



Case report

Bowel perforation on recurrent incisional hernia after laparoscopic repair; case report and literature review

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ARTICLE INFO

Keywords:

Bowel perforation
Case report
Incisional hernia
Laparoscopy
Raphy

ABSTRACT

Introduction: Incisional hernias are located on the site of a previous incision and are due to weakness of the abdominal wall. In years past, the risk of developing an incisional hernia after laparotomy was 25%. This figure has decreased significantly in recent decades thanks to the laparoscopic technique (Hoffman et al., 2021 [1]), but complications occasionally occur.

Case presentation: We describe a case of recurrent incisional hernia with bowel perforation in a 58-year-old man who had undergone laparoscopic cholecystectomy 8 years previously and who required repeated laparoscopic procedures. After multiple attempts at closing the hernia, the patient complained of acute abdominal pain located in the right flank. The patient proved to suffer a bowel perforation one month after the surgery.

Discussion: Due to the lack of similar cases, it was difficult to prevent the bowel perforation. Moreover, opinions are divided on the treatment of incisional hernia by prosthesis, especially if there is an infectious context. Bowel perforation can be a serious complication of incisional hernia repair. In our case, the delay was suggestive of an idiopathic origin of the condition, which is rare and less described.

Conclusion: In the literature, bowel perforation due to laparoscopic adhesiolysis during incisional hernia repair has been described. However, in the current case the complication was most likely directly related to the incisional hernia repair itself.

1. Introduction

The case report is compliant with the SCARE Guidelines 2020 [2]. Incisional hernia is a major problem in abdominal surgery. With laparoscopy, the risks are now estimated to be about 1% [3,4]. Although this prevalence has significantly decreased compared to the laparotomy approach, the laparoscopic treatment has unveiled a new type of issue which is incisional hernia at trocar sites [1–4]. Often, however, incisional hernia deteriorates with time and may progress to strangulation and ischemia.

A 58-year-old man presented himself at the emergency department of the hospital with acute severe abdominal pain located essentially in the right flank. Relevant surgical history included laparoscopic cholecystectomy some 8 years previously. The medical history was significant for type 2 diabetes, severe obesity, arterial hypertension, hypercholesterolemia and hyperuricemia. Physical examination revealed an incisional hernia with signs of occlusion, and CT scan confirmed a left parietal hernia with incarcerated ischemic bowel. Decision was made to advance to surgical exploration (Fig. 1).

2. Surgical technique

After establishing the pneumoperitoneum, a 12-mm trocar with a 30° optic was inserted into the left flank, and two additional 5-mm trocars were placed under visual control. Attempts were made to reduce the incarcerated bowel from the old scar (Fig. 2). Because reduction was deemed hazardous, the hernia defect was enlarged by sharp incision, but this caused perforation of the bowel. The bowel perforation was managed by a stitch of polyglycolic acid #2 (Vicryl, Neuilly, France).

After reduction of the bowel segment, the dusky discoloration regressed, and the bowel appeared viable. The hernia defect was closed by 2 figures of 8 stitches of Vicryl 2 (Fig. 3). After surgery the patient's recovery was unremarkable and the patient was allowed to be discharged home after 3 days.

One month after the operation however, the patient returned to the hospital because of severe abdominal pain located in the same spot. There was no clinical evidence of recurrence of the obstruction. However, on CT scan a collection was noted at the site of the previous incisional hernia. CT-guided percutaneous drainage was carried out (Fig. 4a

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<https://doi.org/10.1016/j.ijscr.2022.107231>

Received 18 April 2022; Received in revised form 3 May 2022; Accepted 17 May 2022

Available online 20 May 2022

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and b).

One month after the aforementioned drainage, the patient returned because of severe recurrent pain. He had no symptoms of vomiting or abnormal stools, and there was no temperature elevation. Physical examination was unremarkable, but blood work showed a severe inflammatory syndrome with elevated C-reactive Protein (CRP) at 20.8 mg/l. A new abdominal CT scan showed persistence of a small collection with a recurrent obstruction and intestinal ischemia. The patient was taken back to the operating room for repeat laparoscopic exploration. There were severe adhesions on the suspensory ligament of the liver, and extended adhesiolysis was performed (Figs. 5, 6). In addition, inguinal hernia repair was performed during the procedure.

