Combined Airwayscope and Fiberoptic Bronchoscopic Airway Management in a Patient With a Tracheal Bronchus

To the Editor:

Tracheal bronchus is an airway that emerges from the lateral tracheal wall and is present in 1% to 3% of the population.1–3 Although the tracheal bronchus usually is found 2 cm above the carina,1 it sometimes is identified 6 cm above the carina.4 Tracheal stenosis distal to the tracheal bronchus3,5,6 and a shorter distance from the vocal cord to the tracheal bronchus,6 which are observed in only 5% of patients with tracheobronchial anomaly,6 include critical problems for the intraoperative airway management, especially in lung isolation.7,8

A 33-year-old woman (164 cm, 85 kg) was scheduled for resection of a sequestrated right lung segment connected to a tracheal bronchus. Preoperative computed tomography showed that the right tracheal bronchus was located 50 mm above the carina with a blind end about 20 mm from the tracheal bifurcation and that the internal diameters of the trachea above and below the tracheal bronchus were 13 mm and 6 mm, respectively (Fig 1). Given these abnormalities, use of a double-lumen tracheal tube to facilitate right lung isolation was rejected. Bronchoscopy prior to trachea intubation under general anesthesia revealed that the carina had a flattened shape with the bifurcation angle higher than normal and that the distance from the vocal cord to the tracheal bronchus was 82 mm.9

The trachea was intubated with an 8.0-mm internal diameter cuffed single-lumen reinforced tracheal tube to facilitate manipulation of the fiberoptic bronchoscope for the observation of the tracheal bronchus and for the bronchial blocker placement. The distance from the tip of the tracheal tube to the proximal edge of the cuff was 70 mm. Then, fiberoptic bronchoscopy and the Airwayscope (AWS) (Pentax-AWS36; Hoya, Tokyo, Japan) were used simultaneously to confirm that the cuff was placed proximal to the tracheal bronchus and that the proximal edge of the cuff was placed beyond the vocal cord (Video clip 1). We eventually did not apply a bronchial blocker to isolate the right lung because we wanted to avoid inadvertent mucosal edema of the congenitally-deformed trachea.

After the patient was moved to the left lateral position, the position of the tip of the tracheal tube and the proximal edge of the cuff were confirmed using flexible fiberscopes (Video clip 2). These confirmations were repeated throughout anesthesia, and repositioning the tracheal tube was not required. Surgery was completed uneventfully under anterolateral thoracotomy without lung isolation. The postoperative course also was uneventful.

In the present patient, advancement of the tracheal tube beyond the tracheal bronchus was restricted due to the small diameter of the trachea peripheral to the tracheal bronchus. Likewise, the proximal edge of the tracheal tube cuff should be placed beyond the vocal cord in order to avoid its injury caused by the cuff. Direct observation of the glottis using a laryngoscope can provide information on the relationship between the vocal cord and the tracheal tube cuff. However, head and neck movements can displace the tracheal tube.9–11 Therefore, we used the AWS that usually is used to place the tracheal tube with the patient’s neck in neutral position. As the AWS should not be kept in the oral cavity throughout anesthesia because of its rigidity, a flexible fiberscope was used to observe the glottis after initial tracheal tube placement.

In conclusion, proper placement of the tracheal tube in a patient with the tracheal bronchus that originated high in the trachea and with the tracheal stenosis distal to the tracheal bronchus was facilitated by simultaneous observation of the tracheal tube position through a fiberoptic bronchoscope and the AWS.

APPENDIX A. SUPPORTING INFORMATION

Supplementary data associated with this article can be found in the online version at doi:10.1053/j.jvca.2014.10.003.

Hiroaki Murata, MD, PhD
Misao Yoshida, MD
Taiga Ichinomiya, MD, PhD
Itsuko Shibata, MD, PhD
Tetsuya Hara, MD, PhD
Department of Anesthesiology, Nagasaki University School of Medicine, Nagasaki, Japan

REFERENCES
Missing Leaflet of Prosthetic Aortic Valve

To the Editor:

A 43-year-old woman presented with shortness of breath on exertion. Transsthoracic echocardiographic evaluation revealed a calcified aortic valve with severe aortic stenosis with a mean gradient of 80 mmHg across the valve (Fig 1). The patient was scheduled for aortic valve replacement. After smooth anesthesia induction, cardiopulmonary bypass was instituted with right atrial venous and aortic cannulation, and the heart was arrested using antegrade cardioplegia. The aorta was opened, and a bileafllet ATS mechanical aortic valve, size 22 mm, was lowered to the annulus with the help of a holder. However, it appeared to cause left coronary ostial obstruction. Hence, it was explanted from the position, and as it was brought out of the aorta, it was noticed that the prosthetic valve had only 1 leaflet. The second detached leaflet could not be seen in the mediastinal surgical field, and it could not be retrieved from the left ventricular cavity. It was decided to fill the heart and allow it to beat to find the missing leaflet in the heart chambers with the help of transesophageal echocardiography (TEE). As the heart started beating, TEE showed the leaflet moving in the left atrium, and then it bounced into the left ventricular cavity (Figs 2 and 3) (Video clip 1). The heart was emptied by venous drainage, and it was arrested by cardioplegia. A dislodged leaflet was removed from the left ventricular cavity. Bileafllet ATS mechanical aortic valve, size 20 mm, was implanted without any difficulty. As the heart started beating, good movements of both leaflets of the prosthetic valve were observed without any significant gradient across the valve. The patient was weaned from cardiopulmonary bypass smoothly and successfully. Postoperatively, the patient’s hemodynamics were stable.

Mosterd et al have reported leaflet fracture of a St. Jude mechanical bileafllet mitral valve 18 months after valve surgery. The missing valve fragment was dislodged from the right iliac artery bifurcation.1 A detached leaflet of the prosthetic valve can be a fatal event. In the present case, TEE helped us to localize the missing leaflet and prevent further complications.

Fig 1. Transesophageal echocardiography long-axis view showing a severely calcified native aortic valve.

Fig 2. Transesophageal echocardiography 4-chamber view showing a detached leaflet of a prosthetic aortic valve in the left atrium. LA, left atrium; LV, left ventricle; RV, right ventricle.

Fig 3. Detached single leaflet of bileafllet aortic prosthetic valve.