CASE REPORT JSLS

Simultaneous Laparoscopy-Assisted Resection for Rectal and Gastric Cancer

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ABSTRACT

Laparoscopy-assisted surgery for either rectal or gastric cancer has been increasingly performed. However, simultaneous laparoscopy-assisted resection for synchronous rectal and gastric cancer is rarely reported in the literature. In our study, 3 cases of patients who received simultaneous laparoscopy-assisted resection for synchronous rectal and gastric cancer were recorded. The results showed that all 3 patients recovered well, with only 253 minutes of mean operation time, 57 mL of intraoperative blood loss, 5 cm of assisted operation incision, 4 days to resume oral intake, 12 days' postoperative hospital stay, and no complication or mortality. No recurrence or metastasis was found within the follow-up period of 22 months. When performed by surgeons with plentiful experience in laparoscopic technology, simultaneous laparoscopy-assisted resection for synchronous rectal and gastric cancer is safe and feasible, with the benefits of minimal trauma, fast recovery, and better cosmetic results, compared with open surgery.

Key Words: Laparoscopy, Rectal cancer, Gastric cancer, Synchronous cancer.

INTRODUCTION

The occurrence of synchronous cancer is a life-threatening condition and remains an issue of great interest and challenge to surgeons. Although the coexistence of synchronous gastric and rectal cancer is rare, it has been reported that the frequency of synchronous rectal and gastric cancer ranges between 1.3% and 3.9%.[1,2] Surgical resection is unequivocally essential for synchronous rectal and gastric cancer. A wide incision is required for conventional open surgery in case of these diseases, which results in a poor cosmetic outcome and an impaired quality of postoperative life. In addition, long surgical time and severe trauma may result in postoperative complications and a delayed recovery. Laparoscopy-assisted resection for either rectal or gastric cancer is performed worldwide, and its advantages over conventional open surgery have been demonstrated.[3–5] However, simultaneous laparoscopy-assisted resection for synchronous rectal and gastric cancer is rarely reported. In the present study, we present 3 cases of synchronous rectal and gastric cancer, which were resected at the same laparoscopic surgery, and we discuss its feasibility and advantages.

CASE REPORTS

Clinical Data

Case 1. A 78-year-old woman was admitted to our hospital in March 2010 with complaints of altering bowel habits for 1-month duration. Her past medical history included hypertension, type 2 diabetes mellitus, multiple cerebral infarction, and lung infection. Digital rectal examination revealed a palpable, tough, and mobile mass 6 cm from the anal verge. Serum CA19-9 level was 76 U/mL, and the Carcinoembryonie Antigen (CEA) level was normal. Colonoscopy demonstrated a circumferential mass 5 cm away from the anal verge, and biopsy findings showed a moderately differentiated rectal adenocarcinoma **(Figure 1)**. Computed tomography scan of the abdomen revealed rectal cancer invading the serosa layer with enlargement of surrounding lymph nodes, and an unexpected duodenal diverticulum **(Figure 2)**. To confirm the character of the duodenal diverticulum, gastros-

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copy was performed, which showed no abnormalities in the duodenum but revealed an ulcerative lesion located in the body of the stomach, and biopsy confirmed the gastric lesion to be poorly differentiated gastric adenocarcinoma **(Figure 3)**. Furthermore, endoscopic ultrasonography indicated that the tumor in the stomach had invaded the serosa layer, with no obvious lymph node enlargement. A chest radiograph and radionuclide bone scan were performed to exclude distal metastasis. The preoperative staging of gastric cancer was $T_3N_0M_0$, stage IIA, and of rectal cancer it was $T_4N_{0\sim1M0}$, stage IIB∼IIIB **(Table 1)**.

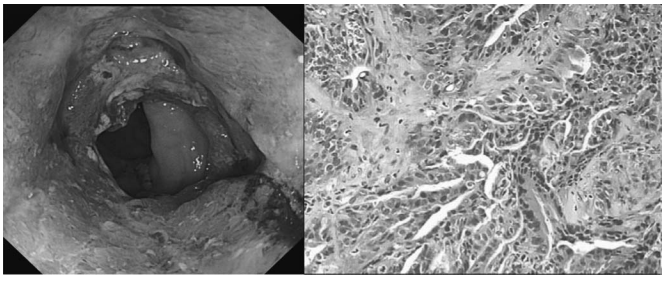

Figure 1. Rectal cancer diagnosed by colonoscopy and biopsy.

