

“Fast Track” nasogastric decompression of rectal cancer surgery

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Abstract This study evaluates the application of fast track (FT) nasogastric decompression in patients who underwent anterior resection of rectal cancer. A randomized control trial was performed comparing the group with the fast track treatment ($n = 57$) and the group with traditional nasogastric decompression ($n = 84$). Preoperative characteristics and postoperative recovery indices were recorded and analyzed. The results indicate no significant differences in gender ($P = 0.614$), age ($P = 0.653$), tumor location ($P = 0.113$), and TNM stages ($P = 0.054$) were observed between the 2 groups. The differences in the type of resection, anastomosis, and adoption of protective colostomy were all not significant between the FT and the traditional group. During the first 24 hours after surgery, the volume of nasogastric drainage averaged 197 ml in the FT group and 155 ml in the traditional group ($P = 0.197$). The initiation of test-meal ($P = 0.000$), semiliquid diet ($P = 0.002$), and ordinary diet ($P = 0.008$) were all significantly shorter in the FT group. Furthermore, compared with the other group, the patients in the FT group enjoyed earlier removal of the abdominal drainage, urinary catheter, and shorter hospital stays ($P = 0.000$). Based on a correlation test, the duration of nasogastric decompression is related to the time of test-meal and semiliquid diet. The routine usage of nasogastric decompression in rectal surgery is unnecessary. The fast track procedure might help in facilitating postoperative functional and diet recovery, reducing the time of catheterization, and shortening hospital stay.

Keywords fast track; nasogastric decompression; rectal cancer; surgery

Introduction

Nasogastric decompression (NGD) is generally viewed as routine after gastrointestinal surgery for the past tens of years. According to related studies, postoperatively, the contractile activity of the small bowel rehabilitates rapidly within hours, followed by gastric propulsivity and colonic motility [1,2]. Considering the tendency of the swallowed gas and secreted liquid to result in bowel distention and to affect healing, treating the patient with a nasogastric tube (NGT) is reasonable. NGD is also reportedly effective in controlling nausea and vomiting, lowering the incidence of aspiration and pneumonia caused by gastrointestinal reflux, thus decreasing the occurrence of related wound complication and anastomotic leakage [3–5].

However, the recent concept of “fast track” advocated treatments facilitate faster recovery of gastrointestinal func-

tion, including early removal of the NGT [6–9]. In the current study, a randomized control trial is conducted on patients receiving anterior resection of rectal cancer, analyzing the difference in postoperative recovery between the fast track (FT) group and the traditional NGD group to present useful information for the clinical application of this fast track method.

Materials and methods

Studied patients

A total of 141 consecutive patients with biopsies showing rectal adenocarcinoma, who underwent anterior resection at the Department of Gastrointestinal Surgery, West China Hospital, Sichuan University from January 2007 to December 2007 were prospectively included. There were 83 male and 58 female patients, with an average age of 57.1 years (range: 25–79). Patients with recurrent or unresectable tumors, and those with tumors that infiltrated the anal canal were excluded.

Definition of related concept

In this study, the resection of the rectum below the peritoneal reflex is designated as low anterior resection (LAR). The procedure with colo-anal anastomosis is termed ultra-low anterior resection (UAR). For the nasogastric decompression of the included patients, the nasogastric tubes (NGT) in the FT group were removed consistently 24 hours after the operation. However, the NGT of the patients in the other group were continuously suctioned until signs of bowel motility were observed (i.e. flatus or defecation).

Randomization

Patients were numbered according to their chronological order of entering. Next, corresponding digit of the random digit table classified them into either of the 2 groups.

Statistical analysis

Data were analyzed using the SPSS 13.0 package. A chi-square test was used in crosstabs statistics. Pearson's coefficient was chosen for bivariate correlation analysis. Differences in continuous variables were analyzed by *t*-test. A *P* value of < 0.05 was considered significant.

