

## Case Series

# Combined laparoscopic and robotic surgery for synchronous colorectal and genitourinary cancer: A case series



Toru Imagami<sup>a,\*</sup>, Satoru Takayama<sup>a</sup>, Taku Hattori<sup>a</sup>, Ryohei Matsui<sup>a</sup>, Masaki Sakamoto<sup>a</sup>, Hisanori Kani<sup>a</sup>, Satoshi Kurokawa<sup>b</sup>, Tsuyoshi Fujiwara<sup>b</sup>

<sup>a</sup> Department of Surgery, Nagoya Tokushukai General Hospital, Kasugai City, Japan

<sup>b</sup> Department of Urology, Nagoya Tokushukai General Hospital, Kasugai City, Japan

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## ABSTRACT

**INTRODUCTION:** Advances in diagnostic techniques and treatment have resulted in an increase in patients with synchronous cancer. Surgical reports of combined laparoscopic and robotic resection for synchronous colorectal and genitourinary cancer are rare.

**MATERIALS AND METHODS:** Between August 2015 and November 2017, three patients underwent combined laparoscopic and robotic surgery for synchronous colorectal and genitourinary cancer in our hospital.

**RESULTS:** Case 1 was a 59-year-old man with synchronous rectal and prostate cancer treated by combined laparoscopic anterior resection and robotic-assisted prostatectomy. Case 2 was a 77-year-old man with synchronous cancer of transverse colon and left kidney treated by combined laparoscopic transverse colectomy and robotic-assisted partial nephrectomy. Case 3 was a 74-year-old man with synchronous adenocarcinoma of descending colon and prostate treated by combined laparoscopic left hemicolectomy and robotic-assisted prostatectomy.

**DISCUSSION:** In simultaneous endoscopic surgery, it is necessary to consider sequence of resection, intraoperative position of patient and port arrangement. Simultaneous surgery allows promptly for postoperative adjuvant chemotherapy.

**CONCLUSION:** Combined laparoscopic and robotic surgery for synchronous colorectal and genitourinary cancer is suitable for advanced cancer cases requiring multidisciplinary treatment.

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## 1. Introduction

Recently, advances in diagnostic techniques have resulted in an increase in synchronous cancer patients. However, surgical reports of combined laparoscopic and robotic resection for synchronous colorectal and genitourinary cancer are rare [1,2]. We performed combined laparoscopic and robotic surgery in three such patients. The procedures and clinical experience are described below with review of selected literature.

## 2. Materials and methods

Between August 2015 and November 2017, three patients underwent combined laparoscopic and robotic surgery for synchronous colorectal and genitourinary cancer in our hospital. This report is retrospective case series. This work has been reported in line with the PROCESS criteria [3].

## 3. Results

### 3.1. Case 1

A 59-year-old man was referred for evaluation of positive fecal occult blood test and elevated prostate-specific antigen (PSA). His past medical history were hypertrophic cardiomyopathy and three surgeries for ascending colon diverticulitis. Colonoscopy found rectal adenocarcinoma (Fig. 2a), with evidence of lymph