Case 2. A 75-year-old female patient was admitted to our hospital in April 2010 because of intermittent left lower abdominal pain for 1 year, which had been aggravated for 2 weeks. Her past medical history was positive for hypertension, hyperlipidemia, and cerebral infarction. No abnormality was detected on her physical examination. Colonoscopy revealed a circumferential mass 12 cm from the anal verge, and biopsy results showed moderately differentiated rectal adenocarcinoma. A computed tomography scan of the abdomen demonstrated rectal cancer as well as thickening of the gastric antrum, with no lymph node enlargement around the rectum or stomach. Gastroscopy was performed to identify the lesion of the gastric antrum, and the biopsy results showed moderately to poorly differentiated gastric adenocarcinoma. Chest radiography and a radionuclide bone scan were performed to exclude distal metastasis of either rectal or gastric cancer. The preoperative staging of gastric cancer was $T_3N_0M_0$, stage IIA, and of rectal cancer was $T_3N_0M_0$, stage IIA.

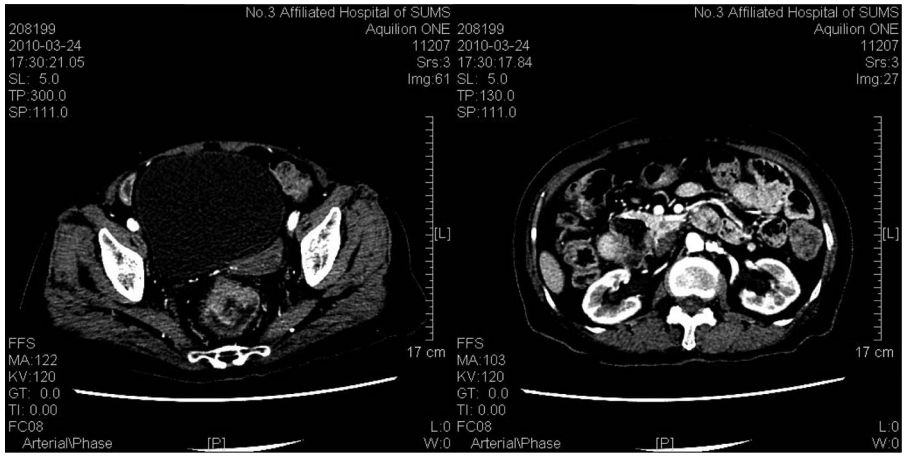

Figure 2. Rectal cancer and duodenal diverticulum presented by computed tomography scan.

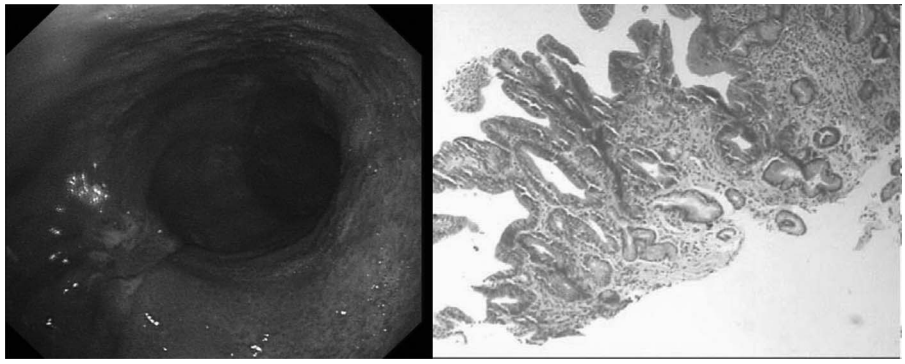

Figure 3. Gastric cancer diagnosed by gastroscopy and biopsy.

Table 1.
Preoperative Clinical Data of the 3 Patients

Case	Sex	Age (y)	BMI	Accompanied Medical Illnesses	Location of Gastric Cancer	Location of Rectal Cancer
1	Female	78	18.5	Hypertension, type 2 diabetes, cerebral infarction, medium anemia, lung infection	Corpus ventriculi	Lower rectum
2	Female	75	25.6	Hypertension, cerebral infarction, hyperlipidemia	Gastric antrum	Upper rectum
3	Female	55	22.1	Hyperlipidemia	Gastric antrum	Upper rectum

BMI, body mass index.

