Short-term Outcomes of Laparoscopic Surgery for Synchronous Gastric and Colorectal Cancer

Ryoji Makizumi1, Shinya Mikami1, Kuniyasu Horikoshi2, Tsukasa Shimamura1, Shinjiro Kobayashi1, Akira Hanai1, Satoshi Tsukikawa1, Yukihito Kokuba2, Nobuyoshi Miyajima4, and Takehito Otsubo1

(Received for Publication: September 25, 2015)

Abstract

Background Although laparoscopic gastrectomy and laparoscopic colorectal surgery are being performed at increasing regularity, simultaneous laparoscopic surgery for synchronous gastric and colorectal cancer is rare, and its feasibility and safety are unknown. We addressed this question by retrospectively evaluating the short-term surgical outcomes of simultaneous laparoscopic surgery performed at our hospital for synchronous gastric and colorectal cancers.

Methods The study group comprised 8 patients (5 men, 3 women, aged 51–84 years) who underwent simultaneous laparoscopic gastrectomy and colorectal surgery at St. Marianna University School of Medicine Hospital between 2011 and 2014. Patients were followed up for at least 14 months. We reviewed patient and tumor characteristics; comorbidities; specific surgical procedures performed; short-term surgical outcomes, including operation time, estimated intraoperative blood loss; postoperative morbidity; duration of postoperative hospital stay; recurrence or metastasis; and mortality.

Results Median operation time for the simultaneous surgery was 674 min, and median estimated blood loss was 242 mg. There were no intraoperative complications, and no conversion to open surgery was necessary. Postoperative morbidity occurred in 2 patients—ileus in 1 and pulmonary edema in 1. Median postoperative hospital stay was 15.5 days. There were no postoperative deaths.

Conclusion Short-term outcomes in our patient group suggest that simultaneous laparoscopic surgery is both feasible and safe for patients with synchronous gastric and colorectal cancer.

Key words laparoscopy, synchronous gastric and colorectal cancer

Introduction

Colorectal cancer is the third most common cancer in men and second most common cancer in women worldwide, and gastric cancer is the fourth most common cancer in both men and women worldwide1). Synchronous colorectal cancer in patients with gastric cancer has a reported prevalence of 1.3–6.8%2-6). Because surgical resection with lymphadenectomy is the standard treatment for both gastric and colorectal cancer, simultaneous resection is indicated if a curative result is expected for both cancers when they are synchronous. Laparoscopic surgery has shown to be both feasible and safe for treating patients with synchronous gastric and colorectal cancer2-9). Currently, laparoscopic colectomy (LAC) is
performed worldwide as a standard treatment, and the short-term clinical benefits of LAC in comparison to conventional open surgery have been reported. Furthermore, laparoscopy-assisted distal gastrectomy (LADG), in comparison to open distal gastrectomy, has been reported to reduce blood loss, decrease the frequency of analgesic administration, lead to faster recovery and a shorter hospital stay, and result in fewer postoperative complications. We conducted a retrospective study to evaluate the technical feasibility and safety of laparoscopic surgery for synchronous gastric and colorectal cancers in 8 consecutive patients.

**Patients and methods**

Between January 2011 and December 2014, 955 patients underwent surgical resection with lymphadenectomy for gastric cancer (n=416) and/or colorectal cancer (n=539) at St. Marianna University School of Medicine Hospital. Nine of these 955 patients had synchronous gastric and colorectal cancer, and 8 of the 9 underwent simultaneous laparoscopy-assisted gastrectomy (LAG) and LAC. Surgical records of these 8 patients were made available for our review, as were the postoperative pathology reports. Pathological staging was based on the Union for International Cancer Control TNM Classification of Malignant Tumours, 7th edition. All patients were fully informed of the details of the operative procedure, and all patients provided informed consent for it. We obtained approval of the St. Marianna University School of Medicine Ethics Committee (approval number: 3163).

**Indications for LAG and LAC**

LAG and LAC were performed according to indications accepted at our hospital. LAG is performed for cT1–3N0–1 gastric cancer. Generally, LADG with D1+ lymph node dissection was performed for cT1N0 gastric cancer, i.e., early-stage gastric cancer, LADG with D2 lymph node dissection was performed for cT2–3 gastric cancer without obvious lymph node swelling. The extent of dissection was determined according to the Japanese Guidelines for the Treatment of Gastric Cancer. LAC was performed for colorectal cancer without clinically evident invasion of the adjacent organs. All patients underwent preoperative evaluation, and the decision to perform simultaneous laparoscopic surgery was made when the criteria for each operative procedure were met.

**Surgical procedures**

The procedures were performed by surgeons with experience in 50 or more laparoscopic surgeries. Patients, under general anesthesia, were placed in the supine position with legs apart. For all patients, LAG was performed first, then LAC. Two 12-mm ports were inserted, 1 on either side of the upper abdomen, 2 5-mm ports were inserted, 1 on either side of the middle abdomen at the level of the umbilicus, and a camera trocar was inserted at the umbilicus. An additional 12-mm port was placed in the right lower abdomen during LAC. Intraabdominal pressure was maintained at 8–10 mmHg. In cases of LADG or pylorus-preserving gastrectomy, enteric anastomosis was achieved extracorporeally. A mini-laparotomy incision was made by extending the umbilical wound 4–5 cm at the midline in all patients. The resected stomach was extracted through this mini-laparotomy. For cases of laparoscopic total gastrectomy, esophagojejunostomy was performed intracorporeally. Colorectal anastomosis was performed intracorporeally by means of a double stapling technique. All resected tumors were examined pathologically. Pathological staging was based on the Union for International Cancer Control TNM Classification of Malignant Tumours, 7th edition.

