

CASE REPORT

Scoliosis as a Rare Risk Factor for Colon Perforation during Colonoscopy: The Second Reported Case and Literature Review

¹Sameer AIOsaimi, ²Shehab Ekrouf, ³Ahmed AIMulla

ABSTRACT

Background: Colonoscopy has been accepted as the best method for the screening, diagnosis, treatment and follow-up of colorectal pathologies. It is an invasive procedure with many recognized complications such as iatrogenic colonic perforation (CP). Knowledge of the factors influencing (CP) is of decisive importance, especially with regard to the avoidance or minimization of the perforations. This is the second case in the literature with such unreported and rare risk factor for iatrogenic colonoscopic perforation.

Case summary: We reported a 66-year-old female, not known to have any medical problems, underwent colonoscopy screening. No abnormalities detected up to the rectosigmoid junction when the gastroenterologist noted sudden and massive abdominal distension, the patient started complaining of severe generalized abdominal pain, however, she was hemodynamically stable. The procedure abandoned. Abdominal X-ray showed severe scoliotic deformity of the lumbar spine with massive pneumoperitoneum. Diagnostic laparoscopy showed a small perforation at the anterior wall of sigmoid colon which was repaired, no fecal soiling of the peritoneal cavity was found as she was prepared for colonoscopy. Her course was unremarkable, and she was discharged 7 days later. A 2-week follow-up showed her to be asymptomatic with healed laparoscopic surgery scars and normal bowel motion.

Conclusion: Patients with skeletal deformity such as scoliosis undergoing colonoscopy have a higher risk of iatrogenic colonoscopic perforation. Symptoms of abdominal pain and distension during colonoscopy in this group of patients should alert the treating doctor for the possibility of colon injury which should be managed accordingly.

Keywords: Colon perforation, Iatrogenic perforation, Scoliosis, Skeletal deformity, Colonoscopy.

How to cite this article: AIOsaimi S, Ekrouf S, AIMulla A. Scoliosis as a Rare Risk Factor for Colon Perforation during Colonoscopy: The Second Reported Case and Literature Review. *World J Lap Surg* 2014;7(3):133-135.

Source of support: Nil

Conflict of interest: None

INTRODUCTION

Colonoscopy is a common procedure for the diagnosis, treatment and follow-up of colorectal pathologies.

However, this invasive procedure is performed with some risk of hemorrhage, perforation and even death.^{1,2}

Colonoscopic perforation (CP) has become one of the most fearsome complications of routine or therapeutic gastrointestinal endoscopy. The incidence of iatrogenic perforation is reported to range between 0.01 and 0.8% for diagnostic and routine colonoscopy, and from 0.15 to 3% for therapeutic colonoscopy,^{1,3-6} with rectosigmoid as the most common site of colonic perforation.⁷⁻¹¹

Major complications such as perforation and hemorrhage occur 2.4 times more often in the right than in the left colon during therapeutic endoscopy.¹² Knowing risk factors, recognizing early signs of perforations, and giving early and optimal treatment may reduce the probability of complications and death.¹¹

We are describing an iatrogenic CP where the mechanism of CP is related to patient's skeletal deformity that precipitated the injury, the CP managed surgically. The first case with such injury was described in 2010,¹³ and still in publishing process.¹⁴ This is the second case in the literature with such unreported and rare risk factor for iatrogenic colonoscopic perforation.

CASE REPORT

We reported a 66-year-old female, not known to have any medical problems, underwent colonoscopy screening. No abnormalities detected up to the rectosigmoid junction when the gastroenterologist noted sudden and massive abdominal distension, the patient started complaining of severe generalized abdominal pain, however, she was hemodynamically stable. The procedure was abandoned and was taken immediately to resuscitation room, abdominal examination showed peritonitis. Chest X-ray revealed air under the diaphragm (Fig. 1). Abdominal X-ray showed severe scoliotic deformity of the lumbar spine with massive pneumoperitoneum (Fig. 2). Diagnostic laparoscopy showed a small perforation of 1.0 cm at the anterior wall of sigmoid colon which was repaired laparoscopically, no fecal soiling of the peritoneal cavity was found as she was prepared for colonoscopy. She was covered with antibiotics postoperatively. Her course was unremarkable, and she was discharged 7 days later. A 2-weeks follow-up showed her to be asymptomatic with healed laparoscopic surgery scars and normal bowel motion.