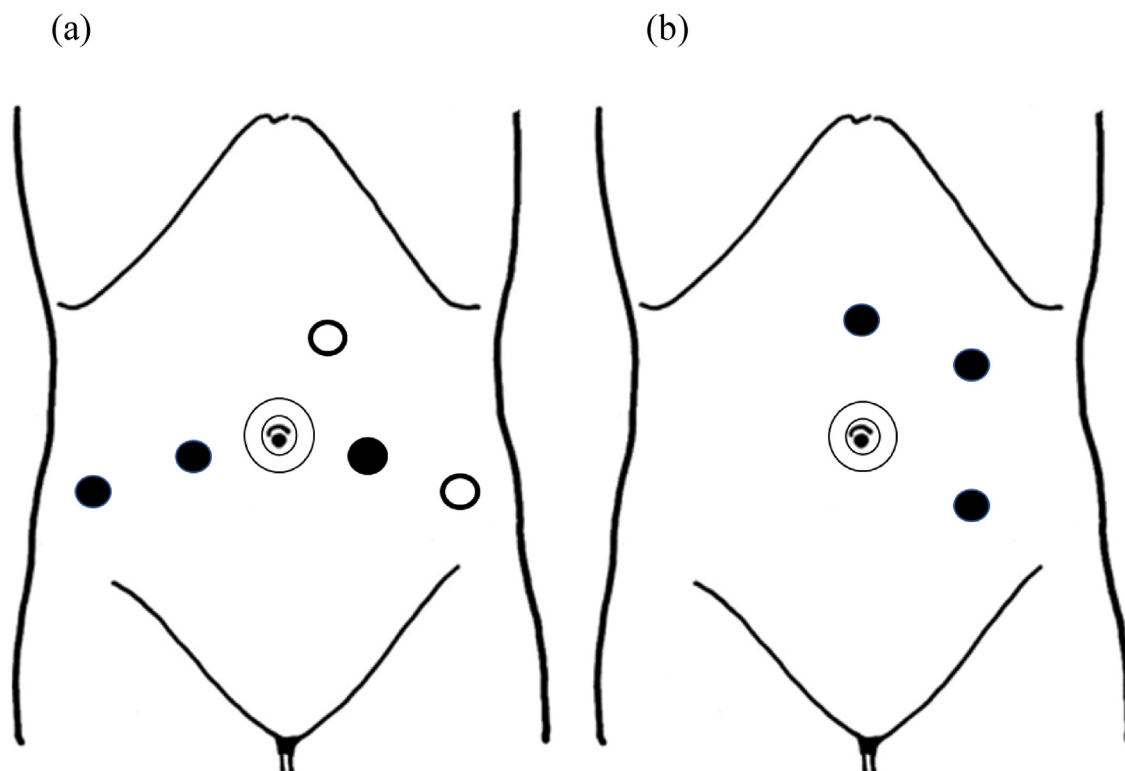
**Abbreviations:** PSA, prostate-specific antigen; CT, computed tomography; MRI, magnetic resonance imaging; RARP, robotic-assisted radical prostatectomy; TAE, transarterial embolization.

\* Corresponding author at: Department of Surgery, Nagoya Tokushukai General Hospital, 2-52 Kouzouji-cho kita, Kasugai City, Aichi, 487-0016, Japan.

E-mail address: [i-toru@nagoya.tokushukai.or.jp](mailto:i-toru@nagoya.tokushukai.or.jp) (T. Imagami).

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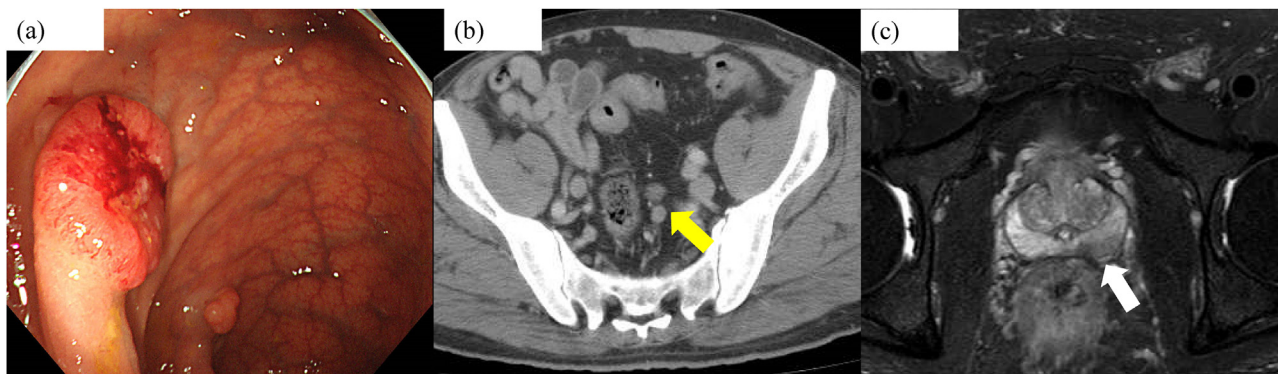


**Fig. 1.** Port arrangement in each operation (◎: 12 mm trocar, ●: 8 mm trocar, ○: 5 mm trocar) (a) Case 1 (b) and case 3. (b) Case 2.

