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Research Article

Enhanced Recovery After Surgery Versus Conventional Care in Elective Colonic and Rectal Surgery: First Experience in Saudi Arabia

Mirza Faraz Saeed[1]*, Ali Asgar Hatim Ali[2], Hussain Abbas Hatim Ali[2], Ayesha Naseem[2], Ebrahim Almahmeed[2] and Amro Salem[3]

[1]*Acting Senior Registrar, Department of Surgery, King Hamad University Hospital, Bahrain*

[2]*Intern, Department of Surgery, King Hamad University Hospital, Bahrain*

[3]*Consultant General and Colorectal Surgeon, Department of Surgery, King Hamad University Hospital, Bahrain*

***Corresponding Author:** Mirza Faraz Saeed, Acting Senior Registrar, Department of Surgery, King Hamad University Hospital, Bahrain.

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Abstract

Introduction: The aim of this study is to evaluate the outcome of enhanced recovery after surgery versus conventional care in elective colonic and rectal surgery.

Methods: Retrospective analysis with outcomes of patients undergoing elective colorectal surgery at King Fahd Specialist hospital-Dammam within the ERAS pathway were compared with patients receiving conventional perioperative care over a 2-year period.

Results: In ERAS group, primary and total LOS were shorter (5 versus 7 days, P = 0.0004) compared to conventional perioperative care. In addition to this, re-admission and complication rates were not significantly different between the groups and there were no deaths within 30 days. Patients undergoing rectal surgery within the ERAS pathway did not show any difference in primary LOS, readmission or complication rate although median total LOS was significantly reduced.

Conclusion: Patients undergoing elective colorectal surgery managed within the ERAS pathway had shorter hospital stays without increased morbidity or mortality.

Keywords: *Elective Colonic and Rectal Surgery; ERAS Pathway*

Introduction

Enhanced Recovery After Surgery (ERAS), first introduced in the mid-1990s, is a set of standardized perioperative procedures and practices that are aimed to reduce mortality and morbidity, early recovery and improve overall patient outcome post operatively. The main focus of ERAS programs looks into length of stay (LOS), patient education, opioid sparing analgesia, fluid requirements, incision length, and early mobilization. When implemented properly, ERAS has been shown to reduce length of hospital compared to conventional management protocols [1].

Colorectal surgeries are concomitant with an inevitable increase in hospital stay. This puts a burden not only on the patient but also with health care ser-vices themselves [2]. A 2011 Cochrane review found that ERAS is associated with a reduction in overall complications and length of stay when compared with conventional perioperative patient management [3]. ERAS programs work in a way that combines various different perioperative, intraoperative and post-operative interventions to reduce surgical stressors, optimize postoperative physiological function and help in hastening recovery [4,5]. The fundamental components of ERAS can vary from center to center. However, most guidelines place an importance on patient education, fluid management, incision lengths, analgesia use, early mobilization and decreasing the use of tubes and drains [6,7]. Various studies have reported that when such elements of ERAS are included, the length of stay has been reduced from an average 9 - 10 days to as low as 5 - 6 days [7].

It is generally agreed that ERAS have acted to reduce the length of hospital stay, however this reduction should not be at the expense of higher rates of read-mission [2]. Successful implementation of an ERAS program requires a multidisciplinary team effort that involves the active participation of the surgeons, anesthesiologists/pain care specialists, nursing staff, physiotherapist, occupational and social workers and active participation of the patient in their goal-oriented functional recovery program [2,8].

Each component of ERAS has shown to benefit in a different way [5,9]. Pre-operative education can help reducing anxiety and enhance adherence to the pro-gram, which would in turn promote early recovery and discharge [5,9]. Pre-operative carbohydrate loading for example has been shown by some RCTs to has-ten recovery by earlier return of gastrointestinal motility [5,9]. Optimal use of pre-anesthetic and anesthetic medication (short acting) can help reduce pro-longed length of stays in the hospital [9]. The duration for preoperative fasting should be at least 2 hours for liquid and 6 hours for solids [9]. Fluid balance of zero in intraoperative fluid management has shown to lead to more favorable outcomes [5,9]. It is also recommended that early mobilization after surgery is encouraged and that bed rest after surgery is undesirable [5,9]. With regards to postoperative nutrition, evidence shows that there is no benefit of delaying oral intake after surgery; in fact early enteral feeding has been associated with reduced hospital stay [5,9].

Methods

A retrospective cohort study, comparing two groups (Group A: Enhanced recover postoperative care, Group B: conventional), each group being managed by one consultant's team.

Sixty-four patients who underwent elective colorectal surgery at King Fahad specialist-Dammam hospital in the period between January 2011 and December 2012 were included in the study.

Exclusion criteria:

- ASA > 4
- Age > 80 year old or < 25 year old
- Any patient with previous oncological resections.

