



Original article

Application of fast track surgery in routine nursing for patient with colorectal cancer

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ABSTRACT

Objective: To investigate the clinical effect of fast track surgery (FTS) in perioperative nursing of colorectal cancer surgery. **Background:** In recent years, many complicated surgery began to develop in the direction of low invasion and short hospital time, which provides an unprecedented opportunity for the development of fast track surgery (FTS). **Methods:** According to different nursing measures, 156 cases of colorectal cancer patients treated in our hospital were divided into FTS nursing group (86 cases) and traditional nursing group (70 cases). FTS nursing care and traditional nursing care were respectively employed to analyze and compare postoperative recovery and complications of the two groups. **Results:** FTS nursing group was significantly shorter than the traditional care group in terms of the first postoperative exhaust time, the first defecation time, the first eating time, ambulation time and postoperative hospital time, with statistical significance ($P < .05$); compared with the conventional nursing group, FTS group significantly had lower incidence of postoperative intestinal obstruction, lower limb vein thrombus formation and gastrointestinal discomfort, with statistical significance ($P < .05$); FTS group has less situations of nausea and vomiting, incision infection, pulmonary infection, urinary tract infection and anastomotic leakage compared to the conventional nursing group. **Conclusion:** FTS nursing can effectively promote the postoperative recovery of intestinal function for patients with colorectal cancer and reduce the occurrence of postoperative complications, which will relieve postoperative pain and shorten the length of stay, giving patients increased rehabilitation quality.

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At present, colorectal cancer is one of the most common gastrointestinal tumors in clinical practice. According to the statistics, there are at least 3–5 million new malignancies in China, 60% of which are gastrointestinal cancer with a rising incidence year by year (Xie et al., 2010). Fast track surgery (FTS) uses a series of optimization measures with evidence-based medical evidence for perioperative management, to reduce the physical and psychological traumatic stress of surgical patients, so that patients can quickly recover (Jiang et al., 2007). Prominent perioperative nursing effect of the concept has been confirmed in patients with colorectal cancer. With rehabilitation indicators, quality of care superior to those of conventional care (Liu et al., 2011; Liu, 2010), it has been widely used. In recent years, many complex surgeries have begun to

develop in the direction of low invasion and shortened hospital hours, which also provides an unprecedented opportunity for the development of FTS. FTS application in colorectal cancer is also getting more mature, which not only can reduce preoperative tension, intraoperative stress response and the incidence of postoperative complications, but also promote the recovery of patients as a unanimously recognized approach by the patients and their families. In this paper, application effect of FTS on colorectal cancer patients treated in our hospital will be studied.

1. Materials and methods

1.1. General information

The colorectal cancer surgery patients treated in our hospital during January 2013–January 2016 were collected. Inclusion criteria: (1) confirmed by pathology as colorectal cancer; (2) patients were informed. Exclusion criteria: (1) patients with history of mental illness; (2) patients with psychotropic drugs in the last three months; (3) patients with palliative resection; and (4) patients

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with other severe visceral organ diseases. In this study, a total of 156 cases were observed, including 87 males and 69 females. Aged 32–76 years, the patients were in the mean age of 52.4 years. There being no significant differences between the observation group (86 cases) and the control group (70 cases) in sex, age, medical history and surgical methods, the results are comparable.

1.2. Methods

Conventional nursing group and FTS group respectively adopted conventional nursing methods and FTS method for care, the specific program is as follows:

1.2.1. Preoperative care

- (1) Psychological care the two groups of patients were given with a certain psychological care to reduce the psychological pressure of patients and enhance coordination.

FTS group patients were introduced with perioperative treatment, care related knowledge, in addition to detailed FST relevant knowledge, including (1) possible time for various stages of recovery; (2) various recommendations to promote rehabilitation; (3) recommendations and measures to encourage early oral feeding and off-bed activities. Meanwhile, patients and their families should be clearly informed of the possible complications of surgery to better actively cooperate with the treatment.

- (2) Preoperative preparation

The conventional nursing group was fasted for food and water for 24 h and 4 h respectively. The 3000 ml 5% mannitol was used for intestinal cleaning 1 day before surgery. Enema cleaning by anal and stomach tube insertion was performed for patients with intestinal obstruction.

FTS group was fasted for food and water for 6 h and 2 h respectively. The patients were instructed to drink 800 mL fluid 6 h before surgery, excluding gas-producing food like milk, soy milk. The patients drank 250 mL 12.5% glucose solution 2 h before surgery. There was no routine mechanical bowel preparation. Only enema was used to promote defecation, enema cleaning was only performed for low rectal surgery patients one night before surgery, and routine stomach tube insertion was excluded.

1.2.2. Intraoperative care

For the conventional nursing group, intraoperative body temperature was not protected.

