

## CASE REPORT

# Small bowel perforation due to an adhesion ruptured by peritoneal insufflation

Andy Petroianu\*

Department of Surgery of the School of Medicine, Federal University of Minas Gerais, Belo Horizonte, Brazil

\*Correspondence address. Avenida Afonso Pena, 1626-apto. 1901, Belo Horizonte, MG 30130-005, Brazil. Tel: +55-31-98884-9192; Fax: +55-31-3274-7744; E-mail: petroian@gmail.com.br

## Abstract

**Background:** Despite the widespread use of laparoscopic cholecystectomy, technical complications unique to the laparoscopic approach may lead to significant postoperative morbidity and mortality. **Case report:** We report the first published case of small bowel fistula due to peritoneal insufflation that broke a thin string adhesion between the peritoneal wall and a jejunal segment, which lead to a focal perforation in a 75-year-old woman. Leakage of enteric fluid through the umbilical scar indicated this adverse event during the early postoperative period. The patient was immediately and successfully treated with a suture of the intestinal lesion. **Conclusion:** Peritoneal insufflation induced for laparoscopic procedures may break abdominal adhesions and lead to organs and vascular injuries, including small bowel perforation.

## INTRODUCTION

Laparoscopy presents well-known advantages, such as less pain, lower rate of surgical site infection, shorter hospital length, earlier resumption of routine activity and cosmetic scar healing [1, 2]. By contrast, 0.13% of procedures have the risk of inadvertent lesions in intra-abdominal organs and vessels when introducing the Veress needle and trocars, or during dissection and cauterization of intracavitary tissues [1, 3–8]. Unrecognized bowel injuries may lead to life threatening complications, including enteric leakage, followed by peritonitis, which is often complicated with sepsis during the early postoperative period [3–5, 7–9]. Immediate detection of such an event with quick and proper surgical intervention is required to avoid the high mortality rate of 3.6% [1, 3, 4, 6, 7, 10, 11].

This work has been reported according to the SCARE criteria [12].

## CASE REPORT

A 75-year-old woman received medical care, complaining of intermittent pain in the right hypochondrium. Ultrasound of the abdomen revealed a few small gallbladder stones with

gallbladder wall thickening. Twenty-three years ago, this patient had undergone a median laparotomy to treat generalized peritonitis due to a perforated duodenal peptic ulcer. No other previous significant disease was reported and she was in good health.

The patient underwent elective laparoscopic cholecystectomy without apparent complications. The first trocar, through the umbilical port, was introduced under direct vision due to the possibility of abdominal adhesions surrounding this site, which were confirmed during the surgical procedure. However, these adhesions did not impair the cholecystectomy.

Four hours after the surgical procedure, the patient complained of increasing left lower quadrant pain and local abdominal distension was observed. Two hours later, enteric fluid leaked through the umbilical port scar, which became inflamed. The evidence of small bowel fistula indicated an immediate new surgical approach. Therefore, the patient began to receive two grams of ceftriaxone, followed by 1 g of IV twice a day.

The laparoscope was introduced through the umbilical port. The right side abdomen presented no abnormality and the

Received: May 9, 2018. Accepted: June 29, 2018

Published by Oxford University Press and JSCR Publishing Ltd. All rights reserved. © The Author(s) 2018.

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited. For commercial re-use, please contact [journals.permissions@oup.com](mailto:journals.permissions@oup.com)

cholecystectomy site continued to show a satisfactory appearance. The enteric leakage began to flow from the lower left abdominal flank, but a wide, left abdominal blockage by adhesions, due to the previous laparotomy, prevented a safe laparoscopic approach. A subsequent exploratory laparotomy through a paraumbilical median incision demonstrated a 0.6 cm focal perforation of the middle jejunum in the left flank, about 10 cm from the umbilical port. A peritoneal thin string adhesion was identified directly above this perforation. This adhesion most likely linked the peritoneal wall to the jejunum on the site of the perforation. During peritoneal insufflation, the distension of the abdominal wall broke the string and led to a jejunal perforation. Three stiches, using 4-0 silk thread closed the perforation [10, 11]. All abdominal fluid was aspirated and no abnormality was found at the cholecystectomy site or in any other part of the abdomen, except for many adhesions, mainly in the left abdomen. The abdomen was closed following common surgical procedures.

