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Case report of an uncommon case of drain-site hernia after colorectal surgery

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ABSTRACT

BACKGROUND: trocar site herniation is a rare but potentially serious complication of laparoscopic surgery. Data about drain site hernia after laparoscopic surgery is scarce and anecdotal.

CASE PRESENTATION: we report an uncommon case of drain site hernia in a man undergone laparoscopic left colectomy for a colonic adenocarcinoma who developed small bowel herniation in a 10 mm port site, in which a 24 FR drain was inserted leaving a real free space of 2 mm.

DISCUSSION: laparoscopic approach has gained widespread acceptance in each surgical fields because of the perceived better postoperative outcomes in terms of less pain, faster recovery, and lower risk of incisional hernia. However, the risk of trocar site hernia has been known since 1967. Different risk factors for the development of trocar site hernia are described in literature: the trocar diameter and design, preexisting fascial defects, enlargement of a port site to remove a specimen, high blood glucose levels, obesity, increase intra-abdominal pressure as in chronic obstructive airway disease or extensive manipulation of the trocar during surgical intervention, which may enlarge the trocar site and thus induce small bowel herniation.

However, the most important recognized risk factor for trocar site hernia is the size of the trocar.

CONCLUSIONS: waiting for further studies, the lesson to be learnt from this case report is that, even if the free space after drain positioning is minimal, drain should not be positioned through the 10 mm trocar to allow the closure of fascial defect in order to avoid any herniation.

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1. Background

Trocar site herniation is a rare but potentially serious complication of laparoscopic surgery. Complications can range from small omental herniation, requiring minor surgery, to delayed hernia formation or even bowel entrapment, further complicated by incarceration, strangulation and necrosis. In this cases major surgical procedures are required, with the risk of significant morbidity and even mortality. Trocar site herniation are more common when a 10-mm port is used, therefore it is common practice to repair port site of 10 mm or more to prevent this complication [1]. Many surgeons do not routinely repair port site of 5 mm because it is believed that such iatrogenic fascial defect are not large enough to predispose to hernia. Although 10 mm trocar site access should be closed, it could be used as the site for drain positioning in daily clinical

practice. Of consequence the fascial defect cannot be closed, even if the presence of drain reduce the space available for the herniation. Thus drain site hernia should be considered a different type of herniation. Although well is known about trocar site-hernia, data about drain site hernia after laparoscopic procedures are scarce and anecdotal.

We report an uncommon case of a drain site hernia in a man undergone laparoscopic left colectomy for a colonic adenocarcinoma.

This work has been reported in line with the SCARE criteria [2].

2. Case presentation

A 65 year-old man underwent laparoscopic left colectomy for a colonic adenocarcinoma. Our perioperative prophylaxis routinely included subcutaneous heparin administration and perioperative handling of antiplatelet drugs according to the current literature [3–4]. The intervention has been performed according to a standardized procedure.

The patients were placed on the operating with open legs and both thighs at the same level of the abdomen to enhance

