Clinical Case Report

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Importance of patient history in diagnosis of foreign body aspiration in children

Two case reports

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Abstract

Rationale: Accidental tracheobronchial foreign body aspiration (FBA) is one of the diseases with the highest morbidity and mortality in early childhood. A history of aspiration is very important for diagnosis, as sometimes there are no abnormalities in the physical examination of the patient. Parental negligence and inappropriate treatment may be important reasons for the delay in diagnosis. We describe 2 cases of misdiagnosed children with an unclear history of aspiration.

Patient concerns: A 5-year-old boy, who fell out of bed when sucking pistachios and landed on his neck, was initially diagnosed as a closed injury of the larynx. An 18-month-old girl, who developed a cough and difficulty breathing after she fell to the ground surrounded by many corn grains.

Diagnosis: Bronchoscopy examination confirmed the diagnosis of tracheobronchial foreign bodies.

Interventions: The foreign bodies were removed by bronchoscopy examination.

Outcomes: Both patients were discharged after removal of the foreign bodies and antibiotic treatment.

Lessons: Aspiration history is crucial for the correct diagnosis of FBA, and lack of history may lead to the misdiagnosis of FBA. Parents should be educated to increase their awareness of tracheobronchial FBA, and avoid providing their children with small objects that can potentially block the airways. When FBA is suspected, the child should be sent to a hospital immediately. Diagnostic rigid bronchoscopy is recommended.

Abbreviations: ENT = ear, nose, and throat, FBA = foreign body aspiration.

Keywords: aspiration history, bronchoscopy examination, foreign body aspiration, pediatric

1. Introduction

Foreign body aspiration (FBA) is a common cause of morbidity and mortality in young children. Early diagnosis and treatment are imperative to prevent mortality and serious complications.[1–3] A patient history of possible FBA together with asthma-like symptoms are crucial for the correct diagnosis of FBA. In many children, FBA is initially misdiagnosed because the initial choking events are often not witnessed, and residual symptoms may mimic other common airway conditions such as recurrent pneumonia or upper respiratory infection. Therefore, it is important to suspect FBA when a child's symptoms persist despite an appropriate treatment for asthma or pneumonia, and even if the diagnosis is initially not supported by sufficient evidence. The present study shows 2 cases of children who were misdiagnosed at first because of the unclear aspiration history, and reviews the literature for available diagnostic options that can help confirm or discard the clinical suspicion of FBA.

2. Case report

2.1. Case 1

A 5-year-old boy, who was previously healthy, was admitted to the ear, nose, and throat (ENT) emergency department due to paroxysmal coughing and breathing difficulties. He fell down from his bed 2 days ago, and his neck was crushed by the toys on the floor. He was initially admitted to a regional hospital, diagnosed with closed injury of the larynx, and received intravenous antibiotics and aerosol inhalation therapy. However, no improvement was observed after treatment. Therefore, the parents took their son to our hospital to seek medical care instead. Physical examination upon admission revealed bilateral expiratory wheezing, which was audible without a stethoscope, and the 3-concave sign (depression of the sternal fossa, supraclavicular fossa, and intercostal space) was weakly positive. Contrary to what was expected, the patient did not complain of

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much pain from the neck and hardly any swelling was observed. The previous diagnosis that the patient received could not explain all the symptoms. Thus, FBA was suspected. To confirm this suspicion, the patient was asked to recall his activities in conjunction with the fall from the bed. After repeated inquiry, the patient was finally able to recall sucking on a pistachio nut right before falling off the bed. His parents were completely oblivious of this fact. A consequent bronchoscopy examination confirmed the patient's story, a piece of pistachio nut was found in the patient's trachea, just above the carina tracheae, and successfully removed. The patient quickly recovered after this procedure without any complication, and was discharged from our hospital 2 days later.