The patient showed an uneventful postoperative follow-up, and was fed on the second postoperative day. On the fifth postoperative day, the patient's hematological and biochemical exams were normal and she was discharged from the hospital in good health. The patient has been undergoing follow-up for 11 months, and no abnormality or complaint occurred during this period.

## DISCUSSION

The literature indicates that major complications occur in ~2.2–3.7% of all patients submitted to laparoscopic procedures during the early postoperative period. While after cholecystectomy the most common complications are bile duct injuries (0.2–0.3%) and postoperative bile leaks (0.2–0.4%), the most lethal complications follow injuries to major vessels and the bowel (0.1–0.3%) [1–5, 7–11]. Bowel injuries may occur as a result of perforation caused by the insufflation needle, electrocautery burn, tearing during retraction or trocar injury [3–6, 8–11]. These events are, in general, unrecognized at the time of laparoscopic cholecystectomy, and become apparent when the patients develop peritonitis or enterocutaneous fistula [3–5, 7–9].

Laparoscopic procedures in patients with many abdominal adhesions due to previous surgeries and abdominal inflammations are relatively common, most of which are feasible. Although we expected to find other similar cases of bowel injuries caused by adhesion ruptures during the peritoneal insufflation, we were unable to find any reliable source referring this event. Therefore, to the best of our knowledge, this is first published case of an important complication that may occur during laparoscopic procedures, and should be considered during peritoneal insufflation.

## CONCLUSION

Peritoneal insufflation induced for laparoscopic procedures may break abdominal adhesions and lead to organ and vascular injuries, including small bowel perforation.

## ACKNOWLEDGEMENTS

The author thanks the National Council of Science and Technology (CNPq), the Research Aid Foundation of Minas Gerais (FAPEMIG) and the Rectorship of Research of the Federal University of Minas Gerais (PRPq) for the financial support.

## CONFLICT OF INTEREST STATEMENT

The author of this paper declares that there are no conflicts of interest.

## ETHICS

This case was an unexpected surgical complication. No innovation was introduced in the propedeutics or treatment of the case submitted to the ethics committee. Informed consent was obtained from the patient in writing in order to publish her adverse effect of peritoneal insufflation.

## REFERENCES

- Lirici MM, Califano A. Management of complicated gallstones: results of an alternative approach to difficult cholecystectomies. *Minim Invasive Ther Allied Technol* 2010;**19**: 304–15.
- Fransen S, Stassen L, Bouvy N. Single incision laparoscopic cholecystectomy. *J Minimal Access Surg* 2012;**8**:1–5.
- Schäfer M, Lauper M, Krähenbühl L. Trocar and Veress needle injuries during laparoscopy. *Surg Endosc* 2001;**15**: 275–80.
- Van der Voort M, Heijnsdijk EA, Gouma DJ. Bowel injury as a complication of laparoscopy. *Br J Surg* 2004;**91**:1253–8.
- Ho AC, Horton KM, Fishman EK. Perforation of the small bowel as a complication of laparoscopic cholecystectomy. *Clin Imaging* 2000;**24**:204–6.
- Sundbom M, Ottosson J. Trocar injuries in 17,446 laparoscopic gastric bypass. *Obesity Surg* 2016;**26**:2127.
- Kaloo P, Cooper M, Reid G. A prospective multicentre study of laparoscopic complications related to the direct-entry technique. *Gynaecol Endosc* 2002;**11**:67–70.
- Van der Voort M, Heijnsdijk E, Gouma D. Bowel injury as a complication of laparoscopy. *Br J Surg* 2004;**91**:1253–8.
- Thomas GP, Willson PD. Electrosurgery ignition of a peritoneal insufflation secondary to prior spontaneous perforation of the small bowel. *Ann Roy Coll Surg England* 2012;**94**: 70e–1e.
- Jagad R. Laparoscopic closure of small bowel perforation. *J Minimal Access Surg* 2009;**5**:47–8.
- Sinha R, Sharma N, Joshi M. Laparoscopic repair of small bowel perforation. *J Soc Laparoendosc Surg* 2005;**9**:399–402.
- Agha RA, Fowler AJ, Saetta A, Barai I, Rajmohan S, Orgill DP. The SCARE statement: consensus-based surgical case report guidelines. *Int J Surg* 2016;**34**:180–6.