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Retrospective Study

Digestive tract reconstruction using isoperistaltic jejunum-later-cut overlap method after totally laparoscopic total gastrectomy for gastric cancer: Short-term outcomes and impact on quality of life

Ze-Ning Huang, Chang-Ming Huang, Chao-Hui Zheng, Ping Li, Jian-Wei Xie, Jia-Bin Wang, Jian-Xian Lin, Jun Lu, Qi-Yue Chen, Long-Long Cao, Mi Lin, Ru-Hong Tu, Ju-Li Lin

Ze-Ning Huang, Chang-Ming Huang, Chao-Hui Zheng, Ping Li, Jian-Wei Xie, Jia-Bin Wang, Jian-Xian Lin, Jun Lu, Qi-Yue Chen, Long-Long Cao, Mi Lin, Ru-Hong Tu, Ju-Li Lin, Department of Gastric Surgery, Fujian Medical University Union Hospital, Fuzhou 350001, Fujian Province, China

Author contributions: Huang ZN and Huang CM conceived the study, analyzed the data, drafted the manuscript, and made the video; Zheng CH, Li P, Xie JW and Wang JB helped revise the manuscript critically for important intellectual content; Lin JX, Lu J, Chen QY, Cao LL, Lin M, Tu RH and Lin JL helped collect the data and design the study; all authors read and approved the final manuscript.

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Informed consent statement: Patients were not required to give informed consent to the study because the analysis used anonymous clinical data that were obtained after each patient agreed to treatment by written consent.

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Abstract

AIM

To evaluate the short-term outcomes and quality of life (QoL) in gastric cancer patients undergoing digestive tract reconstruction using the isoperistaltic jejunum-later-cut overlap method (IJOM) after totally laparoscopic total gastrectomy (TLTG).

METHODS

A total of 507 patients who underwent laparoscopic gastrectomy (D2) from January 2014 to March 2016 were originally included in the study. The patients were divided into two groups to undergo digestive tract reconstruction using either IJOM after TLTG (group T, $n = 51$) or Roux-en-Y anastomosis after laparoscopic-

assisted total gastrectomy (LATG) (group A, $n = 456$). The short-term outcomes and QoL were compared between the two groups after 1:2 propensity-score matching (PSM). We used a questionnaire to assess QoL.

RESULTS

Before matching, age, sex, tumor size, tumor location, preoperative albumin and blood loss were significantly different between the two groups ($P < 0.05$). After PSM, the patients were well balanced in terms of their clinicopathological characteristics, although both blood loss and in-hospital postoperative days in group T were significantly lower than those in group A ($P < 0.05$). After matching, group T reported better QoL in the domains of pain and dysphagia. Among the items evaluating pain and dysphagia, group T tended to report better QoL ("Have you felt pain" and "Have you had difficulty eating solid food") ($P < 0.05$).

CONCLUSION

The IJOM for digestive tract reconstruction after TLTG is associated with reduced blood loss and less pain and dysphagia, thus improving QoL after laparoscopic gastrectomy.

Key words: Esophagojejunostomy; Overlap; Later-cut; Totally laparoscopic total gastrectomy; Quality of life

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Core tip: This paper used propensity score-matched analysis and questionnaire survey to evaluate the short-term outcomes and quality of life (QoL) in patients who underwent digestive tract reconstruction using the isoperistaltic jejunum-later-cut overlap method (IJOM) after totally laparoscopic total gastrectomy (TLTG) and in patients who underwent Roux-en-Y anastomosis after laparoscopic-assisted total gastrectomy. We found the IJOM for digestive reconstruction after TLTG is associated with reduced blood loss and less pain and dysphagia, thus improving the QoL after laparoscopic gastrectomy.

Huang ZN, Huang CM, Zheng CH, Li P, Xie JW, Wang JB, Lin JX, Lu J, Chen QY, Cao LL, Lin M, Tu RH, Lin JL. Digestive tract reconstruction using isoperistaltic jejunum-later-cut overlap method after totally laparoscopic total gastrectomy for gastric cancer: Short-term outcomes and impact on quality of life. *World J Gastroenterol* 2017; 23(39): 7129-7138 Available from: URL: <http://www.wjgnet.com/1007-9327/full/v23/i39/7129.htm> DOI: <http://dx.doi.org/10.3748/wjg.v23.i39.7129>

