Case Report

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Anesthetic Management of Esophagectomy using one Lung Ventilation

Sai Yashaswini Gorle[1], Ravi Madhusudhana[2]

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Abstract

Introduction: Esophagectomy is considered as procedure with highest morbidity and mortality; yet one of the main stream treatment for esophageal cancers. Genetics, age, sex, gender are unmodifiable risk factors for esophageal cancers, it is one of the most common cancers occurring in the world. Most important features of oesophagectomy are perioperative risk assessment, pulmonary morbidity, ventilation strategies, thoracic epidural analgesia, goal directed fluid therapy, ERAS protocol, management of cardiovascular complications. Thoracic epidural analgesia helps in reducing the systemic inflammatory response, by decreasing pain stimulus and post-operative pain control.

Case Report: A 62 year old, 50 kgs man was posted for transthoracic esophagectomy presented with complaints of difficulty in swallowing and generalized weakness. Patient medical history was not significant. Patient had received 4 cycles chemotherapy (paclitaxel and carboplatin). Anaesthetic management was planned with the aim of proper analgesia, minimum respiratory complications following ERAS protocol.

Conclusion: Pre-operative anesthesiological evaluation is mandatory in order to stratify and optimize any medical condition. During surgery, protective ventilation and judicious fluid management are the cornerstones of intraoperative "protective anesthesia". Post-operative care should be provided by an intensive care unit or high-dependency unit depending on the patient's condition, the type of surgery endured and the availability of local resources.

Keywords: One lung ventilation; Esophagectomy; Thoracic epidural.

Key Messages: Most important features of oesophagectomy are perioperative risk assessment; pulmonary morbidity; ventilation strategies; thoracic epidural analgesia; goal directed fluid therapy; ERAS protocol; management of cardiovascular complications.

Author's Affiliation: [1]Resident, [2]Professor & HOD, Department of Anesthesiology, Sri Devaraj Urs Medical College, Sri Devaraj Urs Academy of Higher Education and Research, Kolar 563102, Karnataka, India.

Corresponding Author: Ravi Madhusudhana, Professor & HOD, Department of Anesthesiology, Sri Devaraj Urs Medical College, Sri Devaraj Urs Academy of Higher Education and Research, Kolar 563102, Karnataka, India.

E-mail: ravijaggu@gmail.com

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INTRODUCTION

Esophagectomy is considered as procedure with highest morbidity and mortality; yet one of the main stream treatment for esophageal cancers. Genetics, age, sex, gender are unmodifiable risk factors for esophageal cancers, it is one of the most common cancers occurring in the world. Most important features of oesophagectomy are perioperative risk assessment, pulmonary

morbidity, ventilation strategies, thoracic epidural analgesia, goal directed fluid therapy, ERAS protocol, management of cardiovascular complications. Thoracic epidural analgesia helps in reducing the systemic inflammatory response, by decreasing pain stimulus and post operative pain control.

CASE REPORT

A 62 year old, 50 kgs man was posted for transthoracic esophagectomy presented with complaints of difficulty in swallowing and generalized weakness. Patient medical history was not significant. Patient had received for 4 cycles chemotherapy (paclitaxel and carboplatin). Anaesthetic management was planned with the aim of proper analgesia, minimum respiratory complications following ERAS protocol.

After premedication was given using glycopyrrolate 0.2 mg and with fentanyl 100 mcg. IV anesthetic induction was done using with iv propofol 100 mg and vecuronium 5 mg was given. Patient was intubated with double lumen ET French 37 fixed at 29 cm to allow for isolated one lung ventilation. Inhalational agent isoflurane was used. INJ meterogyl and cefuroxime antibiotics was given.

Thoracic epidural was placed at T8–T9 with catheter fixed at 10 cm. Inj bupivacaine 0.25% with inj fentanyl 25 mcg was given as an analgesic dose.

Positive one lung ventilation was done with tidal volumes 5 ml/kg and optimized PEEP (5-10 cm h20) while limiting peak pressures less than 30 cm h20.

Fluid therapy was given approximately given 2-3ml/kg/hr and blood products around 4 pints prbc and 4 FFP were transfused but not exceeding 10ml/kg/hr. ERAS protocol was followed. transthoracic esophagectomy was done. Feeding gastrostomy was done.

There were no respiratory or hemodynamic incidents during the operation. The double-lumen endobronchial tube was changed to a single-lumen endotracheal tube at the end of the case. The patient was transferred to the intensive care unit and extubated on postoperative day 1 (POD 1). The patient received IV acetaminophen, continuous infusions of bupivacaine 0.125 % at 8 mL/h via epidural infusion catheters until POD 3

Respiratory rehabilitation consisted of active nursing, chest physiotherapy, and incentive spirometry.

DISCUSSION

Esophagectomy is a complex and high risk procedure. The patient was kept intubated overnight, which allowed for extended recovery of the deflated lung, reduction of risk of residual neuromuscular blockade after a long anesthetic, and avoidance of non invasive ventilation or unplanned reintubation in the event of early respiratory deterioration. Given the patient's severe obstructive sleep apnea, continuous positive airway pressure would have been ideal for decreasing the risk of hypoventilation and improving alveolar recruitment; however, we generally prefer to avoid non invasive ventilation in the early postoperative period after esophagectomy because of the theoretical risk of conduit distension and anastomotic complications.

Post-operatively, we provided multimodal pain management including the use of regional analgesic techniques to allow the patient to fully participate in early chest physiotherapy and thus reduce the risk of pulmonary complications.

The combination of a comprehensive analgesic plan, early chest physiotherapy, and early mobilization contributed to an excellent outcome.

While not carrying the same level of evidence, pre-operative optimization of hemoglobin and nutrition as well as early postoperative mobilization and daily evaluation of appropriate drain, catheter and tube removal are important components of an enhanced protocol that have been shown to reduce length of hospital stay. In a pooled analysis of studies on enhanced recovery protocols for esophagectomy Markar et al. [were able to demonstrate significant decreases in anastomotic leaks, PPC and hospital length of stay, however no impact on overall patient mortality. ERAS protocols, therefore, have to cover the full breadth of perioperative factors and need to be devised and revised in a multidisciplinary fashion by surgeons, anesthesiologists and other perioperative care providers. There is a need for large scale, prospective, multicenter trials to establish optimal care pathways.

CONCLUSION

Pre-operative anesthesiological evaluation is mandatory in order to stratify and optimize any medical condition. During surgery, protective ventilation and judicious fluid management are the cornerstones of intraoperative "protective anesthesia". Post-operative care should be provided by an intensive care unit or high dependency unit depending on the patient's condition, the type

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