

CASE REPORT

대장용종절제술 이후 발생한 비장파열: 증례보고 및 문헌고찰

한승희, 이종훈, 김성훈¹

동아대학교 의과대학 내과학교실, 외과학교실¹

Splenic Rupture following Colon Polypectomy: A Case Report and Review of Literature

Seung-Hee Han, Jong Hoon Lee and Sung Heun Kim¹

Departments of Internal Medicine and General Surgery¹, Dong-A University College of Medicine, Busan, Korea

Colonoscopy is a safe procedure performed routinely worldwide. Splenic rupture is a rare complication of colonoscopy with several reported cases since 1974. We report the first case of a complication in the Republic of Korea. The literature on this rare complication is also reviewed here, with focus on the analysis of risk, diagnosis, and treatment. A 77-year-old patient receiving oral aspirin underwent colonoscopy with polypectomy. After 24 hours, the patient experienced dizziness and hypotension. Colonoscopy was performed to exclude intestinal bleeding, which could be diagnosed with hemoperitoneum. A computed tomography scan showed copious abdominal free blood and a splenic rupture. An urgent splenectomy was performed, which was the recognized procedure of choice. Physicians should have greater awareness of the possibility of splenic rupture following colonoscopy in order to avoid delay of diagnosis and treatment for this life-threatening complication. (**Korean J Gastroenterol 2015;65:123-126**)

Key Words: Colonoscopy; Splenic rupture; Complications

INTRODUCTION

Colonoscopy is a safe procedure performed routinely worldwide. The most frequent complications are hemorrhage and colonic perforation with incidence rates of 1-2% and 0.1-0.2%, respectively.^{1,2} Other rare and unusual complications are pneumothorax, pneumomediastinum, appendicitis, small bowel perforation, septicemia, pneumoscrotum, mesenteric tears, retroperitoneal abscess, and colonic volvulus.³ In this report, a case of splenic rupture following colonoscopy with polypectomy without underlying splenic disease is described.

CASE REPORT

A 77-year-old man with a history of low anterior resection due to rectal cancer at 64 years of age as well as unstable angina and coronary artery stenting at 74 years of age underwent colon polypectomy during hospitalization. Aspirin was stopped 5 days prior to the procedure. His initial hemoglobin was 15.1 g/dL, platelet was 188,000/ μ L, and prothrombin time was 11.3 sec. A laterally spreading tumor (1.5 cm) was removed from the splenic flexure. Total procedure time was 25 min. Extra-compression, positional change, or excessive technical maneuvers were not performed during the snare polypectomy following injection. The patient was prepared

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교신저자: 이종훈, 602-714, 부산시 서구 대신공원로 32, 동아대학교의료원 소화기내과

Correspondence to: Jong Hoon Lee, Department of Gastroenterology, Dong-A University Medical Center, 26 Daesingongwon-ro, Seo-gu, Busan 602-715, Korea.
Tel: +82-51-240-2893, Fax: +82-51-242-5852, E-mail: jh2002@dau.ac.kr

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for discharge the next day without any symptoms. However, 24 hours after completion of the procedure, while preparing for discharge, he complained of dizziness and abdominal bloating.

On physical examination, the patient was afebrile with a blood pressure of 70/30 mmHg and heart rate of 84 beats/min. His abdomen was distended but abdominal tenderness and rebound tenderness were not observed. Flank dullness was observed, but no shifting dullness was noted. Abdominal X-rays were taken to rule out a bowel perforation, as free air was not demonstrated. His conjunctiva was pale. His hemoglobin level decreased to 8.2 g/dL. The hematocrit was 27.8%. Although distal rectal examination was negative for rectal bleeding, another colonoscopy was performed for diagnosis of bleeding at the polypectomy site. There was no bleeding at the polypectomy site, but patches of bluish discoloration were seen throughout the colon (Fig. 1). A bluish hue of changing shape suggested collection of extra-colonic blood. A CT scan of the abdomen showed high attenuation

free peritoneal fluid consistent with a hemoperitoneum, and splenic rupture (Fig. 2). While the operating room was prepared, the patient received 1.92 L of packed red blood cells and 3 L of crystalloid infusion. Blood pressure was 90/60 mmHg after fluid therapy. Therefore, we decided to proceed with surgery rather than to manage the problem with splenic artery embolization by an interventional radiologist. Surgical findings included 1.5 L hemoperitoneum and at least another 1 L of clotted blood around the spleen. A splenectomy was performed because of failure of splenorrhaphy in an attempt to control active bleeding. The patient received 1.92 L of red blood cells intraoperatively.

The patient remained hemodynamically stable post-operatively with hemoglobin of 11.5 g/dL. His hemoglobin and hematocrit were monitored throughout the remaining course of his hospital stay, as it was thought that the drop in hemoglobin to 10.9 g/dL was most likely secondary to mobilization of third space fluid rather than acute bleeding. He was discharged without other complications 5 days after surgery.



Fig. 1. Colonoscopic findings. Patches of bluish discoloration were apparent throughout the sigmoid (A) and descending colon (B). The colored borders were irregular and moved in a manner similar to fluid, described as the “shifting blue hue sign”. (C) The polypectomy site showed no evidence of bleeding.



Fig. 2. Computed tomography scan of the abdomen demonstrated active bleeding from the ruptured spleen (A) with perihepatic-free blood collection (B).

