

POSTOPERATIVE ESOPHAGECTOMY MANAGEMENT IN INTENSIVE CARE UNIT: COOPERATION AND COMORBIDITIES

Anasthasia D. Sutedja^{1*}, Sidharta K. Manggala¹

¹Department of Anesthesiology and Intensive Care, Faculty of Medicine, Universitas Indonesia

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Corresponding Author

Name : Anasthasia Devina Sutedja

Email : anas16609@gmail.com

Abstract

Esophagectomy remained a high-risk and high-mortality surgery for patients with esophageal carcinoma, with a rate of morbidity of up to 65% and a 30-day mortality of up to 4%. Although many have described intraoperative management of such patients, long-term and comprehensive analysis of postoperative anesthesia management was limited due to chronic and arduous follow-up throughout intensive care. We present a case of a 64-year-old male in the intensive care unit (ICU) after undergoing esophagectomy and gastric pull-up performed by digestive and thorax surgeons. The patient was found with sputum retention, inadequate cough, and desaturation after stepping down to the ward. Reintubation was done, and the patient was readmitted to ICU. During the second admission, relaparotomy successfully repaired the leakage, but trial extubation was unsuccessful. The patient developed sepsis due to ventilator-associated pneumonia. Tracheostomy was considered and dismissed as there was a high risk of descending pulmonary infection. The patient was signed up for palliative care, and during his last days, the family decided not to resuscitate him. After one month of intensive care, the patient succumbed to his illness. Optimizing patient care in the ICU should include fluid, nutrition, pain, and respiratory management. Multispecialty team approach was essential, with an anaesthesiologist acting as a moderator in managing pain, stress, hemodynamics, ventilation, enhanced recovery, early detection, and management of complications.

Keywords

Esophagectomy, intensive care unit, postoperative, outcome

Introduction

Esophagectomy remained a high-risk and high-mortality surgery for patients with esophageal carcinoma, with a rate of morbidity of up to 65% and a 30-day mortality of up to 4% in central hospitals. The mortality is even higher in national audits, with 30-day mortality above 5%.¹ Most commonly, debilitating complications were caused by pulmonary infection and anastomosis dehiscence.² Postoperative complications have been linked to mortality rate, length of stay, readmission rate, cancer recurrence, survival, and quality of life.³

Open esophagectomy can be performed through a transthoracic approach, with intrathoracic anastomosis (Ivor-Lewis procedure) or cervical anastomosis (McKeown procedure).³ McKeown procedure was associated with a higher incidence of anastomosis leak. However, because of the position of the anastomosis, anastomosis leaks in these patients are usually quickly identified, and there is no difference in mortality rate and rate of intervention between the two methods. From the anesthesiology perspective, intraoperative considerations for esophagectomy included the type of anesthetic agents, airway management, intraoperative monitoring, and enhanced recovery protocols.⁴ Postoperative care of these patients is even more difficult and multidisciplinary, including but not limited to hemodynamics, fluid, nutrition, infection, and early detection of surgical and medical complications.⁵

Many have described intraoperative management of such patients, but long-term, comprehensive analysis of postoperative anesthesia management was limited due to chronic and arduous follow-up throughout intensive care unit (ICU) care. Ultimately, ICU care could mean life or death for the patient and should be meticulously tailored according to the patient's condition and hospital facilities. This case report aims to dissect and elaborate on perioperative, especially postoperative management of patients undergoing the McKeown procedure in the ICU.

Case Report

Pre- and Intraoperative

A 64 year old male arrived at the intensive care unit (ICU) after undergoing esophagectomy and gastric pull-up performed by digestive and thorax surgeons. Previously, the patient was assessed with ASA 3, with difficulty swallowing without any dyspnea. The patient underwent surgery under general anesthesia, with the insertion of a central venous catheter (CVC) and arterial line for beat-to-beat monitoring. Epidural was inserted in T4-5. Intraoperatively, the depth of anesthesia was maintained by Sevoflurane 0.7 MAC and intermittent Fentanyl and Rocuronium.

