

## CASE REPORT

# Laparoscopic anterior pelvic exenteration for locoregionally advanced rectal cancer directly invading the urinary bladder: A case report of low anterior resection with en bloc cystectomy for sphincter preservation

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## Keywords

Advanced rectal cancer; anterior pelvic exenteration; laparoscopic multi-visceral resection

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## Introduction

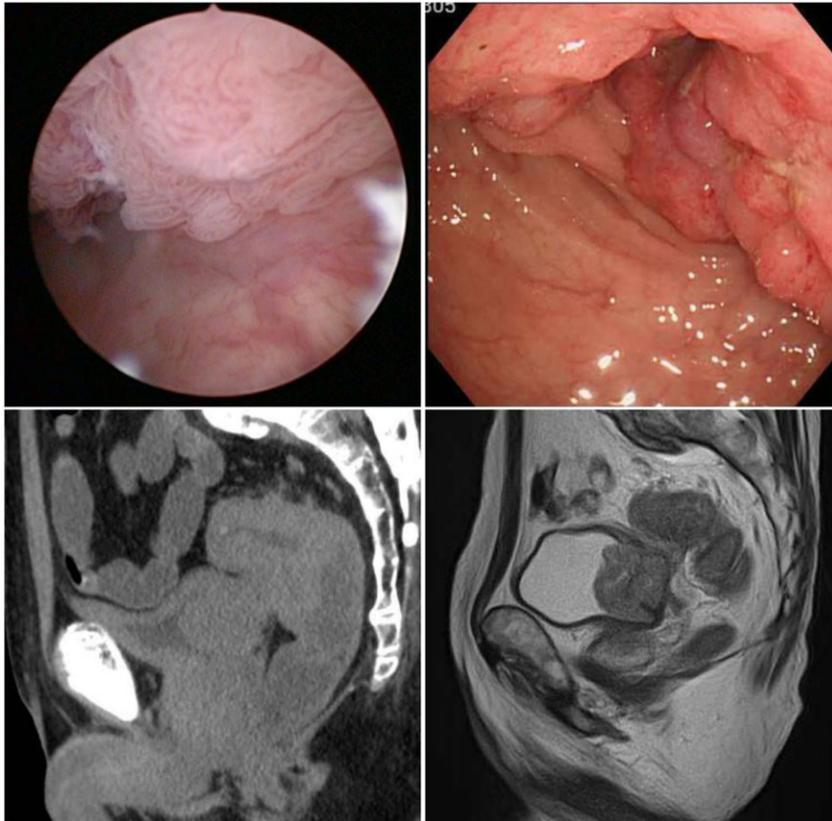
Laparoscopic surgery has been successfully adopted for colorectal surgery because of its favorable effects on short-term outcomes (1–3). However, T4 colorectal cancer is still regarded as an exclusion criterion for laparoscopy, as open conversion may be required (3). Multi-visceral resection for T4 colorectal cancer has acceptable morbidity and mortality rates and a fair long-term prognosis (4). Recent reports suggest that minimally invasive techniques for multi-visceral resection should help achieve adequate short-term outcomes and improvements in quality of life (5–7). Here, we describe our experience of complete en bloc resection by anal-preserving laparoscopic anterior pelvic exenteration in a patient with locally advanced rectosigmoid cancer with direct invasion of the urinary bladder.

## Abstract

Laparoscopic multi-visceral resection in patients with T4 colorectal cancer remains controversial. A 73-year-old man was admitted to the hospital for rectosigmoid cancer directly invading the urinary bladder trigone without distant metastasis. We successfully performed complete resection by laparoscopic anterior pelvic exenteration while preserving the anus. After laparoscopic mobilization of the rectum, urinary bladder, and prostate, the urethra and urethral catheter were dissected to reveal the lower rectum. By pulling the urethral catheter toward the head, the prostate was excised retrogradely from the lower rectum anterior wall. The lower rectum was resected and anastomosed by the double stapling technique with a safe distal margin from the tumor. Pathological findings of the resected specimen indicated no residual tumor in the surgical margin. There was no evidence of recurrence 34 months after surgery. En bloc, R0, laparoscopic anterior pelvic exenteration for T4 rectal cancer is feasible. However, further studies with long-term follow-up are required to resolve oncological outcomes.

