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ORIGINAL ARTICLES

Foreign Body Aspiration in Children in Albania during 2006-2025

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ABSTRACT

Background: Foreign body aspiration constitutes a serious and potentially life-threatening emergency in infants and children. Delayed diagnosis and treatment can result in severe respiratory complications and mortality.
Aim: To evaluate the clinical characteristics, diagnostic approaches, treatments, and outcomes of children with foreign body aspiration managed over a 20-year period in Albania.
Materials and Methods: A retrospective review was conducted of 149 children who underwent rigid bronchoscopy for suspected airway foreign body aspiration at the institution from 2006 to 2015, and 230 children from 2015 to 2024. Demographic data, clinical presentations, referral patterns, diagnostic procedures, complications, and outcomes were analyzed.
Results: During 2006-2015, foreign bodies were removed from the larynx, trachea, or bronchial tree in 105 children. The mean age was 23 months, and 60% of patients were male. A choking episode was reported in 51% of cases, resulting in immediate referral to the ENT service, while 49% initially presented to the pediatric service with symptoms such as cough, pneumonia, or asthma. Flexible bronchoscopy was performed first in the latter group. The overall complication rate was 19%, including emphysema, atelectasis, pneumonia, bronchiectasis, pyopneumothorax, and pneumomediastinum. The false-positive rate was 20%. Complications related to flexible bronchoscopy, such as laryngeal edema, hypoxia, and bleeding, occurred in 6% of patients. One death occurred in a child who presented in hypoxic arrest…
Conclusion: Foreign body aspiration in children remains a medical emergency that requires rapid recognition and prompt intervention with rigid bronchoscopy. Delayed diagnosis is associated with increased complication rates and poorer outcomes.
Keywords: Foreign body aspiration, Pediatric respiratory emergency, Bronchoscopy management, Children's airway obstruction, Albania healthcare context

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INTRODUCTION

Foreign body aspiration is a common and serious emergency in infants and young children. (1)

It is a major cause of morbidity and mortality because of the anatomical and behavioral characteristics of this age group, including incomplete chewing, immature swallowing coordination, and frequent oral exploration. (1,2)

Early diagnosis is often challenging because the clinical presentation may be nonspecific (3). Children may present with cough, wheezing, pneumonia, asthma-like symptoms, or persistent respiratory distress, which can result in delayed recognition and treatment. (4)

In many cases, the diagnosis is initially missed, and the foreign body is identified only after complications have developed. (5)

Airway foreign bodies are most often organic materials, such as nuts or food particles. These materials can cause obstruction, inflammation, infection, atelectasis, and other serious pulmonary complications. (6) Prompt bronchoscopy is essential for both diagnosis and treatment. (7)

The aim of this study was to review a 20-year experience with foreign body aspiration in children, focusing on clinical presentation, diagnostic approaches, complications, and outcomes.

MATERIALS AND METHODS

Study design and setting: This retrospective observational study was conducted at the University Hospital Center (UHC) Mother Teresa in Tirana, Albania.

Study population: The study included 149 children who underwent rigid bronchoscopy for removal of airway foreign bodies between 2006 and 2015, and 230 children from 2016 to 2025.

Data collection: Medical records were reviewed for age and sex, history of choking episode, initial clinical presentation, referral pathway, type of bronchoscopy performed, location of the foreign body, complications associated with aspiration or bronchoscopy, and outcomes including mortality.

Diagnostic and therapeutic approach

Children with a clear choking episode were referred directly to the ENT service and underwent rigid bronchoscopy. Those presenting with respiratory symptoms such as cough, wheeze, asthma, or pneumonia were initially evaluated by the pediatric service and often underwent flexible bronchoscopy prior to definitive management.

Statistical analysis

Data were analyzed descriptively and are presented as frequencies, percentages, and summary measures, as appropriate.