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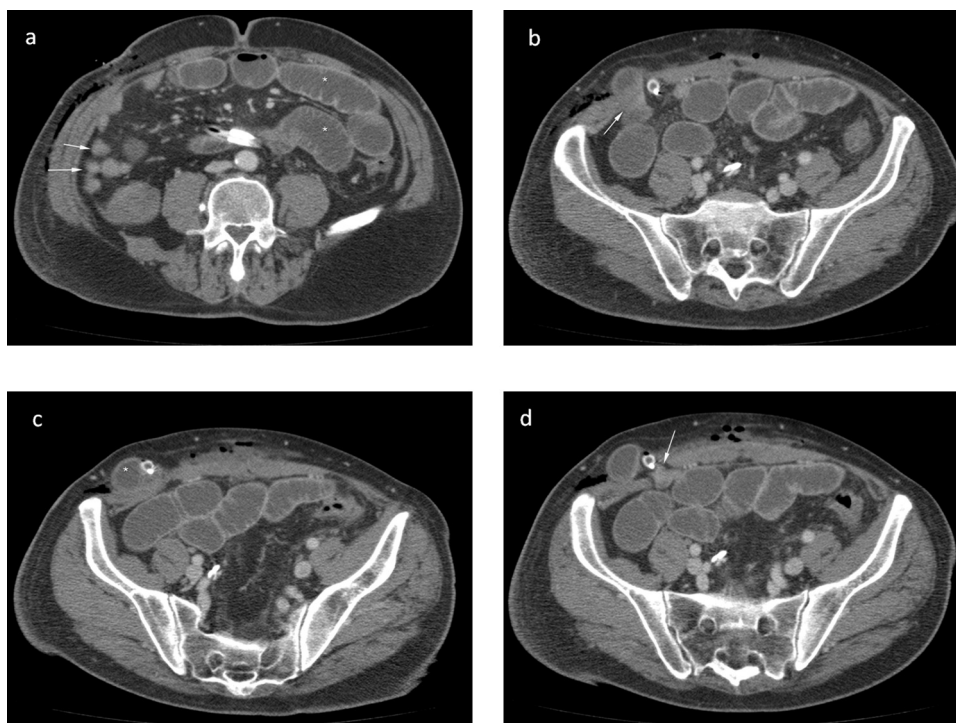


Fig. 1. Axial images of a TC showing small bowel herniated trough drain site. a) signs of small bowel obstruction. Star: dilated loops; arrow: collapsed loops. b) arrow: entrance of the small bowel in the drain site. c) star: herniated bowel. d) arrow: exit of the small bowel from the drain site.

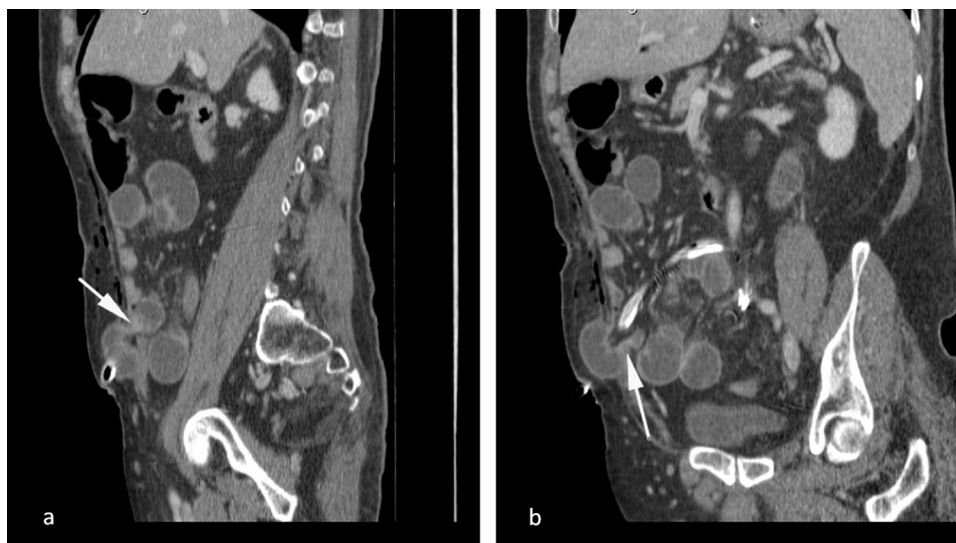


Fig. 2. Sagittal images of TC. Small bowel herniation through the fascial defect near the drain.

manoeuvrability of the laparoscopic instruments. The procedure was performed with the patient under general anaesthesia and intubated orotracheally. A urinary catheter and an orogastric tube were inserted. The surgeon and the assistant stood on the patient's right side, with the scrub nurse to the right of the surgeon.

The first 10-mm Hasson's port was placed two fingers over the umbilicus, and the second 10-mm non-bladed port was inserted in the right flank. The third 10 mm and the fourth 5-mm bladed ports were positioned in the right flank and in the left flank respectively. Pneumoperitoneum was created and maintained at a pressure of 12 mmHg. The abdominal cavity was inspected using a 10-mm 30-

grade laparoscope. The table was tilted toward the right and 10–15 grads in Trendelenburg position.

