SQU Med J, April 2010, Vol. 10, Iss. 1, pp. 106-113, Epub. 17th Apr 10
Submitted 14th June 09
Revision Req. 6th Oct 09, Revision Recd. 1st Nov 09
Accepted 21st Dec 09

CASE REPORT

Port Site Herniation of the Small Bowel following Laparoscopic-Myomectomy

A case report

Ghazi A Elshafie, *Khalifa Al-Wahaibi, Ahmed Al-Azri, Hani Al-Qadhi, Abdullah Al-Harthi

انْفِتاق الأمعاء الدقيقة من منفذ المنظار بعد عملية استئصال الورم العضلي من الرحم

تقرير حالة

غازي الشفيع، خليفة الوهيبي، أحمد العزري، هاني القاضي، عبدالله الحارثي

الملخص: انْفتاق الأمعاء الدقيقة من خلال العيوب اللفافية نتيجة الجراحة بالمنظار من خلال فتحة دخوله حالة نادرة لكنها يمكن أن تكون ذي مضاعفَات خطيرة. من المفضل جدا غلق اللفافة في منطقة منفذ المنظار التي تكون بحوالي 10 ملم أو أكثر لتفادي مضاعفات كهذه. ندرج هنا حالة انفتاق للأمعاء الدقيقة تعرضت للخنق من منفذ المنظار بعد عملية استئصال الورم العضلي من الرحم. تم قطع الجزء المختنق من الأمعاء مع اجراء تفاغر أولي لمعالجة تلك المضاعفات. ندرج هذه الحالة مع مراجعة الأدبيات لمناقشة عوامل الاختطار وطرق تفادي مثل هذه المشاكل بعد عمليات المنظار.

مفتاح الكلمات: انفتاق بطني، انفتاق من منفذ المنظار، الجراحة بالمنظار، مضاعفات، تقرير حالة ؛ عُمان.

ABSTRACT: Bowel herniation, through fascial defects secondary to laparoscopic surgery at the site of trocar entry, is a rare, but potentially serious, complication. Closure of the fascia at port sites measuring 10mm or more has been highly recommended to avoid such complications. We report a case of a small bowel which herniated and strangulated through the port site immediately after laparoscopic myomectomy. Resection of the strangulated bowel with primary anastomosis was required to manage this complication. We present this case report with literature review to discuss the risk factors and the methods to prevent such a complication post laparoscopic surgery.

Keywords: Ventral hernia; Laparoscopy; Complications; Case Report; Oman

Complications involving the abdominal wall, particularly port site hernias, were not expected when laparoscopic procedures were first introduced. With the increasing number of laparoscopic procedures in abdominal surgery, more port site hernias were observed. Port site herniation is a rare, but potentially dangerous complication, following laparoscopic surgery. Visceral herniation into the abdominal trocar entry sites is occasionally mentioned, but seldom reported.[1–4] Kadar *et al.* in a large retrospective case review found the incidence of port site hernias after operative laparoscopy to be (0.17%).[4] In another study, the incidence was 0.47%, but none of the cases in the study had small bowel obstruction, secondary to herniation through the trocar entry sites.[5] In another multicentre, prospective, randomised clinical trial by Bhoyrul *et al.* to study the complications related to laparoscopic port design, with a follow-up period of 6 to 18 months, there were no incisional hernias in any of the patients in the study.[6] In another study done by Nezhat, evaluating the postoperative complication of laparoscopic procedures done on 5,300 patients, only one case needed laparoscopically assisted bowel resection following a strangulated port site hernia.[7] Most of the port site herniations are in the extra umbilical port site.[4,8] The risk factors for the development of trocar site hernias include: the trocar diameter, the trocar design, preexisting fascial defects, and some operation- and patient-related factors.[9]

Department of Surgery, Sultan Qaboos University Hospital, Muscat, Oman.
**To whom correspondence should be addressed. Email: dralwahaibi@hotmail.com*

