



Correspondence

One-lung ventilation in tracheostomized patients: our experience with EZ-Blocker



1. Introduction

Tracheostomized patients may have difficult airway during 1-lung ventilation (OLV) in thoracic surgery [1] and require special airway management [2,3]; moreover, because of the common etiological factor of smoking, patients with laryngeal cancer run an especially high risk of developing lung cancer [4–6]; between 2.8% and 11.2% [7–9]. The treatment of laryngeal carcinoma often involves a total laryngectomy, and a permanent tracheostomy is needed [10]. In these patients, OLV is usually achieved using a shortened version of a double-lumen endotracheal tube or using a bronchial blocker (BB) [11–13].

Bronchial blocker limits are difficulties in positioning, frequent dislodgment, limited suction, and slow lung collapse [14]. Campos [15] has previously reported various methods of OLV in patients with tracheostomy using a BB through a single-lumen endotracheal tube or through a tracheostomy cannula. In our hospital, anesthesiologists are confident with the EZ-Blocker (AnaesthetIQ, Rotterdam, the Netherlands) device and are used to OLV in a patient with tracheostomy using this device. The EZ-Blocker has a Y-shaped distal end. Both distal ends are fitted with an inflatable cuff and a patent central lumen. The multipoint adapter to insert the EZ-Blocker is designed to connect to a ventilation device and contains 2 upper ports: one for the blocker and the other for the bronchoscope (Fig. 1). The EZ-Blocker is brought into position in the trachea, with one distal end into the left bronchus and the other distal end in the right main stem bronchus. The cuffs are inflated separately, allowing each side of the lung to be ventilated independently.

The EZ-Blocker is easy to introduce and position compared with other BBs [16]. We describe our experience in 5 tracheostomized patients undergoing elective thoracic surgery.

2. Case report

Patients received total intravenous anesthesia with propofol and remifentanyl. Curarization was obtained with rocuronium and checked via TOF-Watch. Operating room monitoring consisted of electrocardiogram, peripheral oxygen saturation,

non invasive blood pressure, and bispectral index. At <60 bispectral index level, a tracheal cannula (male, 8.0 mm; female, 7.0 mm) was positioned, and patient was connected to mechanical ventilator. EZ-Blocker was used under direct bronchoscopic vision into the tracheostomy tube until the carina was visualized and the device was properly placed with the extensions in the left and right main stem bronchi, and the cuff of the lung to be isolated was inflated. Time to place the EZ-Blocker was measured, and lung collapse quality was assessed by surgeons (poor, adequate, or excellent). Any EZ-Blocker dislocation during the surgical activity was reported. Surgeon approach and time needed to perform lobectomy were referred.

2.1. Case 1

Case 1 was a 65-year-old male patient scheduled for right upper lobectomy. His weight was 73 kg; height, 1.67 m; and body mass index (BMI), 26. He was a heavy smoker (pack years, 53) and was tracheostomized after total laryngectomy for carcinoma. The patient suffered from hypertension and COPD with severe spirometry obstructive pattern.

Time to place EZ-Blocker was 170 seconds. Lung collapse quality was excellent. There was no dislocation during surgery. Surgeon approach was video assisted thoracic surgery. Surgery time was 160 minutes.

2.2. Case 2

Case 2 was a 57-year-old female patient scheduled for left upper lobectomy. Her weight was 92 kg; height, 1.70 m; and BMI, 31. She was tracheostomized after total thyroidectomy for carcinoma and vocal cord paralysis. The patient suffered from hypertension, obesity, diabetes, and hypercholesterolemia. Time to place EZ-Blocker was 90 seconds. Lung collapse quality was excellent. There was no dislocation during surgery. Surgeon approach was VATS. Surgery time was 210 minutes.

2.3. Case 3

Case 3 was a 74-year-old male patient scheduled for right upper lobectomy. His weight was 86 kg; height, 1.78 m; and BMI, 28. He was heavy smoker (pack years, 78) and was tracheostomized after total laryngectomy for carcinoma. The patient suffered from hypertension and COPD with severe spirometry obstructive pattern.

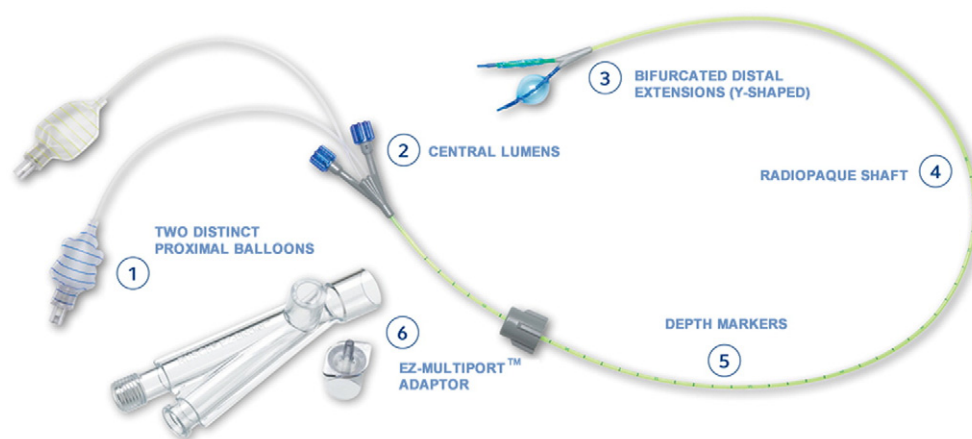


Fig. 1 The EZ-Blocker.

Time to place EZ-Blocker was 83 seconds. Lung collapse quality was adequate. There was no dislocation during surgery. Surgeon approach was VATS converted to thoracotomy. Surgery time was 190 minutes.

