

# Splenic Rupture after Colonoscopy: A Case Report

Chien-Hung Lin, Ching-Chu Lo, Jow-Jyh Hwang,  
Fu-Chin Hung, and Chung-Hung Chen

*Division of Gastroenterology, Department of Internal Medicine,  
St. Martin De Porres Hospital, Chiayi, Taiwan*

## Abstract

Splenic rupture after colonoscopy is a rare but fatal complication and fewer than 50 case reports were described in the English literature. We report a case of splenic rupture with presentation of abdominal pain within 24 hours after colonoscopy. Bowel perforation and bleeding were excluded and abdominal CT revealed splenic rupture and hemoperitoneum. We treated this patient with conservative management successfully. The mechanism of splenic rupture after colonoscopy was still unclear but some risk factors were described. The diagnosis required a high index of suspicion and the awareness of this uncommon complication of colonoscopy, which should be suspected in any patient with persistent abdominal pain or who is hemodynamically unstable after bowel perforation and bleeding have been excluded. ( J Intern Med Taiwan 2009; 20: 457-460 )

**Key Words :** Splenic rupture, Colonoscopy complication

## Introduction

Colonoscopy is a tool commonly used when diagnosing diseases of the colon and rectum. Bowel perforation and bleeding are the most common complications of colonoscopy and are usually associated with polypectomy or biopsy<sup>1</sup>. Other less-common adverse events include pneumothorax, pneumomediastinum, retroperitoneal abscess and emphysema, and colonic volvus<sup>2-5</sup>. Splenic rupture after colonoscopy is a rare complication which was first reported in 1974 by Wherry and Zehner<sup>6</sup>. There were no more than 50 case reports in the English literature. We report a case of splenic rupture after colonoscopy which was managed without surgery.

## Case report

A 70-year-old man was admitted to the hospital for chronic obstructive lung disease with acute exacerbation. He had a history of traumatic rupture of the left diaphragm and underwent one-man colonoscopy to evaluate the cause of anemia (hemoglobin, 4.9 g/dL) which had been corrected by blood transfusion (hemoglobin, up to 11.7 g/dL). An aqueous sodium phosphate (45 mL) regimen was used for colonic cleansing before colonoscopy and there was adequate bowel preparation. Buscopan was the only premedication drug. The colonoscopy insertion time was about 10 minutes and the 65 cm length of colonoscopy was required for cecal

intubation. The patient suffered from moderate discomfort when the scope reached the splenic flexure (Fig.1). The procedure was performed with ancillary maneuvers such as position change, and external abdominal pressure was applied. The diagnostic finding of the colonoscopy showed a normal colon and mixed hemorrhoids. No polypectomy or biopsy was performed.

During post-procedure periods, the patient complained of abdominal fullness, which was remedied by prokinetic drugs. However, he developed severe abdominal pain without radiation 20 hours later after colonoscopy. The abdomen was not distended but diffusely tender with guarding and rebound tenderness. Bowel sounds were normal and the rectum had no blood or tarry stool. Laboratory data showed a white blood count of 5,300 per  $\mu\text{l}$  and a platelet count of 144,000 per  $\mu\text{l}$ . The hemoglobin level acutely decreased from 11.7 g/dL to 7.1 g/dL. Coagulation and chemistry parameters were normal. The abdominal computed tomography scan revealed a large amount of fluid in the peritoneal cavity and splenic rupture with hematoma (Fig.2) (5 days ago, the abdominal CT was negative). Paracentesis was performed and revealed the presence of hemoperitoneum.

The patient was hemodynamically stable (heart rate was 104 bpm and blood pressure 108/70 mmHg) and transferred to an intensive care unit. A transfusion of four units of packed red blood cells was started and the hemoglobin level stabilized at 10 gm/dL within 24 hours of the patient entering the intensive care unit. Based on the patient's stability after management, non-operative conservative management was continued and he was discharged on the 13<sup>th</sup> day.

## Discussion

Abdominal pain is the most common symptom of splenic rupture after colonoscopy<sup>7</sup>. It may be generalized or localized to the left upper quadrant



Fig.1. Splenic flexure without mucosa lesion.



Fig.2. Abdominal CT with IV contrast: splenic laceration (arrow) with blood in the peritoneum but no active extravasation.

and may typically radiate to the left shoulder (Kehr sign). A positive Kehr sign was recorded in 55% of the reviewed literature<sup>8</sup>. The onset of abdominal pain is usually within 24 hours after colonoscopy but can occur 48 hours or more after the procedure<sup>9</sup>.

The causes of splenic rupture after colonoscopy are unclear. The main proposed mechanisms are the excessive traction on the splenicocolic ligament with splenic capsular avulsions and direct trauma to the spleen during colonoscopy<sup>10</sup>. Some colonoscopy manipulations like slide-by blind advancement, hooking the splenic flexure, alpha

maneuver, and straightening the sigmoid loop can result in increased traction on the splenicocolic ligament<sup>11</sup>. External abdominal pressure may predispose an enlarged spleen to direct trauma. Supine position has been suggested as a risk factor due to the force exerted on the spleen caused by gravity and traction during colonoscopy<sup>12</sup>. Other known risk factors for spleen injury include polypectomy, female gender, technically difficult colonoscopy, multiple previous colonoscopies, anticoagulation, splenomegaly, prior surgery and adhesions<sup>7</sup>. Avoiding excessive maneuvers may help the high-risk patients avoiding this fatal complication.

