



Evaluation of a new surgical procedure for simultaneous resection of synchronous thoracic middle-lower segment esophageal and distal gastric cancers

Xusheng Ding^{1,2,3#}, Bin Li^{1,2,3#}, Hui Shen^{1,2,3}, Zezhou Wang^{3,4,5}, Longlong Shao^{1,2,3}, Jiaqing Xiang^{1,2,3}

¹Departments of Thoracic Surgery and State Key Laboratory of Genetic Engineering, Fudan University Shanghai Cancer Center, Shanghai, China; ²Institute of Thoracic Oncology, Fudan University, Shanghai, China; ³Department of Oncology, Shanghai Medical College, Fudan University, Shanghai, China; ⁴Department of Cancer Prevention, Fudan University Shanghai Cancer Center, Shanghai, China; ⁵Shanghai Municipal Hospital Oncological Specialist Alliance, Shanghai, China

Contributions: (I) Conception and design: J Xiang; (II) Administrative support: L Shao; (III) Provision of study materials or patients: Z Wang; (IV) Collection and assembly of data: X Ding, H Shen; (V) Data analysis and interpretation: X Ding, B Li; (VI) Manuscript writing: All authors; (VII) Final approval of manuscript: All authors.

[#]These authors contributed equally to this work.

Correspondence to: Jiaqing Xiang, MD. Departments of Thoracic Surgery and State Key Laboratory of Genetic Engineering, Fudan University Shanghai Cancer Center, Shanghai 200032, China; Institute of Thoracic Oncology, Fudan University, Shanghai 200032, China; Department of Oncology, Shanghai Medical College, Fudan University, 270 Dong'an Rd, Shanghai 20032, China. Email: j.q.xiang@hotmail.com.

Background: An increasing number of patients with synchronous esophageal cancer (EC) and gastric cancer (GC) have been diagnosed in recent years. Colon or jejunal interposition for esophageal reconstruction has been frequently performed. This study aimed to evaluate the technical feasibility of a new surgical procedure for patients with synchronous thoracic middle-lower segment EC and distal GC.

Methods: Between July 2012 and December 2021, 18 patients underwent simultaneous esophagectomy and distal gastrectomy, in which the tubular stomach was formed by greater curvature of proximal stomach, with the right gastroepiploic vessels used as the blood supply. Patient demographics and perioperative data were analyzed.

Results: All 18 patients were male, with a mean age of 64.9 years (range, 51–72 years). The mean \pm standard deviation (SD) operative duration was 249.6 \pm 17.4 min (range, 195–275 min) and mean estimated blood loss was 200.0 \pm 86.6 mL (range, 100–400 mL). Ten (55.6%) patients recovered well without any complications, with a mean postoperative length of hospitalization of 9.2 \pm 2.6 days (range, 6–13 days). Overall, postoperative complications, defined as Clavien-Dindo grades I–V, occurred in eight (44.4%) patients, with anastomotic leakage in four (22.2%), and hydrothorax (11.1%), gastric retention (5.6%), pneumonia (5.6%), and jaundice (5.6%) occurring in two, one, one, and one patient(s), respectively. All patients who experienced complications recovered after treatment, except for one who died of anastomotic leakage.

Conclusions: The surgical procedure might be a new treatment option for selected patients with synchronous thoracic middle-lower segment EC and distal GC.

Keywords: Esophagectomy; distal gastrectomy; multiple malignant neoplasms; anastomotic leakage

Submitted Nov 18, 2023. Accepted for publication Feb 08, 2024. Published online Apr 18, 2024.

doi: 10.21037/jtd-23-1777

View this article at: <https://dx.doi.org/10.21037/jtd-23-1777>

Introduction

Esophageal cancer (EC) and gastric cancer (GC) are common malignant neoplasms that lead to tumor-related deaths among males in China (1). According to a previous study, the incidence rates of synchronous and metachronous GC in patients with EC were 5.3% and 5.1%, respectively (2). With advances and developments in sophisticated detection methods, especially endoscopic techniques for upper gastrointestinal tumors, an increasing number of patients with synchronous esophageal squamous cell carcinoma and gastric adenocarcinoma have been diagnosed in recent years (3,4).

