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RESEARCH ARTICLE

ACUTE FOREIGN BODY ASPIRATION COMPLICATED BY CARDIORESPIRATORY ARREST IN AN INFANT: A CASE REPORT

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Abstract

Background: Foreign body aspiration is a preventable but potentially fatal pediatric emergency, particularly in children younger than three years. Food foreign bodies, including round fruits such as grapes, may cause sudden airway obstruction, acute asphyxia, and cardiorespiratory arrest.

Case presentation: We report the fatal case of a 1-year-8-month-old male infant admitted after aspiration of red grapes. The initial presentation included penetration syndrome, cyanosis, loss of consciousness, vomiting, severe respiratory distress, and hypoxemia. Initial arterial blood gas analysis showed acute respiratory failure with pH 7.306, $PaCO_2$ 52.5 mmHg, PaO_2 63 mmHg on room air, oxygen saturation 89%, and lactate 1.29 mmol/L. Rigid bronchoscopy performed under general anesthesia did not identify a visible macroscopic foreign body, suggesting possible distal migration, fragmentation, or partial expulsion during initial airway clearance. The subsequent pediatric intensive care unit course was complicated by cardiorespiratory arrest requiring cardiopulmonary resuscitation, prolonged mechanical ventilation, severe bilateral infectious pneumonia with multidrug resistant organisms, suspected disseminated intravascular coagulation, diffuse ecchymotic and petechial skin lesions, post-anoxic brain injury with multiple cerebral microbleeds on MRI, multi-organ failure, and death after 83 days of hospitalization.

Conclusion: This case emphasizes the severity of foreign body aspiration in infants, the potential cascade of post-asphyxial and intensive care complications, and the importance of prevention, early recognition, urgent airway management, and close neurological and systemic monitoring after pediatric cardiac arrest.

Introduction:-

Foreign body aspiration is one of the most important pediatric airway emergencies. It is particularly frequent in children younger than three years because of immature swallowing coordination, incomplete dentition, and oral exploratory behavior. Food foreign bodies are the most common in this age group. Nuts, seeds, hard candies, and round fruits such as grapes are especially dangerous because their shape and size can obstruct the larynx, trachea, or main bronchi. The typical warning event is penetration syndrome, characterized by sudden cough, choking, cyanosis, and acute respiratory distress occurring during eating or play. Early recognition is essential because delay in diagnosis may lead to persistent airway obstruction, atelectasis, pneumonia, hypoxic injury, or death. When the

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obstruction is complete or nearly complete, acute asphyxia and cardiorespiratory arrest may occur within minutes. Rigid bronchoscopy remains the reference diagnostic and therapeutic procedure for suspected tracheobronchial foreign body aspiration. However, a negative bronchoscopy does not fully exclude a preceding aspiration event, particularly when the foreign body is organic, friable, fragmented, expelled during first-aid maneuvers, or migrated distally. We report a fatal case of red grape aspiration in a 1-year-8-month-old infant, complicated by severe respiratory distress, cardiorespiratory arrest, multidrug-resistant pneumonia, hemostatic disorders, post-anoxic encephalopathy with cerebral microbleeds, and multi-organ failure. The aim of this report is to highlight the clinical severity of food aspiration in infants and to summarize practical lessons for emergency and intensive care teams.

Case Presentation:-

Patient Information and Reason for Admission:-

The patient was a 1-year-8-month-old male infant weighing 15 kg. He had no significant past medical or surgical history and no history of parental consanguinity. He was admitted to the pediatric emergency department on 19 November 2025 at 00:30 for suspected foreign body aspiration involving red grapes, followed by transfer to the pediatric intensive care unit.

History of Present Illness:-

Two hours before admission, the child suddenly developed a penetration syndrome while eating red grapes. The episode was characterized by choking, cyanosis, loss of consciousness, and two episodes of vomiting. Emergency medical services were contacted by the parents, and the child was transported to hospital for urgent management.

