

**SHORT-TERM OUTCOME OF LAPAROSCOPIC DISTAL  
GASTRECTOMY WITH INTRACORPOREAL ANASTOMOSIS FOR  
THE TREATMENT OF GASTRIC CANCER AT  
VIETNAM NATIONAL CANCER HOSPITAL**

*Pham Van Binh<sup>1</sup>, Nguyen Duc Duy<sup>1</sup>, Thai Duc An<sup>2</sup>  
Ha Hai Nam<sup>1</sup>, Tran Dai Manh<sup>1</sup>, Nguyen Tuan Anh<sup>1</sup>*

**Summary**

**Objectives:** To describe the clinical, paraclinical characteristics and the short-term results of laparoscopic distal gastrectomy with intracorporeal anastomosis for the treatment of stomach cancer. **Subjects and methods:** A descriptive and retrospective study on 109 patients undergoing laparoscopic distal gastrectomy with intracorporeal anastomosis at Vietnam National Cancer Hospital between January 2019 and July 2022. **Results:** Patients were mostly men, > 50 years old. Duration of symptom onset to hospital admission  $\leq$  3 months and epigastric abdominal pain were the most common symptoms. The average surgery duration was 202 minutes, 90.8% of the patients had Billroth I anastomosis (Delta shaped). Post-operative outcomes recorded very few complications, with a fast recovery time. **Conclusion:** Laparoscopic distal gastrectomy with intracorporeal anastomosis is a minimally invasive surgical method with a safe early result and fast post-operative recovery time.

\* *Keywords:* Laparoscopic surgery; Gastric cancer; Intracorporeal anastomosis.

**INTRODUCTION**

Gastric cancer is one of the most frequent cancers in the world, with about 1.1 million new cases and 770,000 deaths according to GLOBOCAN 2020.

In Vietnam, gastric cancer ranks 4<sup>th</sup> among the most common cancers. Treatment of gastric cancer is multimodal, with surgery playing a central role. For the management of distal gastric cancer,

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<sup>1</sup>Vietnam National Cancer Hospital

<sup>2</sup>Department of Surgery, Hanoi Medical University

Corresponding author: Thai Duc An (thaiducan.hmu@gmail.com)

Date received: 13/3/2023

Date accepted: 10/4/2023

<http://doi.org/10.56535/jmpm.v48i4.320>

from the beginning, as open surgery with high invasiveness, laparoscopic surgery was born with the first method that has been performed for many years: Laparoscopy assisted distal gastrectomy (LADG). Along with the advancement of laparoscopic surgical instruments, laparoscopic surgery with intracorporeal anastomosis - totally laparoscopic distal gastrectomy (TLDG) was commenced with many advantages: Reduced blood loss as well as post-operative recovery time compared with open surgery group and LADG. However, studies and comprehensively understanding of this surgery are still inadequate. Therefore, we carried out this study: *To evaluate the effectiveness of this surgical method at Vietnam National Cancer Hospital.*

## PATIENTS AND METHODS

### 1. Subjects

109 patients underwent laparoscopic distal gastrectomy with intracorporeal anastomosis for the treatment of stomach cancer at Vietnam National Cancer Hospital between January 2019 and July 2022.

\* *Inclusion criteria:* The patient was diagnosed with gastric adenocarcinoma for the first time, determined by endoscopic gastric biopsy, with an early clinical stage of c1-2, N1-2, M0 or cT3N0, underwent laparoscopic distal gastrectomy with intracorporeal anastomosis for the treatment.

\* *Exclusion criteria:* Presenting contraindications to laparoscopic surgery, anesthesia, the recurrence of stomach cancer, or other associated cancer.

### 2. Methods

A descriptive, retrospective study.

## RESULTS

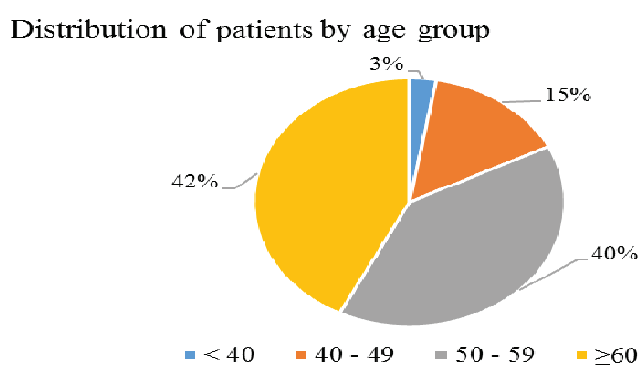


Figure 1: Distribution of patients by age group.

Among 109 patients in the study group, the mean age was  $57.6 \pm 8.9$  years, mainly in the group of 50 - 59 and over 60 years old (40 and 42%, respectively).

