

CASE REPORT

A Rare Complication After Laparoscopic Lateral Lymph Node Dissection for Rectal Cancer: Two Case Reports of Internal Hernia Below the Superior Vesical Artery

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Abstract:

Total mesorectal excision or mesorectal excision with lateral lymph node dissection (LLND) is a standard treatment for locally advanced lower rectal cancer in Japan. Although laparoscopic LLND for rectal cancer is technically complex and challenging, previous studies have demonstrated its feasibility, and the procedure is gradually becoming more common. With this increased use, the incidence of new complications specific to laparoscopic LLND is likely to increase, and a greater awareness of these complications is required. Here we report two cases of internal hernia of the small bowel through an orifice of the vesicohypogastric fascia below the superior vesical artery after laparoscopic LLND. There are six previous reports of internal hernia underneath the pelvic blood vessel after pelvic lymph node dissection for urological or gynecological malignancies, but our cases are the first two that occurred after LLND for rectal cancer. Almost all cases, including our two cases, occurred after laparoscopic surgery and required resection of an incarcerated small bowel. Therefore, the incidence of this complication is likely to increase as the number of cases treated with laparoscopic LLND increases. Our cases show that it is important to perform an emergency operation promptly instead of conservative treatment.

Keywords:

lateral lymph node dissection, internal hernia, rectal cancer, postoperative complications

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Introduction

The standard treatment for locally advanced lower rectal cancer internationally is total mesorectal excision (TME) or mesorectal excision (ME) with neoadjuvant chemoradiotherapy (NACRT), but the standard treatment for locally advanced lower rectal cancer in Japan is TME or ME with lateral lymph node dissection (LLND)¹. In a retrospective multicenter study, Sugihara et al. found that the risk of local recurrence was reduced by 50.3% and the 5-year survival rate improved by 8.0% after LLND in patients with pT3/T4 lower rectal cancer². Moreover, a randomized controlled trial (Japan Clinical Oncology Group Study, JCOG0212) comparing ME with or without LLND for stage II to III lower rec-

tal cancer showed that ME with LLND resulted in lower rates of local recurrence, especially in the lateral pelvis, compared with ME alone³.

Laparoscopic LLND for rectal cancer is a technically complex and challenging procedure; however, its feasibility has been demonstrated^{1,4}, and it is gradually becoming more common. This is likely to increase the incidence of new complications specific to laparoscopic LLND, and a greater awareness of these complications is needed. Here, we report two cases of internal hernia of the small bowel through an orifice of the vesicohypogastric fascia below the superior vesical artery (SVA) after laparoscopic LLND.

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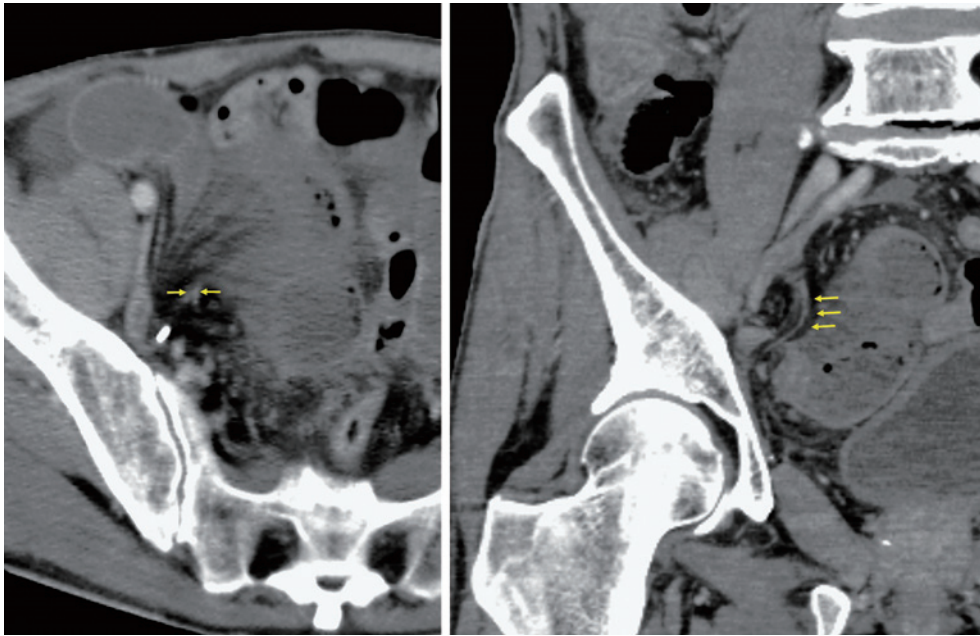


Figure 1. Case 1. Contrast-enhanced CT revealed a caliber change of the small bowel located just to the caudal-dorsal side of the right SVA (arrow).

