HP Groups

Emergency Medicine, Trauma & Surgical Care

Case Report

Blind Finger Sweep Maneuver is not Only Dangerous but Could Be Fatal

Aude Tonson la Tour[1]*, Oliver Sanchez[2], Alain Gervaix[1] and Aaron Vunda[1]

[1]*Department of Children and Adolescents, Division of Pediatric Emergency, University Hospitals of Geneva, Geneva, Switzerland*

[2]*University Center of Pediatric Surgery of Western Switzerland, Geneva, Switzerland*

Abstract

Introduction: The Blind Finger Sweep Maneuver (BFSM) is an automatic reflex behavior seen when caregivers are confronted with a child who is choking after foreign body ingestion. This article reports five cases illustrating that using BFSM to remove oropharyngeal foreign bodies in children is dangerous, can lead to invasive investigations such as endoscopy under general anesthesia and can even be fatal.

Methods: A total of five cases presenting to the Pediatric Emergency Department of Geneva University Hospital between 2011 and 2014 after a history of BFSM following foreign body's aspiration are described.

Results: All five cases were younger than one year of age and a wide diversity of objects were involved. Endoscopy under general anesthesia was performed in 2 cases and we report one fatal case.

Conclusion: These cases illustrate how the use of BFSM to remove oropharyngeal objects in children is potentially very dangerous and could even prove fatal when dislodgement of the foreign body causes complete airway obstruction. In spite of current recommendations suggesting the use of this maneuver only in case of accessible and visible object, there are still many accidents. The danger of this practice is poorly investigated and there are only few case reports on this issue.

Introduction

Presence of a foreign body in the mouth of a conscious infant is a stressful event for any parent and child caregiver because of the strong fear of sudden upper airway obstruction. This situation may lead to an attempt to remove the foreign body using a Blind Finger Sweep Maneuver (BFSM) (Figure1).

This technique is potentially very dangerous and could even prove fatal when dislodgement of the foreign body causes airway obstruction. Reported consequences of this maneuver in the pediatric population are diverse and can go from traumatic epiglottitis to choking and death [1,2].

The danger of performing a BFSM is underestimated in the general population and this problematic is poorly covered by the media. Only few case reports describe the complications associated with this maneuver [2-6].

In the pediatric population children under the age of 4 years are at high risk of foreign body ingestion and inhalation [7]. Most fatal cases occur in children younger than 1 year of age [2,7]. In this young age group BFSM is frequently reported [2]. This might be explained by the fact that they are more closely supervised by their parents, who rapidly notice the presence of a foreign body in the infant's mouth and attempt to retrieve it [2].

We describe five cases of BFSM who presented to the Pediatric Emergency Department of the Geneva University Hospital. These illustrate that using BFSM to remove oropharyngeal objects in children is not only dangerous but can be fatal.

***Corresponding author:** Aude Tonson la Tour, Department of Children and Adolescents, Division of Pediatric Emergency, University Hospitals of Geneva, Rue Willy-Donzé 6; 1211 Geneva, Switzerland Tel: +41 223723311; E-mail: aude.tonsonlatour@hcuge.ch

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Methods

This retrospective case series reports all children presenting with a history of BFSM following ingestion of foreign body to the Pediatric Emergency Department of the Geneva University Hospital between December 2011 and January 2014. Patients information was obtained from the computerized chart database and identified using the keywords "foreign body ingestion" and "choking". From this list, only patients with a clear history of BFSM were selected.

We recorded patient's age, gender, types of foreign body, circumstance of the incident and resuscitation measures. In addition, for the fatal case, we report autopsy data on the type, number and anatomical location of the foreign body.

Results

We report a total of five cases of patients choking on foreign bodies with a history of BFSM presenting between December 2011 and January 2014 for an annual average of 25,000 patient visits. One of these five patients died (20%). All of these cases were younger than 1 year of age with a predominance of boys (4/5). A wide diversity of objects were involved (sheet of plastic, piece of peanut, chewing gum, small piece of plastic, piece of wax). Endoscopy under general anesthesia was performed in two cases.

