

Unusual aspiration of coin in the lower respiratory tract

Two case reports

Ning Fang, MS^a, Zhuo Wang, MS^b, Jing Shang, MS^a, Zhenyu Zhang, MS^a, Xin Wang, MD^{a,*}

Abstract

Rationale: Foreign body (FB) aspiration in adults is occasionally encountered. The aspiration and impaction of a coin in the lower respiratory tract is an unusual accident. This report presents 2 rare adult cases of FB aspiration with coin impaction in larynx and trachea, respectively.

Patient concerns: Two patients presented to the emergency department separately. Both had a similar history of inadvertent ingestion of a 5-jiao coin that was accidentally enveloped in dumplings. The ingestion was immediately followed by violent cough.

Diagnosis: The diagnosis of foreign body aspiration was confirmed by chest x-ray. In the first patient, chest computed tomography (CT) confirmed the shape of the coin and it was located in the laryngeal area, facing C5. In the second patient, CT revealed a metal-density FB located in the tracheal carina.

Interventions: In the first patient, direct laryngoscopy was performed and the 5-Jiao coin was removed in a direction parallel to the vocal cords. In the second patient, rigid bronchoscopy was used to remove the coin.

Outcomes: The postoperative period was uneventful in both the patients.

Lessons: During FB removal, the coin should be positioned parallel to the vocal cords during its retrieval through the glottis. Due attention must be paid to avoid asphyxia due to positional changes of the coin in the trachea. Early diagnosis and intervention is the key in such cases as delay can cause catastrophic complications.

Abbreviations: C5 = fifth cervical vertebra, CT = computed tomography, ED = emergency department, FB = foreign body, RMB = renminbi.

Keywords: coin, foreign body, larynx, trachea

1. Introduction

Foreign body (FB) aspiration is most commonly seen in children younger than 3 years of age but may occur at any age.^[1] A tracheobronchial FB is occasionally encountered in adults and is most frequently localized in the right bronchial tree.^[2,3] The aspiration impaction of a coin is an unusual accident; at least 5 cases of laryngeal FB^[4–8] and 2 cases of tracheal FB^[9,10] have been reported in the literature. None of the reported cases experienced life-threatening asphyxia.

This report presents 2 rare adult cases of 5-jiao (RMB) coin aspiration. Since the diameter of the 5-jiao coin approximates the anteroposterior diameter of the glottis in adults, it is extremely

difficult for a coin to cross the glottis and enter the trachea. Therefore, the presence of a coin in the lower respiratory tract is an exceptional occurrence. Coincidentally, both adult patients presented to the emergency department (ED) on the same day. The clinical features of these 2 patients were recorded and their management and outcomes are discussed.

2. Case report

Ethical approval was not necessary for case report. Informed written consent was obtained from the patients for publication of this case report and accompanying images

2.1. Case 1

An 88-year-old man presented to the ED on the Chinese Lunar New Year 2016 with a history of change in voice associated with foreign body sensation since 12 hours, probably due to inadvertent swallowing of a coin while eating dumplings ravenously. This was followed by a severe bout of cough, altered voice, and foreign body sensation. The foreign body sensation worsened in recumbent position. He immediately went to a local hospital, where a chest x-ray revealed a radiopaque FB in the trachea (Fig. 1A). The patient was referred to the ED of our hospital. At admission, there was no dyspnea or stridor. Clinical examination showed no other remarkable signs. Chest computed tomography (CT) confirmed the shape and site of the coin; it was located in the laryngeal area, facing C5 (Fig. 1B–D).

Direct laryngoscopy was performed under general anesthesia and spontaneous ventilation. The coin was seen through the

Editor: N/A.

The authors have no conflicts of interest to disclose.

^a Department of Otolaryngology-Head & Neck Surgery, ^b Department of Radiology, First Hospital of Jilin University, Changchun, Jilin Province, People's Republic of China.