2.4. Case 4

Case 4 was a 71-year-old male patient scheduled for right lower lobectomy. His weight was 80 kg; height, 1.78 m; and BMI, 25. He was a heavy smoker (pack years, 54) and was tracheostomized after total laryngectomy for carcinoma. The patient suffered from hypertension, chronic ischemic cardiopathy, and COPD with moderate spirometry obstructive pattern.

Time to place EZ-Blocker was 112 seconds. Lung collapse quality was poor but improved to adequate after suction. There was no dislocation during surgery. Surgeon approach was VATS. Surgery time was 140 minutes.

2.5. Case 5

Case 5 was a 69-year-old male patient scheduled for left lower lobectomy. His weight was 96 kg; height, 1.87 m; and BMI, 28. He was a heavy smoker (pack years, 38) and was tracheostomized after total laryngectomy for carcinoma. The patient suffered from COPD with severe spirometry obstructive pattern and poor postoperative predictive respiratory test.

Time to place EZ-Blocker was 56 seconds. Lung collapse quality was excellent. There was no dislocation during surgery. Surgeon approach was VATS. Surgery time was 170 minutes.

3. Discussion

Double-lumen endotracheal tube is the most common device for OLV, but in some clinical conditions, the use of

BBs offers more advantages: abnormal airways, like in permanent tracheostomy, are a specific condition in which the methods that can be used for lung isolation are limited [17,18]. In these cases, positioning EZ-Blocker was easy even though the anesthesiologists involved had different work experiences. Time to place the device was 56 seconds in the best case to 170 seconds in the worst case: the average time was 102 seconds. No failure in using EZ-Blocker was reported. Lung collapse quality was satisfying in all cases but one, but after suction via the central lumen, proper lung isolation was achieved. All procedures were uneventful. The Y-shaped distal tip grants a safe adherence to the carina, and no case dislocation was reported. Our experience confirms the easiness and low learning curve in using EZ-blocker even in abnormal airway patients.

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References

- [1] Campos J. Lung isolation. In: Slinger P, editor. New York: Springer Science & Business Media; 2011. p. 240.
- [2] Tobias JD. Variations on one-lung ventilation. *J Clin Anesth* 2001;13:35-9.
- [3] Robinson RJ. One-lung ventilation for thoracotomy using a Hunsaker jet ventilation tube. *Anesthesiology* 1997;87:1572-4.
- [4] Licciardello JTW, Spitz MR, Ki Hong W. Multiple primary cancer in patients with cancer of the head and neck: second cancer of the head and neck, esophagus, and lung. *Int J Radiat Oncol Biol Phys* 1989;17:467.
- [5] Wagenfeld DJH, Harwood AR, Bryce DP, van Nostrand AWP, de Boer G. Second primary respiratory tract malignant neoplasms in supraglottic carcinoma. *Arch Otolaryngol* 1981;107:135-7.
- [6] Wagenfeld DJH, Harwood AR, Bryce DP, van Nostrand AWP, de Boer G. Second primary tract malignancies in glottis carcinoma. *Cancer* 1980;46:1883-6.
- [7] Gluckman JL, Crissman JD. Survival rates in 548 patients with multiple neoplasms of the upper aerodigestive tract. *Laryngoscope* 1983;93:71-4.
- [8] Rachmat L, Vreeburg GC, de Vries N, Hordijk GJ, Lubsen H, Manni JJ, et al. The value of twice yearly bronchoscopy in the work-up and follow-up of patients with laryngeal cancer. *Eur J Cancer* 1993;29:1096-9.
- [9] Engelen AM, Stalpers LJA, Manni JJ, Ruijs JHJ, van Daal WAJ. Yearly chest radiography in the early detection of lung cancer following laryngeal cancer. *Eur Arch Otorhinolaryngol* 1992;249:364-9.
- [10] America Cancer Society. Surgery for laryngeal and hypopharyngeal cancers. Available from <http://www.cancer.org/cancer/laryngealandhypopharyngealcancer/detailedguide/laryngeal-and-hypopharyngeal-cancertreating-surgery4>. [accessed 10 November 2015].
- [11] Chen KP, Chan HC, Huang SJ. Foley catheter used as bronchial blocker for one lung ventilation in a patient with tracheostomy—a case report. *Acta Anaesthesiol Sin* 1995;33:41-4.
- [12] Brodsky JB, Tobler HG, Mark JB. A double-lumen endobronchial tube for tracheostomies. *Anesthesiology* 1991;74:387-8.
- [13] Vretzakis G, Theodorou E, Mikroulis D. Endobronchial blockade through a tracheostomy tube for lung isolation. *Anesth Analg* 2008;107:1644-5.
- [14] Howell S, Ata M, Ellison M, Wilson C. One-lung ventilation via tracheostomy and left endobronchial microlaryngeal tube. *J Cardiothorac Vasc Anesth* 2014;28:1052-4.
- [15] Campos JH. Lung isolation techniques for patients with difficult airway. *Curr Opin Anaesthesiol* 2010;23:12-7.
- [16] Mungroop HE, Tjong Joe Wai P, Morei MN, Loef BG, Epema AH. Lung isolation with a new Y-shaped endobronchial blocking device, the EZ-Blocker®. *Br J Anaesth* 2010;104(1):119-20.
- [17] Cevik B, Sezen O, Orskiran A, Ozdemir A, Demirhan R. A method of single-lung ventilation in a patient with permanent tracheostomy: torque controlled endobronchial blocker (Uniblocker). *Br J Anaesth* 2014 [Out of the blue E-letters].
- [18] Cohen E. The Cohen flexitip endobronchial blocker: an alternative to a double lumen tube. *Anesth Analg* 2005;101:1877-9.