CASE REPORT

Transmesenteric small bowel herniation causing intestinal obstruction following laparoscopic transperitoneal nephrectomy

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Abstract In the field of urology, laparoscopic nephrectomy has become the most frequently performed laparoscopic procedure. Bowel-related complications are rare and predominantly ileus related. In addition, intestinal obstruction (IO) secondary to internal herniation is rarely documented. According to our review of the literature, only a few such cases have been reported worldwide. Here, we report a 72-year-old man with painless macroscopic hematuria. He was diagnosed with left renal cell carcinoma, and he subsequently underwent laparoscopic transperitoneal left radical nephrectomy. Two days following surgery, he developed acute IO. Computed tomography of the abdomen revealed dilated small bowel loops. Laparotomy revealed small bowel herniation via a sigmoid colon mesenteric defect. After reduction of the herniated bowel loops, the defect was closed using absorbable sutures. The patient was discharged 6 days later. Internal herniation is a rare cause of IO, accounting for <3% of cases. It occurs due to creation of a transmesocolic defect during mobilization of the left colon, facilitating small bowel migration into a potential space in the renal bed. Generally, a meticulous dissection technique is used in such cases to avoid any unnecessary mesenteric tears and repair the evident mesenteric defects observed during the intraoperative period.

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1. Introduction

Laparoscopic nephrectomy (LN) was first performed by Clayman et al in 1991 for a benign kidney disease. Since then, the laparoscopic technique has rapidly evolved and has been used for renal malignancies and live kidney donation. More extensive and complicated laparoscopic renal surgical procedures have been increasingly performed at several urological centers worldwide. The advantages of laparoscopy over open renal surgery have been clearly documented including reduced postoperative pain, shortened hospital stay, more rapid return to normal activities, and improved cosmeses. In the field of urology, LN, including simple nephrectomy, radical nephrectomy, donor nephrectomy, nephroureterectomy, and partial nephrectomy, has become the most frequently performed laparoscopic procedure. However, laparoscopic renal surgery is associated with unique challenges and complications compared with open renal surgery. Such complications are increasingly uncommon because of increasing experience; for instance, bowel-related complications are < 1% and predominantly ileus related.

2. Case Report

A 72-year-old man with a chief complaint of painless macroscopic hematuria and considerable weight loss for 3 months was presented to us. The left loin mass was painless, and he did not have any other constitutional symptoms. A 4-phase computed tomography (CT) scan of the kidneys revealed an 8-cm large mass arising from the lower pole of the left kidney, probably indicating renal cell carcinoma (Figures 1A and 1B), an evident left renal artery and vein, and a minimal surrounding perinephric fat streakiness. The patient's blood investigation and chest X-ray results were normal. He underwent laparoscopic transperitoneal left radical nephrectomy, where the colon and splenic flexure were mobilized, ureter and gonadal vein were identified, and renal artery and vein were ligated. The left adrenal gland was preserved during nephrectomy. The immediate postoperative period was uneventful. However, on Day 2 of surgery, the patient complained of an acute-onset, abrupt, and early abdominal distension, and he was unable to pass stool.

Physical examination revealed a soft, mildly distended abdomen with no masses, rebound tenderness, and no guarding. The patient was hemodynamically stable, and routine blood tests, including complete blood count, liver and kidney functions, and serum amylase, were all normal. No causes for ileus, such as electrolyte imbalance, sepsis, or drug use, were identified; therefore, mechanical bowel obstruction was suspected. A contrast CT scan of the abdomen showed a transitional zone, suggesting mechanical obstruction with no collections (Figure 2). Therefore, laparotomy was performed on Day 3 following surgery. A 2-cm defect in the mesentery of the sigmoid colon was found, and the small bowel (ileum) was herniated through this defect, causing a constriction band near the ileum at ~65 cm from the ileocecal junction. The small bowel proximal to the constricting ileal band was grossly dilated. The incarcerated bowel nonviable loops were reduced, resected, and primarily anastomosed. Subsequently, the defect was repaired with absorbable sutures. Following this, the patient's recovery was uneventful, and he was discharged 6 days later.

3. Discussion

The incidence of LN complications ranges from 5% to 8.2%. Vascular injury is the most common complication, whereas...
bowel-related complications are rare (<1%) and manifest as postoperative ileus. In general, IO resulting from internal bowel herniation via a mesenteric defect is rare. It is possibly created due to extensive colonic mobilization or mesenteric dissection to maximize the length of renal vessels for subsequent anastomosis.

Cases of internal bowel herniation via mesenteric defects have been reported following laparoscopy-assisted colectomy. In such operations, mesenteric incisions are necessary, but they are not routinely closed. The incidence of IO is 0.7–2.7% and that of internal herniation is 0.37%. The mesenteric defect is created during descending colon mobilization, which can be avoided by dissecting medial to the Gerota fascia and staying lateral to the gonadal vein.

Risk factors causing mesenteric defects during descending colon mobilization include tumor size, left-sided tumor, larger potential space in the left renal fossa than in the right renal fossa, and extensive manipulation due to adhesions or fecally loaded colon.

In our case, the 2-cm mesenteric defect and the potential space in the left renal fossa facilitated small bowel herniation. This is distinct from other bowel complications such as bowel injury or ileus in which patients remain unwell from the time of initial surgery. Our case reinforced the utility of CT scans for the diagnosis of complications after laparoscopic urological surgery. Regardless of its size, a mesenteric defect leads to a risk of bowel herniation. In a large defect, a wider neck is thought to prevent incarceration or strangulation of the herniated bowel. However, adhesion around the defect can reduce neck size, leading to this complication. Smaller defects can also cause such complications. Therefore, careful inspection of the mesentery after laparoscopic surgery is mandatory for preventing this rare morbid complication.

Internal herniation is a rare cause of IO, accounting for <3% of cases, and few cases have been reported worldwide. It occurs due to the unintentional creation of a transmesocolic defect during medial mobilization of the left colon along the line of Toldt, facilitating the migration of small bowel into a potential space in the renal bed. Small bowel strangulation is rarely observed; however, delayed presentation and misdiagnosis can engender a catastrophic outcome with increased mortality. Radiological imaging may not reveal the exact point of obstruction or clearly demarcate the transitional zone between collapsed and dilated bowel segments; hence, a high index of clinical suspicion can be lifesaving. The gold standard treatment includes reduction of herniation and closure of the defect. The presence of a compromised bowel segment warrants resection and primary anastomosis. A meticulous dissection technique should be considered in such cases to avoid any unnecessary mesenteric tears and repair the evident mesenteric defects observed during the intraoperative period.

Figure 2  (A) Axial CT scan of the abdomen showing a dilated small bowel (arrows) suggestive of IO. (B) Coronal CT scan of the abdomen showing a dilated small bowel, suggestive of intestinal obstruction with transitional zone (arrow) at the terminal ileum. IO = intestinal obstruction.

Laparoscopic renal surgery is a standard procedure used by many urologists, and the role of laparoscopy is continuously growing in the field of urology. Repetition of the procedure and experience with laparoscopic techniques reduce the unique complications associated with laparoscopy. Although the complexity of urological laparoscopic procedures has increased over time, the rate of complications has not significantly increased. Bowel herniation via a mesenteric defect is a rare cause of IO following LN. CT scans are useful for the diagnosis of bowel herniation when patients present with delayed IO. However, various precautions and measures should be taken to avoid potential laparoscopic complications. Therefore, to eliminate the occurrence of such complications, we recommend active examination for any mesenteric defects, practicing routine closure of all mesenteric defects, including small ones, and preoperatively anticipating the possibility of mesenteric defects in patients with large, left-sided tumors.
References