Foreign Body Aspiration in Children: Analysis of 42 Cases

Tulin Durgun Yetim1, Hanifı Bayarogulları2, Vefik Arıca3*, Bülent Akcora4, Secil Gunher Arıca1 and Murat Tutanc5

1Thoracic Surgery Department, Mustafa Kemal University, Hatay, Turkey
2Radiology Department, Mustafa Kemal University, Hatay, Turkey
3Pediatric Department, Mustafa Kemal University, Hatay, Turkey
4Pediatric Surgery Department, Mustafa Kemal University, Hatay, Turkey
5Family Medicine Department, Mustafa Kemal University, Hatay, Turkey

Abstract

Aim: Tracheal foreign body aspiration is among the major causes of death in developing countries, specifically in infancy and childhood. If it is diagnosed in early period and the foreign body is removed, no complication develops.

Material & Method: Records of 42 forensic child patients who applied to Mustafa Kemal University, Medical Faculty Hospital and the Antakya State Hospital, Thoracic Surgery and Pediatric Surgery clinics between 2008-2011, and hospitalized with the tracheobronchial foreign body aspiration prediagnosis were studied retrospectively.

Results: Of the 42 patients, 22 were male and 20 were female, and their ages ranged from 4 months to 5 years. Foreign body was detected in 38 cases. In 4 cases, bronchoscopy was performed with the suspicion of foreign body, but no foreign body was observed. The foreign body was removed with rigid bronchoscopy in 37 cases, and in one case, metal tip of a pen was removed from left upper lobe bronchus with thoracotomy.

Conclusion: Foreign body aspirations in children mostly originate from accidents. Similarly, the cause of aspiration in children under the age of 5 in our study was mainly accidental and the rest were due to the negligence.

Keywords: Foreign body; Aspiration; Bronchoscopy; Children

Introduction

Tracheobronchial foreign body aspiration can lead to fatal acute respiratory failure when it causes near-complete occlusion at the tracheal level. However, the foreign bodies that have managed to proceed to the lower levels of the tracheobronchial tree can cause to respiratory tract problems at the distal of the region they occluded, because occlusion leads to ventilation failure which creates a favorable environment for infection [1,2].

The children aged between 0-3 constitute more than 75% of the foreign body aspiration cases. Furthermore, foreign body aspiration constitutes 7% of the deaths among the children aged 0-3 [3,4]. In developing countries, foreign body aspiration is among the major causes of death in infancy and childhood [5,6]. It can cause symptoms like coughing, difficulty in breathing and hoarse voice in the early period, and complications like obstructive emphysema, atelectasis, lung abscess, empyema, bronchiectasis or pneumothorax in the late period. All these symptoms and complications may lead to complaints like recurrent infections, hemoptysis or bronchial asthma [5,6]. While a large foreign body can cause a sudden death by occluding the respiratory tract completely, a small foreign object may also result in death by causing first laryngospasm and then hypoxic crisis [5,6].

When the foreign body is diagnosed and removed in the early period, no complications develop [7-9]. This study aimed to investigate the cases of foreign body aspiration.

Material and Method

The records of 42 forensic children who were hospitalized with the tracheobronchial foreign body aspiration prediagnosis in Mustafa Kemal University, Medical Faculty Hospital and in the Antakya State Hospital, Thoracic Surgery and Pediatric Surgery clinics between 2008-2011 were studied retrospectively.

In the study, the patients were evaluated for age, gender, where and when they presented to the hospital, complaints, duration of admittance to the hospital, physical examination findings, radiological findings, characteristics and location of the foreign body, treatment methods, complications and mortality.

Rigid bronchoscopy under general anesthesia, patients were short-acting anesthetics. During the removal/aspiration of the foreign body, the anaesthesia team is requested to reduce the ventilation of the lungs. Thus, it is possible to prevent the foreign body displacements.

Results

Of the patients whose ages range between 4 months and 5 years, 20 (47%) were female and 22 (53%) were male. Foreign body was identified in 38 patients out of 42. Four patients underwent bronchoscopy with the suspicion of foreign body but no foreign body was observed. Negative bronchoscopy cases were mostly the patients who were suspected to have foreign bodies such as dried fruits or nuts. The patients might have suspected to swallow a foreign body although they had swallowed only the secretion.

Of the patients, 22 (53%) had cough, 7 (17%) had dysnea, 3 had (8%) wheezing, 2 (4%) had cyanosis, 2 (4%) had foam at mouth and 1(2%) had recurrent pulmonary infections. In 5 patients, no symptoms were observed. Foreign bodies were removed with rigid bronchoscopy in 37 patients (88%). In 1 case (2%), a metal pen tip was removed from the left upper lobe bronchus with thoracotomy. Thirty patients (74%) presented to the hospital within the first 6 hours, 8 (22%) within the first 24 hours, 2 (4%) within the first 15 days and 2 (4%) in a period over 1 month. Duration of admittance to the hospital is given in Table 1.

