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Case Report

Delayed Small Bowel Obstruction Due to Intra-Abdominal Drain: Case Report and Literature Review

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This is a unique case of a closed-loop bowel obstruction secondary to intra-abdominal drain insertion to illustrate a new complication of drain usage. A 47-year-old patient presents with bowel distention and obstruction. Laparotomy revealed obstructed small bowel looped around a fibrotic tract tracing back to a drain insertion point. This is a case report where a patient suffers rare long-term complications from routine drain insertion. Although beneficial in treating infection and abscess formation after anastomotic leaks, drain insertion as a prophylactic measure has not been proven to be beneficial. Surgeons who routinely use intra-abdominal drains should be aware of the complications of drain insertion and use with caution. Although not extensively documented, serious complications from drain insertion do occur. There is no role for prophylactic drain insertion in colonic anastomoses procedures.

Key words: Drain – Small bowel obstruction – Colorectal surgery

Drains are routinely used in numerous surgical operations to reduce fluid collection and decrease chances of postoperative infection.[1] By reducing the chances of seroma, hematoma, or abscess formation, drains are thought to improve postoperative outcome.[1] In colorectal anastomoses procedures, drains are used therapeutically for anastomotic leaks. Some surgeons use drains prophylactically for prevention of fluid build-up and early detection of anastomotic leak.[2] Many studies have attempted to assess if prophylactic drain insertion should be the standard of care.[2–4] A Cochrane study of 6 randomized controlled trials showed there was no significant difference in mortality, anastomotic dehiscence, wound infection, re-intervention, or other complications between

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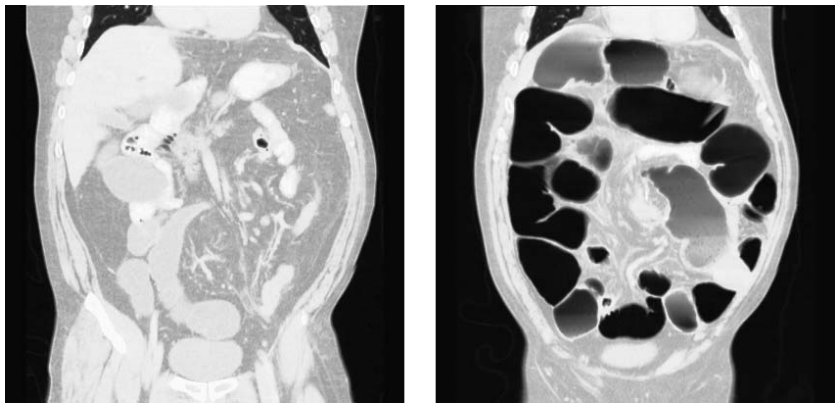

Fig. 1 CT scan showing a closed-loop small bowel obstruction with 2 transition points.

patients with no drains and patients with prophylactic drain insertion.[4] Thus the decision for prophylactic drain usage ultimately lies with the surgeon at the time of operation.[2,3]

Drains, however, are not entirely benign. They are foreign bodies that can act as conduits for infection.[1] They may cause increased pain, discomfort, and scarring.[1,2] Other significant complications include bleeding, bowel injury, and herniation.[3,5,6–8] Furthermore, some studies suggest that placement of prophylactic drains in pelvic surgery may actually increase the risk of anastomotic leak.[9,10] Good evidence is lacking on the true incidence and significance of complications from drain insertion. For a procedure so commonly utilized in general surgery, it is imperative to understand the full extent of risks associated with the procedure. This is a unique case presentation of an unexpected long-term complication from intra-abdominal drain insertion 1 year prior to presentation.

Case Report

Patient

A 47-year-old man with a history of abdominal pain and distention labeled as a colonic motility disorder or volvulus of the transverse colon.

Presentation

One year prior to presentation, this patient had a subtotal colectomy and ileosigmoid anastomosis. Since that time, he had been complaining of intermittent distention and abdominal pain consistent with chronic partial bowel obstruction. The patient presented to our tertiary care hospital after a prolonged episode of nausea, vomiting, abdominal distension, pain, and obstipation. This was more severe and lasted much longer than his usual attacks. At this point, bowel obstruction secondary to adhesions was at the top of our differential diagnosis.

Physical examination

On exam, patient had a distended abdomen with voluntary guarding as well as tenderness in both the left lower and right lower quadrants.

Investigations

Initial investigations were essentially within normal limits with no evidence of electrolyte abnormalities and a normal leukocyte count of 9.6×10^9/L. A nasogastric tube was inserted due to the high likelihood of an obstruction based on history and physical findings. Abdominal X-rays showed an elevation at the left hemidiaphragm, multiple air fluid levels in both small and large bowel, with distended loops of bowel. A CT scan revealed a closed loop small bowel obstruction with 2 transition points (Fig. 1).

Procedure

The patient was brought into the operating room for an exploratory laparotomy. During laparotomy, the patient was found to have massively dilated small bowel looped around a fibrotic tract. There were 2 transition points consistent with a closed loop bowel obstruction. The tract connected a scar on the anterior abdominal wall in the left lower quadrant with the retroperitoneum posteriorly, coinciding with a surgical scar from a previous drain insertion. The fibrotic tract was formed secondary to a previous drain insertion and was the culprit of the patient's small bowel obstruction. The tract, along with adhesions, was resected, thus freeing the

obstructed bowel. The small bowel was viable and did not require resection. Air and stool were emptied from the massively dilated bowels via a rigid sigmoidoscope before the abdomen could be closed. A 24 French Malecot rectal tube was inserted and sutured in place for further decompression.

Outcome

Patient had a slow recovery process but gradually regained normal bowel function. He was discharged from the hospital tolerating a full diet, having regular bowel movements, and free of abdominal distension and pain.

