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ENHANCED RECOVERY AFTER SURGERY IN BARIATRIC SURGERY - REVIEW

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ABSTRACT

Enhanced Recovery After Surgery (ERAS) is a multidisciplinary, evidence-based approach designed to optimize perioperative care, improve patient outcomes, and shorten hospital stays. This review examines the application of ERAS protocols in bariatric surgery—a critical intervention for the management of severe obesity and related comorbidities. Key components of ERAS in this context include preadmission counselling, minimized preoperative fasting, goal-directed fluid therapy, opioid-sparing anaesthesia techniques, and structured postoperative nutritional support. Current evidence indicates that adherence to ERAS protocols significantly reduces postoperative complications, accelerates recovery, and shortens the length of hospitalization. Moreover, ERAS has been associated with decreased incidence of postoperative nausea, improved pain control, and reduced reliance on opioids. The role of anaesthesiologists is pivotal in ERAS implementation, and standardized surgical techniques are essential for ensuring patient safety and consistency of care. Overall, this review highlights the growing importance of ERAS in bariatric surgery, emphasizing its effectiveness in enhancing both short- and long-term outcomes.

KEYWORDS

Enhanced Recovery After Surgery, Bariatric Surgery, Metabolic Surgery, Obesity

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1. Introduction

Enhanced Recovery After Surgery is a multidisciplinary system to the care of the surgical patient. Implementation of the Enhanced Recovery After Surgery (ERAS) process involves a team consisting of surgeons, anaesthesiologists, an ERAS coordinator, and staff from the units caring for the surgical patient [1]. The first information about the protocol comes from 1995, when the Danish surgeon Henrik Kehlet and his team presented 8 cases of patients who underwent laparoscopic colon resection and were treated with a special perioperative program [2]. Kehlet theorized that avoiding certain factors in perioperative care shortens the length of hospital stay by reducing the metabolic stress, fluid overload, and insulin resistance placed on the body. [1] Obesity is a serious medical condition worldwide that requires new approaches in treating diseases that lead to morbidity [3] Treatment for severe obesity includes lifestyle interventions, drug therapy, and bariatric surgery. Evidence from decades of weight loss research suggests that lifestyle interventions and drug therapy often do not help severely obese people lose enough weight to improve their health and quality of life in the long term. However, a growing body of evidence suggests that bariatric surgery can produce lasting weight loss, improve comorbidities, and prolong survival. [4]

1.1 General Information

Bariatric surgery:

We can distinguish four Bariatric/Metabolic surgeries (BMS). Gastric Banding: The adjustable gastric band is used to divide the stomach into a small proximal compartment (pouch) and a larger distal compartment (remaining stomach). Roux-en-Y Gastric Bypass: The stomach is lowered a few centimetres distal to the gastric inlet. The jejunum is divided 50 cm beyond the ligament of Treitz, and its aboral end is connected to a small gastric pouch. Approximately 150 cm distal to this point, the other end of the small intestine is sutured to a loop that has been pulled upward to meet it (known as a Roux-en-Y reconstruction). Sleeve Gastrectomy: More than 80% of the stomach is excised and the remaining stomach is canalized, with an initial filling volume of less than 100 ml. Biliopancreatic diversion (BPD) with duodenal switch (DS): First, the stomach is reduced, like sleeve gastrectomy. Then the duodenum is divided distal to the pylorus, and the jejunum is divided 250 cm proximal to the midgut valve and anastomosed to the duodenum. The other end is connected to the ileum 100 cm proximal to the midgut valve. [5,6,7]

Indications:

The main indication to the bariatric/metabolic surgery is obesity. Current indications for bariatric surgery are a Body Mass Index (BMI) of ≥ 40 kg/m2 or a BMI of ≥ 35 kg/m2 and a coexisting obesity-related disease that can be expected to improve/remit by maintaining the weight loss induced by surgery. MBS is recommended in patients with Type 2 Diabetes (T2D) and BMI ≥30 kg/m^2. BMS should be considered in individuals with BMI of 30–34.9 kg/m^2 who do not achieve substantial or durable weight loss or co-morbidity improvement using nonsurgical methods. [8,9]

Table 1. BMI classification

Category	BMI (kg/m^2)	Risk of concomitant diseases
Underweight (Severe thinness	<16.0	Minimal, but increased levels of other health problems
Underweight (Moderate thinness)	16.0-16.9	Minimal, but increased levels of other health problems
Underweight (Mild thinness)	17.0-18.4	Minimal, but increased levels of other health problems
Normal range	18.5-24.9	Minimal
Overweight (Pre-obese)	25.0-29.9	Medium
Obese (Class I)	30.0-34.9	High
Obese (Class II)	35.0-39.9	Very high
Obese (Class III)	≥ 40.0	Extreme high