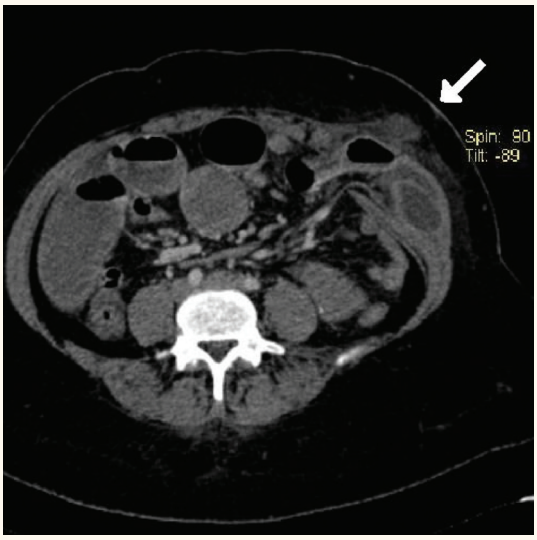

Figure 1: Computed tomography (CT) scan shows the dilated small bowel which is protruding into the muscular layer of the abdominal wall (arrow).

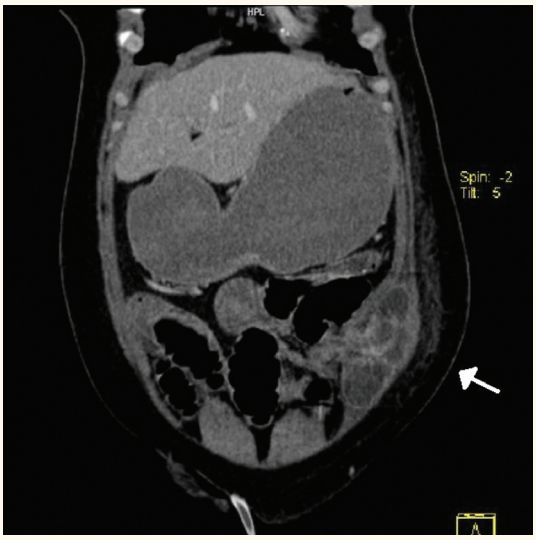

Figure 2: Computed tomography (CT) scan, coronal view, shows the entrapped small bowel loops in the muscular layer of the abdominal wall (arrow).

The following report describes a case of a trocar site hernia that evolved to a strangulated small bowel after laparoscopic myomectomy. We describe the significance of complete closure of the fascial defect at the trocar site in the prevention of this condition and the risk factors involved, as well as the importance of early diagnosis to avoid serious subsequent events.

Case Report

A 42 year-old lady, who had had a previous laparoscopic cholecystectomy in Chennai, travelled abroad for treatment of her chronic abdominal pain, secondary infertility and second degree vaginal prolapse. She was 158 cm in height and weighed 85 kg. She underwent a hysteroscopy with Fothergill's operation and laparoscopic myomectomy. Under general anaesthesia the patient was put in the lithotomy position. The hysteroscopy showed a subseptate uterus so septal resection was done. The anterior vaginal wall and posterior vaginal wall reflected off the cervix. The cervix was amputated 5 cm away from the internal os and homeostasis was secured. A Fothergill's suture was applied to cervix and a neocervix created. Complete homeostasis was then secured and there was no undue bleeding. A 12 mm trocar for the laparoscope was placed in the supraumbilicus area. The pneumoperitoneum was then established with carbon dioxide and the intraperitoneal pressure was maintained at 10 mm Hg. Two more 10 mm trocars were inserted in the right and left iliac fossas. All trocars used were the bladed type. The uterus had two fibroids. One was 2 cm in diameter and deep seated in the anterior uterine wall. It was not indenting the cavity and hence it was not removed. The other fibroid was 2 cm in diameter and situated in the posterior uterine wall. A myomectomy was done, and the specimen was removed through the 12 mm supraumbilical port without extending the skin incision. Complete homeostasis was secured. The fascial defect was closed at the umbilical port site, while the fascia in the right and left iliac fossas port sites was not sutured. The overlying skin was sutured. In the initial post operative period, the patient was asymptomatic and tolerated a normal diet. The patient then returned to Oman seven days after her surgery

