

Hepatic and Splenic Injury: A Rare Iatrogenic Post Colonoscopy Complication

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Abstract

Hepatic and splenic injuries are extremely rare and potentially fatal complications related to colonoscopy, and the diagnosis requires a high index of suspicion. With the increasing use of colonoscopy, physicians are more likely to encounter these rare complications. The most common cause of these injuries is traction on the splenocolic ligament or excessive manipulation while advancing the scope beyond the splenic flexure. Intra-abdominal adhesions and underlying hepatic or splenic disease (hepatomegaly, splenomegaly, etc.) might constitute a predisposing factor; however, it may occur in patients without the aforementioned conditions. Abdominal pain, hypotension and a fall in hematocrit without rectal bleeding after colonoscopy should raise suspicion of hepatic or splenic injury. Most patients present with symptoms within 24 hours after colonoscopy; however, delayed presentations have been reported.

We report a case of hepatic and splenic injury post colonoscopy. Patient presented with cardiac arrest and hemorrhagic shock within 12 hours post colonoscopy requiring urgent exploratory laparotomy with splenectomy and hepatorrhaphy.

Abbreviations List: CPR: Cardio-pulmonary resuscitation, ED: Emergency department, ICU: Intensive care unit, EGD: Esophagogastroduodenoscopy, FAST: Focused Assessment with Sonography for Trauma, ROSC: Return of spontaneous circulation

Keywords: Splenic injury, Hepatic injury, Colonoscopy, abdominal Pain

1. INTRODUCTION

Colonoscopy is a common and relatively safe diagnostic and therapeutic procedure. Iatrogenic complications are rare but have been reported in the medical literature. The most common complications are colonic perforation (0.1%-2.67%) and hemorrhage (0.001%-0.72%), often associated with biopsy or polypectomy [1, 3]. Other rare complications include bacteremia, ileus, mesenteric tears, pneumothorax, pneumoperitoneum, pneumoscrotum and colonic volvulus [2, 4].

Splenic or hepatic injury after colonoscopy is an extremely rare complication. The first case of splenic injury associated with colonoscopy was reported by Wherry and Zehner in 1974 [5]. Hepatic injury after colonoscopy was reported by Levine and Wetzell in 1987 [4]. Because of

their rareness, diagnosis is often delayed leading to increased risk of morbidity and mortality. Early symptoms are often attributed to trapped air in the colon and postpolypectomy serositis, which are often masked by sedation, analgesia, older age, and impaired mental state [1]. The incidence of hepatic or splenic injury after colonoscopy may be higher than suggested in the literature.

2. CASE PRESENTATION

A 71-year-old woman with a history of hypertension, hyperlipidemia, asthma, chronic anemia, and solitary kidney underwent an EGD and colonoscopy for nonspecific abdominal pain. EGD was unremarkable. Colonoscopy revealed a tortuous colon with sigmoid diverticulosis. She was discharged home. Later that day, she was found unresponsive by her

family who started CPR and called 911. ROSC was achieved after prolonged CPR, and she was brought to the ED.

In the ED, she was intubated and started on mechanical ventilation. She was hypothermic and hypotensive requiring vasopressors. FAST exam revealed large volume free fluid around the liver and spleen. CT chest, abdomen and pelvis showed massive hemoperitoneum and subdiaphragmatic and perisplenic hematoma. Hemoglobin and hematocrit were 5.0 and 16.6 respectively. Massive transfusion protocol was initiated, and patient was emergently taken to the OR. She underwent exploratory laparotomy and was found to have massive hemoperitoneum with capsular tear of the spleen and liver with adhesion of omentum to bilateral abdominal wall and pelvis. She underwent splenectomy, hepatorrhaphy with argon beam coagulator, adhesiolysis and placement of direct peritoneal resuscitation catheter with subsequent admission to the ICU. She continued to have severe anoxic encephalopathy. After extensive family discussion, she was made comfort care per family wishes and passed away.