RESULTS

During the 10-year study period (2006–2015), 149 children underwent rigid bronchoscopy for suspected foreign body aspiration. A foreign body in the larynx, trachea, or bronchial tree was successfully identified and removed in 105 patients (70.5%), while 44 procedures (29.5%) yielded no foreign body.

The mean patient age was 23 months, and 60% of the patients were male (Figure 1).

Regarding initial clinical presentation, 51% of children had a witnessed choking episode and were referred directly to the Department of Otorhinolaryngology (ENT) for prompt evaluation. In contrast, 49% initially presented to pediatric services with nonspecific respiratory symptoms, including persistent cough, recurrent pneumonia, or wheezing suggestive of asthma.

The overall negative (false-positive) rigid bronchoscopy rate was 20%, reflecting the diagnostic challenges associated with suspected foreign body aspiration in children, particularly among patients presenting without a clear history of aspiration.

Clinical Presentation (2016–2025)

A witnessed choking episode was reported in 72% of cases, resulting in immediate referral to the Department of Otorhinolaryngology (ENT) for evaluation and management.

The remaining 28% of patients initially presented to the pediatric service with nonspecific respiratory manifestations, including persistent cough, recurrent pneumonia, or wheezing suggestive of asthma. In these cases, flexible bronchoscopy was performed as the initial diagnostic procedure, followed by referral for rigid bronchoscopy when indicated.

The overall complication rate associated with foreign body aspiration was 8%. Reported complications included subcutaneous emphysema, atelectasis, pneumonia, bronchiectasis, pyopneumothorax, and pneumomediastinum.

The negative bronchoscopy rate was 10%, indicating a substantial improvement in diagnostic accuracy compared to the previous study period. Complications of foreign bodies during 2006-2015 were related to delayed diagnosis and the type of material inhaled, often vegetal foreign bodies that swell and infections caused by bacteria. The overall complication rate was 19% and included pneumonia, atelectasis, emphysema, bronchiectasis, pneumothorax, and pneumomediastinum (Fig 2).

Complications during 2015-2024 accounted for 10% and included pneumonia, atelectasis, emphysema, bronchiectasis, pneumothorax, and pneumomediastinum (Fig 2).

Complications of flexible bronchoscopy during 2006-2015 occurred in 6% of cases and included mild