Results

Clinical and pathological characteristics of included patients

No significant differences in gender ($P = 0.614$), age ($P = 0.653$), tumor location ($P = 0.113$), TNM stage ($P = 0.054$), surgical history ($P = 0.806$), and existing complications ($P = 0.691$) were observed between the fast track and the traditional nasogastric decompression group. For the surgical procedure, the differences in the type of resection, mode of anastomosis, and selection of protective colostomy were all not significant between the 2 studied groups. The details are shown in Table 1.

Postoperative recovery

No significant difference in the volume of nasogastric drainage was observed between the two groups ($P = 0.197$) within the first 24 h after surgery. For the FT group, all nasogastric tubes were removed after 24 postoperative hours, whereas the nasogastric tubes in the other group were removed at an average of 3.1 days after surgery ($P = 0.000$). In terms of the indices of postoperative gastrointestinal recovery, the initiation of the starting test-meal ($P = 0.000$), semi-liquid diet ($P = 0.002$), and ordinary diet ($P = 0.008$) were all shorter in the FT group. The average time of the removal of abdominal drainage and urinary catheter were both significantly shorter for the FT group ($P = 0.000$).

Table 1 Clinical and pathological characteristics of included patients

	FT group	Traditional group	<i>P</i> value
Gender			
Male	35	48	0.614
Female	22	36	
Age (year)	56.5±13.7	56.5±11.9	0.653
Tumor distance from anus (cm)	7.4±8.0	5.7±3.4	0.113
TNM stage			
I	8	19	0.054
II	20	38	
III	27	21	
IV	2	6	
Abdominal surgical history			
No	50	72	0.806
Yes	7	12	
Existing complications			
No	44	61	0.691
1	10	18	
2	3	4	
≥3	0	1	
Surgical procedure			
Ultra-low anterior resection	31	44	0.815
Anterior resection	26	40	
Colo-anal anastomosis			
No	46	61	0.271
Yes	11	23	
Protective colostomy			
No	50	73	0.887
Yes	7	11	
Postoperative wards			
Surgical ward	37	43	0.107
Intensive care unit	20	41	

Furthermore, the patients of the FT group also enjoyed a shorter postoperative hospital stay ($P = 0.000$). The details are shown in Table 2.

Relationship between NGD duration and postoperative recovery

Pearson's correlation analysis was also performed to clarify the relationship between the duration of nasogastric decompression and the recovery of gastrointestinal functions. Interestingly, no significant increase in the volume of NGD was observed in the traditional group with prolonged NGT application ($P = 0.311$). However, a relationship between the length of NGD installation and the starting of test-meal ($P = 0.000$) and semi-liquid diet ($P = 0.000$) was found. Furthermore, the time of removal of the abdominal drainage ($P = 0.000$), urinary catheter ($P = 0.000$), and postoperative hospitalized stay ($P = 0.001$) were all related to the length of NGD installation.

Table 2 Comparison of recovery indices between the 2 groups

	FT group	Traditional group	P value
Nasogastric drainage (ml) ^a	197.6±171.4	155.5±142.7	0.197
Removal of the NGD (day) ^b	1.000±0.000	3.1±1.3	0.000
Time of test meal (day)	2.5±1.0	4.4±2.1	0.000
Time of semiliquid diet (day)	4.1±1.9	5.8±3.0	0.002
Time of ordinary diet (day)	4.0±0.9	7.1±4.2	0.008
Removal of drainage tubes (day)	3.3±3.2	6.5±3.7	0.000
Removal of urinary catheter (day)	4.1±2.2	6.6±3.5	0.000
Postoperative hospitalized time (day)	9.2±4.6	12.8±5.6	0.000

a The volume of nasogastric drainage of the first 24 h, postoperatively.

b Nasogastric decompression.

