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Laparoscopic gastrectomy in remnant gastric cancer

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ABSTRACT

Objective: Remnant Gastric Cancer (RGC) describes cancers occurring in the remaining stomach and/or anastomosis in the follow-up after gastric cancer or benign gastric surgery. RGC is diagnosed in esophago-gastroscopy follow-ups of patients who underwent this surgery in the past. Again, the increase in the success of gastric cancer surgery and following medical treatments has increased the incidence of RGC in long-term follow-up after gastric cancer surgery. Laparoscopic surgery has been also reported in few cases. In the present study, the purpose was to present the results of the first five patients that underwent laparoscopic total gastrectomy due to RGC in our clinic.

Material and Methods: The patients who underwent laparoscopic gastric cancer surgery between November 2014 and December 2018 were evaluated retrospectively.

Results: Mean age of the patients was 62.4 years (ranging between 49 and 74 years). Two of these patients had a surgical history due to gastric cancer and 3 due to peptic ulcer. Surgery was completed laparoscopically in all patients. In the early period, one patient had to undergo re-surgery due to stenosis in Jejuno-Jejunostomy, and the patient died. One patient underwent laparotomy due to colonic stenosis in the second month after the surgery. Recurrence was detected on the 140th and 180th days of follow-up in the other two patients.

Conclusion: Laparoscopic surgery is a technically applicable method in RGC; however, it is also a risk factor for past surgical postoperative complications. Early recurrence in this group of patients requires a comparison of open and laparoscopic surgery.

Keywords: Stomach cancer, minimal invasive surgery, laparoscopy, completion gastrectomy, total laparoscopy, remnant stomach neoplasm

INTRODUCTION

Remnant Gastric Cancer (RGC) is a pathology in the remaining stomach in patients undergoing gastric surgery with benign and/or malignant etiology, and its current treatment is surgery. The increase in the frequency of laparoscopic applications after primary gastric cancer surgery has brought with it the application of these applications in RGC to the agenda. Laparoscopic surgical procedures have been reported in a limited number of RGC cases, and early period and oncological results of these cases are limited. In our study, the purpose was to discuss the postoperative period and oncological results of the patients undergoing laparoscopic surgery with the diagnosis of RGC together with the literature data.

MATERIAL and METHODS

Patients Characteristics

A total of 133 patients underwent laparoscopic surgery due to gastric cancer between November 2014 and December 2018, and 5 of these patients underwent surgery with a diagnosis of RGC. Approval was obtained from the Non-Interventional Clinical Research Ethics Board of İnonu University. Preoperative, intraoperative, and postoperative results of these cases were evaluated. Mean age of the patients was 62.4 years (ranging between 49 and 74 years). The time after previous surgery was median 24.25 years (ranging between 9 and 38 years).

Surgical Procedure

Pneumoperitoneum was created with Veres from the upper left quadrant in patients with upper-lower umbilical median incision. Working trocars of 10 mm were placed under the umbilical point, 10 mm from the lower right quadrant, 5 mm from the upper right quadrant, and 10 mm from the lower left quadrant. Liver Ecar-

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teur was not used in patients in whom the liver was adhered to the diaphragm. The adhesions to the front abdominal wall were separated. The bowel ANSs of the Retrocolic Bill Roth II gastro-enterostomy anastomosis were incised and closed with linear stapler. The Retrocolic ANSs were separated from the transvers colon. The great curvature was released with the remaining omentum. The small curvature lymph nodes were dissected, and included in the pieces. The esophagus was dissected and closed with a linear stapler. Then, esophago-jejunostomy was performed intracorporeally with ante-colic hand as single-layer 3/0 prolene. Anastomosis was tested with methylene blue, and no leakage was detected. Jejuno-Jejunostomy was performed intracorporeally with linear stapler between the ANSs coming from Treitz and 100 cm distal part of the esophago-jejunostomy anastomosis manually with a single-layer 3/0 prolene or with 3/0 prolene, and the opening in the anastomosis was closed with stapler 3/0 prolene. The pieces were removed supra-pubically.

RESULTS

Laparoscopic Total Gastrectomy was performed in 5 patients due to RGC. Two patients had distal gastrectomy and Bill Roth II Reconstruction due to gastric cancer, 2 patients had distal gastrectomy due to peptic ulcer and Bill Roth II Reconstruction, and 1 patient had a history of gastroenterostomy (Table 1). When the durations between previous surgical history and cancer development of the patients were evaluated, the interval after gastric cancer was observed as 35 and 38 years, and the interval after ulcer surgery was 9 and 15 years. Tumor placement was detected in the remnant stomach in 3 patients, and in the anastomosis line in 2 patients (Table 1).

