Case Series of Umbilical and Extra-umbilical Port Site Herniae

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Received: 20 November 2009 / Accepted: 28 January 2013 / Published online: 26 February 2013
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Abstract Trocar site hernia or port site hernia (PSH) is a type of incisional hernia occurring at the trocar sites after laparoscopic surgeries. This is a rare but a potentially dangerous complication, as it can lead to considerable morbidity requiring surgical intervention. Various factors have been implicated for its development and various methods are also suggested for its prevention. We present here five cases of port site herniae.

Keywords Laparoscopy · Trocar site · Port site · Hernia

Case Reports

Case 1 A 43-year-old fit female presented with a swelling in the left lower abdomen for about 2 years. Pain developed about 10 days ago. On examination, there was a globular, mildly tender, and irreducible swelling of about 8 cm diameter in the left iliac fossa in the subcutaneous plane, with an 8-mm irregular trocar site scar on the skin (Fig. 1). The pain aggravated on coughing with no obvious cough impulse. Old records showed that she had undergone a diagnostic laparoscopy for infertility, and a 10-mm optical port was used at the umbilicus and a 5-mm port at the left iliac fossa, and only functional cysts of the ovaries were found, for which no treatment was suggested. There was no mention about the closure of trocar sites. A clinical diagnosis of irreducible laparoscopic 5 mm port site hernia was made, which was confirmed by abdominal ultrasound. She was operated through a transverse incision made over the

swelling, and the hernia sac could easily be identified, after splitting the external oblique muscle fibers. The sac was opened and it contained viable omentum. The neck of the sac was about 7 mm in diameter, which was widened more to push back the omentum into the abdominal cavity. The abdominal cavity was explored by inserting a finger through the hernia defect and no adhesions were found. The sac was excised, the defect closed with 1-0 polypropylene, and a polypropylene mesh was placed over the internal oblique muscle and fixed with 1-0 polypropylene sutures. The external oblique muscle was approximated with 2-0 polyglactin sutures over the mesh. The skin and subcutaneous tissues were approximated with staples. The patient had uneventful recovery and remains asymptomatic without recurrence about 5 years after surgery.

Case 2 A 53-year-old female presented with a large swelling in the lower abdomen (Fig. 2), which developed after laparoscopic cholecystectomy done 3 years ago by us. She had noticed this swelling about a year after surgery, and abdominal pain was of recent onset. Though reducible, while standing, the swelling was very prominent and caused back pain. She was diagnosed to have a 10-mm port site hernia, which was confirmed by ultrasonography. Incidentally, she was a cured case of non-Hodgkin's lymphoma, non-cirrhotic portal fibrosis with portal hypertension, and anemia due to hypersplenism. Our records showed that the umbilical port site was closed with a 1-0 polypropylene. Open surgery was performed for this hernia and a large defect of about 15 cm was identified which was closed with 1-0 polypropylene and an onlay polypropylene mesh was applied and fixed with polypropylene sutures. The patient had uneventful recovery and remains asymptomatic without recurrence about 3 years after surgery.

Cases 3, 4, and 5 These patients operated primarily by other surgeons, all laparoscopic cholecystectomies, presented

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Fig. 1 Extraumbilical port site hernia

with painless reducible swellings at the umbilicus, and only two underwent open surgery for the hernia and the third refused surgery as she was asymptomatic (Table 1).

Discussion

Incisional hernia is one of the complications after laparoscopy, with a reported incidence of between 0.14 and 22 % [1], but the actual incidence may be higher, as many patients remain asymptomatic or do not return to the primary surgeon.

In 2004, Tanouchi classified these herniae into three types [2]: *early onset type*—dehiscence of anterior and posterior fascial planes and peritoneum characteristically