Despite achievements in the development of new drugs, surgery remains the mainstay therapy for synchronous EC and GC amenable to resection. Total gastrectomy has been performed in many patients with synchronous EC and GC, and the colon or jejunum has been frequently used as an esophageal substitute (5,6). However, according to a previous study, among patients who underwent total gastrectomy, 63.4% in the colon group and 45.5% in the jejunum group experienced major complications (7). Simultaneous resection of synchronous EC and GC with a preserved part of the stomach may be feasible in a subset of patients. Although several cases have been reported in the literature (8,9), the safety of preserving part of the stomach has not been clearly verified, and studies addressing this

particular surgical procedure remain scarce.

In this context, the present article describes the surgical procedure and documents the evaluation of its technical feasibility in patients with synchronous thoracic middle-lower segment EC and distal GC. We present this article in accordance with the STROBE reporting checklist (available at <https://jtd.amegroups.com/article/view/10.21037/jtd-23-1777/rc>).

Methods

Patients

This retrospective study was approved by the institutional review board of Fudan University Shanghai Cancer Center (No. 1612167-18). The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013), and individual consent for this retrospective analysis was waived. Eighteen patients with synchronous thoracic middle-lower segment EC and distal GC underwent simultaneous esophagectomy and distal gastrectomy at the Fudan University Shanghai Cancer Center between July 2012 and December 2021. EC and GC were diagnosed simultaneously in all patients. The patients were follow-up every 3 months during the first 2 years and every 6 months thereafter by telephone interviews with the patients or their family members. The eighth edition of the American Joint Committee on Cancer staging system was used in this study. The Clavien-Dindo classification was used to assess postoperative complications (10).

Surgical procedure

An upper abdominal incision was made with the patient positioned supine following intravenous administration of epidural anesthesia. The greater curvature of the stomach was dissociated from the reserved right gastroepiploic vessels. The left gastroepiploic vessels, short gastric vessels, left gastric artery, and stomach coronary veins were divided. The lesser omentum was opened, and the right gastric artery was divided, and lymph nodes around the stomach, common hepatic artery, and left gastric artery were dissected. Distal gastrectomy was performed with a resection margin >5 cm from the GC tissue. No GC cells were observed in intraoperative rapid frozen sections, and alimentary tract reconstruction was performed. The remnant duodenum was closed. Billroth I reconstruction was performed in one patient, Billroth II in one, and Roux-en-Y reconstruction

Highlight box

Key findings

- We evaluated the technical feasibility of a new surgical procedure of simultaneous esophagectomy and distal gastrectomy for patients with synchronous thoracic middle-lower segment esophageal cancer (EC) and distal gastric cancer (GC).

What is known and what is new?

- An increasing number of patients with synchronous EC and GC have been diagnosed in recent years. The colon or jejunum has been frequently used as an esophageal substitute.
- In this study, 18 patients with synchronous thoracic middle-lower segment EC and distal GC underwent simultaneous esophagectomy and distal gastrectomy. The surgical procedure yielded a lower morbidity rate and, at the same time, not a higher mortality rate, compared with alimentary tract reconstruction using the colon or jejunum.

What is the implication, and what should change now?

- Simultaneous esophagectomy and distal gastrectomy may be a new treatment option for selected patients with synchronous thoracic middle-lower segment EC and distal GC.