Surgery was completed laparoscopically in all patients. Surgery duration was 396 minutes (ranging between 360 and 420), and the amount of bleeding was median 160 ml (ranging between 100 and 400) (Table 2). Three patients had D2 and 2 patients had D1 lymph node dissection. Esophago-jejunostomy anastomosis was performed manually and intracorporeally, Jejuno-Jejunostomy anastomosis was performed by hand intracorporeally in 3 patients and intracorporeally with stapler in 2 patients. Oral intake of the patients following surgery was started in median 2.6 days (ranging between 1 and 7). Postoperatively, one patient underwent open exploration again due to atelectasis and stenosis in Jejuno- Jejunostomy anastomosis, and the patient died in the postoperative follow-up period (Table 3). Hospital stay was

Table 1. Patient characteristics

Case	Age	Sex	BMI (kg/m^2)	Reason for previous surgery	Type of previous gastrectomy	Interval (years)	Tumor location
1	74	F	17.8	Gastric ulcer	DG + Billroth II	NA	Remnant
2	49	F	20.2	Gastric cancer	DG + Billroth II	15	Remnant
3	58	M	27	Gastric cancer	DG + Billroth II	9	Anastomosis
4	62	M	20.7	Gastric ulcer*	DG + Billroth II	38	Anastomosis
5	69	M	20.5	Gastric ulcer	GE	35	Remnant

DG: Distal gastrectomy, GE: Gastro-enterostomy, *additional surgery: appendectomy, sigmoid volvulus surgery.
Gastrectomy AND laparoscopy* AND ("remnant gastric cancer" OR "gastric remnant cancer" OR "gastric stump cancer")

Table 2. Perioperative data

Case	Operation time (min)	Blood loss (ml)	LN disection	Anastomosis (E-J and J-J)	Open convertion
1	360	100	D2	E-J (H), J-J (S)	-
2	390	100	D1	E-J (H), J-J(H)	-
3	420	100	D1	E-J (H), J-J (S)	-
4	390	100	D2	E-J (H), J-J(H)	-
5	420	400	D2	E-J (H), J-J (S)	-

LN: Lymph node, E-J: Esophago-jejunostomy, J-J: Jejuno-jejunostomy, H: Hand, S: Stapler.

Table 3. Postoperative data

Case	Food intake (days)	Hospital stays (days)	Complication	Mortality
1	1	34	Atelectasis, Stenozis J-J	+
2	1	15	Urinary tract infection	-
3	2	10	-	-
4	2	7	-	-
5	7	18	Arrhythmia	-

J-J: Jejuno-jejunostomy.

Table 4. Pathological results

Case	cStage	Tumor size (mm)	Number of retrieved LN	Positive LN	TNM	Pathology
1		13x10x10	25	0	T1N0M0	Hyperplastic polyp
2		50x40x10	6	0	T4N0M0	Signet ring cell carcinoma
3		30x15x8	15	11	T3N2M0	Poorly cohesive carcinoma
4		130x80x21	36	11	T4aN3aM0	Poorly cohesive carcinoma
5		40x40x20	22	0	pT3N0M0	Well-differentiated adenocarcinoma

LN: Lymph node.

median 16.8 days (ranging between 7 and 34 days). When the pathology results of the patients were evaluated, the number of lymph nodes excised was median 20.8 (ranging between 6 and 36) and the number of positive lymph nodes was median 4.4 (ranging between 0 and 11) (Table 4).

DISCUSSION

The frequency of gastric cancer varies between communities; however, it is among common cancer types. Early diagnosis of gastric cancer is important, and medical treatments applied in the post-operative period have positive effects on patient survival durations. RGC is a pathology in long-term follow-up in the stomach after benign and/or malign gastric surgery. The development of surgical and medical treatment modalities, increased follow-up and controls increase the frequency of RGC. RGC is seen in those with a history of surgery because of benign pathology at an average interval of 25 years, and in those with a history of surgery because of malignant pathology at an average interval of 15 years (1). Patients with a history of gastric surgery should undergo lifelong and regular esophago-gastro duodenoscopy check-ups.

R0 Surgery is the basis and most important prognostic factor of treatment in RGC (2). Increased laparoscopic surgery experience in gastric cancer has brought with it its application in RGC. Laparoscopic surgery was first reported by Yamaha et al. in Remnant Gastric Cancer (3).

Laparoscopic surgery is a technically applicable method in RGC. We believe that intracorporeal anastomosis techniques can be used manually in anastomosis in both primary gastric cancer surgeries and in RGC surgeries. In the literature, short- term results are presented in a small number of cases, and data on follow-up are presented in a small number of cases. In the study conducted by Booka et al., in comparing open and laparoscopic surgeries in RGC, laparoscopic surgery has been found to be advantageous merely in terms of the amount of bleeding (4). Strong et al. have conducted a case control study evaluating 30 laparoscopic and 30 open RGC patients and detected complications in the laparoscopic group at a rate of 26% in the early period and in 43% in the open group. Major complications were observed as colonic leakage in one case in their laparoscopic group, and as delayed gastric evacuation in one case. In the open surgery group; however, intra-abdominal abscesses were observed in two cases as major complications, anastomosis leakage was detected in one case, and intestinal obstruction in one case. When late laparoscopic complications were evaluated, they were not observed in laparoscopic cases, but complications at a rate of 20% were observed as ventral hernia in 3 cases in the open surgery group, nutritional failure was detected in 1 case, chronic abdominal pain in 1 case, wound infection in 1 case and tube jejunostomy was performed to the case that had malnutrition (5).