*Corresponding author: Dr. Vefik ARICA, Mustafa Kemal University Medical Faculty, The chair of Pediatric Clinic, 31100, Hatay, Turkey, Tel: +90505 6797877; E-mail: vefikanrica@hotmail.com

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The children who presented after a month's period had been repeatedly treated by the pediatric outpatient clinics for pulmonary infections, but they had not responded to the treatments and had been directed for bronchoscopy. The period between the aspiration history and treatment ranged from 1 hour to 1 month (Table 1). The patients who had more irritating objects, such as beads or pins admitted to the clinics earlier. Posteroanterior chest radiography and chest CT findings of the children are given in Table 2. The foreign body localizations identified by bronchoscopy are shown in Table 3. The foreign bodies were located in the main bronchus of the right bronchial system in 19 cases (50%) and of the left bronchial system in 17 cases (44%). Additionally, it was detected in 2 cases that foreign bodies were located in the trachea.

The foreign objects identified in the tracheobronchial system and removed successfully were as follows; dried nuts or seeds in 20 cases (Figure 1-4), led bulb in 1 case (Figure 5 and 6), bead-headed pins in 3 cases, coin in 1 case, buttons and press studs in 3 cases, beads in 3 cases, metal tip of a pencil in 1 case (Figure 7), corn in 3 cases, safety pin in 1 case, chicken bone in 1 case (Figure 8 and 9) and a piece of a plastic toy in 1 patient. The foreign body was removed via rigid bronchoscopy with the help of forceps in 37 cases (88%). In one case (2%), the foreign body was removed with thoracotomy because the extraction of the foreign body that completely blocked the right main bronchus could not be achieved. Thus, thoracotomy + bronchotomy were performed to remove the metal tip of a pen. The foreign bodies identified in patients are given in Table 4.

Discussion

Bronchoscopy is the observation of tracheobronchial tree both for the diagnostic purpose and for the treatment. Observation with rigid bronchoscopy still preserves its vital importance in removing the foreign bodies in the tracheobronchial tree.

In practice, fiber-optic bronchoscope has no superiority to rigid bronchoscope in removing foreign bodies [1,10]. Bronchoscopy should be performed in all cases with the suspicion of foreign body aspiration. Observation via bronchoscopy has almost no risk of morbidity with experienced personnel. However, if the operation is performed by inexperienced personnel, or if the personnel get into panic, the process may become life-threatening. Foreign body aspiration is a serious condition which may potentially result in death.

Foreign body aspirations can be seen at any age, however, it has been reported to be observed under the age of 3 (73%) and particularly in children aged 1-3 [1,11,12]. Gürses et al. [13] reported that 84% of the patients were under the age of three. The incidence is high in this age group because the teeth cannot chew effectively and consequently the food kept in mouth longer than normal may lead to the aspiration of solid material. Another significant reason increasing the incidence of aspiration is that the children under the age of two try to recognize...
were organic substances (dried nuts and fruit, corn, etc.). In a series of 2170 patients, it was reported that 12 patients needed tracheostomy and 10 patients developed cardiac arrest, and 2 of them died [6,19]. No tracheostomy was needed in our cases. No mortality occurred in the bronchoscopy or thoracotomy processes. While the foreign body aspirations in underdeveloped countries are mostly due to organic substances, particularly the nuts or nut shells (shells of peanut, hazelnut, etc.), in developed countries, the incidence of plastic foreign body aspirations have increased in recent years [16,19]. It was reported in one study that the 66.3% of the aspirated foreign bodies was seeds of watermelon, which is a highly consumed fruit in summer [19]. However, Pasaoglu et al. [20] reported that in the study they conducted on children, the most commonly aspirated foreign body was dried nuts and fruit, particularly the sunflower seeds with the rate of 21.5%.

The most commonly aspirated foreign bodies in children are...
was 11% in our study. It has been emphasized in the literature that bronchoscopic studies were respectively 8.5%, 15.8% and 10.6% [15,20-25]. This rate refers to negative bronchoscopy. The reported negative bronchoscopy rates in these studies were 50% of the patients with tracheobronchial foreign body aspiration shared the same radiological findings as the foreign body that the children played could be a significant clue. Foreign body aspirations in children under the age of 5 were also mainly accidental or due to negligence, and since they had demonstrated radiological images, they were considered to be worthy of presentation.

References


