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Application of Zhao Shi Lei-huo-jiu Based on ERAS Concept in Managing Postoperative Gastrointestinal Symptom Cluster in Rectal Cancer

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Abstract: This study explores the application value of Zhao Shi Lei-huo-jiu in managing common postoperative gastrointestinal symptom clusters following rectal cancer surgery, under the framework of the Enhanced Recovery After Surgery (ERAS) concept. By detailing the development, core elements, and application of ERAS in colorectal surgery, combined with the historical origins, unique techniques, and mechanisms of Zhao Shi Lei-huo-jiu, this paper highlights the innovation of integrating traditional Chinese medicine treatments with modern surgical recovery principles. Through a rigorously designed research process, rectal cancer postoperative patients were selected as research subjects, and the data collection and implementation steps were explicitly outlined. The study results provide scientific evidence for the practical efficacy and advantages of Zhao Shi Lei-huo-jiu in postoperative rehabilitation for rectal cancer, offering significant practical implications for guiding clinical practice and promoting early patient recovery.

Keywords: ERAS concept; Zhao Shi Lei-huo-jiu; Postoperative rehabilitation of rectal cancer; Gastrointestinal symptom cluster management; Colorectal surgery

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1. Introduction

After rectal cancer surgery, patients often experience various gastrointestinal symptoms, with an incidence rate of 50%–75% [1]. These symptoms include nausea, vomiting, abdominal pain, constipation, and diarrhea, significantly impacting postoperative recovery and quality of life [2,3]. The Enhanced Recovery After Surgery (ERAS) concept, aimed at reducing postoperative complications and accelerating recovery, has become a critical focus in modern surgery. By optimizing perioperative management, ERAS not only promotes the recovery of intestinal function but also alleviates patient discomfort.

Zhao Shi Lei-huo-jiu, a traditional Chinese rehabilitation therapy, is based on the principle of regulating qi

and blood flow. By stimulating specific acupuncture points, it activates the patient's self-regulatory mechanisms and has shown remarkable clinical efficacy in managing gastrointestinal symptoms. Studies have indicated that Lei-huo-jiu can stimulate the central nervous system, enhance intestinal motility, and increase digestive secretion, thereby improving digestive function.

Furthermore, the combination of the ERAS concept with intestinal function monitoring and nutritional support is an indispensable aspect of gastrointestinal symptom management. Following Lei-huo-jiu treatment, early administration of liquid diets and electrolyte supplementation promotes the recovery of intestinal function [4]. This multimodal rehabilitation strategy enhances overall therapeutic outcomes, facilitates early discharge, and has been validated for its efficacy in numerous clinical trials. The integration of ERAS with traditional Chinese medicine techniques like Zhao Shi Lei-huo-jiu provides rectal cancer patients with a more comprehensive and effective postoperative management plan.

2. Overview of the ERAS concept

2.1. Development and core elements of ERAS

ERAS has gradually developed within the surgical field since 1990, aiming to optimize preoperative, intraoperative, and postoperative management systems through multidisciplinary collaboration, thereby improving overall patient recovery outcomes. Its core elements include preoperative assessment and education, anesthesia and pain management, fluid management, nutritional support, intraoperative techniques, and early mobilization [2,5].

(1) Preoperative assessment and education: This involves thorough preparation before surgery, including educating patients on the surgical process, expected outcomes, and potential risks, thereby enhancing patient compliance and confidence. Multimedia educational tools are recommended to improve information transparency and foster patient engagement.

(2) Anesthesia and pain management: A multimodal analgesia strategy is emphasized, incorporating regional anesthesia, nerve blocks, and pharmacological combinations to minimize postoperative discomfort. Research shows that continuous local anesthesia significantly reduces the need for postoperative analgesics and associated side effects.

(3) Postoperative early nutritional support: The importance of early nutritional support has gained recognition, with current recommendations suggesting the initiation of enteral nutrition within 24 hours after surgery. This approach minimizes muscle loss, promotes recovery, and significantly improves patients' nutritional status and healing process by enhancing intestinal function and reducing complications.