## Case Presentation

A 73-year-old man was referred to our hospital for treatment of gross hematuria. Cystoscopy indicated that the tumor protruded into the trigone of the bladder, and a colonoscopy revealed a circumferential rectosigmoid tumor (longest diameter ~6 cm). The urinary cytological examination was class II negative. Histopathological examination revealed a well-differentiated adenocarcinoma via colonoscopic tumor biopsy, and transurethral bladder tumor resection indicated direct invasion of rectosigmoid cancer. CT and MRI revealed that the rectosigmoid cancer had directly invaded the urinary bladder and was protruding into the bladder lumen (Figure 1). There was no lymph node metastasis or distant metastasis according to fluorodeoxyglucose PET-CT. The rectosigmoid cancer was diagnosed clinically as

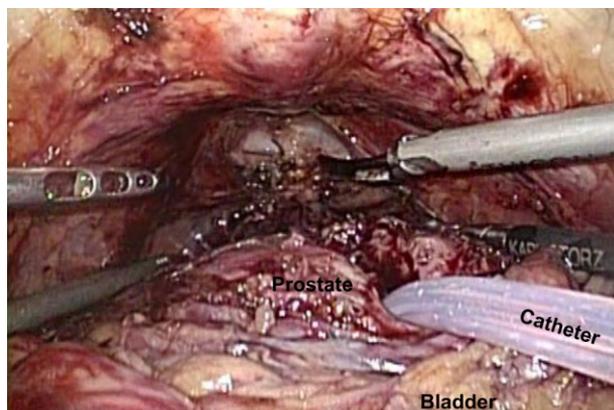


**Figure 1** Preoperative evaluation. Cystoscopy of the bladder tumor, colonoscopy, and pathological findings revealed direct invasion of the rectosigmoid cancer. Because of mild renal dysfunction, CT and MRI scans were performed without contrast enhancement. The rectosigmoid cancer displayed extramural involvement.

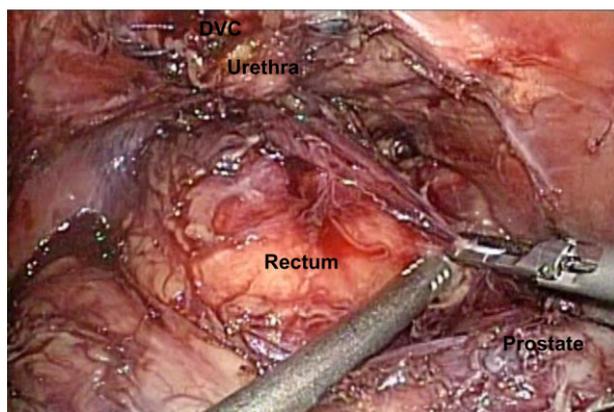
T4bN0M0, stage IIC. Thus, we planned laparoscopic low anterior resection with en bloc cystectomy to preserve the anal sphincter.

The patient was placed in a lithotomy and Trendelenburg position. The surgical procedures were multidisciplinary, and laparoscopic total cystectomy and extracorporeal ileal conduit urinary diversion were performed by urologists. With the patient under general anesthesia, and after pneumoperitoneum was achieved, a 12-mm periumbilical trocar was introduced to allow inspection of the peritoneal cavity for evidence of metastatic disease. This inspection revealed that the primary rectal tumor was directly invading the posterior bladder wall with a small amount of ascites, which were identified as class II ascites by cytology. Additional trocars were introduced as follows: two 12-mm trocars in the upper and lower right abdominal quadrants, a 5-mm trocar in the upper left quadrant, a 12-mm trocar in the lower left quadrant, and an additional 12-mm trocar at the upper border of the pubis. The inferior mesenteric artery was divided close to its origin. After the mobilization of medial-to-lateral retroperitoneal dissection of the mesocolon, posterior and lateral mesorectal excision was performed distally to the pelvic floor and sufficiently beyond the tumor.