Clinical Examination on Admission:-

On arrival, the infant was conscious but cyanotic. Respiratory examination showed expiratory wheezing, severe respiratory distress with suprasternal and intercostal retractions, oxygen saturation of 85% on room air, bilateral bronchospasm, and crackles on auscultation. Hemodynamic examination showed heart rate 164 beats/minute, blood pressure 10/6 mmHg, and capillary refill time below 3 seconds. Initial management included oxygen therapy, semi-seated positioning, bag-mask ventilation when required, bilateral peripheral venous access, tracheal intubation, resuscitation measures, laboratory investigations, and thoracic imaging.

Initial Laboratory and Radiological Findings:-

Arterial blood gas analysis showed acute respiratory failure with pH 7.306, $PaCO_2$ 52.5 mmHg, PaO_2 63 mmHg on FiO_2 21%, oxygen saturation 89%, hematocrit 30%, estimated hemoglobin 10.1 g/dL, and lactate 1.29 mmol/L. These findings supported acute ventilatory impairment related to airway obstruction and aspiration.

Rigid Bronchoscopy:-

Rigid bronchoscopy was performed on 19 November 2025 under general anesthesia. Intubation was uncomplicated. Endoscopic findings showed a free trachea, thinned carina, inflammatory erythematous mucosa, a free right main bronchus with endobronchial secretions requiring suction, and a free left main bronchus with inflammatory mucosa. No visible foreign body was identified during the procedure. In this clinical context, this may be explained by distal migration, fragmentation of the organic foreign body, or partial expulsion during the initial airway clearance and resuscitation maneuvers.

Pediatric Intensive Care Unit Course and Major Complications:-

The subsequent clinical course was severe. It was marked by cardiorespiratory arrest requiring cardiopulmonary resuscitation, followed by delayed awakening and persistent respiratory dependence after sedation withdrawal. Neurological prognosis was assessed in the context of post-arrest hypoxic-ischemic injury and prolonged critical illness. The child developed severe bilateral infectious pneumonia. Microbiological documentation identified multidrug-resistant organisms from serial blood cultures, including imipenem-resistant Acinetobacter baumannii, Serratia marcescens, and carbapenem-resistant Pseudomonas aeruginosa. Antimicrobial therapy included colistin, fluconazole, amikacin, and subsequent adaptation according to antibiogram results and the clinical course. A hemostatic disorder was also documented, with hemoglobin 7.7 g/dL, platelet count 76,000/mm^3, prothrombin time 54%, and activated partial thromboplastin time 52.5 seconds. Hematology consultation suggested possible disseminated intravascular coagulation in the context of severe infection and post-arrest multi-organ dysfunction. Fresh frozen plasma, furosemide, and intravenous vitamin K were administered.

Diffuse ecchymotic skin lesions involving the axillary regions, upper limbs, popliteal fossae, and trunk were observed, associated with petechial lesions and erosive cervical lesions. The main hypotheses were thrombocytopenia/coagulopathy-related lesions and possible drug-related cutaneous reaction in the context of prolonged multidrug antimicrobial therapy. Brain MRI performed on 6 January 2026 for delayed awakening revealed a right parietal subcortical hematoma measuring 18 x 10 mm, multiple supratentorial microbleeds, bilateral symmetrical T2/FLAIR hyperintensity of the basal ganglia, and diffusion restriction. These abnormalities were compatible with severe hypoxic-ischemic encephalopathy after cardiorespiratory arrest.

Outcome:-

The patient died on 9 February 2026 after 83 days of hospitalization, in a context of post-cardiac arrest multi-organ failure following foreign body aspiration. This fatal outcome illustrates the severity of pediatric aspiration complicated by hypoxic injury, infection, coagulopathy, and prolonged intensive care.

Table 1. Chronological Summary of the Case

Time point	Clinical event / finding
2 hours before admission	Penetration syndrome while eating red grapes, with choking, cyanosis, loss of consciousness, and vomiting.
Admission, 19/11/2025 00:30	Severe respiratory distress, SpO_2 85% on room air, HR 164 bpm, BP 10/6 mmHg.
Initial assessment	ABG: pH 7.306, $PaCO_2$ 52.5 mmHg, PaO_2 63 mmHg on room air, SpO_2 89%, lactate 1.29 mmol/L.
19/11/2025	Rigid bronchoscopy under general anesthesia: inflammatory mucosa and secretions; no visible macroscopic foreign body.
PICU course	Cardiorespiratory arrest requiring CPR, prolonged mechanical ventilation, delayed awakening, severe pneumonia, suspected DIC, skin lesions.
06/01/2026	Brain MRI: right parietal hematoma, multiple supratentorial microbleeds, basal ganglia T2/FLAIR hyperintensity, diffusion restriction.
09/02/2026	Death after 83 days of hospitalization from post-arrest multi-organ failure.