Case 3. A 55-year-old female patient was admitted to our hospital in December 2012 because of upper abdominal pain with bloody stool for 6 months. No abnormality was detected on physical examination. Colonoscopy revealed a circumferential mass 11 cm from the anal verge, and biopsy results showed moderately differentiated rectal adenocarcinoma. Gastroscopy revealed a lesion of the gastric antrum, and the biopsy results showed moderately to poorly differentiated gastric adenocarcinoma. Computed tomography scan of the abdomen demonstrated rectal cancer invading the serosa layer, with lymph node enlargement around the rectum, as well as gastric cancer invading the mucous layer, with no lymph node enlargement around the stomach. Chest radiography and a radionuclide bone scan were performed to exclude distal metastasis of either rectal or gastric cancer. The preoperative staging of gastric cancer was $T_{1\text{-}2}N_0M_0$, stage IA–IB, and of rectal cancer was $T_4N_{0\text{-}1M0}$, stage IIB–IIIB.

Preoperative Preparations

All 3 patients were diagnosed as having synchronous rectal and distal gastric cancer. Various treatment strategies were discussed, and simultaneous laparoscopy-assisted low anterior resection for rectal cancer and laparoscopy-assisted distal gastrectomy with D2 lymphadenectomy were chosen. Sufficient preoperative evaluations were performed because of age and complicated past medical history in all patients. Relevant diagnostic examinations including Holter monitoring, echocardiography, pulmonary function tests, and brain magnetic resonance imaging scans were performed, and subspecialties including anesthesia, surgical intensive care unit, cardiology, endocrinology, and neurology were consulted. Informed consent was given for simultaneous laparoscopy-assisted resection for synchronous rectal and gastric cancer.

Surgical Procedures

Details of the surgical procedures for the 3 patients were similar. The operations were performed under general anesthesia. A Veress needle was used to establish a pneumoperitoneum, and the intra-abdominal pressure was maintained at a level of 15 mm Hg. A 10-mm trocar was placed just below the umbilicus for a 30-degree videoscope, and another 3 trocars were placed for manipulation at McBurney point, left and right lateral side of the rectus abdominis at the level of umbilicus, respectively.

The patients were first placed in the lithotomy position to finish the low anterior resection. The sigmoid mesocolon and mesorectum were dissected along the inner side of the ureter by harmonic scalpel. The vessels and lymphatics were ligated at the root of the inferior mesenteric vessel with polymer clips **(Figure 4)**, whereas the distal rectum was transected intracorporeally with a 60-mm laparoscopic linear stapler **(Figure 5)**. After that, the first part of the operation was completed.

Then the patients were placed in the Trendelenburg position and another trocar was placed at the crossing point of the left costal margin and the anterior axillary line to complete the lymph node dissection and distal gastrectomy. First, the greater omentum, together with the frontal layer of the transverse mesocolon and the pancreatic capsule, were dissected from the splenic flexure to the hepatic flexure **(Figure 6)**. The right gastroepiploic vessels were ligated and the No. 6 lymph nodes were dissected simultaneously. Then the hepatoduodenal ligament and the No. 12 lymph nodes were dissected. Afterward, the right gastric artery, common hepatic artery, and left gastric artery were ligated gradually, together with the

