

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/radcr

Case Report

Role of imaging in managing lateral trocar site incisional hernia after abdominoperineal resection ☆,☆☆,★

Karthigesu Aimanan, MD, MRCS, DrGenSurg^a, Muhammad Ridzuan Mohd Nor, MBBCh^a, Wong Ling, MBBS^a, Khairunnisa Che Ghazali, MD, MMed (Surg)^a, Ahmad Junaidi Ahmad Hamidi, MD, MSurg (Gen Surg)^a, Firdaus Hayati, MD, DrGenSurg^{b,*}, Zaidi Zakaria, MD, MMed (Surg)^c, Ismail Sagap, MBBCHBao, FRCS, MMed (Surg)^d

^aDepartment of Surgery, Miri Hospital, Ministry of Health Malaysia, Miri, Sarawak, Malaysia

^bDepartment of Surgery, Faculty of Medicine and Health Sciences, Universiti Malaysia Sabah, Kota Kinabalu, Sabah, Malaysia

^cDepartment of Surgery, School of Medical Sciences, Hospital Universiti Sains Malaysia, Kubang Kerian, Kelantan, Malaysia

^dColorectal Unit, Department of Surgery, Faculty of Medicine, Universiti Kebangsaan Malaysia Medical Centre, Cheras, Kuala Lumpur, Malaysia

ARTICLE INFO

Article history:

Received 4 August 2021

Accepted 11 August 2021

Keywords:

Acute abdomen

Case report

Incisional hernia

ABSTRACT

Trocar site incisional hernia (TSIH) is an unpleasant complication of laparoscopic surgery. A 70-year-old male with low rectal carcinoma underwent a laparoscopic abdominoperineal resection after completion of neoadjuvant radiotherapy. The postoperative recovery was smooth; however, he developed abdominal distension and pain over the previous drain site after removal on day 3. In view of diagnostic ambiguity, an imaging tool was requested as an adjunct to further management. Computed tomography of the abdomen showed small bowel obstruction secondary to herniated ileal loops passing through the right iliac fossa anterior abdominal wall defect at the previous drainage site. An exploration was made and the rectus defect was closed using a non-absorbable suture.

© 2021 The Authors. Published by Elsevier Inc. on behalf of University of Washington.

This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

☆ Acknowledgements: We would like to thank the Director-General of Health Malaysia for his permission to publish this article as a case report.

☆☆ Competing Interests: The authors declare no competing interest.

★ Patient Consent: Patient consent was obtained for publishing this case report.

* Corresponding author.

E-mail addresses: firdaushayati@gmail.com, m_firdaus@ums.edu.my (F. Hayati).

<https://doi.org/10.1016/j.radcr.2021.08.031>

1930-0433/© 2021 The Authors. Published by Elsevier Inc. on behalf of University of Washington. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

Introduction

Trocar site incisional hernia (TSIH) is a distressing yet avoidable complication of laparoscopic surgery and was first described in 1968 by Fear [1]. Since then, few authors have analyzed the incidence and risk factors of this complication. According to the literature, the overall incidence of trocar site hernia is estimated to be around 1%, whereas fascial defects occur in 3%-20% after conventional surgery [2]. Although its incidence is relatively rare in comparison to conventional surgery, it might lead to severe complications requiring emergent surgical intervention. We experience a 70-year-old man who developed TSIH after laparoscopic abdominoperineal resection and discuss our management approaches.

Case description

A 70-year-old male with low rectal carcinoma, 2 cm from anal verge underwent a laparoscopic abdominoperineal resection after completion of neoadjuvant radiotherapy. The procedure was performed utilizing five laparoscopic bladeless trocars. A 12-mm umbilical port was used for the camera; another 12-mm port at the right lower quadrant for the stapler; one 5-mm port at the right upper quadrant and two 5-mm ports at the left upper and lower quadrant each. The procedure was done uneventfully with a total duration of three hours. The sigmoid colon was brought out as an end stoma through the left lower quadrant trocar incision site. An abdominal drain was inserted and placed at the pelvis through the previously created 12-mm port site at the right lower abdomen.

The patient had a good post-operative recovery and the drain was removed on day three. On the same night, he developed abdominal distension and pain over the previous drain site. Because of a diagnostic dilemma, computed tomography (CT) of the abdomen was undertaken showing small bowel obstruction secondary to herniated ileal loops through the right iliac fossa anterior abdominal wall defect, at the previous drainage site (Fig. 1). Exploration was done through the right lower abdominal drain site, and the hernia was reduced spontaneously (Fig. 2). Bowel examination revealed good bowel motility with no ischemic bands. The rectus defect was closed primarily with Daiflon 2/0 non-absorbable suture. Subsequently, the patient had a good recovery and was discharged well with clinic follow up.

Discussion

TSIH is an avoidable complication. Several risk factors have been described in the literature stating the use of 12-mm trocars, prolonged surgical time, increasing age, and higher body mass index [3]. Manigrasso et al also reported that drains were associated with TSIH when retrieved by a trocar larger than 5 mm [4]. Despite the suggestions, in this patient, the drain was retrieved by the right lower quadrant 12 mm trocar because the initial 5-mm trocar on the right side was too high for drainage and on the left side, an end stoma was created. Nevertheless, the lateral abdominal wall which is composed of two fascial planes and muscle make it theoretically less prone to dehiscence [5]. In contrast, our patient developed a hernia that developed through the lateral abdominal wall, likely confounded by obesity. The risk of TSIH is greater in obese patients because of the larger preperitoneal space, weaker



Fig. 1 – Computed tomography at axial view showed a small bowel herniation (arrow) through a fascial defect



Fig. 2 – Small bowel bulging through the fascial defect (arrow) following dissection of the skin and subcutaneous tissue

abdominal wall and elevated intraabdominal pressure; thus, fascial closure is suggested even for trocar size measuring lesser than 10 mm [6].