Another month later the patient reported back to the hospital for persistent pain. He was taken back to the operating room for the third time because of alarming CT scan findings. After insertion of the trocars, generalized peritonitis was visualized. The greater omentum was massively incarcerated in the incisional hernia, (Fig. 8) and pre-existing perforation of the bowel was observed well inside the hernia sac (Fig. 7).

The bowel perforation was primarily closed after complete reduction of the hernia. The hernia defect was again closed with a provisional suture. Three months after the last surgery and after good recovery of the patient, open incisional hernia mesh repair was carried out.

3. Discussion

The prevalence of recurrent incisional hernia has been described as approximately 9% [5–7]. More recently, incidence of 20% has been reported, especially if the patient has already undergone two or more surgical treatments for incisional hernia. The high recurrence rate is probably due to the disappearance of clear anatomical planes and to tissue damage during previous and repeated operations [8].

Patients with multiple recurrences often present a typical profile with risk factors [3,8,9]. Our patient suffered from severe obesity and diabetes, two aggravating factors in terms of risk of recurrence of incisional hernia.

In addition to patient-related risk, some external factors were reported in the literature. Specifically for laparoscopic procedures, According to Leibl et al., the risk of incisional hernia decreases significantly when using a conical trocar instead of a pointed trocar [3]. Conversely, risk of incisional hernia significantly increases when trocars equal to or larger than 10 mm are used [3]. Along the same lines, Kadar and al. showed that the incidence of incisional hernia increased from 0.23% with a 10-mm trocar to 3.1% with a 12-mm trocar [10,11]. In our case, we used a 12-mm trocar and two 5-mm trocars for the three surgeries.

Manipulation of the trocar and the trocar site, including pulling out the surgical specimen, repeatedly repositioning the trocars and/or exchanging the trocar sizes, might cause additional trauma and enlargement of the opening [11], which is significantly related to the size of the defect. In fact, a trocar size greater than 5 cm is considered as creating a larger defect that demands closure [12,13] to avoid incisional hernia [14]. The department’s policy is to close the fascia defect where the 12-mm trocar was located. Karampanis investigated the issue of trocar hernia in a prospective study and found that the risk of incisional

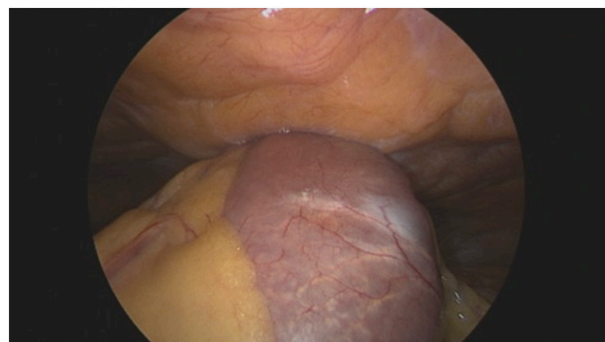


Fig. 2. Intestinal handle caught in the eventration.

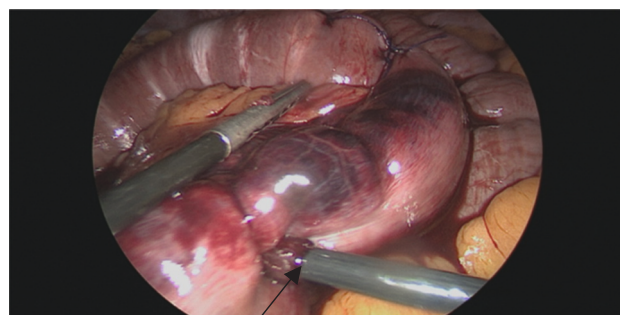


Fig. 3. The small, partially ischemic loop is revascularized 30 min after the beginning of the procedure and after reduction. The laparoscopic grasper (marked by the arrow) shows the perforation that was just at the beginning of the hernia defect, with the ischemic part in front, suggesting that the perforation could be related to the hernia.

hernia was 2.5% with a 5-mm trocar and increased to 10.6% with a 12-mm trocar [15].

