Enhanced recovery after colorectal surgery: principles and current practice

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Abstract

Enhanced recovery after surgery (ERAS) programmes have become an integral part of current management of surgical patients. These have evolved over the years with the key philosophy of improving patient outcomes by combining the best possible preoperative optimization, surgical and anaesthetic techniques and postoperative care, with the specific aim of minimizing disturbance to normal physiology. This article provides an overview of the evidence to support these concepts and provides a framework for setting up an effective ERAS programme for colorectal surgery.

Keywords Colorectal surgery; ERAS; implementation; perioperative care; postoperative care; preoperative care; postoperative recovery; surgical stress

The concept

Enhanced recovery after surgery (ERAS) has become established practice in most surgical specialties based on the principles of speeding up postoperative recovery by operating on appropriately optimized patients, with meticulous attention to intraoperative surgical and anaesthetic techniques and proactive postoperative care. These have been driven by a better understanding of the metabolic response to surgical stress (Figure 1) and have led to the introduction of interventions at every stage: preoperatively to optimize patients, intraoperatively to minimize inflammatory and neuroendocrine responses and postoperatively to promote earlier return to normal physiology.

The concept of ERAS was first proposed by Henrik Kehlet in the late 1990s. Numerous individual interventions such as multimodal analgesia, goal-directed intraoperative fluid management, reduction in postoperative nausea and vomiting (PONV) had been shown to promote quicker recovery. Kehlet brought these under one umbrella as a multimodal package to optimize patients' recovery as the ERAS pathway.[1,2] He stressed the need for interventions to be standardized, evidence driven and procedure specific for successful implementation.

Several changes to the originally proposed protocols have become possible over the past few years with the introduction of new anaesthetic and minimally invasive surgical techniques. In this article, we have attempted to provide an overview of ERAS for colorectal surgery.

ERAS guidelines

Detailed evidence is available on various aspects of ERAS with the most recent guidelines from ERAS society separating the recommendations for rectal/pelvic surgery[3] and colonic resections,[4] although most departments practise minor adaptations rather than separate protocols.

For the purpose of this article, we have discussed the preoperative, perioperative and postoperative interventions separately for ease of understanding and structured implementation.

Preoperative interventions

Patient information and education

Patient information forms a key component for the success of any ERAS programme. The information needs to be simple, highlighting specific 'targets' that most patients are expected to achieve. The information can be provided in a variety of ways, including leaflets, individualized counselling and multimedia resources.[3,4]

The authors have produced an interactive DVD providing an overview of the patient pathway with optional extended sections that the patients can view at their convenience.

Patients likely to require a stoma need to be counselled well preoperatively with the aid of special 'training packs' and DVDs.

Optimization of comorbidity

Preoperative optimization is a crucial step in the physiological preparation for surgery.[3] Increasingly, emphasis is being placed on optimization of anaemia, diabetes mellitus (DM), hypertension etc. in the primary care. Nutritional assessment and oral nutritional support to optimize patients has been shown to reduce infective complications and anastomotic leaks.[5] There is growing evidence to suggest that smoking and alcohol cessation 4 weeks prior to surgery contributes to improved outcomes.[6,7] Prehabilitation, a specific programme of exercise aimed at increasing functional capacity in anticipation of forthcoming surgery, has been shown to have a positive impact on postoperative recovery.[8] These interventions have a role in benign disease but may be impractical in patients with malignancy due to the urgency for treatment.

Conceptual shift – starvation to feeding

Traditionally, prolonged starvation prior to surgery was practised to minimize the risk of aspiration during induction of anaesthesia. However, a Cochrane review showed the safety of shorter periods of preoperative starvation. Current recommendations are to allow intake of clear fluids up until 2 hours before the induction of anaesthesia (6 hours for solid food). In addition, providing a carbohydrate load has been shown to attenuate the insulin resistance following surgery by 50% and to be an independent predictor of better postoperative clinical outcome.[9]

Use of commercially available iso-osmolar drinks such as PreOp® and Preload® for up to 2 hours prior to surgery are now part of most ERAS protocols and have been shown to be safe even in patients with uncomplicated type 2 DM.[3,4]