The tenets of surgical treatment of left colonic adenocarcinoma are left hemicolectomy and anastomosis between splenic flexure and the upper rectum. The procedure started with the division of the gastrospleno-colic ligament, followed by mobilization of the left colic flexure and parietocolic gutter dissection.

Then the mesenteric inferior artery and vein were isolated at their own origin and cut using mechanical stapler and metallic clip respectively. Descending colon and sigma was mobilized and separated from the retroperitoneum layer through Toldt fascia. After

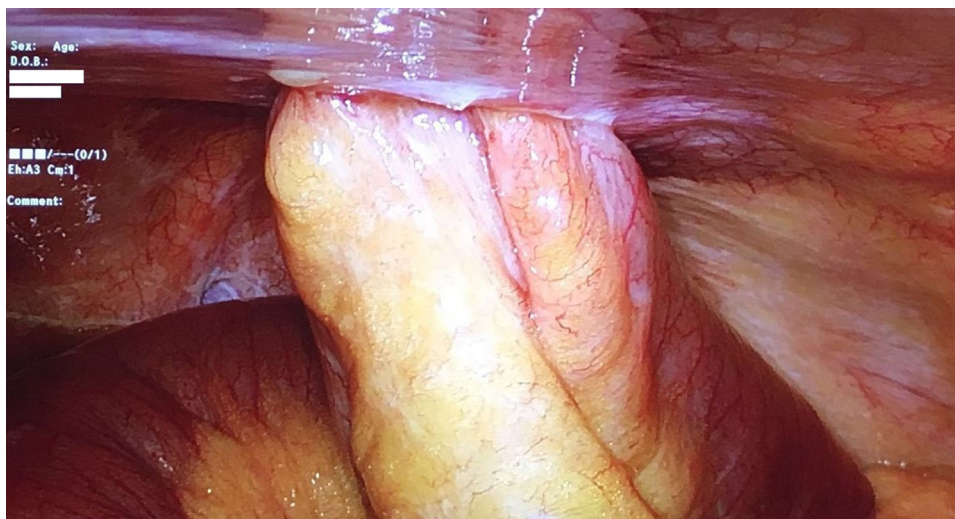


Fig. 3. Image of twisted and incarcerated small bowel loops herniating through the drain site.

isolation and preservation of the left urether, colon was transected at medium rectum using mechanical stapler.

The specimen was removed by Pfannenstiel incision.

Finally, the anastomosis was performed transanally with a circular stapler according to the Knight-Griffen technique. Accurate abdominal washing was performed and complete homeostasis was secured.

Of interest port site access of the 10 mm trocars have been closed and the port site access for 5 mm trocars have not been closed. However the 10 mm port site in the right flank has been used to insert the drain. In details a 24 FR drain has been used. Thus we can stated that the free space in the port site was 2 mm after drain positioning.

The post operative period was initially uneventful. On the 3th days after surgery the patients had absence of symptoms, a tolerance to three meals without restrictions and a normal passage of stool.

Thereafter on the 4th days after surgery complained abdominal pain and nausea. HB was 13,5 g/dL, and WBC count 11200/mL. The day after, abdominal pain increased, vomiting compared and the WBC increased at the value of 19800/mL.

ATC confirmed the intestinal occlusion (Figs. 1–2). The diagnosis of occlusion due to a drain-site hernia has been made.

In fact TC showed the presence of drain in Douglas pouch trough right flank port site and in the same place little small bowel herniation with typical signs of small bowel obstruction: idro-fluid levels and dilated small bowel.

Thus, we decided for an immediate surgical intervention. Patient was moved immediately to the operating room.

Under general anaesthesia and full aseptic condition, Hasson's trocar was placed in the same place of the previous laparoscopy, and the pneumoperitoneum was obtained using carbon dioxide. Intra-abdominal pressure was 12 mmHg. A 5 mm trocar was placed using previous left flank incision, while another 10 mm trocar was placed in epigastrium. Drain was removed manually. Laparoscopy showed twisted and incarcerated small bowel loops herniating through the drain site in the right iliac fossa (Fig. 3). Bowel loops was dilated before the obstruction, but no necrosis was detected. After reduction of bowel loop, abdomen was washed with abundant warm saline to see bowel motility and vitality. Fascial defect was closed laparoscopically with low-readsorbable suture according to the Le Blanc suture.