INTRODUCTION

Since Kitano *et al*^[1] reported laparoscopic-assisted distal gastrectomy in 1991, laparoscopic techniques

and instruments have improved substantially. Consequently, totally laparoscopic distal gastrectomy is increasingly employed and has a proven history of safety and feasibility^[2-8]. However, although scholars have reported a variety of totally laparoscopic total gastrectomy (TLTG) methods^[3,9-13], this technique has not been widely adopted because of the technological difficulty inherent in digestive reconstruction. Interest in improving the postoperative appearance and quality of life (QoL) in patients with gastric cancer has been increased. This goal, combined with the reduced trauma associated with TLTG, has heightened interest in developing ways to improve TLTG. Surgeons have primarily adopted the overlap or functional end-to-end method for digestive tract reconstruction after TLTG. However, these methods have drawbacks, such as jejunal freeness, which is seen particularly frequently with large anastomoses. Therefore, we devised the isoperistaltic jejunum-later-cut overlap method (IJOM), which involves esophagojejunostomy anastomosis after TLTG. Using this technique, we believe that the jejunum can be positioned with greater ease, thereby reducing the difficulties encountered with the anastomosis. However, little is known about the short-term outcomes and QoL of patients following the implementation of this IJOM for digestive reconstruction after TLTG. Thus, this study aimed to assess the short-term outcomes and QoL in gastric cancer patients undergoing digestive tract reconstruction with IJOM after TLTG and with Roux-en-Y anastomosis after LATG using propensity-score matching (PSM)^[14,15] and a QoL assessment scale.

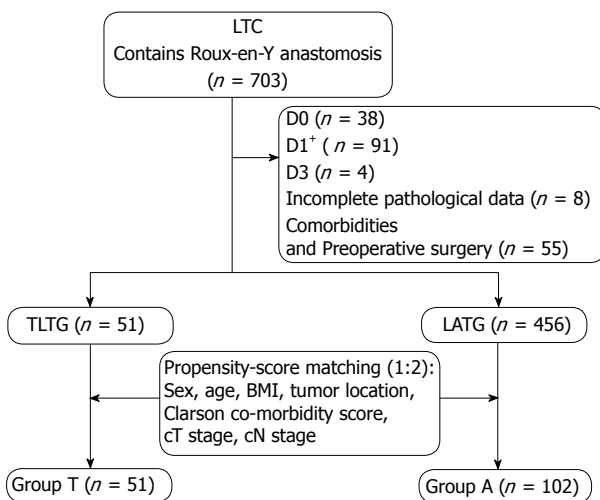
MATERIALS AND METHODS

Study population and inclusion/exclusion criteria

Between January 2014 to March 2016, data were collected from 703 patients who underwent laparoscopic gastrectomy at Fujian Medical University Union Hospital. The including criteria were: (1) pathologically proved gastric cancer by endoscopic biopsy specimen analysis; (2) the aforementioned examination indicated no evidence of distant metastasis; and (3) postoperative pathological diagnosis was curative R0. The exclusion criteria were: (1) intraoperatively proved distant metastasis; (2) T4b stage; (3) missing pathological data; (4) neoadjuvant therapy; and (5) comorbidities that could influence QoL (e.g., previous or combined malignancies; cardiovascular disease; cerebrovascular disease; neurological conditions, such as dementia and seizure; and severe chronic obstructive pulmonary disease requiring persistent medical aid). A number of 507 patients were eligible. Group T consisted of 51 patients who underwent the IJOM after TLTG, and group A comprised 456 patients who received a Roux-en-Y anastomosis after LATG. The 1:2 PSM was performed. Ultimately, group T included 51 patients and group A included 102 patients (Figure 1).

Table 1 Characteristics, merit and demerit of different esophagojejunostomy anastomosis techniques

Anastomosis surgeon	Characteristics	Merit	Demerit
Uyama <i>et al</i> ^[12]	The anastomosis line is vertical with esophageal long axis Jejunum is located in the right side of the esophagus.	Anastomotic is large enough	The number of anastomosis linear staplers is much
Matsui <i>et al</i> ^[37]	Complete the anastomosis before severed esophagus Close the stoma and resect specimens at the same time Jejunum is located in the right side of the esophagus	The number of anastomosis linear staplers is reduced	Probably develop dysphagia 6 mo after operation
Lee <i>et al</i> ^[13]	Suture esophagus, jejunum and right angle of diaphragm after anastomosis Jejunum is located in the right side of the esophagus	Reduce the incidence of esophageal hiatal hernia and anastomotic fistula	Increase the operation time
Okabe <i>et al</i> ^[38]	Before anastomosis, the specimens was removed Jejunum is located in the left side of the esophagus	The size of anastomotic stoma is bigger	The technique is difficult
Inaba <i>et al</i> ^[29]	Overlap anastomosis	Isoperistaltic anastomosis meets the physiological needs	The jejunum is free and difficult for anastomosis
Matsui <i>et al</i> ^[39]	Divide the jejunum before anastomosis Overlap anastomosis Divide the esophagus after anastomosis	Isoperistaltic anastomosis meets the physiological needs	The jejunum is free and difficult for anastomosis

