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CASE REPORT

Sudden death due to hemoperitoneum following rupture of cirrhosis-related mesenteric varices

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KEYWORDS

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Abstract Varices are caused by increased hemodynamic stress on venous channels due to portal hypertension complicating cirrhosis. Although esophageal varices are the most common site of variceal rupture in cirrhosis, mesenteric variceal rupture causing hemoperitoneum is a rare but fatal complication. There are three similar previously reported cases in the literature. We report a fatal case of hemoperitoneum in a woman caused by spontaneous rupture of mesenteric varices as a result of cirrhosis due to chronic alcoholism. The original site of hemorrhage may remain obscure if the lesion is subtle and overlooked. Therefore a diligent search for mesenteric varices is indicated in all cases with unexplained hemoperitoneum.

1. Introduction

Hemoperitoneum is a common finding at medicolegal autopsies and can be due to intra-abdominal injuries or natural conditions. A common cause of hemoperitoneum is blunt abdominal trauma rupturing liver and/or spleen and/or mesentery. Natural causes of hemoperitoneum include rupture of arterial or aortic aneurysms, and rupture and hemorrhage of intra-abdominal tumors such as hepatocellular and ovarian carcinoma. In addition, conditions causing splenomegaly (e.g., infectious mononucleosis) may predispose to splenic rupture after trivial trauma.

In some cases, the cause of the hemoperitoneum may be obscured even after a diligent search for a site of intra-abdominal bleeding. Some of these cases may be due to segmental mediolytic arteriopathy.[1] However, some cases may be due to other rare vascular lesions such as ectopic intra-abdominal varix.[2–5] Hemoperitoneum due to spontaneous rupture of mesenteric varices is a rare[6–8] but fatal complication of cirrhosis. Our review of the literature revealed only three similar previously reported cases. In this case report, we highlight a fatal case of hemoperitoneum due to spontaneous rupture of mesenteric varices as a result of alcoholism-related cirrhosis and a literature review of other reported cases.

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Figure 1 Prominent collection of thin-walled varices within the mesentery. On the surface, one of the varices appeared ruptured.

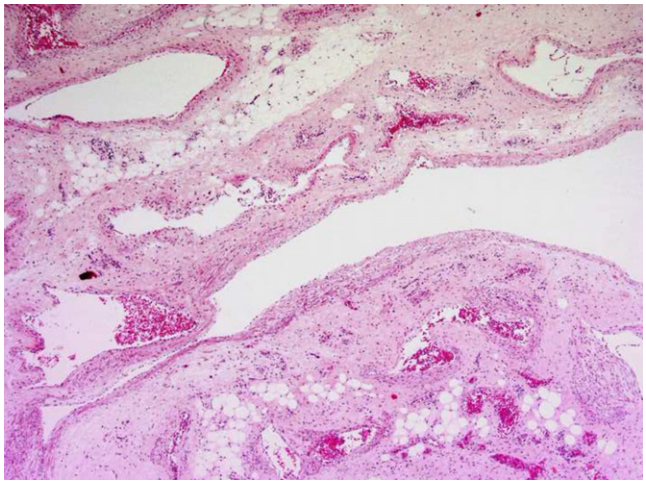

Figure 2 Mesentery (hematoxylin and eosin, 50×) with multiple, dilated, thin-walled varices embedded in mesenteric fat. There is venous intimal hyperplasia.

2. Case report

A 52-year-old woman, with a history of chronic alcoholism and alcoholic liver disease, was found dead at home. Prior to death, she refused any medical intervention. Autopsy revealed a protuberant abdomen and everted umbilicus. There were multiple contusions of varying ages located on the extremities.