Case Reports

Case 1: A 68-year-old male was diagnosed with rectal cancer of clinical stage II. The tumor was located below the peritoneal reflection. In accordance with the Japanese Society for Cancer of the Colon and Rectum (JSCCR) Guidelines for Treatment of Colorectal Cancer, the patient underwent laparoscopic super low anterior resection and laparoscopic LLND.

LLND was performed in accordance with reported methods⁹. The ureter was isolated and displaced away from the LLND side. The border between the internal iliac vessels and the obturator lymph nodes was separated, and then extended to the border of adipose tissues surrounding the urinary bladder and led to the stratum disjuncture extending from the pelvic wall. The lateral surface of the internal pudendal artery was exfoliated to Alcock's canal, and the sacral nerves and coccygeal muscle were exposed. Obturator nerves were preserved. The lateral side of the obturator space was exposed to the pelvic wall along the obturator fascia, and the inside of the pelvic wall was dissected to the lateral side of the internal iliac artery. The proximal side was dissected en bloc to the bifurcation of the internal and external iliac artery. The internal iliac lymph nodes, which are located between the internal iliac artery and the autonomic nerves (pelvic splanchnic nerves and pelvic plexus), were dissected. The umbilical artery and vesical arteries and veins were preserved.

Four months after the initial surgery, the patient was admitted to our hospital with a chief complaint of mild upper

abdominal pain. Contrast-enhanced computed tomography (CT) revealed a caliber change of the small bowel in the right lateral pelvic cavity (Figure 1). There were no findings of ischemia of the small bowel, but an emergency ileus operation was performed because a massive ascites was apparent. Intraoperative findings showed internal herniation of the small bowel through an orifice of the right vesicohypogastric fascia below the right SVA. The incarcerated small bowel was necrotic and required resection of a length of 40 cm. We considered transection of the right SVA to prevent recurrence of the internal hernia, but this was not done because the right SVA was attached to the right obturator nerve. The postoperative course was uneventful, and the patient was discharged on postoperative day 12.

Case 2: A 59-year-old male was diagnosed with rectal cancer of clinical stage III. The tumor was located below the peritoneal reflection. In accordance with the JSCCR Guidelines for Treatment of Colorectal Cancer, the patient underwent laparoscopic intersphincteric resection and laparoscopic LLND. The surgical procedure for LLND was the same as that in case 1. Two months after the initial surgery, the patient was admitted to our hospital with chief complaints of nausea and abdominal pain, which had persisted for 1 week. Contrast-enhanced CT revealed a caliber change of the small bowel in the right lateral pelvic cavity (Figure 2). There were no findings of ischemia of the small bowel, but internal hernia underneath the pelvic blood vessel was suspected, and an emergency laparoscopic ileus operation was performed. Intraoperative findings showed internal herniation of the small bowel through an orifice of the right vesicohy-