¹Department of Surgery, Al-Sabah Hospital, Kuwait City, Kuwait

^{2,3}Department of Surgery, Al-Amiri Hospital, Kuwait City, Kuwait

Corresponding Author: Sameer AIOsaimi, Department of Surgery, Al-Sabah Hospital, Kuwait City, Kuwait, Phone: 0096599302600, e-mail: Hudood2004@yahoo.com

DISCUSSION

The CP may occur as a result of direct mechanical penetration with the instrument tip, sharp flexion of the colonoscope over distended bowel or due to thermal or electrical injury during therapeutic intervention, such as polypectomy.

Anderson et al¹⁵ discussed the risks of perforation after either sigmoidoscopy or colonoscopy. The study compared 10486 colonoscopies with 49501 sigmoidoscopies done over 10 years (1987-1996) at Mayo Clinic, they found two deaths secondary to perforation from colonoscopy, corresponding to an overall mortality rate after a colonoscopy of 0.02% and an incidence of death after a perforation of 10%.

Gatto et al¹⁶ explored a large population-based database to compare the incidence of perforation associated with both of these flexible endoscopic procedures and to investigate what factors predict the occurrence of this complication, they found that the risk of perforation after colonoscopy was statistically significantly increased among patients with diverticulosis and obstruction, whereas the risk of perforation after sigmoidoscopy was increased among patients with diverticulosis and abdominal pain. In their study, there were 77 perforations after 39286 colonoscopies and 31 perforations after 35298 sigmoidoscopies procedures. Further more, risk of CP from either procedure increased in association with increasing age and the presence of two or more comorbidities.

Lohsiriwat et al¹⁷ prospectively reviewed 10124 patients undergoing either colonoscopy or flexible sigmoidoscopy between January 2005 and July 2008. Over a 3.5-year period, there were 15 colonic perforations, they found that patient gender, emergency endoscopy, anesthetic method, and the specialty or experience of the endoscopist were not significantly predictive of CP rate. In the other hand, patient age of over 75 years and therapeutic colonoscopy were two important risk factors

for CP. Pelvic adhesions following previous pelvic operation or infection also contribute to a high incidence of sigmoid perforation.^{9,18} Some authors have also suggested that patients with multiple comorbidities are at greater risk of perforation.^{16,19} Furthermore, that advanced age of patients and endoscopy performed by a trainee shown to increase the risk of CP.^{16,20} It was found that mechanical stress is the most common mechanism of perforation, the other perforations were associated with cone biopsy, electrocautery and pneumatic causes.²¹

Similar to the first reported case,^{13,14} we think scoliosis with sever skeletal deformity can interfere with the usual path of introducing the colonoscope, thus causing CP.

Colonoscopic perforations may be managed operatively or nonoperatively. Several large series have reported that many patients with perforations may be treated successfully without operations. Conservative treatment includes bowel rest, intravenous fluids, and antibiotics to allow the perforation to seal.^{15,22-25}

In Korean study, it is reported that 36% of the patients were managed conservatively. Nine patients underwent endoscopic perforation closure using hemoclips. Twenty-nine percent of those patients underwent colonic resection with anastomosis. In a retrospective review of laparoscopic repair of colonic perforations, the mean colonic perforation size was 2.7 cm.²⁶

Operative treatment is most often necessary in patients with generalized peritonitis, large injuries, or failed conservative treatment.²⁷

In our case, the perforation located at the anterior wall of sigmoid colon, the patient was in peritonitis, with radiological evidence of viscus perforation, so surgical intervention was required. As she was hemodynamically stable, we chose diagnostic laparoscopy to diagnose and proceed with surgical management.

