Case Report

Asymptomatic fixed partial denture aspiration: A case report

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ABSTRACT

Introduction and importance: Foreign body aspiration (FBA) is more frequently presented in children and considered a rare presentation in adults. One of the most common causes of FBA in adults are orthodontic appliances.

Case presentation: We present a case of a 70-year-old male with an accidently discovered fixed partial denture (bridge) in the right mainstem bronchus. The partial denture was removed successfully by flexible bronchoscopy.

Clinical discussion: FBA is an event that most frequently occurs with children, and rarely with adults having various risk factors and complications on patients.

Conclusion: This study aims to spotlight the danger of asymptomatic FBA and how retrieving sharp objects can be managed by flexible bronchoscopy thus leading to better management and increased awareness of such cases.

1. Introduction

Most FBA incidences occur in children [1]. It is a hazardous, life-threatening event, as foreign bodies of huge sizes can lead to deadly airway obstruction and is considered the leading cause of accidental home deaths in children aged less than six years old [2,3]. Moreover, FBA death rates in the United States range from 500 to 2000 yearly [4]. FBA is very uncommon in adults [4–6]. The most affected adult groups include mentally disabled and psychotic patients, prisoners, and alcoholics [7]. Asymptomatic aspiration of dentures in the trachea or bronchus is considered very rare to occur. Interestingly, dental procedures and appliances are considered the second most common leading cause of FBA [8]. For more effective prevention and better management of such cases in the future, we report an unusual case of a 70-year-old male with a denture accidently discovered on Computed Tomography (CT) scan requested for a wholly different medical condition.

1.1 Case presentation

A 70-year-old male, a known case of Hypertension, Diabetes Miletus (DM), and asthma, presented at our clinic with typical asthma symptoms (shortness of the breath and a wheezy chest) and a history of fever, malaise, and loss of smell for a one-week duration after a close contact with positive COVID-19 family members. Polymerase Chain Reaction (PCR) tests for COVID-19 were ordered and turned out negative. Later on, a COVID-19 Antibodies (CoV-19 Abs) IgG Serum result was 53AU/ml ( Reactive reference range ≥ 10 AU/ml). A Chest X-ray was ordered and showed diffuse bilateral patchy infiltrate (Fig. 1) suspected to be an infection. For the control of his asthma exacerbation, a Maintenance and Reliever Therapy (MART) composed of a combination of budesonide and formoterol fumarate dihydrate inhaler substituted his previous regimen (salbutamol inhaler) and based on the chest x-ray findings and the repeatedly negative PCR results, a CT scan was scheduled for further evaluation. The patient postponed his CT appointment, presented for follow-up 20 days later and had fully controlled asthma symptoms. The CT showed multiple areas of peripherally predominant ground-glass opacities with interlobar septal thickening and atelectatic bands seen in both lung fields more prominent in both upper lung lobes in addition to evidence of hyperdense foreign body seen in the right mainstem bronchus and bronchus intermedius with surrounding metallic artifact, measuring about 4.2 cm in length (Fig. 2). Retrospectively, a day before the delayed CT scan, the patient recalled that his denture was lost after he had gone through a syncopal attack that was thought to be due to hypoglycemia and the patient showed complete recovery within 1 min.

Based on the CT findings, the patient was urgently admitted for bronchoscopy. The procedure was performed under deep sedation in the operating room. Vocal cords were anesthetized with a local anesthetic. Using a Laryngeal Mask Airway (LMA), an appropriately sized flexible bronchoscope was inserted down. The partial denture was causing airway obstruction and is considered the leading cause of accidental home deaths in children aged less than six years old [2,3]. Moreover, FBA death rates in the united states range from 500 to 2000 yearly [4]. FBA is very uncommon in adults [4–6]. The most affected adult groups include mentally disabled and psychotic patients, prisoners, and alcoholics [7]. Asymptomatic aspiration of dentures in the trachea or bronchus is considered very rare to occur. Interestingly, dental procedures and appliances are considered the second most common leading cause of FBA [8]. For more effective prevention and better management of such cases in the future, we report an unusual case of a 70-year-old male with a denture accidently discovered on Computed Tomography (CT) scan requested for a wholly different medical condition.

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incomplete obstruction of the right main bronchus (Fig. 3. A). It was grasped through a metal dental post (screw) that was oriented medially using alligator forceps inserted through the flexible bronchoscope’s working channel. To prevent slippage of the partial denture or dislodgment in the LMA, the scope and LMA were pulled all together after crossing the vocal cords. Re-inspection of the endobronchial tree revealed no mucosal injury (Fig. 3. B). This procedure confirmed the presence and the estimated measurement of the partial denture (Fig. 4). The patient was observed for a few hours after the procedure and was discharged afterward. The patient was followed up 25 days after discharge in the clinic, his x-ray was normal and showed no signs of complications.