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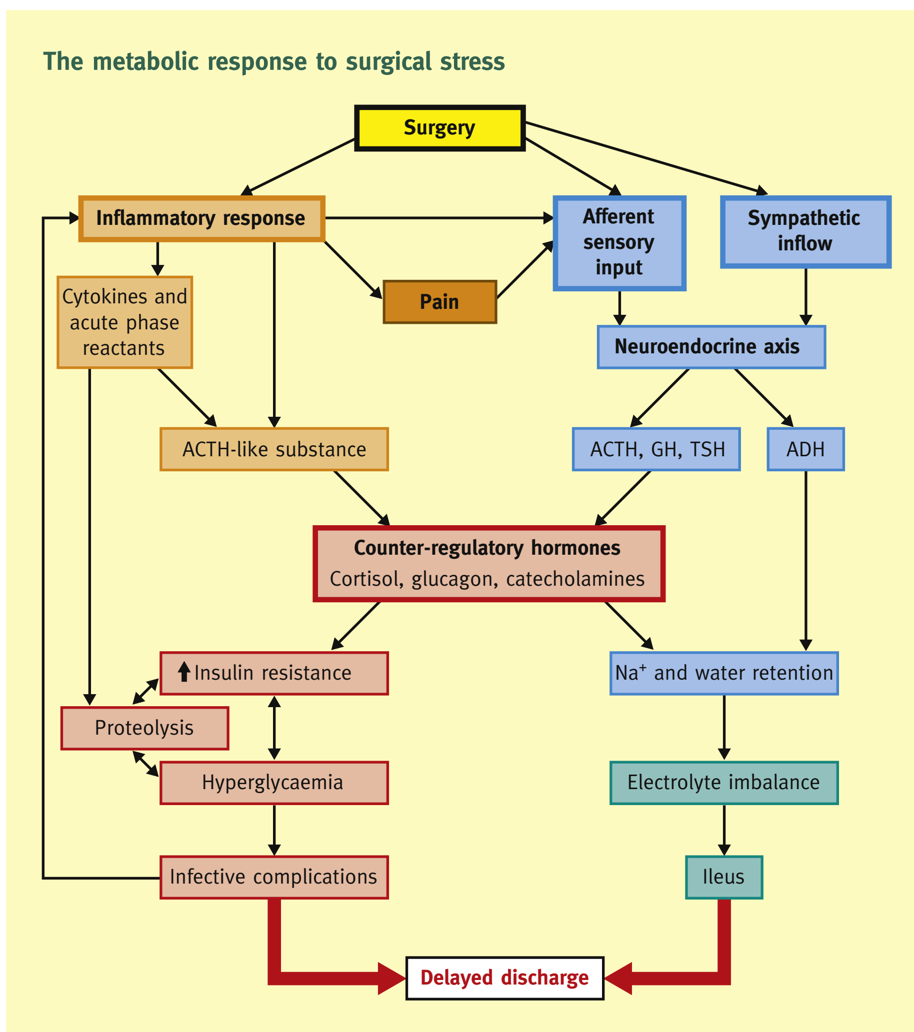

Figure 1

Selective mechanical bowel preparation (MBP)

There is accumulating evidence to suggest that MBP results in dehydration and electrolyte imbalance and may increase the rate of anastomotic leaks and wound complications.[4,10] A recent randomized controlled trial (RCT) looked at the role of MBP in patients undergoing low anterior resection for rectal cancer. More than 80% of these patients had a diverting stoma. This study found a trend towards a twofold higher risk for overall and clinical anastomotic leak and peritonitis without MBP.[11]

The current recommendation is not to use MBP in patients undergoing colonic resection. In patients undergoing rectal resection, MBP is recommended where a diversion stoma or on-table endoscopy is planned.[3]

Thromboembolism prophylaxis

There is strong evidence that in traditional postoperative care, extended prophylaxis with low molecular weight heparins for up to 28 days reduces the risk of venous thromboembolism (VTE). Currently, there is no controlled data available for the value of VTE prophylaxis in patients undergoing major abdominal or pelvic laparoscopic surgery within enhanced recovery protocols, and the recommendation is to start thromboprophylaxis pre-operatively and continue with extended prophylaxis[3,4]

Perioperative interventions

Standardized anaesthetic techniques

Much has been published about the intricacies of the anaesthetic protocol comparing various agents, techniques etc. The main aims of any anaesthetic protocol are threefold: to attenuate surgical stress response, provide goal-directed intraoperative fluid balance, and opiate sparing analgesia.[4] Most departments use a combination of GA with intrathecal/epidural/locoregional blocks etc. relying less on opioids compared to traditional techniques.

Surgical techniques

The role of laparoscopy in colorectal resection (LCR) is gradually being established in the UK with the most recent National Bowel Cancer Audit (NBCA) reporting an uptake of just over 40%.[12] The National Institute for Healthcare and Clinical Excellence (NICE) has recommended the use of LCR for cancer, provided it is carried out by appropriately trained surgeons.[13]

We have been practising LCR for more than 15 years and have demonstrated the safety, feasibility and satisfactory oncological outcomes even in complex cases and have also demonstrated that training and the achievement of proficiency

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