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Original article

Is there a role for enhanced recovery after laparoscopic bariatric surgery? Preliminary results from a specialist obesity treatment center

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Abstract

Background: There has been a relative lack of research on the effect of enhanced recovery in the context of morbid obesity surgery.

Objectives: To determine if the application of enhanced recovery after surgery (ERAS) principles can contribute to reduce postoperative hospital length of stay after bariatric surgery, controlling for other factors that may influence safe discharge on the first postoperative day.

Setting: University teaching hospital, United Kingdom.

Methods: Between February 2011 and December 2014, prospectively collected data on all patients undergoing laparoscopic bariatric surgery under the care of a single surgeon were reviewed. From January 2012, all patients were enrolled in an ERAS protocol and were assessed for fitness for early discharge (within 24 hr from the operation). Baseline patient characteristics and additional concomitant procedures data were compared for patients treated before and after implementation of the ERAS protocol; 30-day readmission data were analyzed for patients discharged on the first postoperative day and those discharged later. The effect of the implementation of the ERAS protocol on discharge on the first postoperative day was analyzed using multivariate analysis, while taking into account the effects of potential confounders (e.g., age, gender, American Society of Anesthesiologists [ASA] grade, concomitant surgical procedures, etc.).

Results: Two-hundred and eighty-eight consecutive patients underwent bariatric surgery. Of these, 278 (96.5%) were potentially suitable for early discharge, while 10 (3.5%) patients developed an acute postoperative complication that delayed discharge irrespective of the effect of ERAS. All these patients required a reoperation within 48 hours and therefore were not considered suitable for early discharge and were not included in the statistical analysis. During the entire study period, 100 of 278 (36%) patients were discharged on the first postoperative day, 28.5% after laparoscopic Roux-en-Y gastric bypass (LRYGB) and 60.9% after laparoscopic sleeve gastrectomy (LSG); 178 of 278 (64%) patients were discharged after $\geq$2 days (mean: 2.58, range: 2–5). After implementation of the ERAS protocol in January 2012, the rate of patients discharged on the first postoperative day increased significantly from 1.6% to 39.7% after LRYGB ($P < .01$). Early discharge increased from 50% to 67.5% after LSG; although this change did not reach statistical significance ($P = .294$), it nevertheless represents a clinically relevant result. Four (4%) patients were readmitted after having been discharged on the first postoperative day, 10 (5.3%) patients after having been discharged $\geq$2 postoperative days. This difference was not statistically significant ($P = .620$).

Preliminary data presented at the Association of Laparoscopic Surgeons of Great Britain and Ireland Annual General Meeting, The Royal College of Surgeons of England, London, UK, November 2013, and the 14th World Congress of Endoscopic Surgery, Paris, France, June 2014.

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Conclusions: The implementation of an enhanced recovery program after bariatric surgery is feasible, well tolerated, and can significantly reduce the length of hospital stay without increasing readmission rates. Controlling for several possible confounders, implementation of the ERAS protocol remained the strongest predictor of discharge on the first postoperative day after laparoscopic bariatric surgery. (Surg Obes Relat Dis 2015;▮:00–00.)

Keywords: Enhanced recovery after surgery (ERAS); Laparoscopic Roux-en-Y gastric bypass (LRYGB); Laparoscopic sleeve gastrectomy (LSG); Length of stay (LOS)

Over the past 2 decades, there has been an enormous increase in the number of bariatric and metabolic procedures being offered to eligible morbidly obese patients throughout the world. Compared with nonsurgical modalities in the treatment of morbid obesity, bariatric surgery leads to more sustained weight loss and higher remission rates of type 2 diabetes and other obesity related co-morbidities [1]. At present, the two most widely used surgical procedures are laparoscopic Roux-en-Y gastric bypass (LRYGB) and laparoscopic sleeve gastrectomy (LSG). Originally popularized by Mason and Ito, Roux-en-Y gastric bypass still remains the most common surgical procedure for morbid obesity and is considered the gold standard operative intervention [2]. It combines a restrictive effect and an intricate metabolic response that leads to reduced food intake and sustained excess weight loss [3]. Over the past 15 years, LSG has gained popularity because it is perceived as a technically simpler procedure compared with LRYGB. This technique also combines a restrictive mechanism with a complex gut-hormones response, which cause persistent weight loss [4].

The use of enhanced recovery after surgery (ERAS) programs has been reported to reduce morbidity in various surgical specialties, particularly in the context of lower gastrointestinal surgery [5]. On the other hand, there has been a relative dearth of research on this subject after bariatric surgery. A recent randomized clinical trial of ERAS versus standard care after LSG has reported a shortened in-hospital length of stay (LOS) and found ERAS to be cost effective with no increase in perioperative morbidity [6]. The U.K. National Health Service (NHS) is under considerable resources and bed pressure and, as such, there is a drive to discharge patients as early as it is safe to do so. It is therefore important to establish whether ERAS principles applied to bariatric and metabolic surgery can help reduce morbidity and postoperative length of stay.

The aim of this study was to determine if the application of ERAS principles can help promote safe postoperative discharge on the first postoperative day after LRYGB and LSG, controlling for the effect of other potentially confounding factors.

Methods

Between February 2011 and December 2014, data were prospectively collected on all consecutive morbidly obese patients undergoing LRYGB and LSG by a single consultant bariatric surgeon in a tertiary bariatric referral center in the United Kingdom.

When considering the suitability for discharge on the first postoperative day, each patient is required to understand the planned procedure and postoperative care and should definitely express willingness to engage in the early discharge process. Social and geographic factors are also taken into account: (a) A responsible adult needs to escort the patient home and provide support for the following 24 to 48 hours; (b) patient's domestic circumstances need to be appropriate for postoperative care (e.g., adequate familial support, presence of facilities on the ground floor, etc.); (c) the patient should live at a distance $\leq$2-hour drive from the hospital.

Patients who experienced an acute postoperative complication that delayed discharge were excluded from this study because it was difficult to evaluate the effect of ERAS on this subset of patients. Baseline demographic factors were compared for patients discharged before and after the implementation of the ERAS protocol, and readmission data were compared between patients discharged on the first postoperative day and those discharged beyond postoperative day 1. All patients had previously undergone a tier-3 medical weight management program, with comprehensive evaluation and support from dieticians, psychologists, bariatric specialist nurses, and a dedicated physician. Each patient had to achieve a 5% total weight loss before being referred to the bariatric surgeon to be counseled and consented for the operation. Preoperative workup included routine blood tests, chest radiograph, and an electrocardiogram. Echocardiogram, sleep studies, abdominal ultrasound, and esophagogastroduodenoscopy with biopsies were performed on an individual basis, depending on clinical history and physical findings. After achieving the expected weight loss, each patient was maintained on a structured, nutritionally balanced, 1200–1500 kcal diet until 2 weeks before the agreed operation, when a liver-shrinking, low-calorie liquid diet, rich in proteins, minerals, multivitamins, and electrolyte supplementations and low in carbohydrates, was prescribed. Low-molecular-weight heparin thromboprophylaxis and H_2-blocker therapy were