A hemoperitoneum of 2800 ml fluid blood was noted. Ruptured mesenteric varices were found to be the cause of bleeding. There was a prominent collection of varices within the mesentery. These thin-walled venous structures coalesced over an area of 3 cm. The surface of one of the varices appeared ruptured (Fig. 1). In addition, there were multiple dilated thin-walled venous channels that represent varices around the gastro-esophageal junction and over the lesser curvature of the stomach. These were intact. The capsular surface of the liver (1700 g) was shrunken, nodular and devoid of injuries. Serial sections of the liver showed multiple nodules of varying in size, which were surrounded by dense fibrous stroma. The cut surface of the nodules was brown to yellow in color. The spleen (300 g) was enlarged and meaty, but not lacerated. The pancreas, stomach, and duodenum were unremarkable.

Histologic sections of the varices revealed multiple, dilated, and thin-walled varices embedded in mesenteric fat. There was venous intimal hyperplasia (Fig. 2). The liver showed micronodular cirrhosis.

The cause of death was concluded as hemoperitoneum, due to rupture of mesenteric varices, cirrhosis, due to chronic alcoholism.

3. Discussion

A varix is defined as an abnormally dilated, tortuous, vein with increased intraluminal pressure, and loss of vessel wall support. Varices are caused by increased hemodynamic stress on venous channels due to portal hypertension complicating cirrhosis. Cirrhosis of the liver causes longstanding portal hypertension which exceeds the resistance of portocaval anastomoses. As a result, these anastomoses open up, become engorged and form venous dilatation. These varices become increasingly susceptible to rupture and bleed. The most common site of occurrence and rupture of cirrhosis-related varices is the distal esophagus. Rupture of distal esophageal varices is a common cause of fatal gastrointestinal hemorrhage in chronic alcoholism. Varices occurring at any other site within the abdomen are by definition ectopic varices.[9]

Ectopic varices occur in diverse sites. Most of them rupture intraluminally[9] and are associated with duodenum,[9,11] jejunum,[11] ileum,[11,12] cecum,[11] colon,[12] recto-sigmoid junction,[12] and rectum[12,13] or with postoperative peri-intestinal adhesions.[14]

Hemoperitoneum from spontaneous rupture of ectopic varices is reported but rare.[3,5,15] In a study of 169 cases of ectopic variceal rupture, it was found that only 9% bled into the peritoneum.[9] Another report indicates that bleeding most commonly occurs from umbilical and peri-umbilical varices.[16] Hemoperitoneum from omental,[10] retroperitoneal,[4] round ligament-related,[17] and mesenteric variceal rupture has also been reported.

In 1968 Rothschild et al. reported a case of a ruptured, dilated varix located at the root of the small bowel mesentery causing hemoperitoneum.[6] Subsequently, Sher described rupture of markedly dilated serpiginous, firm, and thick walled mesenteric veins.[7] As in our case, Sher observed coalescence of these varices in the mesentery. Jhung and Micolonghi reported a fatal hemoperitoneum from ruptured superior mesenteric varices with similar microscopic appearance.[8] In all these cases variceal rupture was secondary to portal hypertension and hepatic cirrhosis.

In the present case, the appearance of the liver was that of micronodular cirrhosis. Coexistence of cirrhosis, splenomegaly, varices around the distal esophagus, perigastric area, and in the mesentery suggest the existence of portal hypertension. The presence of portal hypertension together with dilated thin walled venous channels, logically explains their increased vulnerability to rupture.

Although distal esophageal varices are the most familiar collateral sites of rupture, which require a minimum hepatic

venous pressure gradient of 12 mmHg,[18] it is difficult to explain the absence in this case. A plausible explanation in this context is an idiopathic anatomical lesion within the mesenteric varices, local erosion, or other wall abnormality that may weaken the varix wall at the site of rupture. Subsequent venous wall changes such as attenuation, stretching, fibrosis, and intimal hyperplasia secondary to portal hypertension preclude demonstration of such lesion. Hepatic coagulopathy would have contributed to the extensive nature of hemoperitoneum in this case. Multiple contusions of varying ages indicate easy bruising due to hepatic coagulopathy.

