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Case Report

Button Battery Mimicking a Coin in Oesophagus

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Abstract

Introduction: Foreign body ingestion is common in children and majority of which are low risk objects which needs no intervention. However there are certain high risk objects that need urgent intervention like button batteries, sharp objects, magnets, large objects (>6 cm long and/or wider than 2.5 cm), lead based objects , corrosive objects and objects that cause symptoms and oesophageal obstruction [1]. In case of children the most common site at which foreign body get lodged in oesophagus is cricopharyngeal junction which is narrowest part of oesophagus but if foreign body get lodged lower down which happens mostly in case of adults, an underlying cause such as acquired or congenital stricture ,neuromuscular cause like myasthenia gravis, mechanical cause like spondylitis or malignancy is suspected [2].

Case Report: We report a case of three days old button battery impacted in oesophagus just below level cricopharyngeal sphincter which was mistaken as a one rupee coin from history and X-ray neck and chest-AP view (Figure 1). On third day it was removed by Oesophagoscopy with a rigid oesophagoscope and there was underlying erosion of oesophageal mucosa and deeper layers. After successful removal of coin proper post-operative care was taken of the patient in Paediatric Intensive Care Unit (PICU) and then in general ward. The patient survived with no complication but the patient wanted discharge after seventh day. So delayed complication like oesophageal stricture and stenosis could not be evaluated.

Discussion: Button battery ingestion has become increasingly common because of their widespread use in various devices. Button battery ingestion and impaction in oesophagus is associated with serious complications because of local injury caused by leakage of alkaline electrolyte. Safe period of removal of impacted foreign body without complication is <2hours.In our case as button battery is removed after safe window period complications can happen like delayed oesophageal perforation or stricture.

Conclusion: From our experience we understood that all coin like round foreign body impacted in oesophagus with confused history, should be evaluated to rule out chances of button battery by double ring or step-off sign and it should br removed within two hours to avoid complications.

Keywords: Oesophagoscopy; Rigid Oesophagoscope; X-ray

Introduction

Children, especially in the age-group six months to three years of age have a tendency to put everything in mouth. Ingestion of button batteries is becoming common because of their widespread use in toys and electronic devices. On ingestion they can cause various complications and outcome is worse for large diameter lithium batteries (>=2 cm) and children who are younger than 4 years [3].

Case Report

A one year old baby girl was brought to emergency with history of not being able to feed with drooling of saliva since last three days. The mother gave history of probable coin ingestion three days back. An antero-posterior X-ray neck and chest revealed a round with button battery which is about 2cm in diameter. A nasogastric tube was introduced after that. After foreign body at C6-C7 level in oesophagus which was presumed to be a coin.

The child was taken up for Oesophagoscopy with rigid Oesophagoscope under general anaesthesia. On oesophagoscopy just at the level of cricopharynx accumulated food debris was seen, which was suctioned out, then also no coin came in view as there was lot of slough. On more suctioning and careful examination one round silver coloured shining thing was visible embedded in necrotic tissue. This was button battery impacted in Oesophagus just below cricopharynx, embedded in necrosed oesophageal mucosa which was then removed with great difficulty (Figure 2). A lot of slough was present which was removed along reversal the patient was shifted to Paediatric Intensive Care Unit (PICU) for proper post-operative care but intubation was not found necessary. The child was kept in broad-spectrum antibiotic and proton-pump inhibitor, and steroid therapy. The immediate post-operative period was uneventful with slight rise in temperature to 99.5F, 3 hours post-operatively which subsided on medication. The child was kept nil per mouth for six hours after that liquid feeds were given through nasogastric tube. The child was stable with no complication and on fourth post-operative day the child was shifted to normal paediatric ward. The child was kept under observation for three more days. On seventh day naso-gastric tube was removed and liquid oral feeds started. The child tolerated it well and after two days we planned for Barium-swallow examination of the child so that we can see whether any leak or stenosis developed but her parents wanted discharge of the patient so we had to give her LAMA (Left Against Medical Advice). The child followed up in our ENT outdoor one week after discharge and the child was feeding normal with no complication but we informed the parents that delayed complication like stricture or stenosis may happen. We advised her a Barium-swallow examination but the patient did not follow-up after that.

