

Postoperative Bowel Obstruction as a Rare Complication of an Abdominal Drain

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Although routine intra-abdominal drain insertion following surgery represents a common practice worldwide, its utility has been questioned during the last decades. Several comparative studies have failed to document significant benefits from routine draining, and drain insertion has been correlated with various complications as well. Drain-related complications include, but are not limited to, infection, bleeding, and tissue erosion. Herein, we present the case of a 32-year-old patient with perforated peptic ulcer and purulent peritonitis, whose postoperative course was complicated by early mechanical bowel obstruction due to an abdominal drain. A high level of clinical suspicion, along with accurate imaging diagnosis, dictated prompt removal of the drain, which resulted in immediate resolution of the patient's symptoms. We aim to increase the clinical awareness of this rare complication related to intra-abdominal drain utilization with this report.

Keywords: abdominal drain; complications; bowel obstruction

Introduction

Routine intra-abdominal drain insertion following surgery represents a common practice worldwide, although there is growing evidence that not only does it add no benefit, but may actually increase patients' morbidity. Drain-related complications include, but are not limited to, infection, bleeding, and tissue erosion. Herein, we present the case of a patient with perforated peptic ulcer who was surgically treated in our department, and whose postoperative course was complicated by early mechanical bowel obstruction due to an abdominal drain.

Case Presentation

A 32-year-old male patient presented to the Emergency Department complaining of severe generalized abdominal pain. Past medical history was unremarkable apart from habitual smoking. The patient referred to gradual onset of pain starting 3 days prior to presentation, with sudden worsening during the last 12 hours. Upon presentation, the patient's vital signs were within normal limits except for tachycardia (110 bpm). Clinical examination revealed typical signs of diffuse peritonitis, and an upright chest radiograph indicated the presence of subdiaphragmatic free gas (Fig. 1). The patient underwent emergent exploratory laparotomy during which generalized purulent peritonitis was encountered secondary to duodenal ulcer perforation. Ulcer oversewing with omental patch reinforcement and abdominal washout with copious amounts of saline were undertaken. Two drains were inserted in the abdominal cavity: a penrose drain near the perforation site and a soft silicone tube in the pouch of Douglas.

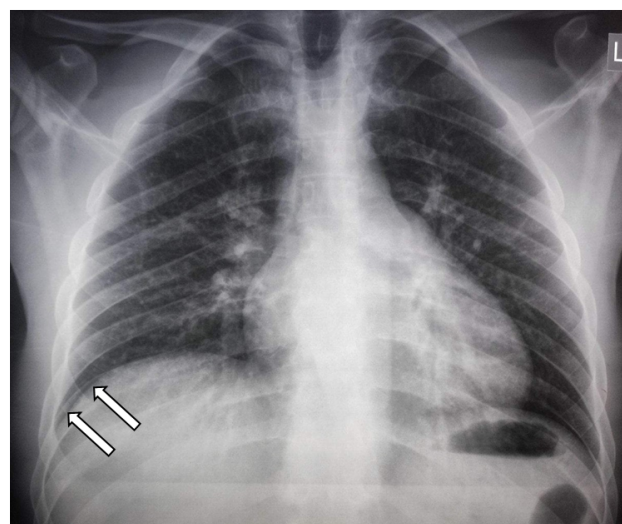


Fig. 1. Erect postero-anterior chest radiograph. Note the presence of subdiaphragmatic air (arrows) outlining the inferior surface of the right hemidiaphragm. The lungs and pleural spaces are clear. L, left.

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The postoperative course was initially uneventful. Return of bowel function was noticed on the 4th postoperative day and the patient was allowed to initiate oral intake of clear liquids. On the 5th postoperative day, the patient started complaining of colicky abdominal pain, distention, nausea, and vomiting. Clinical examination revealed high-pitched bowel sounds and diffuse tenderness without peritoneal signs. An upright abdominal film showed dilated small bowel loops with multiple air-fluid levels (Fig. 2). An abdominal computed tomography (CT) scan with orally administered contrast agent was performed, and confirmed the diagnosis of mechanical small bowel obstruction due to bowel twisting around the pelvic drainage tube (Fig. 3). The drain was promptly removed and the patient's symptoms resolved soon after. On the 6th postoperative day, the patient was started on liquids without any complaints and was quickly advanced on a solid diet. Finally, the patient was discharged on the 7th postoperative day.

