BNS University
Critical Care Department
The Egyptian Journal Of Intensive Care And Emergency Medicine (JICEM)

Airway Foreign Bodies: An Updated Review For Emergency and Intensive Care Unit Professionals

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Abstract:

Background: Foreign body aspiration (FBA) is a critical medical emergency, particularly in pediatric populations, where it ranks as the fourth leading cause of accidental death in children under five. The clinical presentation varies from acute airway obstruction to subtle, chronic respiratory symptoms, often leading to misdiagnosis. Emergency and ICU professionals must recognize high-risk scenarios to ensure timely intervention. **Aim:** This review provides an updated, comprehensive guide for emergency and critical care teams on the diagnosis, management, and prevention of FBA, emphasizing early recognition and interprofessional collaboration. **Methods:** The review synthesizes current literature on FBA epidemiology, pathophysiology, clinical presentation, and management strategies. It highlights evidence-based approaches, including radiographic evaluation, rigid bronchoscopy, and emergency airway interventions. **Results:** FBA most commonly affects children under five, with food items like peanuts and hotdogs posing the highest risk. Acute upper airway obstruction requires immediate surgical intervention, while distal obstructions may present chronic wheezing or recurrent infections. Rigid bronchoscopy remains the gold standard for diagnosis and treatment. Delayed intervention increases complications such as pneumonia, bronchiectasis, and airway stenosis.

Conclusion: Early recognition and prompt bronchoscopic removal are crucial for favorable outcomes. Prevention relies on caregiver education, food modification, and adherence to toy safety regulations. Emergency and ICU teams must maintain a high index of suspicion, particularly in pediatric and high-risk populations.

Keywords:

Foreign body aspiration, pediatric emergency, airway obstruction, rigid bronchoscopy, choking prevention.

1. Introduction:

Foreign body aspiration presents with a wide clinical spectrum in the emergency department, which often contributes to misdiagnosis or delayed recognition. The severity and presentation depend on several factors, such as the nature and size of the aspirated material, its anatomical location in the airway, whether the aspiration was directly observed, the patient's age, and the duration since the event occurred. In cases where the upper airway is acutely obstructed, the patient may exhibit classic signs such as choking, respiratory distress, or stridor. In contrast, if the foreign body lodges more distally within the bronchial tree, the presentation may be subtler, including persistent wheezing, intermittent coughing, vague discomfort, or unexplained shortness of breath. These signs can mimic more common conditions like asthma or viral respiratory infections, complicating diagnosis and delaying appropriate intervention. Foreign body aspiration remains a critical health concern in pediatric populations, ranking as the fourth most common cause of mortality in preschool-aged children and those younger [1]. It contributes substantially to emergency department visits in the United States, highlighting the importance of both public health strategies and clinical vigilance. To address these risks, regulatory bodies such as the Consumer Product Safety Commission have enacted measures to limit exposure to objects that pose a choking risk. One such measure was the implementation of the Small Parts Test Fixture under federal regulation 15 CFR 1501 in 1973, which establishes size standards for toys intended for children under three years of age [2].

Despite these regulatory efforts, limitations remain in the scope of current policies. While labeling requirements for

toys and media-based warnings have improved awareness of choking hazards, these regulations do not extend to food products, which remain a frequent source of aspiration incidents. Items such as peanuts, seeds, and small fruits are commonly aspirated by children, while hotdogs and candies are responsible for many choking-related fatalities [3]. Because many of these incidents involve organic food material, and because not all events are witnessed, early identification depends heavily on symptom awareness. Symptoms such as sudden coughing, drooling, hoarseness, or changes in posture should prompt immediate evaluation for possible airway obstruction. Targeted education efforts directed at parents, educators, and caregivers remain central to preventing these potentially life-threatening events.

