IMPLEMENTATION OF THE FAST TRACK SURGERY IN PATIENTS UNDERGOING THE COLONIC RESECTION – OWN EXPERIENCE

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A perioperative care in the colorectal surgery has been considerably changed recently. The fast track surgery decreases complications rate, shortens length of stay, improves quality of life and leads to cost reduction. It is achieved by: resignation of a mechanical bowel preparation before and a nasogastric tube insertion after operation, optimal pain and intravenous fluid management, an early rehabilitation, enteral nutrition and removal of a vesical catheter and abdominal drain if used.

The aim of the study was to compare the results of an implementation the fast track surgery protocol with results achieving in the conventional care regimen.

Material and methods. Two groups of patients undergoing colonic resection have been compared. The study group was formed by patients treated with fast track concept, the control group – by patients who were dealt with hitherto regimen. Procedures needed stoma performing, rectal and laparoscopic surgery were excluded. The perioperative period was investigated by telephone call to patient or his family.

Results. Statistical significant reduction was reached in a favour of the fast track group in the following parameters: the length of hospital stay (2.5 days shorter), duration of an abdominal cavity and vesicle drainage (3 and 2 days shorter respectively), postoperative day on which oral diet was implemented (2,5 days faster) and finally extended (1.5 days faster). There were no statistical difference in mortality, morbidity neither reoperation rate between two groups.

Conclusion. The fast track surgery is a safe strategy and may improve a perioperative care.

Key words: fast track surgery, colonic resections

The first data regarding the care of colon surgery patients following fast track procedures are from the 1990s. They were published by Prof. Henrik Kehlet’s team from Hvidovre Hospital in Copenhagen and they begin a new chapter in perioperative care. The purpose of this new treatment strategy is to decrease the incidence of complications, improve patient quality of life, and reduce hospitalization, costs mainly through reducing duration of hospital stay. The authors of this strategy emphasize that the decision to forego or to use the new elements of treatment should be based solely on Evidence Based Medicine (EBM). More and more centers have been joining the studies on the topic, and improvements in care have been made in the newest fields of surgery. Currently, the so-called ERAS (Enhanced Recovery after Surgery) outcome parameters in colon surgery can be divided into three groups.

The first group, i.e. the preoperative factors, includes: oral and written information on the consecutive steps of postoperative care, foregoing routine mechanical bowel preparation, allowing the patient to eat and drink up to 6 and 2 hours, respectively, prior the procedure – a particular mention involves carbohydrate-rich drink administration two hours prior to the induction of anesthesia. Further factors in this group will be symbiotic administration and foregoing premedication. The role of the so-called ‘pre-habilitation’ is being considered. This involves preparing the body for the burden of overcoming perioperative stress by in-
Introducing exercises improving the body’s performance and endurance.

The second group, i.e. the intraoperative factors, includes: minimally invasive surgery – mostly involving the use of laparoscopic techniques; pharmacologic prevention of nausea and vomiting; foregoing routine use of nasogastric tube and abdominal drains; prevention of hypothermia and high-concentration oxygen therapy. The postoperative factor group includes early rehabilitation and oral diet introduction, the use of prokinetic agents, and recently also gum chewing. Avoiding excessive fluid administration as well as utilizing optimal anesthesia that limits the use of systemic opioid analgesics play an important role at each stage of care. The investigators usually use only some of these parameters. There have been meta-analyses comparing conventional-treatment and fast-track surgery outcomes. The evidence for the effectiveness of the strategy has been recently presented in English-language literature (1). Below, there are initial results of introduction of some elements of the fast track surgery in the Faculty and Clinic of General and Gastrointestinal Surgery and Oncology at Warsaw Medical University.

MATERIAL AND METHODS

Group characteristics.

Exclusion criteria

Two groups of patients who underwent colon resection were included in the study. The first study group, group I, consisted of patients treated according to the ERAS protocol; the other group – patients treated according to a conventional – previous treatment strategy. The exclusion criteria were rectal resection, the use of laparoscope, and stoma formation. The patients from group I underwent surgery consecutively in the period from May 2010 to June 2011. Data in this group was gathered prospectively. The patients from the other group underwent surgery consecutively during the 2nd and 3rd quarter of 2008 and during the 3rd quarter of 2010. This data was gathered retrospectively.

ERAS Protocol

The ERAS protocol included: oral information on the consecutive steps of postoperative care at the clinic, foregoing mechanical pre-operative bowel preparation (only a small enema was allowed), and the routine use of nasogastric tube and abdominal drains; oral fluid administration and an attempt at bedside rehabilitation on the day of surgery, introduction of diet and rehabilitation on postoperative day 1, early removal of a vesical catheter and abdominal drains, if used; limiting intravenous fluid administration in favor of oral fluid administration. Patients were discharged from hospital after confirming: good diet tolerance, sufficient non-opioid oral analgesia, and proper postoperative wound healing. Patient willingness to leave the hospital was also considered. Two kinds of analgesia were used postoperatively in this group: epidural (bupivacaine with fentanyl), or continuous wound infiltration (bupivacaine solution). Analgesia was complemented with parenteral, and then oral, non-steroidal analgesics, paracetamol or tramadol. Parenteral opioid analgesics were used if needed.