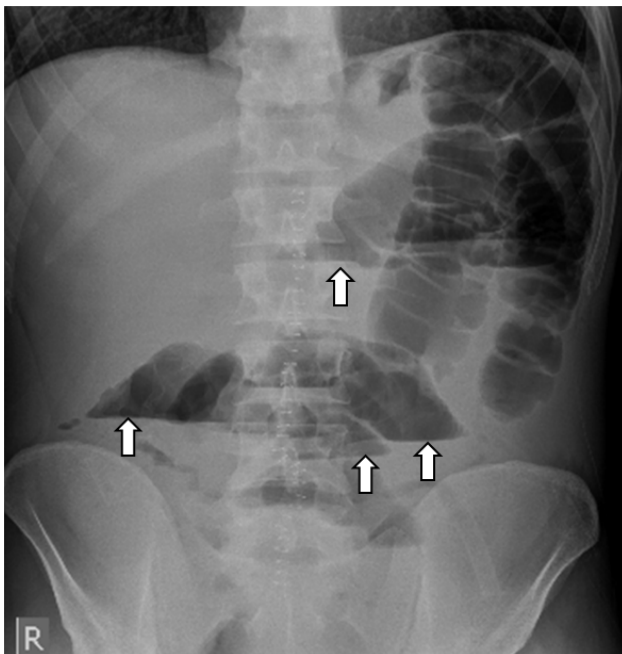


Fig. 2. Upright postero-anterior abdominal radiograph. Note the presence of multiple dilated loops of small bowel with air-fluid levels of differential height (arrows), measuring up to 3.9 cm in width. R, right.

Discussion

The use of surgical drains was first described by Hippocrates and has been advocated by the majority of surgeons over centuries as a simple technique for prevention and early detection of complications after abdominal operations. However, during the last decades, their utility has been questioned. In this regard, several comparative studies have raised the issue of the added value of drain insertion considering the potential complications related to their

utilization. For the majority of abdominal procedures, especially cholecystectomy and colorectal surgery, systematic reviews and meta-analyses have failed to document significant benefits from routine draining [1, 2, 3, 4, 5, 6]. Moreover, intra-abdominal drain insertion has been correlated with various complications, including hemorrhage, incisional hernias, infection, foreign body reactions, tissue erosion, and increased postoperative pain [1].

Drain-related postoperative bowel obstruction, as in the present case, represents a very rare complication typically occurring in the early postoperative period. Potential mechanisms of mechanical bowel obstruction due to an abdominal drain include twisting of a bowel loop around the catheter or herniation of the small bowel mesentery into the side holes of the catheter. This condition has to be differentiated from prolonged postoperative ileus, which has a benign and self-limited course. Distinguishing between these two entities may be rather challenging, since they commonly share similar clinical manifestations. A high degree of clinical suspicion is required for this rare entity, due to lack of specific signs and symptoms. The only fact that could serve as a key indicator for drain-related bowel obstruction is the late onset of symptoms, after the return of bowel function, which excludes prolonged postoperative ileus. However, diagnosing postoperative mechanical bowel obstruction is of crucial importance, as it is more likely to necessitate intervention than prolonged postoperative ileus which usually resolves spontaneously.

To the best of our knowledge, only a few cases of drain-associated bowel obstruction have been reported in the literature so far. The first report was made by Nehme [7] in 1973 on a patient with ileal conduit urinary diversion whose obstruction was relieved after removal of the negative suction drain. Later, in 2007, Rogers *et al.* [8] reported a patient with postoperative bowel obstruction after laparoscopic Roux-en-Y gastric bypass; CT demonstrated a loop of bowel twisting around the abdominal drainage catheter. Patient's symptoms resolved after drain removal [8]. In 2009, Poon *et al.* [9] reported small bowel mechanical obstruction due to herniation of the small bowel mesentery into the side holes of a silicone intra-abdominal drain after laparoscopic colectomy. In 2014, Darshak Shah *et al.* [10] described a case of bowel obstruction by a Jackson-Pratt drain after low anterior resection. In 2015, Salati *et al.* [11] reported a suction drain-related case of bowel obstruction after bladder rupture repair. More recently, in 2019, Al Khaldi *et al.* [12] reported another case of hepaticojejunostomy afferent limb obstruction caused by a Jackson-Pratt drain. Finally, in 2020, Su *et al.* [13] published two cases of drain-associated bowel obstruction after robot-assisted laparoscopic radical prostatectomy and bilateral pelvic lymph node dissection.

