TPM Vol. 32, No. S4, 2025
ISSN: 1972-6325
https://www.tpmap.org/

ANAESTHETIC MANAGEMENT FOR VIDEO ASSISTED THORACOSCOPY IN A CASE OF MASSIVE MALIGNANT PLEURAL EFFUSION

DR NAGHA PRASSANA B[1], DR ASHOK KUMAR B[2], DR. RANJITH MARI[3]
[1](POST GRADUATE),
[2](PROFESSOR)
DEPARTMENT OF ANESTHESIOLOGY, SAVEETHA MEDICAL COLLEGE AND HOSPITALS, SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES, SAVEETHA UNIVERSITY, CHENNAI - 602105, TAMIL NADU, INDIA
[3]SENIOR LECTURER, DEPARTMENT OF PERIODONTOLOGY, SREE BALAJI DENTAL COLLEGE & HOSPITAL, CHENNAI, INDIA

Abstract
Background: Video-Assisted Thoracic Surgery (VATS) for massive pleural effusion poses unique anaesthetic challenges. Combining a Laryngeal Mask Airway (LMA) with an Erector Spinae Plane (ESP) block offers a minimally invasive approach that reduces airway manipulation, provides effective multi-dermatomal analgesia, and limits opioid use—beneficial in patients with compromised respiratory function.[1][2]
Case Presentation: A 63-year-old male, a known case of right nodal mass (T4 N3 M1), right internal jugular vein thrombosis, and moderate pericardial effusion, was scheduled for VATS for massive malignant pleural effusion. Anaesthesia was managed using a combined technique of ESP block and general anaesthesia, with airway secured using a classic LMA.
Discussion: The combination of ESP block and LMA offers a minimally invasive anaesthetic strategy for VATS in high-risk patients. This approach provides excellent pain control, reduces perioperative opioid use, and maintains adequate ventilation without endotracheal intubation. Minimizing airway manipulation is particularly beneficial in patients with compromised cardiopulmonary status. Additionally, effective regional analgesia supports early ambulation and recovery, which is vital for postoperative outcomes in patients with advanced malignancy and poor respiratory reserve.[3]
Conclusion: The use of ESP block with LMA is a safe and effective anaesthetic technique for VATS in patients with massive pleural effusion.[4] It offers significant advantages in terms of analgesia, airway management, and recovery, making it a valuable option in selected high-risk cases.

Keywords: Erector spinae plane block; Laryngeal mask airway; Video-assisted thoracic surgery; Malignant pleural effusion; Regional anaesthesia; Opioid-sparing anaesthesia

INTRODUCTION

Pleural effusion, particularly malignant pleural effusion, can cause significant respiratory distress and requires prompt management. VATS is commonly employed for drainage or pleurodesis. Conventionally, general anesthesia with endotracheal intubation is utilized, but in selected cases, regional anesthesia techniques, like the erector spinae plane (ESP) block, may allow the use of a laryngeal mask airway (LMA) instead, potentially reducing the risks associated with intubation and single-lung ventilation. [5]

CASE REPORT

A 63-year-old male came to hospital with chief complaints of • Dry cough for 2 months, C/O dyspnea on exertion for 1 month (more aggravated for 1 week), C/O low grade fever for 2 days, H/O loss of weight, H/O loss of appetite. • Patient is a known case of Type 2 diabetes mellitus for 10 years on regular medication with OHA. • Patient denied H/O smoking, no H/O COVID - 19 infection - vaccinated (2 doses). • Patient was

