FROM ASPIRATED TO EXPECTORATED TOOTH IN A CHILD: A CASE REPORT

Dzulkafli AH[1], and Abdull Wahab SF[1].
[1]Department of Emergency Medicine, School of Medical Sciences, 16150 Kota Bharu, Kelantan, Malaysia

Correspondence:
Abdul Hafiz Dzulkafli,
Department of Emergency Medicine,
School of Medical Sciences, Health Campus,
University Sains Malaysia,
16150 Kubang Kerian, Kelantan, Malaysia
Email: hafizdzulkafli@student.usm.my

Abstract

Spontaneous expectoration of a foreign body is a rare clinical scenario. We are reporting a case of a boy who spontaneously coughed up his aspirated tooth while awaiting an emergency bronchoscopy.

Keywords: Aspirated Tooth, Children, Spontaneous Expectoration, Emergency Department

Introduction

Reported instances of foreign body aspiration are common in emergency departments, but an aspirated tooth is rare, often encountered in dental clinics. This incident is more prevalent in children than in adults. Aspiration of a tooth poses a potentially serious risk, especially when the tooth completely obstructs the airway or when there are delays in diagnosis and intervention. Hence, anticipating potential clinical deterioration is crucial when preparing for definitive treatment.

Case report

A 10-year-old boy with a background of well-controlled bronchial asthma arrived at the Emergency Department with suspected aspiration of an extracted tooth following a dental procedure. The child had been disruptive during the dental procedure, and the extracted tooth was not found afterward, leading to suspicion of aspiration due to subsequent uncontrollable coughing.

Upon arrival at the emergency room, he appeared well with stable vital signs. Systemic examination revealed no significant findings. Despite not exhibiting respiratory distress and having good oxygen saturation, a lung examination indicated reduced air entry in the right lower zone. A bedside lung point of care ultrasonography (POCUS) was conducted, showing normal results. A chest radiograph displayed a hyper-opaque object resembling a tooth in the right perihilar region (Figure 1).

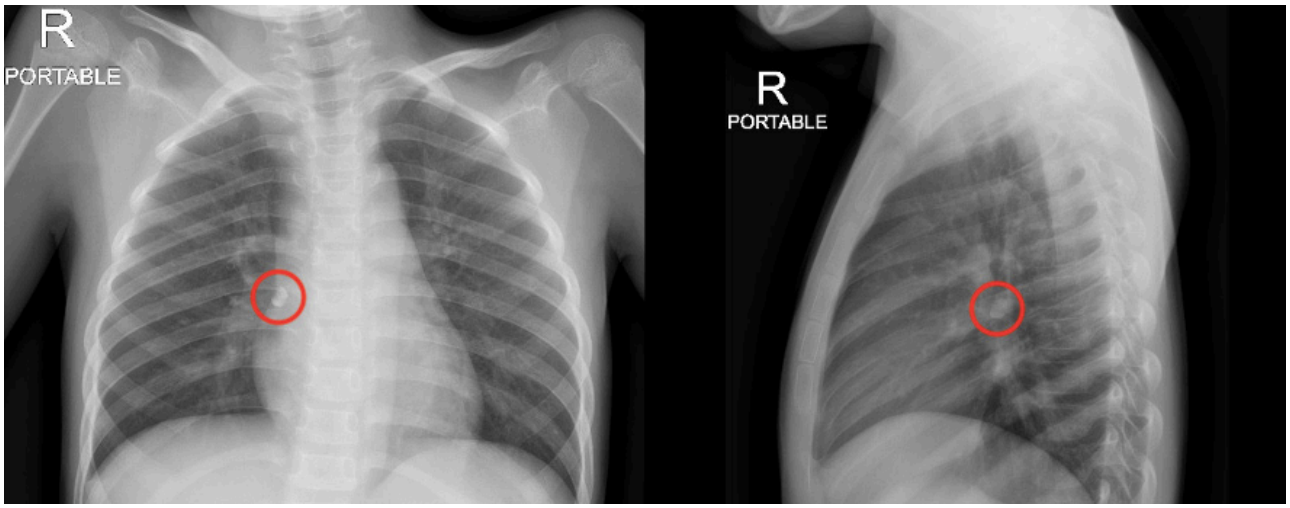

Figure 1: Chest radiograph (AP and lateral view) showed heterogenous opacity object (red circle) in right perihilar region at the level of T7.

A diagnosis of tooth aspiration was confirmed, and an urgent bronchoscopy for foreign body removal was arranged. While observed in the emergency room and positioned upright, the child began experiencing intense coughing episodes and expelled an intact deciduous tooth (Figure 2). A repeat chest radiograph showed no similar opacities in the same spot (Figure 3).

