

Flexible bronchoscopy in foreign body removal

Bronhoscopia flexibilă în extragerea corpurilor străini

Abstract

Although high rates of success have been reported by using flexible bronchoscopy in cases of foreign body (FB) aspiration, this method is seldom used in these circumstances. Even though the discussion still exists on whether the flexible or the rigid bronchoscopy should be used in the management of these cases, flexible bronchoscopy can be reliable, depending on the characteristics of the FB and the patient. Diagnosing this pathology can be difficult and delayed if patients do not recall the episode of aspiration and the FB is non-asphyxiating. This leads to complications and the removal becomes more difficult due to the granulation tissue and the impaction. The purpose of this article is to briefly present the management options currently available for FB extraction, and to present the case of a 60-year-old patient, initially diagnosed with asthma, with a successful cherry pit extraction by flexible bronchoscopy.

Keywords: flexible bronchoscopy, foreign body

Rezumat

Deși au fost raportate rate mari de succes prin utilizarea bronhoscopiei flexibile (FB) în cazul aspirației de corp străin, această metodă este rareori utilizată în aceste circumstanțe. Chiar dacă există încă discuții cu privire la posibilitatea utilizării flexibile a bronhoscopiei rigide în tratamentul acestor cazuri, bronhoscopia flexibilă poate fi fiabilă, în funcție de caracteristicile FB și de pacient. Diagnosticarea acestei patologii poate fi dificilă și întârziată dacă pacienții nu își amintesc episodul de aspirație și FB este non-asfixiantă. Acest lucru conduce la complicații, iar îndepărtarea devine mai dificilă din cauza țesutului de granulare și a impacției. Scopul acestui articol este de a prezenta pe scurt opțiunile de management disponibile în prezent pentru extracția FB, alături de cazul unui pacient, în vârstă de 60 de ani, diagnosticat inițial cu astm bronșic, la care s-a extras cu succes un sămăbure de cireșă prin bronhoscopie flexibilă.

Cuvinte-cheie: corp străin, bronhoscopie flexibilă

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Introduction

Occult foreign body aspiration is a rare event in the adult population, being mostly seen in children. The aspiration may remain undiagnosed for a long period of time in patients who cannot recall the time when it took place, and mistaken for other pathologies such as bronchial asthma, lung cancer, pneumonia or tuberculosis⁽¹⁾. Due to the small number of cases encountered, there is no standard in the management of these cases. Therapeutic methods include flexible or rigid bronchos-

copy. Flexible bronchoscopy can be used successfully in non-life-threatening cases, in the case of intubated patients or in those with cervical instability⁽²⁾. Several studies report success rates of about 90% for foreign body (FB) extraction by using flexible bronchoscopy^(3,4). Therefore, it could represent the cornerstone of the diagnosis, but should only be considered as a treatment method if the bronchologist has the necessary experience and skill, as well as a thoracic surgery service with staff available and resuscitation equipment nearby⁽⁵⁾.