Discussion

It is well established that drains play an important therapeutic role in colorectal surgery when patients develop anastomotic leak.[2–4] Anastomotic leak is one of the most serious complications of colorectal surgery, with elevated patient morbidity and mortality.[12] The benefit of intra-abdominal drains is its therapeutic role in managing abscess formation after anastomotic leak, acute abdominal sepsis, and Crohn's disease.[11,12] In a retrospective review conducted by Baig *et al*[13], 40 patients were identified who developed an intra-abdominal abscess following elective colorectal surgery. All 40 patients underwent CT-guided percutaneous drainage for management of their abscess. Of the 40 patients, 26 (65%) had complete resolution with no recurrence, 8 (20%) were successfully treated with repeat drainage, while the remaining 6 (15%) required laparotomy and drainage. Therefore, a total of 34 (85%) patients were successfully managed with percutaneous drainage.

Although a successful therapeutic intervention for anastomotic leak, prophylactic usage of drains has not been shown to significantly improve outcomes.[2–4,14–18] A randomized controlled trial reported by Sagar *et al*[16] showed no significant benefit with prophylactic drains after colorectal procedures in terms of morbidity, mortality, or early detection of anastomotic leaks. Another RCT by Hoffman *et al*[14] showed no difference in leak rate with prophylactic drains after colonic anastomoses. A meta-analysis of 8 RCTs compared a total of 717 drained patients and 673 nondrained patients after colorectal anastomosis.[18] There was no significant difference between leakage rate, wound infection, or pulmonary complications between the 2 groups.[18]

A small number of studies have demonstrated a possible role for prophylactic drain insertion specifically in low pelvic procedures.[12,19,20] A review by Peeters *et al*[19] looked at the risk factors for anastomotic failure after total mesorectal excisions (TME) using data from the Dutch TME trial and they found a significantly higher need for surgical re-intervention after anastomotic leak in patients without pre-existing drains (98% versus 74%). The authors postulated that the large presacral space allows for formation of hematoma or seroma that can easily cultivate infections, thus prophylactically inserting a drain may prevent this process.[19] Tsujinaka *et al*[20] conducted a retrospective review on 196 patients who underwent elective TME for rectal cancer, all of whom had pelvic drainage in the vicinity of the anastomosis. Of the 21 patients who developed an anastomotic leak, 15 had a change in drain content before diagnosis of anastomotic leak, suggesting that pelvic drains may act as early detectors of anastomotic leaks.[20] Fifteen patients initially underwent conservative therapy including gravity drainage using the prophylactic drain, fasting, and hyperalimentation, whereas the remaining 6 required surgical interventions.[20] Of the 15 patients who underwent conservative therapy, 10 patients improved without further surgical intervention and 5 required surgical revisions.[20] Thus, in total, 11 of 21 patients ultimately needed surgical intervention for their leak. Although 1 interpretation of this study is that prophylactic drainage could potentially reduce the need for surgical intervention in the event of a leak, there are a few limitations that should be considered. First, this study does not consider the possibility that the prophylactic drain may have increased the risk of and caused at least some of the leaks in the first place. There is certainly some evidence to suggest that placement of prophylactic drains in pelvic surgery may actually increase the risk of anastomotic leak.[9,10] Since all patients received prophylactic drains, it is difficult to tease out this issue. It is also difficult to determine whether the prophylactic drains actually prevented the need for surgical intervention. It is possible that those patients may have done equally well with CT-guided percutaneous drainage on an as-needed basis. Finally, it should be noted that patients also developed complications from the drain itself including stitch abscess at the site of drain (5), herniation of omentum through the drain site after drain removal (2), and penetration of bowel lumen by a drain (1).[20]

It should be noted that there are significant complications to drain usage.[5,6,7,21] Hemandas *et al*[6] reported a case of small bowel evisceration after drain usage and removal. The patient required surgical intervention to repair the evisceration. Similarly, Loh and Jones[5] and Komuta *et al*[7] both described cases of small bowel evisceration and herniation with intraperitoneal drain usage. Poon and Leong[21] described a case of small bowel obstruction due to prophylactic drain placement after a laparoscopic low anterior resection. That patient underwent a laparoscopy on postoperative day two and was discovered to have a mechanical small bowel obstruction caused by the drain; the drain was removed laparoscopically. Furthermore, drains pose as a risk for surgical site infections, which complicate postoperative healing and can lengthen hospital stay.[1,12,22]

Although all reported cases of drain complications have been focused on acute complications, this is a case where the patient suffered a rare delayed complication from routine drain usage. The patient had been having intermittent bowel symptoms after his initial surgery, a year prior to presentation, which ultimately culminated in his presentation with a closed-loop bowel obstruction. Fortunately, his closed-loop obstruction was caught and managed early and prevented the need for bowel resection and likely a permanent ileostomy. Although it is difficult to prove, it is highly probable that the fibrotic tract formed from his intra-abdominal drain was the cause of his chronic obstructive symptoms as well.

Conclusion

Intra-abdominal drains are thought to be benign entities, routinely used to decompress excessive fluid or blood postoperatively. Evidence demonstrates benefit for therapeutic, but not prophylactic, drain usage in intraperitoneal colonic procedures. Drain insertion can cause rare but serious complications such as small bowel obstruction, site infection, and small bowel evisceration. Our case presents a new and severe complication from intra-abdominal drain usage that caused significant and long term morbidity in this patient. Given there is no evidence of benefit for prophylactic usage of drains and the severe acute and chronic complications from drain insertion, there should be no role for prophylactic drain insertion in elective intra-abdominal colonic surgeries. It should be noted, however, that routine use of drains in low pelvic procedures such as TME may have potential benefits that require further investigation.

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