Case Report

Case Report: Intestinal obstruction secondary to an internal hernia following Lichtenstein hernia repair

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Abstract

Introduction: Inguinal hernias are usually treated with surgical repair. Intestinal obstruction immediately after inguinal hernia repair is rare. This report describes a case of intestinal obstruction due to an internal hernia after a Lichtenstein hernia repair.
Case: An 80-year-old male presented with intestinal obstruction and underwent a Lichtenstein repair of a right inguinal hernia. On the 5th postoperative day, he developed recurrent obstructive symptoms not improving with nonoperative management, and surgery was undertaken. On entering the peritoneal cavity, the small intestine was herniated through a peritoneal defect in the right lateral inguinal fossa. Absorbable adhesion barrier (INTERCEED®) was applied at site of the defect after laparoscopic resolution of intestinal obstruction. The patient has had no evidence of recurrence 4 months post-operation.
Discussion: The original inguinal hernia was repaired by the Lichtenstein technique, but intestinal obstruction developed postoperatively, which laparoscopy revealed to be an internal hernia. Preperitoneal hernia as a postoperative complication may have occurred due to peritoneal defect. Intraoperative placement of absorbable adhesion barrier at the site of the resected peritoneal defect may help prevent recurrence.
(Keywords: inguinal hernia, intestine obstruction, internal hernia, postoperative complication)

Introduction

Lifetime occurrence of inguinal hernia is 27-43% in men and 3-6% in women[1]. Inguinal hernias usually require operative repair for a definitive cure[2]. Complications after inguinal hernia surgery include hematoma, seroma, pain, and recurrence[3], but intestinal obstruction is rare. A recent report suggested laparoscopic inguinal hernia repairs are associated with peritoneal defects or tears, and failure to close such tears can lead to bowel obstruction[4]. The present report describes intestinal obstruction secondary to an internal hernia after a Lichtenstein hernia repair.

Case

An 80-year-old man with no significant past medical history presented with complaints of pain and bulging in the right inguinal region and was diagnosed with an inguinal hernia. The inguinal hernia was easily reduced but painful, and surgery was planned. He returned to the outpatient clinic the following day reporting vomiting. Vital signs were within normal limits, and his height, weight, and BMI were 157.3cm, 49.1kg and 19.8kg/m^2. Physical examination showed abdominal distension and a soft 3cm bulge in the right inguinal area that was mildly tender and easy to reduce. Laboratory tests revealed a white blood cell count of 12010 cells/μl, hemoglobin of 11.7 g/dL, platelet count 31.9×10^4/μl and C-reactive protein of 6.23 mg/dL. The abdomen was distended, and abdominal x-ray showed multiple dilated small intestine loops with multiple air fluid levels (Fig. 1). Abdominal computed tomography (CT) scan showed caliber change in the small intestine starting at the site of an inguinal hernia with no findings of ischemia (Fig. 2).

Following a diagnosis of intestinal obstruction due to a right inguinal hernia incarceration, a consensus for

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Fig.1. Abdominal x-ray showing multiple dilated small intestinal loops with multiple air fluid levels

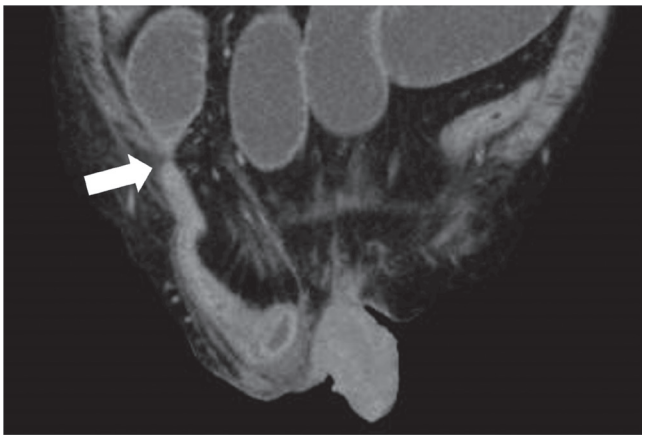

Fig.2. Abdominal CT scan showing a caliber change of the small intestine starting at the site of an inguinal hernia (white arrow) without evidence of ischemia

surgical treatment was reached. However, it was considered difficult to secure a surgical field during laparoscopic surgery. In addition, due to the possibility of intestinal necrosis, intestinal resection, and contamination, an anterior approach was performed. Intraoperative findings revealed an indirect inguinal hernia with a new Japanese Hernia Society (JHS) classification of L-2. Opening the hernial sac confirmed no necrosis of the incarcerated small intestine and it was returned to the abdominal cavity. Although high ligation of the hernia sac was performed, the peritoneum was fragile and some peritoneal injury was observed. The peritoneal injury was repaired with running 3-0 coated synthetic absorbable braided polyglycolic acid sutures (SURGISORB®), and no additional peritoneal injury was confirmed. There was no wound contamination, and Lichtenstein repair using soft flat mesh was performed.