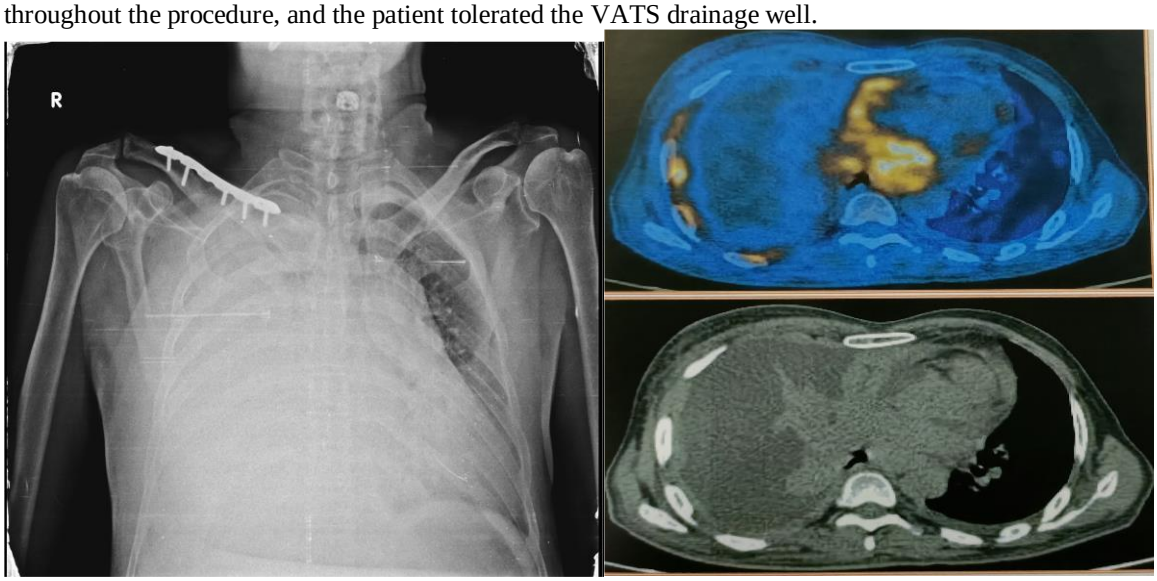
admitted for similar complaints on the month before during which therapeutic and diagnostic pleural tapping was done. Pleural fluid cytology was negative for malignancy. • Based on clinical suspicion, patient was started on ATT. • CT thorax was done which showed few peribronchial infiltrates in right lung, B/L pleural effusion (right > le), right lung volume loss, few prominent mediastinal lymph lodes. • PET-CT was done - highly suspicious for locally advanced right lung primary tumor with mediastinal infiltration, hilar, mediastinal, cervical lymph nodal spread, retrocrural, axillary, lymphnodal metastases, ipsilateral pleural metastases and pericardial metastases.

PREOPERATIVE ASSESSMENT

• The patient was planned for emergency video assisted thoracoscopy and pleural biopsy in view of right massive pleural effusion. • The patient was assessed as ASA physical status III E. • Vitals: HR - 106/min, BP - 140/80 mmHg, SPO2 - 90% in room air. Patient was conscious, oriented and GCS - 15/15. • Respiratory status: The patient had significant respiratory compromise with oxygen saturation of 96% on 2 L/min of oxygen via nasal cannula. Pulmonary function tests showed a restrictive pattern. On auscultation of the chest - decreased breath sounds over all the right lung fields. • Cardiac status: ECG showed a right bundle branch block and 2D ECHO was done which revealed constrictive effusive pericarditis with EF - 60% and grade 2 left ventricular diastolic dysfunction. Cardiologist opinion was obtained following which patient was shifted inside operating room.

INTRAOPERATIVE MANAGEMENT

• Considering the patient's debilitated condition and compromised lung function, it was decided to avoid endotracheal intubation and single-lungventilation. Instead, a combination of regional anesthesia (ESP block) and LMA placement was planned. • On arrival to the operation theatre, all the routine monitors were connected - pulse oximeter, ECG, and NIBP. A 16G IV cannula was secured. • The patient was positioned in the sitting position. Under sterile conditions, an ultrasound-guided erector spinae plane block was performed at the T5 level. • A total of 15 mL of 0.5% levobupivacaine was administered in the fascial plane between the erector spinae muscle and the transverse process of the T5 vertebra, aiming for somatic and visceral analgesia of the thoracic region. • Patient was pre-medicated with Inj. Glycopyrrolate 0.2 mg IV and Inj. Midazolam 1mg IV. Inj. Fentanyl 60mcg IV was given as analgesic. Induced with Inj. Propofol 60 mg IV. • Airway was secured using 4 size classic LMA with EtCO2 monitoring and anaesthesia was maintained with Sevoflurane (MAC 0.8 - 1). FiO2 - 50-60% was maintained and patient was allowed spontaneous ventilation throughout the procedure. • The ESP block provided effective analgesia during the VATS procedure, reducing the need for intraoperative opioids. • Patient was placed in left lateral position. Incision was made in the 4th right ICS along the mid axillary line. Approximately 4000 ml of pleural fluid was suctioned out. Hemodynamics remained stable throughout the procedure, and the patient tolerated the VATS drainage well.



