ERAS Pathway: Need of the Hour in Gynecological Malignancies

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ERAS Approach: Need of the Hour

Enhanced recovery after surgery (ERAS) is firmly established as a global surgical quality improvement pathway [1]. The results are in terms of both improved clinical outcomes and reduced hospital stay, translating ultimately into reduced health-care costs [2]. It is estimated that 234 million surgeries are performed globally annually [3]. Among these patients, 1 in 5 [4, 5] is expected to suffer post-surgical complications that are known to increase morbidity, hospital length of stay and cost and decrease long-term survival [5, 6]. Professor Henrik Kehlet, professor of perioperative therapy at Rigshospitalet, Copenhagen University, introduced the concept of enhanced recovery pathway in 2002 [7]. This approach was previously called as ‘Fast Track (FT) surgery’ or ‘Enhanced Recovery Programs.’ This multimodal FT surgery care team requires not only surgeons but also anesthesiologists, nurses and physiotherapists [8, 9].

Multiple evidence-based perioperative care elements are present which have the potential to decrease post-surgical complications by up to 50% [10], length of stay by 30% [10] and overall costs [11, 12]. Together, these elements form the basis of published enhanced recovery after surgery (ERAS) guidelines [13] now implemented in over 20 countries [1]. Such twenty-one guidelines exist as of today, in various surgical specialties and sub-specialties. [14]. There is an international society, ERAS society, that leads the way in developing and updating ERAS guidelines and has regular meets at various national and international levels [15]. The society was initially called ERAS study group, originated in 2001 by Professor Ken Fearon of University of Edinburgh, UK, and Professor Olle

Ljungqvist of Karolinska Institutet, Sweden. ERAS society was officially formed in 2010 in Stockholm, Sweden [15]. The first ERAS Implementation program was run in Sweden from Örebro University Hospital.

The original ERAS question, posed by Prof Henrik Kehlet in 1997, was whether mitigation of the surgical stress response led to accelerated convalescence and improved surgical outcomes. Dr. Kehlet’s work focused largely on patient education and activation and attenuation of the surgical stress response through aggressive pain relief modalities, early mobilization and early enteral nutrition [16]. The global health-care community has come a long way since, with numerous surgical centers adopting ERAS protocols. These protocols are basically divided in three parts: preoperative, intraoperative and postoperative.

Preoperative	Intraoperative	Postoperative
Patient and career education relative to their roles and expected milestones within the enhanced recovery pathway	Assure multimodal, narcotic-sparing analgesia including regional anesthesia	Assure pain management is adequate to allow for early ambulation
Individualized patient risk-assessment	Assure multimodal postoperative nausea and vomiting prophylaxis	Assure continued postoperative nausea and vomiting management to allow for early alimentation
Optimize medical management	Assure goal-directed fluid therapy including goal-directed hemostasis management	Postoperative patient follow-up including the post-acute care phase
Ensure 12.5% carbohydrate beverage loading within 2 h of surgery	Assure that appropriate standard measures have been completed including maintenance of normothermia	Audit all steps for compliance, review and process improvement

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(continued)

Preoperative	Intraoperative	Postoperative
Ensure adherence to ASA nil-by-mouth guidelines allowing for clear liquid consumption until 2 h prior to surgery	–	–

Preoperative assessment marks the beginning of enhanced recovery protocol. This helps in triage of high-risk patients and provides an opportunity to ‘optimize’ any medical or surgical conditions that may affect outcome of surgery. This has also been termed as ‘Prehabilitation.’ Several interventions have been included like patient’s information, education and counseling; aerobic and resistance exercises to improve physical status; nutritional interventions like high-protein diet [17]. One of key changes in preoperative preparation of surgical patients has been foregoing mechanical bowel preparation. Several randomized trials as well as meta-analysis have conclusively proven that omitting bowel preparation reduces surgical site infection (7.2% vs 16%) as well as hospital length of stay [17]. The concept of preoperative fasting has also been toned down in light of new evidence, with clear fluids been safely given up to 2 h, and a light meal up to 6 h, before elective procedures requiring general anesthesia, in children and adults, are currently recommended. This mitigates the surgical stress and marked postoperative metabolic response [17].

