Researching progress of the fast-track surgery model in perioperative nursing of patients with esophageal cancer

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Keywords: Fast-track surgery (FTS); esophageal cancer; perioperative period; nursing; research progress

Received: 12 October 2022; Accepted: 29 November 2022; Published: 30 December 2022.

doi: 10.21037/amj-22-55

View this article at: https://dx.doi.org/10.21037/amj-22-55

Esophageal cancer is one of the most common digestive tract tumors in China. In the past two decades, the global incidence of esophageal cancer increased by more than 50%. There are many treatments for esophageal cancer, such as surgical resection, radiation therapy, chemical therapy, and biological therapy. However, surgical treatment is still the main treatment for resectable esophageal cancer. In the past two decades, although the mortality has decreased by 5–25%, the postoperative complications remained at a high level of 45–80% even in the specialized treatment center after surgical resection of esophageal cancer (1,2). With the promotion and application of endoscopic technology in the field of surgery, thoracoscopy and laparoscopy combined with radical resection of esophageal cancer have gradually developed. The main advantage of this combined surgical process is that it maintains the integrity of the thorax and abdomen, has little trauma, has little impact on respiratory function, has less postoperative pain than other surgical methods, has a quick recovery time, and has fewer postoperative respiratory complications than other common surgery techniques. At the same time, lymph node dissection under endoscopy is more complete and also in line with the principles of oncology.

Fast-track surgery (FTS), also known as enhanced recovery after surgery, is a multidisciplinary collaboration including anesthesiology, surgical medicine, and nursing, which applies a series of optimized treatment measures with evidence-based medical data to reduce stress reactions, reduce postoperative complications, and accelerate recovery (3,4). The concept of rapid rehabilitation surgery was first proposed and applied to gastrointestinal surgery by Danish surgeon Kehlet in the 1990s. This concept has been widely recognized and applied to many other surgical operations. Only a few studies have examined the clinical application of FTS in the perioperative period of esophageal cancer. However, the research conclusions of some measures are not uniform. A series of targeted optimization measures need to be further confirmed by a large amount of evidence-based medical data. Therefore, we comprehensively searched PubMed, web of science, the Cochrane Library, MEDLINE, CNKI, WanFang Data, VIP, and SINOMED to obtain the latest relevant literature. A series of optimized treatment measures for the perioperative application of esophageal cancer are summarized below.

Primary aim of FTS

The aim of the concept of FTS is to reduce the trauma and stress reaction in the perioperative period, reduce the occurrence of complications, and accelerate the recovery process of patients after surgery. FTS adopts evidence-based medical data and optimizes the treatment measures in three links: preoperative, intraoperative, and postoperative. Preoperative treatment mainly includes adequate education and psychological support before an operation and shortening fasting and water prohibition time. Intraoperative treatment includes keeping the patient warm and controlling their fluid intake during the operation. Postoperative treatment includes removing the tube as soon as possible after the operation, fully relieving pain within

48 hours after the operation, and encouraging the patients to get out of bed and eat soon after the operation (5,6).

Preoperative preparation for rapid recovery

Preoperative health education

Preoperative education is indispensable and is the first step for patients entering the perioperative period. Effective education can strengthen doctor-patient communication, enhance mutual trust, and improve patient compliance (7). Patients or their families should be fully informed of the current condition so that they can understand the occurrence and development of the disease, communicate the treatment plan and prognosis of the disease in detail, and inform preoperative and postoperative suggestions conducive to recovery, such as smoking cessation and eating and getting out of bed soon after the operation. Preoperative education enables patients to fully understand the pathophysiology of their own diseases and wholeheartedly cooperate with medical workers. Doing so can relieve patients' preoperative anxiety as much as possible. Effective communication, providing relevant videos and carrying out positive psychological suggestion are suggested to alleviate the fear of unfamiliar environments such as operating rooms and improve patients' confidence in coping with oral fast after operation. There is evidence that preoperative anxiety and tension are related to postoperative pain, which directly affects patients' postoperative recovery (8).

Preoperative psychological support

Research shows that effective psychological intervention can adjust the psychological environment of patients, which can improve their pain threshold, significantly reduce the anxiety value of surgical patients, reduce pain, relieve tension, and help patients cope with the difficulties of surgery. Preoperative visits and targeted psychological counseling can make patients feel respected and cared for. These can support patients to feel satisfied and psychologically secure. Patients feel confident in the operation, which enables patients to adapt to the needs of the operation so the process can progress smoothly (9).

Fasting and drinking before the operation

The traditional practice is to fast for 12 h and avoids drinking for 6 h before the operation to reduce the probability of reflux aspiration during the operation. However, in recent years, some studies showed that fasting and not drinking for too long increased the subjective feelings of hunger, thirst, and other discomfort of patients, increased their anxiety about surgery, increased the risk of postoperative hypoglycemia and insulin resistance, destroyed the electrolyte balance of the body, and strengthened the postoperative stress response. Tube-free and fasting-free esophageal cancer treatment means that patients do not need indwelling gastrointestinal decompression tubes and enemas before surgery. Patients can be given carbohydrates 2 h before surgery (at present, the mainstream clinical practice is 400 mL of 5% Glu), which can effectively relieve their preoperative tension, hunger, thirst, and other discomfort and also reduce the probability of insulin resistance after surgery. The most important thing is that the risk of aspiration will not be increased during surgery (10).