* Correspondence: Xin Wang, Department of Otolaryngology-Head & Neck Surgery, First Hospital of Jilin University, Changchun 130021, Jilin Province, People's Republic of China (e-mail: fangningning1982@163.com).

Copyright © 2018 the Author(s). Published by Wolters Kluwer Health, Inc. This is an open access article distributed under the terms of the Creative Commons Attribution-Non Commercial-No Derivatives License 4.0 (CCBY-NC-ND), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal.

Medicine (2018) 97:50(e13462)

Received: 3 July 2018 / Accepted: 5 November 2018

<http://dx.doi.org/10.1097/MD.00000000000013462>

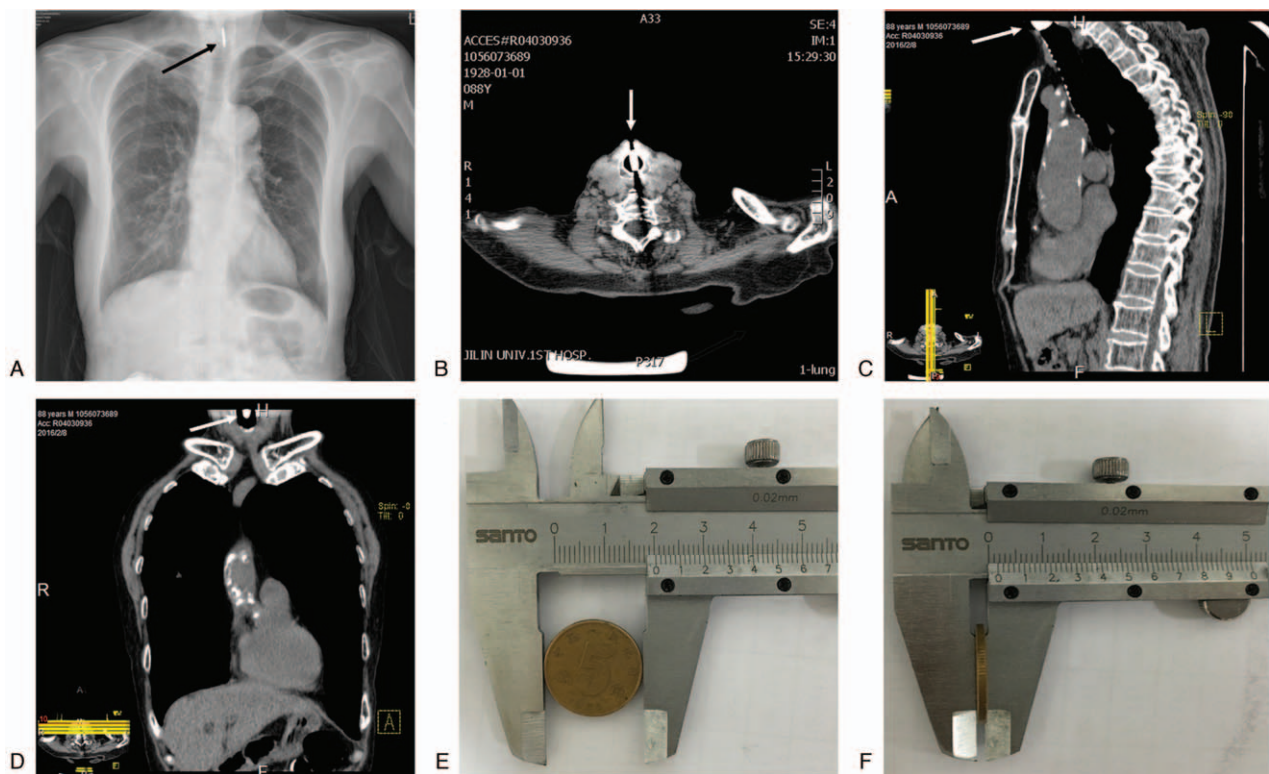


Figure 1. Posteroanterior chest x-ray of case 1 showing a high-density shadow (A). Transverse (B), coronal (C), sagittal (D) CT radiographs showing the foreign body in the larynx (arrows). Diameter (E) and thickness (F) of the 5-jiao coin. CT = computed tomography.

glottis in sagittal position; it was grasped using crocodile forceps and removed parallel to the vocal cords. It was identified as a 5-jiao coin. The glottis and subglottis showed no signs of inflammation. Postoperative period was uneventful, and his voice was regained two days later.

