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Case Report

Unusual case of gravel aspiration in the left main bronchus and iron deficiency anaemia: A rare manifestation of Pica

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Abstract

Introduction: Foreign body aspiration (FBA) is a frequent and potentially life-threatening emergency in young children leading to respiratory sequelae. This usually manifests as sudden onset of cough, dyspnoea and wheezing mimicking asthma and other pulmonary conditions. While common objects such as nuts, coins, and toy parts are typical aspirated items, its association with pica as a sequela of iron deficiency anaemia (IDA), is rare and underreported. Clinical evaluation along with radiologic aspects play crucial role in diagnosis and management.

Case Report: A 2-year-old male child whose built is malnourished presented with a progressive cough and breathlessness.He belonged to lower socio-economic status. Evaluation a foreign body obstructing the left main bronchus on CT scan. CBP as a part of routine investigations revealed moderate iron deficiency anaemia.

Bronchoscopy under general anesthesia successfully removed a small piece of gravel from the bronchus. The child made an uneventful recovery and was discharged after 24 hours.

Conclusion: This case emphasizes the significance of recognizing pica as a possible manifestation of Iron deficiency anaemia (IDA), which may lead to unusual foreign body aspiration in young children. This potential link is often overlooked and hence routine evaluation for iron deficiency anaemia is recommended in pediatric FBA (Foreign Body Aspiration) cases, as early diagnosis and management can help prevent serious complications.

Keywords: Foreign body, Pica, Aspiration, Paediatrics, Bronchoscopy, Lung, Iron deficiency, Anaemia

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1. Introduction

Tracheobronchial foreign body aspiration is a frequent and potentially life-threatening pediatric emergency with global prevalence, particularly affecting children under five years of age. It poses a potential risk of morbidity and mortality. Clinical presentations may range from asymptomatic cases to acute respiratory symptoms including cough, dyspnea, hemoptysis, or even life-threatening respiratory arrest.[1] The most commonly aspirated objects include coins, pins, toy parts, and nuts. Rare presentations, such as hard palate swelling caused by an impacted pistachio shell, have also been reported in the literature.[2]

Pica is a behavioral condition characterized by the persistent ingestion of non-nutritive, non-food substances.[3] It is most commonly seen in children aged 2–3 years but may also occur in pregnant women and individuals with psychiatric or developmental disorders.[4] Although the etiology of pica is not completely understood, it is strongly associated with micronutrient deficiencies—particularly iron.[5] Iron deficiency anaemia is regarded as a major contributing factor and may act as both a cause and a consequence of pica behavior.

2. Case Report

A 2-year-old male child was referred to our institution for evaluation of progressive cough and breathlessness lasting five days. On clinical examination, the child appeared malnourished with a weight of 9 kilograms below the 3rd

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percentile of age. The child also belonged to lower Socio-economic status.

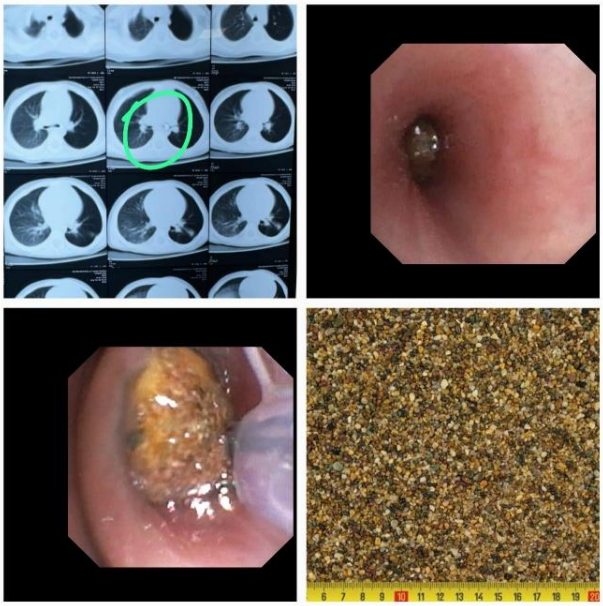

Figure 1: Computed Tomography (CT) of the Chest showing a foreign body in the left main bronchus (circled in green).

Figure 2: Bronchoscopic view of the foreign body lodged in the left main bronchus.

Baseline investigations included a complete blood picture and chest computed tomography (CT) to determine the underlying cause. Hemoglobin was noted to be 7.2 g/dL, suggestive of moderate iron deficiency anaemia. His MCV and MCH values are also low. (**Figure 1**)

Chest CT revealed an obstructing foreign body within the left main bronchus. After obtaining informed consent from the parents the child was administered general anesthesia via a laryngeal mask airway (LMA). Rigid bronchoscopy was performed, and a small piece of gravel was visualized and successfully retrieved using a retrieval basket. No intraoperative or post-operative complications were encountered.

The final diagnosis was foreign body aspiration secondary to pica (confirmed by history of ingesting non-nutritive substances) and associated iron deficiency anaemia as per CBP report. The child was kept under observation for 24 hours and discharged the following day. Further follow-up was not possible, but no post discharge complications were reported by the parents.