2. Etiology:

When a foreign body enters the larynx or proximal trachea, there is immediate risk for airway obstruction and respiratory distress. If the object passes into the lower airways, symptoms may not appear right away but can develop over time, manifesting as persistent coughing, wheezing, or unexplained shortness of breath. The potential for aspiration exists with any item small enough to be inserted into the mouth. This risk is especially high in infants and toddlers who commonly use their mouths to explore objects in their environment. During this developmental stage, children lack the fine motor control and cognitive ability to distinguish safe items from those that pose a hazard. Their swallowing mechanisms are also immature, increasing the likelihood of inhaling or misdirecting food into the airway while eating. This makes constant supervision critical, particularly in environments where small objects or unsafe foods are accessible. Parental or caregiver awareness is a key factor in reducing the incidence of aspiration-related emergencies. Among aspirated items, peanuts are the most frequently involved in Western countries, while hotdogs are associated with a higher rate of fatal outcomes due to their size and shape. Epidemiological data also show that male children experience aspiration events more often than females [3]. Smooth, round food items such as grapes, nuts, beans, and sausage slices present the highest risk. Their shape allows them to lodge firmly within the airway, leading to complete obstruction. Preventive strategies focus on modifying the shape and size of high-risk foods. For instance, cutting grapes into quarters or

slicing hotdogs lengthwise can significantly reduce the likelihood of aspiration. These small changes in food preparation, combined with adult supervision and early education, form the basis of effective prevention in children vulnerable to airway foreign body aspiration.

Epidemiology:

Foreign body aspiration is most commonly observed in specific at-risk populations. Young children, especially those under the age of five, are the most vulnerable. Within this group, male children are affected more often than females. Children with developmental delays also face a higher risk due to poor coordination and delayed reflexes. Older adults, particularly those with neurological impairments or swallowing disorders, are another group with increased susceptibility. Among children, the absence of molars is a significant factor, limiting their ability to adequately chew and process food before swallowing, which increases the risk of aspiration [3]. In Western countries, the majority of aspiration cases involve food items. Peanuts are the most frequently aspirated, followed by hotdogs and hard candy. Non-food items such as marbles, rubber balls, and other small, smooth, round objects are also commonly aspirated. These items pose a risk because of their shape, which allows them to fit tightly into the airway and resist removal or dislodgement.

Data on foreign body aspiration has historically come from small-scale or single-center studies. More comprehensive analyses using nationwide data have only emerged in recent years [7]. Estimates suggest that the incidence of foreign-body airway obstruction (FBAO) is around 0.66 per 100,000 population [8]. In the United States, 17,000 emergency department visits by children under 14 in the year 2000 were directly linked to inhalation of foreign bodies [9]. Among all pediatric accidental deaths, aspiration of a foreign body ranks as the leading cause for infants and the fourth most common for children under five [10]. Age-specific data show that 80% of aspiration cases occur in children under three years old, with a peak in those aged one to two [11]. In a retrospective review of 81 cases, Asif et al. found that 77.8% of foreign body aspiration events occurred in children below five years, 16% in those aged five to fifteen, and only 6.2% in individuals over fifteen. Reilly et al. similarly concluded that children under four years are most susceptible due to their tendency for oral exploration and their immature chewing and swallowing mechanisms [12]. This pattern reinforces the importance of targeted

prevention efforts focused on early childhood.

Pathophysiology

Foreign body aspiration affects the airway through either complete or partial obstruction, each producing distinct clinical outcomes. When the glottis or trachea is completely blocked, the result is an immediate and severe respiratory crisis. The patient typically exhibits clear signs such as audible choking, visible distress, cyanosis, and rapid deterioration. If not urgently relieved, this condition leads to hypoxia and death within minutes. In contrast, complete obstruction of a mainstem or intermediate bronchus may not present with the same dramatic symptoms. In some cases, particularly involving a mainstem bronchus, the patient may appear clinically stable despite significant compromise of ventilation to one lung. Over time, however, the retained secretions and impaired airway clearance in the affected lung can result in secondary infection, such as pneumonia or abscess formation. Partial obstruction produces a wide range of symptoms, influenced by both the location and type of aspirated material. These may include wheezing, coughing, shortness of breath, or localized discomfort. If the foreign body causes irritation or inflammation of the airway, symptoms may mimic common respiratory conditions like asthma. The closer the obstruction is to the upper airway, the more immediate and intense the symptoms tend to be. Distal obstructions, by contrast, often lead to more subtle or delayed clinical signs. Organic materials such as food tend to cause stronger inflammatory responses than inert objects like metal or plastic. This is due to their potential to swell or degrade within the airway, which may intensify the obstruction. For example, peanuts can absorb moisture and enlarge, exacerbating airway blockage. Certain medications also pose specific risks. Iron tablets, when aspirated, can cause severe inflammation and stenosis of distal airways due to their corrosive nature [3][4]. This variability in clinical progression highlights the importance of rapid assessment and intervention to prevent long-term respiratory complications.