Fig. 2 Umbilical port site hernia

Table 1 Details about the patients of port site herniae

Patient no.	Age/sex of patient	Comorbid conditions	Clinical presentation	Site of swelling	Nature of laparoscopic surgery	Port closure	Time after laparoscopic surgery	Size of the defect	Contents of hernia
1	43/F	Nil	Painful irreducible swelling	Left iliac fossa (Fig. 1)	Diagnostic laparoscopy	Not mentioned	10 days	7 mm	Omentum adherent to the sac
2	53/F	Cured NHL, portal hypertension, anemia due to hypersplenism	Large reducible swelling with severe abdominal and back pain while standing	Infraumbilical region (Fig. 2)	Laparoscopic cholecystectomy	Umbilical port closed with 1-0 polypropylene	1 year	15 cm	Small bowel (interloop adhesions and adherent to the sac)
3	58/F	Nil	Painless swelling (3 cm diameter)	Umbilicus	Laparoscopic cholecystectomy	Not known (summary not available)	2 years	3 cm	Nil
4	35/M	Obesity	Painless swelling (4 cm diameter)	Umbilicus	Laparoscopic cholecystectomy	Not known	1 year	3 cm	Nil
5	35/F	Diabetes mellitus	Painless swelling (2.6 cm diameter)	Umbilicus	Laparoscopic cholecystectomy	Not known	3 years	Refused surgery	Refused surgery

occurring in the early postoperative period, presenting with small bowel obstruction, especially the Richter's hernia; *late onset type*—dehiscence of both anterior and posterior fascial planes, but the peritoneum constitutes the hernia sac, but occurs several months after surgery, and not associated with small bowel obstruction, and remain asymptomatic except for a reducible swelling at the trocar site; and *special type*—dehiscence of the whole abdominal wall with intestinal or omental protrusion. It occurs early, immediately after surgery

The contents of these trocar site herniae have been omentum, small bowel, caecum, ascending colon, and vermiform appendix [3].

The early signs of a complicated trocar site hernia can be excessive pain, swelling at the site, and discoloration similar to hematoma. Intermittent or complete bowel obstruction may occur later. Clinical suspicion and liberal use of CT scanning can help the diagnosis in the early postoperative period [4], as CT can even indicate about the viability of the bowel [5]. Ultrasound examination is useful in non-emergent situations.

Surgery is the only option, which involves definition of the hernia sac, reduction of hernia contents by enlarging the defect if needed, removal of excess sac if necessary, followed by fascial defect closure and mesh enforcement. Bowel resection may be needed if viability is compromised.

Several factors contribute to the development of a port site hernia, like wound infection, obesity, the diameter, and the location of the port (common being the 10-mm port at the umbilicus, though some case reports of hernia at 5 and 3 mm trocar sites are available) [6, 7]. Trocar site fascial extension for organ retrieval, aggressive manipulation, and non-deflation of pneumoperitoneum prior to trocar removal are suggested additional factors. In patients who underwent laparoscopic ventral hernia repair, the incidence was about 22 %, mostly in those who had larger meshes probably due to the dilatation of the trocar orifice for the introduction of the mesh [8].

Non-closure of port sites is an important factor. Many follow the policy of non-closure of fascial defect caused by non-bladed trocars, but some disagree and close the defect, on the basis that non-bladed trocars bluntly displace the tissues laterally, which do not return to their original state, but allow the omentum and bowel to herniate through the defect. Latyf et al. recommend that cutting blade trocars should be avoided and all ports greater than 8 mm in diameter should be routinely closed to minimize the incidence of this complication, and when identified, surgical repair is recommended to avoid complications [3].

Delmonaco et al. find in their review that some authors recommend that trocars of >7 mm in adults and ≥ 5 mm in young children should also be closed [9]. Bunting suggests that umbilical port alone should be used for retrieval of

gallbladder during cholecystectomy and the defect closed under direct vision, and all ports of >10 mm should be closed especially when cutting trocars are used [10]. Some suggest closing of port site 5 mm or larger [6], and in children, even less than 5 mm ports are also suggested to be closed routinely [7]. In spite of these suggestions, currently, many high-volume bariatric surgeons do not routinely close fascial defects from 5, 10, and 12 mm trocars [11].

With the introduction of single incision laparoscopic surgery, the incidence of port site hernia (PSH) may be expected to be less, but some authors suggest that this may be associated with an increase in the incidence [12]

Usage of Deschamps ligature needle [13] and insertion of surgical plug into the muscular layer of trocar wounds [14] seem to have reduced the incidence of PSH. Morenzo-Sanz et al. in their pilot study have expressed the feasibility of using a bioabsorbable hernia plug to prevent trocar site herniae [15].

Conclusion

Port site hernia seems to be preventable if the implicating factors are meticulously avoided and also if the defect is closed under vision, especially when the ports are of 10 mm.

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