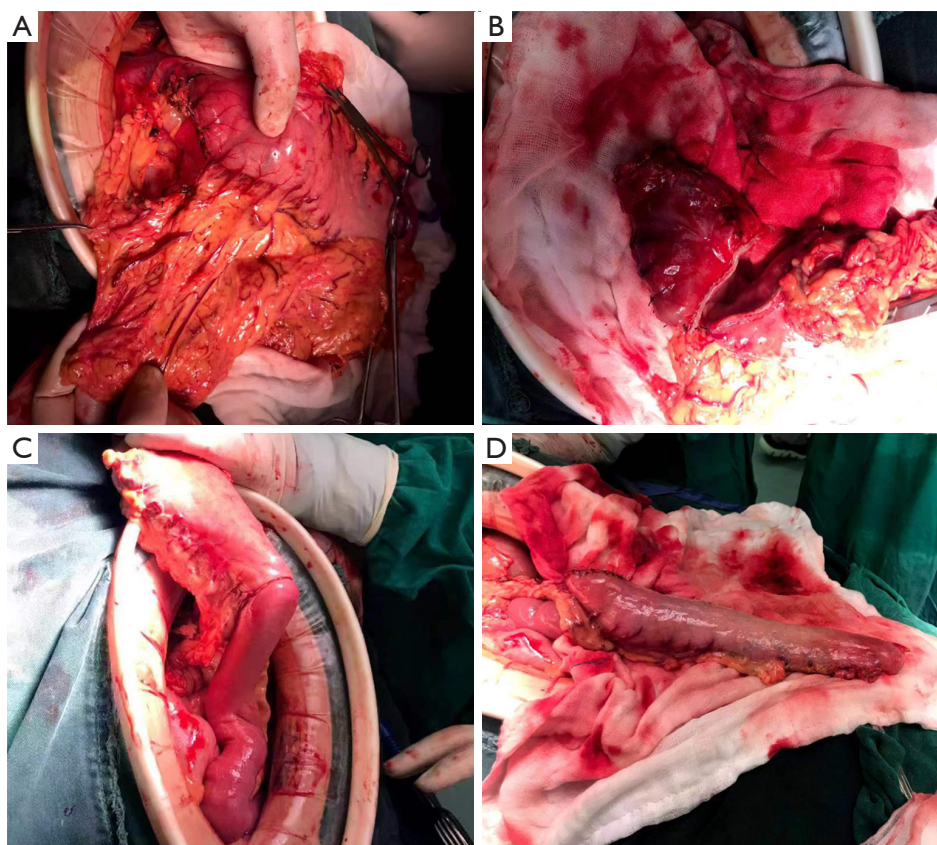


Figure 1 Pictures of the processes of the surgical procedure. (A) The right gastroepiploic vessels are mobilized. (B) Distal gastrectomy is performed. (C) Gastrojejunostomy anastomosis is performed. (D) The tubular stomach is formed.

in 15. A gastrojejunostomy anastomosis was performed in the distal residual stomach. A tubular stomach was formed when the lesser curvature of the stomach tissue was removed. A drainage tube was placed near the abdominal anastomotic stomata. Subsequently, the patient was turned to the left or right lateral position, and esophagectomy was performed with gastroesophageal anastomosis (in this study, in the right chest in 17 patients and the left chest in one). The tubular stomach and right gastroepiploic artery were in the right direction when sent to the esophageal mediastinal bed. The upper mediastinal pleura was sutured. A drainage tube was placed in the mediastinal bed behind the tubular stomach, and another drainage tube was placed in the chest. A nasogastric tube was placed at the blind end of the remnant duodenum. Another nasojejunal nutrient tube was placed in the jejunum, and it was 30 cm away from the distal anastomotic stoma. The surgical procedures and esophageal reconstruction are shown in *Figure 1* and summarized in *Table 1*.

Statistical analysis

Data were presented as numbers and percentages, and means and standard errors. Data were reported as absolute numbers and percentages for categorical variables and as means for continuous variables. Survival was estimated using the Kaplan-Meier method. All statistical analyses were performed using the statistical software SPSS 26.0 (IBM Corp., Armonk, NY, USA).