3. History and Physical Evaluation:

A detailed history is often the most critical step in evaluating a suspected case of foreign body aspiration. If there is any clear or even suspected event of aspiration—especially in children or those with impaired communication, this alone justifies a full diagnostic workup, including a rigid

bronchoscopy. Immediate identification and management of airway foreign bodies rely heavily on recognizing key historical clues and correlating them with physical signs. Prompt action is essential, particularly when the clinical scenario suggests a life-threatening obstruction. The presentation of aspiration varies widely, depending on the size, location, and timing of the event. In cases of acute large airway obstruction, the clinical picture is dramatic and unmistakable. Patients may present with intense respiratory distress, stridor, audible choking, and excessive drooling. These signs reflect a critical compromise of the airway that requires emergency intervention. Attempting to examine the airway in the emergency department with instruments or endoscopes can provoke further distress or complete obstruction. Such patients should be managed gently and taken directly to the operating room for formal airway assessment using rigid bronchoscopy. Preparation for an emergent tracheostomy must be in place in case access to the airway is compromised during the procedure. Even if no foreign body is ultimately found, the presence of significant respiratory distress with an unstable airway mandates airway evaluation in a controlled surgical setting [4].

In contrast, aspiration into distal or smaller airways may result in a less obvious, more insidious presentation. This is especially true in children or developmentally delayed individuals who may not be able to communicate the event accurately or may not recall it. These patients may present with chronic respiratory symptoms such as persistent cough, wheezing, unexplained shortness of breath, or even localized chest discomfort. The symptoms can result from either a complete blockage of a terminal bronchus leading to pneumonia or a partial obstruction that triggers chronic inflammation. Over time, this causes the surrounding mucosa to become edematous and reactive, exacerbating the respiratory symptoms. In such cases, parents or caregivers may report a history of prolonged coughing or repeated respiratory infections lasting for several weeks or even months. The initial aspiration may not be known or may have been dismissed at the time, making the diagnosis more challenging [4].

Understanding pediatric airway anatomy is essential in these cases. In children, the cricoid cartilage represents the narrowest portion of the airway, while in adults, the narrowest point is the glottis. This anatomical difference means that in children,

objects can pass through the glottis and lodge at the cricoid level, where obstruction is more likely and more dangerous. In adults, objects are more likely to get trapped at the glottis, where they can still be accessed more easily for removal. This also means that in children, a foreign body can become lodged lower in the airway with little warning, increasing the danger and complexity of removal. Aspiration tends to occur more frequently into the right mainstem bronchus. In children, this is only slightly more common, but in adults, the right bronchus becomes the primary site due to its steeper, more vertical orientation. As the airway matures, the right mainstem aligns more directly with the trachea, creating a straight path for foreign bodies to follow during aspiration events [4].

The physical examination may provide valuable diagnostic clues. In cases of major airway obstruction, patients may appear in tripod position, drooling, and demonstrating stridor or respiratory distress. These signs reflect critical involvement of the upper airway. In less acute or chronic cases, the physical findings may be subtle. Wheezing may be localized rather than diffuse, and stridor may be intermittent or absent. The symptoms may resemble asthma or bronchitis, leading to misdiagnosis. If a patient fails to respond to standard treatments for presumed reactive airway disease or respiratory infection, and the history includes even the possibility of aspiration, a formal airway evaluation with bronchoscopy should be pursued. This is particularly important in pediatric patients who are more susceptible to progressive symptoms and long-term pulmonary complications when diagnosis is delayed. In sum, both history and physical findings play a central role in identifying foreign body aspiration. While acute presentations are often clear, chronic cases demand a high index of suspicion. Persistent respiratory symptoms, particularly in children and vulnerable populations, require thorough evaluation, especially when initial treatment fails to resolve the issue. A structured approach, grounded in knowledge of airway anatomy and symptom progression, is critical to prevent serious morbidity or mortality in these patients [4].