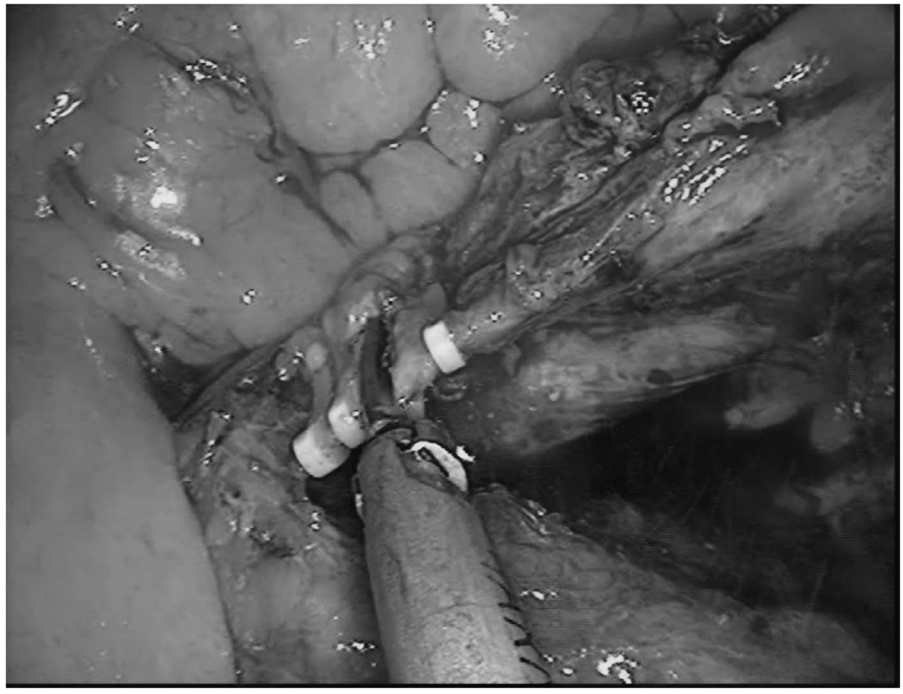

Figure 4. Ligation of the inferior mesenteric vessel.

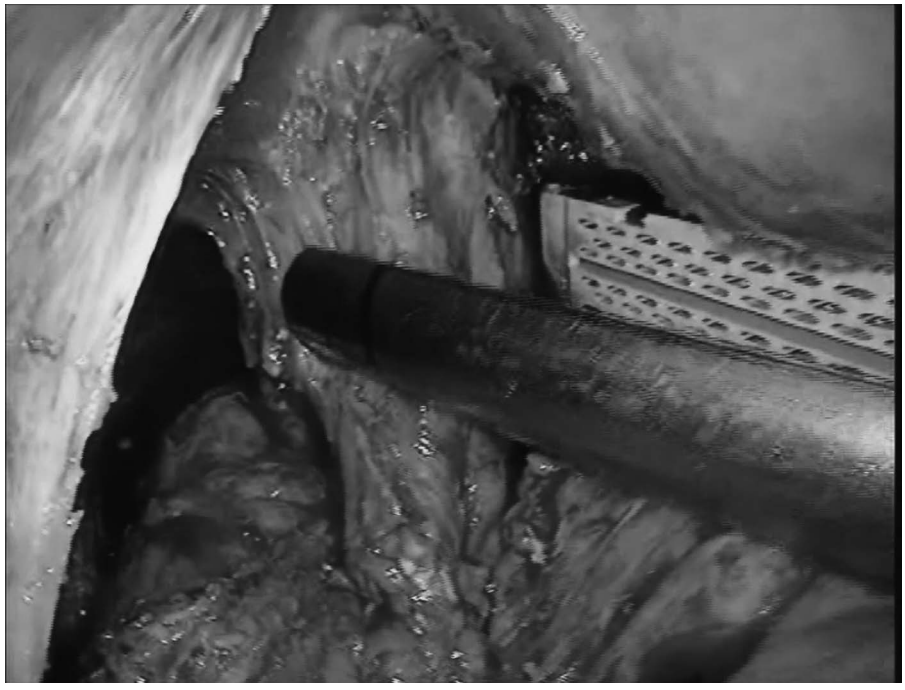

Figure 5. Transection of the distal rectum intracorporeally.

dissection of the No. 5, No. 8, and No. 7 lymph nodes, respectively **(Figure 7)**. After the dissection of the No. 1 lymph nodes, the stomach was totally mobilized with an adequate perigastric lymphadenectomy. The distal stomach and the first portion of the duodenum were also transected intracorporeally with a 60-mm laparoscopic linear stapler **(Figure 8)**. After that, the second part of the operation was completed.

Figure 6. Dissection of the greater omentum.