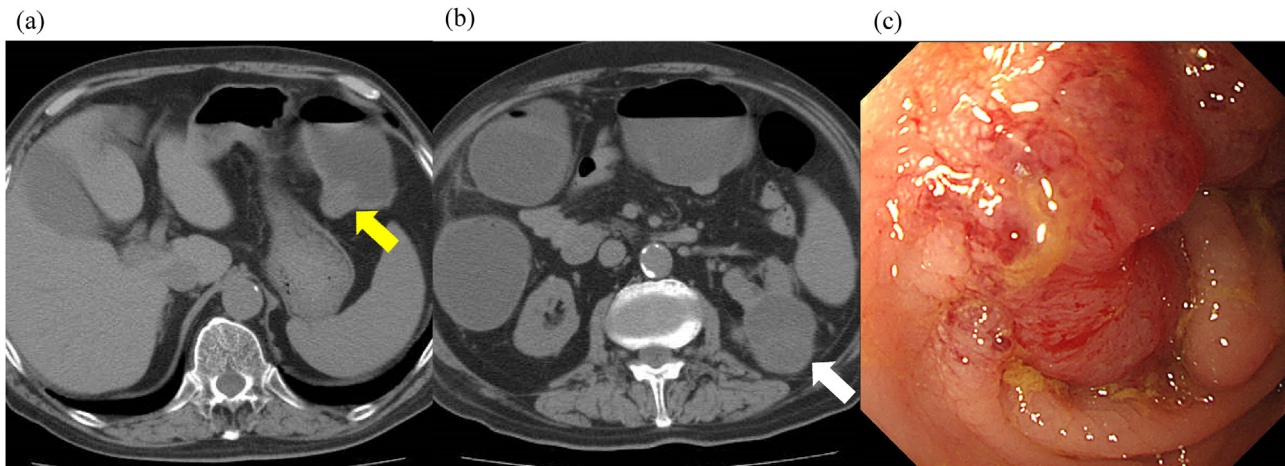
node metastasis on computed tomography (CT, Fig. 2b). Magnetic resonance imaging (MRI) and biopsy revealed prostatic adenocarcinoma (Fig. 2c). We decided to perform simultaneous endoscopic surgical resection. Under general anesthesia, the urologists performed robotic-assisted radical prostatectomy (RARP) with the patient in the lithotomy position (Fig. 1a). It took a long time to separate intra-abdominal adhesions resulting from previous surgery. After resection of the prostate and urethrovesical anastomosis, the surgeons performed a laparoscopic low anterior resection using the same port site. A diverting stoma of the ileum was constructed because the anastomosis was near the anal wedge. The procedure time was 676 min. The pathological diagnoses were rectal adenocarcinoma, stage T3N2M0 and prostate adenocarcinoma, stage T2cN0M0. The patient was diagnosed with recurrences in para-aortic and mediastinal lymph nodes 6 months after surgery. Chemotherapy is ongoing, with stable disease 32 months after surgery.

### 3.2. Case 2

A 77-year-old man was referred to the outpatient department because of diarrhea, nausea, and abdominal pain. Abdominal CT revealed obstruction of the left transverse colon (Fig. 3a), cancer of the left kidney (Fig. 3b), and a splenic aneurysm. Colonoscopy confirmed a constricting tumor of the transverse colon (Fig. 3c) pathologically diagnosed as adenocarcinoma. Endoscopic decompression was performed with a self-expanding metal stent, and transarterial embolization of the splenic aneurysm was done to prevent perioperative rupture. Combined laparoscopic transverse colectomy and robotic-assisted partial nephrectomy were performed. Under general anesthesia, the patient was placed in the right, lateral decubitus position with the port placement as shown in Fig. 1b. The surgeons mobilized the colon, the tail of the pancreas, and the spleen. After mobilization, the urologists performed robot-assisted partial nephrectomy. After rotating the table to bring the



**Fig. 2.** The examination of imaging before the operation in case 1. (a) Colonoscopy showed rectal cancer. (b) CT suggested lymph node metastasis (yellow arrow). (c) MRI showed prostate cancer on the left lobe (white arrow).