4. Evaluation and Diagnosis:

The approach to evaluating a suspected foreign body aspiration depends entirely on the patient's clinical stability. If the patient presents in respiratory extremis, especially in the case of an uncooperative young child, no imaging or nonessential interventions should be attempted. Agitating the patient through unnecessary diagnostic

steps may worsen the airway compromise. The correct course of action is immediate transfer to the operating room for a secure and controlled evaluation under general anesthesia using rigid bronchoscopy. Emergency tracheostomy supplies must be on hand in case airway control proves difficult during the procedure. This is the safest and most definitive way to manage a critically unstable airway and should never be delayed for imaging or bedside examination. For patients who are clinically stable and cooperative, a more systematic diagnostic process can be followed. The initial investigation typically begins with chest radiography, using posteroanterior (PA) and lateral inspiratory-expiratory views. These films may reveal indirect signs of foreign body aspiration. For example, unilateral hyperinflation or air trapping, diaphragm flattening on one side, or mediastinal shift away from the affected lung can suggest obstruction. These signs reflect a ball-valve mechanism, where air enters during inspiration but is partially or fully blocked from exiting during expiration due to the presence of a foreign object. If the aspirated material is radiopaque, standard radiographs may directly visualize the foreign body and help localize it [5].

Venous access should be obtained in stable patients, with blood tests including a complete blood count and electrolytes to prepare for possible surgical intervention under anesthesia. Venous blood gas testing offers little diagnostic value in this context and is not routinely indicated. If the patient remains stable, a clinical examination of the head and neck—including flexible laryngoscopy when needed—can help rule out other upper airway pathologies such as peritonsillar abscess or tonsillitis, which may present with overlapping symptoms. Lung

auscultation is an important step. Findings such as localized wheezing, decreased breath sounds, or focal areas of dullness may point toward aspiration. These findings should be confirmed and supplemented by percussion and tactile fremitus testing. Computed tomography (CT) should be avoided unless the patient is extremely stable and the suspicion of a foreign body is very low. Performing imaging in the radiology department for patients with uncertain airway status carries significant risk. If airway compromise occurs in that setting, mortality rates are high due to delays in intervention. Thus, CT imaging should only be pursued after careful clinical judgment rules out the need for immediate airway control [5].

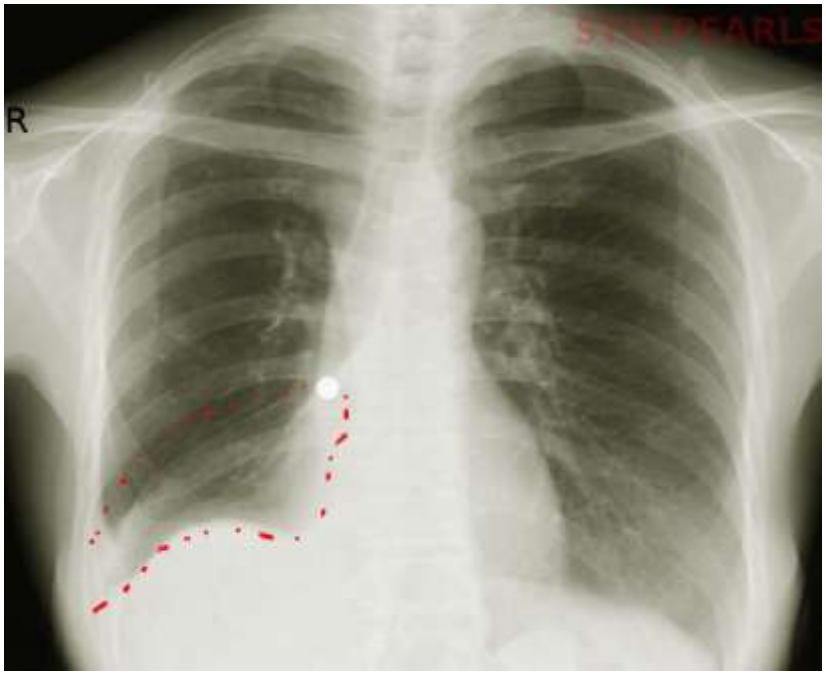

Figure 1: X-Ray of Foreign Body in Airways.

