

Supplement File 2

Comparison of protocols between the Non-ERAS group and the ERAS group

	ERAS group	Control group
a. Preadmission patient education	Coordinator explains the ERAS protocol to patients, all of whom receive an information packet.	-
b. Preadmission screening and optimization	Patients are screened for nutritional deficiency and preoperative cardiopulmonary status, referred for tobacco cessation and alcohol counseling, and referred for exercise training and inspiratory muscle training.	-
c. Fasting and carbohydrate loading guidelines	Normal diet until midnight, clear liquids until 2 h before surgery, 600 ml carbohydrate drink containing a total of 50 grams of maltodextrin finished 2 h before surgery	-
d. Preemptive analgesia	+ (200 mg Celebrex PO on the day of surgery)	-
e. Postoperative nausea vomiting prophylaxis	+ (5-10mg Dexamethasone and 1 mg Granisetron)	Anesthesiologist's preferences
f. Intraoperative fluid management strategy	(1) Crystalloid fluid infusion 4 ml/kg/hr (GDFT with Flotrac monitoring) (Goal: maintain stroke volume during thoracic phase, optimize stroke volume in abdominal phase, maintain MAP above 65mmHg)	Crystalloid fluid infusion 6-8 ml/kg/hr

(2) Keep fluid balance < 2 liter

g. Anesthetics administered	EEG-based anesthesia depth monitoring (goal: BIS 40-50), TIVA(Propofol), Dexmedetomidine infusion 0.1-0.4 mcg/kg/hr	Sevoflurane-based or Propofol-based
h. Patient warming strategy	Forced warm air and intravenous fluid warmer	Anesthesiologist's preferences
i. Protect lung ventilation	(1) 5-7 kg/ ml tidal volume for one lung ventilation (2) 6-8 kg/ml tidal volume for two lung ventilation (3) Respiratory rate is based on PaCO ₂ value (PaCO ₂ range: 35-45mmHg)	Anesthesiologist's preferences
j. Perioperative multi-model analgesia strategy	(1) Preemptive analgesia (2) Thoracic epidural analgesia (3) Dexmedetomidine infusion 0.1-0.4 mcg/kg/hr (4) Short-acting opioid (fentanyl)	Thoracic epidural analgesia with intravenous opioid(fentanyl) during operation
k. Postoperative multi-model analgesia strategy	(1) Patient-controlled thoracic epidural analgesia (2) Routine intravenous acetaminophen Q6H (3) Intravenous parecoxib and weak opioid for rescue analgesia	(1) Patient-controlled thoracic epidural analgesia (2) Intravenous opioid for rescue analgesia
l. Early extubation	Immediately extubation at the operation room	- (Start weaning protocol at POD1)
m. Management of postoperative fluids	LR infusion in rate of 1.5-2.5ml/kg/hr	-

n. Postoperative anti-emetic plans	Granisetron and Metoclopramide for anti-emetic	-
o. Plan for opioid minimization	(1) Routine IV acetaminophen postoperative (2) IV Parecoxib on suitable patient (3) Intravenously Tramadol as rescue analgesia if needed (4) orally Traceton Q6H from POD2	Intravenous Tramadol or Morphine based on surgeons' preferences
p. Drain and line management	(1) Avoid perianastomotic drains (2) Remove chest drains and foley catheters a on POD3	-
q. Early mobilization strategy	(1) sitting in an upright position in bed ,mobilization to sitting position at the edge of the bed or mobilization out of bed to sit in a chair at POD1 (2) Progressing standing at POD2 (3) Walking training at POD3	-
r. Postoperative diet and bowel regimen management	Routine use of enteric feeding tubes and following daily target feeding goal starting on POD1 (Goal: D5W 500 ml in POD1; nutrition supplement of 500kcal, 1000kcal and 1500-1750kcal in POD 2,3 and 4 respectively)	Based on surgeons' preferences
s. Criteria for discharge	(1) Tolerating daily target feeding goal (2) Pain well controlled on oral medication (3) Ambulating in hallways	Based on surgeons' preferences

**t. Tracking of post-discharge
outcomes**

Routine postoperative follow up and the coordinator Routine postoperative follow up
will contact patients 3 & 6 months later

ERAS protocol for esophagectomy is followed “Guidelines for Perioperative Care in Esophagectomy: Enhanced Recovery After Surgery (ERAS®) Society Recommendations” (Low DE, Allum W, Manzoni GD, Ferri L, Immanuel A, Kuppusamy M, et al. Guidelines for Perioperative Care in Esophagectomy: Enhanced Recovery After Surgery (ERAS®) Society Recommendations. World J Surg. 2019;43:299–330) and presented in the framework following RECOVER Checklist (Elias KM, Stone AB, McGinigle K, Tankou JI, Scott MJ, Fawcett WJ, et al. The Reporting on ERAS Compliance, Outcomes, and Elements Research (RECOVER) Checklist: A Joint Statement by the ERAS® and ERAS® USA Societies. World J Surg. 2019;43:1–8.)