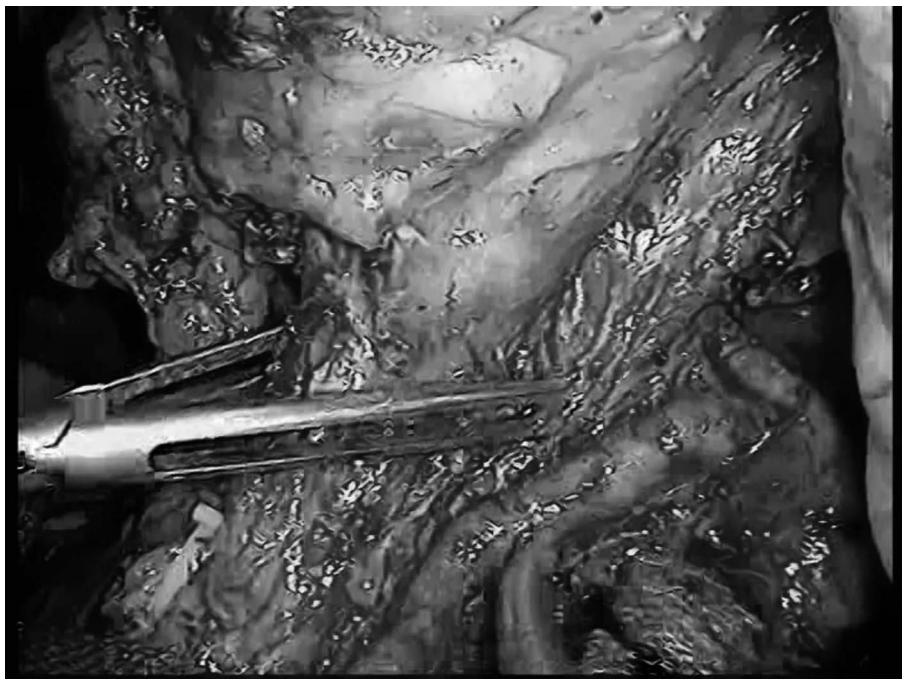

Figure 7. Lymph node dissection of gastric cancer.

The final part of the operation was to finish the digestive reconstruction and complete the sigmoidorectostomy. A 5-cm median epigastric incision was made to remove the proximal rectum, the distal stomach, and the surrounding tissues of the rectum and stomach. A Billroth II reconstruction with a 25-mm intraluminal stapler was completed extracorporeally for gastric cancer. Correspondingly, the sigmoidorectostomy was completed with a 29-mm intralu-

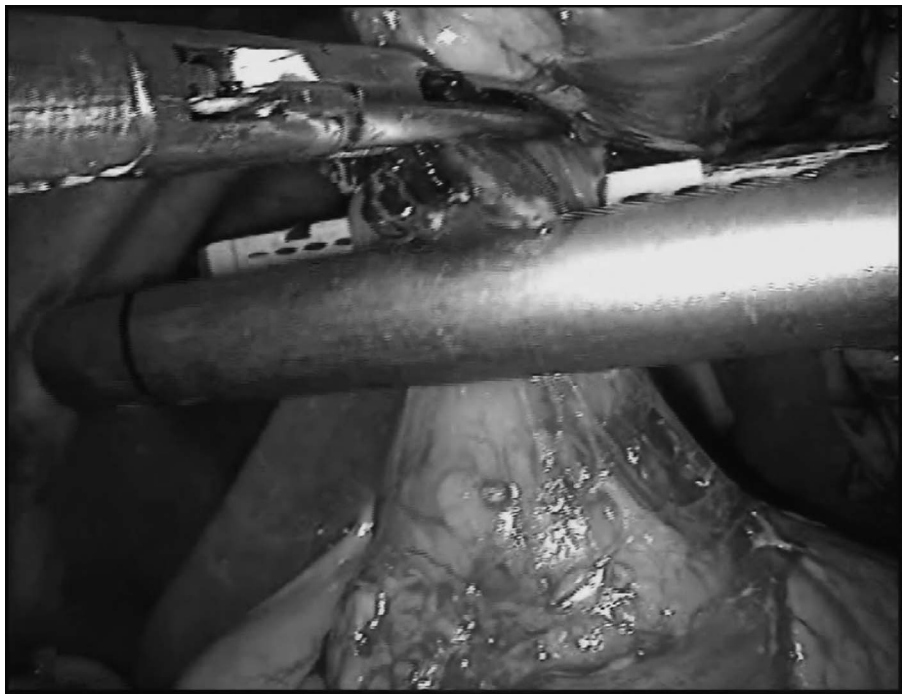

Figure 8. Transection of the distal stomach and the first portion of the duodenum intracorporeally.

