



Foreign body extraction through the rigid bronchoscopy

Uklanjanje stranog tela uz pomoć rigidne bronhoskopije

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Abstract

Introduction. Foreign body aspiration into tracheobronchial tree represents an urgent condition at high level of risk. Etiology is different, and this condition is typical for all ages with highest incidence in pediatric population. **Case report.** A successful foreign body removal (partial denture) in a 34-year old man was presented. Radiography and computerized tomography of the chest showed a foreign body localized at the level of the right bronchus including the right middle lobe bronchus. By the use of rigid bronchoscopy, a foreign body was visualized and mobilized from the segmental bronchus in the first act, and then completely extracted. **Conclusion.** Efficient diagnostics and extraction are imperative for the aspirated foreign body preventing life-threatening complications.

Key words: foreign bodies; bronchi; diagnosis; therapeutics; bronchoscopy.

Apstrakt

Uvod. Aspiracija stranog tela u traheobronhijalno stablo predstavlja urgentno stanje visokog rizika. Etiologija je različita, a pojava je karakteristična za sve uzraste sa najvećom incidencijom u pedijatrijskoj populaciji. **Prikaz bolesnika.** Prikazali smo uspešno uklanjanje aspiriranog stranog tela (parcijalne proteze) kod muškarca, u životnom dobu od 34 godine. Radiografija i kompjuterizovana tomografija (KT) ukazivali su na strano telo lokalizovano u nivou desnog bronha sa penetracijom u bronh za srednji režanj. Primenom rigidne bronhoskopije strano telo je vizualizovano, u prvom aktu mobilisano iz segmentnog bronha, a zatim potpuno ekstrahovano pri ekspirijumu. **Zaključak.** Efikasna dijagnostika i uklanjanje su imperativ u lečenju aspiriranog stranog tela, čime se sprečava nastajanje komplikacija opasnih po život.

Ključne reči: strana tela; bronhusi; dijagnoza; lečenje; bronhoskopija.

Introduction

Foreign body (FB) aspiration into the tracheobronchial tree is an urgent condition at high level of risk. It is typical for all ages, and most common in pediatric population. In 2006 in USA, there were 4,100 mortal outcomes, because of the incidental ingestion or inhalation of food and objects that resulted in obstruction of airways¹. Efficient diagnostics and FB extraction are imperative in the treatment providing less mortality and morbidity. In this paper we presented successful FB removal by the rigid bronchoscopy use in a 34-year old male.

Case report

A 34-year old male was hospitalized because of injuries in a fight. Physical examination verified an expiratory stridor over the right hemithorax, right periorbital hematoma and lip

cuts. Auscultation over the right lung showed lower breathing sound, and the presence of wheezing over the right down lung field.

Chest radiography (Figure 1) showed a nontransparent shadow of metal intensity of the size about 40 × 10 mm. Radiography showed that it corresponded to FB (partial denture), localized in the right major bronchus and included in the segmental bronchus. Computerized tomography (CT) (Figure 2) of the chest visualized less transparency of the lung parenchyma at the level of the middle lobe. At the window for mediastinum, at the level of the right bronchus and towards the bronchus for the middle lobe, the presence of a metal FB was confirmed corresponding to the partial denture by its shape. In the remaining parts of the thorax the findings were clear.

Other clinical and laboratory findings were within the referral limits.

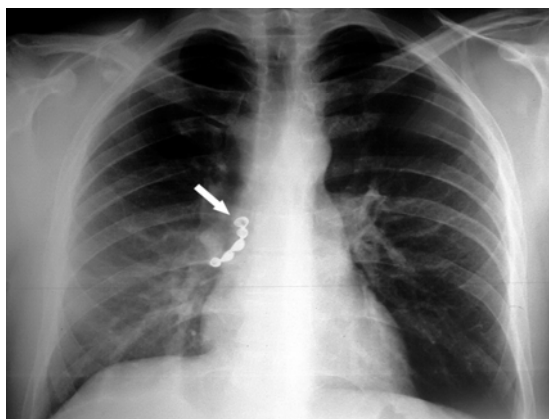


Fig. 1 – Anterior-posterior chest radiograph showed a partial denture (arrow) in the right hilum