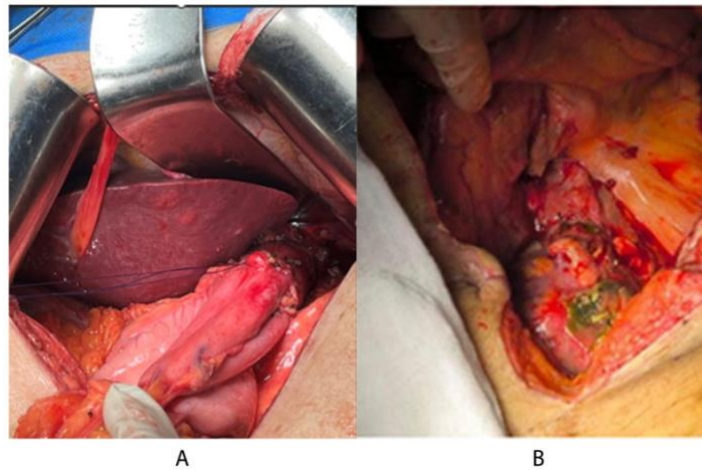


Figure 1. Intraoperative findings (A) neoesophagogastric anastomosis from the first surgery; (B) anastomosis leakage from the last surgery

Postoperative

Initially, the patient arrived in the ICU with unstable hemodynamics aided with Norepinephrine 0.1 microgram per kilogram per minute (mcg/kg/minute). The patient was also given Ciprofloxacin 400 mg two times daily intravenously and Metronidazole 500 mg three times daily. During the next 3 days, the patient developed signs of infection and sepsis, initially with fever and tachycardia, followed by persistent hypotension. Culture from sputum, the base of the wound, and blood was taken. Norepinephrine dose raised up to 0.25 mcg/kg/minute; thus, escalation of antibiotics was given with Meropenem 1 gram per 8 hours. After antibiotic escalation, the patient showed signs of improvement, with heart rate decreased from 130 beats per minute to an average of 110 beats per minute. Epidural was given intermittently every 12 hours as the patient started to regain contact and complained about surgical site pain.

The patient finally stabilized on day 6, with adequate contact, prompting extubation, and a step down to the general ward. However, after 2 days in the general ward, the patient developed anastomosis dehiscence, with fecal material and pus from the esophageal drain. The patient was found with sputum retention, inadequate cough, and desaturation. Reintubation was done, and the patient was readmitted to ICU. During the second admission, relaparotomy successfully repaired the leakage temporarily; however, drain production increased after several days and trial extubation was unsuccessful. Patient developed sepsis due to ventilator-associated pneumonia, complicated by repeated anastomosis dehiscence. Patient's hemodynamic was detailed in Figure 2. Tracheostomy was considered and dismissed as there was a high risk of descending pulmonary infection through tracheostomy.

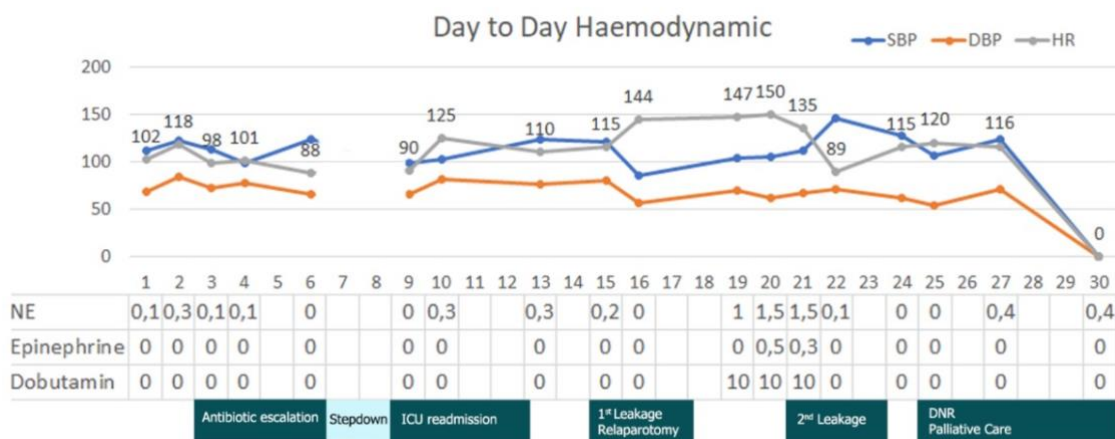


Figure 2. Patient’s hemodynamic indices throughout ICU care

The patient was signed up for palliative care, and during the last days, his family signed on a do not resuscitate (DNR). After one month of care in the ICU, the patient finally succumbed to his illness.