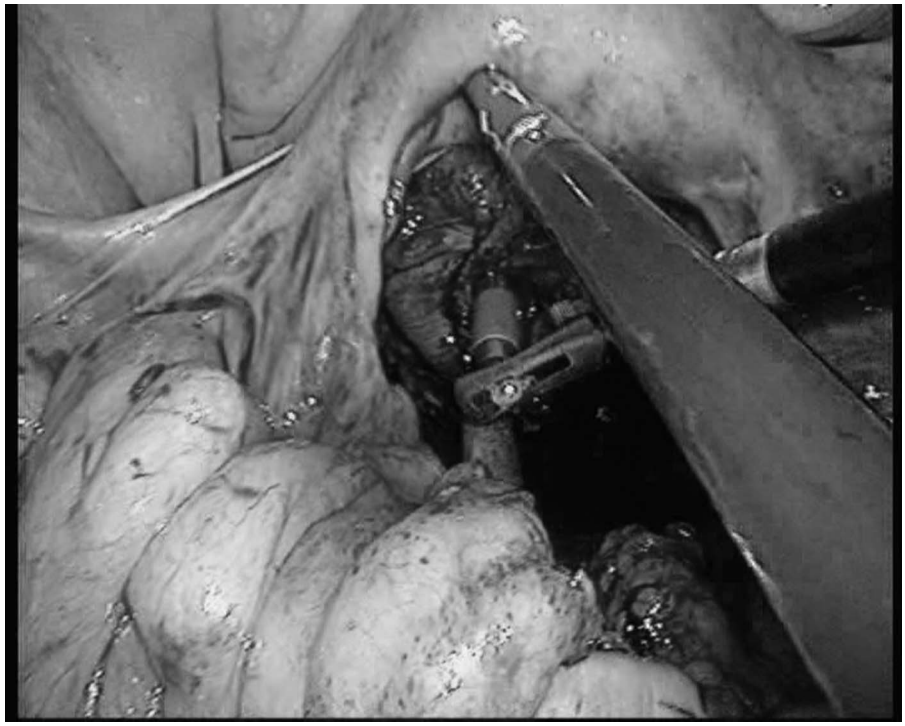

Figure 9. Anastomosis of rectal cancer intracorporeally.

Table 2.
Perioperative and Postoperative Data of the 3 Patients

Case	Surgical Method	Assisted Incision (cm)	Operation Time (min)	Intraoperative Bleeding (mL)	Time to Remove Drainage Tubes (days)	Time to Resume Oral Intake (day)	Postoperative Hospital Stay (day)	Complication
1	LALAR + LADG	5	260	60	4	4	13	None
2	LALAR + LADG	5	255	80	4	5	14	None
3	LALAR + LADG	5	245	30	3	3	10	None

LALAR = laparoscopy-assisted low anterior resection; LADG = laparoscopy-assisted distal gastrectomy.

Figure 10. A short operation incision and good cosmetic results of the surgery.

minal stapler intracorporeally **(Figure 9)**. Finally, two drainage tubes were placed below the liver and in the pelvic cavity, respectively.

RESULTS

The surgical procedures of 3 patients were performed without any intraoperative complication. Mean operation time was 253 minutes, and intraoperative blood loss was 57 mL. The patients recovered well and resumed an oral diet in 4 days. The average postoperative hospital stay was 12 days. Meanwhile, postoperatively complication or mortality did not occur **(Table 2)**. A 5-cm assisted incision led to a better cosmetic result and improved postoperative quality of life for patients **(Figure 10)**.

The pathologic examination of case 1 showed moderately to poorly differentiated gastric adenocarcinoma invading the serosa layer with no lymph node metastasis and poorly differentiated rectal adenocarcinoma invading the muscular layer, with no lymph node metastasis. In contrast, the pathologic result of case 2 showed moderately to poorly differentiated gastric adenocarcinoma invading the serosa layer, with 2 of the 20 lymph nodes' metastasis and moderately differentiated rectal adenocarcinoma invading the muscular layer with no lymph node metastasis. In addition, the pathologic result of case 3 showed moderately to poorly differentiated gastric adenocarcinoma invading the submucosa layer with no lymph node metastasis and moderately differentiated rectal adenocarcinoma invading the serosa layer with 1 of the 24 lymph node metastases **(Figure 11)**.

On the basis of their pathologic reports, all 3 patients were recommended for adjuvant chemotherapy, but only the last patient (case 3) accepted a XELOX regimen of adjuvant chemotherapy, and the other two patients declined chemotherapy because of their fear of the side effects of chemotherapeutic agents. However, all 3 cases complied with regular follow-up and, fortunately, postoperative surveillance, including serum tumor markers, chest radiographs, abdomen computed tomography scan, and endoscopy, revealed no recurrence or metastasis in all patients **(Table 3)**.