On the fifth postoperative day there was no swelling in the

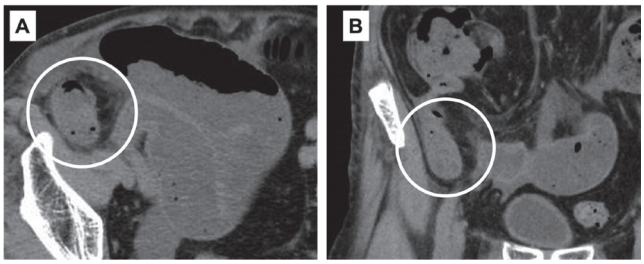

Fig.3. Abdominal CT scan showing dilated small intestine incarcerated with peritoneum in the right inguinal region with dilation of the intestine proximal to that site.
(A) axial image
(B) coronal image

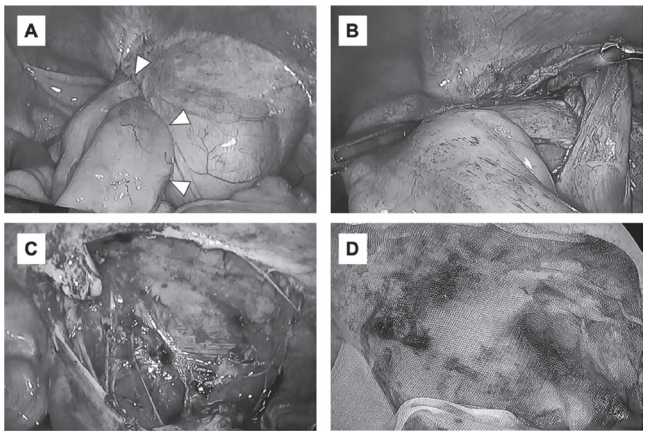

Fig.4. Intraoperative laparoscopic view
(A) Small bowel herniation through the peritoneal defect (white arrows)
(B) Internal hernia where the small intestine could not be reduced
(C) Peritoneal defect after release of intestinal obstruction
(D) Peritoneal defect fully covered with absorbable adhesion barrier

right inguinal region, but the patient developed abdominal distension and vomiting. Abdominal CT scan showed dilated small intestine incarcerated in the right inguinal region with dilation of the small intestine (Fig. 3A, B). A diagnosis of intestinal obstruction was made based on clinical and imaging findings. Adhesive intestinal obstruction was suspected because the point of obstruction was directly below the surgical wound. Nonoperative management with decompression did not resolve the obstruction and laparoscopic exploration was undertaken on the 20th postoperative day. On entering the abdominal cavity with the laparoscope, the small intestine was noted to have herniated through a peritoneal defect at the right lateral inguinal fossa (Fig 4A). The incarcerated small intestine was not easily reduced (Fig 4B). The possibility that the peritoneum was fragile was considered, and that the area during the previous surgery where the hernia sac was closed or the defect was repaired may have been postoperatively damaged through abdominal pressure or contact with the intestinal