Results

Patient characteristics

Clinical characteristics of the 18 patients included in the present study are summarized in *Table 1*. All 18 patients were male, with a mean age of 64.9 years at the time of surgery, of whom 15 had a history of smoking, and 14 with a history of alcohol consumption. Six patients presented with cardiovascular disease (five with hypertension, and one

Table 1 Clinicopathologic characteristics of 18 patients with synchronous esophageal and gastric cancer

Factors	Cases (n=18)
Age (years)	64.9 [51–72]
History of smoking	15 (83.3)
History of alcohol consumption	14 (77.8)
History of other forms of cancer	2 (11.1)
Family history of cancer	4 (22.2)
Location of esophageal cancer	
Middle	4 (22.2)
Lower	14 (77.8)
Histology of esophageal cancer	
Differentiated*	9 (50.0)
Undifferentiated [†]	8 (44.4)
Stage of esophageal cancer [‡]	
ypI	1 (5.6)
I	1 (5.6)
II	5 (27.8)
III	10 (55.6)
IV	1 (5.6)
Histology of gastric cancer	
Differentiated*	8 (44.4)
Undifferentiated [†]	9 (50.0)
Stage of gastric cancer [‡]	
ypI	1 (5.6)
I	12 (66.7)
II	3 (16.7)
III	2 (11.1)
Type of gastroenterostomy	
Billroth I	1 (5.6)
Billroth II	2 (11.1)
Roux-en-Y	15 (83.3)
Site of esophagogastrostomy	
Left chest	1 (5.6)
Right chest	17 (94.4)

Data are presented as mean [range] or n (%). The cancer cell differentiation of a patient who received preoperative chemoimmunotherapy was missing. *, differentiated: well or moderately differentiated; [†], undifferentiated: poorly differentiated, undifferentiated, or signet ring cell; [‡], based on the eighth edition of American Joint Committee on Cancer staging system.

with atrial fibrillation). In addition, one patient had gout and one experienced a previous cerebral vascular accident, and two had a history of another form of cancer (one with laryngocarcinoma and the other with bladder cancer). Four patients had a family history of malignancy (one each with EC, GC, colorectal cancer, and pancreatic cancer).

All 18 patients were diagnosed with synchronous thoracic middle-lower segment EC and distal GC during the first endoscopy. The histological type was adenocarcinoma for GC; 17 patients had squamous cell carcinoma but one was small cell carcinoma in EC. EC was located in the middle thoracic esophagus in four (22.2%) patients and lower thoracic esophagus in 14 (77.8%); GC was located in the antrum in all patients. Among these patients, one received preoperative chemoimmunotherapy with four cycles of pembrolizumab in combination with paclitaxel and cisplatin. ECs included pathological stage I [n=1 (5.6%)], II [n=5 (27.8%)], III [n=10 (55.6%)], and IV [n=1 (5.6%)]. GCs included pathological stage I [n=12 (66.7%)], II [n=3 (16.7%)], and III [n=2 (11.1%)]. Seventeen patients underwent R0 resection for both EC and GC; however, one had a microscopic remnant tumor at the upper esophageal resection margin. The mean number of resected lymph nodes was 32.6±11.1 (range, 16–56).

Operative data

The antrum, including the GC, was removed, and the right gastroepiploic artery was preserved. Billroth I reconstruction was performed in one patient, Billroth II reconstruction in two, and Roux-en-Y reconstruction in 15. Esophagectomy was performed with gastroesophageal anastomosis in the right chest in 17 patients and in the left chest in one. The surgery was successful in all patients. The mean operative duration was 249.6±17.4 min (range, 195–275 min) and mean estimated blood loss was 200.0±86.6 mL (range, 100–400 mL). The mean value of the longest diameter of EC and GC was 3.7±1.7 and 2.3±1.8 cm (both from no residual tumor to 7 cm), respectively. The gastroenterostomy and esophagogastrostomy sites are listed in *Table 1*.