DISCUSSION

The incidence of multiple primary cancers (MPC), especially synchronous MPC, is rare, ranging between 0.5% and 3% in China, which is much lower than that in other countries and may be related to the difference in diagnostic level.[6] In our study, the first two patients were admitted to the hospital for rectal cancer, but they did not present with specific symptoms of gastric cancer, which was diagnosed incidentally by computed tomography scan of the abdomen for exclusion of abdominal metastasis of

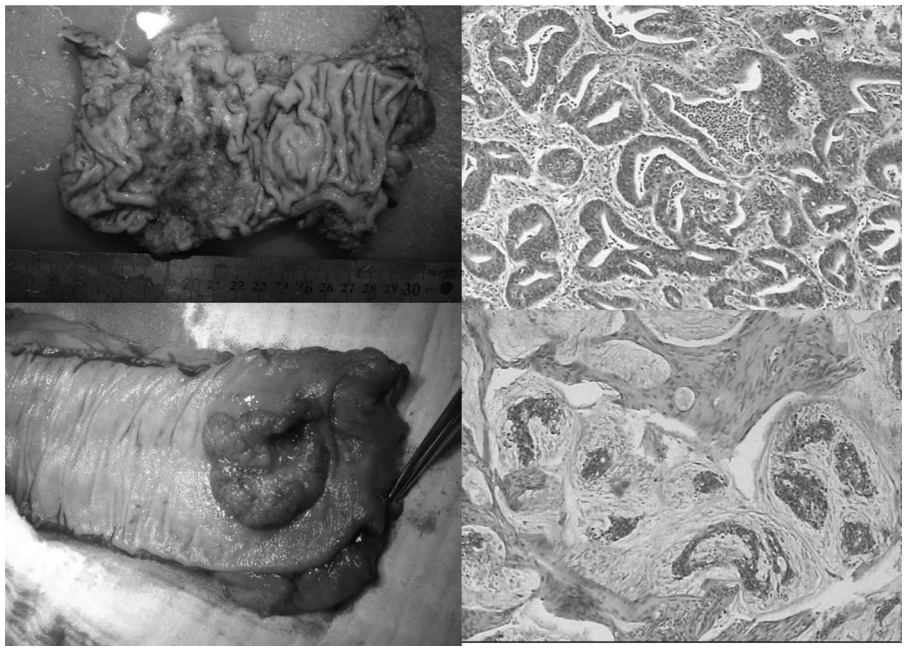

Figure 11. Gross specimens and microscopic results of gastric cancer and rectal cancer (Case 1).

Table 3.
Oncologic Outcomes of the 3 Patients

Case	Cancer	Pathologic Type	Tumor Invading	Margin of Specimen	Lymph Node	Metastasis	TNM Staging	Prognosis
1	Gastric cancer	Moderately poor differentiated adenocarcinoma	Serosa layer	Negative	0/16	None	T3N0M0, stage IIA	Survivable (33 mo later)
	Rectal cancer	Poor differentiated adenocarcinoma	Muscular layer	Negative	0/16	None	T2N0M0, stage I	
2	Gastric cancer	Moderately poor differentiated adenocarcinoma	Serosa layer	Negative	2/20	None	T3N1M0, stage IIB	Survivable (32 mo later)
	Rectal cancer	Moderately differentiated adenocarcinoma	Muscular layer	Negative	0/16	None	T2N0M0, stage I	
3	Gastric cancer	Moderately poor differentiated adenocarcinoma	Submucosa layer	Negative	0/25	None	T1bN0M0, stage IA	Survivable (1 mo later)
	Rectal cancer	Moderately differentiated adenocarcinoma	Serosa layer	Negative	1/24	None	T4aN1M0, stage IIIB	

"primary tumor" rectal cancer. Therefore, complete laboratory examinations and imaging studies such as computed tomography scan of the abdomen, endoscopy, and tumor markers should be arranged to prevent other tumors from being missed. Thus, it emphasizes the importance of a thorough investigation and exploration before carrying out elective surgery.

