

# Application of ERAS Guided Health Education Nursing Pathway Model in Patients Undergoing Laparoscopic Hepatobiliary Surgery

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## Abstract

**Objective:** To study and analyze the application value of health education and nursing pathway model guided by ERAS in patients undergoing laparoscopic hepatobiliary surgery. **Methods:** 100 patients who received laparoscopic surgery in the Department of Hepatobiliary Surgery of our hospital from January 2023 to January 2024 were selected and divided into study group and control group by random number table method, with 50 cases in each group. The control group received laparoscopic perioperative routine nursing, while the study group received ERAS-guided health education and nursing pathway intervention based on routine nursing. Perioperative general conditions, psychological status, and incidence of adverse events were evaluated and compared between the two groups. **Results:** The first feeding time, anal exhaust time, time to get out of bed, and time to pull out the abdominal drainage tube in the study group were all shorter than those in the control group. After nursing, the scores of SAS and SDS in the study group were lower than those in the control group, and the incidence of perioperative adverse events in the study group was lower than that in the control group, with statistical significance ( $P < 0.05$ ). **Conclusion:** The application of ERAS guided health education nursing pathway model in patients undergoing laparoscopic hepatobiliary surgery can effectively promote early postoperative rehabilitation, improve the psychological status of patients, and reduce the risk of adverse events.

## Keywords

Accelerated rehabilitation surgery; Health education nursing path model; Hepatobiliary surgery; Laparoscopic surgery; Psychological status

Enhanced recovery aftersurgery (ERAS) means that during peritreatment, various scientifically and effectively clinically proven measures are adopted to reduce the stress response and risk of complications of patients, alleviate the physiological and psychological trauma of patients, and take shortening the treatment time and speeding up the rehabilitation process as the basic goal [1, 2]. In recent years, the application of ERAS in perioperative nursing has gradually increased, especially in the context of the development of minimally invasive medicine, and the medical field has gradually paid more attention to the concept of ERAS. Laparoscopic surgery is widely used in the diagnosis and treatment of hepatobiliary surgery, which can achieve minimally invasive treatment of gallstones, acute cholecystitis, liver cancer and other diseases [3], effectively reduce surgical trauma, and relieve the physical and psychological burden of patients. Under the background of the development of ERAS concept, our hospital applied ERAS in the nursing work of laparoscopic hepatobiliary surgery, and combined with perioperative nursing and health education, built a health education and nursing pathway model under the guidance of ERAS, aiming at promoting the early

postoperative recovery of patients. The health education and nursing pathway model guided by ERAS can realize the standardization and process of nursing services [4]. This study analyzed the application value of the health education and nursing pathway model guided by ERAS combined with the data of some patients undergoing laparoscopic surgery admitted to the Department of hepatobiliary Surgery in our hospital.

## 1. Data and methods

### 1.1 General Information

A total of 100 patients undergoing laparoscopic surgery admitted to the Department of Hepatobiliary Surgery of our hospital from January 2023 to January 2024 were selected and divided into study group and control group by random number table method, with 50 cases in each group. There were 28 males and 22 females in the study group, aged 33~75 ( $49.58 \pm 5.60$ ) years old, and 26 males and 24 females in the control group. The age range was 35 to 73 ( $50.49 \pm 5.89$ ) years, and there was no statistical significance between the groups ( $P > 0.05$ ). Inclusion criteria: (1) patients undergoing elective surgery and receiving laparoscopic surgery for the first time; (2) Normal cognitive function, good mental condition, with certain reading and writing ability; (3) High degree of cooperation with nursing work; (4) All information is complete. Exclusion criteria: (1) Patients with malignant lesions; (2) Abnormal organ tissue function; (3) The presence of infected persons before surgery; (4) Poor control of underlying diseases.

### 1.2 Methods

#### 1.2.1 Control group

Laparoscopic perioperative routine nursing was carried out, preoperative examination and preparation were done in combination with surgical arrangements, surgical procedures, anesthesia methods, surgical incision size, etc. were explained to patients and their families, with emphasis on the advantages of laparoscopic surgery, so as to improve patients' understanding of surgery. On the day of surgery, the patient was sent to the operating room on time and cooperated with the surgeon to complete the operation. After postoperative observation, the patient was safely transferred back to the ward, and the monitoring of the patient's vital signs and surgical incision conditions was strengthened. About 6h after surgery, the patient's vital signs, feedback to the patient's surgical results, guide the patient to sit up in bed, encourage the patient to drink water, and explain the patient's postoperative diet, activities and other matters for attention. Follow the doctor's advice before leaving the hospital.