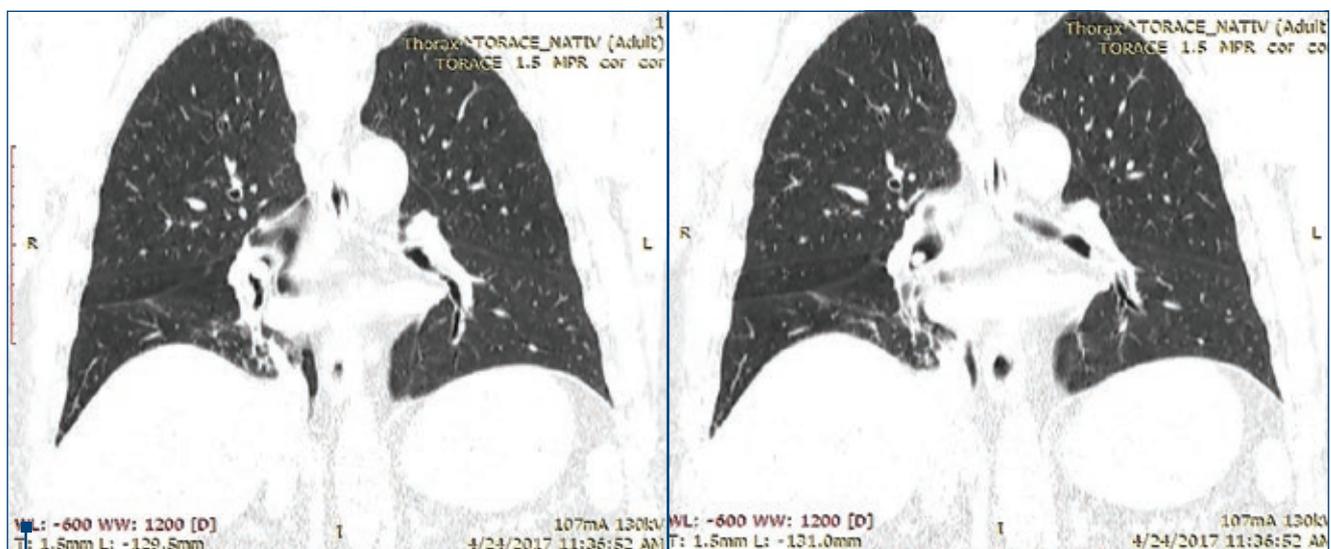


Figure 1. Chest CT scan showing the obstructed intermediate bronchus

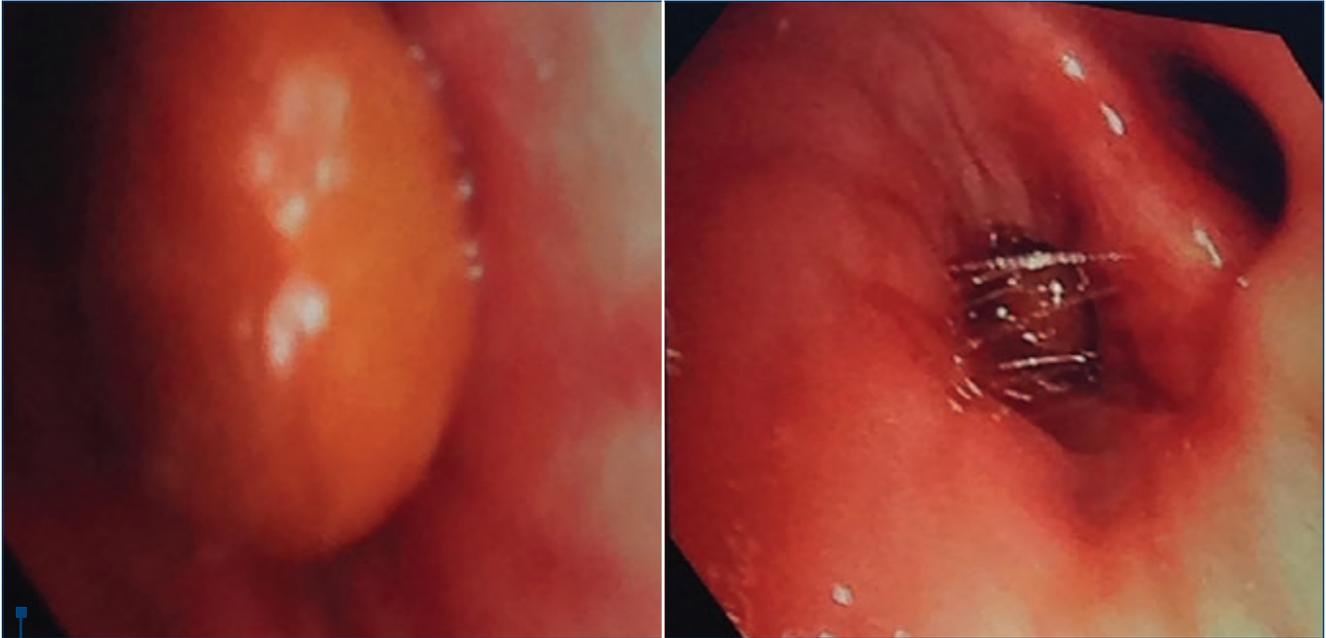


Figure 2. The cherry pit in bronchus



Figure 3. Extraction using Dormia basket

Case presentation

A 60-year old patient diagnosed with COPD-asthma overlap and arterial hypertension was referred for the evaluation of a calcified mass in the intermediate bronchus as seen on a native computer tomography of the thorax. On clinical grounds, the patient experienced persistent cough with mucopurulent expectoration, with a lack of steady improvement following appropriate bronchodilator therapy. On examination, the patient presented an emphysematous thorax and diminished vesicular breath sounds on auscultation of the right hemithorax and an oxygen saturation of 93% on room air. Blood test results showed an elevated level of gamma

glutamyltransferase (GGT) and of the inflammatory markers (CRP, ESR). Pulmonary function tests showed a mixed airway disease, with mild restriction and moderate obstruction. The chest X-ray appearance was one of a small quantity pleurisy with an elevated right hemidiaphragm. CT of the chest revealed a possible calcified mass in the intermediate bronchus and a pulmonary consolidation of 36/15 mm in the medial and basal segment, with no mediastinal or hilar lymphadenopathies (Figure 1).

The patient refused the flexible bronchoscopy at first, but returned after one month with worsened symptomatology and he accepted the examination. A foreign body



Figure 4. Alligator jaw grasping



Figure 5. Rat tooth grasping forceps

was found in the right lower lobe bronchus, a cherry pit (Figure 2), surrounded by granulation tissue with distal secondary suppuration. The extraction was attempted, with local anesthesia with 1% lidocaine solution, with the use of the foreign body forceps. The FB was mobilized proximally, in the intermediate bronchus, and then, with the use of the Dormia basket, the cherry pit was tightly grasped (Figure 3) and successfully removed, together with the bronchoscope.

