.

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