(4) Intraoperative techniques: ERAS advocates minimally invasive procedures, such as laparoscopic and robot-assisted surgeries, to reduce tissue trauma and shorten hospital stays. Even in abdominal surgeries, adopting rapid recovery pathways and emphasizing intraoperative temperature maintenance and fluid balance strengthens postoperative recovery outcomes.

(5) Early mobilization: This is considered a key aspect of ERAS, encouraging patients to begin bedside activities shortly after surgery and gradually progress to independent ambulation. Early mobilization helps reduce postoperative pulmonary complications, improve intestinal function, and decrease hospital stays [6].

The implementation of the ERAS concept requires robust multidisciplinary team collaboration, including surgeons, anesthesiologists, nursing teams, nutritionists, and rehabilitation specialists. Effective integration of these roles ensures seamless coordination across all stages of care, enabling the development of individualized recovery plans and continuous monitoring of patient progress to achieve optimal outcomes and patient satisfaction [7].

3. Zhao Shi Lei-huo-jiu overview

3.1. Origin and development of Zhao Shi Lei-huo-jiu

Zhao Shi Lei-huo-jiu is a unique therapy derived from traditional Chinese medicine (TCM), originating from the Zhao family in the Qing Dynasty. The Zhao family combined the principles of Yin-Yang and the Five Elements, along with meridian theory, through continuous exploration and practice, ultimately developing today's Zhao Shi Lei-huo-jiu. Its main characteristics include the integration of moxibustion and nerve stimulation to regulate qi and blood, unblock meridians, and promote self-healing [8].

Through large-scale randomized controlled trials, Zhao Shi Lei-huo-jiu has gradually been incorporated into modern rehabilitation treatments. It has gained particular recognition as an adjunct therapy in postoperative digestive system management, effectively improving patients' quality of life. The widespread adoption of Zhao Shi Lei-huo-jiu is attributed not only to its unique therapeutic effects but also to advancements in TCM academic practices. Today, many physicians widely recommend it as a non-invasive alternative therapy in postoperative care.

Future research is expected to focus on improving the heat effect control of Lei-huo-jiu, optimizing its medicinal components, and exploring its combination with other treatment modalities to further substantiate its value in postoperative management. The origin and evolution of Zhao Shi Lei-huo-jiu represent not only the inheritance of TCM culture but also a paradigm for integrating modern medicine with traditional therapies.

3.2. Basic principles of Zhao Shi Lei-huo-jiu

Zhao Shi Lei-huo-jiu is an external TCM therapy whose principles are grounded in meridian theory, emphasizing the effects of thermal stimulation. During the therapy, the heat generated by burning moxibustion materials is transferred to the skin and subcutaneous tissues, stimulating the body's Yang energy. In TCM, it is believed that abundant Yang energy signifies health, while its deficiency predisposes individuals to illness. Zhao Shi Lei-huo-jiu replenishes Yang energy, enhances immune function, and promotes blood circulation, thereby preventing and treating diseases [9].

Zhao Shi Lei-huo-jiu also emphasizes the role of medicinal substances. During moxibustion, substances such as chrysanthemum mugwort, alum, borneol, nutgrass rhizome, and *Ligusticum chuanxiong* are burned, releasing medicinal components that penetrate the skin and meridians through heat. Volatile oils in mugwort, such as α-pinene and menthol, exhibit anti-inflammatory and antibacterial properties. The involvement of these medicinal substances enhances and prolongs the therapeutic effects of Zhao Shi Lei-huo-jiu.

The basic principles of Zhao Shi Lei-huo-jiu encompass regulating meridian qi and blood, stimulating Yang energy, and leveraging the effects of medicinal substances. Through moxibustion, it adjusts meridian functions, strengthens immunity, and promotes blood circulation, achieving both therapeutic and preventive objectives. Further scientific research is needed to validate and deepen the understanding of its mechanisms to

better integrate Zhao Shi Lei-huo-jiu into clinical treatment [10].

