

## Enhanced Recovery after Surgery (ERAS) in Emergency Laparotomy

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ERAS is aimed to reduce the surgical stress and accelerate the post-operative recovery and reduce the hospital stay. ERAS protocols involve pre-, intra-, and postoperative elements, and their fundamental aspects focus on preoperative counselling, no fasting, optimal fluid management, decreased use of tubes, opioid-sparing analgesia, and early mobilization. The ERAS group was established in 2001 with collaboration of five European universities. The data on 'fast-track' and 'multimodal recovery' was compiled and Principles of the ERAS protocol were created [1]. Based on this protocol, several clinical trials have been conducted with focus on length of hospital stay, morbidity and mortality, length of time to return to normal activity and patient satisfaction. ERAS protocol has now become well established procedure for elective abdominal surgeries viz. colonic resections, hepatic resections, radical cystectomy etc.

However, the place of ERAS program in emergency surgery (ES) remains uncertain probably because of the significant challenges in applying it in the emergency setting [2]. In ES, the implementation of all ERAS preoperative components such as cessation of smoking and alcohol may not always be feasible. However, the important key elements having significant bearing on post-operative outcome such as perioperative intra-venous fluids and pre-operative carbohydrate treatment can be controlled in ES cases [3,4]. Therefore, a tailored ERAS protocol based on type of ES is likely to give better outcome.

Lohsiriwat performed the first study examining the outcomes of enhanced recovery after surgery (ERAS) programme in the emergency colorectal surgery. Comparing with a conventional postoperative care, ERAS programme in emergency tumour resection for obstructing colorectal cancer was associated with a significantly shorter length of hospital stay and faster recovery of bowel function, without an increase in 30-day mortality and readmission [5]. Shida., *et al.* also studied the modified ERAS protocol programme on the colorectal obstructive surgeries and had similar findings [6].

Gonenc., *et al.* performed a randomized controlled clinical trial to analyze the feasibility of ERAS pathways in emergency laparoscopic surgery for perforated peptic ulcer disease in patients with ASA grade I and II. In ERAS group cases, the nasogastric tube was removed by the anaesthetist at the end of the operative procedure after aspirating the gastric contents. The results revealed that there were no significant differences in the morbidity and mortality rates, whereas the length of hospital stay was significantly shorter in ERAS group. Routine nasogastric decompression and delayed oral feeding was found to be unnecessary in these cases [7].

Jessica and Karen performed a retrospective cohort study of 370 patients undergoing major abdominal surgery with and without ERAS protocol. Details collected included admission and operative details, post-operative management and outcomes. In cases following ERAS protocol, intra-operative ( $P < 0.001$ ) and post-operative ( $P < 0.001$ ) intravenous fluids were significantly reduced. Significantly fewer patients had a catheter ( $P < 0.001$ ), drain ( $P = 0.001$ ) and patient controlled analgesia ( $P = 0.01$ ) for more than 2 days. Major as well as minor complications were all significantly reduced. This study demonstrated a significant change in management towards ERAS principles in emergency patients following the introduction of such program in elective patients [8].

Paduraru, *et al.* recently performed a systematic review for use of ERAS protocol in ES cases in the last ten years and found a very limited number of such trials. The impact of ERAS on 311 emergency patients was assessed, in comparison to 605 patients consisting of 235 emergency patients receiving conventional care and 370 elective patients receiving ERAS. Complication rates and length of stay were reduced in ERAS cases and readmission rates were equal or not increased significantly. The reviewed studies agreed that ERAS in ES was feasible and safe with generally better outcomes, but needed to be adapted for this patient group as compliance with all ERAS elements could be difficult to achieve [9].

Thus, use of ERAS protocol is a relatively new area to explore and to establish its role in emergency abdominal surgery; it needs further trials in a wider spectrum of surgeries such as intestinal obstruction and gut perforation due to peptic ulcer disease, colonic diverticulitis, ulcerative colitis, Crohn's disease, GI malignancies, trauma and infections (enteric perforation, appendicular perforation, tubercular perforation etc).

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