2.2. Case 2

An 18-month-old girl, who was previously healthy, was referred to the ENT emergency department by a pediatrician due to suspected laryngotracheobronchitis. According to the patient's medical history given by her parents, the patient caught a cold about a week ago. However, as the parents were busy harvesting corn, they did not have time to take care of the patient at home, and thereby took her to the cornfield with them. At the end of the day, the patient's condition deteriorated and she suffered from breathing difficulties. The patient received intravenous antibiotics and nebulized bronchodilators at the nearby district hospital, but no obvious improvement was observed 1 week after the treatment. The parents brought their daughter to our hospital to seek medical care instead. Initial auscultation revealed asymmetrical pulmonary respiration sounds, and FBA was suspected. However, the parents denied choking events. After repeated inquiry, the parents were finally able to recall that the patient felt down on the ground once with many corn grains lying around. Bronchoscopy examination revealed the presence of half a grain of corn in the proximal right main bronchus. After bronchoscopical removal of the corn grain and subsequent 5-day intravenous antibiotics treatment against her tracheobronchitis, the patient fully recovered without any complications and was discharged from our hospital.

The study was approved by the ethics committee of The First Hospital of Jilin University. Patient consents were obtained.

3. Discussion

Accidental tracheobronchial FBA is a condition with one of the highest morbidity and mortality in early childhood. It is most often observed in children between 1 to 3 years old[1] due to incomplete dentition (lack of cusped molars), immature swallowing coordination, tendency to be distracted when eating (e.g., playing or running), and the habit of putting objects into their mouths.[2–10] The main symptoms of FBA are cough, choking, wheeze, stridor, and dyspnea. The most frequent signs were diminished or obviously weakened breath sound. However, a considerable number of patients had no abnormalities on physical examination.

Diagnosis of FBA is still a challenge. Clinicians may fail to consider the diagnosis of FBA when a child has no symptoms at presentation and physical examination and chest X-ray findings are normal.[11] A delayed diagnosis (>24 hours) of FBA is associated with increased incidence of complications,[12] such as dyspnea, asphyxia and even death, pneumothorax, pulmonary infection, atelectasis, and obstructive emphysema. For this reason, timely diagnosis is critical. Targeted questions regarding not only choking history but also a detailed food-type consumption history should be asked when children are presented with coughing, wheezing, recurrent pneumonia, or a persistent cough despite medical therapy. FBA should be suspected in all children with a history of possible aspiration, and those who also present with respiratory symptoms such as cough, breathlessness, wheeze, and decreased air entry on the affected side. Positive radiological findings usually associated with tracheobronchial FBA are mediastinal shift, lung collapse, and obstructive emphysema.[13] However, normal appearance of chest X-ray does not exclude the possibility of FBA.

When FBA is highly suspected, diagnostic rigid bronchoscopy is recommended. In the literature,[14] the majority of the foreign bodies were localized to the 2 main bronchi, while some reported the trachea localization and larynx localization.[15] Each place should be carefully examined to avoid missed diagnosis.

As 1- to 3-year-old children are ambulatory, they may be out of parental view during the acute aspiration episode. Therefore, there are often no witnesses to the aspiration. Parental negligence, lack of suspicions, or even undue procrastination on the part of fellow professionals contributes significantly to the delay in diagnosis, which may cause serious complications. Due to hospital misdiagnosis and parents' negligence, the 2 cases we reported got 2 and 7 days delay of correct diagnosis, respectively.

Correct medical history is crucial for the correct diagnosis of FBA, and lack of medical history may lead to negligence or the misdiagnosis of FBA. However, as the obtained medical history is often unclear, FBA should be suspected in all children who present with respiratory symptoms such as coughing and wheezing, and those who do not respond to conventional therapy against pneumonia or upper airway infections, even if the choking history is unclear. When taking the medical history, not only should choking history be included, but also a detailed food-type consumption history. A bronchoscopy examination should be performed when necessary. Parents should be educated to increase their awareness of tracheobronchial FBA, and avoid providing their children with small objects that can potentially block the airways. When FBA is suspected, the child should be sent to a hospital immediately.

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