

## Thoracoscopy for the Removal of Impacted Bronchial Foreign Body Presentation of Two Cases

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### Abstract

Two patients aged 10 and 8 years with a diagnosis of endobronchial foreign body (ES) are described, who were referred from another hospital with respiratory symptoms. Studies were performed with chest x-rays that showed images suggestive of ES in bronchi which was confirmed through bronchoscopy. The impaction of EC in the bronchial wall made it impossible to extract it by endoscopic approach. It was decided to perform a thoracoscopy with bronchotomy for the extraction of the ES. The clinical evolution was favorable, control chest x-ray with adequate lung re-expansion and discharges at 4 postoperative days. Thoracoscopy is used as a route of approach for complex cases of intrabronchial ES that cannot be extracted by bronchoscopy.

**Keywords:** Bronchoaspiration; Foreign Body; Thoracoscopy

### Introduction

Foreign body aspiration (ES) is an important cause of pediatric emergency room consultation. Clinical presentation is variable depending on the size, location and type of ES. Thus, the clinical picture can range from mild episodes of coughing, wheezing and respiratory distress to a severe obstruction of the airway that compromises life [1-4].

The severity of respiratory involvement, as well as the complications arising from the presence of an ES in the airway makes a timely diagnosis necessary, which is carried out through anamnesis, physical examination, radiological methods and bronchoscopy [5,6]. Flexible or rigid bronchoscopy allows not only to confirm the diagnosis but also to show the location, type of ES and even better the extraction of this [6,7].

Usually the extraction of the EC is performed through a bronchoscopy under general anesthesia which has proven to be an effective and safe method, however, on some occasions and due to the physical characteristics of the EC or its location the treatment will require surgical extraction [8-10].

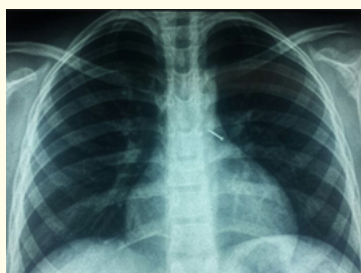
The approach can be through a thoracotomy, a technique most used since it allows adequate exposure for the extraction of the foreign body under direct vision. Currently, thoracoscopy is an option that offers advantages to consider [9,10].

There are two cases of ES in the airway lodged, one in the left main bronchus and the other in the right main bronchus, aged 10 and 8 years respectively, which were extracted by thoracoscopy, a treatment option for foreign bodies that, due to their shape, arrangement, size and inflammatory reaction that it presented in the respiratory tract, prevents its extraction endoscopically.

### Clinical Cases

#### Case 1

A 10-year-old male patient, with a history that while playing accidental aspiration of CE occurs so he is taken to the primary hospital, he underwent a chest x-ray that showed radiopaque CE in the left main bronchus (Figure 1) so he was transferred to our unit. In the initial clinical evaluation in the Pneumology service, the physical examination showed slight respiratory distress and wheezing, so he is taken to the operating room performing rigid bronchoscopy under general anesthesia, a foreign body (Chinche, metal tip towards proximal and plastic tip towards distal) was visualized in the left main bronchus. When trying the extraction the tip embedded in the endobronchial mucosa was observed, 4 extraction attempts were made, and it was not possible (edema and inflammation and bleeding occur so he received antibiotic and anti-inflammatory therapy) so the procedure was stopped. A week later he is taken back to the operating room for a new attempt of extraction by rigid bronchoscopy, during the procedure he breaks extractor clamp, so the procedure is concluded (Figure 2). It is consulted and transferred to the surgery service.



**Figure 1:** Chest X-ray showing radiopaque CE in the left main bronchus.



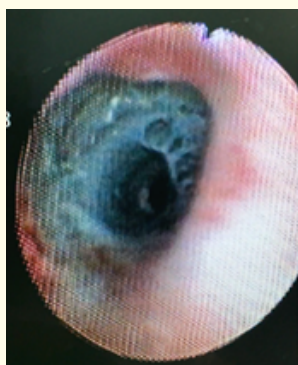
**Figure 2:** Chest X-ray showing two radiopaque ES in the left main bronchus after attempted endoscopic extraction.

## Case 2

An 8-year-old male patient, from the primary hospital with a history that two weeks prior to his transfer while playing with a pen in his mouth accidentally aspirates the tip of this, presents cough, vomiting and feeling of suffocation, improving the symptoms so he did not go to medical consultation. Two weeks later manifesta respiratory picture, productive cough and fever, so he goes to the primary hospital where he is evaluated, they take chest x-ray that evidence data of aerial entrapment and widening of intercostal spaces, and image of a foreign body in left main bronchus (Figure 3) so they decide to transfer him. In the clinical evaluation by the Pneumology service, management with antibiotics and anti-inflammatories continues. He is taken to the operating room and performs rigid bronchoscopy under general anesthesia. A conical, foreign body located in the right main bronchus with inflammatory secretions was visualized (Figure 4). When attempting the extraction, it was observed that the EC was involved in an inflammatory reaction with the formation of granulation tissue that made extraction impossible due to the impaction of the EC in the endobronchial mucosa, so the procedure was stopped, consulted and transferred to the surgery service.