The specific operative procedures used will depend on the size of perforation, the degree of peritoneal soilage,

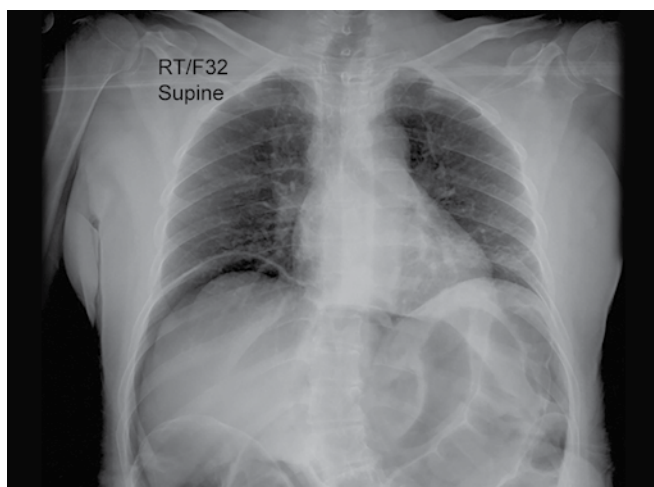


Fig. 1: Chest X-ray showing air under the diaphragm



Fig. 2: Abdominal X-ray showed severe scoliotic deformity of the lumbar spine with massive pneumoperitoneum

the presence of associated colonic pathology, the stability of the patient and the overall underlying condition of the patient. Primary repair of the colon is reserved for limited injury with no coexisting pathology. Surgical resection with primary anastomosis should be attempted if abdominal contamination or concomitant pathology is present.^{23,24,27}

In our case, the perforation was small (1.0 cm), with no fecal soiling of the peritoneal cavity and the perforation repaired laparoscopically using absorbable sutures.

CONCLUSION

Patients with skeletal deformity such as scoliosis undergoing colonoscopy have a higher risk of iatrogenic colonoscopic perforation. Symptoms of abdominal pain and distension during colonoscopy in this group of patients should alert the treating doctor for the possibility of colon injury which should be managed accordingly. This is the second reported case, aiming to alert surgeons and endoscopists about such rare risk factor.

CONSENT

Written informed consent was obtained for publication of this case report and accompanying images.