**Fig. 3.** Abdominal CT and endoscopic findings in case 2.  
 (a) Abdominal CT in outpatient show obstruction of left side transvers colon (yellow arrow).  
 (b) Left kidney mass was incidentally found, suggested renal cell carcinoma (white arrow).  
 (c) Colonoscopy showed tumor obstruction.

patient position to 45°, the surgeons performed a transverse colectomy with lymph node dissection without inserting an additional port. The operating time was 510 min, the blood loss was 50 mL, and the pathological diagnoses were adenocarcinoma of the transverse colon, stage T3N0M0 and renal cell carcinoma of the left kidney, stage T3aN0M0. The patient remains cancer free with no evidence of recurrence 12 months after surgery.

### 3.3. Case 3

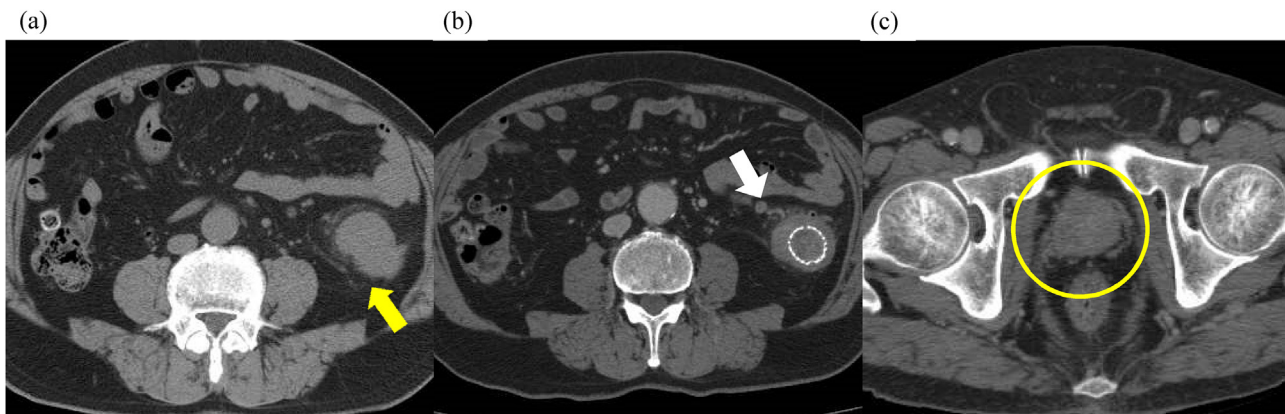
A 74-year-old man was referred for evaluation of elevated PSA, and a prostate biopsy revealed adenocarcinoma of the prostate. Endocrine therapy was started, and surgery was scheduled, but a preoperative abdominal CT was suspected tumor of the descending colon (Fig. 4a). A colonoscopy revealed cancer constricting the descending colon, which was decompressed by endoscopic placement of a self-expanding metal stent. The diagnosis was synchronous adenocarcinoma of the descending colon and the prostate, both of which were advanced (Fig. 4b, 4c). The patient was treated by combined laparoscopic left hemicolectomy and RARP. Under general anesthesia, the urologists started the RARP with the patient in the lithotomy position and using six ports, the same arrangement as shown in Fig. 1a. After resection of the prostate and

urethrovessical anastomosis, the surgeons performed laparoscopic left hemicolectomy while maintaining the same port placement. The operating time was 547 min with a blood loss of 50 mL. The pathological diagnoses were adenocarcinoma of the descending colon, stage T3N1M0 and adenocarcinoma of the prostate, stage T4N1M0. The patient remains cancer free with no evidence of recurrence 6 months after surgery.

### 4. Discussion

Aydiner et al. estimated that 1% of patients with carcinoma had multiple primary malignancies, 4% of which were synchronous colorectal and renal carcinomas and about 1% were synchronous colorectal and prostate carcinomas [4,5]. Halak et al recommended routine use of preoperative imaging studies to exclude synchronous asymptomatic renal lesions in patients with colorectal cancer [6–8].