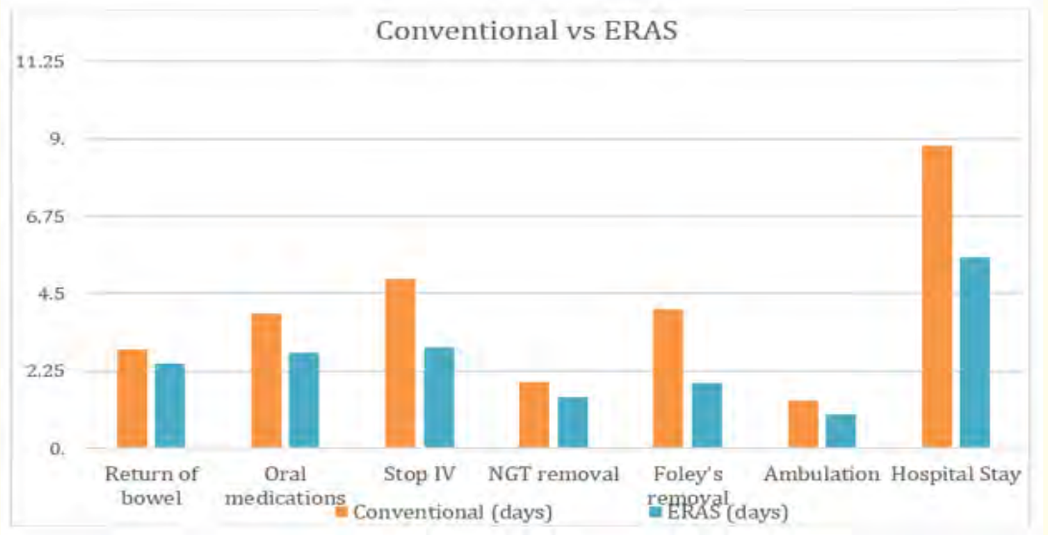
An informed consent was taken from all the patients regarding their inclusion in the research.

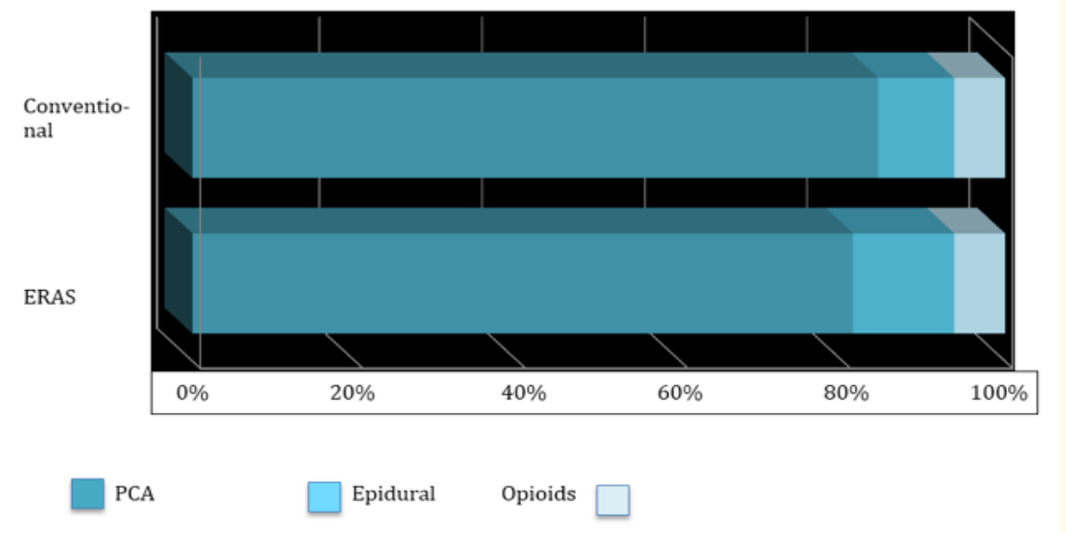
Data including hospital stay, 30 days morbidity and mortality, 6 month follow up and return to normal ambulation, bowel motion and normal diet were collected from the patients files in both group A and B.

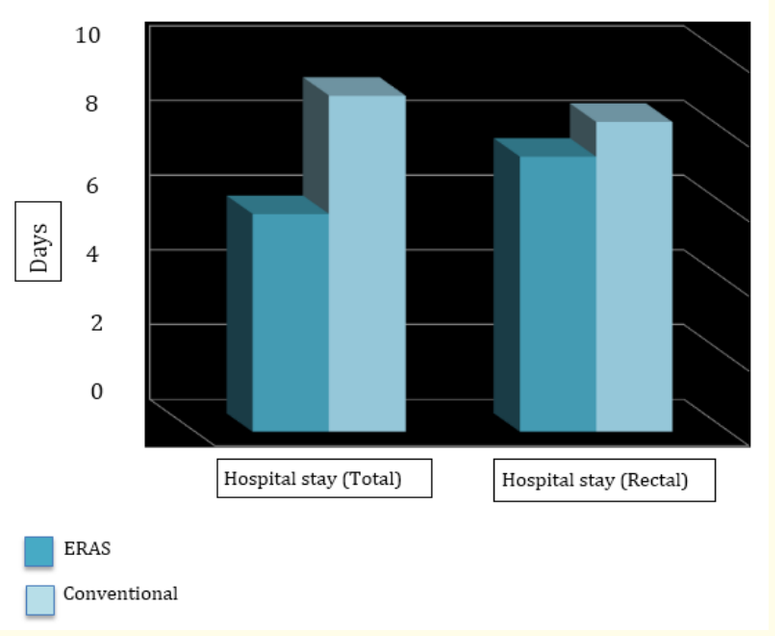
All the data were processed using excel software.