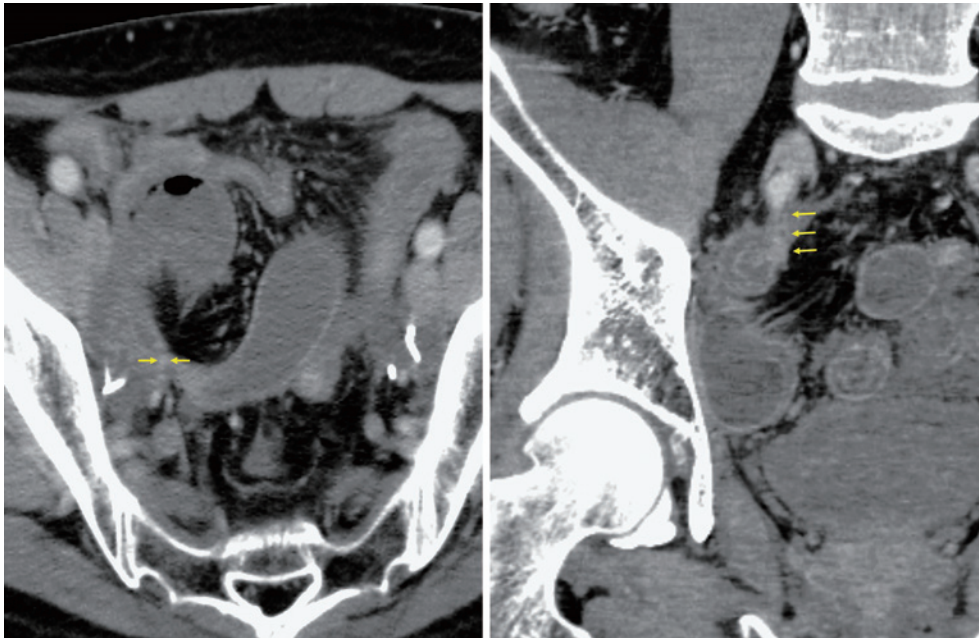


Figure 2. Case 2. Contrast-enhanced CT revealed a caliber change of the small bowel located just to the caudal-dorsal side of the right SVA (arrow).

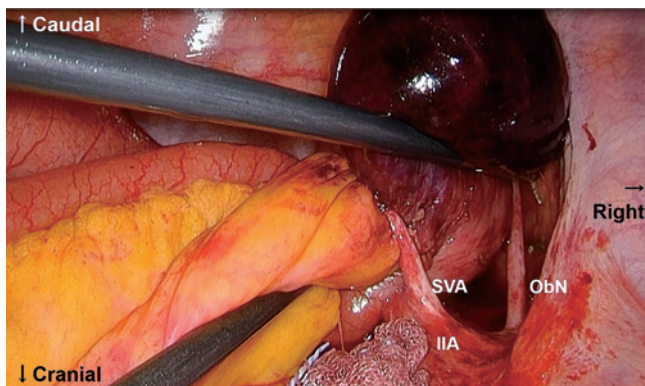


Figure 3. Case 2. Intraoperative findings showed internal herniation of the small bowel through an orifice of the right vesicohypogastric fascia below the right SVA. SVA: superior vesical artery; IIA: internal iliac artery; ObN: obturator nerve.

pogastric fascia below the right SVA, as in case 1 (Figure 3). The incarcerated small bowel was highly congested and required resection of a length of 15 cm. The right SVA was transected to prevent recurrence of the internal hernia. The postoperative course was uneventful, and the patient was discharged on postoperative day 11.

Discussion

In a retrospective multicenter study in Japan, the incidence of lateral pelvic lymph node metastasis in patients with T3 or T4 lower rectal cancer was 18.1%²⁾. The 2014 JSCCR Guidelines for Treatment of Colorectal Cancer list

TME or ME with LLND as the standard procedure for lower rectal cancer in Japan⁶⁾. In the JCOG0212 study, the noninferiority of ME alone to ME with LLND could not be confirmed, and LLND was found to reduce local recurrence, especially in the lateral pelvis. These findings supported the efficacy of ME with LLND for lower rectal cancer, defined as a tumor with the lower margin below the peritoneal reflection, including clinical stage II/III tumors³⁾.

Some previous studies have shown the feasibility of laparoscopic LLND for rectal cancer. In a multicenter retrospective cohort study, Yamaguchi et al. compared laparoscopic LLND with open LLND and concluded that laparoscopic LLND is safe and feasible and is associated with oncological outcomes similar to those of open LLND¹⁾. Ogura et al. reported that additional laparoscopic LLND is feasible in patients with advanced lower rectal cancer and clinically swollen LLNs treated with NACRT, with no significant increase in major complications compared with TME alone⁴⁾. Based on such accumulated evidence, laparoscopic LLND has gradually been accepted as a safe and feasible procedure for rectal cancer in recent years. Additional prospective, randomized controlled trials are necessary to confirm the long-term oncological outcome and the feasibility.

Laparoscopic gastrectomy is widely used as a treatment option for gastric cancer, but internal hernia may occur as a result of postoperative small-bowel obstruction, particularly after Roux-en-Y reconstruction; in contrast, more adhesions occur after open gastrectomy⁷⁾. Hiki et al. reported significantly more postoperative intra-abdominal adhesions in open surgery than in laparoscopic surgery⁸⁾. Typical compli-

Table 1 Previous Reports of Internal Hernia Underneath the Pelvic Blood Vessel after Pelvic LLND.

