|| ISSN(online): 2589-8698 || ISSN(print): 2589-868X ||
International Journal of Medical and Biomedical Studies
Available Online at www.ijmbs.info
NLM (National Library of Medicine ID: 101738825)
Index Copernicus Value 2019: 79.34
Volume 5, Issue 10; October: 2021; Page No. 51-55

Original Research Article

THE EFFICIENCY OF EARLY ORAL FEEDING IN GASTRIC CANCER PATIENTS AFTER LAPAROSCOPIC TOTAL GASTRECTOMY

[1]Dinh Van Chien, [1]Nguyen Van Huong, [2]Ha Van Quyet, [1]Nguyen Thi Thom, [1]Pham Thi Thu Ha, [1]Hoang Van Thai, [1]Hoang Thi Hai, [1]Nghiem Thi Thu Huong, [1]Nguyen Thi Diep, [1]Cao Tuan Anh, [1]Nguyen Thi Huyen, [1]Hoang Thi Quynh

[1]Nghe An General Friendship Hospital, Vietnam.

[2]Hai Phong University of Medicine and Pharmacy, Vietnam

Article Info: Received 13 July 2021; Accepted 28 September 2021
DOI: https://doi.org/10.32553/ijmbs.v5i10.2053
Corresponding author: Dinh Van Chien
Conflict of interest: No conflict of interest.

Abstract

Background: The early oral feeding after the laparoscopic total gastrectomy contributes to the enhanced treatment efficiency and improved quality of life of gastric cancer patients. To evaluate the efficiency of early oral feeding after laparoscopic total gastrectomy in gastric cancer patients at the Nghe An General Friendship Hospital.

Methods: A retrospective observational study, performed in patients who underwent laparoscopic total gastrectomy from 2014 to 2020.

Results: 126 patients were recruited. The mean age was 60.6 ± 11.1 years. The male/female ratio was 2.8/1. 15.9% of patients had the tumor at the one-third upper stomach, 81.7% at the middle of the stomach. 70.6% of patients contracted adenocarcinoma and ductal carcinoma, 24.6% of patients had ring cell carcinoma. The percent of tumor at stages I, II, III were respectively 19.0%, 49.2%, 31.7%. There were 71.4% of cases underwent laparoscopic total gastrectomy and were made the anastomosis by linear staplers. No case presented complications relating to the anastomosis after the surgery. The mean oral feeding time was 4.4 ± 1.9 (2 – 8 days), 27.8% of cases started at the second postoperative date, 8.7% of cases at the third postoperative date, 29.4% of cases from the fourth and fifth date, and 34.1% of cases started from the sixth date and further. The later the oral feeding time was, the slower recovery of the peristalsis was and vice versa ($p < 0.05$). There was no difference between the feeding time and the complications ($p > 0.05$). The more early the feeding time was, the shorter duration of antibiotic therapy observed and vice versa ($p < 0.05$). The more early the feeding time was, the short duration of hospital stay was and vice versa ($p < 0.05$).

Conclusions: The early oral feeding after laparoscopic total gastrectomy was safe and contributed to improving the efficiency of the treatment, the quality of life in gastric cancer patients.

Keywords: Early oral feeding, gastric cancer.

Introduction

Gastric cancer is a common disease in Vietnam and surgery is still the most effective treatment at present [1]. Umaya is the first person who reported a case using the laparoscopic total gastrectomy in 1999 [2,3]. Until now, this treatment is widely applied to cure gastric cancer, and improves the surgical technique as well as patient care after the surgery [3].

The early oral feeding after the laparoscopic total gastrectomy contributes to the enhanced treatment efficiency and improved quality of life of gastric cancer patients, the recovery of digestive function and early motor function, early health recovery, reduced postoperative stress, reduced proportion of complications, short duration of antibiotic therapy, and hospital stay. Thus, early oral feeding could reduce the cost of treatment of gastric cancer in patients [4,5,6,7,8,9].

To enhance the treatment efficiency in gastric cancer patients, we conducted this study aiming to evaluate the efficiency of early oral feeding after laparoscopic total gastrectomy at the Nghe An General Friendship Hospital.

Methods

2.1. Study patients

We recruited 126 patients who underwent laparoscopic total gastrectomy at the Nghe An General Friendship Hospital from 2014 to 2020, and their medical records included sufficient data as needed.
The study was approved by the ethics board of Nghe An General Friendship Hospital.

2.2. Study design: A retrospective observational study.
* ***Inclusion selection***: All patients who underwent laparoscopic total gastrectomy.

* ***Exclusion selection:*** Patients under open surgery, partial gastrectomy.