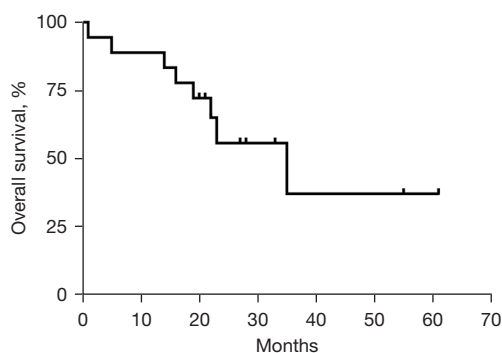
Surgical results

Ten (55.6%) patients recovered well without any complications, with a mean length of hospitalization of 9.2±2.6 days (range, 6–13 days) after simultaneous resection of EC and GC. Each of other eight patients

Table 2 Morbidity and mortality of patients with simultaneous resection

Factors	Cases (n=18)
Morbidity	
Anastomotic leakage	4 (22.2)
Hydrothorax	2 (11.1)
Gastric retention	1 (5.6)
Pneumonia	1 (5.6)
Clavien-Dindo grade	
I	2 (11.1)
II	1 (5.6)
IIIa	3 (16.7)
IIIb	1 (5.6)
V	1 (5.6)
Mortality	1 (5.6)

Data are presented as n (%).

**Figure 2** Overall survival in patients who underwent simultaneous esophagectomy and distal gastrectomy.

experienced at least one complication, corresponding to an overall postoperative morbidity rate of 44.4%. Overall postoperative complications, defined as Clavien-Dindo grades I, II, IIIa, and IIIb, occurred in two, one, three and one patient(s), respectively. Among these, four patients required re-intervention after the initial surgery. Four patients experienced anastomotic leakage, one of whom died 40 days after surgery. Two patients with anastomotic leakage required further surgery and one was managed conservatively. Two patients experienced hydrothorax that required thoracentesis, and one patient simultaneously exhibited jaundice. Gastric retention and pneumonia were

observed in one patient. Although the complications, including hydrothorax, gastric retention and pneumonia, were observed postoperatively, they were uniformly nonfatal. Thus, the in-hospital morbidity rate was 44.4% (n=8) and the mortality rate was 5.6% (n=1). Overall morbidity and mortality rates are summarized in *Table 2*.

Survival

Survival curves for the 18 patients who underwent simultaneous esophagectomy and distal gastrectomy are presented in *Figure 2*. The median follow-up period is 22 months, and the median overall survival is 35 months, with no patients lost to follow-up. The 5-year overall survival rate is 37.1%.

Discussion

Owing to increasingly efficient screening programs and increased cancer survival, the number of coexisting primary neoplasms of the esophagus and other organs is increasing, presenting a unique oncological challenge to surgeons given the lack of evidence regarding the management of such patients. GC is one of the leading primary cancers in patients with EC (4,5,11). The present study evaluated the technical feasibility of a new surgical procedure for patients with synchronous thoracic middle-lower segment EC and distal GC.

According to previous studies, simultaneous resection of EC and GC is feasible, safe, and associated with low perioperative mortality (4,12). The colon or jejunum is commonly used as an esophageal substitute for total gastrectomy (13,14). However, morbidity and mortality rates in colon group (63.4% and 2.4%, respectively) and jejunum group (45.5% and 9.1%, respectively) remain high (7,15). The stomach is the primary choice for esophageal reconstruction due to the decreased anastomosis required and a reliable blood supply; thus, partial gastrectomy has also been performed (6,16,17). According to previous studies, partial gastrectomy yields a shorter operative duration and lower complication rates than total gastrectomy in patients who undergo esophagectomy (6,16). A previous study reported significantly higher incidences of anastomotic leakage and intra-abdominal septic complications in the colon group than in the stomach group (18). No significant difference in operative mortality was found between the partial and total gastrectomy groups; however, a longer operative duration and greater blood loss

were reported in the total gastrectomy group (6). When patients are diagnosed with synchronous EC and gastric antrum cancers, distal gastrectomy may be performed by preserving the right gastroepiploic artery as a blood supply for the residual tubular stomach (9,19). However, the use of this surgical procedure has rarely been reported. In the present study, 18 patients with synchronous thoracic middle-lower segment EC and distal GC underwent simultaneous resection of these cancers, with morbidity and mortality rates of 44.4% and 5.6%, respectively.