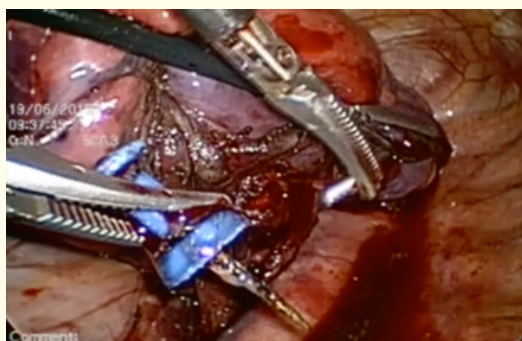


**Figure 3:** Chest X-ray showing radiopaque CE in the right main bronchus.



**Figure 4:** Endoscopic view with foreign body, conical involved in inflammatory reaction with formation of granulation tissue in right main bronchus.

In the 2 cases after administration of antibiotics and anti-inflammatories, they are taken to the operating room, under general anesthesia a flexible bronchoscopy was performed for the exact location of intrabronchial ES. We proceeded to perform thoracoscopy of 4 ports of 5 mm (1 for optics, two for work and 1 for separation). Transillumination with the gui bronchoscopeor the location of the bronchus and THE EC. Dissection and bronchotomy followed by EC extraction (Figure 5-8) were performed. The bronchial incision was closed with a 4-0 prolene suture. The procedures passed without incident, with favorable postoperative evolution, glucocorticosteroids and intravenous antibiotics were administered to reduce edema and infection of the respiratory tract, orotracheal intubation for 48h, maintenance of pleural drainage 72h, removed without incident, verified with chest x-ray (Figure 9 and 10). There were no postoperative complications and they graduated on the 5<sup>th</sup> day of surgery. In the outpatient clinic at 3 and 6 months, they remained completely asymptomatic.



**Figure 5:** Foreign bodies case 1.



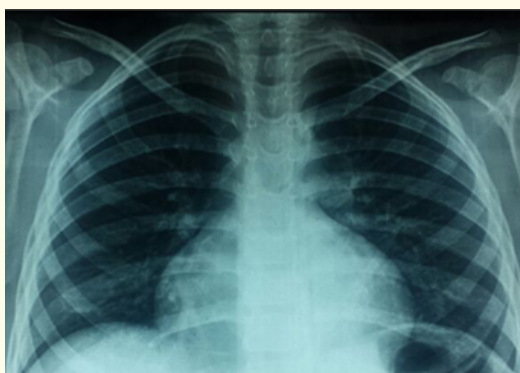
**Figure 6:** Foreign bodies case 2.



**Figure 7:** Foreign bodies: Bedbug and part of clamp case 1.



**Figure 8:** Foreign bodies: pen tip case 2.



**Figure 9:** Chest X-ray, post-EC removal control. Case 1.



**Figure 10:** Chest X-ray, control after EC extraction. Case 2.

## Discussion

Generally, the extraction of foreign bodies in the airway turns out to be successful and safe by endoscopic approach, however, the sharp SEs impacted in the airway in children are a challenge for management.

In the first case, a bedbug was evidenced, as can be seen in the initial x-ray, located in the left main bronchus with its proximal tip embedded in the bronchial mucosa in a position that makes it impossible to extract it by bronchoscopy. In the second case, a capsule from the tip of a pen housed in the right main bronchus, due to its shape, arrangement, size and inflammatory reaction with the formation of granulation tissue and the bleeding it presented prevented its extraction endoscopically.

Although rigid bronchoscopy is considered of choice for the diagnosis and treatment of foreign bodies in the airways, in these patients' endoscopic extraction was impossible, continuing with extraction attempts by this route could lead to serious complications, such as bleeding, laceration of the bronchial wall and air leakage. On the other hand, the permanence of THE EC in the airway also becomes a potential focus of complications such as recurrent pneumonias, pneumothorax, pneumomediastinum among others, therefore, in these patients the surgical option for extraction had to be considered [9,11].

In these cases, different techniques for extraction have been reported, including image-guided instrumentation techniques, tracheostomy and thoracotomy [2,11,12].

Usually thoracotomy is required for the extraction of ES that was not possible endoscopically, since it is a technique that allows under direct vision an adequate exposure for extraction, however, thoracoscopy or video-assisted thoracic surgery (VATS) [11] offers advantages for being a safe, effective technique with a low incidence of postoperative complications, associated with less pain and an earlier recovery and discharge [2,9,11].

In these two patients, thoracoscopy was preferable because the impaction of the ES in the mucosa of the main bronchi made it impossible to extract them endoscopically, so the thoracoscopy combined with a bronchoscopy allowed to identify the exact site of location of

the EC, perform the dissection and opening of the airway, an extraction of the EC without causing further damage and the bronchial suture safely and without complications, thus avoiding major procedures such as a lobectomy [13,14].

Given that there are no national reports of extraction of EC by this route, we consider it of interest to publicize this work that will serve as a treatment option for foreign bodies that, due to their shape, arrangement, size and inflammatory reaction that presented in the respiratory tract is not possible endoscopically.

### Conclusion

Those cases of ES in bronchi in which bronchoscopy failed to remove them, the surgical approach by thoracoscopy may be an alternative procedure of choice since it allows to locate and extract the foreign body safely. Thus, confirming that this approach could be indicated in these complex cases if it is performed under optimal conditions of safety and experience of the surgical team.

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