Conventional treatment

Patients from the other group received the established perioperative care based on conventional principles. This included: information about postoperative care provided only upon questions from the patient, preoperative mechanical bowel preparation, routine use of abdominal drains, use of nasogastric tube according to the need as perceived subjectively by the investigator. The patient was allowed to drink not earlier than on the first day after the surgery. Oral diet was introduced from the time of peristalsis return (passing gas or stool). Similar analgesia was used as that in the study group; continuous wound infiltration was not used. On principle, rehabilitation was commenced on the first day following surgery. The patients were discharged after meeting the same criteria as those in the study group.

In group I and II, wound inspection and suture removal was recommended to take place in the outpatient clinic 10–14 days post surgery. Following histopathological examination results, the patients were referred to further oncology treatment, if needed. Information on any possible complications during 30 days after the surgery was obtained telephonically from the patient or his/her family members.
Evaluated parameters

The primary endpoints were: the number of complications, mortality and re-hospitalization rates, and also the duration of hospital stay. The secondary endpoints were: the post-operative day of: initial diet (porridge or puréed soup) and full diet introduction, drain removal, vesicular catheter removal, and passing a stool. Study team compliance with protocol, as well as procedure duration, patient classification according to the American Society of Anesthesiologists (ASA) scale, and histopathological findings were also assessed.

Statistical method

The data were analyzed statistically with the use of a chi-square test. The results were presented as median values. The p value <0.05 was considered statistically significant.

RESULTS

Fifteen patients (10 men and 5 women) aged from 35 to 82 underwent surgery in group I, i.e. the study group. The control group, group II, comprised 18 operated patients (11 men and 7 women) aged from 50 to 83. Both groups were homogeneous in terms of median age, sex distribution, and the ASA score. The most common indications for surgery were neoplastic disease, especially adenocarcinoma, mainly G2. In group I, only 2 patients were operated for non-cancer-related reasons; in the second group, there was one such patient.

In group I, 6 patients developed complications and these were: anastomotic disruption, urinary tract infection, bronchitis, and wound suppuration. In group II, 4 patients developed complications and these were: wound suppuration, anastomotic disruption, and bleeding from the anastomosis. In two cases from the control group re-laparotomy was required. There were no repeated procedures in the study group. In the study group, there was 1 death in a 78-year-old female following palliative right hemicolectomy. There were 4 deaths in the control group. No rehospitalizations were recorded in either group. There were no statistically significant differences with respect to the complication rate, mortality, or the rate of required reoperations. The [median] duration of postoperative hospital stay was 8 (days) in the study group and 10.5 (days) in the control group (p = 0.027). One patient from the study group and two from the control group could not be reached for telephone follow-up.

The individual endpoints were achieved on the following postoperative days in groups I and II, respectively: abdominal drain removal on day 2 and 5 (p = 0.001), vesical catheter removal on day 2 and 4 (p = 0.016), oral diet introduction on day 1.5 and 4 (p = 0.001), full diet introduction 4.5 and 6 (p = 0.027), passing stool on day 3 and 4.5 (p = 0.097). Vomiting occurred in 5 patients from group I and in one patient from group II (p = 0.239). Mechanical bowel preparation with oral agents was performed in one patient from the study group. Also, nasogastric tube was retained postoperatively in one patient from this group. Six patients received epidural anesthesia in the perioperative period; continuous wound infiltration was used in one case. The peritoneal cavity was drained in each case.

The table presents a summary of the results.

DISCUSSION

This paper is the first one in Polish literature to present the results of studies on fast surgical tract. Mortality and the duration of hospital stay were reduced, with similar complication rates. However, our results still differ from those reported in literature, where patients are discharged as early as 3 days after

Table. The outcomes. n – number of patients, POD – postoperative day(s), * – statistically significant difference (p<0.05)

<table>
<thead>
<tr>
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<th>Study group – fast track</th>
<th>Control group – conventional</th>
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<tbody>
<tr>
<td>Patients with complications (n)</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Mortality (n)</td>
<td>1</td>
<td>4</td>
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<tr>
<td>Reoperation (n)</td>
<td>0</td>
<td>2</td>
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<td>Re-hospitalization (n)</td>
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<td>0</td>
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<tr>
<td>Duration of hospital stay (POD)</td>
<td>8*</td>
<td>10,5</td>
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<tr>
<td>Drain removal (POD)</td>
<td>2*</td>
<td>5</td>
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<tr>
<td>Catheter removal (POD)</td>
<td>2*</td>
<td>4</td>
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<tr>
<td>Initial diet (POD)</td>
<td>1,5*</td>
<td>4</td>
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<td>Final/full diet (POD)</td>
<td>4,5*</td>
<td>4</td>
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<tr>
<td>Stool (POD)</td>
<td>3</td>
<td>4,5</td>
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<tr>
<td>Vomiting (n)</td>
<td>5</td>
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surgery (2). The reason behind this difference may be reluctance of surgeons to introduce a new method of patient management. This results from a lack of understanding of, or suspicions towards, the new strategy of perioperative care, fear of taking responsibility for the possible negative consequences, as well as the particular character of Polish health care (3). Patients’ misgivings are also not without importance. The present study showed that these fears and misgivings are largely groundless.

