The application of fast-track surgery in the perioperative nursing of gastrointestinal surgery patients

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Abstract: Objective: This study aimed to explore the clinical application effects of fast-track surgery (FTS) in patients undergoing total gastrectomy during the perioperative period, to provide a foundation for the application of FTS during the gastrointestinal surgery perioperative period. Methods: A total of 50 gastric cancer patients undergoing total gastrectomy were selected as clinical research objects. 25 of the patients were nursed routinely as a control group, and 25 patients were nursed as an observation group following instructions based on fast-track surgery. The two groups’ intraoperative blood loss, operation times, drainage tube extubating times, and C-reactive protein content at 3 days after surgery were analyzed and compared. Their differences in the first anal exhaust times, intestinal sound recovery times, hospitalization times, operation costs, and postoperative complications were also evaluated and recorded after surgery. Results: Both groups were cured and discharged smoothly. Compared with the control group, the observation group showed significantly better performance in intraoperative blood loss, drainage tube extubating times, and C-reactive protein content at the third day after surgery (all P<0.001), and there was no significant difference between the two groups in operation times (P>0.05). The observation group nursed under instructions based on FTS experienced a significantly earlier first anal exhaust, a faster recovery of intestinal sound, and a shorter hospitalization time, showed a lower postoperative complication rate, and had significantly lower operation costs than the control group (all P<0.05). Conclusion: Because it is able to reduce intraoperative trauma and complications, speed up the postoperative recovery rate, and improve the treatment satisfaction of patients, FTS has definite clinical value and safety for patients with gastric cancer undergoing total gastrectomy during the perioperative period.

Keywords: Fast-track surgery, gastrointestinal surgery, total gastrectomy, perioperative period, clinical application effect

Introduction

In recent years, with a rapidly increasing incidence and a high lethality, gastric cancer has become the fourth most common malignant tumor in the world [1, 2]. China is one of the countries with a high incidence of gastric cancer, whose gastric cancer patients account for more than 1/3 of those throughout the world [3]. Therefore, the treatment and nursing of gastric cancer are key issues for medical workers.

Many clinical data have shown that perioperative nursing for patients during surgery has an important impact on the patients’ postoperative rehabilitation and reduction of complications [4]. With the development of the new Western concept of surgical treatment, fast-track surgery (FTS) has been gradually popularized and tried in China, and it has been accepted and recognized by many medical institutions and medical staff [5, 6]. FTS is an evidence-based medicine concept rather than a traditional perioperative nursing concept without sufficient supporting evidence. It is patient-centered and focuses mainly on the perioperative rehabilitation indicators of patients [7]. Recent studies on FTS during the perioperative periods of different surgeries found that patients nursed under FTS experienced faster postoperative rehabilitation with fewer complications and less hospitalization time [8].
Although FTS has demonstrated a good clinical application effect, it is still at the initial stage of development, and the study of its clinical application needs to be further improved, so there are certain internal and external constraints for it [9]. This is especially true because there are few studies on its application during the perioperative period of gastrointestinal surgery. Therefore, this study aimed to explore and evaluate the nursing effects of FTS in gastrointestinal surgery (total gastrectomy for gastric cancer), to provide the basis and a reference for its subsequent clinical application in gastrointestinal surgery.

**Materials and methods**

**General data**

A total of 50 patients with gastric cancer undergoing total gastrectomy in Shanxi Provincial People’s Hospital from June 2014 to June 2018 were chosen as research objects. 25 of the patients were nursed routinely during the perioperative period as a control group, and, as an observation group, 25 of the patients were nursed following instructions based on fast-track surgery. The patients were randomly divided into these groups without considering their gender, and the patients in the two groups were operated on by the same group of operating personnel and anesthetists. The study was approved and filed by the Ethics Committee of Shanxi Provincial People’s Hospital.

**Diagnostic and inclusion criteria**

Patients meeting all the criteria below were included: patients between 18 and 70 years old and diagnosed with gastric cancer based on a gastroscopy; patients without distal organ or lymph node metastasis based on a B-ultrasound scan, chest film, and CT detection before treatment; patients who had not received anti-tumor treatment such as radiotherapy or chemotherapy before; patients without severe organ diseases; patients suitable for a total gastrectomy, and patients who had obtained consent from their families based on communication and who signed an informed consent form. Patients with poor compliance or mental diseases and those whose surgery failed were excluded.

