

Aspiration of Perforated Pen End Plug

Mária Homolová*, Andrea Jovankovičová and Irina Šebová

Department of Pediatric Otorhinolaryngology, National Institute of Children's Diseases, Faculty of Medicine, Comenius University, Bratislava, Slovakia

***Corresponding Author:** Mária Homolová, Department of Pediatric Otorhinolaryngology, National Institute of Children's Diseases, Faculty of Medicine, Comenius University, Bratislava, Slovakia.

Received: April 30, 2020; **Published:** December 15, 2020

Abstract

Foreign body aspiration is an acute potentially life-threatening event in childhood. Because of often unreliable history and uncertain clinical and radiologic finding, it represents a diagnostic and therapeutic challenge. Aspirated pen cap predisposes to complete airway obstruction. Extraction is difficult due to its smooth surface. We report a case of an aspiration of perforated pen cap in a schoolchild with negative radiologic finding. We describe a safe and simple bronchoscopic technique of foreign body removal using an extraction basket.

Keywords: Foreign Body Aspiration; Pen Cap; Flexible Bronchoscopy; Prevention

Introduction

The aspiration of a foreign body represents a sudden potentially life-threatening event with the highest incidence in childhood between the 1st and 3rd year of life. Male dominates in relation to female 2:1. On Department of Pediatric Otorhinolaryngology in Bratislava have been over the last 10 years in the period from 31.7.2006 to 31.7.2016 recorded 245 hospitalizations due to aspiration of a foreign body.

These are usually foreign bodies of organic origin, especially various types of nuts, fruits and vegetables. Approximately 3 - 8% of the total number of inhaled inorganic foreign bodies is aspiration of pen components [1]. When learning, writing or drawing, children tend to insert the pen into the oral cavity or nasal cavity, which can result in ingestion or aspiration of individual parts of the pen. Due to their size, cylindrical shape, smooth surface and rigid material, they predispose to complete airway obstruction in case of aspiration and represent a therapeutic challenge. For these reasons, several stationery companies have produced pens with perforated lids and end plugs in order to reduce the risk of death from suffocation.

Case Report

On Department of Pediatric Otorhinolaryngology in Bratislava in January 2017 we dealt with the case of 8-year-old girl transferred from another town. Subjectively, the patient reported a short episode of cough while playing with a pen in a school setting. After the subsequent consumption of the sandwich, it was without any clinical difficulties. About two days after this episode, the child confessed to

parents and informed them about the possible inhalation of part of the pen. Despite the fact that the parents did not trust the child at first, due to the rare cough, they decided to visit a paediatrician, who recommended hospitalization at the children's clinic with subsequent transfer to a specialized otorhinolaryngologic clinic.

At admission, the patient was cheerful and asymptomatic. We objectively found a negative local otorhinolaryngologic finding. Auscultation revealed expiratory wheezing present above the lungs on the right, which was partially transmitted to the left. A chest X-ray was assessed as normal, with no signs of atelectasis or emphysema. Laboratory parameters were within normal limits.

Based on the anamnesis and auscultation finding, we indicated bronchoscopy under general anaesthesia. On the right side of the lungs in the area of the bronchus intermedius, we verified a blue-stained plastic end plug of pen with a central perforation (Figure 1). We removed it using a flexible bronchoscope with an extraction basket (Figure 2). The endoscopic procedure was fast, simple and efficient thanks to the instruments used.

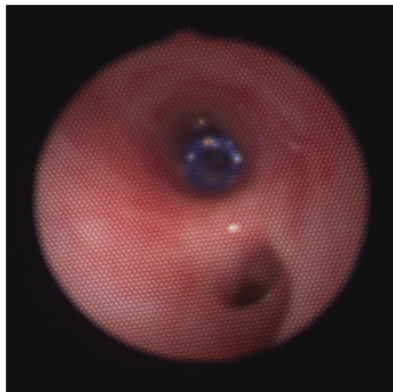


Figure 1: Pen end plug in the bronchus intermedius.

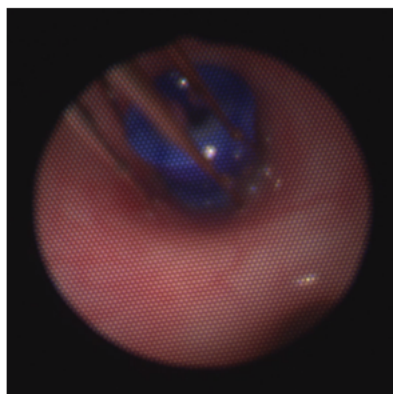


Figure 2: Removal of the pen end plug by the extraction basket.