5. Treatment / Management:

Managing foreign body aspiration begins with recognizing the urgency of upper airway obstruction. In acute cases, the immediate goal is to secure the airway without worsening the obstruction. Blind sweeps of the mouth, unplanned use of oral instruments such as tongue blades, or unskilled use of Magill forceps can be dangerous and should be avoided unless the patient is fully alert, adult, cooperative, and free of distress. These procedures can convert a partial obstruction into a complete one or dislodge the object into a more distal airway. Such attempts at removal are rarely successful outside of controlled environments and should not be attempted in emergency settings. Even well-meaning attempts to visualize the airway outside an operating room often increase agitation, worsen symptoms, and delay definitive management [6]. The preferred approach for upper airway obstruction is to move directly to the operating room. If airway access must be secured urgently, intubation attempts may be made, but this should be done by experienced personnel prepared for possible failure. In some cases, intubation past the foreign body or deliberate displacement into

a bronchus may be required, but these maneuvers are high-risk and should only be performed in a controlled surgical setting. If no other options exist and the patient has entered respiratory arrest, emergency cricothyroidotomy becomes necessary. This is a life-saving measure and should be executed without delay when other ventilation methods fail. For lower airway obstruction or suspected aspiration without immediate compromise, management begins with a careful and detailed history. This includes any observed choking, recent coughing episodes, or unexplained respiratory symptoms. Even short periods during which a child was unsupervised around small items are relevant. A comprehensive physical examination follows to detect wheezing, decreased breath sounds, or focal abnormalities. If prior medical treatment has failed or imaging and clinical findings raise suspicion, a formal diagnostic bronchoscopy is indicated [6].

Rigid bronchoscopy remains the gold standard for both diagnosis and removal of aspirated objects. In experienced hands, it is highly effective and safe. Some centers proceed with bronchoscopy based on history alone, even when imaging and clinical signs are inconclusive. This is supported by evidence showing that up to 15% of patients with confirmed aspiration may have normal examination and imaging findings [1]. Therefore, reliance on clinical suspicion is often justified, especially in children or uncommunicative patients. The definitive treatment for both radiopaque and radiolucent foreign bodies is extraction through rigid bronchoscopy under general anesthesia. Once the object is removed, most patients recover uneventfully. Postoperative care may involve corticosteroids, either orally or via inhalation, to reduce airway inflammation. If signs of infection were present before removal—such as fever, localized crackles, or purulent secretions—antibiotics should be started to treat likely post-obstructive pneumonia or other infectious complications [6]. Timely identification and surgical management of aspirated objects prevent prolonged morbidity. Delay in treatment increases the risk of airway stenosis, chronic infection, bronchiectasis, and respiratory failure. Practitioners must maintain a low threshold for rigid bronchoscopy in patients with unresolved symptoms, particularly in high-risk groups like toddlers, developmentally delayed individuals, or elderly patients with impaired swallowing. Effective management of aspiration is not limited to removal but also includes patient monitoring, post-procedural

care, and caregiver education to prevent recurrence [6].

6. Differential Diagnosis:

The clinical presentation of foreign body aspiration can resemble multiple other conditions, which complicates diagnosis, especially in children or individuals unable to provide clear history. Several respiratory and infectious diseases share overlapping symptoms such as coughing, wheezing, dyspnea, or fever, making the differential broad and variable in severity. Asthma is one of the most common misdiagnoses in cases of aspirated foreign bodies, particularly when wheezing or shortness of breath is the primary complaint. Asthma typically shows improvement with bronchodilators, while foreign body aspiration does not. Pneumonia is another frequent alternative diagnosis due to associated fever, localized lung findings, and radiographic infiltrates. However, pneumonia secondary to aspiration often fails to improve with antibiotics until the obstruction is removed. Tuberculosis may mimic chronic airway symptoms, especially if there is a long-standing cough and localized findings on imaging, but it typically presents with systemic features such as night sweats, weight loss, and hemoptysis. Infections like epiglottitis, retropharyngeal abscess, and peritonsillar abscess can present with drooling, voice changes, or airway obstruction. These should be differentiated based on physical exam and imaging of the neck. These infections generally have an infectious prodrome, fever, and specific anatomical findings absent in foreign body cases [7].

Other potential mimics include bronchiolitis in infants, especially if wheezing is prominent. Post-viral pleuritis or pericarditis may cause chest discomfort or respiratory distress, and in some cases, may mislead clinicians toward an airway-related diagnosis. Traumatic injuries involving the airway, lung parenchyma, or diaphragm may also result in respiratory symptoms that mimic foreign body aspiration, particularly if the history of trauma is unclear or subtle. The challenge lies in the variable and often non-specific presentation of foreign body aspiration, compounded in populations such as toddlers or those with cognitive impairment who may not describe the incident. Clinicians must maintain a high index of suspicion when encountering unexplained or persistent respiratory symptoms, especially when standard treatments for presumed conditions like asthma or pneumonia fail to result in clinical improvement [7].

