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Case Report

Melatonin aspiration: Treatment with flexible bronchoscopy

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ABSTRACT

A 68-year-old male with past medical history 84 pack year smoking history (quit in 2000), mild chronic obstructive pulmonary disease (COPD), adenocarcinoma of right upper lobe treated with surgery and chemoradiation, and melanoma resection in 2013 presented with a one-month history of cough with sputum production and progressive dyspnea on exertion. He did not improve with standard treatment of antibiotics and steroids. He underwent flexible bronchoscopy that revealed an aspirated pill. This was successfully removed in the same session with the flexible bronchoscope.

Medicinal pill aspiration is estimated to represent approximately 7% of all foreign body aspiration events [1]. It is a well-established phenomenon in children but is unusual in adults and is often overlooked as a cause of airway obstruction. Impaired swallowing mechanism is an important predisposing cause. However, aspiration of a pill in the air passages can occur even among adults with an intact swallowing mechanism. A wide variety of pill aspirations have been described in the literature, with iron and calcium tablets being most notorious for causing airway complications such as inflammation and bronchial stenosis [2–4]. A sizeable number of pill aspirations are thought to be missed, as pills are likely to dissolve in the bronchial tree and are not found on bronchoscopic exam. In such cases, a detailed history and high index of suspicion are necessary for the correct diagnosis. Symptoms and complications related to pill aspiration are usually immediate and require prompt attention [5]. Rigid bronchoscopy with foreign body retrieval has been considered the standard of care; however flexible bronchoscopy has been successfully utilized and well described in literature [6,7]. We describe an unusual case of an aspirated pill that was retained for one month without causing any airway inflammation prior to bronchoscopic retrieval.

1. Case vignette

A 68-year-old male with past medical history 84 pack year smoking history (quit in 2000), mild chronic obstructive pulmonary disease (COPD), adenocarcinoma of right upper lobe treated with surgery and chemoradiation, and melanoma resection in 2013 presented with a one-month history of cough with sputum production and progressive dyspnea on exertion. He had received two courses of antibiotics and steroids for presumed COPD exacerbation and community acquired pneumonia by his primary care physician prior to presentation. On detailed history, patient mentioned that he might have choked on a melatonin tablet around the time when his symptoms started.

Physical examination showed mild bilateral expiratory wheezing with no respiratory distress. He was started on bronchodilator therapy, oral prednisone and cefdinir. A computerized tomography of the chest was performed which demonstrated a foreign body lodged in the right lower lobe truncus basalis bronchus, with associated distal bronchiectasis and mucus plugging (Fig. 1).

After consent, the patient underwent flexible bronchoscopy to retrieve the foreign body under general anesthesia. An Olympus bronchoscope with a 2.8 mm working channel was introduced via orally placed endotracheal tube (ETT). Examination revealed a pill

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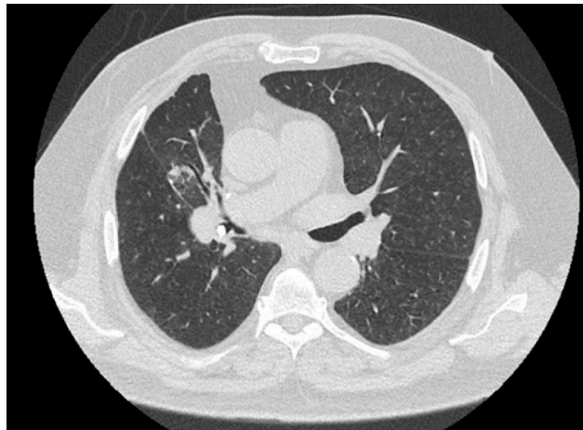


Fig. 1. CT chest showing pill lodged in right lower lobe airway.

to be lodged in the basal segments of the right lower lobe (Fig. 2). Suction was utilized to gently dislodge the pill and move it proximally in right main bronchus, for ease of access with the basket retriever. (Fig. 3). The pill was uneventfully retrieved with an Olympus FG-460-YR basket retriever. The proximal ETT connector was disconnected to allow for simultaneous removal of bronchoscope and basket retriever keeping the pill under bronchoscopic view throughout the retrieval. Endobronchial examination after removal of pill showed minimal mucosal swelling without any major inflammatory changes in right lower lobe bronchus. (Fig. 4). Surprisingly, the pill maintained its original size and shape with no signs of disintegration during initial bronchoscopic exam and during the process of retrieval (Fig. 5). Post-procedure, the patient reported a rapid resolution of all his symptoms.

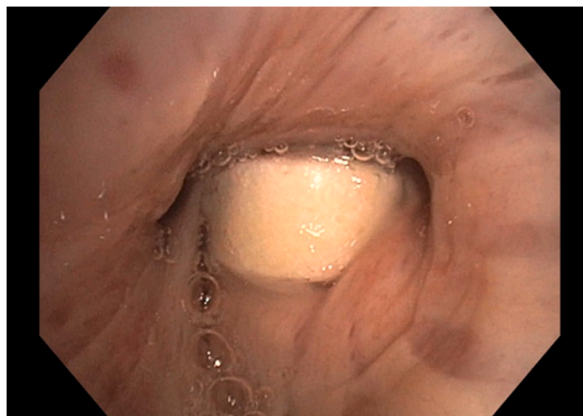


Fig. 2. Pill visualized in right lower lobe on bronchoscopy.