Ten days later she was admitted to sultan Qaboos University Hospital with a history of colicky abdominal pain and bilious vomiting, but had normal bowel habits. On physical examination, her abdomen was soft and there was no tenderness. Her umbilical wound showed some serous discharge. There was a 4 cm x 4 cm tense mobile non-tender fluctuant mass in the left iliac fossa just below the left-sided port site. Aspiration was done for the underlying clinically diagnosed seroma, which revealed 10 ml of sero-sanguinous fluid. An abdominal X-ray was done and was normal so the patient was treated conservatively. On fifteenth post operative day, the patient had an episode of

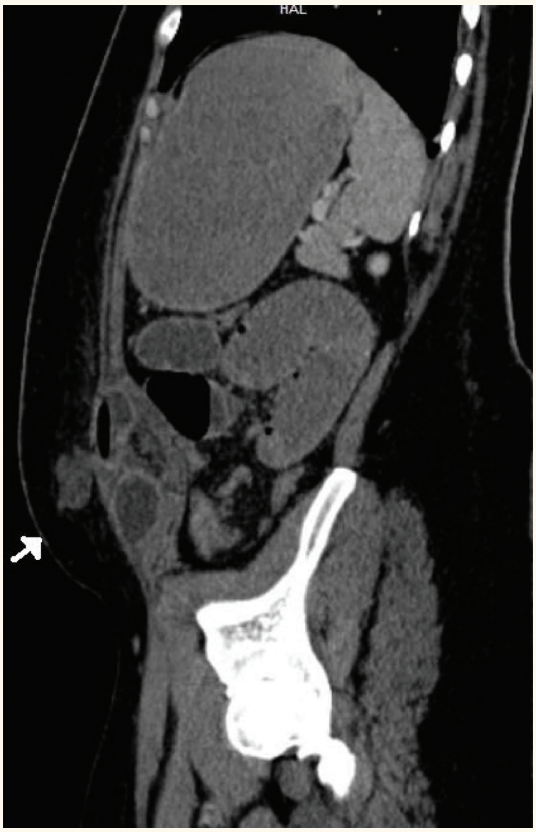

Figure 3: Computed tomography (CT) scan, sagittal view, shows the dilated small bowel which is protruding into the muscular layer of the abdominal wall (arrow).

excessive vomiting and severe epigastiric pain, her last bowel movement had been 2 days previously and she had not passed any flatus per rectum for one day. The abdominal X-ray was repeated and showed evidence of small bowel obstruction (dilated small bowel, with multiple air fluid levels). This was followed with an abdominal computed tomography (CT) scan which showed evidence of a left-sided abdominal wall incisional hernia with entrapped bowel loops between the abdominal muscles [Figures 1, 2, and 3]

The patient then was moved to the operating room. Under general anaesthesia and full aseptic condition, a 1 cm infraumbilical incision was made. A 10 mm trocar was introduced using an open technique. Pneumoperitoneum was achieved using carbon dioxide. A 10 mm camera was introduced. Incarcerated small bowel loops were found herniating through the previous left-sided port site. A 5 mm trocar was introduced in right iliac fossa under direct vision; reduction of the herniated bowel loops was attempted laparoscopically, but this was difficult technically. Another attempt was made to release the incarcerated bowel loops through the abdominal wall. A transverse skin incision was made at the previous left-sided port site; subcutaneous and fascial planes were carefully dissected out. A sero-purulent collection was found and multiple twisted bowel loops which were stuck to the abdomen wall. Multiple attempts to manipulate and reduce the hernia failed. The procedure was converted to an open laparotomy. A midline incision was made extending from just above the umbilicus to the suprapubic area. The hernia contents were reduced by extending the fascial defect. Multiple distended jejunal loops were found, with a 20 cm area of ischaemic bowel. Resection and stapled primary anastamosis was done. The abdomen was washed with a copious amount of warm saline and an antibiotic based solution. The fascia over the hernia site was closed using a non-absorbable continuous suture. The midline incision was closed with a non-absorbable suture for the fascia and an absorbable subcuticular suture for the skin. No drain was required and the skin over the hernia site was kept open over loose skin sutures which were closed 5 days later after daily dressing. The patient went home on the 6th post operative day with no complications. We saw her in our outpatient clinic a month after her discharge with no further complications.