Case No 1

A 9 month-old boy was playing with a pack of handkerchiefs and suddenly developed breathing difficulty in association with coughing, stridor and salivation. His mother looked in his mouth and saw no foreign body. She then performed an unsuccessful BFSM and called the ambulance.

On arrival in our Emergency Department (ED), the infant had normal vital signs (Respiratory Rate (RR) of 36/min, saturation of 98% in Room Air (RA) and Heart Rate (HR) 125/min). The patient was anxious and crying, his mouth was open with increased salivation but there was no respiratory distress or stridor. Throat examination did not reveal any foreign body. The patient was then placed in supine position and his head extended; direct laryngoscope was performed and a rectangular 2 cm long and 1 cm wide sheet of plastic situated in the nasopharynx was successfully retrieved with a Magill forceps.

Case No 2

A 10 month-old male child developed severe respiratory distress and cyanosis at home. The father first tried a thoracic compression maneuver in vain. He then put his finger in the child's mouth with the impression he had touched a foreign body and involuntarily pushed it in further. Following this maneuver, the child coughed and a piece of peanut was found in his mouth. Upon arrival in the ED, vital signs were normal (HR 114 bpm, Blood Pressure (BP) 84/71 mmHg, RR 24/min and saturation of 99% in RA). The patient was calm and throat examination revealed mucosal injury over the soft palate. There was no difficulty with breathing and respiratory auscultation was symmetrical. Chest X-rays were performed under full inspiration and expiration and no air trapping was seen. There was a slight asymmetrical radiolucency on the chest X-ray under expiration.

In the absence of clinical signs of respiratory obstruction, emergency bronchoscopy was not initially performed. We concluded that the child had swallowed the peanut following the father's maneuver. A few days later, the child presented with a persistent cough. A bronchoscopy was performed under general anesthesia and did not reveal any foreign body.

Case No 3

A 9 month-old boy swallowed a chewing gum and suddenly started coughing. His mother immediately put a finger in his mouth. The boy then vomited, the respiratory symptoms subsided and he tolerated subsequent feeding. Clinical examination was reassuring: vital signs were in normal range (saturation 98% in room air, HR 120/min) and the child was calm without any sign of respiratory distress or coughing. Throat examination didn't reveal any foreign body and the child was discharged.

Case No 4

A 12 month-old female was playing with a Christmas bauble and suddenly started to cough. Her mother noted that the plastic part of the bauble attached to the hanging line was missing. She immediately performed an unsuccessful BFSM with the feeling that she had touched a foreign body and involuntarily pushed it further in. Following this maneuver, the child suddenly developed cough with severe respiratory distress and cyanosis. She then positioned her child head down and delivered back blows. Respiration immediately improved and the coughing stopped. Upon arrival in the ED, the child was eupneic with a saturation of 100% in room air and throat examination revealed mucosal injury of the soft palate. The respiratory auscultation was normal and symmetrical. Throat, chest and abdominal X-rays were performed and revealed no foreign body. During a phase of observation, the child developed swallowing difficulties and increased salivation. A gastroscopy was performed under general anesthesia and revealed petechial lesions of the stomach lining but no foreign body was found. The child improved and was discharged home after 24 hours of observation.

Case No 5

The emergency team was sent to attend 10 month-old boy with a history of choking after ingestion of a piece of wax. He was reportedly unconscious and the father had performed a BFSM before calling the ambulance. On arrival of the rescue team, the child was unconscious, cyanotic, not breathing and pulseless. A rapid throat examination did not reveal any foreign body. Cardiopulmonary resuscitation was performed and the boy was rapidly intubated. After 45 minutes the child was transferred to the Emergency Unit. On arrival he was still in cardiac arrest and was pronounced dead. The autopsy revealed two pieces of wax measuring 4 and 6 mm in diameter inside the upper third of the right and left stem bronchi. Numerous closely related petechial hemorrhages were seen just below the vocal cords.

