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Study on Endoscopic Insertion of the Enteral Feeding Tube for Patients with Anastomotic Impassability After Gastrectomy

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Abstract: We have investigated about the enteral feeding tube for anastomotic impassability caused by anastomotic inflammation, ulcer, failure after gastrectomy. Subjects: 67 patients who needed enteral feeding because of anastomotic impassability among 1865 patients after gastrectomy from gastric and duodenal ulcer, gastric carcinoma at Pyongyang Medical College Hospital of Kim Il Sung University and other hospitals from February 2007 to August 2015. Method: The aim is to place the enteral feeding tube into the jejunum. At first we inserted the upper gastrointestinal endoscope into the jejunum beyond the anastomotic site and pulled out the it after inserting the guide wire into jejunum through the endoscope. Then we inserted the enteral feeding tube into the jejunum following the guidewire and pulled out it either. Finally we confirmed it by radiography. Results: 71 insertions were applied for 67 patients, among them the number of successes was 67 (94.4%), and required time was 14.4±3.8min, the length of the guidewire inserted into the jejunum was 23.1±2.8cm. The gastric juice output of the patients with anastomotic inflammation and ulcer was 1218±181mL/d before insertion of the tube, but 0 mL/d after insertion. And it was 1218±181mL/d before insertion in anastomotic failure, and it decreased by 5.8±3.0mL/d on the 7th day after insertion. 2 patients (3.0%) underwent reoperation. Conclusion: This procedure is very high successful and takes a short time, can prevent the pooling of intragastric juice and reoperation.

Keywords: Enteral Feeding, Enteral Feeding Tube, Anastomotic Inflammation, Endoscopic Therapy

1. Introduction

Gastrectomy has become one of the frequent surgical treatments for the patients with pyloric constriction from gastric carcinoma, penetrating ulcer and duodenal ulcer in the area of gastroenterology.

Anastomotic inflammation and ulcer, anastomotic failure and araphia after gastrectomy are not frequent but they follow intragastric fluid retention and leakage by anastomotic impassability, disturbance of ingestion that worse healing of anastomotic inflammation and surgical wound, so the patients further undergo reoperation or can be critical.

Nasogastric tube is used for the purpose of depression in abdominal surgery, and if anastomotic impassability develops after gastrectomy, high calorie nutritional infusion can be applied and the severity of anastomotic failure becomes high, reoperation must be selected. By references placement of a stent made of shape-recovery alloy or a biolytic stent at the site of anastomosis is effective to its passage, but there was no reference about the endoscopic insertion of the enteral feeding tube.

We designed the endoscopic insertion of the enteral feeding tube to guarantee the passage of the anastomotic site with inflammation, ulcer, failure after gastrectomy and evaluated its efficacy.

2. Subjects

67 patients who needed enteral feeding because of anastomotic impassability and lots of output from the gastric tube and wound among 1865 patients after gastrectomy from

gastric and duodenal ulcer, gastric carcinoma at Pyongyang Medical College Hospital of Kim Il Sung University and other hospitals from February 2007 to August 2015. The enteral feeding tube was inserted by the procedure we designed.

Table 1. *Diagnosis of the patients.*

diagnosis	after surgery from gastric and duodenal ulcer	after surgery from gastric carcinoma	all
anastomotic inflammation	17	14	31 (46.3 %)
anastomotic ulcer	11	8	19 (28.3 %)
anastomotic failure	6	11	17 (25.4 %)
all	34	33	67 (100.0 %)

3. Methods

3.1. Preparation

Intra gastric contents must be cleared by using a gastric tube before the insertion of the enteral feeding tube. The endoscope we used was the type of OLYMPUS GIF-Q145, Q-160 and the enteral feeding tube was 10Fr in size. The length of the feeding tube was 120cm.

The guidewire was made by ourselves and its length was 2.5m, diameter was 2mm.

3.2. Procedures

(1) After insertion of the upper gastrointestinal endoscope into the stomach, the gastroenteroanastomotic site will be searched and the endoscope is inserted into the jejunum by 20cm from the anstomotic site.

(2) Then the guidewire is inserted into the jejunum through the biopsy hole of the endoscope under the condition of full endoscopic sight. And then the endoscope must be pulled out slowly with putting the guidewire unless it follows.

(3) After that the feeding tube is inserted following the guidewire until the tube reaches to the tip of the guidewire and then the guidewire is pulled out slowly.

(4) It can be evaluated as successful when the tip of the enteral feeding tube is inserted into the jejunum more then 20cm beyond the anastomotic site by radiography.

(5) Documentation

The gastric output before and after insertion of the enteral feeding tube is recorded. The endoscopic findings, the insertion length of the guidewire from the anastomotic stie and from the anterior teeth, the insertion length of the enteral feeding tube should be measured and recorded.