Discussion

Port-site herniation, which is one of the major complications after laparoscopic procedures, can sometimes develops into serious complications, such as bowel obstruction due to incarceration into the fascial defect at the port site. Boughey *et al.* have reported four cases of Richter's hernia that occurred at a port site after laparoscopic surgery[3] The frequency of incisional hernias was significantly higher for 12 mm than for 10 mm trocars. The frequency of incisional hernias at extraumbilical 10 mm and 12 mm trocar insertion sites was 0.23% and 3.1% respectively[4] suggesting that the wound created by a larger port carries a greater risk of herniation. Incisional hernias were also significantly more common if the fascia was left open, as it the case in our patient. Most surgeons now routinely close the fascia of port sites to prevent this complication.[4] According to previous reports, port site herniation apparently happens more often with the use of

bladed type trocars than non-bladed type trocars.[10] Indeed, Kolata demonstrated, in a pig experimental model, that the wounds made by the non-bladed trocar were narrower than those created by bladed trocars[11] Several reports even concluded that port sites created by non-bladed trocars do not require fascial closure.[10] Our current case support this theory as a 10 mm bladed trocar was used here and also suggests that the thick preperitoneum is a potential space that allows the development of bowel herniation. A previous report also described port site herniation, despite the closure of the superficial layer of the fascial defect.[12] Holzinger and Klaiber made an attempt to classify trocar hernias by their onset and related features. They classified trocar hernias into the early-onset type, the late-onset type and the special type. According to this classification our case belongs to the early-onset type that occurred immediately after the operation, with a small-bowel obstruction.[9] The risk factors for the development of trocar site hernias include: 1) the trocar diameter; 2) the trocar design; 3) preexisting fascial defects;[9] 4) enlargement of a port site to remove a specimen; 5) high blood glucose levels; 6) obesity; 7) increase intra-abdominal pressure as in chronic obstructive airway disease; or 8) extensive manipulation of the trocar during relatively prolonged surgical duration, which might enlarge the trocar site and thus induce bowel herniation.[13] The current case had the following risk factors: obesity, the use of a trocar with a large diameter (10 mm), the use of a bladed trocar and the lack of fascia closure. Most surgeons will recommend closure of port sites, especially those measuring 10 mm or more[2,6] and associated with any of the risk factors described above; unfortunately, this was not done in our case with a 10 mm port site. The prevention of extra-umbilical incisional hernias and dehiscences appears to be more achievable when the closure is performed under laparoscopic vision. Both the aponeurosis and the peritoneal membrane should be treated;[14] however, it is sometimes difficult to completely close the defect, including the peritoneum, especially in obese patients. Shaher reviewed different wound closure techniques by a literature search.[15] In this review, old methods using classical instruments, including the Deschamps needle, are also seen to be useful as well as special wound devices designed for port site closure. Elashry *et al.* described a prospective randomised study demonstrating that the Carter-Thomason device was faster and resulted in fewer port-closure-related complications among eight different techniques tested.[16] Insertion of a surgical plug into the muscular layer of trocar wounds has also been proposed by Chiu *et al.*[17] Alternatively, tangential insertion of a trocar through the abdominal wall might be effective in reducing the size of fascial defects. Moreover, recent publications have demonstrated that radially expanding type trocars could be useful to avoid the necessity of closing the fascial defect.[18] From the clinical point of view, we recommend serial radiological examinations of the abdomen as early as possible for any case with suspected bowel obstruction. In our case, intestinal obstruction was missed on an initial normal abdominal X-ray despite the patient been symptomatic, but the repeated X-ray and CT scan showed evidence of small bowel obstruction. Moreover, special attention should be paid to patients with risk factors for port site hernia such as: obesity, the use of large bladed trocars and the lack of fasical defect closure during surgery.

