



# The Journal of Biomedical Research

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Cite this article as:

Yao Juan, Tan Xiao-Xiang, Sun Jie. Should we open or close the suction port of bronchial blocker during one-lung ventilation?[J]. *Journal of Biomedical Research*, 2022, 36(2): 145–146. doi: 10.7555/JBR.35.20210172

View online: <https://doi.org/10.7555/JBR.35.20210172>

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## Should we open or close the suction port of bronchial blocker during one-lung ventilation?

Dear Editor,

With the development of video-assisted thoroscopic surgery (VATS), one-lung ventilation (OLV) technique has become a fundamental component of thoracic anesthesia as it facilitates surgical field exposure. Bronchial blocker (BB) functions as one of the frequently used equipment for OLV. It tends to bring less stress response and less postoperative airway complications than a traditional double-lumen endotracheal tube<sup>[1]</sup>. But to anesthesiologists and surgeons, it takes more time to collapse the in-dependent lung. The anesthesiologists often open the suction port of BB to accelerate non-ventilated lung collapse during OLV<sup>[1]</sup>. Our two cases here may challenge the feasibility of opening the suction port of BB during OLV.

The two patients in this report were operated by the same thoracic surgeon and their written permissions for publication were obtained. After induction of anesthesia, the anesthesiologist placed a single-lumen endotracheal tube (SLT, an internal diameter of 7.5 mm for female) for the patients through a video laryngoscope. A Coopdech BB (Hangzhou Tappa Medical Technology Co., China) was introduced to the left main bronchus with a fiberoptic bronchoscope. During two-lung ventilation (TLV), the cuff of the BB was kept deflated, with a FiO<sub>2</sub> level at 1.0. When the blocker cuff was inflated with 5 to 8 mL of air to establish OLV, the anesthesiologist closed the suction port on BB to observe whether the maneuver could accelerate the non-ventilated lung collapse. The duration from OLV to pleural opening was about 15 and 20 minutes, and the surgeon would assess lung collapse quality using a verbal analog scale (from 0, no collapse to 10, complete collapse). The lung collapse score of the two patients was 7 and 8, respectively (*Fig. 1A*). The negative pressure

measured by the artery transducer connected to the suction port on BB was about -31 mmHg (*Fig. 1B*). Both patients had no perioperative hypoxemia, respiratory depression, pulmonary edema, or other adverse cardiovascular events.

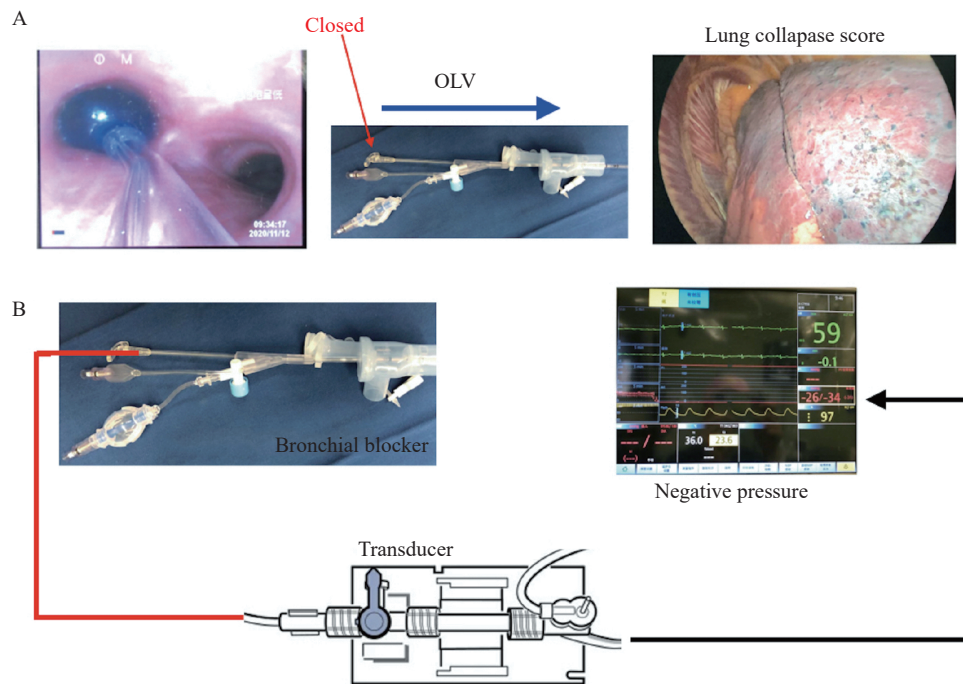
As VATS operations are more and more widely used, satisfactory surgical fields with non-ventilated lung collapse became remarkably important. With double-lumen tube (DLT) and BB being the two principal devices to obtain lung separation, it is widely accepted that a DLT provides faster and better lung collapse during VATS<sup>[2]</sup>. However, a DLT has a larger outer diameter and needs to be rotated during the insertion process, which may cause traumatic injuries to the airway and reduce patient satisfaction<sup>[2]</sup>. The BB can cause less hemodynamic perturbation and relieve postoperative sore throat. However, some studies have shown that BB takes longer time to promote lung collapse than DLT<sup>[3]</sup>. So far, there are mainly two techniques reported to accelerate lung collapse during the use of the BB: the disconnection technique and the bronchial suction technique<sup>[4]</sup>. However, few studies have investigated whether we should open or close the suction port of BB at the beginning of OLV. During the TLV period, anesthesia was maintained with sevoflurane in 100% oxygen. OLV was initiated by BB balloon inflation after turning the patient to a lateral decubitus position. Then we observed the level of liquid (1 mL of methylene blue and 1 mL of 10% physiological saline) rising in the U-shaped tube, which showed significant negative pressure followed by air influx during one-lung ventilation when opening the suction port of BB (*Supplementary Video 1*, available online). In our video, opening the suction port of BB significantly leads to air influx during one-lung ventilation, which potentially slows down the

Received: 10 October 2021; Revised: 21 November 2021; Accepted: 30 November 2021; Published online: 28 January 2022

CLC number: R655, Document code: B

The authors reported no conflict of interests.

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**Fig. 1 Lung collapse and negative pressure.** A: The trachea carina and collapse of the non-ventilated lung for one-lung ventilation when closing the suction port in thoracoscopic surgery. B: The negative pressure measured by the artery transducer connected to the suction port of bronchial blocker was about  $-31$  mmHg after OLV in the first patient. OLV: one-lung ventilation.

lung collapse. Therefore, we conclude that closing the suction port of BB during OLV facilitates lung collapse. Further clinical trials remain needed to compare the lung down efficacy and even the pulmonary functions under different methods.

Yours sincerely,

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