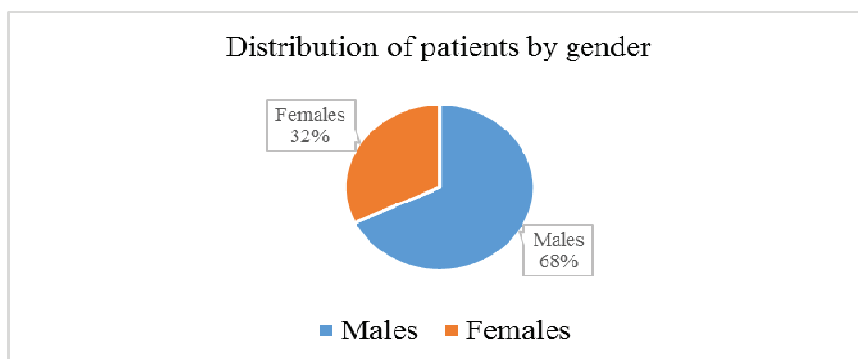


Figure 2: Distribution of patients by gender.

The gender was mostly male (68%).

Table 1: Clinical characteristics of the study group.

Characteristics	Classify	Frequency	%
The interval between the first symptoms and the time of admission	≤ 3 months	65	59.6
	3 - 6 months	34	31.2
	> 6 months	10	9.2
Clinical symptom	Epigastric pain	77	70.6
	Weight loss	30	27.5
	Hematemesis or melena	21	19.3
	Belching	15	13.8
	Vomiting	6	5.5
	Anorexia	1	0.9
Body mass index (BMI)	Nothing to report	5	4.6
	BMI < 18.5 (Underweight)	15	13.8
	18.5 ≤ BMI < 25 (Normal)	90	82.6
	BMI ≥ 25 (Overweight)	4	3.7

The interval between the first symptoms and the diagnosis: mainly in group ≤ 3 months (59.6%), 2.47 months on average. The most common clinical symptom was epigastric pain (70.6%). Most patients had BMI in the normal range (82.6%).

Table 2: Results of digestive endoscopy and preoperative TNM classification.

<b>Characteristics</b>	<b>Classify</b>	<b>Frequency</b>	<b>%</b>
Distribution of tumors in the stomach	Pylorus	23	21.1
	Antrum	67	61.5
	Lesser curvature	15	13.8
	Greater curvature	10	9.2
Tumor size (cm)	< 3	67	66.3
	3 - 5.9	28	27.7
	≥ 6	6	5.9
Primary tumor based on computerized tomography	T1	65	59.6
	T2	38	34.9
	T3	6	5.5
Regional lymph node based on computerized tomography	N0	80	73.4
	N1	14	12.8
	N2	0	0.0

Results of digestive endoscopy: Most of the tumors were located in the antrum of the stomach (61.5%) with a tumor size < 3 cm recorded in the majority (66.3%). Preoperative TNM stage: cT1 and cT2 accounted for the highest rate, and most patients did not have preoperatively any regional lymph node metastasis (73.4%).

Table 3: Operative time and some characteristics of surgery.

<b>Characteristics</b>	<b>Classify</b>	<b>Frequency</b>	<b>%</b>
Types of anastomosis	Billroth I (Delta shaped)	99	90.1
	Billroth II	4	3.7
	Roux-en-Y	10	9.2
Blood volume loss	< 100 mL	29	29.6
	100 - 200 mL	59	60.2
	≥ 200 mL	10	10.2
	Average	170.7 mL	
Operative time (minutes)	Minimum	Maximum	Average
	135	300	202.3

The average operative time was 202.3 minutes, the shortest was 135 minutes, and the longest was 300 minutes. The most conventionally used anastomosis was

Delta shaped, with 90.8% of cases. Blood loss in the range of 100 - 200 mL accounted for the highest rate.

Table 4: Some characteristics of care and complications after surgery.

<b>Characteristics</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Average</b>
Time to withdraw from nasogastric tube (hour)	4	30	12.4
Time to remove bladder catheterization (hour)	6	48	26.5
Time to remove abdominal drainage (day)	5	10	6.72
The duration of postoperative treatment (day)	6	10	7.27
Postoperative refeeding time (day)	1	4	2.2
Early postoperative complications	<b>Classify</b>	<b>n</b>	<b>%</b>
	Pneumonia	5	3.7
	Anemia	4	3.7
	Wound infection	4	3.7
	Venous thromboembolism	2	1.8
	Anastomotic leak	1	0.9
	Postoperative intestinal obstruction	0	0

The most commonly reported early postoperative complications were pneumonia, anemia, and wound infection.

Table 5: Postoperative pathological examination.

Type of histology	Frequency	%
Well-differentiated adenocarcinoma	18	16.5
Moderately differentiated adenocarcinoma	40	36.7
Poorly differentiated adenocarcinoma	27	24.8
Signet ring cell adenocarcinomas	15	13.8
Dysplasia	9	8.3
Total	109	100

Although the preoperative endoscopic gastric biopsy results were adenocarcinoma, the postoperative results recorded 8.3% of cases as dysplasia.

