

# Hemoperitoneum as a Consequence of Colonoscopy

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## ABSTRACT

Hemoperitoneum without evidence of organ damage is a rare complication of colonoscopy. It is most frequently seen in association with splenic rupture due to traction on the splenocolic ligament. In our case, we present a 48-year-old cirrhotic man who developed peritoneal bleeding during a diagnostic colonoscopy for iron deficiency anemia. However, he was without signs of splenic damage or colon perforation. We suggest that the most likely source of bleeding is a ruptured portal-caval collateral vessel based on a computed tomography performed following the procedure.

## INTRODUCTION

There are approximately 1.69 million colonoscopies performed yearly, with more being performed each year.<sup>1</sup> As more colonoscopies are being performed, endoscopists can expect to see a corresponding increase in the number of complications.<sup>2</sup> Currently, the 2 most common complications of colonoscopies are bleeding and perforation.<sup>3</sup> At least 2 large studies have analyzed the rates of complications, reporting rates between 1.01 and 2.01 per 1000 examinations.<sup>4</sup> Hemoperitoneum, which is a rare complication associated with colonoscopy, has been associated with organic damage such as bowel perforation, adhesion traction due to endoscope movement, and most commonly, splenic injury.<sup>5</sup> In rare cases, it has been documented that severe peritoneal bleeding can occur as a complication of colonoscopy with no evidence of organ damage.<sup>6</sup>

## CASE REPORT

A 48-year-old cirrhotic man developed worsening peritoneal signs the morning after an attempted diagnostic colonoscopy for iron deficiency anemia. The procedure was aborted due to a sudden onset of wheezing and abdominal distention upon entering the ascending colon while applying external pressure. Immediate imaging postcolonoscopy was negative for a perforation. A follow-up computed tomography that was done the next morning demonstrated the presence of possible blood in the paracolic gutters without extravasation of contrast and in the hepatorenal fossa (Figure 1). Due to the presence of a fluid wave pulse on examination, a paracentesis was performed and revealed grossly bloody ascitic fluid. Postcolonoscopy chest x-ray was performed and found no evidence of pneumoperitoneum (Figure 2).

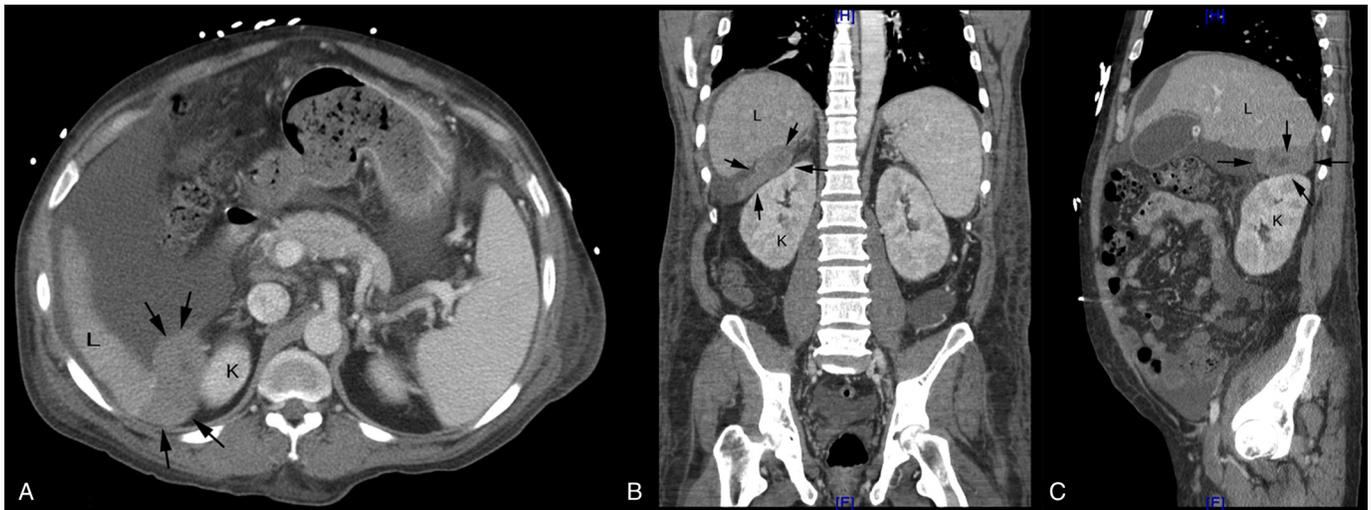
No surgical intervention was required, and the patient was managed conservatively. Lab testing confirmed transudative ascitic fluid with the presence of blood. The patient remained stable during the remainder of his admission. Due to the lack of alternate sources of bleeding, the etiology of the patient's hemoperitoneum was thought to be secondary to a ruptured portal-caval collateral.