In this case report, we confirm previous observations that varices can also form in the mesentery. This is significant because mesenteric varices may rupture and cause hemoperitoneum, but original site of hemorrhage may remain obscure if the lesion is subtle, and could be easily overlooked. On this basis, all cases of cirrhosis with fatal hemoperitoneum, a diligent search for mesenteric varices is indicated.

Conflict of interest

The authors declare that they have no conflict of interest.

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References

1. Rosenfelder NA, Taylor-Robinson SD, Jackson JE, Stamp GWH. Segmental mediolytic arteriopathy in a patient with intraperitoneal bleeding. *Eur J Gastroenterol Hepatol* 2006;**18**:295–7.
2. Lucey BC, Varghese JC, Anderson SW, Soto JA. Spontaneous hemoperitoneum: a bloody mess. *Emerg Radiol* 2007;**14**:65–70.
3. Hunt JB, Appleyard M, Thursz M, et al. Intraperitoneal haemorrhage from anterior abdominal wall varices. *Postgrad Med J* 1993;**69**:490–3.
4. Sincos IR, Mulatti G, Mulatti S, Sincos IC, Belczak SQ, Zamboni V. Hemoperitoneum in a cirrhotic patient due to rupture of retroperitoneal varix. *HPB Surg* 2009;1–5.
5. Kosowsky JM, Gibler WB. Massive hemoperitoneum due to rupture of a retroperitoneal varix. *J Emerg Med* 2000;**19**(4):347–9.
6. Rothschild JJ, Gelernt I, Solan W. Ruptured mesenteric varix in cirrhosis-unusual cause for haemoperitoneum. *N Engl J Med* 1968;**278**:97.
7. Sher MH. Spontaneous rupture of a mesenteric varix in portal hypertension. *Hum Pathol* 1970;**1**(1):167–9.
8. Jhung JW, Micolonghi TS. Ruptured mesenteric varices in hepatic cirrhosis: a rare cause of intraperitoneal haemorrhage. *Surgery* 1985;**97**:377–80.
9. Norton ID, Andrews JC, Kamath P. Management of ectopic varices. *Hepatology* 1998;**28**(4):1154–8.
10. Bataille L, Baillieux J, Remy P, Gustin R-M, Denie C. Spontaneous rupture of omental varices: an uncommon cause of hypovolemic shock in cirrhosis. *Acta Gastroenterol Belg* 2004;**67**:351–4.
11. Fleming RJ, Seaman WB. Roentgenographic demonstration of unusual extra-oesophageal varices. *Am J Roentgenol* 1968;**103**:281–90.
12. Hamlyn AN, Lunzer MR, Morris JS, Puritz H. Portal hypertension with varices in unusual sites. *Lancet* 1974;**2**:1531–4.
13. Firoozi B, Gamagaris Z, Weinshel EH, Bini EJ. Endoscopic band ligation of bleeding rectal varices. *Dig Dis Sci* 2002;**47**(7):1502–5.
14. Monocure AC, Waltman AC, Vandersalm TJ, et al. Gastrointestinal haemorrhage from adhesion-related mesenteric varices. *Ann Surg* 1976;**183**:24–9.
15. Sprayregan S, Brandt LJ, Bohm S, Stechel R. Bleeding intraperitoneal varix: demonstration by arteriography and successful treatment with infusion of vasopressin into the superior mesenteric artery. *Angiology* 1978;**29**:857–61.
16. Goldstein AM, Gorlick N, Gibbs D, Fernández-del C. Hemoperitoneum due to spontaneous rupture of the umbilical vein. *Am J Gastroenterol* 1995;**90**:315–7.
17. Dal Pos R, Sartori CA, Di Natale I, Patelli G, Dal Pozzo A, Sorato R. Intra-abdominal rupture of varices of the round ligament: a rare cause of hemoperitoneum in patients with cirrhosis. *Chir Ital* 1988;**40**(1):83–90.
18. Gracia-Tsao G, Grozman RJ, Fisher RL, Conn HO, Atterbury M, Glickman M. Portal pressure, presence of gastrooesophageal varices and variceal bleeding. *Hepatology* 1985;**5**:419–24.