For the FTS group, the temperature of input liquid and blood products was constant at 37 °C, operating room temperature was maintained at 25 °C, body cavity rinse liquid temperature was maintained at 37 °C, and inflatable blanket was used to keep patients warm.

1.2.3. Postoperative care

- (1) Postoperative analgesia

The conventional nursing group took opioid analgesics to relieve pain, while FTS group had epidural or intravenous placement of analgesic pump, or orally took non-opioid analgesics on a regular basis.

- (2) Diet care

The conventional nursing group was fasted for food and water after the surgery. Appropriate water could be drunk after anus

exhaust, which could transit from ordinary fluid to semi-liquid food step by step.

FTS group drank a small amount of warm water or about 50 mL warm saline 6 h after awakening up, ate a small amount of fluid the first day after the surgery, ate semi-liquid food the second day after the surgery, with intake gradually increased. Meanwhile, the patients had chewing gum 3 times a day.

- (3) Early postoperative activity

Early activities are emphasized for both conventional nursing group and FTS group. Early self-activity is encouraged for FTS group: limbs stretching and rollover movement after postoperative anesthesia awareness, sitting on the bed 12 h after the surgery, walking around the bed 24 h after the surgery, and normal activities 48 h after the surgery.

- (4) Catheter disposal

The average postoperative retention for conventional nursing group is 3–5d, while the catheter is removed immediately after postoperative awakening for FTS group and removed 2–3d after lower rectal surgery.

1.3. Evaluation indicators

Observe and record first postoperative exhaust time, first defecation time, ambulation time, first eating time, postoperative hospital time and postoperative intravenous infusion time; nausea and vomiting, incision infection, urinary tract infection, pulmonary infection, intestinal obstruction and lower limb vein thrombosis formation, anastomotic leakage, re-admission rate of the two groups.

1.4. Statistical method

Data were analyzed with statistical software SPSS22.0, with results indicated as ($\bar{x} \pm s$). The numerical variables were tested by *t* test, and the rate comparison was tested by χ^2 . $P < .05$ indicates significant significance in difference.

2. Results

2.1. Comparison of postoperative recovery between the two groups

The recovery of the two groups is shown in Table 1. Except postoperative infusion time, the FTS group needed significantly lower time than the conventional nursing group in terms of first postoperative exhaust time, first defecation time, first eating time, ambulation time and postoperative hospital time, and the comparison is statistically significant ($P < .05$).

2.2. Comparison of postoperative complications between the two groups

The incidence of postoperative complications in both groups is shown in Table 2. The incidence of postoperative intestinal obstruction, lower limb vein thrombosis formation and gastrointestinal discomfort was significantly lower in FTS group compared with control group, with a statistically significant difference ($P < .05$); and the incidence of nausea and vomiting, incision infection, pulmonary infection, urinary tract infection and anastomotic leakage was lower in varying degrees in FTS group compared with the control group, but without statistical significance ($P > .05$).

Table 1
Postoperative recovery of the two groups ($\bar{x} \pm s, d$).

Group	Case number	First postoperative exhaust time	First defecation time	First eating time	Ambulation time	Postoperative infusion time	Postoperative hospital time
Control group	70	4.0 ± 0.6	4.9 ± 0.8	3.7 ± 0.8	2.9 ± 0.7	12.0 ± 1.8	14.5 ± 2.6
FTS group	86	2.7 ± 0.4**	3.6 ± 0.7*	1.5 ± 0.5**	1.3 ± 0.3**	6.1 ± 2.2	8.1 ± 1.5**

* Indicates that comparison with the control group, $P < .05$.

** Indicates that comparison with the control group $P < .01$.

Table 2
Incidence of postoperative complications in the two groups [case, (%)].

Observation index	FTS group (86)	Control group (70)	X ²	P value
Nausea and vomiting	4(4.7%)	7(10%)	1.69	0.19
Incision infection	5(5.8%)	6(8.6%)	0.45	0.50
Pulmonary infection	1(1.2%)	4(5.7%)	2.58	0.11
Urinary tract infection	5(5.8%)	7(10%)	0.95	0.33
Intestinal obstruction	2(2.3%)	8(11.4%)	5.33	0.02
Lower limb vein thrombus formation	3(3.5)	10(14.3%)	5.89	0.02
Anastomotic leakage	2(2.3%)	2(2.9%)	0.04	0.84
Gastrointestinal discomfort	1(1.2)	6(8.6%)	4.94	0.03

3. Discussions

Fast track surgery aims to use a series of optimal measures with evidence-based medical evidence for perioperative treatment, to reduce physical and psychological traumatic stress of surgical patients and achieve rapid rehabilitation purposes (Li, 2007; Kehlet and Wilmore, 2002). FTS concept is greatly different from traditional concept, bringing greater impact and change to surgical treatment.

