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

M. Manigrasso a,*, P. Anoldo a, F. Milone a, G.D. De Palma b, M. Milone a

a Department of Surgical Specialties and Nephrology, University “Federico II” of Naples, Italy
b Department of Surgery and Advanced Technologies, University “Federico II” of Naples, Italy

ARTICLE INFO
Article history:
Received 1 November 2017
Accepted 23 December 2017
Available online 9 January 2018

Keywords:
Colorectal
Drain
Trocar
Hernia
Laparoscopic

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.

© 2018 The Authors. Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

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...
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 flesure and the upper rectum. The procedure started with the division of the gastropleno-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
isolation and preservation of the left urethra, 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 3rd 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 the patients had absence of symptoms, a tolerance to three meals without restrictions and a normal passage of stool.

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 extrubilical, 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.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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 Francesca: 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.

References

[1] H. Tonouchi, Y. Ohnori, M. Kobayashi, M. Kusunoki, Trocar site hernia, Arch. Surg. 139 (2004) 1248–1256, http://dx.doi.org/10.1001/archsurg.139.11.1248.
[2] R.A. Agha, A.J. Fowler, A. Saeta, I. Barai, S. Rajmohan, D.P. Orgill, SCARE Group, The SCARE Statement: Consensus-based surgical case report guidelines, Int. J. Surg. 34 (October) (2016) 180–186, http://dx.doi.org/10.1016/j.ijsu.2016.08.014.
[3] C.M. Samama, Perioperative venous thromboembolism prophylaxis: short review and recommendations. Ann Fr Anesth Reanim. Dec 27 (Suppl 3) (2008) S2–S8, http://dx.doi.org/10.1016/j.afrr.2008.11.007.
[4] M.N.D. Di Minno, M. Milone, P. Mastronardì, A. Ambrosio, A. Di Minno, A. Parolari, E. Tremoli, D. Prisco, Perioperative handling of antiplatelet drugs: a critical appraisal, Curr. Drug Targets 14 (2013) 881–896.
[5] M. Milone, M. Musella, A. Di Spiezio Sardo, G. Bifulco, G. Salvatore, L.M. Sosa Fernandez, P. Bianco, B. Zizzolo, C. Nappi, F. Milone, Video-assisted ablation of pilonidal sinus: a new minimally invasive treatment? a pilot study, Surgery 155 (March) (2014) 562–566, http://dx.doi.org/10.1016/j.surg.2013.08.021.
[6] M. Milone, U. Elmore, E. Di Salvo, et al., Intraocular versus extracorporeal cataract surgery. Results from a multicentre comparative study on 512 right-sided colorectal cancers, Surg. Endosc. 29 (8) (2015) 2314–2320, http://dx.doi.org/10.1007/s00464-014-3950-7.
[7] L.P. Andersen, M. Klein, I. Gogenur, J. Rosenberg, Incisional hernia after open versus laparoscopic sigmoid resection, Surg. Endosc. 22 (2008) 2026–2029, http://dx.doi.org/10.1007/s00464-008-9924-x.
[8] B.E. Fear, Laparoscopy: a valuable aid in gynaecologic diagnosis, Obstet. Gynecol. 31 (1968) 297–300.
[9] E.Boldo, G. Perez de Tuccia, J.P. Arcali, F. Martin, J. Escrig, D. Martinez, J.M. Miralles, A. Armelles, Trocar site hernia after laparoscopic ventral hernia repair, Surg. Endosc. 21 (2007) 798–800, http://dx.doi.org/10.1007/s00464-006-9815-9.
[10] M.G. Munro, Laparoscopic access: complications, technologies, and techniques, Curr. Opin. Obstet. Gynecol. 14 (2002) 365–374.
[11] P.R. Reardon, A. Preciado, T. Scarborough, B. Matthews, J.L. Marti, Hernia at 5-mm laparoscopic port site presenting as early postoperative small bowel obstruction, J. Laparoendosc. Adv. Surg. Tech. A. 9 (1999) 523–525, http://dx.doi.org/10.1089/lap.1999.523.
[12] G.E. Baldassarre, G. Valenti, G. Torino, I. Prosperi Porta, V. Valenti, C. Campisi, Small bowel evisceration after laparoscopic cholecystectomy: report of an unusual case, Minerva Chir. 61 (2006) 167–169.
[13] R. Sanz-Lopez, C. Martinez-Ramos, J.R. Nuñez-Pena, M. Ruiz de Gopegui, L. Pastor-Sierra, S. Tarnames-Escobar, Incisional hernias after laparoscopic vs open cholecystectomy. Surg. Endosc. 13 (9) (1999) 922–924.
[14] Z. Shaper, Port closure techniques, Surg. Endosc. 21 (8) (2007) 1264–1274, http://dx.doi.org/10.1007/s00464-006-9895-6.
[15] E. Bowey, D. Blom, P.F. Jones, C.G. Bergemann, J.L. Johansson, R.V. Lord, et al., Risk factors and the prevalence of trocar site herniation after laparoscopic fundoplication, Surg. Endosc. (2001), http://dx.doi.org/10.1007/s00464-008-0146-6.
[16] J.L. Bergemann, M.L. Hibbert, G. Harkins, J. Narvaez, A. Asato, Omental herniation through a 3-mm umbilical trocar site: unmasking a hidden umbilical hernia, J. Laparoendosc. Adv. Surg. Tech. A. 11 (3) (2001) 171e3, http://dx.doi.org/10.1097/01.ASG.0000082833.08283.c1.
[17] D.S. Yee, R.P. Duel, Omental herniation through a 3-mm umbilical trocar site, Endoetriodology 20 (2) (2006) 133e4, http://dx.doi.org/10.1089/end.2006.20.133.
[18] M. Ramalingam, K. Kershill, A. Murugesan, M. Pai, Early-onset port site (drain site) hernia in pediatric laparoscopy: a case series, J. Laparoendosc. Adv. Surg. Tech. A. 22 (4) (2012) 416–418, http://dx.doi.org/10.1089/lap.2011.0220.
[19] G. Moreaux, S. Estrade-Huchon, G. Bader, B. Guyot, D. Hertz, A. Fauconnier, C. Huchon, Five-millimeter trocar site small bowel eviscerations after gynecologic laparoscopic surgery, J. Minim. Invasive Gynecol. 16 (5) (2009) 643–645, http://dx.doi.org/10.1016/j.jmig.2009.05.014.
[20] M. Milone, M.N. Di Minno, M. Musella, P. Maida, V. Iaccarino, G. Barone, F. Milone, Computed tomography findings of pneumatocele and portomesenteric venous gas in acute bowel ischemia, World J. Gastroenterol. 19 (39) (2013) 6579–6584, http://dx.doi.org/10.3748/wjg.v19.i39.6579.
[21] S. Oda, T. Nakura, D. Utsunomiya, Y. Funama, N. Taguchi, M. Imuta, Y. Nagayama, Y. Yamashita, Clinical potential of retrospective on-demand spectral analysis using dual-layer spectral detector-computed tomography in ischemia complicating small-bowel obstruction, Emerg. Radiol. 24 (4) (2017) 431–434, http://dx.doi.org/10.1007/s10140-017-1511-9.

Open Access

This article is published Open Access at sciencedirect.com. It is distributed under the IJSCR Supplemental terms and conditions, which permits unrestricted non commercial use, distribution, and reproduction in any medium, provided the original authors and source are credited.