#### 1.2.2 Study group

Based on routine nursing, health education and nursing pathway model intervention under the guidance of ERAS was carried out, specifically as follows:

(1) Establishing a nursing and health education pathway group under the guidance of ERAS: The nursing and health education pathway group under the guidance of ERAS was headed by the head nurse of hepatobiliary surgery, with one deputy chief physician as the instructor and six patients with more than 8 years of nursing experience in hepatobiliary surgery as the group members. The division of responsibilities should be clearly defined. Members of the group should independently search the ERAS concept and literatures related to hepatobiliary surgery laparoscopy. The contents related to perioperative health education of hepatobiliary surgery laparoscopy should be discussed in group meetings, and the paths of nursing and health education should be constructed. Repeat education on the areas that are difficult for the patient to understand until the patient has mastered them.

(2) Preoperative care: According to the surgical plan before surgery, patients and their families were introduced in detail to the process of laparoscopic surgery, precautions before and after surgery, preoperative preparation and examination contents, and common postoperative complications through relevant popular science videos and oral explanations, etc., so that patients and their families could have a direct understanding of the surgery. Considering that there are certain differences in patients' ability to accept, relevant health education is carried out in stages and gradually deepened to deepen the impression of patients. In health education, we patiently answer patients' questions, understand patients' emotional status through nurse-patient communication, strengthen emotional comfort for those with negative emotions such as anxiety and irritability, and guide patients to relax through deep breathing training and watching entertainment programs. Follow the doctor's advice to improve the examination before surgery, and comprehensively evaluate the physiological indicators of patients. At 10h before surgery, 500ml glucose solution was given as instructed by the doctor, and 300ml glucose solution was given orally at 2h before surgery.

(3) Intraoperative nursing: During the operation, heat preservation was strengthened through infusion temperature meter and constant temperature blanket, so that the room temperature in the operating room was controlled at about

25°C. Actively cooperate with the doctor to complete the operation.

(4) Postoperative care: Regular postoperative pain assessment of patients, pain can not be tolerated, according to the doctor's advice to give analgesia pump, oral analgesic drugs, and other analgesia. At the same time, explain the inevitability of postoperative pain to patients and alleviate their concerns. Early postoperative position management should be strengthened, patients should turn over regularly, and patients should be instructed to effectively cough and cough sputum and strengthen skin cleaning care. After the patient's vital signs stabilized, explain the health knowledge of postoperative diet and rehabilitation to the patient. The attending physician and the rehabilitation therapist shall formulate the postoperative rehabilitation training program for the patient, and the nursing staff shall explain the rehabilitation training program and its purpose to the patient. The passive function exercise shall be carried out in the early postoperative period, and the active function combined with passive function exercise and active function exercise shall be gradually transferred. Before leaving the hospital, the home rehabilitation exercise manual was distributed to explain to patients the importance of carrying out rehabilitation exercises according to the doctor's advice and to improve patients' compliance with home rehabilitation training.

### 1.3 Observation indicators

#### 1.3.1 General situation evaluation during the perioperative period

The first postoperative feeding time, anal exhaust time, time to get out of bed, and time to pull out the abdominal drainage tube of patients in the two groups were counted to evaluate the general situation of patients after surgery.

#### 1.3.2 Evaluation of psychological status during the perioperative period

Self-rating Anxiety Scale (SAS) and self-rating Depression Scale (SDS) were used to evaluate the psychological status of patients before and after surgery. SAS > 50 and SDS > 53 points indicated the existence of negative psychological status, and the higher the score, the more serious it was.

#### 1.3.3 Perioperative adverse event statistics

The incidence of common perioperative adverse events in the two groups was analyzed, mainly including unplanned extubation, abnormal bleeding, new infections, falls or bed falls, etc.

### 1.4 Statistical methods

SPSS23.0 statistical software was used for processing, measurement data were represented by  $(\bar{x} \pm s)$ , comparison by t-test, counting data by percentage, comparison by  $\chi^2$  test, and  $P < 0.05$  was considered statistically significant.

## 2. Results

### 2.1 Comparison of perioperative general conditions between the two groups

The first postoperative feeding time, anal exhaust time, time to get out of bed, and time to pull out abdominal drainage tube in the study group were all shorter than those in the control group, with statistical significance ( $P < 0.05$ ), as shown in Table 1.