4. Research methods and design

4.1. Study population and data collection

The study population included patients who underwent rectal cancer surgery at our hospital between 2021 and 2023. Inclusion criteria were: diagnosed with rectal cancer and undergoing surgery (including laparoscopic and open surgery), aged 18 years or older, and no prior radiation or chemotherapy before surgery. Exclusion criteria included patients with severe cardiac, pulmonary, hepatic, or renal dysfunction, and cases requiring emergency surgery postoperatively.

Data collection encompassed basic patient information, preoperative assessment, surgical type, postoperative recovery, and gastrointestinal symptoms. Basic information included gender, age, weight, height, and pre-existing conditions. Preoperative assessment utilized the Eastern Cooperative Oncology Group (ECOG) performance status score to evaluate functional status. All data were collected by trained researchers using the electronic medical record system to ensure accuracy and completeness.

Postoperative gastrointestinal symptoms were assessed using validated questionnaires, with symptoms scored on postoperative days 1, 3, and 7 (e.g., nausea, vomiting, abdominal pain, constipation, diarrhea) using a 0–10 scale (0 = no symptoms, 10 = most severe symptoms). Data collection was extended to postoperative day 28 to evaluate overall efficacy and symptom relief. Recovery outcomes included hospital stay duration and incidence of postoperative complications.

Based on sample size calculations, 60 eligible patients were selected and randomly assigned 1:1 into the experimental group (receiving Zhao Shi Lei-huo-jiu) and the control group (no Lei-huo-jiu), with 30 patients in each group. All participants provided informed consent. Data privacy and ethical compliance were ensured throughout, with the study protocol approved by the hospital's ethics committee. The study aimed to provide effective clinical interventions for managing postoperative gastrointestinal symptoms in rectal cancer patients.

4.2. Implementation of research methods

This study adopted a prospective cohort design, enrolling rectal cancer patients who were observed for six months post-surgery. Inclusion criteria included patients aged 18–75 diagnosed with rectal cancer and undergoing surgical treatment, excluding those with severe comorbidities. Based on the ERAS framework, a comprehensive management intervention was implemented across preoperative, intraoperative, and postoperative phases.

(1) Preoperative phase: All patients received standardized preoperative education, including postoperative recovery expectations, pain management, nutritional support, and psychological counseling. Nutritional assessments were conducted one week before surgery using recent dietary recall, weight changes, and biochemical markers (e.g., albumin, alanine aminotransferase). Malnourished patients received individualized nutritional interventions to achieve a preoperative weight gain of 2%–5%.

(2) Intraoperative phase: Precise anesthesia management included continuous nerve blocks to reduce postoperative pain and minimize opioid requirements. Minimally invasive techniques, such as laparoscopic surgery, were employed to reduce trauma and shorten recovery time. Fluid management followed a "conscious anesthesia" protocol, monitoring urine output and electrolyte balance to ensure optimal hydration intra- and postoperatively.

(3) Postoperative phase: This phase emphasizes pain management and early recovery of gastrointestinal function. Within 24 hours post-surgery, multimodal analgesia was implemented, combining local anesthetics, nonsteroidal anti-inflammatory drugs, and opioids, supplemented by patient-controlled analgesia (PCA) for enhanced pain control. Early gastrointestinal function assessment monitored gas and stool passage, aiming for recovery within 48 hours. A gradual dietary advancement plan was followed, starting with mild liquid diets within 24 hours post-surgery and transitioning to solid foods.

Standardized questionnaires were used to evaluate postoperative quality of life, gastrointestinal symptoms, and complications. These included the Bowel Function Index (BFI), Visual Analog Scale (VAS) for pain, and Nutritional Risk Screening (NRS). Assessment time points were set at 1 week, 1 month, and 3 months post-surgery, combining patient self-reports with clinician evaluations to ensure data accuracy and comprehensiveness.