Intraoperative nursing for rapid recovery

Anesthesia and analgesia

There are a few studies on intraoperative anesthetic analgesia for esophageal cancer. Some scholars apply the multimodal preemptive analgesia (PMA) model to perioperative patients with esophageal cancer and observe its impact on the recovery process of patients. The multimodal PMA model is a multimodal PMA that combines drugs or methods with different mechanisms. It has a good analgesic effect (11). It also reduces the incidence of adverse reactions after surgery, accelerates postoperative rehabilitation, and improves patient satisfaction (12,13).

Pay attention to thermal insulation

A normal body temperature is necessary for the body to carry out metabolism and normal life activities. The human body maintains a constant body temperature through autonomous and behavioral thermoregulation. During anesthesia, the behavioral thermoregulation function is lost, and the hypothalamic thermoregulation center is also restricted by anesthesia. In addition, surgical exposure and flushing, liquid infusion, and other procedures often result in a drop in body temperature during surgery. Mild to moderate intraoperative hypothermia significantly increases the probability of wound infection and increases the total oxygen demand during postoperative rehabilitation (14). Therefore, it is particularly important to actively warm patients before, during, and after anesthesia.

Perioperative infusion control

Fluid management is a crucial part of surgery recovery. Patients should be prevented from being dehydrated as much as possible before the operation. The goal of intraoperative fluid treatment is to maintain the homeostasis of the body fluid and avoid organ dysfunction caused by fluid load or insufficient perfusion. There are many controversies in the academic field of liquid therapy, and there is little evidence on how to optimize the liquid management of esophageal cancer surgery. Currently, the liquid treatment measures with evidence-based data are (I) keep the total intravenous fluid replacement volume below 20 mL/kg in the first 24 h; (II) avoid excessive use of fluids (less than 2 mL/kg/h during operation, not more than 1.5 mL/kg/h in the first 12 h), and stop fluid replacement after recovering adequate oral intake; (III) colloids should only be considered if there is intraoperative bleeding and immediate blood transfusion is not required, and in any case, the maximum dose is 1 L; and (IV) there is no need for the urine volume to be greater than 0.5 mL/kg/h immediately after surgery, except for patients with risk factors for AKI (15,16).

Postoperative nursing for rapid recovery

Management of various catheters after the operation

The concept of fast esophageal cancer rehabilitation without tubes and fasting was proposed by Academician Li Yin. Patients can eat 24 h after surgery, get out of bed, and pull out their urinary tubes. The quality of life of patients after surgery is significantly improved (17). The incidence of complications is significantly reduced (18). Patients can be discharged 7 days after surgery.

Postoperative pain management

Alleviating the pain of patients with esophageal cancer is critical to the rapid rehabilitation of esophageal cancer. Many scholars and research institutions have proposed that good analgesic treatment in the perioperative period of thoracic surgery is the basic element of the whole rapid rehabilitation strategy. Accurate analgesic measures can significantly reduce the postoperative pain score of patients, improve the postoperative discomfort of patients, and encourage patients to get out of bed early and start walking, which can reduce postoperative cardiopulmonary complications and further shorten the hospitalization time of patients (19). Relevant studies show that a good block of the local intercostal nerve after the operation can alleviate short-term postoperative pain in patients and also reduce the incidence of post-traumatic pain syndrome (20).

Early postoperative feeding

Early oral feeding is the most important measure in the rapid rehabilitation treatment mode for esophageal cancer. In the traditional surgical treatment method for esophageal cancer, to fully heal the anastomotic stoma, patients should routinely fast for 7 days and decompress their gastrointestinal tract for 5–7 days after surgery. Some studies found that gastrointestinal decompression tubes can make 70% of patients feel very uncomfortable (21). The results of a meta-analysis also show that gastrointestinal decompression did not reduce the complications of abdominal surgery (22). Another meta-analysis abroad shows that early recovery of oral feeding (clear liquid food can be fed 4 h after the operation) can reduce complications, such as abdominal distension and abdominal infection after gastrointestinal surgery, thus shortening the hospitalization day and reducing the hospitalization cost without increasing the incidence of complications, such as anastomotic leakage (23). However, there is not enough research evidence to support whether early oral feeding in the concept of accelerated rehabilitation surgery can accelerate the recovery of patients, especially the recovery of gastrointestinal function.

Early postoperative activities

One of the treatment measures of the concept of rapid rehabilitation surgery is to guide patients to move in and out of bed as soon as possible and promote patients' exhaustion. Relevant studies found that getting out of bed soon after surgery can improve the regulation of visceral nerves, promote the recovery of intestinal function, shorten the time of exhaustion, alleviate or eliminate the concern of abdominal distension caused by late exhaustion after surgery, and improve the comfort of patients (24).

Prospect of clinical application of rapid rehabilitation surgery

The concept of rapid rehabilitation surgery is an important direction in the development of surgery in the 21 century. However, its application in the field of esophageal cancer

in China is still in the initial stage, and there is still a lack of standardized and professional guidelines. The hospital management department should pay attention to the clinical application and development of the concept of rapid rehabilitation surgery, strengthen the training of medical personnel, combine the concept of rapid rehabilitation surgery with the actual situation of the hospital and patients, and explore a rapid rehabilitation surgical management mode suitable for the characteristics of the hospital to meet the growing needs of patients for medical services.

Acknowledgments

Funding: None.

Footnote

Provenance and Peer Review: This article was commissioned by the editorial office, *AME Medical Journal*. The article did not undergo external peer review.

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at https://amj.amegroups.com/article/view/10.21037/amj-22-55/coif). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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doi: 10.21037/amj-22-55
Cite this article as: Cao L, Liu M, Wang Z, Dong L, Yang L. Researching progress of the fast-track surgery model in perioperative nursing of patients with esophageal cancer. AME Med J 2022;7:32.