International Surgery Journal
Babu JA et al. Int Surg J. 2026 Apr;13(4):604-606
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902
DOI: https://dx.doi.org/10.18203/2349-2902.isj20260845

Case Report

Lung isolation and one-lung ventilation in a tracheostomised patient undergoing minimally invasive direct coronary artery bypass surgery: a case report

Jecco Ani Babu*, Nisha Joseph Pattani, Tony Jose Joseph, Rajesh Ramankutty

Department of Cardiothoracic Surgery, Caritas Heart Institute, Kottayam, Kerala, India

Received: 28 November 2025
Revised: 05 January 2026
Accepted: 21 February 2026

***Correspondence:**
Jecco Ani Babu,
E-mail: jecc05@yahoo.co.in

ABSTRACT

MIDCAB being a safe and effective procedure may be considered ideal for non-diffuse multivessel occlusions, adequate left ventricular function and for those who prefer to return to their normal life without sternotomy wound care. In such patients, the use of bronchial blockers as an adjunct via elective tracheostomy prior to the cardiac surgery facilitates prolonged ventilation for an extended period. Moreover, this technique expands the scope of MIDCAB to be applied in a diverse spectrum of patients with minimal risk. This is a rare case of insertion of bronchial blockers along with pre-operative tracheostomy for airway management prior to MIDCAB surgery.

Keywords: Lung isolation, OLV, Tracheostomy, MIDCAB

INTRODUCTION

Minimally invasive direct coronary artery bypass (MIDCAB) is a safe and effective alternative to the conventional gold standard coronary artery bypass grafting (CABG) via sternotomy.[1] It is ideal for non-diffuse multivessel occlusions, adequate left ventricular function and who prefers to get back to normal life earlier without a sternotomy wound care. Unlike the conventional surgical methods, MIDCAB has reportedly lower mortality, minimal conversions and fewer postoperative complications.[2]

Elective tracheostomy is a procedure indicated in chronic neurologic impairment, neuromuscular disorders such as amyotrophic lateral sclerosis, severe chronic obstructive pulmonary disease (COPD) and complex congenital heart disease causing in poor secretion clearance and requiring prolonged mechanical ventilation. In patients advised for MIDCAB, an elective tracheostomy may be done when the patient is anticipated to require prolonged ventilation for an extended period, to secure the airway and manage the secretions, known prior intubation issues, pre-existing tracheostomy, severe neck extension difficulty and the infection or sepsis control.[3-5] A Uniblocker or bronchial blocker (BB) can be inserted through a tracheostomy tube to achieve lung isolation, particularly when a single-lumen endotracheal tube is already in place via the tracheostomy to perform one-lung ventilation (OLV) in patients.[6]

In situations where the use of a BB can be used as an adjunct via tracheostomy prior to the cardiac surgery expands the role and adaptability of MIDCAB to facilitate the minimal access surgery in a more diverse spectrum of patients with reduced risk and ease.[7] This is a rare case where a pre-operative tracheostomy was performed and BB were inserted for airway management prior to MIDCAB surgery.

CASE REPORT

A 69-year-old male patient with a history of diabetes mellitus, hypertension and coronary artery disease was

scheduled for MIDCAB. Coronary angiogram of the patient was suggestive of triple vessel disease and the preoperative echocardiogram revealed good biventricular function and mild mitral regurgitation (MR). However, no regional wall motion abnormality (RWMA) was detected with normal functioning of all the cardiac valves. The preoperative blood investigations were within the normal limits.

Figure 1: One lung ventilation facilitated through a tracheostomy prior to CABG surgery.

Pre-anesthetic evaluation of the patient showed very severe restriction in neck movements. Further evaluation with magnetic resonance imaging (MRI) of the cervical spine revealed straightening of the cervical spine, ossification of anterior and posterior longitudinal ligaments with spondylotic changes of C3 to C7 vertebrae. After combined discussion with the surgical, anesthesia, ENT and the neurology teams, it was decided to electively perform a tracheostomy for the patient in view of difficulty in managing the airway during perioperative period. Tracheostomy was performed by the ENT surgeon 2 days prior to the surgery. On the day of surgery, the patient was shifted to the Operating Room (OR), standard ASA monitors were applied, radial arterial and central venous lines were established. Tracheostomy was connected with the ventilator circuit and anesthesia was induced with Etomidate, Fentanyl, Midazolam, and Rocuronium, and maintained with oxygen–air mixture, Sevoflurane and intermittent Fentanyl boluses. For lung isolation and OLV an EZ blocker was introduced through the existing tracheostomy tube. Fibreoptic bronchoscope (FOB) guidance was used for visualization and positioning of the blocker at the carina. Initial difficulty in positioning was encountered due to the short distance between the tracheostomy tube tip and carina. This was successfully managed by retracting the tracheostomy tube by approximately 1 cm, allowing proper deployment of the blocker's bifurcated tips into the right and left main bronchi.

After confirming correct placement and lung isolation, OLV was initiated, providing satisfactory surgical exposure. The intraoperative period remained stable with adequate oxygenation and hemodynamics. No desaturation or ventilatory difficulty occurred after proper positioning. At the end of the procedure, bilateral ventilation was re-established, and the blocker was removed. The patient was shifted to ICU with ventilation through the tracheostomy and had an uneventful postoperative recovery.