Discussion

These cases illustrate that BFSM in conscious infants is dangerous, can lead to invasive investigations such as endoscopy under general anesthesia and can even prove fatal. However, in our series, most infants survived and in particular the case No 2 did in fact benefit from this maneuver.

This case series differs from most previously published articles, which report fatal outcomes after BFSM. Indeed, Lavoie et al. describes foreign body airway obstruction as the major cause of deaths in children and reports that it accounts for more than 7% of deaths in children under the age of 4 years [8]. Commonly aspirated foreign bodies are organic or food matter [7]. Any foreign body lodged in the mouth can be pushed into the larynx causing a sudden airway obstruction if an improper finger sweep is performed. This may be facilitated by the infant's uncoordinated movements and crying. According to Hasan's report, crying, which is associated with a wide opening of the larynx increases the risk of choking on a foreign body [2]. Furthermore, the crying can, on occasion, be triggered by the frightened parents' or caregiver's attempt to remove the foreign body from the mouth.

The clinical presentation of foreign body impaction varies according to the object's location and depth of penetration. In most cases, children present with typical symptoms of coughing, stridor, wheezing or hoarseness, often in association with respiratory distress. Often temporary, perioral cyanosis can follow these initial symptoms. Physical findings include tachypnea, cough, diminished breath sounds, stridor, wheezing, dyspnea, cyanosis and thoracic retractions. However, absence of these findings does not rule out the possibility of foreign body aspiration [7].

Any sign of choking such as sudden coughing or change in an infant's breathing may lead parents or caregivers to attempt desperate measures to clear the child's mouth; the BFSM seems an automatic natural reflex behavior when confronted with this distressing situation. Current guidelines state that performing the blind finger sweep could provoke not only vomiting but also impaction of foreign body, which can then result in airway obstruction. Pediatric Life Support guidelines recommend keeping using the finger sweep maneuver in unconscious and non-responsive patients only if the object is accessible and visible. Care must be taken not to push it further into the airway [9,10]. The current American Academy of Pediatrics guidelines for a choking infant suggest back slaps and chest thrusts with the infant in a head-down position for children younger than 1 year and abdominal thrusts (Heimlich maneuver) are recommended for children older than 1 year (Table 1) (Figures 2-5) [7,11]. This recommendation is illustrated by case number 4 which improved immediately after the mother positioned him head-down and delivered back slaps. This case shows that educating parents can be life-saving. However, despite these current recommendations, there are still many accidents.

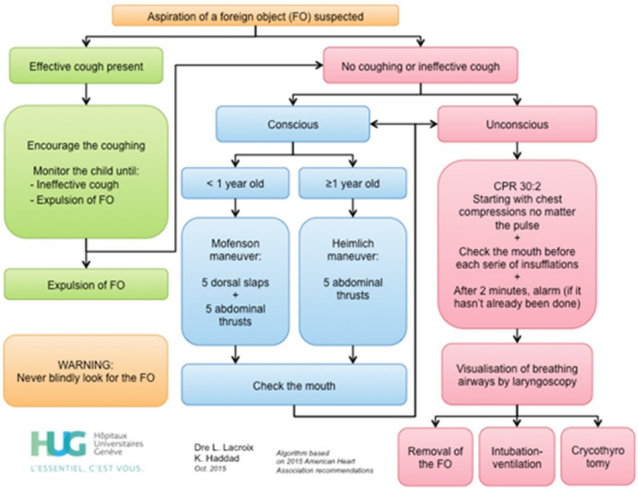

Table 1: Algorithm based on 2015 American Heart Association recommendations [11].

Figure 1: Blind Finger Sweep Maneuver.

Figure 2: Dorsal Slaps (< 1 year old).

Figure 3: Abdominal thrusts (<1 year old).

Figure 4: Check the mouth.

Figure 5: Heimlich Maneuver (≥ 1 year old).

Aside from the fact that most of these children survived, this case series adds support to recommendations that BFSM should be avoided in conscious children because of the possible fatal consequences. Finally, these cases showed the need for prevention and health education programs to raise public awareness, especially for child caregivers, regarding the danger of this practice.

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