Our protocol did not include carbohydrate-rich drink administration 2 hours prior to surgery. There are reports indicating that introduction of such practice contributes to reduced insulin resistance and fatigue, as well as reduced anxiety, hunger and thirst, and reduced hospital stay (4, 5). However, a recently published randomized study did not confirm many of the above advantages of preoperative carbohydrate loading (6). Brady et al. (7) conducted a meta-analysis of 22 randomized studies comparing preoperative administration of various drinks with no administration of oral drinks after midnight before the procedure. Carbohydrate drinks, tea, coffee and juice administered up to 1.5 hours prior to surgery in volumes of 150 to 450 mL were evaluated. The authors showed the safety of such practice based on the observed statistically significant difference in terms of pulmonary aspiration and nausea rates. The superiority of this practice was proven by the observed reduction in thirst and anxiety in the intervention group. These results encourage the preoperative administration of such drinks.

In group I of the present study, one patient underwent mechanical bowel preparation. In an analysis of 14 studies in over 4,500 patients, Slim et al. did not show statistically significant differences in the rates of anastomotic leakage, intra-abdominal abscess, wound infection, extra-abdominal sepsis, reoperation, or mortality between the group of patients who underwent bowel preparation and the group without such preparation, however, there were fewer surgical-site complications in the latter group, by 1.12% in total (odds ratio [OR] = 1.4, with 95% confidence interval [CI] of 1.05-1.87) (8). Also, in a study with similar sample size, Guenaga et al. did not show a statistically significant difference in the rate of anastomotic leakage, peritonitis, wound infection, intra-abdominal infection, as well as complications unrelated to infection (9).

Verma and Nelson (10) considered the issue of routine gastric tube retention (used in one patient from the present study). Their systematic review of 37 randomized studies in over 5,000 patients did not show a statistically significant difference in the incidence of pulmonary complications or anastomotic leakage between the group with routine indwelling tube retention and the group with early tube removal or no tube use.

In the present study, the peritoneal cavity was drained in every patient. Jesus et al. (11) and Petrowsky et al. (12) have cast doubt on the rationale for routine drain retention. In both studies, a meta-analysis of 6 and 8 clinical studies randomizing over 1,000 patients each, was conducted. The first meta-analysis did not show statistically significant differences in the rates of anastomotic disruption, wound infection, extra-abdominal complications, reoperation, or mortality. The other meta-analysis did not show significant differences in the rates of anastomotic leakage, wound infection, or pulmonary complications.

In the present study, a delay in oral feeding introduction was observed in comparison with the results reported in the literature. This is likely to be due to both the surgeons’ fear of early oral feeding introduction and a worse diet tolerance by the patients, which in turn could be a result of foregoing the use of both routine conduction analgesia and restrictive fluid management. Andersen et al. (13) conducted a meta-analysis of 13 studies in patients randomized into groups of postoperative oral feeding introduction within 24 hours or later. There was no statistically significant difference between these groups in terms of wound infection, intra-abdominal abscess, pulmonary complications, anastomotic disruption, or vomiting rates. However, early commencement of postoperative feeding was associated with lower mortality (relative risk [RR]=0.41, 95% CI: 0.18–0.93). Rahbari and Zimmerman (14) conducted a meta-analysis of 9 studies in 971 patients randomized to receive standard (of approximately 1750 mL), liberal (at least by 10% more), and restrictive (at least by 10% less than standard) intravenous fluid management. The three groups did not differ...
significantly in terms of wound infection, intestinal anastomosis leakage, total complication, or mortality rates. However, the patients receiving restrictive fluid administration showed reduced complication rates compared with those receiving standard fluid management (OR = 0.45; 95% CI 0.28–0.72). Marret et al. (15) conducted a meta-analysis of 16 randomized studies comparing epidural analgesia with parenteral opioid analgesia. More than 800 patients underwent colorectal resection and the group receiving conduction analgesia showed a statistically significant reduction in Visual Analogue Scale (VAS) scores (on day one and two: 18 and 12 mm, respectively). Epidural analgesia was also shown to reduce the duration of ileus (on average by 36 hours, p < 0.001). In another meta-analysis including over 3,000 patients, Wu et al. (16) also demonstrated improved pain management with epidural analgesia. Statistically significant VAS scores were achieved in both the total population and the group of patients undergoing abdominal surgery. Another type of analgesia is continuous wound infiltration with a topical analgesic (this was used in one patient in the present study) (17).

Like in Pascal et al. (18), in the present study the data in group I were collected prospectively, and the data from the control group – retrospectively. However, retrospective data analysis, as well as a lack of randomization are known to negatively affect robustness of the results. The use of patient randomization and the associated prospective data collection, like in the recent studies by Ionescu et al. (19) or Wang et al. (20) is considered to be more accurate. Following this trend in methodology should be the next step in the studies on fast track surgery introduction.

CONCLUSION

Fast surgical track is a safe perioperative management strategy in patients undergoing colon resection.

REFERENCES


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