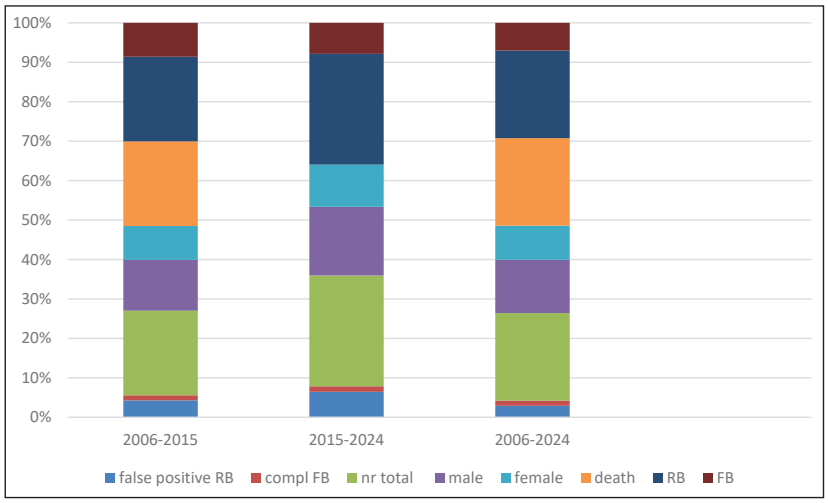

Figure 1. Rigid bronchoscopy and flexible bronchoscopy in foreign bodies

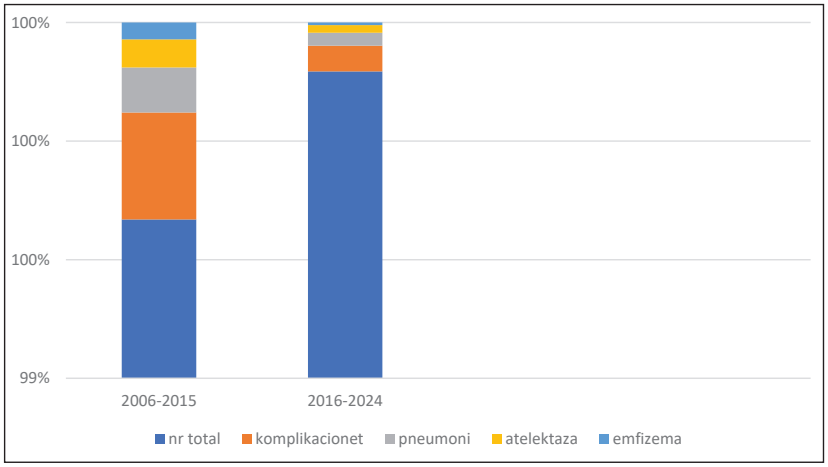

Figure 2 Foreign bodies in the airways in children, 2006-2015 vs 2016-2024

hypoxia (saturation O2 < 90%), stridor, and bleeding. During 2015-2024, 5% of cases experienced moderate hypoxia (saturation O2 > 80%) but no other complications (Fig 1).

DISCUSSION

Foreign body aspiration in children remains a significant clinical problem due to frequent delays in diagnosis. In this series, nearly half of the patients initially presented with symptoms that could be mistaken for lower respiratory tract disease, contributing to delayed recognition. (8,9)

The complication rate during 2006-2015 was relatively high, likely reflecting delayed presentation and referral. Severe complications such as pneumomediastinum, pyopneumothorax, and bronchiectasis indicate prolonged obstruction and inflammatory injury. The single death in this cohort occurred in a child with hypoxic arrest, underscoring the potentially fatal nature of this condition.

During the 2015-2024 period, increased clinician awareness of foreign bodies in children's airways and improved clinical management led to better diagnosis and prompt treatment. Despite a greater number of cases, this resulted in fewer severe complications.

The 20% false-positive rate in rigid bronchoscopies during 2006-2015 underscores the diagnostic challenges of this condition and contributed to an increased number of rigid bronchoscopies during this period.

During 2015-2024, the false-positive rate for rigid bronchoscopy due to suspected airway foreign body was reduced to 10%. This reflects improvements in clinical and radiological diagnosis prior to rigid bronchoscopy, thereby reducing the number of unnecessary interventions.

Rigid bronchoscopy remains the treatment of choice for airway foreign body removal in children because it allows secure airway control and effective extraction. Flexible bronchoscopy may be useful diagnostically, especially in atypical presentations, but it is not always sufficient for definitive removal. (9,10)

These findings support the need for greater awareness among parents, primary care providers, pediatricians, and emergency physicians to ensure early recognition and rapid referral.

Indications for flexible versus rigid bronchoscopy in children with suspected foreign body aspiration remain the same, as rigid bronchoscopy remains the gold standard for removing a foreign body from the airways and ensuring adequate oxygenation. (11,12)

CONCLUSION

Foreign body aspiration in children is a medical emergency that requires prompt diagnosis and treatment. Rigid bronchoscopy remains the mainstay of therapy. Delayed diagnosis increases the risk of complications and mortality. Prevention, early recognition, and urgent referral are essential for improving outcomes.

Editorial Statements

Ethics Approval and Consent to Participate: This study analyzed publicly available YouTube videos and did not involve human participants, patient data, or animal subjects. Therefore, according to institutional and international research ethics standards, formal ethical approval and informed consent were not required.

Data Availability Statement: The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Author Contributions: MB: Conceptualization, study design, and supervision. SS & AP: Data collection, analysis, and manuscript drafting. KTh: Literature review and critical revision. All authors approved the final manuscript.

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