

Successful Removal of Sharp Foreign Body from the Secondary Bronchus by Flexi-Rigid Bronchoscopy Approach: A Case Report

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ABSTRACT

Foreign body aspiration leading to tracheobronchial airway obstruction is a potentially life-threatening condition that needs immediate intervention through bronchoscopy. Flexible bronchoscopy is primarily a diagnostic procedure as it helps reach the distal airways with better visualisation of the foreign body. The rigid bronchoscopy is preferred for removing foreign bodies allowing easy handling. The authors report a case of a 7-year girl who presented with complaints of aspiration of a sharp foreign body. It was impacted at the bifurcation of the secondary bronchus lying in the medial-basal segment (lower lobe) of the left lung. Initially, the rigid and flexible bronchoscopies proved futile when utilised separately. Later on, a combined flexi-rigid approach proved successful.

Key Words: Bronchoscopy, Secondary bronchus, Foreign body.

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INTRODUCTION

Foreign body aspiration causing airway obstruction is an emergency condition. Bronchoscopy is a diagnostic as well as a therapeutic procedure in these cases. Flexible bronchoscopy is an advancement to assess distal airways with better visualisation.¹ Rigid bronchoscopy is the modality of choice for retrieving foreign bodies.² In complicated cases, such as a sharp, partially embedded, or distally located foreign body, the simultaneous use of rigid and flexible bronchoscopes is highly recommended.³

Here, the authors present a case of removing a sharp foreign body from the lower respiratory tract by simultaneously utilising rigid and flexible approaches, called flexi-rigid bronchoscopy. To the best of the authors' knowledge, no prior studies in the local literature have reported a combined approach similar to the one employed in this study. This case report will contribute to the literature regarding the management of unique cases of aspirated sharp foreign bodies and hence, the use of combined flexible and rigid bronchoscopy.

CASE REPORT

A 7-year female patient presented with a one-day history of aspiration of a foreign body which was a straight pin. Her presenting symptoms included cough and mild shortness of breath.

On auscultation, her chest had bilateral equal and good air entry. Chest x-ray showed a radio-opaque shadow in the middle zone of the left lung suggestive of a foreign body (Figure 1).

A rigid bronchoscopy proved futile in removing the pin due to poor visibility. An attempt by the flexible bronchoscope was also unsuccessful as the grasper could not grasp the thin pin. However, it was visualised clearly by the flexible bronchoscope.

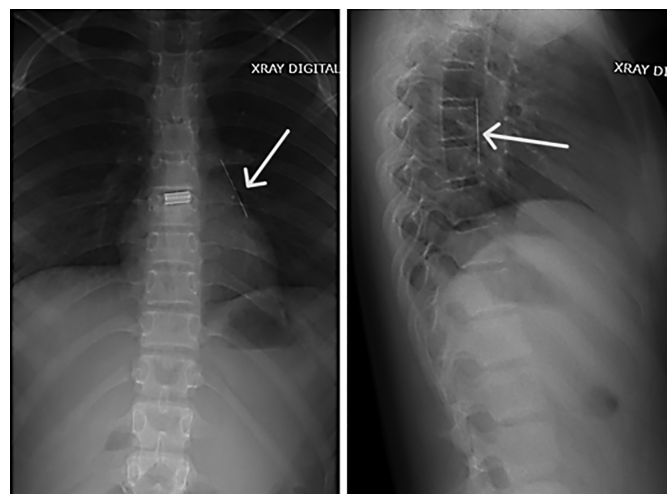


Figure 1: Chest x-ray showing thin linear radio-opaque shadow in the middle zone of the left lung. Postero-anterior view (left) and lateral view (right).