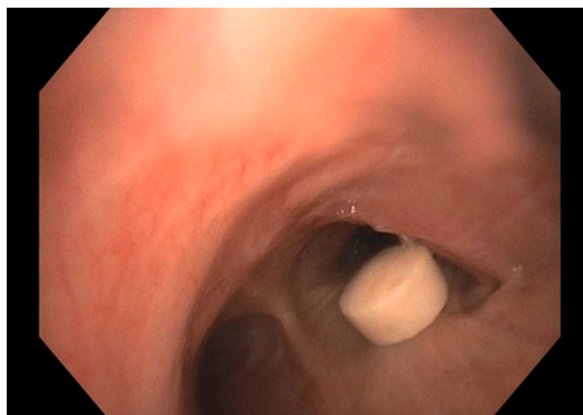


Fig. 3. Pill moved to carina.

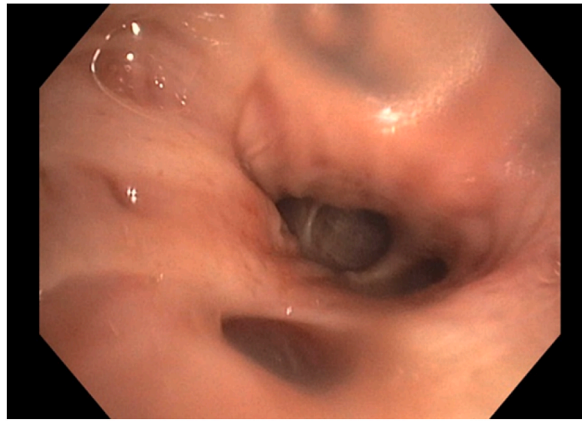


Fig. 4. Clean airways after pill retrieval.



Fig. 5. Pill after retrieval.

2. Discussion

Pill aspiration is a relatively common cause of foreign body aspiration and is likely to be underreported due to difficulty in securing diagnosis in a timely fashion. This is especially true for elderly patient with underlying dementia or psychiatric illnesses. A symptom triad of unexplained cough, wheezing, and decreased air entry should alert clinicians to suspect aspiration. The presence of the foreign object in the airway is a medical emergency as it may lead to airway obstruction, atelectasis, granulation tissue formation, post obstructive pneumonia, hemoptysis and bronchiectasis. Symptoms due to aspiration of pills may arise due to physical irritation and obstruction or due to chemical irritation caused by the dissolved tablet. Due to presence of protective covering, enteric-coated tablets or capsules are less likely to induce chemical inflammation, causing fewer complications [5]. Kupeli et al. described a case of an enteric-coated intact vitamin pill embedded in the trunchus intermedius for > 2 years with minimal granulation at the site of the foreign body after its removal. Gelatin coating of the pills or plastic-or enteric-coated capsules cause fewer complications because of the lack of proteolytic enzymes in the airways that are needed to dissolve the outer protective layer of the pill. Aspiration of such pills and capsules can still cause symptoms of cough and airway obstruction but the inflammatory reaction is less likely. On the contrary, certain medications such as iron tablets can dissolve in the airways and incite severe airway inflammation. Aspirated sucralfate is reported to expand in the presence of bronchial secretions and cause life-threatening airway obstruction [8].

Diagnosis can be challenging because chest radiographs are either normal or show nonspecific findings because many pills are radiolucent and may already be partially or completely dissolved in the airways. Maintaining a high index of suspicion is the key to an early diagnosis. Chest CT should be obtained in suspected cases. Flexible bronchoscopy is diagnostic method of choice. Although rigid bronchoscopy has superior ability to remove airway foreign bodies, flexible bronchoscopy has been used extensively for this purpose with high success. To some extent, the choice of bronchoscope for foreign body extraction depends on the type of foreign body, and training and skills of the operator. Flexible bronchoscopy causes less trauma and is very helpful for identifying and localizing foreign bodies lodged in more distal bronchial regions [9]. Bronchoscopic tools like forceps, baskets, and snares can be used for pill extraction. It is important to be certain that pill does not disintegrate during attempted removal. A thorough airway examination must be performed after removal of any foreign body including pills, making sure that there are no additional foreign bodies or fragments are left in the airways. In some circumstances, airway foreign body removal with flexible scope is not feasible and a rigid bronchoscope is

needed [7]. We strongly recommend having a back-up facility of rigid bronchoscopy in readiness every time extraction of airway foreign body is attempted using a flexible bronchoscope.

The myriad complications have been described from pill aspiration, categorized into inflammation, airway obstruction and systemic effects [5]. Long term complications include airway stenosis [10]; and therefore, prompt bronchoscopic intervention is recommended to mitigate the detrimental effects of dissolved pills. If airway stenosis develops, it requires bronchoscopic or surgical interventions.

Our patient predominantly had cough and even a month after the aspiration event, we were able to remove the intact pill. Although there are prior reports of enteric coated pills remaining intact in airways for such an extended period, it is highly unusual to find near absence of any airway inflammation or damage [11]. We believe that enteric coating prevented the dissolution of the pill in the airways and despite being lodged for four weeks, and therefore, caustic or inflammatory changes or signs of airway stenosis were not seen due to the unusually inert nature of this pill. This case illustrates the importance of timely flexible bronchoscopy in the management of chronic cough unresponsive to usual initial measures. Early bronchoscopic evaluation and close follow-up may prevent devastating airway complications. In conclusion, melatonin aspiration caused cough and insomnia for an extended period that was cured by bronchoscopy in our patient. Physicians must remember to include foreign body aspiration in the differential diagnosis of chronic cough.

3. Follow-up

Our patient did well post procedure. He remained free of respiratory symptoms, including cough and dyspnea. He was subsequently discharged home the next day.

Declaration of competing interest

We know of no conflicts of interest associated with this publication, and there has been no financial support for this work that could have influenced its outcome. As Corresponding Author, I confirm that the document has been read and approved for submission by all the named authors.

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