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Button battery aspiration in children: Our experiences in a tertiary care teaching hospital of eastern India

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ABSTRACT

Background: Aspiration of button battery is in children is increasing in recent years due to more accessibility of electronic toys to the children. The electrochemical composition of button battery may cause extensive damage. It should be promptly and immediately removed otherwise it leads to complications and death. **Objective:** To study the clinical presentations and outcome of the button battery aspiration among the children. **Study design:** A retrospective study. **Methods:** Six children those aspirated button battery and underwent rigid bronchoscopy with spontaneous ventilation and followed by removal from the tracheobronchial tree during December 2012 to January 2017. **Results:** Button battery aspiration is common among male child in our study. All children were symptomatic after aspiration. One child came with stridor. The time interval between battery aspiration and attending hospital was 25.33 h. Out of six patients two shows button battery in left bronchus, three in right bronchus and one is near the carina. Average hospital stay was 3.16 days. **Conclusion:** Early detection of such foreign bodies is essential to safe removal. Management approach has to be systematic. Preoperative history taking, radiological assessment followed by rapid intervention by skilled bronchoscopist usually results in favorable outcome.

Introduction

Aspiration of foreign body (FB) is a leading cause of death among children in the age group of 1–3 years [1]. Often death occurs due to FB aspiration at the time of inhalation, but those reach the hospital and alive are less in number. Button battery ingestion is relatively rare occurrence and increasing in now days due to more accessibility of electronic toys to the children. One also except more incidence of button

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battery aspiration, however few such reports have been reported [2]. This may be due several causes. Most of the aspirated FBs are food items whereas the batteries are unpleasant taste sensation which is usually expectorated or swallowed immediately. Children accesses to button batteries are often technically difficult as these are usually housed in devices which act as barriers. The rarity of FB aspiration is also due to the protection of airways with epiglottis, arytenoids and cough reflex. FB aspirations to the tracheobronchial tree are rare and fatal occurrences, more common among pediatric age group in emergency rooms. The common sites of FB impaction in tracheobronchial tree in order are right bronchus, left bronchus and trachea [3]. The smooth and shiny appearance of button battery often attractive to the children and they eagerly pick and handle them [4]. Button battery FBs are always have fatal outcome to the human being due to their chemical composition [5, 6]. FB aspiration is a fatal accident in children, especially during 3–4 years age group and is a common etiology of morbidity and mortality [7]. The button batteries are commonly used in hearing aid, watches, toys or games and calculators. After lodgment of button batteries, lead to rapid tissue damage. Early detection of button batteries in airways is the key behind the protection of fatal outcome. Our study aims to describe the experiences of the clinical presentations, management and outcome of the button battery aspiration among the children in a tertiary care teaching hospital.

Materials and methods

This is a retrospective study where six children with aspiration of button batteries attended the Department of Otorhinolaryngology in a tertiary care teaching hospital of eastern India during period of December 2012 to January 2017. The age, sex and presenting clinical features of the patient as well as imaging localization of the button batteries, interval between aspiration and clinical course followed by treatment were analyzed retrospectively. All patients were managed by rigid bronchoscopy. The composition, discharge state and type of the battery were not known for all aspirated children. Four patients were male child and two were female. Age ranged from 1 year to 6 years. Institutional ethical committee approved our study. A thorough history was taken with accidental inhalation of battery into the airways along with clinical symptoms like cough, chocking sensation and breathing difficulty. Proper head and neck examination along with appropriate radiological evaluation were done for the diagnosis of button battery in the tracheobronchial airways. The button batteries were removed on the emergency basis under general anesthesia.

Brief clinical profiles of the six patients are given below.

Case 1

A 13-month-old female baby brought to the emergency department after 6 hours of sudden onset of dyspnea and cough. Parents of baby were not able to provide any source of FB ingestion. A chest radiograph showed a metallic FB in the lower airway. CT scan of the thorax confirmed a disc shaped metallic FB at the lower part of the left bronchus (Fig. 1). Patient was immediately shifted to operation theater and underwent rigid bronchoscopy under general anesthesia with 2.5 mm size in diameter. The FB (Fig. 2) was removed without any complications with the help of telescopic optical bronchial FB forceps. The postoperative period of the child was uneventful. The chest X-ray was done on second day and found to be normal. The child was discharged after 72 hours.

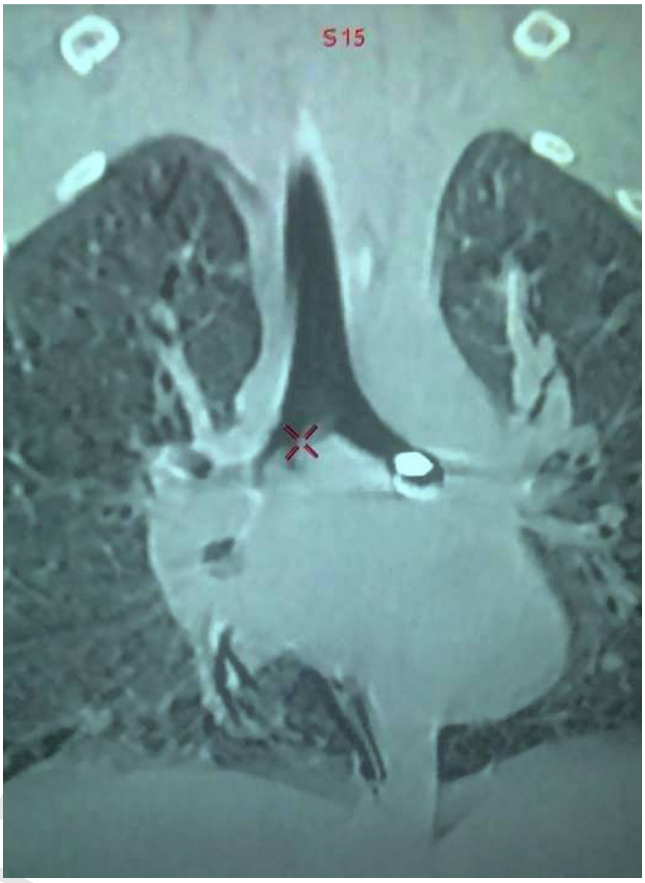

Fig. 1 – CT scan of the thorax showing button battery in the left bronchus

Case 2

A 4-year-old boy was seen in the emergency department with history of button battery ingestion 24 hours before presentation. After ingestion, he was presenting with cough and shortness of breath. Chest X-ray confirmed the metallic disc shaped FB in the right bronchus. The patient was urgently shifted to the operation theater for removal of FB. He underwent rigid bronchoscopy with spontaneous ventilation *via* attached port of rigid bronchoscope. The button battery was removed. There was necrosis of the mucosa of the bronchus due to button battery (Fig. 3a and b), may be due to rapid release of chemicals from the battery. Postoperatively patient developed bronchospasm and managed with steroid nebulisation and steroid injection. He recovered and shifted to pediatric intensive care unit for observation. He was discharged after 5 days of hospital stay.

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