For colorectal cancer surgery, the traditional concept holds that conventional preoperative bowel preparation such as enema cleaning is needed. However, the latest study found that excessive bowel preparation will lead to intestinal flora imbalance, destroy intestinal natural barrier, and thus increased probability of postoperative abdominal infection. Meanwhile, long-time fasting of food and water can lead to dehydration, causing water and electrolyte balance disorders, which is not conducive to postoperative rehabilitation and nutritional status improvement (Zhang et al., 2010). Studies have reported that mechanical enema will lead to dehydration and increase the incidence of postoperative intestinal edema and intestinal paralysis (Slim et al., 2004); causing intestinal bacterial ectopic, significantly increasing the incidence of postoperative abdominal infection and anastomotic leakage (Pang, 2008). Moreover, premature fasting of food and water will easily lead to hypoglycemia and increased surgical stress response (Soop et al., 2001). Soop et al. (Yamada et al., 2012) demonstrated that 800 ml of sugar-containing beverages before midnight or 400 ml 2–3 h before the surgery would reduce preoperative hunger, thirst and anxiety, and significantly reduce postoperative insulin resistance. In this study, FTS group was not routinely and strictly prepared for intestine, fasted for food 6 h before surgery and took 12.5% glucose solution 2 h before surgery. The results showed that FTS group had significantly reduced incidence of complications like intestinal obstruction, lower limb vein thrombosis formation and gastrointestinal discomfort. In conventional nursing concept, body temperature protection of intraoperative patients has not been concerned, and too much emphasis is given to the role of drainage tube.

FTS concept holds that intraoperative low body temperature is not conducive to wound healing and will increase the risk of infection, and that placement of stomach tube and catheter itself is a bad stimulus. Patients' surgical site is exposed during surgery, so anesthesia and surgery will increase the body heat dissipation, and intraoperative body cavity washing with unheated rinse

solution and input of low temperature liquid and blood products can lead to lower body temperature which will result in incidence of complications such as blood coagulation disturbance, prolonged wound healing time, increased infection, decreased drug metabolism (Zhong et al., 2010). In this study; room temperature, input liquid and blood products, body cavity rinse solution were maintained at a constant temperature, greatly reducing the incidence of postoperative complications. Meanwhile, irregular placement of stomach tube and immediate removal of catheter are important factors for better recovery of FTS group patients. Zhong et al. (Yang and Li, 2010) held that to accelerate rehabilitation nursing, colorectal cancer patients should be encouraged to refuse preoperative stomach tube placement and resume diet as soon as possible after surgery. Stomach tube only plays a role of emptying stomach during surgery, which is difficult for it to effectively reduce intestinal pressure and prevent anastomotic breakage, but adversely increase complications such as patient discomfort instead. Urinary catheter should be removed as soon as possible after surgery, as catheter retention can increase patient's discomfort, affect early postoperative activities, and increase the chance of urinary tract infection. Studies show that (Soop et al., 2004; Gao, 2017a,b), catheter retention will not only increase the risk of urinary tract infection, but also significantly affect patients' postoperative activities, increase patients' psychological disorder in postoperative rehabilitation, thereby affecting patients' postoperative rehabilitation.

Postoperative nursing is also essential for recovery of colorectal cancer patients. In conventional nursing, opioid analgesics are adopted for pain killing, patients are encouraged but not actively instructed to take early activities, they can only gradually drink, eat after anal exhaust. These measures are not conducive to patient rehabilitation. For instance, opioid analgesics can easily lead to nausea, vomiting, fatigue, inhibition of gastrointestinal motility, while postoperative fasting can easily cause thirsty, throat pain and stomach discomfort. In this study, FTS group orally took non-opioid analgesics with analgesic pump, which not only reduced patients' pain, but also effectively alleviated the side effects such as intestinal palsy. Meanwhile, the FTS group could drink a small amount of warm water or warm saline 6 h after awaking, and take chewing gum 3 times a day, which reduces stress response and postoperative complications, thereby reducing hospital stay and hospital costs. Early postoperative activity is also an important part of FTS nursing. Studies have shown that bed rest will lead to weakened or disappeared muscle strength, and even

cause lung injury, deep vein congestion and thrombosis (Gao, 2017a). Although the conventional nursing group encourages patients to carry out early activities, specific activity program is not provided, so that patients passively take activities, and fail to achieve good results. Nevertheless, FTS group developed a scientific activity program: limbs stretching and rollover movement after postoperative anesthesia awareness, sitting on the bed 12 h after the surgery, walking around the bed 24 h after the surgery, and normal activities 48 h after the surgery. This helps reduce complications, shorten patients' infusion time and hospital stay.

In summary, this study compared perioperative management of colorectal cancer patients. The results show that application of fast track surgery can effectively promote colorectal cancer patients' postoperative intestinal function recovery, reduce postoperative complications, reduce patients' pain and shorten the hospital stay, so that the quality of rehabilitation is significantly improved.

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