DISCUSSION

The first splenic injury after colonoscopy was reported in 1974.⁴ Among other rare complications of colonoscopy, splenic rupture following the procedure is one of the rarest. Calculation of the real incidence is challenging as under-reporting is likely. Some groups have reported a higher incidence of 1 in 6,000-7,000 colonoscopies.^{5,6} Kamath et al.⁷ reported four cases in 296,000 colonoscopies, representing an incidence of 0.001%. Since 1974, more than 100 cases of splenic injury have been reported after routine colonoscopy, but only five cases were reported after polypectomy.⁸ Although a case of splenic rupture after colonoscopy was reported in 2010,⁹ ours is the first case reported after polypectomy in Korea. In the 2010 case, the patient complained of severe abdominal tenderness, as well as dizziness, and CT scan was taken. Blood pressure remained stable by fluid therapy, thus conservative therapy was administered. One study reported that patients with a history of abdominal surgery, inflammatory bowel disease, use of anti-platelet agents or blood thinners, difficulties during colonoscopy, and interventions including polypectomy during colonoscopy were at a higher risk for development of splenic injury.¹⁰ In our patient, a history of abdominal surgery, aspirin, and polypectomy could have been risk factors. However, Singla et al.⁸ found that few patients who suffered from splenic injury had prior predisposing factors. Of 102 patients who suffered from splenic injuries, 11 used aspirin, clopidogrel, or warfarin, 7 had undergone colonic surgeries, and 4 had undergone polypectomies, which might be predisposing factors.⁸ Cases of splenic rupture following polypectomy are so rare that determining its incidence rate or risk factors is difficult. We believe that physical changes due to duration or intensity of electrosurgical currents used for removal of primary lesion or chemical changes such as injection of mixed solutions for lift-

ing might be important factors. Further studies are merited in order to determine factors associated with splenic rupture following polypectomy.

The precise mechanism of splenic injury is unclear. Shatz et al.¹¹ postulated that injury to the spleen may occur from traction of the splenocolic ligament, which may be complicated by adhesions from previous abdominal surgeries or disease processes such as Crohn's disease and pancreatitis. The technical maneuvers of slide-by, alpha maneuver, straightening of the sigmoid loop, and externally applied pressure are possible causes. In addition, direct trauma to the spleen during colonoscopy has also been recognized as a cause of splenic rupture.¹²

The most common symptom of splenic injury is abdominal pain within 24 hours, which accounts for 94.6% of patients, with dizziness alone accounting for 10%.^{3,8,13} On physical examination, the Kehr sign (referred pain at the left shoulder tip) was positive in 56%.⁸ Our patient complained only of dizziness and abdominal bloating following hypotension. Thus, splenic injury was not considered initially. If the pain is associated with hypotension or decreasing hematocrit and hemoglobin rate, an abdominal ultrasound or CT scan should be considered mandatory. In our case, a colonoscopy was performed first in order to exclude intestinal bleeding as splenic injury was not considered initially. In colonoscopy, we do not determine intestinal bleeding except "shifting blue sign". A characteristic feature of hemoperitoneum is a patchy bluish discoloration throughout the colon, described as the "shifting blue hue sign".¹⁴ A bluish hue that changes shape with respiration or positional change is suggestive of extra-colonic blood collection. CT is the most sensitive diagnostic tool, even if another study is initially done for diagnosis.⁸ An initial ultrasound early in the course of evaluation can identify free fluid in the abdomen.¹⁵ Physicians should have greater awareness of the possibility of splenic rupture following colono-

Table 1. American Association of Surgeons for Trauma Splenic Injury Grading Scale¹⁶

Grade	Injury description
I	Hematoma Subcapsular, < 10% surface area
	Laceration Capsular tear, < 1 cm parenchymal depth
II	Hematoma Subcapsular, 10-50% surface area; intraparenchymal, < 5 cm diameter
	Laceration 1-3 cm parenchymal depth; does not involve a trabecular vessel
III	Hematoma Subcapsular, > 50% surface area or expanding; ruptured subcapsular or parenchymal hematoma
	Laceration > 3 cm parenchymal depth or involving trabecular vessels
IV	Laceration Laceration involving segmental or hilar vessels and producing major devascularization (> 25% of spleen)
V	Laceration Completely shattered spleen

scopy in order to avoid delay of diagnosis and treatment of this life-threatening complication.

Further information can be collected in hemodynamically stable patients by performing a contrast-enhanced CT scan, which increases the accuracy of diagnosing splenic injury to nearly 98%, enables grading of splenic injury, and identifies other concomitant injuries.^{16,17} Splenic injuries can be graded according to the American Association of Surgeons for Trauma (AAST) Splenic Injury Grading Scale (Table 1) based on CT scan findings.¹⁶ The splenic injury grading scale can be helpful in distinguishing patients who are potential candidates for non-operative management. AAST grade III or higher injury requires transfusion and operative management.¹⁷ Our patient underwent splenectomy that was AAST grade III with a ruptured subcapsular hematoma and intractable hypotension. Although these symptoms are significant, the one absolute indication for surgical intervention is intractable hypotension referable to the spleen.

Since 1974, splenic injury after colonoscopy has been reported in more than 100 cases. A technically difficult colonoscopy is a possible risk factor. The onset of symptoms often occurs after discharge from the recovery area usually within 48 hours of colonoscopy. Colonoscopy or ultrasound can be helpful in the diagnosis, but a CT scan is the preferred diagnostic test. Patients with hemodynamic instability and hemoperitoneum are more likely to undergo surgery. Patients with confined intrasplenic hematoma and hemodynamic stability can usually be managed conservatively. The decision regarding surgery vs. supportive care and observation rests on clinical judgment in individual patients. As awareness of this injury increases, more patients will be identified, which will not only improve our understanding of this complication but also encourage better management for patients.

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