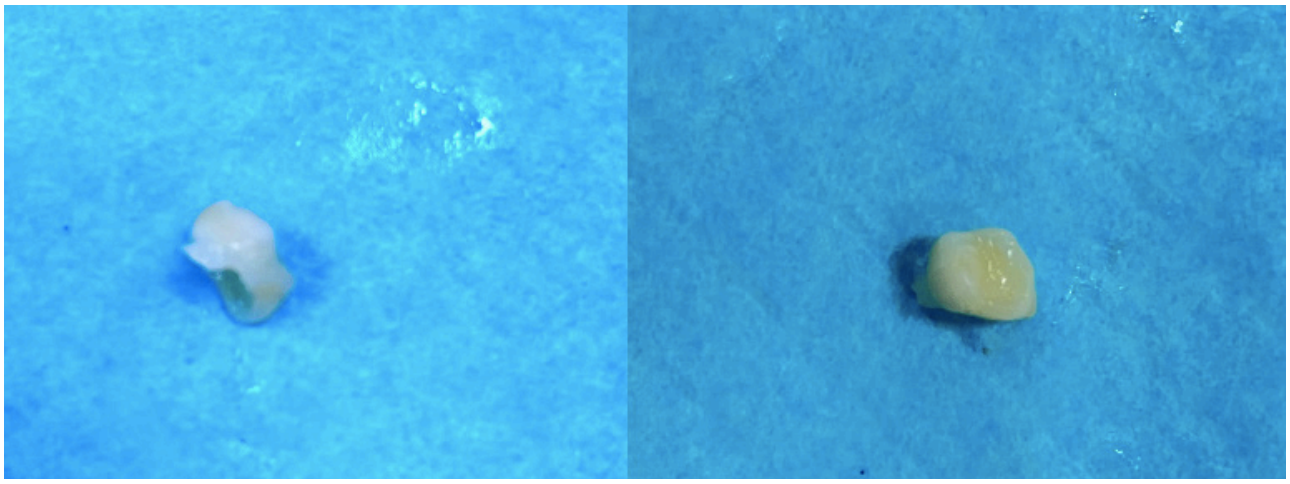

Figure 2: A maxillary right 2nd molar deciduous tooth (tooth 55) measured about 7x4x3mm was spontaneously expulsed after bouts of cough.

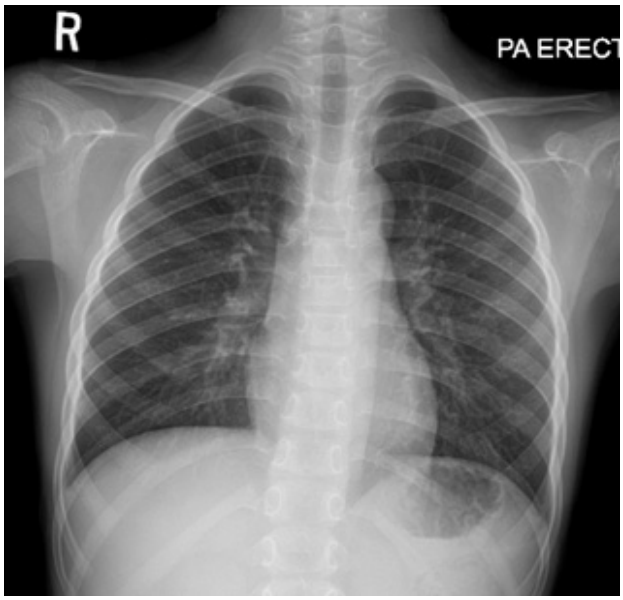

Figure 3: Repeated chest radiograph after tooth expectoration.

After monitoring, the child remained in good health and returned to his usual state. He was discharged home on the same day.

Discussion

Children with foreign body aspiration (FBA) are at risk of sudden deterioration and may require emergency airway intervention. It is one of the common causes of mortality and morbidity in children, especially those aged two years old and younger. Between 2001 and 2016, a total of 305,814 non-fatal injuries were reported in the United States due to choking in children aged 0 to 19 years. Seventy-three percent of non-fatal injuries and 75 percent of choking fatalities were accounted for by children under five years old (1).

Children are generally vulnerable to FBA due to the smaller diameter of their airways, making them more prone to obstruction. Airflow resistance is inversely proportional to the radius of the airway to the power of four. Therefore, compared to adults, even a slight reduction in the cross-section of the airway can lead to significant changes in airway resistance and airflow (2).

The most common foreign bodies (FBs) aspirated by children, especially infants or toddlers, are organic materials such as peanuts, while older children are more likely to aspirate non-organic materials such as pen caps, paper clips, and pins (3). A tooth in the airway is considered a rare occurrence but is a possible complication following tooth extraction in an anxious patient (4).

