

Foreign body aspiration: approach and therapeutic management

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ABSTRACT

Foreign body aspiration represents one of the main causes of rising morbidity and mortality in children, mostly for the toddlers' category of age. Both acute and silenced manifestation of this phenomena determines an immediate attitude in the management of the child in question. We present you a clinical case of a 2 years and 8 months old patient, diagnosed with sunflower seed coat aspiration, through flexible bronchoscopy. The implemented treatment consisted in rigid bronchoscopy and extraction of the foreign body.

Keywords: foreign body aspiration, toddler, bronchoscopy

INTRODUCTION

Foreign body aspiration is a medical emergency with a high fatal risk which requires an appropriate management and a rapid establishment of therapeutic procedures in order to minimize the onset of eventually life-threatening complications. According to guidelines, children aged between 1 and 3 years old are the most likely to accidentally inhale food and non-food items, in absence of an attentive and adequate supervising. When it comes to toddlers, nuts, seeds and beans represent the most frequently encountered types of foreign bodies. The obstruction can happen at any level of the respiratory tract, consequently, signs and symptoms can vary from the loudest to the subtlest ones, being, thus, interpreted frequently such as other respiratory diseases [1,2]. An adequate anamnesis along with a rigorous clinical examination could offer important clues about the etiology of the respiratory disfunction. Nevertheless, investigations, such as imagistics and exploratory bronchoscopy, in particular cases, are the ones which sustain the presumptive diagnosis. The treatment consists of re-

moving the foreign body from the respiratory tract through minimal invasive endoscopic ways [3].

CASE PRESENTATION

We present the case of a 2 years and 8 months old female toddler, who was admitted to The Pediatric Department of The Clinical County Emergency Hospital of Targu Mures, for fever associated with productive cough, with an onset 7 days before the hospital admission, without favorable evolution under symptomatic treatment given at home. Regarding patient's medical history, she is affirmatively known with perinatal hypoxia, septal atrial defect, patent arterial duct, left ventricular hypertrophy and recurrent respiratory infections. The mother confirms that the toddler is incompletely vaccinated according to The National Calendar of Vaccination.

CLINICAL FINDINGS

At the admission, the clinical exam showed the toddler had an altered general condition, fever



FIGURE 1. Thoracic X-Ray
Left lung atelectasis



FIGURE 2. Chest CT Scan with contrast
Left lung atelectasis

(38,4°C), a mildly hyperemic pharynx with purulent secretions on the pharyngeal wall, pulmonary clinical findings such as bilateral intercostal and subcostal retractions, abolished vesicular breath sound in the left pulmonary area and diminished in the right one, without pulmonary rales, SpO₂: 94% in room air. Laboratory tests highlight a rising inflammatory marker (CRP > 160 mg/l) with leukocytosis (Leukocytes: 20.970/uL) and neutrophilia (Neutrophils: 15.170/uL), normochromic microcytic anemia (Hemoglobin: 9,70 g/dL, Hematocrit: 30,4%, Mean corpuscular volume: 66,10 fL), thrombocytosis (Thrombocytes: 656.000/uL), respiratory alkalosis (ASTRUP: pH: 7,54, pCO₂: 30,5 mmHg, HCO₃ 24,2 mmol/L). The thoracic X-Ray and the chest CT scan with contrast emphasize diffuse pulmonary parenchymal consolidation along with total opacity on the left pulmonary area, suggestive for pleural effusion with left lung atelectasis.

CLINICAL AND PARACLINICAL INVESTIGATIONS

Admitted to our clinic, the patient was tested for SARS-CoV2 virus via RT-PCR test and the result was

negative. Her persistent poor health status determined us to collect hemoculture and to repeat the laboratory tests. The high value of the inflammatory marker (CRP: 241,49 mg/L), in the absence of a positive hemoculture, led us to initiate a large spectrum antibiotic therapy (Imipenem iv. and Vancomycin iv.), corticotherapy, proton pump inhibitor and antipyretics. Subsequently, besides the following laboratory tests that showed a decrease of the inflammatory marker (CRP: 12,36 mg/L), the clinical pulmonary findings didn't diminish. Therefore, we repeated the thoracic X-Ray, which now showed similar modifications to the first one taken, plus lateralisation of the trachea and the heart to the left side. Following, we requested surgical examination that recommended a pulmonology consultation and surgical later check-up if needed. During the pulmonology examination, regarding the vaccination history of the patient, the clinical and paraclinical aspects, the suspicion of Koch's bacillus infection is being raised, which is infirmed later through gastric aspiration sample. Judging by the unfavorable clinical evolution of the patient, the persistent modified auscultation findings and imaging, we suspected the case to be an aspiration syndrome. A more comprehensive anamnesis emphasized that the girl was frequently given sunflower seeds for consume. All of the above led us to transfer the toddler to the Intensive Care Unit in order to proceed exploratory flexible fibrobronchoscopy. It confirmed the existence of the specific foreign body located in the intermediate right bronchia, migrated from the left one along with foreign body reaction, objectified by acute left hemorrhagic bronchitis.

THERAPEUTIC APPROACH

The sunflower seed coat is eventually removed using the rigid bronchoscopy and the bronchial secretions are aspirated withal. The patient remains in the Intensive Care Unit for monitoring, where she receives antibiotics associated with mucolytics and corticotherapy. A control Thoracic X-Ray emphasized multiple bronchopneumonic foci with a tendency to conflate, dispersed on the left pulmonary area, and a pronounced bilateral diffuse interstitial pulmonary aspect. After 24 hours the toddler is transferred back to our clinic in a fair general condition, with no fever, with stable cardiac and respiratory signs, without functional respiratory disorder.