Intraoperative measures include venous thrombo-embolism prophylaxis (combination of mechanical measures such as pneumatic compression devices, pharmacological anti-coagulation with low molecular weight heparin, unfractionated heparin or direct-acting oral anticoagulants). Extended (28-day) anticoagulation is now recommended in high-risk cases [17]. Surgical site infections (SSIs) are one of commonest postoperative complications encountered in surgical population. Several SSI reduction bundles have been suggested and are an integral part of enhanced care pathways. The main components are antimicrobial prophylaxis with appropriate antibiotics, cephalosporins commonly; skin preparation by chlorhexidine-based soap shower prior to surgery and chlorhexidine-alcohol skin preparation in operating room; prevention of perioperative hypothermia by active intraoperative warming, using pre-warmed parenteral fluids; avoidance of drains/tubes routinely, though strong evidence for same lacks presently; control of perioperative hyperglycemia, which has been found to have effects on mortality [17].

There are subset of guidelines for anesthetists; in fact a ‘champion’ anesthetist is an integral part of ERAS

algorithm, just as a ‘champion nurse’ and a ‘champion surgeon’ are. They comprise the three pillars of success of an enhanced recovery pathway. The use of short-acting anesthetics, monitoring of neuromuscular block depth and complete reversal are recommended. Ventilation should use a protective strategy with tidal volumes 6–8 mL/kg and positive end expiratory pressure 6–8 cm H₂O [17]. Minimal invasive surgical techniques are recommended to be used whenever feasible due to largely proven benefits in earlier postoperative recovery.

One of the most important components of an ERAS program is the use of goal-directed fluid therapy; this may be facilitated by the use of minimally invasive hemodynamic monitoring to detect flow-related parameters and/or dynamic parameters of fluid responsiveness. This is done in order to titrate therapeutic interventions (intravenous fluids and/or inotropic therapy administration) to optimize end organ tissue perfusion [18]. Goal-directed fluid therapy in ERAS pathways is simpler to implement as compared with patients on traditional surgical pathways. This is because patients on an ERAS pathway are not exposed to prolonged periods of fasting, or mechanical bowel preparations, and, in addition, are given carbohydrate loading solutions the night before and the morning of surgery, allowing for better hydration and a normal intravascular volume status [17].

A multimodal postoperative analgesic protocol has been recommended to reduce overall opioid administration. This is usually achieved by non-opioid oral medicines and local injection of anesthetic agents at incisional site. ‘Early feeding’ has been found to improvements in return of bowel activity, reduced length of hospital stay and equivalent complication rates as measured by wound healing, anastomotic leaks, or pulmonary complications [19]. High-protein diet especially has been found to enhance recovery after surgery. Early feeding also prevents and reduces risk of postoperative ileus, the risk of which could be as high as 30%, especially in cancer surgeries. Postoperative coffee consumption has been found to reduce these rates by as low as 10% [20].

There has been a lot of buzz lately to include patients’ perspectives in analyzing outcome of any clinical trial. In fact, ‘patient-reported outcomes’ are an integral part of ERAS programs now. The recovery process is complex and encompasses the multiple dimensions of physical, emotional, economic and social health [21]. Consistent collection and documentation of patient-reported outcomes within ERAS programs allow institutions to monitor, understand and compare functional recovery in a patient-centered fashion [17]. Patients managed under ERAS pathway are discharged in an intermediate recovery phase, with the recovery process expected to extend into the home setting. Patients are thus given detailed education about recovery process, to avoid unplanned hospital visits.

Implementation of ERAS requires coordination by a multidisciplinary team spanning the entire continuum of care from preoperative counseling to return to normal function. Assessing adherence to specific ERAS elements is an essential component of an ERAS program. To improve the quality of ERAS reporting, ERAS USA and the ERAS Society have published the Reporting on ERAS Compliance, Outcomes, and Elements Research (RECOvER) Checklist. Clinicians are encouraged to use ERAS auditing tools. Two examples include the ERAS interactive audit system (EIAS) (<https://erassociety.org/interactive-audit/>) and the Agency for Healthcare Research and Quality (AHRQ) safety program for improving surgical care and recovery (<https://www.ahrq.gov/professionals/quality-patient-safety/hais/tools/enhanced-recovery/index.html>) [17]. To conclude, ERAS program continues to expand across various surgical disciplines as this editorial is written. Switching to and adopting these guidelines have been proved to improve patient outcomes and reduce health-care costs whether to state or individual patients.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical issues Nil.

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