During the process of gastrointestinal and esophageal reconstruction, less tissue tension and a reliable blood supply for the esophageal substitute are the primary considerations because they are essential for reduction in anastomotic leakage and postoperative recovery. To remove the GC and preserve the right gastroepiploic artery, the size of the gastric antrum cancer and degree of infiltration were assessed, and no GC cells were observed in the intraoperative rapidly frozen sections before gastrojejunostomy anastomosis in the present study. The three most widely used reconstruction methods include Billroth I, Billroth II, and Roux-en-Y anastomoses after distal gastrectomy. Billroth I reconstruction is similar to the normal anatomy and results in fewer early postoperative gastrointestinal disturbances than Billroth II reconstruction (20). However, Billroth I reconstruction is not the first choice when extensive resection is required or when the duodenal stump is too short. Billroth II reconstruction provides a sufficient range of gastrectomy, but increases the incidence of gastritis and bile reflux compared to Roux-en-Y reconstruction (21,22). Although the incidence of gastric residue is more common in the Roux-en-Y reconstruction group in the early postoperative period (23), quality of life is significantly improved in patients who undergo Roux-en-Y reconstruction than in those who undergo Billroth I or II reconstructions (24,25). Roux-en-Y reconstruction demonstrate more anastomotic placement and reduce tissue tension in the residual tubular stomach. In this study, three surgical methods were used for gastrojejunostomy anastomosis. The patients underwent Billroth I reconstruction and recovered well without any complications. In the two patients who underwent Billroth II reconstruction, one had gastric retention and recovered three weeks after surgery. Four patients with Roux-en-Y reconstruction experienced anastomotic leakage, which may be due to more anastomoses being required, and one died despite the administration of effective antibiotics and additional treatments. In the present study, the fundus near the greater curvature in the residual tubular stomach was

used in esophagogastrostomy to guarantee a reliable blood supply. Given that more anastomotic placement was needed in cervical anastomosis, and a residual tubular stomach was made after distal gastrectomy, esophagogastrostomy was performed in the chest in all 18 patients with thoracic middle-lower segment EC. To avoid obstruction and severe complications caused by an external fistula of the duodenal stump, a nasogastric tube was placed at the blind end of the remnant duodenum for several days, and another nasojejunal nutrient tube was placed before the patients could eat normally.

We described herein a surgical procedure involving the simultaneous resection of synchronous thoracic middle-lower segment EC and distal GC, which has rarely been reported. The surgical procedure yielded a lower morbidity rate and, at the same time, not a higher mortality rate, compared with alimentary tract reconstruction using the colon or jejunum, according to previous studies (7,13,14,26). In our study, the median overall survival was 35 months, which was longer than that for alimentary tract reconstruction using the colon or jejunum (26). However, the 5-year overall survival rate was lower than that for alimentary tract reconstruction using the colon or jejunum reported in another study (7), which may be due to the high proportion of stage III and IV ECs in the present study.

The present study has some limitations, the first of which is its retrospective design and small sample size. Due to the rare incidence and diagnosis of patients with synchronous thoracic middle-lower segment EC and distal GC in last decades, and that the colon or jejunum interposition for esophageal reconstruction has been frequently performed in clinical practice, it is hard to collect enough number of cases to conduct a prospective clinical study. In addition, no other surgical groups are available for comparison in the present study. Considering heterogeneity of the populations and surgeons from different medical centers, the results of comparison between the surgical procedure and different techniques performed by other groups are not compelling. Compared with traditional surgical procedure with colon or small bowel interposition for esophageal reconstruction, the surgical procedure preserves part of proximal stomach, which is conducive to the food digestion. Therefore, this surgical procedure seems to induce a lower depression of digestion physiology function compared with alimentary tract reconstruction using colon or jejunum. However, indicators reflecting the nutritional status of patients, such as body fat indexes, triceps skinfold thickness and serum albumin, are not completely recorded during

follow-up period.