The evidence and recommendations for ERAS are divided of four periods connect with operation: preadmission, preoperative, intraoperative. We can distinguish different level of evidence for ERAS recommendation: very low, low, moderate, high. Recommendations for preadmission care in bariatric surgery contains information, education and counselling, indications and contraindications for surgery, smoking and alcohol cessations, preoperative weight loss, prehabitations and exercise. Preoperative care in bariatric surgery are supportive pharmacological interventions, preoperative fasting, carbohydrate loading, prophylaxis of postoperative nausea and vomiting (PONV). Intraoperative recommendations are perioperative fluid management, standardized anaesthetic protocol, airway management, ventilation strategies, neuromuscular blockade, surgical technique – volume and training, abdominal drainage and nasogastric decompression. After operation recommendations contains postoperative oxygenation, thromboprophylaxis, early postoperative nutritional care, supplementations of vitamins and minerals. High level of evidence contains: Avoiding PONV, standardized anaesthetic protocol (*Opioid-sparing anaesthesia using a multimodal approach, including local anaesthetics, should be used to improve postoperative recovery),* surgical technique (*Laparoscopic approach whenever possible),* thromboprophylaxis (*Thromboprophylaxis should involve mechanical and pharmacological measures. Doses and duration of treatment should be individualized) and* supplementations of vitamins and minerals (*A regimen of life-long vitamin and mineral supplementation and nutritional biochemical monitoring is necessary) [9].*

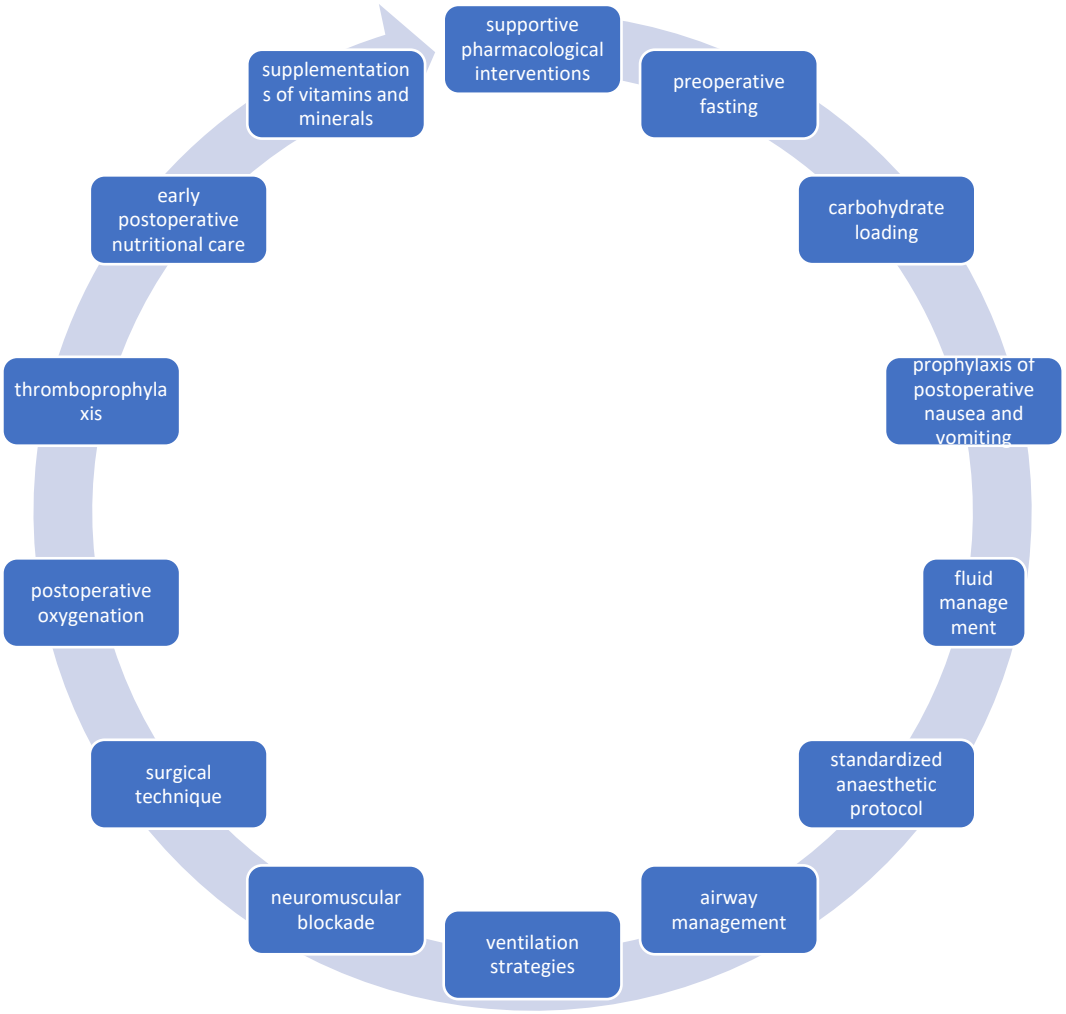

Fig. 1. *Elements of ERAS*

2. Review of results

PONV

An observational study by T.A.Halliday et al. included 74 patients undergoing bariatric surgery under total intravenous anaesthesia. Patients received PONV prophylaxis based on published guidelines and a simplified PONV risk score [10]. Morbidly obese patients undergoing laparoscopic bariatric surgery are at increased risk of PONV. Postoperative nausea and vomiting are major side effects of general anaesthesia. Not only does it lead to decreased well-being, but it can also cause serious adverse events, in addition to prolonged hospital stays and increased medical costs. [11,12]