Table 3 Pearson correlation test of recovery indices with the duration of NGD^a

Recovery indices	Pearson correlation	P value
Nasogastric drainage (ml) ^b	0.105	0.311
Time of test meal (day)	0.597	0.000
Time of semiliquid diet (day)	0.390	0.000
Time of ordinary diet (day)	0.390	0.066
Removal of drainage tubes (day)	0.425	0.000
Removal of urinary catheter (day)	0.343	0.000
Postoperative hospitalized time (day)	0.276	0.001

a Nasogastric decompression.

b The volume of nasogastric drainage for the first 24 postoperative hours.

Discussion

For nearly 300 years, nasogastric tubes have been used to evacuate the contents of the upper digestive tract. The treatment is useful in decreasing abdominal distension, relieving nausea and vomiting, while serving as a marker for gastrointestinal hemorrhage. In the past century, it was widely accepted as routine for abdominal operations [10]. However, controversies regarding the necessity of such intervention for all abdominal operations, especially in the lower digestive tract, have arisen [11]. Bauer *et al.* reported that the patients felt more comfortable and easy without nasogastric tubes, while no increase in the incidence of complications, such as pulmonary infection, anastomotic leakage, and wound rupture, were observed [12]. This was recently supported by another study of Li *et al.*, which concluded that routine prophylactic nasogastric decompression after radical gastrectomy is unnecessary through the comparison of postoperative variables between groups [13].

Consistent with Bauer, Cheatham *et al.* reported that, although the incidence of nausea and abdominal distension was lower in patients with NGD, the occurrence of postoperative complications and hospitalized time did not differ [14]. Cochrane systemic assessment of the same topic reported faster recovery of gastrointestinal function and

less pulmonary infections in patients without NGD, while the incidence of wound complication (rupture, hernia) is similar. Thus, a selective usage of nasogastric tube is advocated for better outcomes [2–5].

Concerning colorectal diseases, Wolff *et al.* performed a randomized control trial and claimed that NGD is not essential in most colorectal procedures [15]. Otchy *et al.* reported that no significant difference in the incidence of incisional hernia was observed between the group with nasogastric tube and the group without [16]. A survey of colorectal surgeons from 5 countries in Northern Europe, performed in 2003 by Lassen *et al.*, found that most surgeons insisted on the early removal of NGT for better postoperative recovery [17]. Recently, Zhou *et al.* claimed that routine NGD may lead to postoperative fever and pulmonary infection, thus increasing the occurrence of laryngopharyngitis [18]. In terms of the timing of NGT removal, a survey performed by Roig *et al.* reported that 16% of surgeons chose to remove it within 24 h of surgery, whereas 9% favored a little later, and 51% would wait until peristalsis starts [19]. Compared with the study in 1996, the surveyed surgeons also reported less NGD usage in 2008.

To investigate the value of nasogastric decompression in lower rectal surgery, we examined the recovery indices in patients who underwent low and ultra-low anterior resection of rectal cancers. As shown in the results, the patients in the FT group experienced early recovery of diet, early removal of abdominal drainage and urinary catheter, resulting in shorter hospital stays. This might be explained by the reduction of discomfort because of the absence of an NGT, which helps in the early recovery of bowel movement. Moreover, no relationship between the volume of nasogastric drainage and other recovery indices was observed. The result suggests that traditional gastrointestinal decompression, usually viewed as effective in evacuating gas and fluid of the upper digestive tract, failed to help in the recovery of gastrointestinal function. Furthermore, the earlier removal of NGTs and recovery of diet might facilitate the early removal of abdominal drainage and urinary catheters, leading to early discharge. To our knowledge, the shorter hospitalizations

might have resulted from the early recovery of diet, which helped in the absorption of nutrition, thereby increasing the energy supply for synthesis while reducing the chance of ileus and the risk of postoperative complications [20–22].

In conclusion, routine nasogastric decompression might be unnecessary for the majority of patients undergoing rectal surgery. Fast track treatment helps in the recovery of postoperative digestive function, reducing the time of catheterization, and ultimately shortening hospital stay.

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