**Variables evaluated**

In evaluating the feasibility and safety of simultaneous laparoscopic surgery for synchronous gastric and colorectal tumors, we investigated patient and tumor characteristics; comorbidities; specific surgical procedures performed; short-term surgical outcomes, including operation time, estimated intraoperative blood loss, postoperative morbidity, and duration of postoperative hospital stay; recurrence or metastasis, and mortality.

**Results**

Clinical characteristics of the 8 patients who underwent laparoscopic surgery for synchronous gastric and colorectal cancer are shown on Table 1. The male/female sex ratio was 5/3, and median age was 76 years (range, 51–84 years). Patient 1 had multiple gastric cancers, including low rectal cancer, so laparoscopic total gastrectomy was performed. Intraabdominal pressure was maintained at 8–10 mmHg. In cases of LADG or pylorus-preserving gastrectomy, enteric anastomosis was achieved extracorporeally. A mini-laparotomy incision was made by extending the umbilical wound 4–5 cm at the midline in all patients. The resected stomach was extracted through this mini-laparotomy. For cases of laparoscopic total gastrectomy, esophagojejunostomy was performed intracorporeally. Colorectal anastomosis was performed intracorporeally by means of a double stapling technique. All resected tumors were examined pathologically. Pathological staging was based on the Union for International Cancer Control TNM Classification of Malignant Tumours, 7th edition.
blood loss was 242 mg. There were no intraoperative complications, and no patient required conversion to open surgery. All laparoscopic procedures were performed as planned, with no intraoperative adjustments. Postoperative morbidity occurred in 2 patients — ileus in 1 and pulmonary edema in 1. Median postoperative hospital stay was 15.5 days. The median number of lymph nodes retrieved was 36.5 in association with gastric lesions and 18 in association with colorectal lesions. Six of the 8 patients were followed up at our hospital for at least 14 months, with 1 of the 6 followed up for 43 months, and there was no evidence of cancer recurrence or metastasis in any of these 6 patients.

### Discussion

Laparoscopic surgery is currently performed worldwide. The number of laparoscopic surgeries, including LAG and LAC, performed in Japan has steadily increased with technological advances in op-
tical and surgical devices. LAC is now recommended as a standard treatment for colorectal cancer because it results in minimal damage to the abdominal wall and a quick recovery without sacrificing the oncological outcome\(^1\)\(^3\)\(^14\). Fukunaga et al. reported good oncologic outcomes for patients with gastric cancer treated by LADG with extended lymph node dissection\(^5\)\(^9\). The conventional treatment of synchronous gastric and colorectal cancer has been open surgery. This surgery requires a long medial incision from the xiphoid to the pubis for simultaneous gastrectomy and colorectal resection.

Simultaneous laparoscopic surgery for synchronous gastric cancer and colorectal cancer is theoretically feasible\(^15\)\(^–\)\(^23\). Such surgery for gastric and colorectal cancer has many advantages, including good cosmetic results, reduced postoperative pain, and a reduced incidence of complications. However, the technical difficulty of the simultaneous laparoscopic resections is high, and there is a greater risk for additional problems because it is seldom performed; the need for it occurs only rarely\(^2\)\(^–\)\(^6\). Also, the operation time for laparoscopic surgery is greater than that for open surgery. In 39 reported cases of simultaneous laparoscopic gastrectomy and colorectal resection, the median operation time was 365 minutes (range, 165–746 minutes)\(^16\)\(^–\)\(^24\). The median operation time for our 8 patients was 674 minutes (range, 332–903 minutes). For 1 patient, more than 900 minutes were required to complete simultaneous laparoscopic total gastrectomy with D2 dissection and abdominoperineal resection with D3 dissection. Although the operation time in this case was considerably longer than that in the other 7 cases, no surgical or postoperative complications developed, and the patient was discharged 20 days after surgery. Thus, even when the operation time was long, the outcome was good, like that for other patients, so we consider simultaneous laparoscopic gastrectomy and colorectal resection beneficial for patients in whom the operative criteria are met. Because both the surgical operator and the assistant are exhausted by the long operation time, simultaneous laparoscopic gastrectomy and colorectal resection are performed by 2 different teams at our hospital. Surgery performed by different teams reduces the physiological and psychological stress experienced by the operator and assistant.

Optimal port placement and mini-laparotomy placement are additional challenges associated with the simultaneous procedure. For left-sided rectosigmoid lesions, it may be difficult to perform simultaneous resection via shared ports and a mini-laparotomy incision. It may also be necessary to add some ports for lymph node dissection during laparoscopic colorectal surgery\(^17\). We inserted an additional 12-mm port into the right lower abdomen during LAC.

The oncologic feasibility of laparoscopic surgery for malignant disease is still under investigation. However, laparoscopic surgery has been shown to be feasible and safe and to provide favorable short- and mid-term outcomes for patients with stage I and II rectal cancer\(^7\). In the present study, LAC with D3 lymph node dissection was performed for patients with stage I, II, or IIIa colorectal cancer. LAG is generally indicated for cT1–3N0–1 gastric cancer at our hospital. LAG with D1+ lymph node dissection was performed in 3 patients with cT1N0 early gastric cancer, and LAG with D2 lymph node dissection was performed in 4 patients with cT2–3 gastric cancer. The median number of dissected lymph nodes in our patient series was similar to that in other reported series\(^8\)\(^13\)\(^15\)\(^18\)\(^20\)\(^24\). There was no evidence of recurrence or metastasis during the follow-up period in any of our study patients.

Conclusion

We recognize the limitations of our study, including its retrospective nature and small patient group. However, after evaluating the clinical characteristics, surgical procedures, and outcomes of 8 patients who were successfully treated with simultaneous laparoscopic surgery for synchronous gastric and colorectal cancers, we conclude that this laparoscopic approach is both feasible and safe when performed by an experienced surgeon.

References