2.2. Case 2

A 56-year-old man came to the ED on the Chinese Lunar New Year in 2016 with a history of acute irritant cough since 16 hours. He stated that he had drunk about 20 mL liquor during swallowing of a dumpling while talking with his family. He complained of intermittent cough after a transient bout of irritant cough. No cyanosis or loss of consciousness was observed. The vital signs of the patient were normal; however, bilateral rhonchi were audible on auscultation. Chest x ray and CT revealed a metal-density FB located in the tracheal carina (Fig. 2A–E).

Rigid bronchoscopy was performed under general anesthesia and spontaneous ventilation. A circular metallic FB covered with abundant purulent secretions was visualized lying obliquely on the tracheal posterior wall above the carina. A “crocodile” forceps were introduced through the rigid bronchoscope to grasp the FB tightly and the coin edge was flipped up for easy evacuation through the glottis. The FB was identified as a 5-jiao coin (Fig. 2F). After removal of purulent secretions, a slight bruise at the carina was seen. Postendoscopic period was uneventful. The patient was discharged on the subsequent day.

3. Discussion

Since the process of mastication is well regulated by various protective reflexes in adults, tracheobronchial FBs are less

common in this age group than in the pediatric group.^[1] Risk factors for FB aspiration in adults include neurological dysfunction, trauma, poor eating habits, alcohol consumption, sedative use, and psychological disorders.^[2,3,11]

The main symptoms of patients with tracheobronchial FBs include cough, sudden choking, hemoptysis, fever, dyspnea, and chest pain.^[12] FBs lodged in the large airways (trachea and main bronchi) tend to be more symptomatic than those localized in distal airways.^[12] The FBs in our 2 patients were lodged in the larynx and trachea, respectively. They provided specific pertinent medical history with initial symptoms of irritant cough. Severe cough resolved spontaneously in both patients, while the second patient experienced intermittent cough. Unlike the case 2, the first case developed a change in voice and complained of foreign body sensation; in addition, the foreign body sensation aggravated in recumbent position. A plausible explanation for this is that FBs lodged below the glottis (case 1) may more markedly impact airflow than those localized near the tracheal carina (case 2) and are liable to affect the vibration of the vocal fold.

The treatment options depend on the setting and on the preference of the ENT team. The technique for retrieval of tracheobronchial FBs include direct laryngoscopy, flexible bronchoscopy, rigid bronchoscopy, tracheotomy, and thoracic surgery;^[13] there is no consensus as to which technique is most suitable.^[14] Direct laryngoscopy may be adequate for FBs localized in the laryngeal or glottic regions.^[13] The FB in our case 1 was seen below the glottis and was successfully extracted with alligator forceps through direct laryngoscopy. However, in case 2, the FB was lodged near the carina and rigid bronchoscopy was used to remove the FB. Fiberoptic bronchoscopy has been recommended as the initial investigation for suspected FBs.^[13,15,16]