FOLLOW-UP AND MONITORING

Under the treatment, the clinical evolution of the patient is considered to be favorable. The toddler is discharged in a good general condition, hemodynamic and respiratory stable, 7 days after the proce-



FIGURE 3. Fragments of the sunflower seed coat, post rigid bronchoscopic removal



FIGURE 4. Thoracic X-Ray. Multiple bronchopneumonic foci with a tendency to conflate, dispersed on the left pulmonary area

DISCUSSIONS

Foreign body aspiration represents one of the causes for rising mortality and morbidity between children, utmost for those under the age of 3 years old [1,4]. The diagnosis can easily be distinguished if the symptoms are acute, fact that necessitates prompt intervention. In contrary, an asymptomatic patient, with an incomplete personal history, could be easily wrong treated for the secondary complications, such as fever, asthma or recurrent pneumonia [5]. Similar to ours, a clinical study conducted in Poland reveals the fact that some of the most frequent aspirated types of foreign bodies are sunflower seed and nuts (67,85%) and the most frequent localization of impaction in the lower respiratory tract is in the left bronchia (50-60%) [6].

According to guidelines, the diagnosis of foreign body aspiration with impaction in the lower respiratory tract is sustained by a detailed personal history, the presence or absence of primary respiratory symptoms and paraclinical investigations (thoracic X-Ray, exploratory bronchoscopy) [3]. In correlation, the first peculiarity of the case is being emphasized: a difficult anamnesis. The mother declares tardy from the moment of admission the fact that she is usually giving her daughter sunflower seeds for consume and that, lately, the toddler gets tired much more often after small efforts. The second peculiarity is distinguished by the presence of both primary respiratory symptoms and those secondary to pneumonia (fever).

A clinical algorithm associated with a scale system was designed to facilitate the management of diagnosing a patient suspected of foreign body aspi-

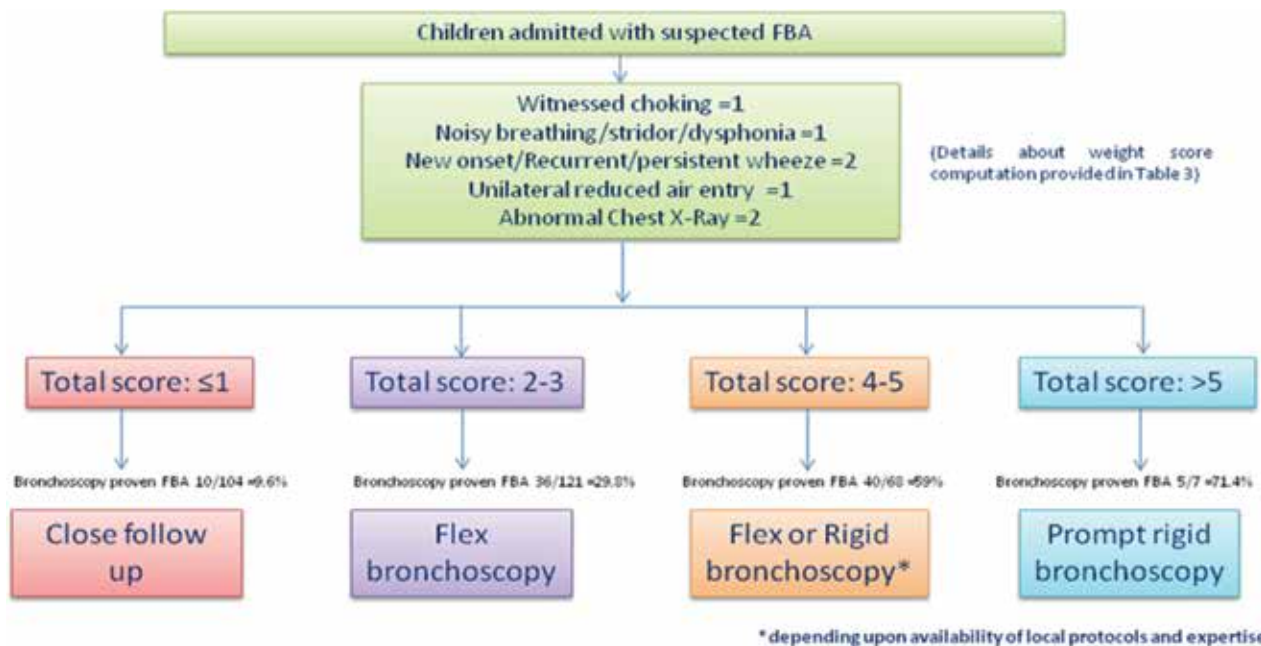


FIGURE 5. A clinical algorithm associated with a scale system, designed to facilitate the management of diagnosing a patient suspected of foreign body aspiration [7]

ration, depending on five criteria: assisted aspiration, dysphonia or stridor, wheezing, unilaterally diminished vesicular breath sound and abnormal thoracic X-Ray [7]. Our case gets a score of 3 points, fact that indicates the necessity of exploratory flexible bronchoscopy.

The rigid bronchoscopy is considered to be the standard therapy in case of lower airway obstruction [6]. Regarding our case, the procedure facilitated both the extraction of the foreign body and aspiration of the bronchial secretions.

CONCLUSION

Foreign body aspiration represents one of the main causes of death through asphyxia in children,

with a higher tendency in toddlers. The diagnostic of lower respiratory tract obstruction, and so the initiation of the treatment, can be delayed by the presence of the symptoms associated to the complications or by light respiratory disorder.

The complexity of our clinical case is given by the incompletely elucidated etymology of a massive pneumonia, which, following medical investigations, it is finally proven to be a complication of a foreign body aspiration. Subsequently, after receiving the treatment, the evolution was favorable.

Conflict of interest: none declared

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