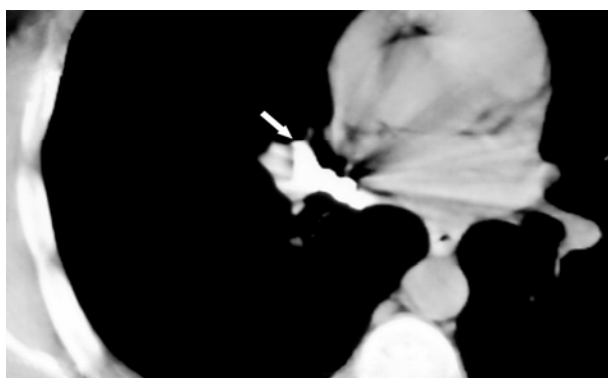
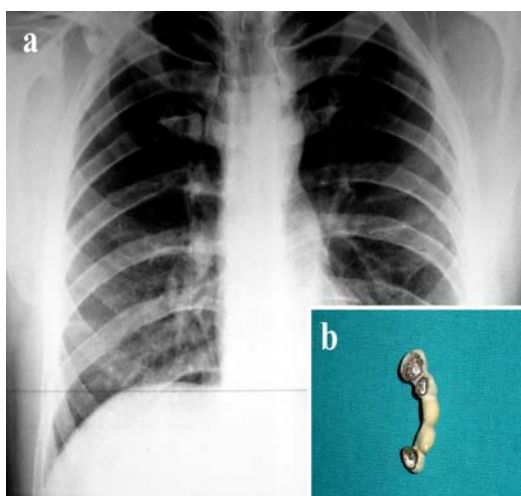


Fig. 2 – Computerized tomography of the chest showed a partial denture (arrow) in the right major bronchus

After finishing diagnosticall procedures, council of doctors made a decision to extract FB by the use of rigid bronchoscopy. The patient was intravenously brought into general anesthesia with ventilation through a rigid bronchoscope where the Hopkins's telescopic system was placed. After visualization, FB together with the bronchoscope, with application of forceps was moved out of the segmental bronchus to trachea. A complete extraction of the denture (Figure 3) was done in expiration, with the patient ready to cooperate.



**Fig. 3 – a) chest radiograph after a denture removal
b) the extracted partial denture**

No complications were observed in a postsurgery period and after 2 days the patient was discharged in a good condition.

Discussion

Aspirated FB can have organic and anorganic derivation. Regardless the age, organic FB have been more common. In children, the most often are fruits and leguminous plants (nuts, hazelnuts, beans, peas, cereals); in adults, food and bone pieces. The most common aspirated FB of anorganic derivation in pediatric population have been beads, coins, toy parts and school tackles, and in adults they are tablets and teeth parts.

FB aspiration is an accidental event among children with high incident rate of morbidity and mortality. About 75–85% of cases are under 15 years of age, and most often under 3 years of age², which is explained by fast psychomotor development, inadequate dentition and undeveloped act of swallowing³. FB aspiration appears rarely in adults, most often during dental interventions, with mentally disordered people, people with neurological disorders or due to drug and alcohol abuse⁴. The right bronchus is usually involved in adults due to the anatomical configuration.

Medical examination shows atypical findings, and it depends on nature, size, localization and the time FB spends in tracheobronchial tree. When they are larger, they can cause sudden death, while smaller usually remain in lower parts of the tracheobronchial tree, giving the poorer or richer clinical picture. The most often described symptoms are coughing, wheezing, expiratory stridor and weakened breathing sound. Complete diagnostics and removal of FB should be done in the shortest possible time, which sometimes could be complicated after the first spontaneous shocking asphyxia attack has gone, and appearance of a latent stadium when the symptoms reveal another respiratory disease⁵.

FB extraction could be made harder by localization and kind of FB, lack of adequate instruments, as well as inexperience of the doctors⁶. Special problem is extraction of organic FB that has been performed a couple of times, due to forceps destruction. Incomplete and or untimely extraction, granulation tissue formation or postobstructive infection followed by recurrent bronchopneumonia, lung abscess, hemoptysis or empyema. Removal of the left parts of FB is even harder due to bad visualization caused by bleeding and increased saliva excretion.

Thoracotomy has been indicated at patients with increased risk. Interventional radiological methods, such as Fogarty balloon catheter, were used rarely, due to high level of risk for rupture o the bronchus wall or lowering of the FB into lower tree parts⁷.

The application of rigid bronchoscopy with different dimension forceps is, in general, the therapeutical standard for safe removal of aspirated FB anesthesia, which significantly decreases appearance of post-instrumental edema. Dimensions of a bronchoscope used for extraction are determined in accordance with a patient's age, while dimen-

sions of the forceps depend on the size of FB. In cases of hardened intubation, the primary method used is direct laryngoscopy, and if a patient is willing to cooperate, local application of anesthetics is possible in the area of upper laryngeal nerves and over the mucous membrane of the bronchial tree⁸.

In our case, due to the size and kind of FB, the safest method applied was rigid bronchoscopy under the general intravenous anesthesia with ventilation through a rigid bronchoscope. This method enabled adequate access of telescopic system and forceps, as well as simple extraction of the den-

ture. Apart from that, rigid bronchoscopy was selected because of the origin of FB and efficient suction in case of massive bleeding during intervention⁹.

Conclusion

Imperative in aspirated FB removal is the efficient diagnostics and extraction thus preventing life-threatening complications. In the case when FB is big and of irregular shape, a reliable and safe method is rigid bronchoscopy under general anesthesia.

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