Fluoroscopy, a useful alternative for confirming accurate placement of double-lumen tube or bronchial blocker

Dear Editor,

Lung isolation and one-lung ventilation are fundamental to modern thoracic surgical and anesthetic practice.[1,2] The need for timely lung resection surgery for patients with lung cancer continues throughout the COVID-19 pandemic. However, there is an increased risk of viral exposure during thoracic surgical procedures, due to the need to perform frequent intra-operative aerosol-generating procedures (AGPs).[3-5] The Association for Cardiothoracic Anaesthesia and Critical Care and the Society for Cardiothoracic Surgery in Great Britain and Ireland recently endorsed recommendations for the management of airway and lung isolation for thoracic surgery during the COVID-19 pandemic. These recommendations discuss modifications of existing techniques for the alleviation of risk of AGP to ensure the safety of healthcare workers and the patients.[6]

Flexible bronchoscopy remains the gold standard for the confirmation of double-lumen tube (DLT) position.[7] However, this is an AGP. Therefore, clinical methods, such as visual inspection and auscultation may be used to confirm the correct placement of the DLT. However, clinical confirmation has been shown to have poor sensitivity.[7] We recommend the use of fluoroscopy to confirm the position of the DLT or bronchial blockers to minimize the risk of AGP. The use of fluoroscopy for DLT placement and confirmation has previously been reported.[8,9] Fluoroscopy allows placement and adjustment of the DLT in real time. It also allows the visualization of the entire length of the tracheal tube and storage of the captured images. Image intensifiers are commonly available in operation theatres and do not require sterilization between cases. When consecutive procedures are performed, sharing of the bronchoscope without proper sterilization can be a potential source of contamination. Meanwhile, the use of single-use flexible bronchoscopes has cost implications. Moreover, unlike the use of flexible bronchoscopes, fluoroscopic imaging does not require additional training.[8] This technique has been recommended for the placement of DLT when there is bleeding in the trachea or primary bronchi, and bronchoscopic visualization is not possible.[9] Pediatric bronchoscopes (3 mm) cannot be used in patients below the age of 2 years, and fluoroscopy is invaluable in confirming lung isolation in these patients.[10]

The main concern with fluoroscopy-guided DLT placement is the risk of radiation exposure. Calenda *et al.* measured the dose of ionizing radiation at the exit of ionizing chamber. They found that the average radiation exposure was 0.0043 mGy.m^2 (0.0005–0.035 mGy.m^2) and the mean duration of the procedure was 8 min (5–35 min). The longest duration for DLT placement in their study was 35 min, where they found the exposure to radiation was equivalent to that of two chest X-rays.[8]

We have frequently used fluoroscopy to confirm the position of DLT and bronchial blockers with good results. Lung

ultrasonography is proving to be an additional tool to confirm one lung ventilation, but involves a steep learning curve. Further studies may be required to gauge the value of this technique before it can be added to the recommendations.

Though flexible bronchoscopy will remain the standard method for confirming the position of DLT placement, these unprecedented times have forced us to explore alternative techniques in order to minimize the risk to OT personnel. The risk of AGP must be reduced wherever possible to ensure the safety of patients and healthcare staff.[6] Fluoroscopy can therefore be a useful alternative for confirming accurate placement of DLT.

Financial support and sponsorship
Nil.

Conflicts of interest
There are no conflicts of interest.

Aparna Date, Harshal D. Wagh, Milin Shah[1]
Kokilaben Dhirubhai Ambani Hospital and Medical research Centre, Mumbai, [1]Kokilaben Dhirubhai Ambani Hospital and Medical Research Centre, Mumbai, Maharashtra, India

Address for correspondence:
Dr. Harshal D. Wagh,
Kokilaben Dhirubhai Ambani Hospital and Medical research Centre, Four Bungalows, Mumbai - 400 053, Maharashtra, India.
E-mail: drhdw2701@gmail.com

Submitted: 13-May-2021, **Accepted:** 13-May-2021,
Published: 02-Sep-2021

References

1. Falzon D, Alston P, Coley E, Montgomery K. Lung isolation for thoracic surgery: From inception to evidence-based. J Cardiothorac Vasc Anesth. 2017;31:678-93.
2. McCall P, Steven M, Shelley B. Anaesthesia for video-assisted and robotic thoracic surgery. Br J Anaesth Educ 2019;19:405-41.
3. Wang W, Xu Y, Gao R, Wang W, Xu Y, Gao R, Lu R, Han K, Wu G, *et al*. Detection of SARS-CoV-2 in different types of clinical specimens. JAMA 2020;323:1843–44.
4. Public Health England. COVID-19 personal protective equipment (PPE). 2020. Available from: https://www.gov.uk/government/publications/wuhan-novel-coronavirus-infection-prevention-and-control/covid-19-personal-protective-equipment-ppe. [Last accessed on 2020 Apr 13].
5. Cook TM, El-Boghdadly K, McGuire B, McNarry AF, Patel A, Higgs A. Consensus guidelines for managing the airway in patients with COVID-19. Anaesthesia 2020;75:785-99.
6. Thornton M, Reid D, Shelley B, Steven M. Management of the airway and lung isolation for thoracic surgery during the COVID-19 pandemic: Recommendations for clinical practice endorsed by the Association for Cardiothoracic Anaesthesia and Critical Care and the Society for Cardiothoracic Surgery in Great Britain and Ireland. Anaesthesia 2020;75:1509-16.
7. de Bellis M, Accardo R, Di Maio M, Lamanna C, Rossi GB, Pace MC, *et al*. Is flexible bronchoscopy necessary to confirm the position of double-lumen tubes before thoracic surgery? Eur J Cardiothorac Surg 2011;40:912-8.
8. Emile C, Jean MB, Ridha H, Rezig N, Moriceau J, Diallo Y, *et al*. Fluoroscopic guidance for placing a double lumen endotracheal tube in adults. Acta Anaesthesiol Taiwan 2014;52:107-9.
9. Parmar SD, Kakde AS, Wagh H. Correct placement and rapid confirmation of double lumen tube and bronchial blocker using fluoroscopic guidance. Clin Case Rep Open Access 2018;1:104.
10. Letal M, Theam M. Peadiatric lung isolation. BJA Educ 2017;17:57-62.

Access this article online	
Website: www.saudija.org	Quick Response Code
DOI: 10.4103/sja.sja_341_21	

How to cite this article: Date A, Wagh HD, Shah M. Fluoroscopy, a useful alternative for confirming accurate placement of double-lumen tube or bronchial blocker. Saudi J Anaesth 2021;15;473-4.