7. Prognosis:

The prognosis for children who experience foreign body aspiration is generally favorable when the object is identified and removed promptly. Early intervention, especially within the first few hours or days, significantly reduces the likelihood of long-term complications or mortality. Most children brought to the Emergency Department with signs of foreign body aspiration are stable and recover completely following rigid bronchoscopy and object removal. When aspiration involves a large object or one that blocks the trachea or upper airway, the situation can become critical. Complete airway obstruction leads rapidly to hypoxia and, if not addressed immediately, can result in respiratory arrest and death. These cases require urgent recognition and airway intervention, ideally in a surgical setting equipped for bronchoscopy or emergency tracheostomy [8]. Delays in diagnosis or removal increase the risk of secondary complications such as pneumonia, bronchiectasis, chronic cough, or airway stenosis due to prolonged local inflammation or infection. However, with appropriate treatment, even delayed cases often result in full recovery. A retrospective study involving 94 children who all presented more than three days after aspirating foreign bodies found that 93 of them recovered fully, even if complications had occurred. Only one child in the cohort died from respiratory failure, indicating that although the risks increase with delay, most patients still have a positive outcome if treated adequately [8]. Ultimately, the prognosis depends on several factors including the location and size of the object, the speed of medical intervention, and the presence of any secondary complications. Consistent clinical suspicion, especially in high-risk groups such as toddlers, remains essential to ensuring timely treatment and reducing mortality and morbidity [8].

8. Complications:

Foreign body aspiration management carries a measurable risk of complications, though most are mild when intervention occurs early. Approximately 25% of early-treated cases experience some form of complication, but these typically include transient airway irritation, mild bleeding, or minor post-procedural coughing. These outcomes are generally self-limiting and resolve without long-term effects. In contrast, delayed intervention is associated with more serious and potentially life-threatening complications. If the object remains lodged in the trachea or mainstem bronchus, prolonged obstruction can result in hypoxia or, in severe

cases, anoxic brain injury. These outcomes are uncommon but represent the most critical risks in cases where the airway is significantly compromised and ventilation is inadequate. Prolonged retention of the foreign object can also lead to localized damage in the airway, including bronchial injury or airway stenosis due to chronic inflammation or pressure necrosis. Infection is another concern, especially when organic material is involved. This may result in lung abscess formation, recurrent pneumonia, or bronchiectasis. Pneumothorax, although rare, can occur if the airway trauma leads to alveolar rupture and air leakage into the pleural space [8]. Despite these risks, the overall prognosis remains favorable for the majority of children, even in delayed cases. Most complications, including more severe ones, are treatable with appropriate medical or surgical management. Mortality from foreign body aspiration remains low, especially when there is timely recognition and access to surgical care. Only a small number of cases, particularly those involving prolonged hypoxia or complete airway obstruction, result in fatal outcomes [8].

Patient Education:

Education remains a primary strategy in preventing foreign body aspiration, especially in young children. The Consumer Product Safety Commission plays a key role by regulating toys and other items that may pose choking hazards. Federal regulations require specific packaging and labeling to indicate small parts that could be aspirated by children under three years of age. These include warning labels on toys and marketing materials to alert caregivers to the potential dangers. However, regulations focus primarily on non-food items. Most fatal aspirations in children involve food, particularly hard, round items such as nuts, grapes, seeds, hotdogs, and hard candy. Unlike toys, these items do not carry standardized choking hazard warnings. Therefore, public education is essential in addressing this gap. Parents, caregivers, teachers, and babysitters must be informed about the risks of aspirating food items. They should learn to identify high-risk foods and how to modify them to reduce risk. For example, grapes and hotdogs can be cut into small, non-round pieces to prevent airway obstruction. Caregivers should also be advised to supervise young children during meals and snacks and encourage slow, deliberate chewing to build safe eating habits [9]. Education should emphasize the vulnerability of children under the age of five, especially those still developing

chewing and swallowing coordination. Caregivers need to understand that aspiration can occur silently and may not always be associated with an obvious choking episode. Encouraging attentiveness during feeding and avoiding distractions can lower the risk of unrecognized aspiration. Targeted education campaigns, reinforced during pediatric visits and community health programs, can raise awareness and promote preventive behaviors. Early recognition of symptoms and timely response can reduce morbidity and mortality from foreign body aspiration [9].