The parent was counseled regarding PICA as a manifestation of iron deficiency anemia and probable link with FBA. Dietary advice and iron supplements were prescribed.(**Figure 2**)

3. Discussion

Although foreign body aspirations are common in the pediatric age group, its presentation as a consequence of pica is uncommon. FBA is established as the first cause of accidental infantile deaths and the fourth one among under 5 children.[6] Approximately, 80%–85% of the cases are below 5 years and the peak incidence of Foreign Body Aspiration (FBA) is between the ages of 12 months and 3 years.[7]

The recognition of pica in the context of Iron deficiency anemia (IDA) has important clinical implications in the management of Foreign Body Aspiration. In young children presenting with unexplained respiratory symptoms, especially when choking is absent and signs of IDA are present, a history of pica should be elicited to avoid misdiagnosis of conditions like pneumonia or asthma, particularly when the foreign body is radiolucent.

The commonly involved objects in FBA among 1-3 years are seeds, nuts, bone fragments, nails, small toys, coins, pins, medical instrument fragments, and dental appliances.[8]

Most FBAs are removed via bronchoscopy. If unsuccessful, surgical intervention like bronchotomy or segmental resection may be required. In cases of chronic bronchial obstruction leading to bronchiectasis or extensive lung parenchymal damage, segmental or lobar resection may become necessary.[9]

In the present study, we report the case of a 2-year-old male child with a history of progressive cough and breathlessness over five days. The child looked malnourished and had a known history of pica and CBP revealed iron deficiency anemia.

Imaging revealed an obstructing foreign body in the left main bronchus, which was successfully removed using a bronchoscope without complications. This case underscores the importance of early recognition and timely intervention in suspected FBA.

Although there are very few studies with FBA as a manifestation of PICA, a similar case was first reported by Ekinci et al., involving a 3-year toddler admitted with a 3-day history of cough and respiratory distress. Further evaluation

revealed foreign body aspiration on X-ray which was subsequently removed with rigid bronchoscopy. The FBA aspirated was identified as a stone of approximately 1 cm in diameter. Further assessment revealed association with iron-deficiency anaemia and pica for the last 2 months.[4] Unlike our case, the child in Ekinci et al.'s report developed respiratory failure requiring PICU admission and mechanical ventilation, highlighting potential severity.

A Turkish study found 77% of FBA cases occurred in children under 5 years. [10] While choking is a typical symptom, aspiration of gravel may present atypically with pneumonia-like symptoms.[11]

The low incidence of radiopaque foreign bodies can contribute to delays in the diagnosis of FBA, as patients may initially be misdiagnosed and treated for conditions such as bronchopneumonia, bronchiolitis, upper respiratory tract infections, or asthma. This misdiagnosis can potentially lead to life-threatening emergencies. The present study highlights the association between pica and FBA, emphasizing the need for evaluating all infants and toddlers for iron deficiency anaemia.[12]

While Ganesan & Vasauskas emphasize the link between pica as a behavioral symptom of iron deficiency, the current case highlights an atypical scenario where a non-nutritive substance (gravel) was aspirated, leading to respiratory distress rather than ingestion for consumption. This raises the possibility that in very young children, iron-deficiency anaemia and malnutrition may predispose to non-purposeful ingestion or aspiration of foreign objects, rather than classic pica behaviors described in older children and adults.[13]

While our patient had a foreign body clearly visualized on CT, Ciftci et al. reported normal radiologic findings in 13% of FBA cases, emphasizing that imaging can sometimes be inconclusive. Similarly, physical exams were normal in 14% of FBA cases, highlighting diagnostic challenges.

In line with the present study, Hiradfar et al. found significant association between FBA and anaemia with 34.8% of FBA cases found to have anaemia.[14]

It is important to emphasize that foreign body aspiration (FBA) can produce indirect radiologic signs that aid in diagnosis. One such sign is unilateral air trapping, which may or may not be accompanied by mediastinal and subcutaneous emphysema. Some studies suggest that computed tomography (CT) can be used prior to bronchoscopy in suspected cases of FBA, but the precise role of CT in the diagnostic algorithm remains unclear.[15] Bronchoscopic removal was successful in 99% of Ciftci et al.'s cases, as seen in our patient, who had an uneventful recovery. However, they observed life-threatening complications in 4% of FBA cases and a 0.8% mortality rate, underlining the importance of skilled technique and close monitoring.[7]

In contrast to these complications, our patient's smooth recovery may reflect the benefits of early intervention and safe anesthesia practices, such as the use of a laryngeal mask airway (LMA).

Furthermore, evaluating children with FBA for underlying nutritional deficiencies and behavioral indicators of pica can help guide secondary prevention strategies and reduce recurrence risk. Hence, a multidisciplinary approach involving pediatricians, nutritionists, and behavioral specialists is warranted.

4. Conclusion

The present study highlights the critical importance of early intervention with bronchoscopy in cases of suspected foreign body aspiration (FBA) to ensure favorable outcomes. Additionally, it emphasizes the association between FBA, iron deficiency anaemia, and pica, suggesting that anaemia screening should be routinely considered in young children presenting with FBA. Early identification and management of iron deficiency may help prevent misdiagnosis and reduce the risk of pica-related complications in this vulnerable population.

5. Ethics Approval

Clearly state in your report that "Ethics Committee approval was not required as this is a single case report based on clinical observation and patient consent has been obtained."

6. Source of Funding

None.

7. Conflict of Interest

None.

8. Acknowledgment

None.

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