Figure 1: Antero-posterior X-ray neck, chest and abdomen showing round foreign body.

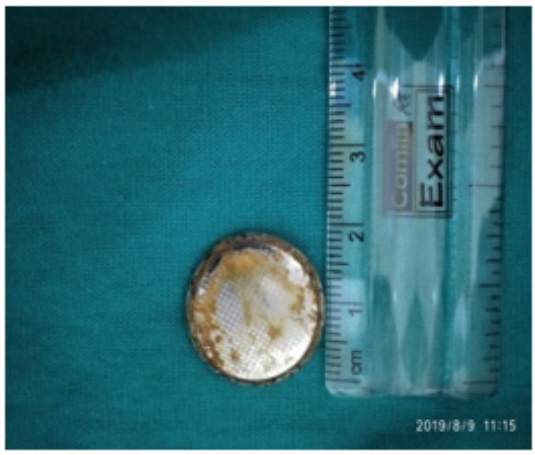

Figure 2: The Button Battery.

Discussion

Children has a tendency to explore new things by putting them in mouth, thus foreign body ingestion is so common among them. Current data on incidence of foreign body ingestion in India is not available. In the USA, oesophageal foreign bodies accounts for more that 100,000 cases per year [1]. The frequency of ingested button batteries is about 10 per million population per year and one in thousand cases of these have serious complication [4]. Annual incidence of battery ingestion reported to US poison centers from 1985-2009 fluctuated between 6.3 to 15.1 cases per million population and serious complications resulting from button battery

ingestion has increased 6.7-fold in this period [5]. This is a case of button battery lodgement in oesophagus which was mistaken as coin from history and x-ray. Button battery can cause serious complication by causing local injury by –alkaline electrolyte (45% of potassium or sodium hydroxide) in battery causing erosion and generation of a local external electrolytic current that hydrolyses tissue fluid and produces more hydroxide at battery negative pole. Window of opportunity for un-eventful removal of button battery from oesophagus is <2 hrs, so oesophageal button battery should be removed within 2 hours, but if has passed to stomach and below and is asymptomatic, it should be left to pass spontaneously, unless magnet is co-ingested, with observation of stool and possible repeat radiographs after 10-14 days to confirm passage [5].

As in our case in which button battery is removed after safe window period complications can happen like-delayed oesophageal perforations, tracheo-oesophageal fistula, damage of great vessels wall and haemorrhsge, oesophageal stricture and stenosis, vocal cord paralysis if recurrent laryngeal nerve involved, pneumothorax, pneumomediastinum, mediastinitis, tracheal stenosis, lung abscess and spondylodiscitis.

Thus in the absence of a history of observed ingestion , it should be assumed that coin-like foreign bodies are button batteries until proven otherwise [6]. Moreover signs of button battery should be carefully checked for in X-ray i.e. double-ring or halo sign in antero-posterior x-ray and step-off in lateral x-ray. But two over-lapping one pence coins simulate a 'halo' sign in antero-posterior axis which can be differentiated from button battery in lateral x-ray [7]. In contrary coin has no double density and has sharper edge.

Innovative solutions have been discussed to eliminate hazards posed by button batteries like-ingestion deterrents, guard on cell to prevent current flow, cell deactivation designs that can eliminate exposure to electrical current if cell are swallowed [8].

In the period between button battery ingestion and its removal ingestion of acidic substance like honey and sucralfate can neutalize base leaked out from button battery and reduce severity of complications [9]. Also oesophageal irrigation with sterile 0.25% acetic acid after button battery removal ,neutralize alkaline tissue micro-environment and these reduces chances of further liquefactive necrosis even after removal of button battery [10].

If Oesophageal perforation develops it is managed by repair of defect by Cardio-thoracic vascular surgeon –exposure of perforation site, debridement of wound, repair in single or double layer.

Conclusion

Any coin like foreign body in x-ray should be carefully examined to rule out button battery. In our case we missed to do a lateral view x-ray but we should not forget to do both antero-posterior and lateral view x-ray. Once suspected the button battery should be removed as early as possible by oesophagoscopy and proper post-operative care should be given to prevent or treat a oesophageal perforation due to leaked alkali from button battery.

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