9. Other Issues and Important Notes:

Peanuts represent the most frequently aspirated food item in children. Non-food items such as marbles and small rubber balls also account for a significant number of aspiration events. Among the most dangerous food items are hotdogs and hard candies, both associated with fatal airway obstruction due to their shape and consistency. In terms of non-food items, latex balloons are the leading cause of fatal aspiration events in children. These materials can easily mold to the airway, resist removal, and prevent air passage completely. Most aspiration events result in lower airway obstructions rather than laryngeal or tracheal obstruction. However, upper airway obstructions, when they occur, require immediate and aggressive airway management. Even a brief delay in addressing a complete upper obstruction can result in irreversible hypoxia or death. Emergent airway control is the priority in such scenarios and should be managed in the operating room under controlled conditions whenever possible [9].

Lower airway obstructions are often more insidious and demand a high index of suspicion. This is particularly true in children and developmentally delayed individuals, who may not reliably communicate symptoms or the aspiration event. A thorough history and detailed physical examination guide diagnosis. If aspiration is suspected, imaging with inspiratory-expiratory chest radiographs, routine preoperative labs, and an otolaryngology consultation should be obtained. Antibiotics may be indicated when signs of infection are present. Definitive treatment for both radiopaque and suspected radiolucent foreign bodies is rigid bronchoscopy under general anesthesia. Acute aspirations usually require only retrieval and routine postoperative care. If aspiration has led to infection or prolonged symptoms, treatment should include appropriate antibiotics to address post-obstructive pneumonia or bronchitis based on

the clinical findings and duration of symptoms. Early intervention is directly linked to better outcomes and fewer complications [9].

10. Enhancing Healthcare Team Outcomes:

Foreign body aspiration often leads to complex clinical presentations that challenge immediate diagnosis. Symptoms may include persistent cough, unexplained shortness of breath, and discomfort without any clear history or underlying condition. These nonspecific manifestations may originate from infectious, allergic, traumatic, or obstructive causes. Without a clear aspiration history, clinicians must rely on subtle physical exam findings such as localized wheezing, unilateral breath sounds, or abnormal percussion to raise suspicion of an aspirated object. An interprofessional team approach is essential for proper diagnosis and treatment. Pulmonologists are typically the primary specialists involved due to their role in evaluating lower airway symptoms and performing bronchoscopic procedures. However, otolaryngologists must be involved when upper airway foreign bodies are suspected, particularly if rigid bronchoscopy or surgical airway access may be required. In more complex or high-risk cases, particularly when complications affect lung parenchyma or involve deeper structures, cardiothoracic surgeons may also need to intervene [10].

Nursing staff play a critical supportive role throughout care. They monitor vital signs continuously, assist in patient stabilization, and maintain communication with family members. Their presence is particularly important in the perioperative period, when complications such as infection, bleeding, or respiratory distress may arise. They are also responsible for maintaining a calm environment to prevent further distress in pediatric or anxious patients. Pharmacists contribute to post-procedural care by verifying and managing medication regimens. This includes ensuring proper dosing of analgesics, prescribing bronchodilators when reactive airway symptoms are present, and selecting appropriate antibiotics if infection is suspected. Their role minimizes medication errors and enhances patient recovery. Radiologists assist by interpreting imaging studies used in the diagnostic workup. Their accuracy improves when they receive specific clinical information regarding the suspected aspiration event, suspected object type, and timing. In the absence of this context, findings may be subtle or misinterpreted. Successful management of foreign body aspiration

depends on timely identification and coordinated action among all involved specialties. When each professional understands and fulfills their specific responsibilities, outcomes improve significantly. Most patients recover without lasting complications, but delays in diagnosis or fragmented care may lead to avoidable harm. Prompt interdisciplinary collaboration enhances diagnostic precision, treatment speed, and overall patient safety and recovery [9][10].