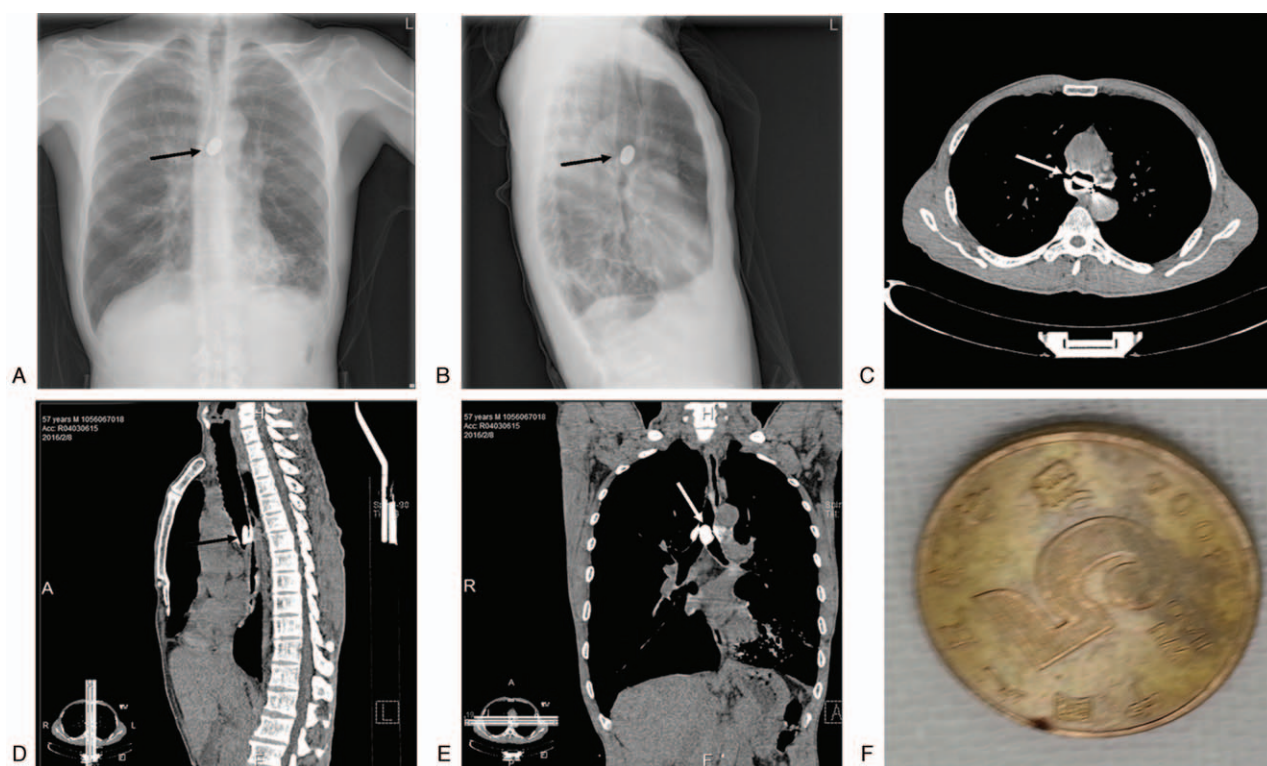


Figure 2. Posteroanterior (A) and lateral (B) chest x-ray of case 2 showing the foreign body. Arrows indicate the radiopaque shadows in the trachea in transverse (C), coronal (D), and sagittal (E) CT radiographs. The foreign body was identified as a 5-jiao coin (F). CT=computed tomography.

Given the large dimensions of the 5-jiao coin (Fig. 1E and F), it is difficult to remove the coin using fiberoptic bronchoscope. In addition, since the diameter of the 5-jiao coin (20.5 mm) approximates the anteroposterior diameter of the glottis in adults (21 mm), severe stimulation of the respiratory tract may occur during retrieval of the coin through the glottis. Therefore, the coin must be removed parallel to the vocal cords. In case 2, the coin was lying on the posterior tracheal wall; therefore, the FB was firmly held with the forceps and its edge flipped up (parallel to the vocal cords) prior to retrieval. The rigid bronchoscope, forceps, and the coin were all retrieved as a single unit during the removal process. More attention must be paid to avoid asphyxia due to positional changes of the coin in the trachea. Hathiram et al^[6] performed an elective tracheotomy before extracting the FB, to protect the airways.