* ***Postoperative feeding regime:*** This includes five stages [4]:

- Stage 1: Right after the surgery, conducting intravenous feeding with 800 to 1200 kcal.
- Stage 2: Mainly conducted intravenous feeding while starting early oral feeding using soft food with 50 to 100ml (50 – 100 kcal). The feeding was performed every two to three hours and made sure to supply 1.200 kcal to 1.500 kcal per day.
- Stage 3: Conducted intravenous feeding and oral feeding at the same time and made sure to supply 1.900 kcal to 2.300 kcal per day.
- Stage 4: Mainly conducted the oral feeding while maintaining the intravenous feeding. The energy supply was from 1.900 kcal to 2.300 kcal per day.
- Stage 5: Entirely conducted the oral feeding, made sure to supply from 1.900 kcal to 2.300 kcal per day.

* ***Study measures***:

- Patients' characteristics: Age, gender, American Society of Anesthesiology (ASA) score, the position of the tumor, pathological characteristics, stages of cancer.
- Surgical outcomes: Surgical technique and the production of anastomosis.
- Postoperative treatment outcomes: the complications after the surgery, time to recover digestive function (time to first flatus), time of oral feeding, the duration of antibiotic therapy, and hospital stay.

2.3. Statistical analysis: Statistical analysis was conducted using SPSS 26.0. Data were analyzed by t-test, $\chi 2$ test or Fisher-test, Anova-test or Well-test.

Results

We recruited 126 patients who underwent laparoscopic total gastrectomy. The patients' characteristics are as follows

Table 1: Patients' characteristics

Age	60.6 ± 11.09 (26 - 88) years	
BMI	20.29 ± 2.1 (14.7 - 25) kg/m^2	
Gender	Male	93 (73.8%)
	Female	33 (26.2%)
Tumor location	One-third upper	20 (15.9%)
	Middle	103 (81.7%)
	Ulcer with infiltration	3 (2.4%)
Pathological characteristics	Adenocarcinoma and ductal carcinoma	89 (70.6%)
	Mucous gland carcinoma	6 (4.8%)
	Ring cell carcinoma	31 (24.6%)
Tumor stage	I	24 (19.0%)
	II	62 (49.2%)
	III	40 (31.7%)

The preoperative status of patients was mainly ASA1 and ASA2. There were 15.9% of patients having tumors at the one-third upper stomach, 81,7% at the middle. 70.6% of cases were adenocarcinoma and ductal carcinoma, while 24.6% showed ring cell carcinoma. Tumor stages I, II, III accounted for 19.0%, 49.2%, 31.7%.

Table 2 : Surgical techniqu*e*

Surgical technique	N	%
Assisted-laparoscopic using circle staplers	36	28.6
Total laparoscopic using linear staplers	90	71.4

There were 71.4% of patients underwent total laparoscopic total gastrectomy using linear staplers to produce the anastomosis.

Table 3: Postoperative complications

Postoperative complications	N	%
Pneumonia	1	0.8
Residual abscess after the surgery	1	0.8
Wound infection	1	0.8
Duodenal leakage after the surgery	0	0.0

There were 2.4% of cases witnessing postoperative complications. However, all cases were well treated using medicines. There was no death case after the surgery.

Table 4: Time of feeding after the surgery

Time of oral feeding	N	%
≤ 2 days	35	27,8
3 days	11	8,7
4 – 5 days	37	29,4
> 5 days	43	34,1

The mean time of oral feeding was 4.4 ± 1.9 (2 - 8) days.

Table 5: Hospital stay after the surgery.

Hospital stay	N	%
< 6 days	35	27.8
7 – 10 days	72	57.1
> 10 days	19	15.1

The mean hospital stay was 8.3 ± 2.5 (5-19) days.

Table 6: Comparison of the time of oral feeding between surgical technique

Surgical technique	time of oral feeding (days)	
Totally laparoscopic surgery using linear staplers	3.59 ± 1,5	P < 0.05
Assisted-laparoscopic using circle staplers	6.56 ± 0,84	

The length of time of oral feeding in the group of assisted laparoscopic surgery using circle staplers (Orvil) was longer than that in the group of total laparoscopic using linear staplers (Functional). The difference was significant (p < 0.05).

Table 7: Comparison of the time of oral feeding between patients classified by postoperative complications

Complications	The time of oral feeding				p
	≤ 2 days	3 days	4-5 days	> 5 days	
Pneumonia	0	0	0	1	0.610
Residual abscess after the surgery	0	0	1	0	
Wound infection	1	0	0	0	

There was no significant difference in time of oral feeding between patients with different complications (p > 0.05).

Table 8: The feeding time classified by time to first flatus

Time to first flatus	N	Feeding time	
≤ 48 hours	80	3.93 ± 1.89	P < 0.05
49 – 72 hours	38	5.13 ± 1.49	
> 72 hours	8	6.25 ± 1.91	

The more early the oral feeding time was, the more early the time to first flatus was and vice versa (p < 0.05).