**Figure 1** The flow chart of patient selection. LTG: Laparoscopic total gastrectomy; TLTG: Totally laparoscopic total gastrectomy; LATG: Laparoscopic assisted total gastrectomy.

Anastomosis step

In group T, the IJOM was performed after TLTG. After dissecting the lymph nodes laparoscopically and mobilizing the esophagus (Figure 2A) and the duodenum (Figure 2B), an endoscopic linear stapler was used to transect them sequentially in predetermined locations. Two small incisions were made on the left side of the resection margin of the esophagus (Figure 2C) and the antimesenteric border of the jejunum (Figures 2D) approximately 20 cm away from the ligament of Treitz, respectively.

Then, the two limbs of the stapler were inserted into each incision, respectively, and the forks of the stapler were closed and fired, achieving a side-to-side esophagojejunostomy (Figure 2E). After confirming that there was no bleeding *via* common stab incision (Figure 2F), the common stab was manually sutured (Figure 2G). Then, the jejunum was transected after

barring the mesenteric border approximately 1 cm into the jejunum wall and approximately 3 cm away from the esophagojejunostomy (Figure 2H). After a small incision was made each on the antimesenteric border of the margin of the proximal jejunum and the distal jejunum roughly about 45 cm from esophagojejunostomy, the two limbs of the stapler were inserted into each incision, and the forks of the stapler were closed and fired to achieve a side-to-side jejunojejunostomy (Figure 2I). After confirming that there was no bleeding or damage to jejunal mucosa by common stab incision, the common stab incision was sutured laparoscopically (Figure 2J). Finally, we removed the specimen through a 3.5-cm incision on the lower abdomen. The differences between this method and other esophagojejunostomy anastomosis techniques are summarized in Table 1.

For patients in group T, the lymph nodes were dissected laparoscopically, and the esophagus and duodenum were mobilized. Then, the traditional open Roux-en-Y anastomosis was performed using a circular stapler^[16].

Definition

All patients signed the informed consent form before operation. Preoperative computed tomography (CT) scanning, ultrasonography of the abdomen and endoscopic ultrasonography were routinely performed. When distant metastasis was suspected, positron emission tomography was performed. Preoperative morbidities were scored according to the Charlson score system^[17]. Tumor staging was performed according to the 7th edition of the International Union against Cancer (UICC) classification^[18]. Postoperative anastomosis-related complications were diagnosed by gastrografen esophagram or clinical manifestations and stratified using the Clavien-Dindo classification^[19]. Perioperative death was defined as death that occurred during hospitalization. The Institutional Review Board