Post operative period was uneventfully.

The outpatient follow-up excluded any complications after surgery.

3. Discussion

Compared with open abdominal surgery, the laparoscopic approach has gained widespread acceptance in each surgical fields because of the perceived better postoperative outcomes in terms of less pain, faster recovery, and lower risk of incisional hernia [5–7].

However, the risk of trocar site hernia has been known since 1967 [8]. Nevertheless, data is sparse and based mostly on retrospective studies with a short and poorly defined follow-up [1,9,10].

Different risk factors for the development of trocar site hernia are described in literature: the trocar diameter and design, preexisting fascial defects, enlargement of a port site to remove a specimen, high blood glucose levels, obesity, increase intra-abdominal pressure as in chronic obstructive airway disease or extensive manipulation of the trocar during relatively prolonged surgical duration, which may enlarge the trocar site and thus induce small bowel herniation [1].

However, the most important recognized risk factor for trocar site hernia is the size of the trocar. The frequency of incisional hernias was significantly higher for 12 mm and 10 mm trocars than 5 mm or 3 mm trocars. In fact many of described herniation at the port site involve ports of at least 10 mm [1,11,12].

For this reason Sanz-Lopez et al. recommended the routine fascial closure of laparoscopic port size greater than 5 mm [13]; however, others have suggested that 5 mm fascial defects should be closed only in circumstances such as prolonged procedures with excessive manipulation at the port site [10,14].

Another critical factors in preventing postoperative port site herniation is the location of ports. Midline ports, especially umbilical ports, are the most common site of herniation [13,15]. This may be due to the single fascia layer at the linea alba and the presence of the umbilicus, that creates a natural defect at this site.

Regarding our case, it is very particular because our patient had no risk factors: he was not obese, the location of trocar site hernia was extraumbilical, and the port used was non-bladed.

Nevertheless, we used at the right iliac fossa a 10 mm port, but we used this site to insert a 24 FR drain, thus we can stated that the free space in the port site was 2 mm after drain positioning.

In the literature there are other cases of hernias through 3 mm sites in both gynaecological [16] and pediatric population [17], but

there are not cases of trocar site hernia where the drain was still inserted.

In our best knowledge other two cases are described in literature regarding pediatric [18] and gynaecologic [19] patients.

In the first, Ramalingam et al. [18] described in a case series five omental herniation after drain removal from 5 mm trocar site after various types of laparoscopic urologic procedures. In the second, Moreaux et al. [19] analyzed in a case series two cases of drain site herniation after removal of the drain from a 5 mm port site. In this gynaecological case series, both of cases had symptomatic small bowel herniation.

Probably in this two case series the drains could have facilitated the herniation because they create a suction effect of the bowel when they are removed.

Our case is similar with the others described, but it differs from these because the drain was still inserted when small bowel herniation occurred, and it was worsened by the torsion of the mesentery, fortunately well detected by CT scan, an important diagnostic tool for the assessment of a lot of pathologic conditions [20,21].

Waiting for further studies, the lesson to be learnt from this case report is that, even if the free space after drain positioning is around 2 millimetres, drain should not be positioned through the 10 mm trocar to allow the closure of fascial defect in order to avoid any herniation.

Conflict of interest

All the authors have nothing to declare.

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Ethical approval

I certify that this kind of manuscript does not require ethical approval by the Ethical Committee of Federico II University.

Consent

Written informed consent for publication of his clinical details and clinical images was obtained from the patient. A copy of the consent form is available for review by the Editor of this journal on request.

Authors' contributions

Manigrasso Michele and Milone Marco: conception, design, acquisition of the data and drafting of the article; Manigrasso Michele, Anoldo Pietro, Milone Francesco: acquisition of the data and writing of the manuscript; De Palma Giovanni Domenico, Milone Marco: interpretation of the data and critical revisions; De Palma Giovanni Domenico, Milone Marco: critical revisions and final approval.

Guarantor

Michele Manigrasso.

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