

Our experience of using the ERAS program in surgical interventions in patients with dolichomegacolon

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Keypoints

The use of the ERAS program for surgical interventions on the large intestine helps to reduce the body's response to operational stress, reduces the time required for the patient's rehabilitation, and reduces the risk of postoperative complications.

Abstract

Introduction

The ERAS program is a multicomponent system of activities carried out in the pre-, intra- and postoperative period, aimed at reducing the incidence of postoperative complications, accelerating the recovery of normal activity of patients and reducing the length of stay of patients in the hospital. Despite the proven benefits, the ERAS program is still underused in practice. Its implementation requires a whole range of organizational measures.

Purpose of the study: To evaluate the effectiveness of the ERAS program after surgery for dolichomegacolon.

Material and methods

233 surgical interventions were performed in patients with dolichomegacolon in a planned manner at the surgical clinic of the AMU. The age of the patients varied from 7 to 26 years. Surgical interventions were performed both laparoscopically and traditionally. The patients were divided into 2 groups: main (n=130) and control (n=103). In the control group, the perioperative period in patients was conducted traditionally. In the main group, the perioperative period was managed using elements of the generated optimized ERAS protocol.

Results

In the main group, the absolute majority of patients started enteral nutrition within the first 6 hours of the postoperative period. Against this background, their protein pool was restored already by the 4th day of the postoperative period, while in the control group not earlier than the 9th day ($p<0.05$), which coincides with the literature data. In the main group, the frequency of prescribing narcotic analgesics also decreased, as they were used only in 23.5% of patients, while in the control group, opioids were prescribed after surgery in 95.7% of patients ($p<0.05$). In the main group of patients, there were no cases of thromboembolic complications in any patient, and postoperative nausea and vomiting were observed only in 1.2% of patients.

Conclusion

The use of the ERAS program for surgical interventions on the large intestine helps to reduce the body's response to operational stress, reduces the time required for the patient's rehabilitation, and reduces the risk of postoperative complications.

Keywords

Dolichomegacolon, Enhanced recovery after surgery, laparoscopy.

Introduction

The ERAS program is a multicomponent system of activities carried out in the pre-, intra- and postoperative period, aimed at reducing the incidence of postoperative complications, accelerating the recovery of normal activity of patients and reducing the length of stay of patients in the hospital. The ERAS program provides for the use of a targeted set of measures at each of the stages, aimed primarily at ensuring the fastest recovery, and not just reducing the length of stay of patients in the hospital (6,7,8,9). The main steps of the ERAS program are as follows:

Preoperative stage:

1. Preoperative informing the patient, if the child, then the parents and the necessary instructions.
2. Refusal to use mechanical cleaning of the large intestine before surgery.
3. Refusal of premedication: tranquilizers according to strict indications, refusal of an opioid analgesic, prescription of non-steroidal anti-inflammatory drugs as components of multimodal analgesia (principle of preventive analgesia).
4. Appointment of probiotics before surgery.
5. Refusal of preoperative starvation.
6. Appointment of food carbohydrate mixtures 3-4 hours before surgery.
7. Application of dextrose solution 2 hours before surgery.
8. Antibiotic prophylaxis.
9. Hospitalization on the day of surgery.

Intraoperative stage:

1. Multimodal anesthesia in combination with regional anesthesia.
2. Control and restriction of infusion of colloid and crystalloid solutions before and during surgery.
3. Reducing the trauma of surgical approaches, the use of minimally invasive technologies.
4. Prevention of hypothermia during and after surgery.

5. Administration of high concentrations of oxygen prior to surgery.
6. Refusal from the routine installation of drains and a nasogastric tube into the abdominal cavity.

Postoperative stage:

1. Early removal of urinary, central venous and epidural catheters and drains.
2. Appointment of prokinetics in the postoperative period.
3. Appointment of early postoperative enteral nutrition.
4. Early activation of the patient.
5. Refusal to use narcotic analgesics in the postoperative period.

Despite the proven benefits, the ERAS program is still underused in practice. Its implementation requires a whole range of organizational measures.

Purpose of the study: To evaluate the effectiveness of the ERAS program after surgery for dolichomegacolon.

Material and Methods

233 surgical interventions were performed in patients with dolichomegacolon in a planned manner at the surgical clinic of the AMU. The age of the patients varied from 7 to 26 years. All patients were examined according to existing examination standards before planned interventions on an outpatient basis. Surgical interventions were performed both laparoscopically and traditionally. The patients were divided into 2 groups: main (n=130) and control (n=103). In the control group, the perioperative period in patients was conducted traditionally. In the main group, the perioperative period was managed using elements of the generated optimized ERAS protocol. The preoperative strategy in the main group of patients was carried out as follows:

- preoperative informing the patient or the child's parents about the upcoming surgical intervention, its features, the benefits and importance of the patient's cooperation;

- routine use of mechanical bowel cleansing and laxatives was not performed, as this led to dehydration of the body;
- drug premedication was replaced by a psychological conversation with the patient on the eve of the operation;
- patients were allowed to drink a clear carbohydrate-containing liquid during the night and stop taking the liquid 2 hours before the start of anesthesia, as fasting before surgery depleted glycogen reserves and led to insulin resistance;
- prophylactic doses of antibiotics (third-generation cephalosporins) were administered once 60 minutes before the start of the operation, and when using fluoroquinolones or vancomycin to prevent antibiotic-associated infections, the infusion was started 120 minutes before the operation;
- the patient was hospitalized on the day of surgery, which reduces the risk of nosocomial infections.
- tight bandaging of the lower extremities before surgery.