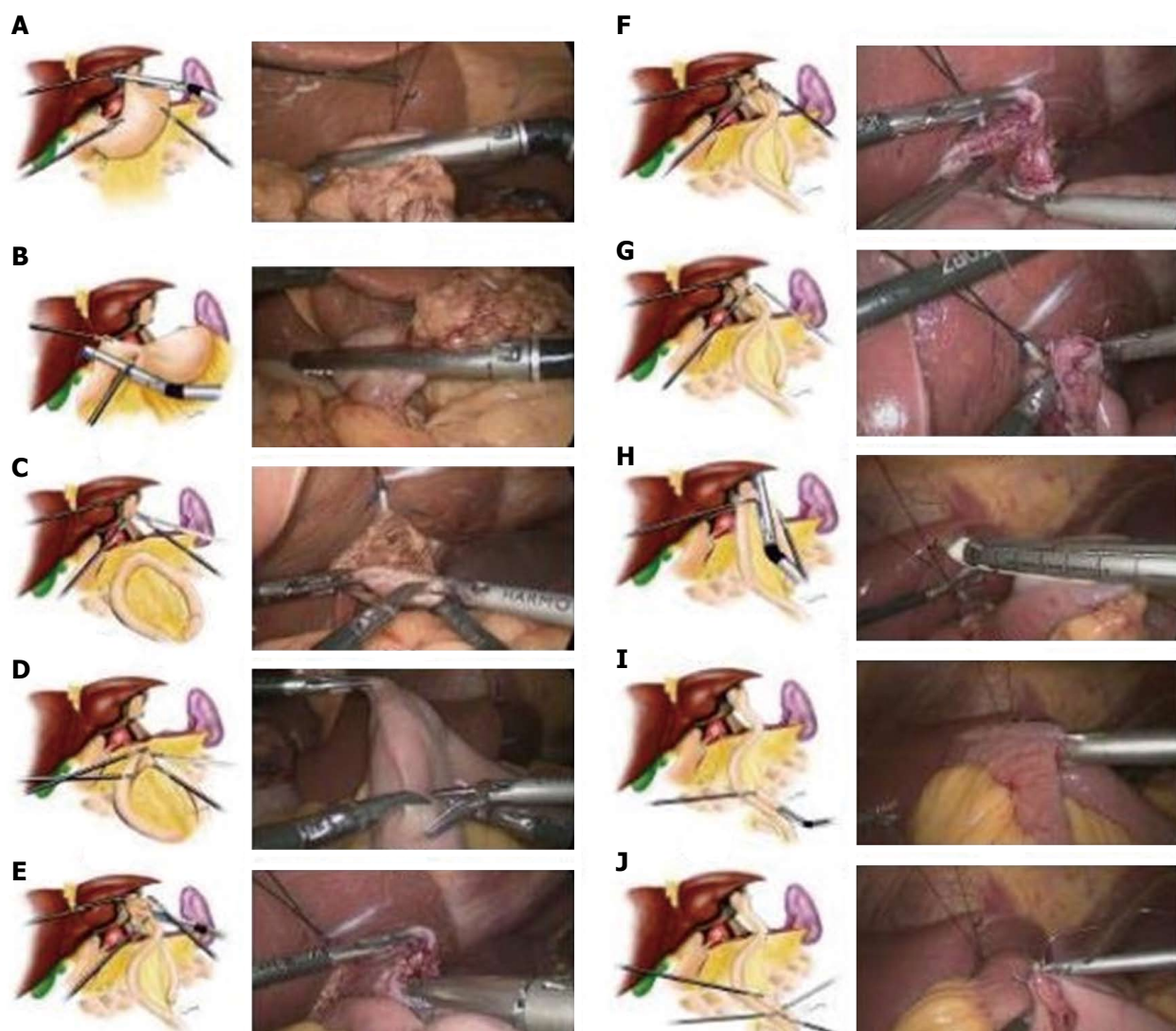


Figure 2 The schematic diagram of anastomosis.

of Fujian Medical University Union Hospital approved this study.

QoL questionnaire

We used the validated Chinese version of the European Organization for Research and Treatment of Cancer 30-item core QoL questionnaire (EORTC-QLQ-C30)^[20] to assess QoL. The questionnaire includes a global health status, five functional items, three symptom dimensions, and six individual symptom items (Table 2). Furthermore, we used the validated Chinese version of the 22-item EORTC-QLQ gastric cancer module (EORTC-QLQ-STO22)^[21] to assess tumor-specific QoL. This questionnaire includes a functional scale, five symptom dimensions, and three individual symptom scales. QoL is represented by a score ranging from 0 to 100 for every scale. Better QoL is indicated by the higher scores in the functional scales of the EORTC-QLQ-C30 and lower scores in the symptom scores of EORTC-QLQ-C30 and STO22 (Table 2).

Follow-up

The follow-ups were performed *via* mailing, telephone

call, or outpatient service. We explained the content of each item of the questionnaire to the patients 6 mo postoperatively, and the patients chose their own responses. Most patients underwent physical examinations, laboratory tests, chest radiography, abdominal ultrasonography or CT, and annual endoscopic examinations.

Statistical analysis

The Statistical Package for Social Science version 18.0 (SPSS, Chicago, IL, United States) was used to perform statistical analyses. The *t* tests or paired *t* tests were performed to compare continuous variables. χ^2 tests were performed to compare categorical variables. $P < 0.05$ was considered statistically significant.