Table 2. Main Complications and Clinical Interpretation

Complication	Patient-specific findings	Clinical interpretation
Acute respiratory failure	Penetration syndrome, cyanosis, SpO_2 85% on room air, and hypercapnia.	Compatible with airway obstruction and aspiration-related respiratory compromise.
Cardiorespiratory arrest	CPR required during PICU course, followed by delayed awakening.	Major determinant of neurological prognosis after pediatric asphyxia.

Severe pneumonia	Multidrug-resistant Acinetobacter baumannii, Serratia marcescens, and carbapenem-resistant Pseudomonas aeruginosa.	Consistent with severe aspiration and ventilator-associated infectious complications.
Coagulopathy / suspected DIC	Platelets 76,000/mm³, PT 54%, APTT 52.5 seconds, ecchymoses and petechiae.	Likely related to severe infection, systemic inflammation, and post-arrest organ dysfunction.
Post-anoxic brain injury	Basal ganglia T2/FLAIR hyperintensity with diffusion restriction; microbleeds; parietal hematoma.	Suggestive of severe hypoxic-ischemic encephalopathy with hemorrhagic components.

Figure Legends:-

Figure 1. Chest imaging at admission or during the intensive care course showing aspiration-related pulmonary abnormalities. Image to be inserted by the authors if available.

Figure 2. Bronchoscopy view showing inflammatory tracheobronchial mucosa and secretions. Image to be inserted by the authors if available.

Figure 3. Brain MRI performed on 06/01/2026 showing hypoxic-ischemic injury: bilateral basal ganglia T2/FLAIR hyperintensity, diffusion restriction, multiple supratentorial microbleeds, and right parietal subcortical hematoma. Image to be inserted by the authors if available.

Discussion:-

Foreign Body Aspiration in Infants:-

Foreign body aspiration is a major cause of preventable accidental death in young children. Children younger than three years are particularly vulnerable because they frequently place objects and food in the mouth, have incomplete molar dentition, and may laugh, cry, or run while eating. Round and compressible foods such as grapes are high-risk because they may conform to the airway lumen and produce complete or near-complete obstruction. In this case, the history of choking during ingestion of red grapes, followed by cyanosis and loss of consciousness, was highly suggestive of acute foreign body aspiration. Even though bronchoscopy did not identify a visible foreign body, the clinical presentation remains strongly compatible with aspiration. Organic foreign bodies may fragment, migrate, swell, or be partially expelled during prehospital or emergency airway maneuvers.

Penetration Syndrome and Emergency Management:-

Penetration syndrome is the key clinical clue. Sudden cough, choking, cyanosis, and respiratory distress during feeding should prompt immediate suspicion. Initial management depends on the level of obstruction and the child's clinical status. In life-threatening obstruction, appropriate age-specific choking maneuvers and rapid emergency airway management are essential. In hospital, oxygenation, ventilation, hemodynamic stabilization, and early bronchoscopy are priorities. This case also underlines the importance of rapid referral to a center capable of pediatric airway management, rigid bronchoscopy, and pediatric intensive care support.

Cardiorespiratory Arrest and Post-Anoxic Encephalopathy:-

Cardiorespiratory arrest secondary to asphyxia is associated with a high risk of hypoxic-ischemic brain injury. In infants, basal ganglia involvement on MRI is a recognized pattern of severe hypoxic injury. In our patient, delayed awakening after sedation withdrawal prompted neuroimaging. MRI findings of bilateral basal ganglia T2/FLAIR hyperintensity with diffusion restriction, multiple microbleeds, and a right parietal hematoma were consistent with severe post-anoxic encephalopathy. Cerebral microbleeds in this setting may reflect a combination of hypoxia-reperfusion injury, endothelial damage, systemic inflammation, coagulopathy, and critical illness. Their presence should raise concern for severe neurovascular injury and poor prognosis, especially when associated with diffusion restriction in deep gray matter structures.