Table 9: The feeding time classified by the duration of antibiotic therapy

The oral feeding time	N	The duration of antibiotic therapy	
≤ 2 days	35	6.29 ± 0.86	P < 0.05
3 days	11	6.64 ± 0.50	
4-5 days	37	8.30 ± 2.27	
> 5 days	43	9.23 ± 2.49	

The later the oral feeding was, the longer duration of antibiotic used was and vice versa (p < 0.05).

Table 10: The oral feeding time classified by hospital stay

The oral feeding time	N	Hospital stay	
≤ 2 days	35	6.31 ± 0.83	P < 0.05
3 days	11	6.64 ± 0.50	
4-5 days	37	8.65 ± 2.43	
> 5 days	43	9.91 ± 2.50	

The later the oral feeding time was, the longer duration of hospital stay was and vice versa (p < 0.05).

Discussion

The mean age of the population was 60.6 ± 11.1, ranging from 26 to 88 years. Male patients accounted for 73.8%, while 26.2% of patients were females. The male/female ratio was 2.8/1. The ages of gastric cancer patients were 62.7 – 64.8 years in Japan and 63.6 – 73 years in Europe and American [2, 3, 10]. The mean value of BMI of the study population was 20.29 ± 2.1 (14.7 – 25) kg/m^2.

The tumor location of patients who underwent total gastrectomy was at one-third upper (15.9%) and the middle (81.7%). There were 2.4% of cases having infiltrated ulcers. Among cases, 70.6% were adenocarcinoma and ductal carcinoma, 24.6% showed ring cell carcinoma, and 4.8% were mucous gland carcinoma. Tumor stages I, II, III were respectively 19.0%, 49.2%, 31.7%. Patients underwent total gastrectomy following the previous recommendation. These cases include tumors locating at the cardia or the body, infiltrated ulcers, the distance between the tumor margin and the cardia < 6 cm, tumor stage ≤ IIIc [3,10,11].

The surgical outcomes revealed 71.4% of cases were total laparoscopic total gastrectomy using linear staplers to produce functional end-to-end anastomosis by Roux-En-Y technique without dissecting the esophagus and jejunum. There were 28.6% of cases undergoing assisted laparoscopic surgery using circular staplers (Orvil) to produce end-to-side anastomosis by the Roux-En-Y technique. There was no case demanding open surgery transfer because of the incidents [3,10,11]. Among 126 patients, there was no case observing leak of esophagojejunal anastomosis and jejunojenunal anastomosis after the surgery in both cases of early and late oral feeding. The results were similar to previous studies showing no incident relating to the anastomosis in cases of early oral feeding [4 - 7].

There were 2.4% of cases having postoperative complications in which there was one case of a residual abscess below the left liver. This case was stable after the fluid was removed using an ultrasound-guided technique. The patient was discharged on the 13th date after the surgery. Another case with pneumonia on the fourth date was well treated by medicines and discharged on the 10th postoperative date. Regarding the case having wound infection, we performed suture removal and kept the wound open. Bandages were replaced every day. When the wound was stable, the wound was closed and the patient was discharged. There was no death case after the surgery. The complication rates reported in the literature in Europe and American ranged from 21 to 26% [2,3].
Our study showed that there was no relationship between the time of oral feeding and postoperative complications ($p > 0.05$), this result was accordant to previous studies in the world [4-7]. In addition, our study and other reports did not record any incidents relating to the leak of anastomosis as well as early oral feeding after the surgery.
The mean time of oral feeding was 4.4 ± 1.9 (2 – 8) days. Among cases, there were 27.8%, 8.7%, 29.4%, 34.1% of cases had respectively started the oral feeding since the second postoperative date, the third postoperative date, the fourth and fifth postoperative date, and after the fifth postoperative date. Jang et al. (2019) reported the average time of oral feeding was 2.1 ± 3.9 days, while Jeong et al. (2013) reported this value of 1.8 ± 1.8 days [5, 6].
The early oral feeding contributes to the enhancement of the treatment quality and quality of life of patients, promotes the recovery of digestive functions and early motor function, results in the early health recovery, reduces postoperative stress, postoperative complication rate, the duration of antibiotic therapy, hospital stay, and treatment cost [4, 5, 7].
If the oral feeding starts late, the recovery of digestive function and motor function, the health recovery are observed. That prolongs the duration of antibiotic therapy and the hospital stay, thus, increases the treatment cost [8, 9, 12, 13, 14]. Our study indicates the duration of hospital stay of 8.3 ± 2.5 (5 – 19) days. Besides, the results also showed that the more early the oral feeding started, the more early recovery of the digestive function was. This result was statistically significant ($p < 0.05$). The later the oral feeding started, the longer the duration of antibiotic therapy and hospital stays after the surgery observed. These results were also statistically significant ($p < 0.05$)

Conclusions

The early oral feeding in patients undergoing laparoscopic total gastrectomy was safe. That also promotes the treatment efficiency, the quality of life of gastric cancer patients, the early recovery of digestive function, and reduces the duration of antibiotic therapy as well as the hospital stay.

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