3. Discussion

FBA is considered a frequently encountered life-threatening event that occurs mainly in children [10,11]. Although it is frequently suspected in children with pulmonary symptoms, it is infrequent to occur in adults. Only 20% of FBA cases are patients above the age of 15 [10]. Aspirated foreign bodies can be classified into organic bodies like food, nuts or seeds aspirated due to incomplete chewing of substances, and inorganic bodies like nails or pins [12,13]. Dental prosthetics and procedures are considered the second most common leading cause of FBA after food; they represent up to 27.7% of this event’s causes [14]. FBA can also occur in adults as a result of various risk factors such as advanced age, primary neurologic disorders (cerebrovascular accidents, alzheimer’s, mental retardation, primary brain neoplasm, cerebral palsy, seizures, dementia, parkinson’s disease), drugs, and alcohol consumption leading to the loss of consciousness and altered mental status. It can also take place without any notable risk factors [15–17]. Patients’ symptoms of FBA differ based on the size and location of the foreign body, but the most common symptom in adults is a chronic
cough. Less common symptoms may include chest pain, fever and hemoptysis [18,19]. In rare cases FBA can be asymptomatic as in our case [20].

Asthma medications may mask various FBA symptoms. Bronchodilators may reduce airway obstruction and corticosteroids decrease inflammation and irritation of airway mucosa. Moreover, Asthma or some respiratory infections symptoms may overlap with presenting FBA symptoms [21,22].

Most foreign bodies get aspirated into the right bronchi as in our case because it is broader, steeper, and more directly aligned with the trachea [23]. Acute presentation is infrequent [24]. Interestingly, some cases may take years to diagnose the presence of a foreign body in the bronchi [20]. Most patients do not remember aspiring foreign bodies thus, delaying their diagnosis [25]. Depending on the foreign body’s effect on airflow, its characteristics, and the period after aspiration of the foreign body, it might lead to some serious manifestations and complications such as unresolved pneumonia, granulation tissue formation around the foreign body, lung abscesses, and inflammatory polyps [26–28]. Moreover, this can lead to the false diagnosis of various respiratory diseases [1]. Usually, FBA cannot be diagnosed clinically [29]. The diagnosis depends mainly on the visualization of the foreign body usually by chest radiograph or bronchoscopy. In some fewer cases, advanced imaging techniques can be used like Computed Tomography (CT) scanning, Magnetic Resonance Imaging (MRI) and fluoroscopy for the diagnosis [30–34]. In many cases as our case, foreign bodies are discovered accidentally after ordering images for other medical conditions [35].

The proper intervention for FBA is to remove it once detected leading to rapid improvement of symptoms and preventing any further damage from progressing [36]. Universally, rigid or flexible bronchoscopy are the most common techniques used in removing foreign bodies [37]. The first reported successful bronchoscopic elimination was by Gustav Killian in 1897 [38]. Rigid bronchoscopy is considered the first choice for foreign body retrieval as it provides broader view, allows airway ventilation, and requires less surgical experience [37,39]. Recently, flexible bronchoscopy has been more commonly used for FBA cases as it is operated under conscious sedation instead of general anesthesia thus, reducing procedure duration and its associated complications. In addition, flexible bronchoscopy reaches more distal branches of the bronchial tree and has less traumatic effects [40,41]. In our case, considering the age and co-morbidities of the patient, and the shape of the partial denture, flexible bronchoscopy was preferred. However, thoracotomy and bronchotomy may be required in 2% of FBA cases [42].

Protective orthodontic techniques have been suggested to prevent FBA, like securing loose orthodontic structures or devices in the mouth during different procedures and periodically checking and replacing any defective appliances [43]. In our case, there were no limitations or complications, the procedure went smoothly and the patient did not show any kind of complications.

4. Conclusion

In conclusion, foreign body aspiration can be a serious life-threatening situation that requires appropriate attention, when it comes to children or elderly patients using orthodontic appliances. Such events need a high level of physicians’ suspicion for patients presenting with various respiratory symptoms.

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Ethical approval

Ethical approval for case reports and case series are waived from any institutional review board approval according to the ongoing regulations of Yarmouk university.

Research consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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Author contribution

Case report design and patient medical and surgical care: S.G and S-H.

Wrote the initial draft of the case report: S-H and F-H and M.A.

Critically, revised the manuscript: S.G and S-H.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.amsu.2021.102391.

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