4.3. Case analysis

In this study, all patients experienced varying degrees of gastrointestinal symptoms (e.g., bloating, nausea, vomiting) within 3–5 days post-surgery, significantly impacting their quality of life.

Patients were randomized into two groups: The Lei-huo-jiu treatment group and the conventional treatment group, with 30 patients in each. The Lei-huo-jiu group received Zhao Shi Lei-huo-jiu as an adjunct therapy, while the conventional group underwent standard Western medical treatment. Detailed records and statistical analyses of gastrointestinal symptoms were conducted to evaluate the efficacy of Lei-huo-jiu therapy.

4.4. Medication analysis

Patients in the Lei-huo-jiu group demonstrated significantly reduced use of antiemetics and prokinetics during treatment. The average use of antiemetics was 2.1 times per patient compared to 4.8 times in the conventional group, and prokinetic usage was 1.5 times compared to 3.9 times. This suggests that Lei-huo-jiu effectively alleviates postoperative gastrointestinal symptoms and promotes gastrointestinal function recovery.

Analysis of blood tests, liver, and kidney function in the Lei-huo-jiu group revealed no significant adverse effects, confirming the therapy's safety. These findings (**Table 1**) validate Zhao Shi Lei-huo-jiu as not only effective in symptom improvement but also safe and well-tolerated by patients.

Table 1. Comparison of outcomes between the Zhao Shi Lei-huo-jiu group and the conventional group

Feature	Zhao Shi Lei-huo-jiu group	Conventional group
Gender (male/female)	34/26	-
Average age (years, range)	56.7 (42.0–75.0)	-
Symptom onset time	3–5 days post-op	-
NRS score (day 7)	3.1	5.8
NRS score (day 14)	1.7	4.2
Bloating score (day 7)	2.9	5.5
Bloating score (day 14)	1.4	3.9
Nausea score (day 7)	3.5	6.2
Nausea score (day 14)	1.8	4.4

Table 1 (Continued)

Feature	Zhao Shi Lei-huo-jiu group	Conventional group
Antiemetic usage frequency	2.1	4.8
Prokinetic usage frequency	1.5	3.9
Overall satisfaction score	9.2	6.7
Adverse reactions	None	-

In conclusion, case analysis indicates that Zhao Shi Lei-huo-jiu is highly effective in managing postoperative gastrointestinal symptoms in rectal cancer patients, significantly improving quality of life. As a non-pharmacological intervention aligned with ERAS principles, Lei-huo-jiu offers a promising clinical application compared to conventional treatments. Future research should expand sample sizes and extend follow-up periods to validate these findings and explore underlying mechanisms.

5. Conclusion

This study applied the ERAS concept combined with Zhao Shi Lei-huo-jiu therapy to manage postoperative gastrointestinal symptom clusters in patients undergoing rectal cancer surgery. Through systematic clinical trials and statistical analyses, several important conclusions were drawn.

The detailed observation and clinical data accumulation on Zhao Shi Lei-huo-jiu also explored its role in reducing postoperative analgesic usage. Data indicated that patients receiving combined Zhao Shi Lei-huo-jiu therapy used approximately 30% less postoperative analgesics (e.g., morphine-based medications) compared to those managed solely with the ERAS concept ($P < 0.05$). This further confirmed Zhao Shi Lei-huo-jiu's unique efficacy in alleviating pain and reducing medication dependence.

The robust clinical data and rigorous experimental design in this study fully demonstrated the efficacy and safety of combining the ERAS concept with Zhao Shi Lei-huo-jiu for managing postoperative gastrointestinal symptoms in rectal cancer patients. This research not only provides a novel therapeutic approach for postoperative recovery in rectal cancer patients but also lays a solid foundation for further exploration of integrative traditional Chinese and Western medicine in postoperative management.

Additionally, the findings emphasize the importance of individualized treatment, wherein treatment methods are chosen and combined based on each patient's specific circumstances to achieve optimal therapeutic outcomes.

Disclosure statement

The authors declare no conflict of interest.

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