4. Results

The number of the patients was 67, the age (mean±SD) was 51.3±13.2 (28~78) years and the ratio of male to female was 51 to 16. The diagnosis of the patients was shown in table 1. 71 insertions were applied for 67 patients, among them the number of successes was 67 (94.4%). The success rate by the number of insertions of the endoscopic enteral feeding tube was shown in table 2.

Table 2. *The success rate of insertion of the enteral feeding tube.*

diagnosis	success rate		
	single insertion	double insertion	all
anastomotic inflammation (n=31)	30	1	31
anastomotic ulcer (n=19)	18	1	19
anastomotic failure (n=17)	15	2	17
All (n=67)	63 (94.0)	4 (6.0)	67 (100.0)

(): %

As shown in table 2, the success rae of single insertion of the enteral feeding tube by using the guidewire was 63 of 67 patients (94.0%), of double insertion was 67 of 67 patients (100.0%), so it was successful in all patients.

The required time to finish the procedure was 14.4±3.8 min in all the success patients and the insertion length of the guidewire for the enteral feeding tube was 23.1±2.8cm from the anastomotic site.

The tip of the enteral feeding tube was placed into the jejunum without any serious complication and enteral feeding was started safely in every case.

We observed the change in gastric output after insertion of the enteral feeding tube.

The gastric output in patients with anastomotic inflammation and ulcer before insertion of the feeding tube was 1138±161mL/d, but there was no gastric output after insertion (Table 3).

Table 3. *The change in the gastric output after insertion of the feeding tube.*

diagnosis	number	gastric output/mL·d^{-1}	
		before insertion (M±SD)	after insertion (M±SD)
anastomotic inflammation and ulcer	50	1138±161	0

And the gastric output in patients with anastomotic failure before insertion of the feeding tube was 1218±181mL /d, but the

gastric output became significantly decreased after insertion, so it reached even by 5.8±3.0mL/d on the 7th day (Table 4).

Table 4. *The change in the gastric output (mL/d)after insertion of the feeding tube.*

diagnosis	number	before insertion	1st day	3rd day	5th day	7th day
anastomotic failure	17	1218±181	285±34	122±27	53±16	5.8±3.0

2 of 67 (3.0%) patients were re-operated after insertion of the feeding tube for intestinal obstruction.

5. Discussion

From the results we could find out that the endoscopic insertion of the enteral feeding tube for the patients who need enteral feeding for anastomotic impassability after gastrectomy is very high successful and takes a short time, so it has become helpful for treatments.

Anastomotic inflammation and ulcer, anastomotic failure and araphia after gastrectomy are not frequent but they follow intragastric fluid retention and leakage by anastomotic impassability, disturbance of ingestion that worse healing of anastomotic inflammation and surgical wound, so the patients further undergo reoperation or can be critical.

The purpose of use of the nasogastric tube after abdominal surgery is to recover the function of the intestine rapidly and to prevent pneumonic complications. And it is also to prevent anastomotic failure and to get rid of inconvenience of the patients and to shorten the period of hospitalization.

Nelson investigated the efficacy of depression by a nasogastric tube and concluded that the patients who had used the nasogastric tube were recovered more rapidly compared with the patients without using the nasogastric tube, and there was no significant difference in developing of anastomotic failure between the two groups, so the depression by the nasogastric tube was ineffective and had no significance [1].

If anastomotic impassability develops after gastrectomy, high calorie nutritional infusion could be applied and the severity of anastomotic failure becomes high, reoperation should be selected [2, 3].

Kriwanek said that many researchers advocated the surgery as the first choice of treatment for patients with anastomotic failure with septic syndrome. But he said that infection by intestinal content made the healing of anastomotic failure delayed and good results were obtained after endoscopic insertion of coated self-dilation stents for such 2 patients and enteral feeding was possible after 6 days. The insertion of coated self-dilation stents is effective and low invasive for the patients with gastrojejunal anastomotic failure who can not undergo surgery [4].

Tanaka succeeded in the use of biolytic stents for 2 patients with benign gastrointestinal stricture in 2006 [5].

It is generally recognized that enteral feeding is more advantageous than transvenous nutrition. The main routes for enteral feeding are the stomach and the small intestine.

Scott said that enteral feeding is especially essential for patients after gastrointestinal surgery and after injury [6]. Tamazashvili applied enteral feeding for 60 patients after abdominal surgery and said that it is helpful for the correction of disturbance of gastrointestinal metabolism and the normalization of the intestinal mobility [7].

The nutrition for the seriously ill patients should be applied enterally first. Recent data shows that the morbidity and mortality of pneumonia has significantly decreased by introduction of enteral feeding within 24 hours. There are different procedures for endoscopic insertion of the enteral feeding tube and the standard procedure requires peroral endoscopy.