Bilateral ureters were identified and mobilized distally to the level of the ureterovesical junction. The pelvic peritoneum was incised anteriorly through the medial umbilical ligaments and the urachus. The vas deferens was doubly clipped and incised between the clips. With combined blunt and sharp dissection, the retropubic space, also known as the space of Retzius, was opened down to the puboprostatic ligament. The endopelvic fascia was identified and incised bilaterally. The pelvic ureters were clipped and divided just proximal to the clip. The dorsal venous complex was ligated with an intracorporeal knot (0 Vicryl™; Ethicon, Somerville, USA) (8). The posterior urethra was transected, and any remaining prostatic attachments were freed. To avoid the dissemination of cancer cells, the Foley catheter was clipped and cut (Figure 2). Pulling the cut end of the catheter toward the abdominal space enabled the prostate to be dissected retrogradely from the lower rectum. Mobilizing the prostate provided an adequate length of lower rectum for anastomosis (Figure 3). Total pelvic exenteration was avoided by this procedure. We used an Endo GIA™ Ultra Universal Stapler with Tri-Staple™ Technology (45-mm purple cartridge; Covidien, Mansfield, USA) for rectal transection. Two cartridges were used intentionally for complete resection due to the



**Figure 2** Laparoscopic view. After the dissection of the bladder and prostate, the posterior urethra was transected. The Foley catheter was clipped and then cut.



**Figure 3** Laparoscopic view. Retrograde dissection of the prostate from the lower rectum involved pulling the cut end of the Foley catheter toward the abdominal space. DVC, dorsal venous complex.

narrow male pelvic space. The surgical specimen was extracted through the mini-laparotomy with an Alexis Wound Retractor (Applied Medical, Rancho Santa Margarita, USA). The sigmoid colon was transected extracorporeally, and the double stapling technique for anastomosis was performed with a circular stapler (CDH29, Proximate Curved Intraluminal Stapler; Ethicon). The urinary diversion with ileal conduit was constructed extracorporeally through the mini-laparotomy. The total estimated blood loss was 1050 mL, and the total operation time was 888 min.

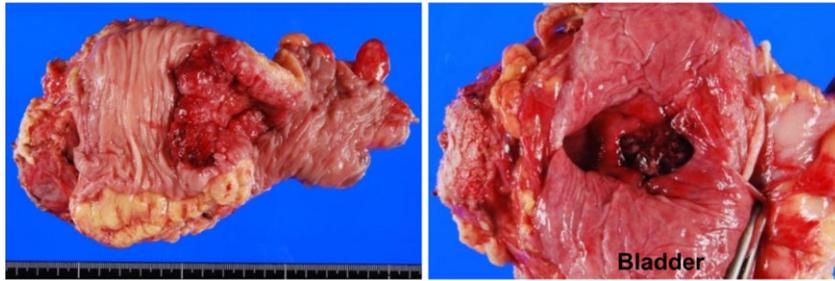
The tumor was an advanced rectosigmoid cancer 5.4 cm in diameter (Figure 4). The circumferential resection margin demonstrated no evidence of tumors microscopically. The cancer cells had directly infiltrated the wall of the urinary bladder, forming a large polypoid mass in the lumen. According to the TNM staging system, the staging was T4bN0M0, stage IIC.

## Discussion

The indications for laparoscopic surgery of colorectal cancer have recently increased dramatically, ranging from additional bowel resection for stage I colorectal cancer to curative surgery for stage II/III cancer and palliative operations for stage IV cancer (9,10). An important surgical consideration in T4 colorectal cancer is the ability to perform en bloc resection. Although the performance of multi-visceral resection for T4 colorectal cancer has not been universally accepted, extended en bloc resection may improve overall survival (11). To be considered oncologically sound, minimally invasive procedures must include complete en bloc resection.