Discussion

An anesthesiologist is the leading figure in esophagectomy patient care. Optimizing patient care in the ICU should include fluid, nutrition, pain, and respiratory management.⁴ Optimal pain management of esophagectomy could prevent postoperative complications, including aspiration and pulmonary infection. Multimodal intravenous analgesia combined with regional anesthesia could facilitate postoperative pain with satisfactory results.⁵ In our case, intravenous analgesics using paracetamol and ketorolac were used; however, regional anesthesia was not used considering the hemodynamic instability causing limited use of epidural analgesia, although thoracic epidural was applied in this patient. Early postoperative pain management could decrease the prevalence of chronic pain, and thoracic epidural analgesia was considered as gold standard management.⁵ Thoracic epidural was shown to reduce duration of ventilator use, shorter ICU stay, and lower opioid requirement, with a lower risk of anastomotic leak.⁵ When epidural was not possible, systemic multimodal analgesia could be an alternative with adequate pain relief. Care to avoid high doses of opioids should be taken as long-term use of high-dose opioids could cause hyperalgesia, chronic pain, and opioid dependence.⁶

A multispecialty team approach was essential, with the anesthesiologist acting as a vital moderator for managing pain, stress, hemodynamics, ventilation, enhanced recovery, early detection, and management of complications.^{1,6} Hemodynamic swing could prompt an anesthesiologist to administer excess fluid, which could cause pulmonary edema and anastomosis venous congestion. On the other hand, insufficient fluid could increase the need for vasopressors, increase myocardial strain, and cause ischemia of anastomosis due

to vasoconstriction. Goal-directed fluid management with cardiac output monitoring could improve patient outcomes. However, techniques such as esophageal Doppler and transesophageal echocardiography have limited use in esophagectomy surgery.⁵ Other than that, supraventricular arrhythmia, especially atrial fibrillation, could be a direct or indirect result of the surgery and could increase the risk of mortality.

Anesthesiologists should be able to detect early signs of possible complications as it could lead to a life-threatening condition. The most common complication was respiratory complications (17-51%), including pneumonia, which could lead to ARDS and sepsis.⁵ Anastomotic leak is one of the most serious surgical complications, ranging from 10-37%, causing 35% of the total mortality rate post esophagectomy.⁵ During the case, complications arose postoperatively due to an anastomosis leak and infection that followed, which prolonged the ICU stay and caused further decline in the patient's condition. Slower complication progression may be caused by smaller leaks, and the patient may initially improve with stable hemodynamic before eventually getting worse. In this case, the patient showed significant improvement in the general ward before stepping up to the ICU again.

For patients in terminal stages, palliative and end-of-life care are just as important as aggressive therapeutic management; therefore, knowledge of the perioperative care of the patient could improve outcomes significantly. Up to 85% of patients with oesophageal carcinoma were never treated with the intention to cure, with 5 years mortality of more than 50%.⁴ Therefore, the cornerstone of care for these patients includes palliative care to tackle long-term complications, including dysphagia, residual tumor, chronic pain, cachexia, and GI bleeding.⁵ In the case above, end-of-life care included multidisciplinary meetings, family meetings, and thorough education. Communication with the patient's family is as important as patient care, and the family should be informed about changes in the patient's condition, therapy plans, and outcomes for the patient.

ICU management of esophagectomy patients is long and arduous, with multiple life-threatening complications that could happen at any stage of care. An anesthesiologist must understand complications, difficulties, and strategies to improve the postoperative outcome of patients undergoing esophagectomy.

Competing Interests

There is no conflict of interest in this paper.

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