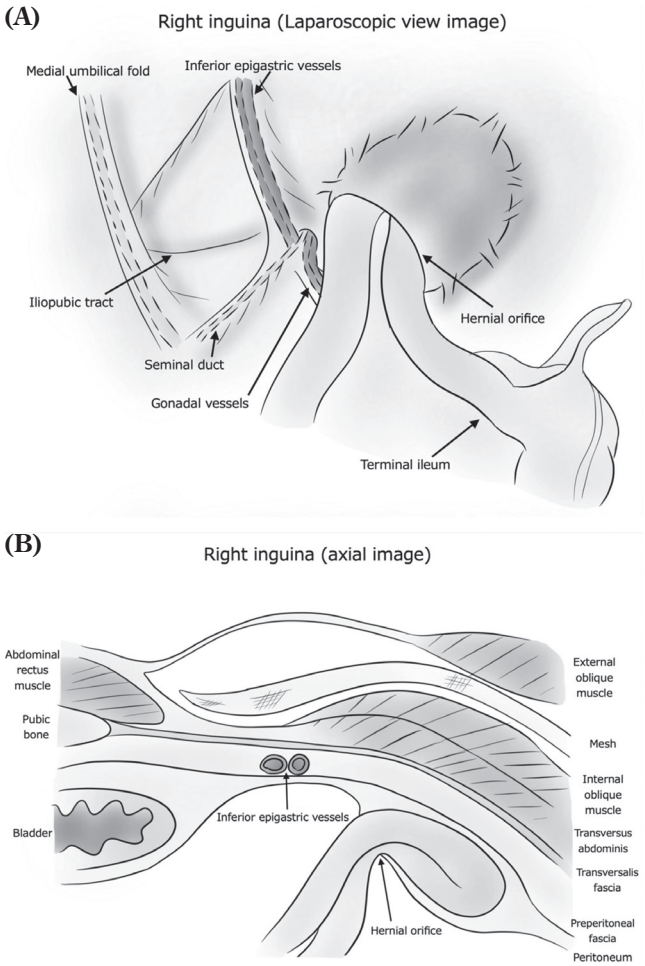

Fig.5. Schema regarding internal hernia in which the peritoneal defect formed a hernia orifice.
(A) Laparoscopic view image
(B) Axial image

tract. Furthermore, the peritoneal defect could have formed a hernial orifice, with the intestine entering the peritoneal defect and adhering to the preperitoneal tissue (see Fig 5 schema).

An abdominal incision was made to reduce the incarcerated small intestine. The small intestine was adherent in the preperitoneal region and reduced with the adherent peritoneum, resulting in a large loss of peritoneum (Fig 4C). The 12mm port site was incised and extended by 5cm, and a wound protector placed to eviscerate the incarcerated small intestine. The incarcerated loop (Fig 6) was then excised and replaced into the abdominal cavity after performing a two-layer anastomosis. For the peritoneal defect, absorbable adhesion barrier was applied to cover the entire defect (Fig 4D), and the operation was completed. The operating time was 260 mins with minimal blood loss. The patient made an uneventful recovery and was discharged 10 days after the second surgery. Four months after repair, the patient is doing well without recurrence of inguinal hernia or intestinal obstruction.

Fig.6. Intraoperative image indicating the small intestinal loop became point of obstruction.

Discussion

Several surgical repairs are commonly performed for inguinal hernia. Among them, the Lichtenstein repair in which mesh is placed anterior to the fascia transversalis has become one of the most common approaches[5]. Intestinal obstruction is a rare complication after inguinal hernia repair, and frequency varies depending on the surgical procedure. Bringman et al. reported that incidence of intestinal obstruction after laparoscopic inguinal hernia repair with Totally Extra-Peritoneal repair (TEP) and Trans-Abdominal Pre-Peritoneal repair (TAPP) was 0.07% for TEP repair, 0.5% for TAPP, and 0.16% for open Lichtenstein repair[6].

Among the potential causes of intestinal obstruction after TAPP is preperitoneal herniation of small intestine through a peritoneal defect[7], and herniation at the trocar site and obstruction due to postoperative adhesions[8, 9]. However, there are no detailed reports on the mechanism of intestinal obstruction after Lichtenstein repair or other anterior approaches. This patient underwent a Lichtenstein repair, but intestinal obstruction occurred postoperatively. Laparoscopic exploration led to the diagnosis of intestinal obstruction due to an internal hernia in which the small intestine herniated through a peritoneal defect. In this procedure, the peritoneum was fragile and torn due to inflammation during high ligation of the hernia sac and was repaired with a running suture. We surmised that the peritoneal defect became the hernia orifice, and the small intestine entered the preperitoneal space through this orifice.

There are no case reports or reviews of postoperative complications of anterior approach related to internal hernia due to a similar mechanism. Peritoneal repair should be performed more carefully in cases where the peritoneum may be fragile before surgery such as elderly patients, cases with inflammation due to intestinal obstruction, cases on hemodialysis due to chronic renal failure, or cases on long-term oral steroid therapy. Therefore, careful intraoperative

confirmation of the presence or absence of peritoneal damage and the need for sufficient repair is necessary. Furthermore, avoiding excessive changes in intra-abdominal pressure after surgery may lead to prevention of postoperative internal hernia. For cases in which peritoneal weakness is suspected or confirmed, it is necessary to conduct follow-up observation regarding the possibility of a postoperative internal hernia developing.