The intraoperative strategy in the main group was carried out as follows:

- multimodal anesthesia was performed using fast- and short-acting volatile inhalation (sevoflurane, desflurane) and intravenous (propofol) anesthetics, opioids (remifentanyl), muscle relaxants (rocuronium bromide, atracurium and cisatracurium besilate) and sugammadex, as well as in combination with epidural blockade;
- an epidural catheter was placed after induction of anesthesia and an epidural infusion of bupivacaine was started;
- for the treatment of hypotension associated with epidural anesthesia, an infusion of a vasopressor has been started;
- adhered to optimized targeted infusion therapy with balanced electrolyte solutions;

- maintained normothermia, since even moderate hypothermia ($<10^{\circ}\text{C}$) increased blood loss by 16% and the need for transfusion by 22% and increased the risk of postoperative complications (arrhythmias) by 2-3 times; maintained normothermia with the help of special heating systems and transfusion of warm solutions;
- for the purpose of prevention, high concentrations of oxygen were used;
- drainage of the abdominal cavity, the installation of drains and nasogastric tubes was carried out according to strict indications.

The postoperative strategy in the main group was carried out as follows:

On the day of surgery:

- the patient is activated within the bed, turns in bed;
- after 5-6 hours after the operation, it is allowed to sit in bed;
- enteral nutrition with adapted mixtures of 500 ml was started 8 hours after the operation;
- the use of antiemetics and prokinetics to improve intestinal motility and prevent paresis;
- in order to prevent thrombosis, subcutaneous administration of low molecular weight heparins was started;

1 day after surgery:

- urethral catheter removed;
- self-feeding with solid food;
- special nutritional support - fluids 2-3 times a day;
- refusal of routine infusion therapy;
- full mobilization independent movement in the ward.

2nd day after surgery:

- epidural infusion stopped and epidural catheter removed;
- analgesia with non-opiates.

Subsequent days:

Discharge after 5 days based on the following criteria:

- tolerability of complete self-nutrition;
- the presence of peristalsis and the discharge of gases;
- independent movement;
- the possibility of anesthesia with oral drugs;
- proper home care for the sick.

After discharge from the hospital:

Outpatient monitoring of the patient for 7 days by a family doctor.

Results and discussion

In the main group, the absolute majority of patients started enteral nutrition within the first 6 hours of the postoperative period. Against this background, their protein pool was restored by the 4th day of the postoperative period, while in the control group not earlier than the 9th day ($p < 0.05$), which coincides with the literature data (2). The average bed-day in the intensive care unit was 1.5 ± 0.4 in the main group, which is almost 3 times lower than in the control group (4.8 ± 0.6 ; $p < 0.05$). The terms of drainage removal in the main group decreased by 2 times and amounted to 1.9 ± 0.4 days versus 4.2 ± 0.2 days in the control group ($p < 0.05$). A similar statistically significant difference was noted when comparing the average standing time of the urethral catheter: in the main group, this indicator decreased from 5.3 ± 0.2 to 2.0 ± 0.2 days, which led to a significant decrease in the number of cases of urinary infection ($p < 0.05$).

In the main group, the frequency of prescribing narcotic analgesics also decreased, as they were used only in 23.5% of patients, while in the control group, opioids were prescribed after surgery in 95.7% of patients ($p < 0.05$). In the main group of patients, there were no cases of thromboembolic complications in any patient, and postoperative nausea and vomiting were observed only in 1.2% of patients. In the main group, the frequency of prescribing narcotic analgesics also decreased, as they were used only in 23.5% of patients, while in the control group, opioids were prescribed after surgery in 95.7% of

patients ($p < 0.05$). In the main group of patients, there were no cases of thromboembolic complications in any patient, and postoperative nausea and vomiting were observed only in 1.2% of patients.

The study of the results of questionnaires, assessed before surgery and on days 4 and 7 of the postoperative period after laparoscopic and open surgery, respectively, showed a statistically significant ($p < 0.05$) improvement in most life indicators when using the ERAS protocol. Similar results are shown in the works of world researchers (1, 3, 4, 5).

Thus, the optimized ERAS protocol after dolichomegacolon surgery is a multimodal concept aimed at optimizing the perioperative period. This set of measures reduces the stress response to surgery and improves the metabolic response to it.

Conclusion

The use of the ERAS program for surgical interventions on the large intestine helps to reduce the body's response to operational stress, reduces the time required for the patient's rehabilitation, and reduces the risk of postoperative complications.

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