RESULTS

Demographics and clinical characteristics

Before matching, age, sex, tumor location, tumor size, and preoperative albumin level differed significantly between the two groups ($P < 0.05$). After 1:2

Table 2 Structure of EORTC QLQ-C30 and EORTC QLQ-STO22

Scale	Number of constituting items
EORTC QLQ-C30	
Global health status/QoL scale ¹	2
Functional scales ¹	
Physical functioning	5
Role functioning	2
Emotional functioning	4
Cognitive functioning	2
Social functioning	2
Symptom scales ²	
Fatigue	3
Nausea and vomiting	2
Pain	2
Dyspnoea	1
Insomnia	1
Appetite loss	1
Constipation	1
Diarrhoea	1
Financial difficulties	1
EORTC-QLQ-STO22 ²	
Dysphagia	3
Chest and abdominal pain	4
Reflux	3
Eating restrictions	4
Anxieties	3
Dry mouth	1
Taste problem	1
Body image	1
Hair loss	2

¹Higher scores represent better QoL; ²Higher scores represent worse QoL. EORTC QLQ indicates European Organization for Research and Treatment of Cancer Quality-of-life Questionnaire; QoL: Quality-of-life.

matching, 51 and 102 patients were included in groups T and A, respectively, and well balanced in their clinicopathological characteristics (Table 3).

Perioperative results

After matching, blood loss and postoperative days of hospital stay were significantly less in group T than in group A ($P < 0.05$). The number of harvested lymph nodes, operative time, time to first flatus, time to fluid diet, and hospitalization costs were similar in the two groups (Table 4).

Postoperative complications

Before matching, one patient had an anastomotic fistula in group T. In contrast, Group A included 22 patients with anastomotic fistula, one with anastomotic hemorrhage and four with anastomotic obstruction. The incidences of anastomosis-related complications were 2.0% and 5.9% in groups T and A, respectively; the two rates were similar. After matching, there was one patient with anastomotic fistula in group T, whereas there were four patients with anastomotic fistula, one with anastomotic hemorrhage, and two with an anastomotic obstruction in group A. The incidence of anastomosis-related complications had no statistical difference in the two groups, and no perioperative deaths occurred (Table 5).

Functional scales

After matching, six patients died and one was lost to follow-up 6 mo postoperatively in group T. Eventually, 44 patients joined the questionnaire survey. In group A, ten patients died, and three were lost to follow-up. A total of 89 patients from group A participated in the questionnaire survey. The functional scales of EORTC-QLQ-C30 were all similar in both groups (Figure 2).

Symptom scales

After matching, the symptom scales of EORTC-QLQ-C30 and STO22 were compared. Based on the pain scales of EORTC-QLQ-C30 and dysphagia scales of EORTC QLQ-STO22, group T reported better QoL (Figure 3). Subgroup analyses of two items in the pain scale ("Have you felt pain?" and "Has your life been affected by pain?"), group T tended to report better QoL in "Have you felt pain?" ($P = 0.018$). In the dysphagia scale, subgroup analyses of three items ("Have you had difficulty eating solid food?", "Have you had difficulty swallowing liquid or eating soft food?", and "Have you had difficulty drinking water?") revealed that group T tended to report better QoL in response to the question "Have you had difficulty eating solid food?" than group A ($P = 0.039$) (Table 6).

DISCUSSION

Laparoscopy offers several advantages over traditional laparotomy, such as reduced trauma, faster recovery, fewer postoperative complications, and greater aesthetic appeal. These benefits are attributable to the minimal invasiveness of laparoscopy and the good clinical outcomes that have been reported^[22-25]. Currently, the methods of digestive tract reconstruction employed after LG include LATG and TLTG. In LATG, the digestive tract reconstruction is performed *via* a small incision after lymphadenectomy, although this decreases the advantages of laparoscopic minimally invasive surgery. Since Uyama *et al.*^[12] reported totally laparoscopic digestive tract reconstruction, substantial research in Japan and Korea has revealed that TLTG has desirable short-term outcomes and is also safe and effective^[11,26-28].