The extracted pen end plug was 1 cm long, one end with a perforation with a diameter of 5 mm and the other end with a diameter of 8 mm and with a perforation with a diameter of 2.5 mm (Figure 3). This end plug of pen almost completely obstructed the lumen of the bronchus intermedius, which has a diameter of about 10 mm. However, the central perforation allowed bilateral airflow and ventilation of the middle and lower lobes of the right side of the lungs. This fact explains the asymptomatic course and the negative radiological finding.

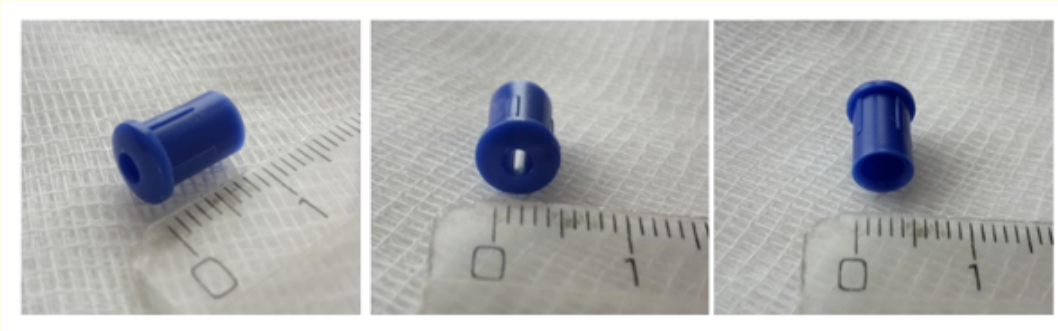


Figure 2: Extracted pen end plug.

After endoscopic surgery, the patient 's respiration was vesicular, with no adventitious breath sounds. The next day she was released into home care.

Discussion

Aspiration of a foreign body can lead to a life-threatening situation that requires prompt bronchoscopy. More than 80% of foreign body inhalation events occur in children under 5 years of age. In this age group of patients, the anamnesis is often unreliable, and the symptomatology is ambiguous. Retrospective studies have shown that more than 90% of cases are accompanied by at least one of the following symptoms - initial suffocation, cough, stridor or dyspnoea. Impaired respiration is present in up to 80% of patients on auscultation. The sensitivity of chest radiological examination in the early period after aspiration is 62-68% [2].

Based on a retrospective analysis of 1015 cases of foreign body aspiration, the diagnosis was delayed in approximately 40% of patients, in 29% by more than a week, and in 10% by more than 30 days [3].

CT virtual bronchoscopy can also be used in the diagnosis of foreign body aspiration. This is a modern method that allows non-invasive examination of the tracheobronchial tree. Using sophisticated software, the axial representation creates a realistic three-dimensional endoscopic image that interprets the tracheobronchial wall and lumen. The sensitivity of this modality is higher than 90% [4,5].

In our case report, the patient was of compulsory school age, therefore her medical history was considered reliable. Equally convincing was the auscultation examination of the chest with the finding of expiratory wheezing. A chest X-ray was assessed as normal because of the radiolucent material and the central perforation of the pen end plug allowing airflow and distal airway ventilation. The performed flexible bronchoscopy confirmed the presence of a foreign body on the right side of the lungs in the bronchus intermedius, which was successfully removed by means of an extraction basket introduced through the working channel of the flexible bronchoscope. Early diagnosis led to prompt endoscopic intervention.

Conclusion

Diagnosis as well as therapy for foreign body aspiration is often complex. The basis for the indication of bronchoscopy is the anamnesis, symptomatology and auscultation examination of the chest. Endoscopic revision of the lower respiratory tract should be considered whenever foreign body aspiration is suspected, despite a negative radiologic finding. This will prevent possible complications related to the presence of a foreign body in the respiratory system, such as atelectasis, emphysema, bronchopneumonia, granulation, and the like. Most cases of foreign body aspiration are preventable, especially for young children. In this sense, it is necessary to educate the professional and lay public.

Bibliography

1. Jiaqiang S., *et al.* "Rigid bronchoscopy for inhaled pen caps in children". *Journal of Pediatric Surgery* 44 (2009): 1708-1711.
2. Zhijun C., *et al.* "Therapeutic experience from 1428 patients with pediatric tracheobronchial foreign body". *Journal of Pediatric Surgery* 43 (2008): 718-721.
3. Saki N., *et al.* "Foreign body aspiration in infancy: a 20-year experience". *International Journal of Medical Sciences* 6 (2009): 322-328.
4. Bhat KV, *et al.* "Evaluation of computed tomography virtual bronchoscopy in pediatric tracheobronchial foreign body aspiration". *The Journal of Laryngology and Otology: JLO* 124 (2010): 875-879.
5. Cevizci N., *et al.* "Virtual bronchoscopy as a dynamic modality in the diagnosis and treatment of suspected foreign body aspiration". *European Journal of Pediatric Surgery* 18 (2008): 398-401.

Volume 10 Issue 1 January 2021

©All rights reserved by **Mária Homolová., et al.**