In summary, the presence of a coin in the respiratory tract is an exceptional occurrence. The clinical signs may be unremarkable; however, the history helps in the diagnosis as adults can relate to the history more precisely than children. Cultural and regional differences can lead to variations in foreign body aspiration. Early diagnosis and intervention is the key in such cases as a delay can cause catastrophic complications.

Author contributions

Data curation: Ning Fang.

Formal analysis: Ning Fang, Zhenyu Zhang.

Funding acquisition: Ning Fang, Zhenyu Zhang, Xin Wang.

Investigation: Zhenyu Zhang, Xin Wang.

Methodology: Zhuo Wang, Xin Wang.

Project administration: Zhuo Wang, Zhenyu Zhang.

Resources: Jing Shang.

Software: Zhuo Wang.

Supervision: Zhuo Wang.

References

- [1] Baharloo F, Veyckemans F, Francis C, et al. Tracheobronchial foreign bodies: presentation and management in children and adults. *Chest* 1999;115:1357–62.
- [2] Nguyen LH, Nguyen DH, Tran TN, et al. Endobronchial foreign bodies in Vietnamese adults are related to eating habits. *Respirology* 2010;15:491–4.
- [3] Sehgal IS, Dhooria S, Ram B, et al. Foreign body inhalation in the adult population: experience of 25,998 bronchoscopies and systematic review of the literature. *Respir Care* 2015;60:1438–48.
- [4] Dutta SK, Ghosh SN, Munshi DM. Unusual case of coin in larynx (glottic chink) presenting as dayshagia. *Ind J Otolaryngol Head and Neck Surg* 2006;58:209–10.
- [5] Hada MS, S. SM. , Chadha MS, et al. Laryngeal foreign bodies among adults. *J Bronch Intervent Pulmonol* 2015;22:145–7.
- [6] Hathiram BT, Khattar VS, Hiwarkar B, et al. An unusual presentation of impacted foreign-body in the adult larynx. *Ind J Otolaryngol Head and Neck Surg* 2011;63:96–8.
- [7] Singh GB, Rai AK, Singh H, et al. A rare case of coin impaction in larynx in an adult. *Clin Pract* 2011;1:3.
- [8] Ndiaye C, Regonne EJ, Ahmed H, et al. An unusual laryngeal foreign body in adult. *Case Rep Otolaryngol* 2016;2016:1–2.
- [9] Su CY. A coin as a tracheal foreign body for 30 years. *J Laryngol Otol* 1989;103:798–800.
- [10] Kurashev RI. Localization of a foreign body (coin) in the trache. *Vestn Otorinolaringol* 1971;33:104–5.
- [11] Ramos MB, Fernandez-Villar A, Rivo JE, et al. Extraction of airway foreign bodies in adults: experience from 1987–2008. *Interact Cardiovasc Thorac Surg* 2009;9:402–5.
- [12] Dong YC, Zhou GW, Bai C, et al. Removal of tracheobronchial foreign bodies in adults using a flexible bronchoscope: experience with 200 cases in China. *Intern Med* 2012;51:2515–9.

- [13] Gonullu H, Ozturk Y, Akay S, et al. Turban pin: an unusual cause of foreign body aspiration in young islamic adult. *Iran Red Crescent Med J* 2014;16:e2975.
- [14] Mise K, Savicevic AJ, Pavlov N, et al. Removal of tracheobronchial foreign bodies in adults using flexible bronchoscopy: experience 1995–2006. *Surg Endoscop* 2009;23:1360–4.
- [15] Fang N, Sun L, Zhang Y, et al. Combined application of laryngoscopy and flexible bronchoscopy in endobronchial foreign body extraction. *Minim Invasive Ther Allied Technol* 2016;25:351–4.
- [16] Rodrigues AJ, Oliveira EQ, Scordamaglio PR, et al. Flexible bronchoscopy as the first-choice method of removing foreign bodies from the airways of adults. *J Bras Pneumol* 2012;38:315–20.