

# Combined use of a Fogarty Balloon Catheter, Bronchoscope, and Tracheostomy for the Controlled Retrieval of an Endobronchial Foreign Body: A Case Report

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**Abstract:** *The inhalation of foreign body into the tracheobronchial tree presents a life-threatening situation. A satisfactory outcome requires the timely and atraumatic removal of the offending agent. The morbidity associated with present methods of dealing with this problem is well documented. A case is illustrated describing the efficacy and simplicity of technique of endoscopic extraction with the aid of a fogarty embolectomy catheter and tracheostomy.*

**Keywords:** Foreign body; bronchoscopy; tracheostomy; and fogarty catheter

## 1. Introduction

The inhalation of foreign body into the tracheobronchial tree presents a life-threatening situation.<sup>1</sup> Foreign body aspiration is classically a paediatric problem with the highest incidence occurring in children younger than 5 years. Bronchial foreign body can occur in adults as well, albeit often with less acute symptoms. The classical signs of acute choking, wheezing, loss of unilateral breath sounds with corresponding volume loss, or hyperinflation due to air-trapping on the radiographs have a sensitivity of 70%. Other findings such as chronic cough, recurrent pneumonia in the same chest region, atelectasis, pneumothorax, or pneumomediastinum, are more common in adults. Rigid bronchoscopy has been the standard procedure for removal of airway foreign bodies, and remain so in the pediatric population. However, there should always be a backup plan for rigid bronchoscopy should the aspirated foreign body prove too stubborn for removal by rigid bronchoscopes.<sup>2</sup>

We present a case report of a 9 year old girl who aspirated a gemstone of approximate size 1.5x1.5 cm, that got lodged at carina, which was unsuccessfully attempted to be removed by rigid bronchoscopy and grasping forceps, and finally it was removed with the help of a fogarty catheter.

## 2. Case Report

A 9 year old girl was brought to our institute with history of aspiration of a gemstone 1 day prior. Patients had two episodes of vomiting and cough since then, and on presentation, she was having mild difficulty in breathing. Patient was immediately investigated for X-ray chest, along

with routine investigations. X-ray chest showed a round radiopaque shadow at the level of carina (Fig 1). Patient was taken up for rigid bronchoscopic foreign body removal under general anesthesia. Foreign body was visualized in trachea at the level of carina, and was attempted to be removed by grasping forceps. Multiple attempts were made, but because of its smooth surface and large size, foreign body could not be successfully grasped by the forceps. Opinion of cardiothoracic surgeon was taken who advised for thoracotomy. Despite that, trial with fogarty catheter was decided by us. Trachesostomy was done. Bronchoscope was again introduced through mouth and foreign body was visualized impacted at carina. Through the bronchoscope, fogarty catheter was passed beyond the foreign body, bulb was inflated, and catheter was gently and gradually withdrawn, disimpacting the foreign body, and slowly negotiating it proximally towards the tracheostomy stoma. The foreign body was visualized at tracheostomy stoma, from where it was grasped by allis forceps and removed (Fig 2). Patient in the postoperative period had stable vitals and maintained oxygen saturation at 95-100% at room air. Trachesotomy stoma was closed on post operative day 5.

## 3. Discussion

The inhalation of foreign bodies into the tracheobronchial tree in small children is frequently an emergency situation.<sup>1,3</sup> Accidental aspiration of foreign body into the tracheobronchial tree in both adults and children can result in significant morbidity and mortality.<sup>4,5</sup> Management of airway foreign bodies consists of clinical examination, appropriate tests to diagnose the presence of an airway foreign body, and quick removal of FB from airway.<sup>6,7</sup>

Many airway FBs are expectorated before the patient seeks medical attention. Non bronchoscopic techniques have included the use of systemic steroids to decrease edema of airway mucosa. The extraction of tracheobronchial FBs has traditionally and is still being performed with rigid bronchoscopy, particularly in pediatric patients because FB extraction success rates of rigid bronchoscopy is high. Rigid bronchoscopy is performed under deep intravenous sedation, or general anesthesia, and is ideal for airway control as well as for removal of FBs. Small airway FBs can be removed through rigid bronchoscope. With larger FBs that will not pass through the bronchoscope, FB is grasped by forceps and brought at the end of the bronchoscope, and entire unit is removed en masse.<sup>8</sup> Certain foreign bodies which are large, round, and smooth may pose a challenge to the endoscopist.<sup>1,3</sup> A wide variety of instruments are available for use with rigid bronchoscope for various FB extraction. These include rigid cupped forceps, alligator forceps, rigid suction catheter, a flexible bronchoscope through a rigid bronchoscope, ureteral stone basket, fogarty balloon catheter.<sup>9,10</sup> The use of fogarty catheter for removal of foreign bodies from the respiratory tract has also been documented in the literature.<sup>1,3</sup> When the fogarty balloon catheter is utilised, it is passed beyond the FB, and the balloon is inflated, and then slowly withdrawn. This is often successful in bringing the FB from a distal position in the bronchial tree to a more proximal one where it can be more easily grasped.<sup>9,10</sup>

Hence, be rigid bronchoscopy and grasping forceps the method of choice for removal of most foreign bodies in airway, but fogarty catheter is effective and important adjunct when round smooth surface foreign body is suspected to be lodged in airway.

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## Legend to Figures

Fig. 1 - X- ray chest shows foreign body at carina.

Fig. 2 – Foreign body (Gem stone)



Figure 1



Figure 2