Kim et al. have reported complications at a rate of 23.5% in the laparoscopic group and 30% in the open surgery group in their study comparing 50 patients with open surgery and laparoscopic 17 patients (6). Major complications were observed in two laparoscopic cases, and leakage was detected in esophago-jejunostomy anastomosis in one case, who was followed-up with parenteral nutrition, and internal herniation was detected in another case who underwent laparoscopic surgical intervention (6). Kwon et al. have conducted a study and compared 58 open and 18 laparoscopic RGC cases in similar groups. They showed similar early and oncological results (7). Although complication rates were 44.8% in open cases, and 33.3% in laparoscopic cases, major complication rates were 15.5% to 16.7%. Major complications were observed in 1 laparoscopic case that had duodenal switch leakage, intra-abdominal bleeding in 1 open case, intra-abdominal abscess in 3 open cases, pulmonary complications in 6 open cases, and anastomosis leakage in laparoscopic 2 and 1 open case (7). In our study, re-surgery was required due to stenosis in Jejuno-jejunostomy anastomosis in the early period, and this case died. Duration of hospital stay was extended in one case due to urinary tract infection. Surgical intervention was required due to stenosis in the transvers colon in 1 case in the late period, and proximal transvers colostomy was opened.

CONCLUSION

Laparoscopic Surgery is a technically applicable method in patients with adhesiolysis in RGC. However, past surgical history complicates the dissection, increasing the duration of surgery. We believe that it also increases complications after surgery. The results of laparoscopy should be investigated and followed-up in a multi-centered fashion in Remnant Gastric Cancer in terms of long-term recurrence and complications.

Ethics Committee Approval: The approval for this study was obtained from Inönü University Health Sciences Non-Interventional Research Ethics Committee (Decision no: 2020/1206 Date: 10.11.2020).

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Remnant mide kanserinde laparoskopik gastrektomi

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ÖZET

Giriş ve Amaç: Remnant mide kanseri (RMK), benign veya malign nedenli mide cerrahisi sonrası takipte, kalan mide ve/veya anastomozda ortaya çıkan kanserleri tanımlamaktadır. Geçmişte mide cerrahisi geçiren hastalarda özofago-gastroskopi kontrollerinde RMK tanısı koyulmaktadır. Mide kanser cerrahisi ve sonrasındaki medikal tedavilerin başarısındaki artış, mide kanser cerrahisi sonrası uzun dönen takipte RGK görülme sıklığını artırmıştır. Laparoskopik cerrahi az sayıda olguda bildirilmiştir. Bu çalışmada kliniğimizde remnant mide kanseri nedeniyle laparoskopik total gastrektomi uyguladığımız ilk beş hastasının sonuçlarını sunmayı amaçladık.

Gereç ve Yöntem: Kasım 2014 - Aralık 2018 yılları arasında laparoskopik mide kanser cerrahisi uygulanan hastalar retrospektif olarak değerlendirildi.

Bulgular: Hastaların yaş ortalaması ortalama 62,4 (49-74 aralığında) olup ikisinde mide kanseri, üçünde peptik ülser nedeniyle cerrahi öykü mevcut idi. Tüm hastalarda cerrahi laparoskopik olarak tamamlandı. Özofago-jejunostomi elle intrakorporeal, jejuno-jejonostomi anastomozları üç hastada elle intrakorporeal, iki hastada ise stapler ile intrakorporeal yapıldı. Erken dönemde bir hastada jejuno-jejunostomide darlık nedeniyle tekrar cerrahi gerekti ve bu hastada mortalite görüldü. Bir hastada ameliyat sonrası ikinci ayda kolonik stenoz nedeniyle laparatomi yapıldı. Diğer iki hastada takipte 140 ve 180. günlerde nüks saptandı.

Sonuç: Remnant mide kanserinde laparoskopik cerrahi teknik olarak uygulanabilir bir yöntem ancak geçirilmiş cerrahi postoperatif komplikasyonlar açısından risk faktörüdür. Erken dönemde nüks görülmesi bu hasta grubunda açık ve laparoskopik cerrahinin karşılaştırılmasını gerektirmektedir.

Anahtar Kelimeler: Mide kanseri, minimal invaziv cerrahi, laparoskopi, tamamlayıcı gastrektomi, total laparoskopi, remnant mide kanseri

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