Currently, the digestive tract reconstruction methods used after TLTG include overlap^[12] and functional end-to-end^[29] techniques. However, jejunal freeness is one of several drawbacks associated with these methods and makes the anastomosis more difficult. Therefore, we devised the IJOM, which involves esophagojejunostomy anastomosis after TLTG. We believe that, using this technique, the jejunum can be more easily positioned, thereby reducing the difficulty in creating the anastomosis. Moreover, because the proximal jejunum is divided after the anastomosis, the length of the blind loops can be easily grasped. We found that blood loss was reduced in group T, and this may be attributed to the clearer,

Table 3 Demographic and clinical characteristics of patients in the two groups

	All patients			Propensity-matched patients		
	Group T (n = 51)	Group A (n = 456)	P value	Group T (n = 51)	Group A (n = 102)	P value
Age (mean ± SD, yr)	55.5 ± 12.1	61.6 ± 11.2	< 0.001	55.5 ± 12.1	55.9 ± 11.0	0.916
Gender			< 0.001			1.000
Male	34	345		34	68	
Female	17	111		17	34	
Charlson comorbidity index			0.281			0.608
0	48	418		48	92	
1-2	3	38		3	10	
BMI (mean ± SD, kg/m ²)	22.5 ± 13.1	22.3 ± 13.5	0.919	22.5 ± 13.1	22.6 ± 12.8	0.965
Tumor size (mean ± SD, cm)	4.5 ± 1.5	4.9 ± 1.3	0.041	4.5 ± 1.5	4.7 ± 1.7	0.142
Tumor location			< 0.001			0.177
Upper third	4	188		4	12	
Middle third	34	169		34	76	
Whole	13	99		13	14	
Histology type			0.453			0.482
Differentiation	47	416		47	97	
Undifferentiation	4	40		4	5	
Preoperative albumin (mean ± SD, g/L)	40.8 ± 4.3	39.1 ± 5.2	0.025	40.8 ± 4.3	40.6 ± 4.6	0.796
Depth of infiltration (T)			0.174			0.643
T1	15	82		15	23	
T2	8	83		8	18	
T3	10	135		10	16	
T4a	18	166		18	45	
Nodal status (N)			0.729			0.534
N0	21	190		21	34	
N1	11	77		11	18	
N2	5	66		5	10	
N3	14	123		14	40	
UICC stage			0.319			0.502
I	13	78		13	18	
II	17	159		17	40	
III	21	219		21	44	

BMI: Body mass index; UICC stage: 7th edition of the International Union against Cancer.

Table 4 Operative variables of the patients

	All patients			Propensity-matched patients		
	Group T (n = 51)	Group A (n = 456)	P value	Group T (n = 51)	Group A (n = 102)	P value
Operative time, min (mean ± SD)	209.3 ± 41.0	203.6 ± 49.3	0.427	209.3 ± 41.0	200.5 ± 55.6	0.318
Blood loss, mL (mean ± SD)	48.3 ± 38.5	98.4 ± 149.1	0.017	48.3 ± 38.5	105.4 ± 147.9	0.008
Harvested LNs (mean ± SD)	44.5 ± 15.0	41.2 ± 14.2	0.237	44.5 ± 15.0	42.6 ± 15.2	0.465
Time to first flatus, days (mean ± SD)	3.8 ± 1.2	3.5 ± 1.7	0.220	3.8 ± 1.2	3.6 ± 1.2	0.332
Time to fluid diet, days (mean ± SD)	5.6 ± 1.4	5.6 ± 1.6	1	5.6 ± 1.4	5.5 ± 1.9	0.739
Postoperative days (mean ± SD)	12.6 ± 4.3	14.7 ± 8.9	0.097	12.6 ± 4.3	15.4 ± 8.9	0.035
hospitalization costs, yuan	75450 ± 20038	73308 ± 21932	0.505	75450 ± 20038	70407 ± 13254	0.065
Chemotherapy	33	310	0.635	33	78	0.123

LN: Lymph node.

amplified field of vision achieved during laparoscopic digestive tract reconstruction. As a result, blood vessels in the muscles and mesentery can be more readily identified and are less likely to be transected during the procedure. Consistent with our findings, previous studies have shown that reduced blood loss is associated with better postoperative recovery^[30]. We found that the length of the postoperative stay in group T was significantly shorter than that in group A, confirming that less trauma and blood loss during TLTG can promote faster recovery.