As a main treatment for digestive synchronous MPC, simultaneous surgical resection indicates more difficulties and higher operation risk than surgical resection for single tumor. Today, laparoscopy-assisted surgery has been performed worldwide and laparoscopy-assisted colorectal surgery has even been advocated as the standard treatment for colorectal cancer because of less trauma and faster recovery, with similar oncologic outcome.[7,8] However, simultaneous laparoscopy-assisted resection for digestive synchronous MPC is rarely reported in the literature. One case report of esophageal cancer with a sigmoid

colon tumor treated by laparoscopic surgery and another case of a laparoscopic resection of sporadic synchronous gastric and jejunal gastrointestinal stromal tumors indicated that laparoscopy-assisted resection for digestive synchronous MPC is feasible and safe.[9,10] Ten cases of simultaneous laparoscopy-assisted resection for synchronous rectal and gastric cancers have been reported by 3 surgeons, and the results showed a fast recovery, low incidence of complication, and a good cosmetic result.[11–13] In the present study, various treatment strategies were discussed for these 3 patients and finally surgical resection was arranged, although the operation was challenging because of the advanced ages and multiple medical diseases of these patients.

A conventional open resection for synchronous rectal and gastric cancer required a wide incision from the xiphoid to the pubic symphysis, which may lead to a poor cosmetic result and impaired quality of postoperative life. Meanwhile, a long operation time and severe trauma may result in postoperative complications and a delayed recovery. Our surgeons have performed numerous laparoscopy-assisted surgeries and are experienced in laparoscopic technology, so we performed simultaneous laparoscopy-assisted resection for synchronous rectal and gastric cancer. Instead of a wide incision, we made several small incisions for trocar placement and a 5-cm assisted incision, which led to a better cosmetic result and improved quality of postoperative life. Meanwhile, patients had less postoperative pain and analgesic use, early mobility, quick recovery of gastrointestinal function, and fewer postoperative complications such as pneumonia, bed sores, and thromboembolism. In addition, advanced laparoscopic instruments containing harmonic scalpel, titanium, and polymer clips ensured a better hemostatic effect and reduced intraoperative bleeding. All patients regained mobility on the second postoperative day, resumed oral intake on the third to fifth postoperative day, and were discharged on the 10th to 14th postoperative day. The results were similar to those of single laparoscopy-assisted gastrectomy and even better than those of single open gastrectomy,[14,15] which supported the feasibility and advantages of this operation. Furthermore, at least 16 lymph nodes were dissected for both rectal and gastric cancers, and no recurrence or metastasis was found within a mean follow-up of 22 months, which suggested a similar oncologic outcome compared with open surgery.

In the present study, laparoscopic rectal resection was performed first and then laparoscopic gastric resection and reconstruction were followed, which was different from some reports in which laparoscopic gastric resection and reconstruction were performed before laparoscopic rectal resection.[11] In theory, if laparoscopic gastric resection was performed first and in case of severe intraoperative bleeding, blood accumulating in the pelvic cavity might affect the observation and operation of the laparoscopic rectal resection.

Our surgeons, who are specialized in laparoscopic surgery, have performed numerous laparoscopic surgeries including appendectomy, pancolectomy, radical resection for colon and rectal caner, and radical resection for gastric cancer. Thus, compared with other 10 reported cases of simultaneous laparoscopy-assisted resection for synchronous rectal and gastric cancers, patients in the present study were older but had less intraoperative blood loss, shorter operation time, and shorter postoperative hospital stays. In addition, the role of multidisciplinary physicians in a safe recovery of patients seems to be vital. The departments of cardiology, endocrinology, and neurology were consulted for blood pressure and blood glucose control to reduce the risk of malignant hypertension, cerebral infarction, and postoperative delirium. Blood pressure was in control, especially during anesthesia induction, to avoid cerebral accident. In addition, the surgical intensive care unit made great contributions to help early resuscitation and hold homeostasis to create conditions for early mobility.

The advanced laparoscopic technology has become an attractive method in the treatment of digestive synchronous MPC, especially for elderly patients. If laparoscopic surgery is performed by experienced surgeons for synchronous rectal and gastric cancer simultaneously, it is safe and feasible, with the advantages of a better cosmetic result, faster recovery, and a lower incidence of complications, with no influence on the short-term prognosis of cancer. In addition, closed cooperation among multidisciplinary physicians plays a crucial role in the care of the patient perioperatively.

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