Complete exsufflation of the pneumoperitoneum before trocar extraction is advisable to avoid abdominal visceral expulsion at the same time as carbon dioxide (CO2) expulsion [11].

In terms of trocar hernia treatment, it is of the utmost importance to use a prosthesis if the hernia defect is larger than 3–5 cm [16–19]. In our patient who suffered from generalized peritonitis, we decided initially not to use a prosthesis because of the risks of infection that are well described in the literature [20,21]. Of note, some authors recommend the use of a non-absorbable prosthesis even in a septic situation, as the complication rate is not significantly different compared to a non-septic environment [13,22]. However, in our case, where the defect measured 3 cm, we would have had to enlarge the defect to place a prosthesis of any kind, and this would have meant an additional traumatic act [23].

Possible complications of an incisional hernia include infection, seroma, or more dangerously, the risk of occlusion due to incarceration, which can lead to intestinal ischemia [24,25].

Trocar site hernias in particular may encounter complications such



Fig. 1. Medical history of the patient.

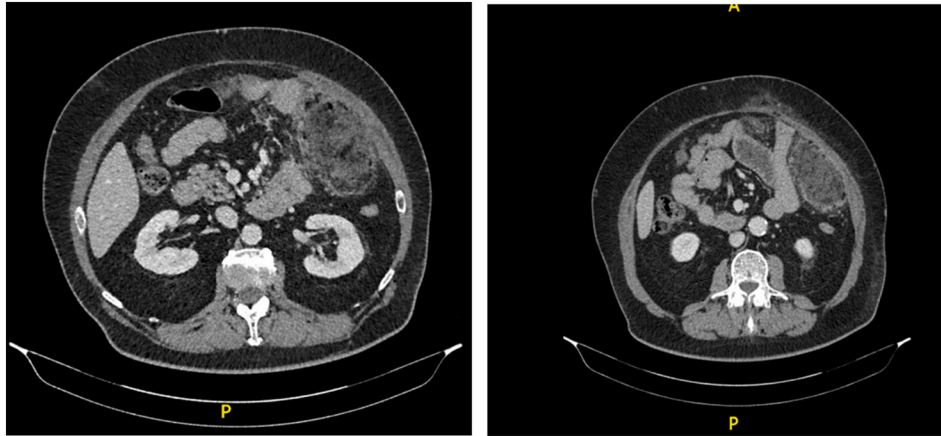


Fig. 4. a and b: The scanner shows a 39.3 × 99 mm collection at the former site of the incisional hernia. There is also a heterogeneous intra-abdominal collection located above the parietal collection with a cranio-causal diameter of 65.3 × 106 mm.

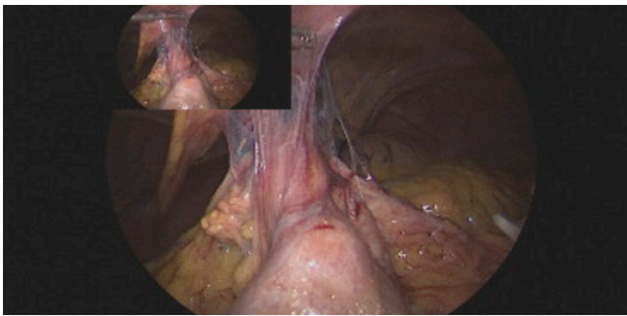


Fig. 5. We visualize an adherent magma attached from the suspensory ligament of the liver and requiring dissection.

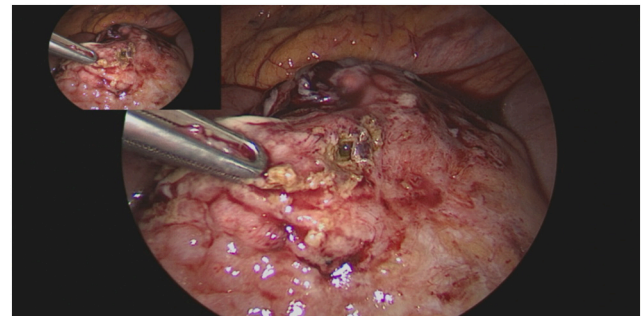


Fig. 7. After reduction of the incarcerated hernia an intestinal perforation is seen.