POST OPERATIVE COURSE

LMA was removed and the patient was transferred to the recovery unit and reported a pain score of 2/10 on the visual analog scale (VAS). No intravenous opioids were required postoperatively, and the patient was able to resume oral intake within a few hours. HPE report suggested evidences of small cell CA lung.

DISCUSSION

The ESP block is an effective regional anesthesia technique for thoracic surgery, providing both somatic and visceral analgesia. In this case, it allowed avoidance of endotracheal intubation and single-lung ventilation, reducing potential complications such as ventilator-induced lung injury, especially in a patient with compromised pulmonary function. The use of an LMA enabled spontaneous ventilation, avoiding the risks associated with general anesthesia in patients with significant respiratory compromise.[6][7]

CONCLUSION

The combination of an erector spinae plane block and LMA for anesthesia management in patients undergoing VATS for massive malignant pleural effusion is a feasible and effective alternative to general anesthesia with endotracheal intubation. [8]It offers excellent analgesia, reduces opioid consumption, and avoids the complications associated with intubation and single-lung ventilation. This technique can be considered in carefully selected patients, particularly those with poor respiratory reserve.[9][10]

REFERENCES

1. Xie Y, Liu J, et al. Evaluation of ultrasound-guided erector spinae plane block for postoperative management of video-assisted thoracoscopic surgery: a prospective, randomized, controlled clinical trial. *J Thorac Dis*. 2020;12(12):7243–52.
2. Hamid H, Smith P, et al. Opioid-sparing effects of ultrasound-guided erector spinae plane block for video-assisted thoracoscopic surgery: a randomized controlled study. *Perioper Med (Lond)*. 2024;13:53.
3. Zhang W, Li M, et al. Effects of ultrasound-guided erector spinae plane block on postoperative analgesia and plasma cytokine levels after uniportal VATS: a prospective randomized controlled trial. *Thorac Cancer*. 2021;12(11):1679–85.
4. Li J, Chen Y, et al. Use of erector spinae plane block improves postoperative recovery and preserves pulmonary function after VATS: A cohort study. *Ann Thorac Surg*. 2020;110(2):466–72.
5. Rossi M, Bianchi L, et al. Comparing erector spinae plane (ESP) and thoracic paravertebral (TPV) block analgesic effect after elective video-assisted thoracic surgery: a randomized, multiple-blinded, non-inferiority trial. *J Thorac Dis*. 2025;17(4):556–64.
6. O'Gara ÁN, Buggy DJ, et al. Programmed intermittent bolus versus continuous infusion for catheter-based erector spinae plane block on quality of recovery in thoracoscopic surgery: a single-centre randomized controlled trial. *Br J Anaesth*. 2024;132(6):876–84.

7. Carter D, Martin P, et al. Erector spinae plane block did not improve postoperative pain-related outcomes and recovery after video-assisted thoracoscopic surgery: a randomized controlled double-blinded multi-centre trial. *Perioper Med (Lond).* 2024;13:74.
8. van den Broek RJC, Postema JMC, et al. Continuous erector spinae plane block versus thoracic epidural analgesia in video-assisted thoracoscopic surgery: a prospective randomized open-label non-inferiority trial. *Reg Anesth Pain Med.* 2025;50(1):11–9.
9.Oostvogels L, Weibel S, et al. Erector spinae plane block for postoperative pain. *Cochrane Database Syst Rev.* 2024;2(2):CD013763.
10. La Via A, Durey A, Finnerty O, et al. Effectiveness and safety of erector spinae plane block vs conventional pain treatment strategies in thoracic surgery: a retrospective cohort study. *J Clin Med.* 2023;14(9):2870.