Discussion

A detailed medical history that raises clinical suspicion of aspiration is an essential step in the diagnosis of tracheobronchial FB. Knowing the timing of the event and the nature of the FB makes it easier to extract it. In patients with neurological and psychiatric disorders, with a possible decrease of the pharyngeal and glottic protective reflexes, FB aspiration may be suspected in case of a sudden onset of respiratory symptoms. In the present case, the isolated high level of GGT could indicate chronic alcohol consumption, with the possible aspiration of the kernel during an episode of intoxication, the patient reporting the consumption of cherry liqueur. If the patient does not recall the episode of aspiration, the diagnosis may be missed and the FB may be detected during a flexible bronchoscopy performed in order to investigate symptoms ascribed to other pathologies such as hemoptysis, chronic cough, relapsing pneumonia, or uncontrolled asthma⁽⁶⁾.

Rigid bronchoscopy performed under general anesthesia is the traditional method used to remove FB, allowing for a better visualization and using various available extraction tools. Smaller FB are extracted through the rigid bronchoscope and the larger ones are clamped with rigid forceps, being brought to the end of the bronchoscope and extracted together with it. If the



Figure 6. Grasping basket

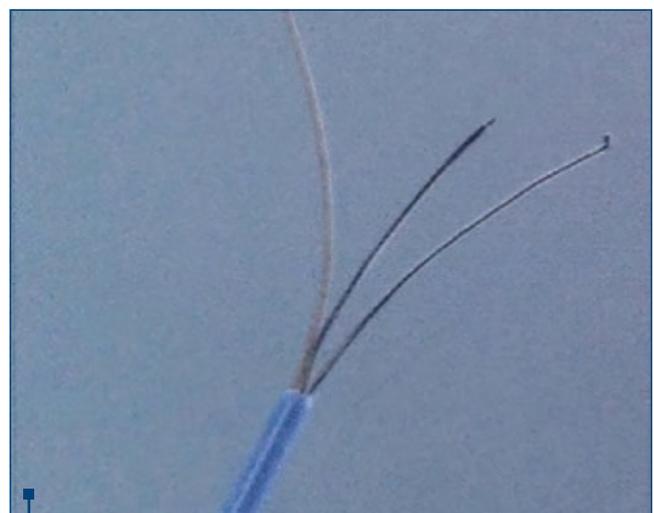


Figure 7. Mini three prong grasping forceps

FB is located distally, the flexible bronchoscope can be inserted through the channel of the rigid one, in order to facilitate visualization and extraction. Fluoroscopy is also a useful tool. The disadvantages of the rigid bronchoscopy are represented by a longer learning curve and the possibility of complications such as laryngeal spasm, bleeding or laryngeal tracheal dilation⁽⁷⁾. It remains strongly indicated in impacted foreign bodies, in asphyxiating ones and after multiple attempts of extraction by flexible bronchoscopy. According to a systematic review⁽⁸⁾, attempts to remove FB by flexible bronchoscopy were successful in 90% of cases, thus avoiding rigid bronchoscopy. An important step when deciding to use the flexible bronchoscope is to evaluate the need for an endotracheal tube to secure the airway. It can be withdrawn along with the bronchoscope when the FB has an increased size. Depending on the nature of the aspirated object, the necessary tools for removal are the following: the alligator jaw grasping forceps (Figure 4) for thin and solid organic objects, the rat tooth grasping forceps (Figure 5) for objects such as coins, the Dormia basket (Figure 6) for round, smooth objects (the forceps can cause fragmentation) and the mini three prong grasping forceps (Figure 7) for soft, irregular bodies.

In the case of sharp objects, these could be extracted by pointing the sharp edge towards the forceps to avoid damage to the airway wall. Laryngospasm, stridor and obstruction of the airway are some of the complications that may occur. Local anesthesia of vocal cords, along with conscious sedation with anxiolytics and narcotics are necessary to prevent complications and ensure patient comfort. The possibility of extraction under these conditions is a great advantage for using the flexible bronchoscope. The remaining granulation tissue may require a three-week cortisone treatment and nebulisers. In cases of remnant granulation tissue cryotherapy, electrocauterization or plasma argon coagulation can be used for its removal.

In conclusion, flexible bronchoscopy is the gold standard method for the diagnosis of FB aspiration, but it can also be reliable for the extraction, even though rigid bronchoscopy is the gold standard method used in the management of these cases. The successful management of FB aspiration depends on the bronchologist's experience and skillfulness, as well as the careful planning of the stages, focusing on the type of anesthesia required, the procedure chosen, and the patient's airway stability. ■

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