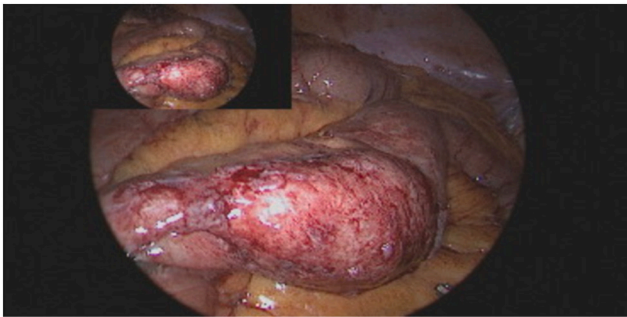


Fig. 6. During the operation an epiploic magma is found, probably an old necrosis on an incarcerated hernia.

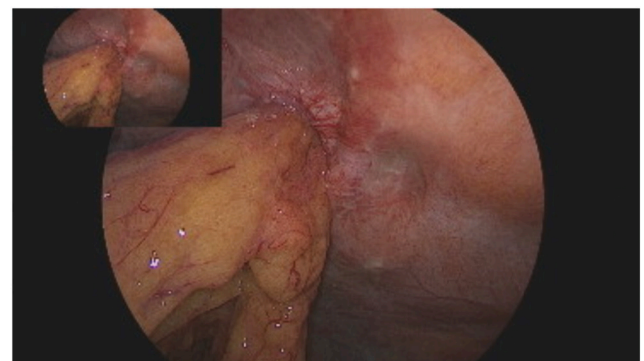


Fig. 8. Omentum incarcerated in the abdominal wall.

as trocar site cellulitis, seromas, active bleeding, hematomas, intestinal infections, and, rarely, peritonitis by intestinal perforation and enterocutaneous fistulas [22,26]. Persisting pain has also been mentioned.

One of the typical disadvantages of laparoscopic access is the increased risk of bowel rupture during manipulation, especially in cases of severe adhesions and multiple previous surgeries [27,28]. Adhesions are directly related to previous surgery and are due to excessive inflammation. Adhesions are generated within hours after surgery, but their complications may appear weeks or even years later [29]. In order to cause as little damage to the bowel as possible, it is recommended to grasp the mesentery rather than the bowel wall during exploration. In addition, it is preferable not to use bipolar or even monopolar scissors, as they can cause perforations that may manifest days after surgery [27]. In case of active bleeding, it is recommended to use sponges and to use the

monopolar or bipolar scissors only at the end of the procedure, after completion of the treatment of the obstruction [27].

In our patient, perforation occurred one month after the procedure, which probably rules out a direct causal link with the previous surgery. Besides the fact that we were very careful not to damage any structure, the perforation was observed at the very beginning of the surgery, long before adhesiolysis (Fig. 6). In addition, the entire bowel was checked at each surgical procedure, to exclude any possible cause which leads us to believe that the perforation was of idiopathic origin. A similar case of probable idiopathic bowel perforation occurring several weeks after surgery was reported by Amorosi et al. [30]

In the current case, the greater omentum was massively encased in the hernia (Fig. 7), putting the small bowel loop under extreme tension,

causing strangulation and eventually perforation.

4. Conclusion

Incisional hernia after laparoscopic procedure is difficult to prevent.

In terms of, placement of a prosthesis immediately after the initial surgery may be advised, despite the risk of infection. Intestinal perforation shortly following incisional hernia treatment is described as a rare complication mostly due to traumatic tissue handling. In the current case, perforation occurred 1 month postoperatively, leading us to suspect another cause such as excessive tension of the bowel after incarceration.

Provenance and peer review

Not commissioned, externally peer-reviewed.

Sources of funding

None.

Ethical approval

Not applicable.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

Nasrallah Marwa: Writing the paper, design, data analysis.
Lipski David: Paper supervision.
Himpens Jacques: Paper review.

Registration of research studies

Not applicable.

Guarantor

Marwa Nasrallah.

Declaration of competing interest

None declared - the authors have no financial, consultative, institutional, and other relationships that might lead to bias or conflict of interest.

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