**Treatment methods**

Patients in the control group were nursed in a traditional way, including receiving notification of perioperative precautions, and bowel preparation before surgery (fasting for 12 h and water deprivation for 6 h before surgery). A feeding tube and a gastric tube were placed into each patient in the group whose urinary catheter was indwelt after general anesthesia during surgery, and a drainage tube was placed at the duodenal stump in each of them. After surgery, the patients’ drainage fluid was evaluated, and if their drainage fluid was normal, their drainage tubes were extubated at 3-5 days after surgery, and their urinary catheters were extubated at about 2 d after surgery. The patients were infused with 3500 ml of fluid each day, and their gastric tubes were extubated after anal insufflation. After surgery, the patients’ pain was relieved through analgesia pumps, and they were advised to begin physical activity 1 day after surgery.

The patients in the observation group were nursed under FTS as follows: (1) the nursing staff fully communicated with the patients before surgery to explain in detail the basic mode of FTS, the possible outcomes and the coping strategies. The nurses relieved their anxiety, dispelled all doubts, and answered all their questions earnestly to strengthen the trust between them and doctors. The patients were instructed to perform breathing exercises five times a day for the lungs 2 days before the surgery, and they were given liquid food 1 day before the surgery, and as appropriate, a 10% warm glucose solution 2 h before surgery to maintain satiety. (2) The operating room temperature was adjusted to around 25°C before the operation to maintain the patients’ body heat. The temperatures of the normal saline for the abdominal cavity flushing and the infusion solution were maintained at about 37°C using a warming device. The anesthesia was performed using the general anesthesia and combined spinal-epidural method. The patients were operated on without any gastric tube insertion, just with a feeding tube to the gastric area before anesthesia that was appropriately adjusted to the jejunum during surgery. (3) The patients were given warm glucose saline through a feeding tube on the 1st day by gradually adding it, and they were given liquid food at
4 d to improve the recovery rate of their gastrointestinal function. The urinary catheter was extubated at 6 h after surgery, and the drainage tube was extubated at 2 h after surgery when the drainage fluid was normal and less than 50 ml. After the surgery, the patients were encouraged and guided to get out of bed as soon as possible, encouraging activity. Within 48 h after the surgery, the patients were continuously treated with extradural administration of drugs for pain relief [10].

Observation indexes

Intraoperative blood loss, the operation times, the drainage tube extubating times, and the C-reactive protein content at 3 d after surgery in the two groups were analyzed, and their first exhaust times, and their intestinal sound recoveries after surgery, hospitalization times, operation costs and postoperative complications were also analyzed and recorded.

Data statistics and analysis

The statistical software SPSS 13.0 was adopted for the data analysis. The enumeration data (n, %) were checked using χ², and the ranked data were checked using a rank sum test. The measurement data in the normal distribution were expressed as the means ± standard deviation (X ±sd), and the comparisons between the groups were analyzed using an independent t test. P<0.05 indicated a significant difference.

Results

General clinical data of the patients in the two groups

There were no significant differences between the two groups in terms of the general clinical data, including gender, age, weight, and the severity of illness (all P>0.05) (see Table 1).

Technical indexes during surgery

Both groups were cured and discharged from the hospital smoothly. The observation group lost less blood during the operation and experienced an earlier extubating of the drainage tube than the control group (all P<0.001), and the two groups had no significant differences in their operation durations (P>0.05). See Table 2.

C-reactive protein content of the two groups after surgery

Fasting blood was sampled from each patient in the two groups on the morning of the 3rd day after surgery for the C-reactive protein determination. As can be seen in Figure 1, the control group showed significantly higher C-reactive protein content than the observation group (P<0.001). See Figure 1. It suggested that the FTS intervention had a direct influence on the patients undergoing total gastrectomy and could effectively control the risks of wound inflammation and infection.

Table 3 shows that the observation group under FTS experienced significantly earlier first exhaust times and faster recoveries of intestinal sound than the control group (both P<0.05).

Social indexes about postoperative recovery of the two groups after surgery

The patients' recovery status after treatment was the core index for clinical success, and treatment costs and discharge times were also important aspects that need to be paid attention to. In this study, the observation group under FTS showed significantly better performance than the control group under routine nursing in terms of both hospitalization times and operation costs (P<0.01). See Table 4.

Postoperative complications of the two groups

The postoperative complications of the two groups were evaluated, and it was found that the control group showed a complication rate of 6/25, with 1 patient suffering abdominal distension, 1 suffering nausea, 1 suffering lower
In the observation group, the complications included 1 limb vein thrombus, 1 suffering wound infection, and 2 suffering pulmonary infections. The observation group showed a complication rate of 1/25, with only 1 patient suffering nausea and vomiting. The control group showed a significantly higher complication rate than the observation group (P<0.05), which indicated that nursing under FTS was obviously effective in lowering the complication rate and was conducive to the patients’ rapid recovery in the later stages. See Table 5 and Figure 2.