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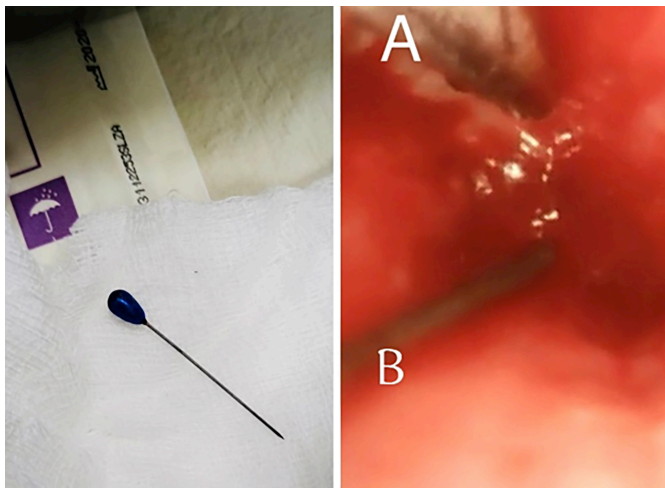


Figure 2: Retrieved sharp pin 3 cm in length (left), bronchoscopic view (right). A-grasping forceps, B-impacted sharp pin.

After two failed attempts, the surgical team decided to proceed with flexi-rigid bronchoscopy. Under inhalational anaesthesia, the rigid bronchoscope was passed down the airway along with a flexible bronchoscope. The flexible bronchoscope localised the pin lodged at the bifurcation of the secondary bronchus at the proximal end of the tertiary bronchus, with its pointed sharp end embedded in the tissue and head lying distally. A rigid bronchoscope grasper was used to dislodge the pointed end from the bronchial mucosa and then removed successfully (Figure 2). Care was taken while retrieving the straight pin from the trachea and bronchus to avoid possible damage to the airways. No intra-operative or postoperative complications were occurred. The entire procedure took approximately half an hour.

DISCUSSION

Rigid bronchoscopy is the primary procedure to remove aspirated foreign bodies. It can visualise the airways to the main bronchi, but approaching peripherally located foreign bodies by this method is difficult.⁴ Flexible bronchoscopy gives better visualisation of distal airways to the upper lobe and basal segments of the lower lobes.¹ Hence, rigid and flexible bronchoscopes complement each other in retrieving foreign bodies from peripheral airways.

In the present case, the flexible bronchoscope provided a clear visibility of the foreign body. Ruegemer *et al.* presented a case of ball-bearing impacted at the right main bronchus. Better visualisation by flexible bronchoscope helped identify the exact location. It was then removed using the better manoeuvrability of the rigid bronchoscope.⁴ Hajjar *et al.* reported an aspirated dental bur impacted in the right middle lobe. A flexible bronchoscope provided better localisation. It was removed by combined rigid and flexible bronchoscopy.¹

Rigid bronchoscopy provides a better grip to remove the impacted foreign bodies. In the present case, the rigid bronchoscopy provided better transfer of the force through instrumentation and thus, the removal of the foreign body. Similarly, Shao *et al.* reported a case of fish bone impacted in the left lower lobe, which was visualised and dislodged using flexible bronchos-

copy. Later, the rigid bronchoscope helped its removal from the upper airways.⁵ Wu *et al.* presented a case of a plastic wheel, aspirated six months ago. The scar tissue obstructed the left lower lobe bronchus. A clear view using the flexible bronchoscope and the grasping efforts of the rigid bronchoscope were utilised for its removal.² Schembri *et al.* reported an aspirated trachea-oesophageal valve in the right lower lobe where the simultaneous use of flexible and rigid bronchoscopes aided the removal.³ Madan *et al.* reported a case of endobronchial tumour retrieval, where the mass slipped into the left lower lobe bronchus due to poor grip by the flexible grasper. Subsequently, the rigid bronchoscope was used to remove the mass.⁶

In the future designs of rigid bronchoscopes, incorporating a fibre-optic camera at its distal end would significantly enhance procedural precision and safety by providing better visualisation. Until such innovative technology is developed, a combined approach flexi-rigid bronchoscopy is an efficient method for removing aspirated foreign bodies in surgically challenging cases.

ETHICAL APPROVAL:

This study was conducted in accordance with the Ethical Standards of the Institutional Review Board of Khyber Teaching Hospital, Peshawar, Pakistan.

PATIENT'S CONSENT:

Written consent was obtained from the parents of the patient.

COMPETING INTEREST:

The authors declared no conflict of interest.

AUTHORS' CONTRIBUTION:

MM: Study conception and manuscript drafting.

NL: Study conception and review of the manuscript.

IUD: Interpretation and review of the manuscript.

PM: Manuscript drafting and interpretation of the manuscript.

JAQ: Manuscript drafting and acquisition of the data.

All authors approved the final version of the manuscript to be published.

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