# Tracheotomy: An Alternative for Tracheobronchial Foreign Body Removal

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**SUMMARY**

**A 6 years old girl accidentally aspirated a plastic whistle while playing. Computed Tomography of thorax showed foreign body at carina level. Rigid bronchoscope under general anesthesia was attempted but unable to extract the whistle through vocal cord. Tracheostomy was later performed and foreign body was removed.**

**KEY WORDS:**
*Foreign body at carina, rigid bronchoscope, tracheostomy*

## INTRODUCTION

Foreign body aspirated into air passage can lodge from supraglottis to the terminal bronchioles. They are seen most frequently during childhood. Plastic or metallic foreign bodies are relatively non-irritating and may remain symptomless for a long time. Tracheal and bronchial foreign bodies can be removed conventionally using rigid bronchoscopy with fewer complications. We reported a case where tracheaobronchial foreign body removed through tracheostome.

## CASE REPORT

A 6 year old girl with no significant past medical and surgical illness was referred from district hospital for foreign body aspiration. History from caretaker, the child was lying in supine position when playing with the plastic whistle. She accidentally aspirated the whistle during inspiration. Bouts of cough noticed after the aspiration but she was unable to cough it out. She was immediately brought to the nearest hospital by family members. On arrival, she was not in respiratory distress with oxygen saturation of 96-100% under room air. Audible whistling sounds were heard during cough or respiration. No foreign body was found on throat examination. Chest X- ray showed no significant finding. An urgent computed tomography of thorax (CT thorax) was done and foreign body noted at carina level, almost entering right bronchus. She was transferred to a Major Specialist Hospital for emergency rigid bronchoscopy and foreign body removal. Intra-operatively, we encountered great difficulty in extracting the whistle from vocal cord. Airway oedema developed as a consequence of multiple attempts, and the procedure was then abandoned. Despite airway oedema, the child managed to be intubated and nursed in intensive care unit. Intravenous Dexamethasone was commenced prior to the procedure and continued to minimise airway oedema. Intravenous Augmentin/Metronidazole started as prophylaxis for aspiration pneumonia. She was planned for tracheostomy and foreign body removal later. However within the next 24 hours, the child developed episodes of desaturation with cyanosis as a result of blocked endotracheal tube with secretion. Eventually we resorted to an emergency tracheostomy combined with rigid bronchoscope which required two surgeons. A Bjork flap was firstly created on the trachea by one of the surgeons. Rigid bronchoscope was then inserted by the second surgeon who acted as bronchoscopist after tracheostomy. The whistle was brought to tracheostoma level and successfully removed through tracheostoma by the first surgeon. Post-operatively, the child was ventilated through tracheostoma, and weaned off the ventilator after one day. We managed to wean off her tracheostomy tube after four days and repeated flexible nasopharyngolaryngoscope showed no more laryngeal oedema with mobile bilateral vocal cord. She was discharged well five days later. On subsequent follow up two weeks later, tracheostomy wound healed with normal voice quality and no neurological deficit.

## DISCUSSION

Paediatric airway foreign body aspiration is a life threatening clinical entity. Majority of foreign body aspirations are irritating in nature, e.g., seeds and nuts. Tracheobronchial foreign bodies are often lodged in the right bronchial tree due to the anatomic angle, the right main bronchus being shorter and wider, as the trachea extends [1].

The most common presenting symptoms were sudden cough and cyanosis, while the others were not symptomatic.[1] The most important element in diagnosis is a detailed and reliable history, confirmed on physical and X-ray examinations. A chest X-ray is recommended in all patients with suspected tracheobronchial foreign body, while negative finding does not invalidate the diagnosis [1]. In this case, CT thorax was performed at referring hospital and foreign body was seen at carina level. This further validates the diagnosis of foreign body aspiration besides reliable history. CT thorax is useful in cases where history and clinical examination is doubtful or not conclusive.

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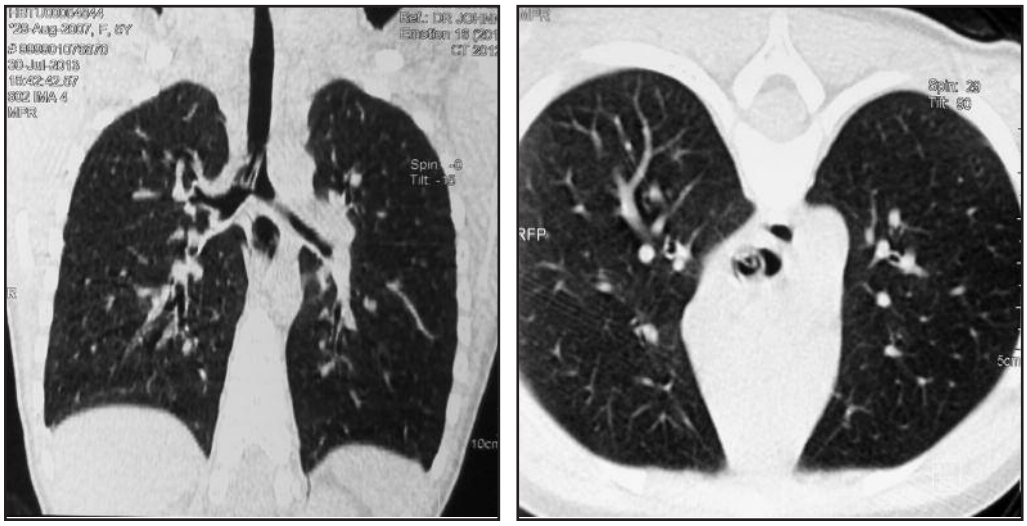