Conclusion

Port-site herniation is a rare, but very dangerous complication, after laparoscopic procedures. Closure of a port site of more than 10mm is highly recommended especially with patients with risk factors such as: obesity, the use of large bladed trocars and the lack of fasical defect closure during surgery. Immediate diagnosis and management of port sites hernias will prevent further complications.

ACKNOWLEDGEMENTS

The authors would like to thank Dr. Geetha Haripriya of the Prashanth Fertility Research Centre in Chennai for providing a detailed description of the treatment abroad.

References

1. Patterson M, Walters D, Browder W. Postoperative bowel obstruction following laparoscopic surgery. Am Surg 1993; 59:656–7.
2. Itoh T, Fuji N, Taniguchi H, Watanabe T, Kosuga T, Kashimoto K, et al. Port site herniation of the small bowel following laparoscopy-assisted distal gastrectomy: a case report. J Med Case Reports 2008; 2:48.

3. Boughey JC, Notingham JM, Walls AC. Richter's hernia in the laparoscopic era. Four case reports and review of the literature. Surg Laparosc Endosc Percutan Tech 2003; 13:55–8.

4. Kadar N, Reisch H, Liu CY, Manko GF, Gimpelson R. Incisional hernias after major laparoscopic gynecologic procedures. Am J Obstet Gynecol 1993; 168:1493–5.

5. Filip V, Pleşa C, Târcoveanu E, Bradea C, Moldovanu R. Incisional hernias after operative laparoscopy. Rev Med Chir Soc Med Nat Iasi 2000; 104:83–6.

6. Bhoyrul S, Payne J, Steffes B, Swanstrom L, Way LW. A randomized prospective study of radially expanding trocars in laparoscopic surgery. J Gastrointest Surg 2000; 4:392–7.

7. Nezhat C, Nezhat F, Seidman DS, Nezhat C. Incisional hernias after operative laparoscopy. J Laparoendosc Adv Surg Tech A 1997; 7:111–15.

8. Lajer H, Widecrantz S, Heisterberg L. Hernias in trocar ports following abdominal laparoscopy. A review. Acta Obstet Gynecol Scand 1997; 76:389–93.

9. Holzinger F, Klaiber C. Trocar site hernias. A rare but potentially dangerous complication of laparoscopic surgery. Chirurg 2002; 73:899–904.

10. Liu CD, McFadden DW. Laparoscopic port sites do not require fascial closure when nonbladed trocars are used. Am Surg 2000; 66:853–4.

11. Kolata RJ, Ransick M, Briggs L, Baum D. Comparison of wounds created by non-bladed trocars and pyramidal tip trocars in the pig. J Laparoendosc Adv Surg Tech A 1999; 9:455–61.

12. Margossian H, Pollard RR, Walters MD. Small bowel obstruction in a peritoneal defect after laparoscopic Burch procedure. J Assoc Gynecol Laparosc 1999; 6:343–5.

13. Tonouchi H, Ohmori Y, Kobayashi M, Kusunoki M. Trocar site hernia. Arch Surg 2004; 139:1248–56.

14. Le Bouëdec G, Kauffmann P, Mille P, Scherrer C, Raiga J, Dauplat J. Post-laparoscopic incisional hernia. A propos of a case. J Chir (Paris) 1995; 132:259–63.

15. Shaher Z. Port closure techniques. Surg Endosc 2007; 21:1264–74.

16. Elashry OM, Nakada SY, Wolf JS Jr, Figenshau RS, McDougall EM, Clayman RV. Comparative clinical study of port-closure techniques following laparoscopic surgery. J Am Coll Surg 1996; 183:335–44.

17. Chiu CC, Lee WJ, Wang W, Wei PL, Huang MT. Prevention of trocar-wound hernia in laparoscopic bariatric operations. Obes Surg 2006; 16:913–18.

18. Johnson WH, Fecher AM, McMahon RL, Grant JP, Pryor AD. VersaStep trocar hernia rate in unclosed fascial defects in bariatric patients. Surg Endosc 2006; 20:1584–6.