DISCUSSION

Performing MIDCAB in tracheostomized patients presents unique challenges for both anesthesiologists and surgeons. The altered airway anatomy, presence of a tracheostomy tube, and restricted neck movement can make airway management, lung isolation, and surgical access technically demanding. Despite these constraints, this case demonstrates that MIDCAB can be safely and effectively performed in tracheostomized patients, provided that careful planning and multidisciplinary coordination are undertaken.

From an anesthetic perspective, achieving OLV in tracheostomized patients requires a tailored approach. Conventional double-lumen tubes although can be introduced via the tracheostomy stoma to achieve OLV but are usually unsuitable because of the short tracheostomy–carina distance and the rigidity of DLT shafts. BB, such as the EZ Blocker, provide a practical alternative by enabling selective bronchial occlusion through a standard tracheostomy tube. The use of EZ blockers offers several advantages including simplified placement, adaptability to atypical airway anatomies, minimized airway trauma, enhanced bronchoscopic visualization, and the ability to achieve intraoperative lung re-expansion without necessitating endotracheal tube exchange.[8] In our case, the blocker could be successfully positioned under FOB guidance, and the difficulty caused by limited space was resolved by retracting the tracheostomy tube by 1 cm, allowing adequate deployment of the blocker's bifurcated tips. The EZ blocker is considered superior compared to other BB such Univent and Arndt blockers because of ease of administration and lesser chance of dislodgment during the surgery. The successful establishment of OLV in this patient enabled optimal surgical exposure for left internal mammary artery (LIMA) harvesting and grafting through a small 7 cm thoracotomy, illustrating that a tracheostomy does not preclude the feasibility of a

minimally invasive coronary bypass approach. Continuous intraoperative monitoring of blocker position is essential; as even minor displacements can lead to malposition or desaturation. The ability to troubleshoot desaturation by temporarily re-establishing bilateral ventilation or readjusting the blocker adds to the safety margin of this approach. Other significant considerations during tracheostomy and introduction of blockers include evaluating patient specific anatomy, avoiding the risk of any potential complications like blocker displacement, airway blockage, or injury to the lung tissue, resulting in conditions like mediastinitis and death in rare but extreme cases.[9-11]

CONCLUSION

This experience highlights that MIDCAB can be safely performed in patients with a tracheostomy when the anaesthesia and surgical teams collaborate closely, airway management is individualized, and fibreoptic guidance is employed throughout the procedure. The case underlines the feasibility and safety of OLV via tracheostomy using modern BB, enabling tracheostomized patients to benefit from the advantages of successfully undergoing minimally invasive cardiac surgeries.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Kayatta MO, Halkos ME, Narayan P. Minimally invasive coronary artery bypass grafting. Indian J Thorac Cardiovasc Surg. 2018;34(3):302-9.
2. Santavy P, Lonsky V, Gwozdziewicz M. Minimally invasive direct coronary artery bypass grafting (MIDCABG): our experience in Olomouc, Czech Republic. J Cardiothorac Surg. 2013;8(1):P142.
3. Raimonde AJ, Gaston S, Wang CF. Tracheostomy. In: Stat Pearls. Treasure Island (FL): Stat Pearls Publishing. 2025. Available at: http://www.ncbi.nlm.nih.gov/books/NBK559124/. Accessed on 28 October 2025.
4. Medicine JH. Tracheostomy. Baltimore (MD): Johns Hopkins Medicine. 2025. Available at: https://www.hopkinsmedicine.org/health/treatment-tests-and-therapies/tracheostomy. Accessed on 28 October 2025.
5. Tracheostomy: MedlinePlus Medical Encyclopedia. Bethesda (MD): U.S. National Library of Medicine. 2025. Available at: https://medlineplus.gov/ency/article/002955.htm. Accessed on 28 October 2025.
6. Campos JH, Musselman ED, Hanada S, Ueda K. Lung isolation techniques in patients with early-stage or long-term tracheostomy: a case series report of 70 cases and recommendations. J Cardiothorac Vasc Anesth. 2019;33(2):433-9.
7. Vorias BJ, Barton NJ, McGlade DP, Alam N. Bronchial blockers: has side-by-side fallen by the wayside? Not quite. Anaesth Intensive Care. 2024;52(2):137-9.
8. Kumar SN, Panchanathan I, Singh S, Benedicta RR, Kuppuswamy B, Davis K, et al. The EZ-Blocker®: a safer alternative in complex airway scenarios: a case series. Ann Card Anaesth. 2025;28(4):480-5.
9. Maiti A, Moitra S, Guha A. Challenges and complications of using EZ™ bronchial blocker in minimally invasive coronary artery bypass grafting surgery: a case series. Indian J Clin Anaesth. 2024;11(4):588-92.
10. Fernandes L, Freitas AC, Azevedo M. Challenges in lung isolation in a tracheostomized patient: a case report. Cureus. 2024;16(9):e69668.
11. Curtis JJ, Clark NC, McKenney CA, Walls JT, Schmaltz RA, Demmy TL, et al. Tracheostomy: a risk factor for mediastinitis after cardiac operation. Ann Thorac Surg. 2001;72(3):731-4.

Cite this article as: Babu JA, Pattani NJ, Joseph TJ, Ramankutty R. Lung isolation and one-lung ventilation in a tracheostomised patient undergoing minimally invasive direct coronary artery bypass surgery: a case report. Int Surg J 2026;13:604-6.