Table 1. Comparison of perioperative general conditions between the two groups ( $\bar{x} \pm s$ )

Group	Time of first feeding after surgery (h)	Anal exhaust time (h)	Time off the bed (h)	Abdominal drainage tube extraction time (d)
Study Group/50	6.59±1.23	26.84±5.96	9.23±2.34	3.84±0.83
Control group/50	9.84±2.04	36.52±6.91	15.60±3.39	4.79±0.75
t	9.647	7.501	10.935	6.005
P	< 0.001	< 0.001	< 0.001	< 0.001

### 2.2 Comparison of perioperative psychological status between the two groups

After nursing, SAS and SDS scores of the study group were lower than those of the control group, with statistical significance ( $P < 0.05$ ), as shown in Table 2.

**Table 2. Comparison of perioperative psychological status between the two groups ( $\bar{x} \pm s$ )**

group	SAS (points)		SDS (points)	
	pre-care	After care	pre-care	After care
Study Group/50	58.42±2.94	43.49±3.74*	58.04±3.41	42.01±2.94 *
Control group/50	59.02±3.13	49.50±4.51*	57.82±3.20	48.50±3.64 *
t	0.988	7.253	0.333	9.808
P	0.326	< 0.001	0.740	< 0.001

Note: Compared with before nursing, \*P < 0.05

### 2.3 Comparison of perioperative incidence of adverse events between the two groups

The incidence of perioperative adverse events in the study group was lower than that in the control group, with statistical significance ( $P < 0.05$ ), as shown in Table 3.

**Table 3. Comparison of perioperative incidence of adverse events between the two groups (case %)**

group	Unplanned extubation	Abnormal bleeding	Emerging infection	Fall or fall out of bed	Total incidence
Study Group/50	0 (0.00)	1 (2.00)	0 (0.00)	0 (0.00)	1 (2.00)
Control group/50	1 (2.00)	2 (4.00)	2 (4.00)	2 (4.00)	7 (14.00)
$\chi^2$					4.891
P					0.027

## 3. Discussion

At present, the start of ERAS in China is later than that in some developed countries, and the nursing model guided by ERAS generally requires the participation of medical staff and is applied to perioperative patients. Feasible nursing models need to be discussed and formulated based on case characteristics [5] and implemented into perioperative nursing work. The basic goal is to promote early postoperative rehabilitation and improve the physical and mental state of patients [6]. This study analyzed the effect of the ERAS-guided health education and nursing pathway model applied to perioperative patients undergoing laparoscopic hepatobiliary surgery. It showed that the first postoperative feeding time, anal exhaust time, bed leaving time and abdominal drainage tube extraction time of patients in the study group were shorter than those in the control group. The SAS and SDS scores of patients in the study group were lower than those in the control group after nursing. The incidence of perioperative adverse events in the study group was lower than that in the control group, with statistical significance ( $P < 0.05$ ), indicating that compared with the conventional nursing mode, the health education and nursing pathway mode guided by ERAS can effectively promote early postoperative recovery, improve patients' negative emotions such as anxiety and depression, and enhance the safety of patients in the perioperative period.

In the nursing pathway model guided by ERAS, a nursing education pathway group composed of medical personnel is first established. The members of the group construct the nursing model by consulting a large number of relevant research literature [7] and combining the characteristics of patients undergoing laparoscopic hepatobiliary surgery with specific nursing needs. The corresponding nursing intervention is carried out from pre-operation, intraoperation, and post-operation, which have the characteristics of sequence and pertinence. Under the guidance of ERAS, the emphasis of health education and the nursing pathway model is health education, and the emphasis of health education in different stages is different. Preoperative health education focuses on the characteristics of laparoscopic surgery and perioperative precautions, etc. At the same time, strengthening the psychological counseling of patients is conducive to relieving the anxiety of patients before surgery [8]. Preoperative gastrointestinal preparation is conducive to early postoperative gastrointestinal rehabilitation [9]. Intraoperative nursing focuses on strengthening insulation measures, which can stabilize patients' vital signs during surgery [10]. Postoperative care involves pain guidance and management, posture intervention, guidance for patients to cough, early rehabilitation training, etc. Early postoperative rehabilitation training is the key content of the ERAS concept. Early passive exercise can effectively

improve lower limb blood circulation [11, 12], reduce the risk of lower limb deep vein thrombosis and pressure injury, etc., and promote early postoperative rehabilitation.

#### 4. Conclusion

In conclusion, the application of health education and nursing pathway model under the guidance of ERAS in patients undergoing laparoscopic hepatobiliary surgery can promote early postoperative rehabilitation, improve the psychological status of patients, and reduce the risk of complications, which is worthy of development.

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