Computed tomography of the abdomen with intravenous contrast is the most sensitive and specific imaging modality for evaluating splenic injury. It can demonstrate splenic laceration and active extravasation and can also identify hemoperitoneum. These radiologic findings may help to decide which patients will need conservative treatment or operative management<sup>13</sup>.

Our patient had a history of prior surgery and a proposed risk factor, underwent technically difficult colonoscopy (external pressure and position change), and presented with acute anemia and abdominal pain without Kehr sign 20 hours after colonoscopy. Bowel perforation and bleeding were excluded by abdominal CT and digital examination. Splenic rupture after colonoscopy with hemoperitoneum was diagnosed in our patient by image and paracentesis.

The management of splenic rupture after colonoscopy can be conservative or surgical intervention depending on the patient's hemodynamic status and the degree of splenic injury. The conservative treatment includes bed rest, intravenous fluids, blood transfusion, and close hemodynamic monitoring<sup>5</sup>; however, about 70% of patients eventually require splenectomy<sup>7</sup>. The predictors of failed conservative treatment include

hemodynamic instability, underlying splenic disease, a grade III traumatized spleen by CT, old age and hemoperitoneum, according to Janes<sup>5,14</sup>.

Our patient was elderly and presented with hemoperitoneum, but he was hemodynamically stable without active extravasation. We treated our patient with conservative management successfully. The hemodynamic status of the patient may be crucial to the management of splenic rupture after colonoscopy.

## Conclusion

The diagnosis of splenic rupture after colonoscopy required a high index of suspicion and the awareness of this uncommon complication of colonoscopy. This complication after colonoscopy is rare but fatal and should be suspected in any patient with persistent abdominal pain and who is hemodynamically unstable after bowel perforation and bleeding have been excluded. Abdominal CT is the best image modality to evaluate splenic injury and can help to make an auxiliary decision about management. Splenic rupture can be managed by conservative or surgical intervention, and the patient's hemodynamic status is a good predictor of failed conservative management. The awareness splenic rupture after colonoscopy is principal to early recognition and appropriate management of this potentially fatal complication.

## References

1. Ghazi A, Grossman M. Complications of colonoscopy and polypectomy. *Surg Clin North Am* 1982; 62: 889-96.
2. Lezak MB, Goldhamer M. Retroperitoneal emphysema after colonoscopy. *Gastroenterology* 1974; 66: 118-20.
3. Taylor R, Weakley FL, Sullivan BH, Jr. Non-operative management of colonoscopic perforation with pneumoperitoneum. *Gastrointest Endosc* 1978; 24: 124-5.
4. Ostyn B, Bercoff E, Manchon ND, et al. Retroperitoneal abscess complicating colonoscopy polypectomy. *Dis Colon Rectum* 1987; 30: 201-3.
5. Ahmed A, Eller PM, Schiffman FJ. Splenic rupture: an unusual complication of colonoscopy. *Am J Gastroenterol* 1997; 92: 1201-4.
6. Wherry DC, Zehner H, Jr. Colonoscopy-fiberoptic

- endoscopic approach to the colon and polypectomy. *Med Ann Dist Columbia* 1974; 43: 189-92.
7. Saad A, Rex DK. Colonoscopy-induced splenic injury: report of 3 cases and literature review. *Dig Dis Sci* 2008; 53: 892-8.
  8. Tsoraides SS, Gupta SK, Estes NC. Splenic rupture after colonoscopy: case report and literature review. *J Trauma* 2007; 62: 255-7.
  9. Merchant AA, Cheng EH. Delayed splenic rupture after colonoscopy. *Am J Gastroenterol* 1990; 85: 906-7.
  10. Smith LE, Nivatvongs S. Complications in colonoscopy. *Dis Colon Rectum* 1975; 18: 214-20.
  11. Taylor FC, Frankl HD, Riemer KD. Late presentation of splenic trauma after routine colonoscopy. *Am J Gastroenterol* 1989; 84: 442-3.
  12. Tse CC, Chung KM, Hwang JS. Prevention of splenic injury during colonoscopy by positioning of the patient. *Endoscopy* 1998; 30: S74-5.
  13. Janes SE, Cowan IA, Dijkstra B. A life threatening complication after colonoscopy. *Bmj* 2005; 330: 889-90.
  14. Tsugawa K, Koyanagi N, Hashizume M, et al. New insight for management of blunt splenic trauma: significant differences between young and elderly. *Hepatology* 2002; 49: 1144-9.

## 大腸鏡術後脾臟破裂：一病例報告

林建宏 羅清池 黃國智 洪福枝 陳忠宏

財團法人天主教聖馬爾定醫院 肝膽腸胃科

### 摘 要

脾臟破裂是一個罕見但會致命的大腸鏡併發症之一，到目前為止少於50個病例報告被描述。我們報告一個以24小時內腹痛為表現的大腸鏡術後的脾臟破裂病例。在腸穿孔和出血併發症排除後，腹部電腦斷層顯示脾臟破裂合併腹腔內積血。我們以非外科的保守方式成功地治療這名病患。目前，大腸鏡術後的脾臟破裂機制並不清楚，但有一些危險因子已被描述。要診斷一個大腸鏡術後的脾臟破裂是需要高度懷疑和察覺這種少見併發症的鑑別診斷。如果一個大腸鏡術後的病人有持續的腹痛或血液動力學不穩定時，除了腸穿孔和出血併發症外，脾臟破裂的併發症是要被考慮的。