Simultaneous laparoscopic resection of coexisting lesions has been shown to be feasible [9,10], and the benefits of which have been previously described [11–13]. There are few cases of simultaneous endoscopic surgery for colorectal cancer and genitourinary cancer, therefore surgical procedures have not been well described. In simultaneous endoscopic surgery, it is necessary to consider sequence of resection, intraoperative position of patient and port



**Fig. 4.** Abdominal CT findings in case 4.  
 (a) Preoperative abdominal CT showed peripheral wall irregularities of the descending colon (yellow arrow).  
 (b) After colonic stent placement, enhanced CT showed metastatic lymph node (white arrow).  
 (c) Wall irregularities and rearward protrusion of prostate in enhanced CT (yellow circle).

arrangement [2,14]. In case 1, RARP was performed before rectal resection because the ureter was easily seen on the inner approach and dissection of the ventral aspect of the rectum was not necessary. In case 3, the ureter was dissected during the RARP, making it easier to see the ureter on the inner approach. In cases involving simultaneous prostatectomy and left hemicolectomy or rectal surgery, it may be better to perform the prostatectomy first. In case 2, mobilization of the left side of the colon and spleen were required for performing the left nephrectomy using an intraperitoneal approach. In our hospital, nephrectomy is often performed by the retroperitoneal approach. Therefore, the surgeons were more comfortable with mobilization of the left side of the colon and spleen than the urologists were. For that reason, the surgeons started the operation and the urologists performed the nephrectomy after mobilization. Lymph node dissection and colectomy were performed after nephrectomy. To maintain physical relationships and ensure good healing of the anastomotic site, reconstruction was performed as the last step. The position of case 2 during surgery was different from that of the other patients. In that patient, a lateral decubitus position was required for nephrectomy; therefore, the colectomy was performed with the patient in a semilateral position achieved by rotating the operation table. The difference in position had no influence on surgical procedure.

As the port arrangements used in separate procedures may differ, additional port insertion may be required for simultaneous surgery. However, in these patients, colorectal surgery was successfully performed with a port arrangement generally used in urogenital surgery, which resulted in use of the minimum number of ports. The port arrangement for urogenital rather than colorectal surgery was used because robotic surgery is more restricted in port arrangement than laparoscopic surgery. Previous studies stress the importance of planning port placement to share trocars and to avoid the use of unnecessary trocars [2,11]. Reducing the number of ports results in minimally invasive surgery, and previous reports of simultaneous surgery for colorectal and genitourinary cancer have noted the insertion of additional ports. However, our experience is that sharing ports in simultaneous endoscopic surgery for synchronous colorectal and urogenital cancer is possible.

Benefits of simultaneous surgery include decreased hospital stay, less postoperative pain and morbidity, early return to work [15]. Performing a second surgery for synchronous cancers prevents the initiation of adjuvant chemotherapy until both procedures are completed. In contrast, simultaneous surgery allows promptly for postoperative adjuvant chemotherapy. For this reason, synchronous advanced cancer cases that require multidisciplinary treatment may be indicated for simultaneous endoscopic surgery. This report is small case series, therefore further large research such as randomized control study should be required to evaluate the combined laparoscopic and robotic surgery for synchronous colorectal and genitourinary cancer.

## 5. Conclusion

Combined laparoscopic and robotic surgery for synchronous colorectal and genitourinary cancer allowed prompt initiation of adjuvant chemotherapy. Our experience supports simultaneous endoscopic surgery for advanced cancer cases requiring multidisciplinary treatment. Further research such as randomized control study should be required.

## Conflict of interest

The authors have no conflict of interest to declare.

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## Ethical approval

This report was approved by the ethics committee in Nagoya Tokushukai General Hospital (Institutional Review Board approval 2018-07-002).

## Consent

Consent was obtained from patients for publication.

## Author contribution

TI, ST and SK performed operation. TI drafted the manuscript. ST and SK participated in the correction of the manuscript. All authors read and approved the final manuscript.

## Registration of research studies

This research registry UIN is 4269.

## Guarantor

Toru Imagami.

## Provenance and peer review

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