It has to be stressed that in the majority of published cases the diagnosis of drain-related bowel obstruction was made at reoperation. Only in three patients, the offending drain

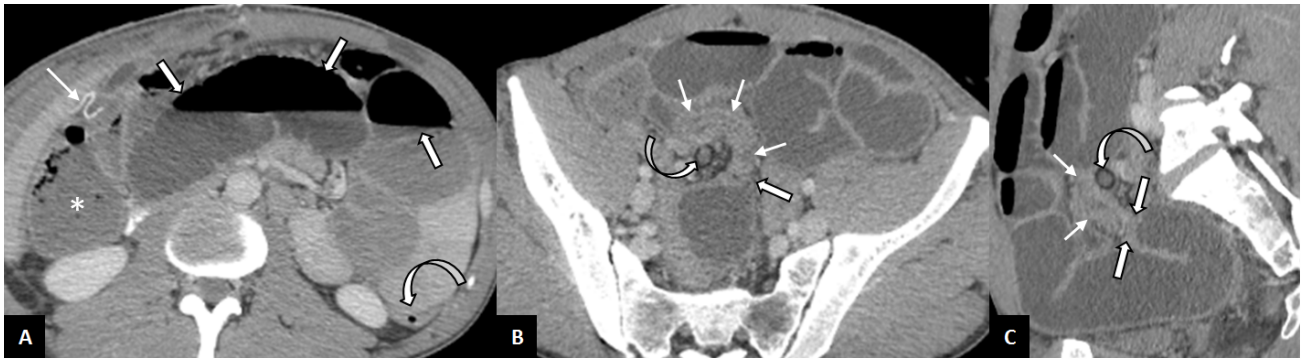


Fig. 3. Contrast-enhanced computed tomography in the portal venous phase obtained on the 5th postoperative day. (A) Axial image of the upper abdomen reveals multiple, distended small bowel loops with air-fluid levels (thick arrows) measuring up to 4.2 cm in width. The descending colon appears collapsed (curved arrow), whereas the ascending colon still contains fluid material (asterisk) due to the early onset of bowel obstruction. The hyperdense formation (thin arrow) corresponds to a penrose catheter. (B) Axial image of the lower abdomen shows a point of transition from dilated to normal-caliber small bowel (thick arrow) located at the distal ileum. Distal to the transition site, an ileal loop (thin arrows) can be seen twisting around an intra-abdominal drain (curved arrow). (C) Reconstructed image in the sagittal plane shows the course of the ileal loop (thin arrows) distal to the transition site (thick arrow) running caudal and anterior to the intra-abdominal catheter (curved arrow).

was removed without the need for reoperation, as in the present case. In one of them, CT imaging demonstrated the causative factor, whereas in another patient, the surgical team removed the drain based on their previous empirical experience. In our case, the patient's clinical course was not suggestive neither of prolonged postoperative ileus, as bowel function had already returned, nor of other probable causes of postoperative bowel obstruction, including intra-abdominal abscess or adhesions. Consequently, a clinical awareness of this rare cause of early postoperative bowel obstruction led the surgical team to address a specific question to the radiologist. Imaging diagnosis was accurate and was confirmed by the patient's final outcome.

Conclusion

In conclusion, despite the fact that drain insertion after abdominal operations represents a common practice, its use should not be routine and should always be individualized, and one should be focused on its prompt removal. Even if drain insertion is deemed necessary by the surgeon, a high level of clinical suspicion regarding potential associated complications, such as bowel obstruction, should be maintained.

Availability of Data and Materials

The data that support the findings of this study are available from the corresponding author [IP], upon reasonable request.