REFERENCES

- Rogers BH, Silvis SE, Nebel OT, Sugawa C, Mandelstam P. Complications of flexible fiberoptic colonoscopy and polypectomy. *Gastrointest Endosc* 1975;22:73-77.
- Smith LE. Fiberoptic colonoscopy: complications of colonoscopy and polypectomy. *Dis Colon Rectum* 1976;19:407-412.
- Niv Y, Hazazi R, Levi Z, Fraser G: Screening colonoscopy for colorectal cancer in asymptomatic people: a meta-analysis. *Dig Dis Sci* 2008.
- Shahmir M, Schuman BM. Complications of fiberoptic endoscopy. *Gastrointest Endosc* 1980;26:86-91.
- Muhldorfer SM, Kekos G, Hahn EG, Ell C. Complications of therapeutic gastrointestinal endoscopy. *Endoscopy* 1992;24:276-283.
- Wullstien CH, Köppen MO, Gross E. Laparoscopic treatment of colonic perforations related to colonoscopy. *Surg Endosc* 1999;13:484-487.
- Lohsiriwat V, Sujarittanakarn S, Akaraviputh T, Lertakyananee N, Lohsiriwat D, Kachinthorn U. What are the risk factors of colonoscopic perforation? *BMC Gastroenterol* 2009;9:71.
- Repici A, Pellicano R, Strangio G, Danese S, Fagoonee S, Malesci A. Endoscopic mucosal resection for early colorectal neoplasia: pathologic basis, procedures and outcomes. *Dis Colon Rectum* 2009;52:1502-1515.
- Iqbal CW, Cullinane DC, Schiller HJ, Sawyer MD, Zietlow SP, Farley DR. Surgical management and outcomes of 165 colonoscopic perforations from a single institution. *Arch Surg* 2008;143:701-706.
- Teoh AY, Poon CM, Lee JF, Leong HT, Ng SS, Sung JJ, Lau JY. Outcomes and predictors of mortality and stoma formation in surgical management of colonoscopic perforations: a multicenter review. *Arch Surg* 2009;144:9-13.
- Lüning TH, Keemers-Gels ME, Barendregt WB, Tan AC, Rosman C. Colonoscopic perforations: a review of 30,366 patients. *Surg Endosc* 2007;21:994-997.
- Heldwein W, Dollhopf M, Rosch T, Meining A, Schmidtdorff G, Hasford J, Hermanek P, Burlefing R, Birkner B, Schmitt W. The Munich polypectomy study (MUPS): prospective analysis of complications and risk factors in 4,000 colonic snare polypectomies. *Endoscopy* 2005;37:1116-1122.
- Al-Harbi O, Al-Osaimi S, Al-Kandari I. Scoliosis as a rare risk factor for colon perforation during colonoscopy: a case report. Kuwait University, Health Sciences Center (HSC), Poster Conference 2010. Poster No. 272.
- AlHarbi O, AlOsaimi S, AlKandari I. Scoliosis as a rare risk factor for colon perforation during colonoscopy: a case report. *KMJ*. Submitted for publishing.
- Anderson ML, Pasha TM, Leighton JA. Endoscopic perforation of the colon: lessons from a 10-year study. *Am J Gastroenterol* 2000;95:3418-3422.
- Gatto NM, Frucht H, Sundararajan V, Jacobson JS, Grann VR, Neugut AI. Risk of perforation after colonoscopy and sigmoidoscopy: a population-based study. *J Natl Cancer Inst* 2003;95:230-236.
- Lohsiriwat V, Sujarittanakarn S, Akaraviputh T, Lertakyananee N, Lohsiriwat D, Kachinthorn U. What are the risk factors of colonoscopic perforation? *BMC Gastroenterol* 2009;9:71.
- Damore LJ, Rantis PC, Vernava AM, Longo WE. Colonoscopic perforations. Etiology, diagnosis and management. *Dis Colon Rectum* 1996;39:1308-1314.
- Arora G, Mannalithara A, Singh G, Gerson LB, Triadafilopoulos G. Risk of perforation from a colonoscopy in adults: a large population-based study. *Gastrointest Endosc* 2009;69:654-664.
- Galandiuk S, Ahmad P. Impact of sedation and resident teaching on complications of colonoscopy. *Dig Surg* 1998;15(1):60-63.
- Cobb WS, Heniford BT, Sigmon LB, Hasan R, Simms C, Kercher KW, Matthews BD. Colonoscopic perforations: incidence, management and outcomes. *Am Surg* 2004;70:750-757.
- Christie JP, Marrazzo J III. Mini-perforation of the colon—not all postpolypectomy perforations require laparotomy. *Dis Colon Rectum* 1991;34:132-135.
- Jentschura D, Raute M, Winter J, Henkel T, Kraus M, Manegold BC. Complications in endoscopy of the lower gastrointestinal tract. Therapy and prognosis. *Surg Endosc* 1994;8:672-676.
- Lo AY, Beaton HL. Selective management of colonoscopic perforations. *J Am Coll Surg* 1994;179:333-337.
- Dafnis G, Ekblom A, Pahlman L, Blomqvist P. Complications of diagnostic and therapeutic colonoscopy within a defined population in Sweden. *Gastrointest Endosc* 2001 Sep;54(3):302-309.
- Hansen AJ, Tessier DJ, Anderson ML, Schlinkert RT. Laparoscopic repair of colonoscopic perforations: indications and guidelines. *J Gastrointest Surg* 2007;11:655-659.
- Farley DR, Bannon MP, Zietlow SP, Pemberton JH, Ilstrup DM, Larson DR. Management of colonoscopic perforations. *Mayo Clin Proc* 1997;72:729-733.