Lee *et al.*^[31] showed that distal gastrectomy dec-

reases the QoL because of problems with eating restrictions and body image. However, compared with open surgery, laparoscopic-assisted distal gastrectomy improves QoL, specifically by reducing the incidence of postoperative intestinal obstruction^[32]. Fujii *et al.*^[33] suggested that this reduction in postoperative intestinal obstruction may be attributable to the less abdominal manipulation required for laparoscopic surgery, which may blunt the systemic cytokine and inflammatory responses^[34,35]. Similarly, totally laparoscopic technology reduces the amount of intestinal manipulation required during digestive tract reconstruction and may also

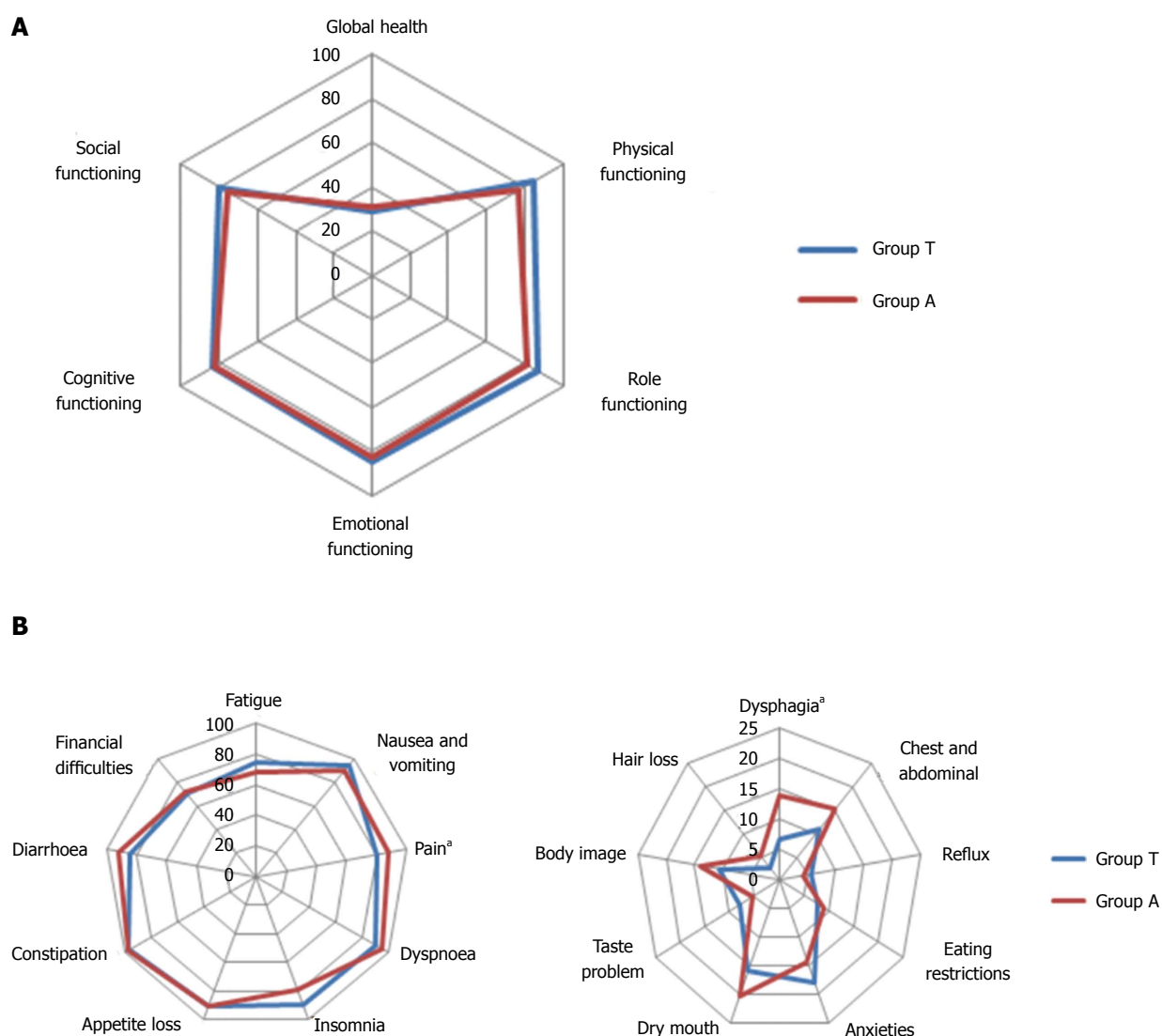


Figure 3 The functional scales. A: EORTC-QLQ-C30; B: EORTC-QLQ-C30 and EORTC-QLQ-STO22. ^a $P < 0.05$, EORTC-QLQ-C30 vs EORTC-QLQ-STO22.