### DISCUSSION

In our study, the mean age of the study group was  $57.6 \pm 8.9$  years, predominantly in the 50 - 59 and 60-year-old group. These statistics are similar to the results of other authors [1]. The most common clinical symptom was epigastric pain (70.6%). 5 patients (4.6%) were admitted to the hospital without clinical symptoms and detected by gastrointestinal endoscopy randomly. 59.6% of patients have an interval between the first symptoms and time of admission  $\leq 3$  months, the cause may be because our study group is mainly early gastric cancer. There were 10 patients with this interval  $> 6$  months. Nonetheless, the preoperative clinical stage was still early, so we indicated laparoscopic surgery for this group of

patients. Most patients had BMI in the normal range (82.6%). However, 5 cases had BMI in the overweight group. Wang, et al. reported the disadvantages of prolonged surgery time, more difficult technique, slower bowel movement time, and more post-operative complications in the group with BMI  $> 25$  when performing LADG [2].

Since our study evaluated the outcome of TLDG, the majority of tumors were located in the antrum (61.5%). We only performed TLDG in patients with clinically early gastric cancer, with the majority of cases in cT1 and the cT2 stage (94.5%) and endoscopic tumor size principally  $< 3$  cm (66.3%). Yan Chen et al.'s study on the early gastric cancer patient group also recorded

similar results [3]. Tumor size has been evaluated by many authors as a crucial factor in predicting postoperative stage and long-term outcomes after gastric cancer surgery [3, 4].

During surgery, the surgeon stands on the patient's right side to ensure a parallel approach to the major blood vessels, making lymph node dissection easier. All of our patients underwent laparoscopic distal gastrectomy with intracorporeal anastomosis and D2 lymphadenectomy. Nowadays, the majority of guidelines in the world recommend performing D2 lymph node dissection in gastric cancer surgery [5, 6], especially in early gastric cancer, in particular the patient in the study group. Our average operative time was 202.3 minutes; this result was equivalent to the study by Han-Gil Kim [7] and Ke Chen [8]. Borong Chen's meta-analysis [9], which summarizes the results of 20 comparative studies between LADG (2,398 patients) and TLDG (1,811 patients), showed that the TLDG group had a shorter operative time, while TLDG performed a more extensive lymphadenectomy. The average blood loss was 170 mL, equivalent to Zhang C's et al. findings [9]. The Billroth I Delta-shaped anastomosis was the most performed in our study. Because

all of these cases had tumors at an early stage and the tumor location is suitable to ensure the resection margin. Our surgeons prefer and have experience in performing this anastomosis. Furthermore, Delta-shaped anastomosis has a faster completion time, is more convenient, maintains the physiological intestinal continuity, and is more cost-effective [8]. Roux-en-Y anastomosis helps to reduce inflammation and gastroesophageal reflux, as well as reduce the possibility of recurrence, but it is more complicated, requires more operating time, and is more expensive due to the performance of 2 anastomosis [8]. Currently, Japanese and Korean surgeons prefer to use Delta Shape anastomosis. Nevertheless, in the study by Ke Chen, et al. on 139 Chinese patients, the most performed anastomosis was Billroth II. This is explained by the authors because the patient has a higher tumor location, a more advanced stage, and limited economic resources. Consequently, which anastomosis to perform depends on many factors on the patient (location, cancer stage, economic conditions), as well as on the surgeon. The most commonly reported early postoperative complications were pneumonia, anemia, and wound infection; no serious complications were found,

such as a hepatopancreatic lesion or postoperative intestinal obstruction. The time to withdraw from nasogastric tube, time to remove bladder catheterization, time to remove abdominal drainage, the duration of postoperative treatment, and the liquid diet time are equivalent to other results [9]. This result also demonstrated that the TLDG group had an earlier postoperative recovery time than LADG on many criteria considering short-term outcomes. This can be explained by diminishing the incidence of touching and tension during anastomosis, as well as the smaller incision of TLDG.

Although the preoperative endoscopic gastric biopsy results were adenocarcinoma, the postoperative results recorded 8.3% of cases as dysplasia. Currently, there is no study estimating the number of cases of gastric cancer overdiagnosis with false-positive results. Based on the results of endoscopic screening for gastric cancer, the observed number of detected cancers was twice compared with the expected number in the target group of endoscopic screening for gastric cancer. Hamashima, et al. claim that a false-positive result is a common harm in cancer screening and necessitates supplementary investigation or even

surgery to conclusive diagnose gastric cancer [10].

LADG and TLDG are two minimally invasive techniques used in gastric cancer surgery. The main difference between these two procedures is the level of laparoscopic support in the surgery. In LADG, the surgeon uses an additional small incision to remove the specimen and perform an anastomosis. On the other hand, TLDG is a completely laparoscopic procedure, which expresses the entire surgery achieved by the maneuver of laparoscopic instruments uniquely. In terms of indications, both LADG and TLDG are indicated for patients with early gastric cancer, with tumors located in the distal part of the stomach. Nevertheless, the decision to perform LADG or TLDG depends on numerous factors, such as the surgeon's preference and experience, the patient's overall health and anatomy, and the stage and invasion of cancer.

### **CONCLUSION**

Laparoscopic distal gastrectomy with intracorporeal anastomosis is a minimally invasive surgical method with a safe early result and fast postoperative recovery time, equivalent to the result of an extracorporeal.



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