Discussion

With the continuous improvement of domestic healthcare, traditional nursing concepts or empirical nursing methods can no longer meet patients’ high requirements, so FTS began to be practiced, and it has been recognized and applied by more and more hospitals [11].

FTS aims mainly to reduce stress, and lower treatment risks and the complication rate, in order to speed up patients’ recovery. Common measures for FTS include comprehensive health education before surgery, nutritional support during the perioperative period, non-special bowel preparation, the reduction of pressure relief measures for gastric tubes, early food-taking and ambulatory activity after surgery [12, 13]. Some scholars believe that FTS is effective during the perioperative period of gastrointestinal surgery, and nursing based on FTS can significantly lower the postoperative complication rate and improve patients’ prognosis [14, 15].

Patients undergoing surgical treatment usually suffer from different degrees of anxiety and fear due to the disease or worry about the surgery itself, which will aggravate their adverse stress reactions and affect their postoperative recovery. A study by Yun et al. reported that most patients faced an increased surgery risk and an increased complication rate due to their nervous and behavioral abnormalities caused by fear [16]. This study adopted an FTS mode to nurse patients, and it turned out that patients undergoing total gastrectomy under FTS had a lower stress response, a higher postoperative rehabilitation rate, and a lower complication rate than the control group. This may be true, since those patients were targeted and nursed upon admission in terms of the pre-admission education, psychological nursing, and detailed instruction of disease and surgery plan, which helped them fully understand their disease, relieved their fear of the disease, and reduced their psychological stress reaction.

FTS holds that premature gastrointestinal preparation before surgery has no obvious clinical significance in reducing anastomotic leakage. A study by Zmora found that it was safer to adopt a simplified bowel preparation plan for patients undergoing colonic anastomosis, and this plan had no direct effect on the postoperative complications [17]. In addition, a study by Sakurai et al. considered that conventional premature fasting before surgery was not conducive to a smooth operation and was not as good as preoperative glucose supplementation for patients in intestinal evacuation [18]. This study found

<table>
<thead>
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<th>Groups</th>
<th>Number of cases</th>
<th>Intraoperative bleeding volume (ml)</th>
<th>Operation time (min)</th>
<th>Drainage tube extubating time (d)</th>
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<tr>
<td>Control group</td>
<td>25</td>
<td>288.54±59.32</td>
<td>137.24±20.55</td>
<td>7.22±1.16</td>
</tr>
<tr>
<td>Observation group</td>
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<td>131.44±18.73</td>
<td>5.14±1.23</td>
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<tr>
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<td></td>
<td>&lt;0.001</td>
<td>0.302</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

**Table 2. Comparison of the technical indexes during surgery**

**Figure 1.** The C-reactive protein content of the two groups after surgery. *** indicates P<0.001 compared to the control group.
that patients nursed under FTS who did not do the traditional intestinal preparations such as fasting 12 hours before the operation did not have severe complications, and they showed a significantly lower complication rate than the patients in the control group who had done the conventional intestinal preparation, which indicated that patients who were not deprived of food could better maintain their body state and have a lower stress response.

Recent studies indicated that patients could recover their intestinal digestive ability within half an hour after surgery, and early-stage feeding after surgery could increase gastrointestinal peristalsis and facilitate intestinal recovery [19]. In this study, the observation group, which was nursed through preoperative energy supplement and early-stage feeding based on FTS, showed better physiological and social indexes and a higher postoperative rehabilitation rate than the control group, and the group showed a good spiritual state, which indicated that FTS had a prominent clinical nursing effect and a definite clinical value for patients during the perioperative period of gastrointestinal surgery. In addition, this study took measures to maintain and control temperature and took effective measures for anesthesia and pain relief during surgery, and it also developed exercise plans for early ambulatory activity for the patients, so the patients showed more ideal physiological indexes, an enhanced confidence of overcoming disease, and a significantly decreased complication rate, which was consistent with the application results of FTS in an esophageal operation and a venous thrombosis operation reported by Wang, Venclauskas, and others [20, 21].

There are some problems in this study, such as the small sample size and the short follow-up time. In the future, the application of FTS during the perioperative period of gastrointestinal surgery will be further studied by expanding the scope of research based on ensuring scientific nursing, and improving the nursing level, in order to provide empirical support for the clinical promotion of FTS.
To sum up, FTS has definite clinical value and safety for the perioperative nursing of gastrointestinal surgery (total gastrectomy for gastric cancer). Compared with traditional nursing modes, FTS can better reduce intraoperative trauma and complications, speed up the postoperative recovery rate, and improve patients’ treatment satisfaction.

Disclosure of conflict of interest

None.

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References


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