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**Figure 1.** Postcolonoscopy abdominal computed tomography in 3 views. (A) Axial, (B) coronal, and (C) sagittal views demonstrate blood in the hepatorenal fossa as indicated by the arrows. Blood collection can be seen between the right kidney (K) and the liver (L). No evidence of organ damage or free air can be seen.

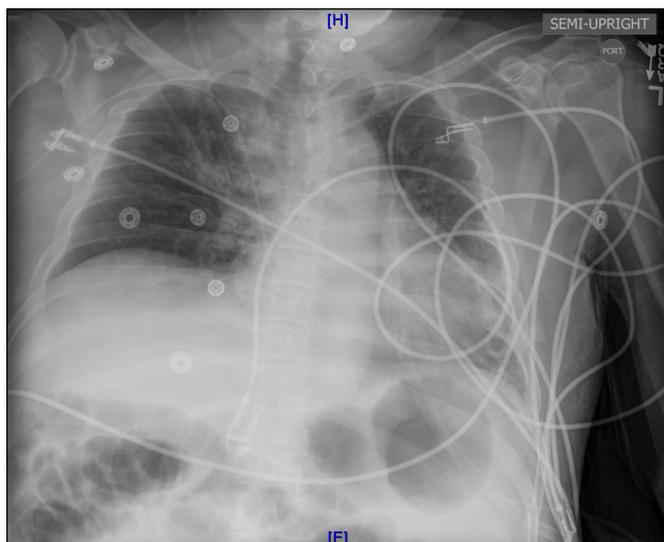
## DISCUSSION

The development of hemoperitoneum without any evidence of organ damage, ruptured tumors, or adhesions is rare and has been only documented 3 times.<sup>6-8</sup> Typically, the mechanism of injury occurs with splenic damage by traction from manipulation or adhesions causing increased mobility of the splenicocolic ligament.<sup>9-11</sup> It is thought that tension on the splenicocolic ligament can tear the splenic capsule, inducing bleeding into the peritoneum. Risk of splenic damage is increased due to the common use of external pressure to the left hypochondrium to facilitate colonoscope advancement.<sup>11</sup> Another known cause of hemoperitoneum is colonic perforation secondary to

barotrauma. The increased luminal pressures used to assist in visualizing the colonic mucosa can cause the lumen to rupture in rare cases.<sup>12</sup> Furthermore, there is documented evidence that spontaneous hemoperitoneum can occur in cirrhotic patients due to increased porto-systemic pressure. Some cases have found that rupture of the umbilical vein or retroperitoneal varices to be the cause of bleeding in end-stage cirrhosis.<sup>13,14</sup> Interestingly, some studies have shown that intraprocedure use of certain sedatives increased the risk of perforation. One study showed that the risk of perforation is significantly increased with the use of propofol during therapeutic colonoscopies in patients older than 65, but this was not observed in diagnostic colonoscopies. It is hypothesized that this effect is due to increased use of force by endoscopists because of lack of patient pain perception.<sup>15</sup> Lastly, the risk of perforation and bleeding has been shown to be increased in patients who received their procedures from nongastrointestinal endoscopists.<sup>16</sup> Our patient did not demonstrate any splenic damage or luminal perforation upon imaging, suggesting an alternate cause of his hemoperitoneum. We propose that in the setting of cirrhosis and increased intraabdominal pressures, the application of an external force may have led to rupture of a portal-caval collateral. Given that this phenomenon has been documented in past studies, it is the most likely cause of bleeding in our patient.

## DISCLOSURES

Author contributions: M. Khosla and L. Webster performed the literature search. M. Khosla and K. Ahmad collected data. All authors wrote and revised the article. M. Khosla is the article guarantor.



**Figure 2.** Semiupright chest x-ray demonstrating absence of pneumoperitoneum.

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