Standardized anaesthetic protocol

Short-acting agents and minimal use of opioids during surgery are important to improve recovery. Induction of anesthesia should ideally be based on lean body mass to avoid hypotension. Morbidly obese subjects receiving a propofol infusion based on total body water had a significantly larger propofol dose and significantly shorter time to LOS. Although current evidence does not allow for the recommendation of specific anesthetic agents or techniques, there is a high level of evidence to support the use of multimodal, opioid-sparing methods of analgesia to improve postoperative recovery. [13,14,15]

Surgical technique

In 2016, the three most performed primary bariatric/metabolic surgical procedures worldwide were sleeve gastrectomy - 54%, Roux-en-Y gastric bypass with 30%, and one anastomotic gastric bypass - 5%, respectively. [16] In open with open surgical exits there is a quality on that laparoscopic in bariatric surgery turned on with LOS and earlier recovery, and high-quality connection on the connection with reduced frequency of operation launched and hernia. In the justification of the common, during the operation and the risk of the operation, there is a risk of occurrence for laparoscopy [17,18,19]

Thromboprophylaxis

Thromboembolic complications continue to be a major cause of morbidity and mortality after bariatric surgery. Risk factors, in addition to obesity itself, include a history of venous thromboembolism, increased age, smoking, varicose veins, cardiac or respiratory failure, OSA, thrombophilia, and oral estrogen contraception. Guidelines suggest thromboprophylaxis, including unfractionated heparin or low molecular weight heparin (LMWH) given within 24 hours of surgery, for all patients who have had bariatric surgery [20,21,22,23]

Supplementations of vitamins and minerals

Postoperative dietary monitoring is essential. After bariatric surgery, there is an increased risk of deficiencies in iron, folate, vitamin B12, vitamin D, and the trace minerals zinc, copper, and selenium. Hypoabsorptive procedures may further increase the risk of deficiencies in vitamins A, E, and K. Therefore, patients are required to follow a lifelong vitamin and mineral supplementation regimen and biochemical monitoring of nutrition [24,25,26]

Researches:

Research conducted by Biao Zhou et. al in 2021 on 435 patients showed that the introduction of ERAS in a large bariatric surgery centre in China significantly shortened the postoperative hospital stay and reduced postoperative complications and readmissions. study showed that ERAS care significantly increased the postoperative day 1 discharge rate without increasing complications or hospital readmissions. Study showed that ERAS also significantly reduced postoperative complications in bariatric surgery. The most common postoperative complications were nausea and vomiting and resulting dehydration, which are particularly targeted by antiemetics and ERAS-directed antiemetics. [27] Júlia Gonçalves Zandomenico et. Al. in 2021 showed that Anaesthesiologists are the main players responsible for conducting the ERAS protocol In addition to being responsible for the largest number of elements in the perioperative optimization of bariatric surgery patients, the anaesthesiologist is also responsible for the overall recovery of the patient and thus plays the role of a hospital outcome modifier [27]. Jenny Lam et al. included 214 consecutive patients undergoing sleeve gastrectomy. The median hospital stay was significantly shorter in the ERAS group compared with the standard care group. There were no differences in 7- or 30-day readmission rates or postoperative complications. The ERAS group also had reduced median intraoperative opioid use and self-rated pain on postoperative day 1. [29] Giovanni Fantola et. al. in 2021 performed bariatric surgery in 471 patients: the study group showed a higher rate of previous surgical history compared with the control group. Roux-en-Y gastric bypass was the most common procedure in both groups. The mean length of hospital stay (LOS) was shorter in the study group (3.16 days) compared with the control group (4.81 days) with no difference in the rate of clinical outcomes. All logistical endpoints showed a time saving in the study group compared with the control group. The study group was not associated with complications or readmissions, but the duration of surgery was a factor associated with complications [30]

3. Methods

This review paper analysed 30 scientific articles from 1993 to 2025. The articles were sourced from PubMed, Google Scholar, Frontiers and Science Direct.

4. Conclusions

The integration of Enhanced Recovery After Surgery (ERAS) protocols in bariatric surgery has significantly improved patient outcomes by reducing perioperative complications, shortening hospital stays, and enhancing recovery. Adherence to ERAS guidelines, including optimized anesthesia, multimodal pain management, and structured postoperative care, has been shown to minimize postoperative nausea, decrease

opioid use, and improve overall patient well-being. Research supports the effectiveness of ERAS in lowering readmission rates and improving long-term metabolic outcomes. As ERAS continues to evolve, further studies are needed to refine protocols and ensure their widespread adoption in bariatric surgery. Ultimately, ERAS represents a crucial advancement in surgical care, promoting safety, efficiency, and improved quality of life for patients undergoing bariatric procedures.

5. List of abbreviations

ERAS – Enhanced Recovery After Surgery
BMS – Bariatric/metabolic surgery
BPD – Biliopancreatic diversion
DS – Duodenal switch
BMI – Body mass index
PONV – postoperative nausea and vomiting
LOS – length of hospital stay
LMWH – low molecular weight heparin

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