Successful One-Lung Ventilation in a Patient with Aberrant Tracheal Bronchus

Hui-Ling Lee, MD, Angie C.Y. Ho, MD, Robin K.S. Cheng, MD, and Ming-Hwang Shyr, MD, PhD

Department of Anaesthesia, Chang Gung Memorial Hospital and Chang Gung University, Taoyuan, Taiwan

One-lung ventilation is widely practiced in major thoracic and mediastinal surgery. In some circumstances, lung isolation is mandatory. We report the case of an incidentally found aberrant tracheal bronchus (right upper lobe bronchus originating in the trachea). This atypical origin of the right upper lobe bronchus complicated one-lung ventilation. In addition to a Univent tube, we used a Fogarty catheter to block the tracheal bronchus and successfully establish isolation of the right lung.

Case Report

A 47-yr-old man was scheduled for esophagectomy and reconstruction with gastric tube substitution because of esophageal cancer (T4N1M0). Six years ago, he suffered from right buccal cancer and received radical neck dissection, marginal mandibulectomy, and left forearm-free flap for inner and outer defects. Postoperative radiotherapy was completed. At this admission, preoperative laboratory workups, including biochemical tests, chest radiograph, and electrocardiogram, were unremarkable. Trismus was noted after the radiotherapy. The mouth opening was up to 2 cm.

In the operating room, after routine monitors were placed, the patient received general anesthesia with IV atropine, fentanyl, thiopental, and vecuronium. A flexible fiberoptic bronchoscope was used as a guide to pass a Univent tube (inner diameter, 6.0 mm) through the right mouth angle into the trachea. The right mainstem bronchus was identified and blocked with a Univent bronchial blocker. A right thoracotomy was performed. Unfortunately, the right upper lobe was still inflated during mechanical ventilation, although the right middle and lower lobes were successfully collapsed. The position of the bronchial blocker was reconfirmed by bronchoscopy. Accidentally, we found an ectopic opening from the tracheal wall. Aberrant tracheal bronchus was suspected (Fig. 1). The surgeon requested complete lung collapse. We inserted a 6F Fogarty catheter through the left nostril to the opening of the tracheal bronchus, which had been tied together with the fiberoptic bronchoscope with a retractable knot. We successfully blocked the right upper lobe bronchus by inflation of the Fogarty catheter. The airway pressure under one-lung ventilation was up to 31 cm H_2O, and no desaturation was noted through the procedure. The surgical procedure proceeded uneventfully with good visualization of the operative field.

Discussion

Selective ventilation of one lung has been accomplished by several methods (1,2). The Univent tube might be advantageous for this purpose and easier to place, especially in patients with difficult airways (3). We described a patient with anticipated anatomical constraint of mouth opening, which disallowed the passage of the double-lumen tube. Using a flexible bronchoscope was a sure way to accomplish selective bronchial block by a Univent tube.

The tracheal bronchus is an aberrant, accessory, or ectopic bronchial branch arising directly from the lateral wall of the trachea above the carina, with an incidence ranging from 0.1% to 2% (4). It occurs almost exclusively on the right side, involves the right upper lobe, and usually represents a displaced origin of the right main bronchus or apical segmental bronchus (5). Most cases of tracheal bronchus are asymptomatic, like our patient, but some patients may experience recurrent pneumonia, chronic bronchitis, or bronchiectasis (4). Although it is usually of little clinical significance, this atypical origin of the right upper lobe bronchus may complicate one-lung ventilation during thoracic surgery (6).

The combination of a Fogarty catheter with a double-lumen endotracheal tube may be practically used to provide excellent lung separation and obviate the need to re-intubate the patient's trachea (7). In this case, we used a Univent tube instead of a double-lumen endotracheal tube with a Fogarty catheter and provided excellent lung separation. Advantages of placing a Fogarty catheter within a Univent tube may include the ability to deflate/inflate a lung on the

Accepted for publication April 23, 2002.

Address correspondence and reprint requests to Ming-Hwang Shyr, MD, PhD, Department of Anaesthesia, Chang Gung Memorial Hospital, Taoyuan 333-33, Taiwan. Address e-mail to an001@adm.cgmh.org.tw.

DOI: 10.1213/01.ANE.0000021364.42109.AA

0003-2999/02

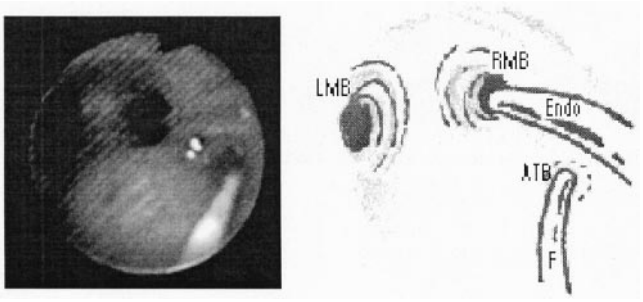

Figure 1. Fiberscopic view of the patient (left) and the relative position of the anatomical structures with the Univent tube blocker (Endo) and Fogarty tube (F), as illustrated (right). LMB, left main bronchus; RMB, right main bronchus; ATB, aberrant tracheal bronchus.

operative side, easier placement in patients with difficult airways, and avoiding the need for exchanging a double-lumen tube for a single-lumen tube when postoperative mechanical ventilation is planned. Although the combined use of a Fogarty catheter with a Univent tube is not a routine practice, it was useful in this patient who had an unanticipated tracheal anatomical anomaly. The case also illustrates the importance of a careful and thorough bronchoscopic examination to detect any tracheal bronchus anomaly before positioning for surgery.

References

1. Robertshaw FL. Low resistance double-lumen endobronchial tubes. Br J Anaesth 1962;34:576–9.
2. Inoue H, Shohtsu A, Ogawa J, et al. Endobronchial tube with movable blocker to prevent intratracheal bleeding. Ann Thorac Surg 1984;37:497–9.
3. Ransom ES, Carter L, Mund GD. Univent tube: a useful device in patients with difficult airways. J Cardiothorac Vasc Anesth 1995; 9:725–7.
4. Okubo K, Ueno Y, Isobe J. Upper sleeve lobectomy for lung cancer with tracheal bronchus. J Thorac Cardiovasc Surg 2000; 120:1011–2.
5. Reed R, Cyr J, Marek J. Bronchial anomaly of the right upper lobe. Ann Thorac Surg 1990;5:110–6.
6. Peragallo RA, Swenson JD. Congenital tracheal bronchus: the inability to isolate the right lung with a univent bronchial blocker tube. Anesth Analg 2000;91:300–1.
7. Capdeville M, Hall D, Koch CG. Practical use of a bronchial blocker in combination with a double-lumen endotracheal tube. Anesth Analg 1998;87:1239–41.