Postoperative adhesions are the most common cause of small intestinal obstruction[10], so their prevention may decrease the overall incidence of postoperative small intestinal obstruction. Antiadhesion agents prevent postoperative adhesions directly under wounds and peritoneal defects. Recently, an antiadhesion film Seprafilm® was reported to reduce postoperative intestinal obstruction[11], and INTERCEED® has also been reported to have the potential after laparoscopic surgery for colorectal cancer[12]. In addition, various other types of absorbable adhesion barrier have become available recently such as TENALEAF® and AdSpray®. Here, INTERCEED® was used to prevent postoperative adhesions to the peritoneal defect. When there is a wide peritoneal defect during intraperitoneal surgery, Seprafilm® is film-like but has low flexibility making it difficult to apply in a manner covering the peritoneal defect sufficiently. TENALEAF® is film-like, so it is highly flexible and possibly easier than Seprafilm® to maneuver within the peritoneal cavity, but there is less evidence it prevents intestinal obstruction compared to other absorbable adhesion barriers. AdSpray® is a powdered adhesion prevention agent that can be sprayed effectively onto the peritoneal defect to prevent adhesions. However, the spray may be uneven if the peritoneal defect is extensive, and compared to other film agents may be partially scraped off due to contact with organs such as the intestinal tract. Because INTERCEED® is cloth-like and flexible, it is easier to operate intraperitoneally than other products. Furthermore, even if it adheres to other tissues, it can be reapplied if there is no excessive moisture. Based on the above considerations, INTERCEED® was considered appropriate for this case. Table 1 compares each absorbable adhesion barrier. At 4-month follow-up, there has been no evidence of recurrence of intestine obstruction or inguinal hernia after resection.

Conclusion

Here we reported a peritoneal defect occurring as a complication after inguinal hernia surgery and resulting in intestinal obstruction. To the best of our knowledge there have been no such previous case reports following a Lichtenstein repair. To prevent future occurrence of a similar incident, it is necessary to close the peritoneal defect securely in cases where the peritoneum is fragile. Also, avoiding excessive intra-abdominal pressure after surgery may lead to prevention. In addition, applying absorbable adhesion barrier to the peritoneal defect may help prevent intestinal obstruction by limiting adhesions to peritoneal defects.

Declaration of interest

The authors have no conflict of interest to declare.

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Table.1. Comparisons of absorbable adhesion barriers.

Advantages and disadvantages of each absorbable adhesion barrier in laparoscopic surgery

	Advantages	Disadvantages
Seprafilm®	· Much use experience and evidence regarding prevention of intestinal obstruction.	· Low flexibility makes it difficult to apply in a manner covering peritoneal defect sufficiently
TENALEAF®	· Highly flexible and possibly easier than Seprafilm® to maneuver within peritoneal cavity	· Less evidence for preventing intestinal obstruction compared to other absorbable adhesion barriers
AdSpray®	· Can be applied by spray to peritoneal defects more effectively than other absorbable adhesion barrier	· Spray may be uneven if the peritoneal defect is extensive
INTERCEED®	· Easier to operate intraperitoneally than other products · Even if adheres to other tissues, can be reapplied if not excessive moisture	· May be difficult to apply depending on skill of surgeon and space with abdominal cavity

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鼠径ヘルニアに対してLichtenstein術後に内ヘルニアに起因する腸閉塞を発症した１例

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要　　約

緒言：鼠径ヘルニアは通常，外科的手術で治療される。鼠径ヘルニア術後に腸閉塞が生じることは稀である。本報告では，Lichtenstein術後の内ヘルニアによる腸閉塞の患者について説明する。
症例：80歳男性。右鼠径ヘルニアに対してLichtenstein法での手術を施行した。術後５日目に腸閉塞が出現し，非手術管理で改善が得られず手術を施行した。腹腔鏡での観察で右外鼠径窩に腹膜欠損を認め，腹膜欠損部に小腸が嵌入し内ヘルニアを来していた。吸収性癒着防止剤（INTERCEED®）を腸閉塞解除後の腹膜欠損部に貼付した。術後４ヶ月で再発の兆候なく経過している。
考察：鼠径ヘルニアはLichtenstein法で修復されたが，術後に腸閉塞が出現し，腹腔鏡での観察で内ヘルニアによる腸閉塞の診断となった。腸閉塞解除後の腹膜欠損部位に吸収性癒着防止剤を留置することは，癒着性腸閉塞の防止に寄与する可能性がある。
（キーワード：鼠径ヘルニア，腸閉塞，内ヘルニア，術後合併症）

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