Role of ICU and Emergency Unit:

The Emergency Department (ED) and Intensive Care Unit (ICU) play vital roles in the recognition, stabilization, and management of patients with foreign body aspiration, particularly when complications arise or the airway is critically compromised. These departments are often the first point of contact and represent essential components of a coordinated care pathway that prioritizes rapid assessment, airway protection, and escalation of care. In the ED, the primary goal is rapid triage and identification of patients with signs of airway obstruction. Patients presenting with acute symptoms such as stridor, drooling, cyanosis, or respiratory distress require immediate intervention. Emergency physicians must assess airway patency without causing agitation or further obstruction. In cases of severe upper airway compromise, any unnecessary manipulation, including oral exams, should be avoided. These patients must be taken directly to the operating room with anesthesiology and otolaryngology teams available, prepared for rigid bronchoscopy or, if necessary, emergency tracheostomy [11].

Stabilized or less symptomatic patients undergo targeted evaluation in the ED, including inspiratory-expiratory chest radiographs to assess for air trapping, localized hyperinflation, or visible foreign objects. Emergency physicians initiate early intravenous access, order bloodwork in preparation for possible surgical intervention, and coordinate with surgical teams. If respiratory symptoms are mild or intermittent but suggestive of distal aspiration, admission may be warranted for observation and further diagnostic workup. The ICU becomes crucial in more severe cases, such as those involving complete tracheal or bronchial obstruction, respiratory arrest, or patients who are intubated and mechanically ventilated. ICU teams provide continuous respiratory support, monitor for hypoxia or post-obstructive pneumonia, and manage sedation or paralytics when necessary. Bronchoscopic retrieval in critically ill patients is often

performed under ICU care, especially when comorbidities or unstable hemodynamics preclude transfer to the operating room. Children with prolonged hypoxia due to delayed diagnosis may require intensive neurological monitoring to detect anoxic brain injury. In post-procedural care, the ICU monitors patients for complications such as airway edema, re-obstruction, pneumothorax, and infection. They may also initiate or continue corticosteroids or antibiotics. Multidisciplinary coordination between ICU staff, pulmonologists, otolaryngologists, and anesthesiologists ensures prompt response to clinical deterioration. Both the ED and ICU serve as critical environments for early intervention and sustained care in foreign body aspiration cases. Their ability to deliver rapid assessment, airway control, and continuous monitoring is essential to minimizing morbidity and mortality in these high-risk scenarios [11].

11. Conclusion:

Foreign body aspiration remains a significant cause of morbidity and mortality, particularly in young children and vulnerable populations such as the elderly and those with neurological impairments. This review underscores the critical role of emergency and intensive care professionals in recognizing and managing FBA, where timely intervention can mean the difference between life and death. The clinical presentation of FBA varies widely, from acute choking and respiratory distress to chronic, subtle symptoms mimicking asthma or recurrent pneumonia. A high index of suspicion is essential, especially in cases where the aspiration event was unwitnessed. Emergency providers must prioritize rapid assessment, avoiding unnecessary manipulations that could worsen airway obstruction. For unstable patients, immediate transfer to the operating room for rigid bronchoscopy is paramount, while stable cases may undergo systematic evaluation with radiography and clinical examination. Rigid bronchoscopy under general anesthesia remains the definitive diagnostic and therapeutic intervention, with high success rates when performed early. Delayed diagnosis increases the risk of severe complications, including post-obstructive pneumonia, bronchiectasis, and airway stenosis. Despite these risks, most patients recover fully with prompt treatment, emphasizing the importance of early suspicion and intervention. Prevention is equally crucial. Regulatory measures, such as the Small Parts Test Fixture for toys, have

reduced non-food-related aspirations, but food items remain a leading cause of fatal choking incidents. Public health efforts must focus on caregiver education, particularly regarding high-risk foods like grapes, nuts, and hotdogs, which should be modified in shape and size before being given to young children. Interprofessional collaboration is vital for optimal outcomes. Emergency physicians, intensivists, otolaryngologists, pulmonologists, and anesthesiologists must work cohesively to ensure rapid diagnosis, airway stabilization, and post-procedural care. The ICU plays a key role in managing complications such as respiratory failure or anoxic injury in critically ill patients. In conclusion, FBA demands a multifaceted approach involving clinical vigilance, prompt intervention, and preventive strategies. By integrating these principles into emergency and critical care practice, healthcare teams can significantly reduce the mortality and long-term morbidity associated with this preventable yet life-threatening condition. Continued education, public awareness, and adherence to safety regulations are essential to mitigating the burden of FBA across all age groups.

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