Conclusions

In conclusion, this study evaluated the technical feasibility of a new surgical procedure involving simultaneous esophagectomy and distal gastrectomy for patients with synchronous thoracic middle-lower segment EC and distal GC. And the surgical procedure might be a new treatment option for these selected patients, especially those with previous history of intestinal surgery.

Acknowledgments

Funding: This work was supported by the National Natural Science Foundation of China (82203648).

Footnote

Reporting Checklist: The authors have completed the STROBE reporting checklist. Available at <https://jtd.amegroups.com/article/view/10.21037/jtd-23-1777/rc>

Data Sharing Statement: Available at <https://jtd.amegroups.com/article/view/10.21037/jtd-23-1777/dss>

Peer Review File: Available at <https://jtd.amegroups.com/article/view/10.21037/jtd-23-1777/prf>

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at <https://jtd.amegroups.com/article/view/10.21037/jtd-23-1777/coif>). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). This retrospective study was approved by the institutional review board of Fudan University Shanghai Cancer Center (No. 1612167-18) and individual consent for this retrospective analysis was waived.

Open Access Statement: This is an Open Access article distributed in accordance with the Creative Commons Attribution-NonCommercial-NoDerivs 4.0 International License (CC BY-NC-ND 4.0), which permits the non-

commercial replication and distribution of the article with the strict proviso that no changes or edits are made and the original work is properly cited (including links to both the formal publication through the relevant DOI and the license). See: <https://creativecommons.org/licenses/by-nc-nd/4.0/>.

References

1. Chen W, Zheng R, Baade PD, et al. Cancer statistics in China, 2015. *CA Cancer J Clin* 2016;66:115-32.
2. Ito R, Kadota T, Murano T, et al. Clinical features and risk factors of gastric cancer detected by esophagogastroduodenoscopy in esophageal cancer patients. *Esophagus* 2021;18:621-8.
3. Malhotra GK, Yanala U, Ravipati A, et al. Global trends in esophageal cancer. *J Surg Oncol* 2017;115:564-79.
4. Papaconstantinou D, Tsilimigras DI, Moris D, et al. Synchronous resection of esophageal cancer and other organ malignancies: A systematic review. *World J Gastroenterol* 2019;25:3438-49.
5. Lee GD, Kim YH, Kim JB, et al. Esophageal Cancer Associated with Multiple Primary Cancers: Surgical Approaches and Long-term Survival. *Ann Surg Oncol* 2013;20:4260-6.
6. Kato H, Tachimori Y, Watanabe H, et al. Esophageal carcinoma simultaneously associated with gastric carcinoma: analysis of clinicopathologic features and treatments. *J Surg Oncol* 1994;56:122-7.
7. Park B, Kim HK, Choi YS, et al. Simultaneous Resection of Synchronous Esophageal and Gastric Cancers. *Thorac Cardiovasc Surg* 2016;64:611-8.
8. Zhang XT, Wang W, Zhu Q, et al. Treatment of esophageal-gastric double primary cancer by pedunculated remnant gastric interposition, esophageal-gastric anastomosis and gastrojejunal Billroth II anastomosis: A case report. *Oncol Lett* 2015;10:891-4.
9. Zhao Y, Cong B. A new surgical procedure for synchronous esophageal squamous cell carcinoma and gastric adenocarcinoma: Case report: three cases reports. *Medicine (Baltimore)* 2019;98:e14725.
10. Dindo D, Demartines N, Clavien PA. Classification of surgical complications: a new proposal with evaluation in a cohort of 6336 patients and results of a survey. *Ann Surg* 2004;240:205-13.
11. Kumagai Y, Kawano T, Nakajima Y, et al. Multiple primary cancers associated with esophageal carcinoma. *Surg Today* 2001;31:872-6.
12. Park SJ, Ahn JY, Jung HY, et al. Endoscopic resection