**Fig. 1:** Coronal and Axial view of computed tomography of thorax showing foreign body at carina level of tracheal.

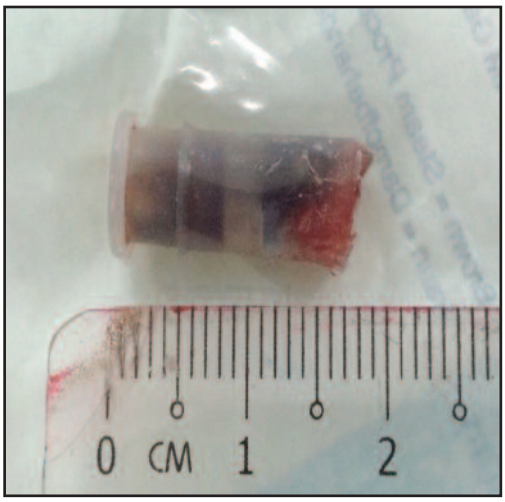


**Fig. 2:** Whistle measuring 18 mm in length and 12mm at largest diameter after removal.

The rigid bronchoscope remains the standard equipment used for treatment.[2] Considering the relatively high reliability of bronchoscopy, it must be performed in all suspicious cases without exception.[1] There are also cases where radioopaque foreign body aspirated into lower airways but spontaneous expectoration might occur and go largely unnoticed.[3]

In this 6 years old girl, the diagnosis was made immediately as history and examination pointed to aspiration, In addition to that, the caretaker witnesses the incidence. It is crucial to diagnose foreign body aspiration early to prevent complications like lung abscess, bronchiectasis and bronchopneumonia. Therefore, primary health care workers should be aware when dealing with children with positive aspiration symptoms like acute stridor, coughing bouts or acute dyspnoea. A detailed history is essential to prevent morbidity and mortality.

Rigid bronchoscopy was our first treatment modality. The wide instrument channel and lumen allowed both easy ventilation and easy access to the target. However, we encountered few difficulties when managing this case. Firstly, the whistle was unable to pass through the lumen of rigid bronchoscope in view of its larger diameter compared to the lumen. In order to remove the whistle, rigid bronchoscope has to be withdrawn together. Secondly, the jagged edge of whistle is faced upwards. It can be easily grasped but stuck at the vocal cord level upon withdrawal. Multiple attempts to extract the whistle failed; as repeated insertion and withdrawal of the rigid bronchoscope, resulted in laryngeal oedema.

Patients in whom the removal of foreign body was impossible due to inflammation, marked suppuration of the bronchial mucosa, or bronchospasm, although stable from respiratory point of view, were referred to treatment with systemic antibiotic and corticosteroids, followed by a new attempt to remove the foreign body in 48-72 hours.[2] Open surgical procedures like tracheostomy, tracheotomy and thoracotomy should be an alternative for failed therapeutic bronchoscopy. Literature also recommends not to directly extract the friable foreign body that swells easily but first directed to right main bronchus and broken up after securely protecting the left main bronchus and the trachea.[1] The use of steroid before and after bronchoscopy to reduce the frequency of postoperative subglottic oedema is also recommended.[1]

We found a solution by using combination of tracheostomy and rigid bronchoscopy to remove the whistle. Despite maintaining airway, tracheostome allows passage of large diameter foreign body that could not pass through lumen of rigid bronchoscope. Airway oedema reduced after 24 hours interval from previous surgery enabling insertion of rigid bronchoscope for extracting the whistle to tracheostome level. The whistle was easily removed with minimal force.

Unexpected objects like stones, metallic spheres and small screws in distal airway are difficult to grasp using the conventional techniques.[2] Combination of tracheostomy and rigid bronchoscopy can be recommended as differential

techniques in handling large foreign bodies which has failed to deliver conventionally. Although leaving a surgical scar at anterior neck, it is of upmost importance to protect airway and remove the culprit foreign body.

## CONCLUSION

Tracheobronchial foreign body aspiration, if not diagnosed and treated early will cause significant morbidity and mortality in children. First line health care workers must be able to diagnose foreign body aspiration for early intervention. Rigid bronchoscopy is the preferred diagnostic and therapeutic treatment method. However, in settings where it failed to remove foreign body or unexpected large foreign body, a combination of tracheostomy and bronchoscopy will be an alternative.

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