Infectious and Hemostatic Complications:-
Aspiration of organic material may cause chemical pneumonitis, bacterial pneumonia, atelectasis, and secondary ventilation difficulties. Prolonged mechanical ventilation increases the risk of ventilator-associated pneumonia and colonization or infection with multidrug-resistant organisms. In the present case, Acinetobacter baumannii, Serratia marcescens, and carbapenem-resistant Pseudomonas aeruginosa were documented, requiring prolonged and adapted antimicrobial therapy. The hemostatic disorder was compatible with suspected disseminated intravascular coagulation in the context of severe infection and multi-organ dysfunction. Thrombocytopenia, prolonged prothrombin time, prolonged activated partial thromboplastin time, and diffuse ecchymoses supported this hypothesis. A drug-related cutaneous reaction was also considered because of prolonged antimicrobial exposure, although the available data do not allow definitive confirmation.

Differential Diagnosis:-
The main differential diagnoses considered during the clinical course included infectious pneumonia unrelated to aspiration, viral bronchiolitis, severe asthma-like bronchospasm, congenital airway abnormality, metabolic encephalopathy, septic encephalopathy, primary central nervous system infection, non-accidental trauma, primary coagulation disorder, and drug-related skin reaction. The temporal relationship with choking while eating grapes, the initial penetration syndrome, severe hypoxemia, and the subsequent post-anoxic MRI pattern supported foreign body aspiration complicated by hypoxic-ischemic injury as the main diagnostic framework.

Lessons Learned for Clinicians:-
This case provides several practical lessons. First, a witnessed choking episode with cyanosis in an infant should be treated as foreign body aspiration until proven otherwise. Second, a negative bronchoscopy does not necessarily invalidate the diagnosis when the clinical history is highly suggestive. Third, children who survive severe asphyxia require systematic neurological surveillance after sedation withdrawal. Fourth, prolonged pediatric intensive care exposes patients to multidrug-resistant infections, coagulopathy, and multi-organ dysfunction. Finally, prevention remains the most effective strategy.

Prevention and Public Health Implications:-
Preventive education should be directed at parents, caregivers, nursery staff, and healthcare professionals. Whole grapes, nuts, seeds, hard candies, popcorn, and similar foods should be avoided in young children or prepared in a safer form. Grapes should be cut lengthwise into small pieces. Children should be seated and supervised while eating. Caregivers should be trained in age-appropriate choking first aid and encouraged to seek urgent medical care after any severe choking event, even if symptoms temporarily improve.

Limitations:-
This report is limited by its single-case design and by the absence of inserted radiological or bronchoscopic images in the submitted file. The exact time course and hemodynamic details around the cardiorespiratory arrest should be verified against the original intensive care record before return of the corrected proof. Long-term neurological assessment was not possible because the outcome was fatal.

Conclusion:-
We report a fatal case of food foreign body aspiration in a 1-year-8-month-old infant complicated by acute respiratory failure, cardiorespiratory arrest, post-anoxic encephalopathy, severe multidrug-resistant pneumonia, suspected disseminated intravascular coagulation, and multi-organ failure. This observation highlights the need for rapid recognition of penetration syndrome, urgent airway stabilization, early bronchoscopy in suspected aspiration, and close multidisciplinary monitoring after pediatric cardiac arrest. It also reinforces the essential role of prevention and caregiver education regarding choking hazards in young children.

Ethics Approval and Consent for Publication:-
This manuscript contains no directly identifiable patient information. Formal ethics committee approval was not required for this anonymized single case report according to local institutional policy. Written informed consent for publication was obtained from the parents/legal guardians before submission.

Competing Interests:-
The authors declare no competing interests.

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Authors' Contributions:-
All authors contributed to patient care, data collection, manuscript preparation, and critical revision. All authors approved the final version before submission.

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