Table 5 Morbidity and mortality associate with anastomosis

	All patients			Propensity-matched patients		
	Group T, % (n = 456)	Group A, % (n = 51)	P value	Group T, % (n = 102)	Group A, % (n = 51)	P value
Morbidity	1 (2.0)	27 (5.9)	0.893	1 (1.9)	6 (11.8)	0.552
Anastomotic fistula	1	22		1	4	
Anastomotic hemorrhage	0	1		0	0	
Anastomotic obstruction	0	4		0	2	
Mortality	0	0	/	0	0	/

reduce the incidence of postoperative intestinal obstruction. However, no studies have evaluated QoL following totally laparoscopic surgery. Schneider *et al.*^[36] reported that the diameter of the anastomotic stoma obtained using the linear stapler was significantly larger than that achieved with the circular stapler, which benefits the passage of food. At 6 mo post-surgery, we found that symptoms of dysphagia were better in group T, especially in terms of eating solid food. This finding indicates that using a linear stapler can expand

the diameter of the anastomotic stoma and that the decreased intestinal manipulation involved in TLTG can reduce the incidence of intestinal obstruction.

Patients who underwent TLTG reported significantly less pain than those undergoing LATG. We believe that this is because the incision in the abdominal wall involved in TLTG is shorter, leading to less pain from inflammation and scar formation. In addition, less intra-abdominal manipulation likely contributes to decreasing the formation of intra-abdominal adhesions

Table 6 Constituent items of pain of EORTC-QLQ-C30 and dysphagia of EORTC-QLQ-STO22 as compared between group T and group A

	Propensity-matched patients		<i>P</i> value
	Group T (<i>n</i> = 44)	Group A (<i>n</i> = 89)	
Constituent items of pain of EORTC-QLQ-C30			
Have you felt pain?			0.018
Not at all	28	66	
A little	12	7	
Quite a lot	3	14	
Very much	1	2	
Have your life affected by pain?			0.271
Not at all	39	73	
A little	4	7	
Quite a lot	1	9	
Very much	0	0	
Constituent items of dysphagia of EORTC-QLQ-STO22			
Have you felt difficult to eat solid food?			0.039
Not at all	26	31	
A little	11	32	
Quite a lot	7	21	
Very much	0	5	
Have you felt difficult to eat liquid or soft food?			0.275
Not at all	38	67	
A little	5	15	
Quite a lot	1	7	
Very much	0	0	
Have you felt difficult to drink water?			0.194
Not at all	39	80	
A little	5	5	
Quite a lot	0	4	
Very much	0	0	

and, thus, the associated discomfort.

This is the first study investigating the differences in short-term outcomes and QoL between the IJOM after TLTG and Roux-en-Y anastomosis after LATG using PSM and a QoL assessment scale. The results show that utilizing the IJOM after TLTG can reduce intra-operative blood loss and relieve symptoms of pain and dysphagia. However, this study has several limitations. First, the follow-up period was short. Second, a retrospective, single-center design was used. Therefore, a prospective, multiple-center study with a longer follow-up period is needed.

COMMENTS

Background

Surgeons have primarily adopted several methods for digestive tract reconstruction after totally laparoscopic total gastrectomy (TLTG). However, these methods have drawbacks, such as jejunal freeness and difficult to perform. Therefore, we devised the isoperistaltic jejunum-later-cut overlap method (IJOM), but little is known about the short-term outcome and quality-of-life (QoL) in patients following the implementation of this digestive reconstruction.

Research frontiers

The QoL after distal gastrectomy was reported to be affected by eating restrictions and body image. For TLTG, scholars have reported a variety of digestive reconstruction methods which are safe and effective, but the QoL is uncertain.

Innovations and breakthroughs

The authors used propensity score-matched analysis and questionnaire

survey to perform this research. The authors found that IJOM for digestive reconstruction can reduce blood loss compared with Roux-en-Y anastomosis and was associated with less pain and dysphagia, thus improving QoL after laparoscopic gastrectomy.

Applications

Through this study, we can focus the symptoms which probably happen after surgery and accordingly improve the QoL of patients. However, a prospective, multiple-center study with a longer follow-up period is needed.

Terminology

EORTC-QLQ-C30: Chinese version of the European Organization for Research and Treatment of Cancer 30-item core QoL questionnaire. EORTC-QLQ-STO22: the validated Chinese version of the 22-item EORTC-QLQ gastric cancer module. PSM: A statistical matching method which can reduce the bias of variables.

Peer-review

This study is a pioneer study about esophagojejunostomy anastomosis after TLTG.

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