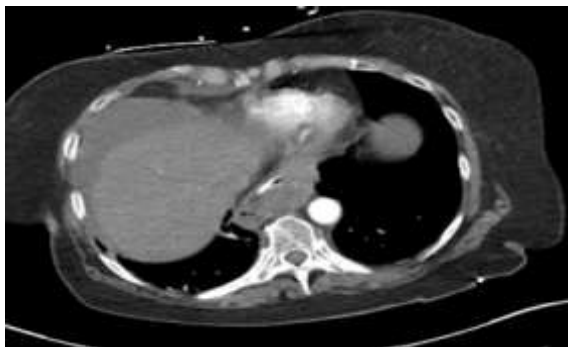


Image 1: Axial View: Subdiaphragmatic hematoma

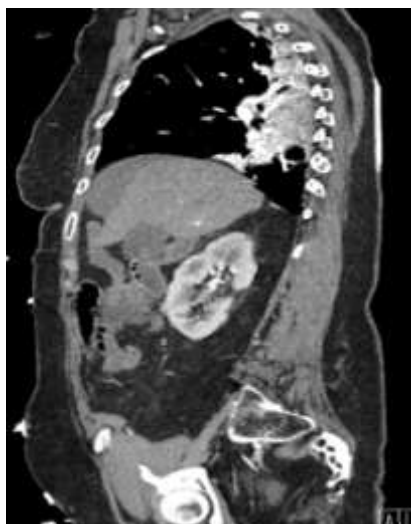


Image 2: Sagittal View: Subdiaphragmatic Hematoma

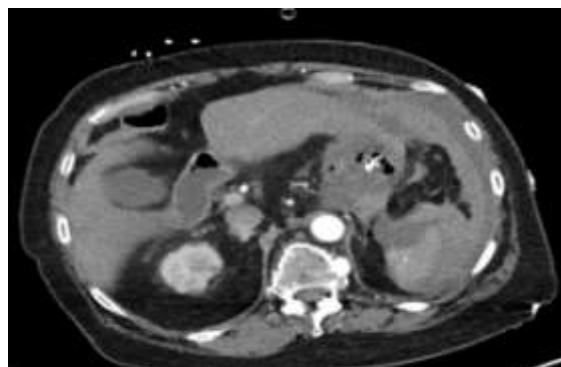


Image 3: Axial View: Perisplenic Hematoma

3. DISCUSSION

Hepatic and splenic injuries after colonoscopy are extremely rare but potential complications that can lead to significant morbidity and mortality. Cases may go undetected and thus underreported. Due to a low index of suspicion, many of the previously reported cases were diagnosed relatively late even up to 10 days after the procedure. The most likely mechanism of injury is traction on the splenocolic ligament, preexisting adhesions, or both due to manipulations of the sigmoid, descending or transverse colon or due to a more direct effect occurring during the passage of the endoscope through the splenic flexure resulting in parenchymal tears or avulsion of the spleen [6]. Hepatic and splenic injuries can occur in a normal spleen and liver after a technically difficult colonoscopy; however, many injuries have occurred in otherwise reportedly easy colonoscopies in patients without significant adhesions.

Predisposing factors for injury include previous abdominal surgery, inflammatory bowel disease, pancreatitis, splenomegaly, hepatomegaly as well as hematological, infectious and infiltrative diseases [7]. Other contributing factors include certain techniques used to navigate the splenic flexure, such as the blind advancement of the endoscope past the splenic flexure or hooking the splenic flexure to straighten the left colon [7].

Signs and symptoms depend on the severity of injury. In the majority of cases, symptoms developed within 24 hours of the procedure. Most common signs and symptoms are abdominal pain without radiographic evidence of perforation, left shoulder pain (Kehr's sign), peritoneal irritation and orthostatic changes. Patients may or may not present with a drop in hematocrit and hemodynamic instability, depending on the degree of splenic injury [8].

Diagnosis can be challenging as abdominal discomfort is common after colonoscopy due to trapped air in the colon, which could lead to the misdiagnosis of some cases of mild splenic rupture [9, 10]. Prior to the advent of CT scans, diagnosis was predominantly made with laparotomy. A Focused Assessment with Sonography for Trauma (FAST) is used in the emergent setting as it is easily performed at the bedside and able to provide a rapid diagnosis of intraabdominal fluid [11]. A plain radiograph is of limited utility as it does not allow for easy evaluation of the spleen and would only yield a positive result in cases associated with hollow viscus perforation. Contrast enhanced CT scan is the diagnostic modality of choice as it can visualize the extent of injury and hemoperitoneum and help determine the need for laparotomy [1, 7]. CT may also rule out other organ injury.

For splenic injury, treatment options include close observation, selective arterial embolization or splenectomy. Hemodynamic instability is the primary factor determining surgical versus non-operative management. Conservative approach is preferred in patients who are hemodynamically stable with no intraperitoneal blood and a closed subcapsular hematoma [2]. Conservative management included observation in the ICU, bed rest, intravenous fluids, serial hemoglobin and hematocrit monitoring, and imaging. The predictors of failed conservative management include grade II splenic laceration, old age, preexisting splenic disease, hemodynamic instability, 1 unit of blood transfusion, and hemoperitoneum [12]. Splenectomy is the definitive management if the patient is hemodynamically unstable with peritonitis.

For hepatic injury, management options include conservative approach, angiographic embolization, percutaneous drainage or exploratory laparotomy with drainage depending on hemodynamic stability.

4. CONCLUSION

Splenic and hepatic injuries are extremely rare and potentially fatal complications of colonoscopy that may be on the rise as more colonoscopies are performed. Physicians should have a high index of suspicion when a patient presents with abdominal pain, hemodynamic instability, and an acute drop in hematocrit after colonoscopy. Abdominal pain within 24 hours is the most reliable indicator and requires further

workup and monitoring. Patients who continue to have pain after colonoscopy should be monitored for complications like perforation and bleeding. Persistent hemodynamic instability mandates operative management. Recognition of predisposing risk factors before the procedure, awareness of potential for injury, follow-up after colonoscopy, and knowledge of typical presenting signs and symptoms among physicians are all essential to prevent morbidity and mortality.

CONFLICT OF INTEREST STATEMENT

The authors report no conflict of interest and no financial and non-financial interest in the subject matter or materials discussed in this manuscript. The authors alone are responsible for the content and writing of this article.

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This case has not been presented at any previous conferences and has not been submitted to any other journals.

SH, EM, AL and SI contributed substantially to the conception, writing, and revision of this manuscript.

All authors read and approved the final manuscript.

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