Removal of a Foreign Body (Artificial Tooth) from the Bronchial Tree: A New Method

Maki Bunno¹, Masanori Kawaguchi¹, Kunihiro Yamahara¹ and Chieri Kanda²

Abstract

A 70-year-old man who had aspirated an artificial tooth during treatment at a dental clinic visited our hospital. His symptoms and physical condition were not remarkable. CT of chest revealed a foreign body in the right middle bronchus; bronchoscopy revealed it was wedged there. First, the authors tried to remove it using a suction device attached to a bronchoscope, as well as by using a forcep; however, the attempt failed. Therefore, a second effort was made using a cap constructed of a nasogastric tube, based on the concept of attaching an endoscopic cap to a bronchoscope. The latter was successful.

Key words: bronchial foreign body, artificial tooth, bronchoscopy, removal

(Intern Med 47: 1695-1698, 2008)
(DOI: 10.2169/internalmedicine.47.1173)

Introduction

The aspiration of a foreign body (FB) into the tracheobronchial tree can occur in all age groups. This condition is uncommon in adults, and adult patients frequently have an underlying condition, such as a dental procedure resulting in aspiration, mental retardation, a neurological disorder, or alcohol or sedative abuse (1).

Tracheobronchial FB can be very difficult to remove depending on the location and type of FB, the experience of bronchoscopist, and the availability of appropriate instruments (2). We report the successful removal of a foreign body (artificial tooth) from the bronchial tree using a customized cap of nasogastric tube, based on the concept of attaching an endoscopic cap to the end of a bronchoscope.

Case Report

A 70-year-old man who had aspirated an artificial tooth during treatment at a dental clinic visited our hospital. His symptoms and physical condition were not remarkable, and vital parameters were within normal limits. Chest X-ray showed the artificial tooth in the right hilum (Fig. 1a). CT of chest revealed the FB was shown at the right middle bronchus (Fig. 1b). Bronchoscopy (FUJINON EB-410S) was carried out under general anesthesia in the operating room at the patient’s request and revealed it was wedged in the right middle bronchus (Fig. 1c). The size of the endotracheal tube was 9.5 mm. The authors did not use a rigid bronchoscope, and attempted to remove the FB by suction using bronchoscopy. The applied suction power was 400 mmHg. However,
Figure 1b. CT of chest revealed foreign body was shown at the right middle lobe bronchus.

Figure 1c. Bronchoscopy revealed the FB was wedged in the right middle lobe bronchus.

Figure 2a, b, c. The handmade hood of a part of the 14Fr nasogastric tube based on the concept of attaching an endoscopic hood to the bronchoscope. The nasogastric tube we used was 5 mm in diameter, and 10 mm in length.

Figure 2d, e. The artificial tooth is put in the hood which is attached to the tip of the bronchoscope.

removal proved difficult. Next, employment of an alligator type forceps was attempted, however, the FB moved further to the peripheral side, and consequently removal appeared to be more difficult. There was no cap for the bronchoscope as with esophagogastroduodenoscopy, so extraction using a handmade cap utilizing a portion of 14Fr nasogastric tube was suggested, based on the concept of placing an endoscopic cap on a bronchoscope; the result was successful. The nasogastric tube used was 5 mm in diameter, and 10 mm in length (Fig. 2a, b, c). Figures 2d, 2e show the hood attached to the tip of the bronchoscope (Fig. 2d, e). The FB was approximately 4 mm in diameter and 13 mm in length.
Figure 2f. The foreign body was an artificial tooth about 4 mm in diameter, and 13 mm in length.

Figure 3a, b. Bronchoscope without modification (Figure 3a). Used as-is, in cases where a gap forms between it and the bronchus wall, and suction is applied, the suction force is weak, and accordingly not possible to remove the FB by bronchoscope. Even where possible to apply suction, due to weak suction, a risk is presented during the removal process. On the other hand, a bronchoscope with a handmade hood modification prevents a gap between the hood and the bronchus wall (Figure 3b). When suction is applied, it causes shadow pressure in the peripheral bronchus. Therefore, it becomes possible to draw the FB with stronger force. Furthermore, a FB which can be drawn into the hood simplifies the removal process.
scope, a front-end hood for an endoscope allows an observation image of a portion which is transmitted through the transparent front-end hood to be less distorted, and produces an excellent observation image even in the periphery of a wide visual field. An optically transparent front-end hood projects from the insertion portion of an endoscope so that an observation port located in the front-end face of the insertion portion is positioned inside the hood. A portion of the front-end hood may be formed into a spherical shape, the diameter of which decreases toward the opening end of the hood. Endoscopic hoods are commonly used accessories for both endoscopic therapy and diagnosis. Many variations of endoscopic hoods are available. Hood-assisted endoscopic mucosal resection is the most common application. Hoods are also used for hemostasis, FB removal, magnifying endoscopy, and improved visualization of lesions that are difficult to access. Novel endoscopic hoods have been developed for en bloc resection of large lesions that typically require piecemeal resection. Endoscopic hoods are easy to use. Appropriate selection of an endoscopic hood based on indication and location of the lesion is important for procedural success (4). If bronchoscopic removal fails or the FB cannot be seen with bronchoscopy, thoracotomy is required.

We encountered a successful case of bronchial FB removal and suggested making an attempt using a handmade hood constructed from nasogastric tube, based on the introduction of the endoscopic hood concept to bronchoscopy. Removal of bronchial FB may be very challenging to the endoscopist; however, the arrangement of the application to bronchoscopy will continue to decrease the need for removal by thoracotomy.

References


© 2008 The Japanese Society of Internal Medicine
http://www.naika.or.jp/imindex.html