Author Contributions

The authors confirm contribution to the paper as follows: study conception and design: IP, EV, EB; data acquisition: GS, VC, PT; analysis and interpretation of results: EV, MT, EP; draft manuscript preparation: IP, EV, EB. All authors

contributed to editorial changes in the manuscript. All authors reviewed the results and approved the final version of the manuscript. All authors have participated sufficiently in the work and agreed to be accountable for all aspects of the work.

Ethics Approval and Consent to Participate

Signed informed patient's consent was obtained from the patient included in this case report and is available upon request. Considering its retrospective nature and in accordance with the CARE guidelines, requiring only obtaining patient's informed consent, Ethics Statement exempted by University Hospital of Heraklion. The study followed the Declaration of Helsinki.

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Conflict of Interest

The authors declare no conflict of interest.

References

- [1] Petrowsky H, Demartines N, Rousson V, Clavien PA. Evidence-based value of prophylactic drainage in gastrointestinal surgery: a systematic review and meta-analyses. *Annals of Surgery*. 2004; 240: 1074–1084; discussion 1084–1085.
- [2] Messenger M, Sabbagh C, Denost Q, Regimbeau JM, Laurent C, Rullier E, *et al*. Is there still a need for prophylactic intra-abdominal drainage in elective major gastro-

- intestinal surgery? *Journal of Visceral Surgery*. 2015; 152: 305–313.
- [3] Gavriilidis P, Hidalgo E, de'Angelis N, Lodge P, Azoulay D. Re-appraisal of prophylactic drainage in uncomplicated liver resections: a systematic review and meta-analysis. *HPB: the Official Journal of the International Hepato Pancreato Biliary Association*. 2017; 19: 16–20.
- [4] Jesus EC, Karliczek A, Matos D, Castro AA, Atallah AN. Prophylactic anastomotic drainage for colorectal surgery. *The Cochrane Database of Systematic Reviews*. 2004; 2004: CD002100.
- [5] Karliczek A, Jesus EC, Matos D, Castro AA, Atallah AN, Wiggers T. Drainage or nondrainage in elective colorectal anastomosis: a systematic review and meta-analysis. *Colorectal Disease: the Official Journal of the Association of Coloproctology of Great Britain and Ireland*. 2006; 8: 259–265.
- [6] EuroSurg Collaborative. Intraperitoneal drain placement and outcomes after elective colorectal surgery: international matched, prospective, cohort study. *The British Journal of Surgery*. 2022; 109: 520–529.
- [7] Nehme DA. Bowel obstruction from drainage tubes. *JAMA*. 1973; 226: 200.
- [8] Rogers AM, Cherenfant J, Kipnis S, Haluck RS. Drain-associated intestinal obstruction after laparoscopic gastric bypass. *Obesity Surgery*. 2007; 17: 980–982.
- [9] Poon CM, Leong HT. Abdominal drain causing early small bowel obstruction after laparoscopic colectomy. *JSLS: Journal of the Society of Laparoendoscopic Surgeons*. 2009; 13: 625–627.
- [10] Darshak Shah, Howard Tiszenkel, Ashish Padnani, Saurabh Sharma. “Maypole” small bowel obstruction from Jackson Pratt drain. 2014. Available at: <https://www.sages.org/meetings/annual-meeting/abstracts-archive/may-pole-small-bowel-obstruction-from-jackson-pratt-drain/> (Accessed: 9 October 2023).
- [11] Salati SA, Lone NA. Abdominal drain-associated early postoperative small bowel obstruction. *Journal of Pioneering Medical Sciences*. 2015; 5: 60–62.
- [12] Al Khaldi M, Thibeault F, Létourneau R. When a Drain is the Culprit: An Unexpected Case of Small Bowel Obstruction with Biliary Peritonitis. *Cureus*. 2019; 11: e4964.
- [13] Su YW, Chang LW, Li JR, Chiu KY, Hung SC. Surgical Drain-Related Intestinal Obstruction After Robot-Assisted Laparoscopic Radical Prostatectomy in Two Cases. *Journal of Endourology Case Reports*. 2020; 6: 343–347.

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