The clinical presentation of FBA depends on the child's age, their physical position when aspirated, the size of the object, and the location where it lodges. Airway obstruction can occur due to the object itself or due to local inflammation with edema of the surrounding airway, especially if FBA removal is delayed or following instrumental manipulation during the removal. In contrast to non-organic material, organic material is known to cause more complications. Organic FBs may swell up when in contact with the fluid and may elicit a more inflammatory reaction in the airway, causing more airway obstruction, thus requiring much earlier emergency retrieval (5).

Upper airway involvement, usually caused by larger objects, varies from complete to partial obstruction. Complete obstruction can cause life-threatening asphyxia and cardiorespiratory compromise, while partial obstruction may manifest as stridor, coughing, wheezing, and respiratory distress. Smaller foreign bodies may dislodge further down the lower airway, leading to pulmonary changes dependent on the type of obstruction. Below the age of 15 years, a child's mainstem bronchi angle is more symmetrical than in adults, thus the frequency of dislodgement to either bronchus is almost equal (6).

Initial evaluation of a child with FBA is an assessment of the airway patency and respiratory status. In a symptomatic, unstable choking child, an attempt for dislodgement with a Heimlich manoeuvre, back blow, or abdominal thrust should be attempted immediately, as outlined by American Heart Association. The performance of cardiopulmonary resuscitation (CPR) may be done if they become arrested. A child who can speak without stridor or respiratory distress indicates the airway is still patent. While preparing for the definitive removal of a foreign body, it is important to keep the child calm and comfortable throughout the observation as crying and restless children can impair the patency of the airway and increase their work of breathing.

Focus assessment should include evaluation of breathing pattern and quality of breath air entry for possibilities of lung atelectasis, hyperinflation, pneumothorax, or evidence of pneumonia in late presentation (7). Point-of-care ultrasound (POCUS) lung examination plays a role in ruling out pneumothorax, thoracic free fluid, pulmonary oedema, and pneumonia in an aspirated patient (8). Thus, the findings are not specific and vary depending on the extent of the clinical condition.

Rigid bronchoscopy remains the procedure of choice for removing FBA. Nevertheless, the flexible fiberoptic bronchoscope offers a better range of visibility and is used more frequently as a diagnostic or to determine the location of the foreign body (9).

Conclusion

Spontaneous expectoration of a foreign body can occur due to an intense cough, miming the effects of a Heimlich maneuver. When preparing for definitive treatment to remove a foreign body in a stable patient, it is crucial to keep the patient upright in a calm and comfortable position while monitoring for any signs of airway collapse or deterioration.

Acknowledgement

The authors would like to thank the patient's family for their permission to publish this case report.

Competing Interests

There are no conflicts of interest regarding the publication of this case report.

Financial support

No funding was received for this work.

Informed Consent

Given the retrospective nature of this case report and the logistical constraints preventing the patient and his guardian from returning to the hospital, verbal consent was acquired from the patient's mother before writing this report.

References

1. Chang DT, Abdo K, Bhatt JM, Huoh KC, Pham NS, Ahuja GS. Persistence of choking injuries in children. Int J Pediatr Otorhinolaryngol. 2021; 144:110685.
2. Gardner HG, Baum CR, Dowd MD, Durbin DR, Lichenstein R, Quinlan KP, *et al*. Policy statement - Prevention of Choking Among Children. Pediatrics. 2010; 125(3):601-7.
3. Fitzpatrick PC, Guarisco JL. Pediatric airway foreign bodies. J La State Med Soc: Official Organ of the Louisiana State Medical Society. 1998; 150(4):138-41.
4. Swain SK, Sahoo S, Sahu MC. From tooth extraction to fatal airway complication in a child - A case report. Egypt J Ear Nose Throat Allied Sci. 2016; 17(1):27-9.
5. Sehgal IS, Dhooria S, Ram B, Singh N, Aggarwal AN, Gupta D, *et al*. Foreign Body Inhalation in the Adult Population. Respir Care. 2015; 60(10):1438-48.
6. Cleveland RH. Symmetry of Bronchial Angles in Children. Radiology. 1979;133(1):89-93.
7. Newby MD, Thomas D, Mullett CJ, Vijay C, Carr MM. Foreign Body Aspiration Presenting as Pneumothorax in a Child. Cureus. 2020; 12(5):8161.
8. Weerdenburg KD, Kwan CW, Fischer JW. Point-Of-Care Ultrasound Findings Associated With Foreign Body Aspiration in the Pediatric Emergency Department. Pediatr Emerg Care. 2016; 32(7):486-8.
9. Martinot A, Closset M, Marquette CH, Hue V, Deschildre A, Ramon P, *et al*. Indications for Flexible Versus Rigid Bronchoscopy in Children with Suspected Foreign-Body Aspiration. Am J Respir Crit Care Med. 1997; 155(5):1676-79.