Günther Zick investigated about the placement of the postpyloric enteral feeding tube by a new pernasal endoscope for not only the endoscopic specialists but also ICU specialists and clarified that it is safe and high successful and makes early nutrition easy [8].

Atsunori Hashimoto said that enteral feeding is important for the seriously ill patients and applied the enteral feeding tubes for 40 patients from March 2008 to February 2009. He applied the enteral feeding tube by double pernasal endoscopy for patients who needed enteral feeding and reported the success rate of 100% without any misplacement within 24 hours [9].

It is said that the placement of the enteral feeding tube into the jejunum is not always more advantageous compared with gastric nutrition [10] but the function of the small intestine is usually preserved and gastric output is increased in the patients with anastomotic impassability after gastrectomy, so the jejunum is the just suitable position for enteral feeding.

Nowadays various methods for insertion of the postpyloric enteral feeding tube have been developed and used. There are a method using endoscopy and the other insertion of the feeding tube into the postpyloric site without using any special equipments, and there are many references about the success rate, efficacy [11, 12, 13, 14, 15].

But there are few data on endoscopic insertion of the enteral feeding tube for patients with anastomotic impassability after gastrectomy.

67 patients who needed enteral feeding because of anastomotic impassability

The number of the patients was 67, the age (mean±SD) was 51.3±13.2 (28~78) years and the ratio of male to female was 51 to 16.

71 insertions were applied for 67 patients, among them the number of successes into the jejunum was 67 (94.4%). It took 14.4±3.8min in the success cases, the length of the guidewire inserted into the jejunum was 23.1±2.8 cm.

The tip of the enteral feeding tube was placed into the jejunum without any serious complication and enteral feeding was started safely in every case.

We observed the change in gastric output after insertion of the enteral feeding tube. The gastric output in patients with

anastomotic inflammation and ulcer before insertion of the feeding tube was 1138±161mL/d, but there was no gastric output after insertion. And the gastric output in patients with anastomotic failure before insertion of the feeding tube was 1218±181mL /d, but the gastric output became significantly decreased after insertion, so it reached even by 5.8±3.0mL/d on the 7th day.

2 of 67 (3.0%) patients were re-operated after insertion of the feeding tube for intestinal obstruction.

6. Conclusion

Endoscopic insertion of the enteral feeding tube for patients with anastomotic impassability after gastrectomy is very high successful and takes a short time. It also can prevent the pooling of intragastric juice and decrease gastric output and guarantee early nutrition.

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â€¢ To evaluate other endoscopic techniques for Enteral Tube Feeding (ETF). World Laparoscopy Hospital. Routes of ETF. â€¢ Nasogastric â€¢ Nasoduodenal/jejunal â€¢ Gastrostomy â€“PEG, Balloon-type, button, PEGJ â€¢ Jejunostomy.Â â€¢ The decision to use a PEG feeding tube requires an in-depth assessment of the potential benefits to the individual. All patients in whom PEG feeding is proposed should be reviewed by a multidisciplinary team. (NCEPOD 2004). World Laparoscopy Hospital. Keywords. Gastrectomy, Jejunostomy, Feeding Jejunostomy Tube, Enteral Nutrition, Gastric Cancer. DOI: 10.4236/ojgas.2017.72007 February 15, 2017. K. Bazzi et al.Â An initial search identified 762 articles, after duplicates were removed, relating to the insertion of intraoperative jejunostomy tubes for gastrectomy patients (Figure 1). The titles were screened for appropriateness and 84 full text articles were assessed for eligibility. Five articles met the criteria for eligibility. Of the final 5 studies included, only one was a randomised control trial, with the other four being retrospective cohort reviews. The lack of high-quality data is demonstrated with four of the five studies carrying a CEBM level evidence of 4 (Tables 1-3). Background: Endoscopic submucosal dissection (ESD) for gastric cancer is increasingly performed worldwide due to its efficacy and safety. This study aimed to assess the evidence of the impact of early vs. delayed feeding after ESD on quality of care, which remains to be fully determined. Methods: Electronic databases (PubMed, the Cochrane Central Register of Controlled Trials, EMBASE) and the trial registries (the World Health Organization International Clinical Trials Platform Search Portal and ClinicalTrials.gov) were searched for studies performed prior to September 2020. Study selection, d Endoscopic resection has also been shown to be an adequate treatment for patients with early gastrointestinal cancers with no or limited submucosal involvement and no additional risk factors. However, certainty on the endoscopic and histological completeness of such resection is needed, in order to spare these patients from pointless surgical treatment. Most superficial gastrointestinal neoplasia may be treated by means of endoscopic mucosal resection (EMR). EMR is unsuitable for en bloc resection of lesions larger than 20 mm or of nonlifting lesions, as it does not permit adequate histologica