- for synchronous esophageal squamous cell carcinoma and gastric adenocarcinoma in early stage is a possible alternative to surgery. *Gut Liver* 2015;9:59-65.
13. Hamabe Y, Ikuta H, Nakamura Y, et al. Clinicopathological features of esophageal cancer simultaneously associated with gastric cancer. *J Surg Oncol* 1998;68:179-82.
 14. Koide N, Adachi W, Koike S, et al. Synchronous gastric tumors associated with esophageal cancer: a retrospective study of twenty-four patients. *Am J Gastroenterol* 1998;93:758-62.
 15. Saeki H, Morita M, Harada N, et al. Esophageal replacement by colon interposition with microvascular surgery for patients with thoracic esophageal cancer: the utility of superdrainage. *Dis Esophagus* 2013;26:50-6.
 16. Suzuki S, Nishimaki T, Suzuki T, et al. Outcomes of simultaneous resection of synchronous esophageal and extraesophageal carcinomas. *J Am Coll Surg* 2002;195:23-9.
 17. Kwon JS, Kim JB, Cho KB, et al. Gastric tube reconstruction of esophagus for esophageal and stomach carcinomas. *Asian Cardiovasc Thorac Ann* 2012;20:600-3.
 18. Davis PA, Law S, Wong J. Colonic interposition after esophagectomy for cancer. *Arch Surg* 2003;138:303-8.
 19. Motoyama S, Saito R, Okuyama M, et al. Treating gastric tube cancer with distal gastrectomy preserving the gastroepiploic artery. *Ann Thorac Surg* 2006;81:751-3.
 20. Sah BK, Chen MM, Yan M, et al. Gastric cancer surgery: Billroth I or Billroth II for distal gastrectomy? *BMC Cancer* 2009;9:428.
 21. In Choi C, Baik DH, Lee SH, et al. Comparison Between Billroth-II with Braun and Roux-en-Y Reconstruction After Laparoscopic Distal Gastrectomy. *J Gastrointest Surg* 2016;20:1083-90.
 22. Shim JH, Oh SI, Yoo HM, et al. Roux-en-Y gastrojejunostomy after totally laparoscopic distal gastrectomy: comparison with Billroth II reconstruction. *Surg Laparosc Endosc Percutan Tech* 2014;24:448-51.
 23. Wu CH, Huang KH, Chen MH, et al. Comparison of the Long-term Outcome Between Billroth-I and Roux-en-Y Reconstruction Following Distal Gastrectomy for Gastric Cancer. *J Gastrointest Surg* 2021;25:1955-61.
 24. Xiong JJ, Altaf K, Javed MA, et al. Roux-en-Y versus Billroth I reconstruction after distal gastrectomy for gastric cancer: a meta-analysis. *World J Gastroenterol* 2013;19:1124-34.
 25. Zong L, Chen P. Billroth I vs. Billroth II vs. Roux-en-Y following distal gastrectomy: a meta-analysis based on 15 studies. *Hepatogastroenterology* 2011;58:1413-24.
 26. Jiang R, Wang Y, Xu J, et al. Reconstruction using the colon or jejunum in patients with synchronous advanced esophageal and gastric cancers: a retrospective study from a single institutional database. *BMC Surg* 2023;23:175.

Cite this article as: Ding X, Li B, Shen H, Wang Z, Shao L, Xiang J. Evaluation of a new surgical procedure for simultaneous resection of synchronous thoracic middle-lower segment esophageal and distal gastric cancers. *J Thorac Dis* 2024;16(4):2236-2243. doi: 10.21037/jtd-23-1777