Results

A total of 64 patients undergoing colorectal surgery were included; 32 patients received conventional perioperative care and 32 patients were managed within the ERAS pathway. Primary and total LOS were shorter in the ERAS group (5 versus 7 days, P = 0.0004). Re-admission and complication rates were not significantly different between the groups. There were no deaths within 30 days. Patients undergoing rectal surgery within the ERAS pathway did not show any difference in primary LOS, readmission or complication rate although median total LOS was significantly reduced.


Conventional vs ERAS
11.25
9.
6.75
4.5
2.25
0.
Return of bowel
Oral medications
Stop IV
NGT removal
Foley's removal
Ambulation
Hospital Stay
Conventional (days)
ERAS (days)


Conventio-nal
ERAS
0%
20%
40%
60%
80%
100%
PCA
Epidural
Opioids


10
8
6
4
2
0
Days
Hospital stay (Total)
Hospital stay (Rectal)
ERAS
Conventional

Discussion

In this retrospective cohort study of patients undergoing colorectal surgeries, a highly significant difference in regards to length of hospital stay and return to normal diet was observed. There was no significant reduction in postoperative complications, 30 days' morbidity or 6 months follow up. There was no statistically significant reduction in readmission among the two groups which complies with the results of a recent meta-analysis of ERAS applications following colorectal surgery [10].

The duration to commence oral feeding was significantly reduced in the ERAS group as compared to those receiving conventional treatment. This conforms with previous studies which have shown that early enteral feeding leads to re-duction in the duration of hospital stay [5,11]. Patients receiving treatment as per the ERAS protocol received significantly less intravenous fluids and progressed to normal diet sooner after surgery ($p < 0.01$). Excessive fluid demonstration has been shown to contribute to an increased complication rate [2].

In regards to postoperative analgesia, 80% of each group had PCA while remaining had epidural analgesia. Research has shown that epidural analgesia is one of the key elements of the ERAS protocol since it provides optimal pain relief leading to reduced surgical stress response and eventually reducing post-operative morbidity and mortality [2]. The compliance to the epidural analgesia in both the groups in this study was minimal. Adequate analgesia also plays a key role in early mobilization which in turn reduces the risk of thromboembolism. Immobilization is known to increase insulin resistance leading to muscle loss and decreased muscle strength. Pulmonary function and tissue oxygenation are other variables affected due to immobilization [11]. Abdominal drains and urinary catheters impede mobilization and should be removed as early as possible. In this study, a statistically significant reduction was noted in the removal of Foley's catheter in the ERAS group compared to that of the control group (2 vs 4.3; $p < 0.001$).

Literature states that routine nasogastric decompression should be avoided after colorectal surgery since there is a reduction in fever, atelectasis and pneumonia along with an earlier return in bowel function in patients without a NG tube [11]. 36% of the patients in the ERAS group had a NG tube inserted post-operatively, that was removed the next day. There was no significant reduction in the return of bowel habits in both the groups. In concordance with the literature, the overall length of stay in the hospital decreased to 5.83 days in the ERAS group compared to the conventional treatment group who had a LOS of 9 days ($p < 0.004$).

A few limitations of our study should be mentioned. This was a single-center observational study. Multicenter and large-scale studies are needed to corroborate the present results. Since this is a retrospective cohort study, it is not possible to exclude selection bias since the outcomes have already occurred at the time of selection. There were some differences in demographic characteristics such as sex, age and perioperative variables between the two groups like ASA grade. These differences may have influenced the incidence of postoperative complications as higher ASA grades lead to higher postoperative complications. Literature also states that males are predisposed to an increased incidence of anastomotic leakage after colorectal surgery [2].

This retrospective study has utilized existing clinical data in a relatively quick and inexpensive way to collect preliminary data which may aid in identifying feasibility issues and carries the potential to design future prospective studies.

Conclusion

In conclusion, this study demonstrates that the ERAS program is clearly superior to conventional treatment and is not associated with unexpected negative outcomes. Restricted fluid administration, early Foley's catheter removal, enter-al feeding and ambulation are thought to be the main contributing factors to for an overall reduced length of hospital stay. More research is warranted to optimize perioperative care and postoperative follow up for long-term complications.

Conflict of Interest

The author(s) declare that there is no conflict of interest regarding the publication of this paper.

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