Age, Sex	Initial diagnosis	Initial operation	Interval between two operations	Chief complaint	Orifice of herniation	Required small-bowel resection	Discharge
52, M	Right testicular teratocarcinoma	Radical retroperitoneal lymphadenectomy after orchiectomy	3 months	Abdominal pain, nausea, vomiting	Right common iliac artery	Yes	POD66
67, F	Cervical cancer	Laparoscopic radical hysterectomy, and bilateral salpingo-oophorectomy with pelvic lymphadenectomy	Several months	Abdominal pain	Right external iliac artery	Yes	POD9
56, F	Right ovarian cancer	Bilateral salpingo-oophorectomy, total abdominal hysterectomy, omentectomy, appendectomy with radical retroperitoneal lymphadenectomy	4 years	Abdominal pain, vomiting, inability to pass gas or stools	Left external iliac artery	No	POD1
39, F	Cervical cancer	Laparoscopic trachelectomy with pelvic lymphadenectomy	2 years	Abdominal pain, nausea, vomiting	Right common iliac artery	Yes	POD6
50, M	Bladder cancer	Robot-assisted laparoscopic partial cystectomy with extended pelvic lymphadenectomy	5 months	Abdominal pain, nausea, vomiting	Right common iliac artery	Yes	Not listed
50, M	Prostate cancer	Robot-assisted laparoscopic prostatectomy with extended pelvic lymph node dissection	1 year	Abdominal pain	Left external iliac artery	Yes	POD13
68, M	Rectal cancer	Laparoscopic super low anterior resection with lateral lymph node dissection	4 months	Upper abdominal pain	Right superior vesical artery	Yes	POD12
59, M	Rectal cancer	Laparoscopic intersphincteric resection with lateral lymph node dissection	2 months	Abdominal pain, nausea	Right superior vesical artery	Yes	POD11

cations of LLND include lymphocele, pelvic hematoma, and deep-vein thrombosis. An internal hernia is rarely seen after open LLND because postoperative intra-abdominal adhesion prevents internal herniation in the lateral pelvic cavity. However, in systematic laparoscopic LLND, an orifice of the vesicohypogastric fascia is formed behind the preserved SVA, and internal hernia of the small bowel through the orifice may occur if there is slight postoperative intra-abdominal adhesion. We performed LLND for 476 cases in our department from January 2010 to October 2017: 200 cases using open LLND and 276 cases with laparoscopic LLND. The morbidity of internal hernia in the lateral pelvic cavity was 0.7% (2/276) in the laparoscopic group, whereas this complication did not occur in the open group. Therefore, internal hernia may be specific to laparoscopic LLND.

We searched the PubMed database using the key words “internal hernia,” “pelvis (or pelvic),” and “artery” and found six case reports of internal hernia underneath the pelvic blood vessel after pelvic LLND (Table 1)⁹⁻¹⁴. In these six reports, three cases occurred after urological surgery and three after gynecological surgery. Therefore, our cases are the first two reports of this condition after LLND for rectal cancer. In six of eight cases, including our two cases, internal hernia underneath the pelvic blood vessel occurred after

laparoscopic surgery. There is a possibility that internal hernia underneath the SVA will increase in future as the number of cases treated with laparoscopic LLND increases.

When signs and symptoms of small-bowel obstruction occur after surgery, the most common reason is adhesive ileus¹⁵. Therefore, after laparoscopic LLND, it is important to distinguish internal hernia below the SVA from adhesive ileus. Symptoms do not distinguish these two diseases because they are nonspecific, but contrast-enhanced CT is useful for this purpose. The most characteristic CT finding is the caliber change of the small bowel located at the caudal-dorsal side of the SVA, and this finding is more easily detectable in the coronal plane of CT (Figure 1, 2). Ischemic change of the small bowel is barely observed in contrast-enhanced CT because an orifice of the vesicohypogastric fascia formed after LLND is relatively wide, and seven of eight cases of internal hernia underneath the pelvic blood vessel required resection of the incarcerated small bowel (Table 1). Therefore, an emergency operation is required instead of conservative treatment. In our cases, the SVA was transected to prevent recurrence of internal hernia in case 2. This was not done in case 1 because the SVA was adhered to the obturator nerve. If organ perfusion and nerve function are not affected, transection of the SVA and opening of the

hernia orifice may be useful to prevent recurrence.

In conclusion, after systematic laparoscopic LLND, there is a risk of internal herniation of the small bowel through an orifice of the vesicohypogastric fascia below the SVA. The incidence of this complication is expected to increase as the number of cases of laparoscopic LLND increases. When this complication is suspected, it is important to distinguish it from adhesive ileus and to perform an emergency operation promptly.

Conflicts of Interest

There are no conflicts of interest.

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