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CASE REPORT

A Case of Thoracotomy with One Lung Ventilation for Carcinoma Oesophagus

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ABSTRACT

Anaesthetic management in carcinoma oesophagus is particularly challenging due to the need for maintaining adequate oxygenation and ventilation during OLV, managing hemodynamic fluctuations, and addressing perioperative risks such as hypoxemia, postoperative pulmonary complications, and pain control.

Our patient was a 45 year old female with carcinoma oesophagus , mild pneumonitis; other investigations were within normal limits. She was premedicated, induced and intubated with a double lumen tube; she did not tolerate one lung ventilation and changed to regular single lumen tube and low tidal volumes were tried; developed acidosis and treated and extubated uneventfully. Low tidal volumes can be used in patients with bad lung for facilitating the surgery.

KEYWORDS:

• One Lung Ventilation • Esophagectomy

INTRODUCTION

Carcinoma oesophagus is a common thoracic malignancy often requiring esophagectomy via thoracotomy, necessitating one-lung ventilation (OLV) to provide optimal surgical exposure. Anaesthetic management in such cases is particularly challenging due to the need for maintaining adequate oxygenation and ventilation during OLV, managing hemodynamic fluctuations, and addressing perioperative risks such as hypoxemia, postoperative pulmonary complications, and pain control.

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OLV poses unique physiological challenges by creating a significant ventilation-perfusion mismatch, requiring precise anesthetic planning and vigilant intraoperative monitoring. This case highlights the anaesthetic considerations, intraoperative strategies, and perioperative management in a patient undergoing thoracotomy for carcinoma oesophagus, emphasizing the importance of tailored anaesthetic techniques to ensure safe surgical outcomes.

Case Report

A 49 year old female came with the complaints of dysphagia for past 3 months who was known case of carcinoma oesophagus (moderately differentiated squamous cell carcinoma). Patient received radiation of 41-40Gy in 23 fractions to lower end of oesophagus from 26/4/25 to 28/5/25 and chemotherapy (Paclitaxel+Carboplatin) 5 cycles. Last cycle was on 26/5/25 with radiotherapy. The patient was planned for VATS/Trans-thoracic esophagectomy

ECG showed normal sinus rhythm. 2D ECHO showed normal chamber dimensions, no RWMA, mild MR, mild AR, mild TR, RVSP-25mmHg, mild PR, adequate LV systolic function, LVEF-60%. X-ray showed prominent broncho vascular markings. CT-Chest showed patchy focal pneumonitis, consolidation area seen in posterior basal segments of left lower lobe. Few enlarged pre, paratracheal lymph nodes are seen. Oesophageal biopsy revealed moderately differentiated squamous cell carcinoma. Other investigations are under normal limits.

Airway examination revealed that there is no anticipated difficult Airway with Mallampati grade-2.

Epidural catheter was placed at T8-T9 level fixed at 9 cm with 18G Tuohy's needle. Test dose of Lignocaine 2% + Adrenaline 3ml was given after negative aspiration of blood and CSF. 2 epidural top ups of 0.125% Inj. bupivacaine 8ml was given after negative aspiration of blood and CSF.

Patient was preoxygenated with 100% Oxygen for 3 minutes with 12 litres of O2 with face mask of size 3, direct laryngoscope was done intubated orally with double lumen tube of size 35fr and was fixed at 26 cm. CL grading was grade 1.

The patient was given 0.2mg of Inj. Glycopyrollate as premedication, followed by Inj. Fentanyl 60mcg for sedation. Inj. Lignocaine IV 40mg was given followed by which she was induced with Inj.Propofol 80mg. Muscle relaxant Inj.vecuronium 3mg was given. The patient was light every 40-45 mins when Inj. vecuronium 1mg was repeated.

Intraoperatively, initially the patient was in left lateral position maintaining in 3 Litres of Oxygen and 2 litres of air for initial 4 hours. As the patient was not tolerating to 1 lung ventilation she was put to supine position and double lumen tube was changed to normal tube and fixed at 20 cms and the patient was maintaining with 1.5 litres of Oxygen and 2 litres of nitrous oxide. Vitals were stable with heart rate 80-85 per min, BP of 120/80mmHg and saturation of 98% and 6 pints of fluid was given.

Arterial blood gas analysis was done twice intra operatively and 1st ABG done during single lung ventilation showed metabolic acidosis with pH of 7.21 with pCO2 retention of 61. Ventilation settings were changed rate was increased. And the second ABG after 2 hrs turned out normal with pH of 7.40.

The Maximum allowable blood loss of thus patient was 440ml and almost 450 ml was lost intraoperatively. So 1 unit of PRBC and was transfused intraoperatively. 500ml colloid was also given. Antibiotics were repeated every 4th hourly intraoperatively.

The patient was shifted to ICU with tube insitu for 1 day elective ventilation. NPO was maintained for 6 hrs after which Ryle's tube feeding was started. Pain management was done with PCEA when in ICU and epidural top ups of 0.125% Inj. Bupivacaine when shifted out to general wards until Post-operative day 5 after which epidural catheter was removed. Vitals were stable.

DISCUSSION

Carcinoma of the oesophagus often requires surgical resection, with either video-assisted thoracoscopic surgery (VATS) or open transthoracic esophagectomy being the preferred approaches for operable disease. Both techniques require one-lung ventilation (OLV) to provide optimal surgical exposure and minimize lung trauma during thoracic dissection. OLV, however, presents significant

physiological challenges, including hypoxemia due to increased intrapulmonary shunt, increased airway pressures, and potential postoperative pulmonary complications.[1]

Anaesthetic management of these patients is particularly challenging because they frequently present with poor nutritional status, weight loss, anaemia, and possible coexisting comorbidities such as chronic obstructive pulmonary disease (COPD) or cardiovascular disease.[2] Securing the airway in carcinoma oesophagus patients can be complicated by mass effect, distorted anatomy, or risk of aspiration from oesophageal obstruction. Awake fibreoptic intubation or careful rapid sequence induction may be considered in select cases.[2]

Intraoperatively, the choice of lung isolation device (double-lumen tube vs bronchial blocker) is determined by the surgical approach, airway anatomy, and anaesthetist preference.[2] Lung-protective ventilation strategies during OLV using low tidal volumes (5–6 mL/kg predicted body weight), adequate positive end-expiratory pressure (PEEP), and intermittent recruitment manoeuvres help reduce ventilator-induced lung injury.[3] Maintenance of adequate oxygenation may require intermittent reinflation of the non-dependent lung or application of continuous positive airway pressure (CPAP) to the non-ventilated side.[3]

Postoperative care includes early extubation if feasible, aggressive pulmonary physiotherapy, and effective analgesia. Thoracic epidural analgesia or paravertebral block is recommended to facilitate deep breathing and coughing, thereby reducing pulmonary complications.[2] Previous reports have shown that enhanced recovery protocols, careful fluid management, and multimodal analgesia improve postoperative outcomes in these high-risk patients.[4]

CONCLUSION

One lung ventilation with DLT is choice of isolation for surgical approach from thorax for CA-oesophagus, our patient could not tolerate one lung ventilation because of fibrosis as we went ahead with low tidal volume ventilation successfully.

Conflict of Interest: Nil

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