In this report, we describe our initial case of complete en bloc resection with laparoscopic anterior exenteration of the pelvis conducted in a patient with locally advanced rectal cancer. There were two major advantages to this procedure. First, the magnified view provided by the laparoscope allowed us to recognize the exact surgical orientation in the narrow pelvic space. Second, complete en bloc resection was performed while the sphincter and an adequate length of lower rectum for rectal anastomosis were preserved. Pulling the dissected Foley catheter toward the abdominal space enabled the prostate to be dissected from the lower rectum with a safe surgical margin from the primary tumor and without injury to the dissected rectum in the narrow pelvic space. However, the oncological concern still remains because there is no evidence of the oncological safety of this maneuver. Although we clipped the Foley catheter to prevent urine spillage, it would be better to add mass ligation of the urethra and catheter before cutting a catheter (12). During the postoperative course, the patient was administered fluids because of a large amount of watery stool from the diverting ileostomy. Otherwise, the patient had an uneventful postoperative course and was discharged from the hospital 30 days after the operation. Stoma closure of the diverting ileostomy was performed 2 months after the operation. There were no signs of tumor recurrence or metastasis at the last follow-up (34 months after the surgical procedure).

Laparoscopic anterior pelvic exenteration may be a suitable modification of the classic surgical procedure in selected patient groups with locally advanced rectal cancers. The benefits of the method include better visualization and exact orientation in the small pelvic space along with other generally accepted advantages of minimally invasive procedures. However, further studies with long-term follow-up are required to resolve oncological outcomes.



**Figure 4** Resected specimen. Left, rectum; right, bladder lumen. The circumferential resection margin did not display cancer cell (R0) involvement. Rectal cancer: pT4b(bladder) N0 M0, stage IIC.

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## References

- Miyajima N, Fukunaga M, Hasegawa H *et al.* Results of a multicenter study of 1,057 cases of rectal cancer treated by laparoscopic surgery. *Surg Endosc* 2009; **23**: 113–118.
- Guillou PJ, Quirke P, Thorpe H *et al.* Short-term end points of conventional versus laparoscopic-assisted surgery in patients with colorectal cancer (MRC CLASICC trial): Multicentre, randomized controlled trial. *Lancet* 2005; **365**: 1718–1726.
- Buunen M, Veldkamp R, Hop WC *et al.* Survival after laparoscopic surgery versus open surgery for colon cancer: Long-term outcome of a randomised clinical trial. *Lancet Oncol* 2009; **10**: 44–52.
- Ishiguro S, Akasu T, Fujita S *et al.* Pelvic exenteration for clinical T4 rectal cancer: Oncologic outcome in 93 patients at a single institution over a 30-year period. *Surgery* 2009; **145**: 189–195.
- Mukai T, Akiyoshi T, Ueno M *et al.* Laparoscopic total pelvic exenteration with en bloc lateral lymph node dissection after neoadjuvant chemoradiotherapy for advanced primary rectal cancer. *Asian J Endosc Surg* 2013; **6**: 314–317.
- Nagasaki T, Akiyoshi T, Ueno M *et al.* Laparoscopic abdominosacral resection for locally advanced primary rectal cancer after treatment with mFOLFOX6 plus bevacizumab, followed by preoperative chemoradiotherapy. *Asian J Endosc Surg* 2014; **7**: 52–55.
- Kim KY, Hwang DW, Park YK *et al.* A single surgeon's experience with 54 consecutive cases of multivisceral resection for locally advanced primary colorectal cancer: Can the laparoscopic approach be performed safely? *Surg Endosc* 2012; **26**: 493–500.
- Porpiglia F, Fiori C, Grande S *et al.* Selective versus standard ligation of the deep venous complex during laparoscopic radical prostatectomy: Effects on continence, blood loss, and margin status. *Eur Urol* 2009; **55**: 1377–1383.
- Toda S & Kuroyanagi H. Laparoscopic surgery for rectal cancer: Current status and future perspective. *Asian J Endosc Surg* 2014; **7**: 2–10.
- Akagi T, Inomata M, Kitano S *et al.* Multicenter study of short- and long-term outcomes of laparoscopic palliative resection for incurable, symptomatic stage IV colorectal cancer in Japan. *J Gastrointest Surg* 2013; **17**: 776–783.
- Lehnert T, Methner M, Pollok A *et al.* Multivisceral resection for locally advanced primary colon and rectal cancer: An analysis of prognostic factors in 201 patients. *Ann Surg* 2002; **235**: 217–225.
- Chan KG, Guru K, Wiklund P *et al.* Robot-assisted radical cystectomy and urinary diversion: Technical recommendations from the Pasadena Consensus Panel. *Eur Urol* 2015; **67**: 423–431.