Incisional hernia can happen in 1%-3% of patients after minimally invasive procedures [7]. Abdominal radiograph, ultrasonography and magnetic resonance imaging (MRI) are among the beneficial modalities to evaluate incisional hernia. In an acute presentation, a radiograph is limited yet helpful to look for obstruction and pneumoperitoneum. The ultrasonography meanwhile offers the dynamic real-time evaluation, rapid, inexpensive, non-ionizing radiation, and can determine the size of the defect, contents and musculature thickness. However, it is operator-dependent and limited in obesity, the presence of bowel gases, surgical dressing and stoma as well as difficult to replicate in very large hernias [8]. MRI is a great tool to evaluate herniation with increased intraabdominal pressure, non-ionizing radiation, and is able to provide superior soft-tissue contrast resolution [9]. But, at present, MRI is not readily available, remains relatively more expensive than CT, and not warranted routinely. Among all, CT remains the primary modality to look for the diagnosis of hernia and its complications. Despite its risk of ionizing radiation, CT is readily available, less expensive than MRI, less prone to motion-related artifacts, and relatively independent of operator experience [9].

Several studies, including a randomized prospective trial, have suggested that access sites established using bladeless trocars do not require fascial closure at the end of the procedure because no incisional hernias were detected after a variety of procedures [10]. This advantage was perceived due to the uniqueness of the bladeless trocar which split the fascial layer throughout the course rather than cutting. However, lat-

eral infra fascial hernias have been reported in a few instances [11]. The authors in this report have recommended the adherence to proper port insertion techniques and careful laparoscopic examination of the port sites for significant defects at the end of each procedure, with a view for closure, to prevent hernia formation [11]. Regarding the treatment strategies of TSIH, the current literature is extremely rare. In early occurrence, the defect is usually smaller than 2 centimeters and does not require a mesh closure. Lambertz et al indicated a mesh closure in defects more than 2 centimeters, based on his series which was composed of late-onset incisional hernias [12].

Conclusion

TSIH can occur, despite preventative measures such as inserting in an appropriate technique or using a non-cutting trocar. Recognition and early treatment of port-site hernias avoids strangulation of an incarcerated hernia and the need for bowel resection. Although port site hernias after laparoscopic surgery are uncommon, they remain a significant cause of postoperative morbidity and require prompt intervention if extensive bowel resection is to be avoided.

REFERENCES

- [1] Fear RE. Laparoscopy: a valuable aid in gynecologic diagnosis. *Obstet Gynecol* 1968;31(3):297–309.

- [2] Montz FJ, Holschneider CH, Munro M. Incisional hernia following laparoscopy: a survey of the American association of gynecologic laparoscopists. *J Am Assoc Gynecol Laparosc* 1994;1(4):S23–4 Part 2.
- [3] Swank HA, Mulder IM, la Chapelle CF, Reitsma JB, Lange JF, Bemelman WA. Systematic review of trocar-site hernia. *Br J Surg* 2012;99(3):315–23.
- [4] Manigrasso M, Anoldo P, Milone F, De Palma GD, Milone M. Case report of an uncommon case of drain-site hernia after colorectal surgery. *Int J Surg Case Rep* 2018;53:500–3.
- [5] Duron JJ, Hay JM, Msika S, Gaschard D, Domergue J, Gainant A, et al. Prevalence and mechanisms of small intestinal obstruction following laparoscopic abdominal surgery: a retrospective multicenter study. *Arch Surg* 2000;135(2):208–12.
- [6] Eid GM, Collins J. Application of a trocar wound closure system designed for laparoscopic procedures in morbidly obese patients. *Obes Surg* 2005;15:871–3.
- [7] Dholakia C, Reavis KM. Component separation in the treatment of incisional hernias. *J Long Term Eff Med Implants* 2010;20:129–32.
- [8] Hayati F, Azizan N, Ariffin AC, Kiang KF, Zamri Zuhdi Z, Jarmin R. Diagnostic challenge in a cystic lesion of the epigastrium: a case report. *GMJ*; 2018;29(3):253–5.
- [9] Parikh KR, Al-Hawary M, Millet JD, Burney R, Finks J, Maturen K. Incisional hernia repair: what the radiologist needs to know. *AJR Am J Roentgenol* 2017;209(6):1239–46.
- [10] Siqueira TM Jr, Paterson RF, Kuo RL, Stevens LH, Lingeman JE, Shalhav AL. The use of blunt-tipped 12-mm trocars without fascial closure in laparoscopic live donor nephrectomy. *JLS* 2004;8:47–50.
- [11] Chiong E, Hegarty PK, Davis JW, Kamat AM, Pisters LL, Martin SF. Port-site hernias occurring after the use of bladeless radially expanding trocars. *Urology* 2010;75(3):574–80.
- [12] Lambertz A, Stüben BO, Bock B, Eickhoff R, Kroh A, Klink CD, Neumann UP, Krones CJ. Port-site incisional hernia - A case series of 54 patients. *Ann Med Surg (Lond)* 2017;14:8–11.