



Clinical profile of Button Battery foreign bodies in Otolaryngology in the University of Portharcourt Teaching hospital

Authors

Dr Nwogbo A. C., Dr Oparaodu U. A.

ENT Department, University of Port Harcourt Teaching Hospital, Port Harcourt, Nigeria

*Corresponding Author

Dr Nwogbo Augustine

Abstract

Background: *The appearance of button batteries in toys, and electronics appear to be a source of increased morbidity and mortality especially in the Paediatric age group. These foreign bodies observed were removed from various orifices found in the regions of the ear, nose and throat.*

Method: *This is a retrospective study of button batteries removed as foreign bodies accidentally lodged in the ear, nose, throat, as well as the laryngo-tracheobronchial airway, in the department of otolaryngology of the university of portharcourt teaching hospital. Case notes were retrieved from theater records, clinics and wards. Records from this case notes were put in tables and analyzed.*

Results: *Show button batteries in the various locations of the ear, nose, hypopharynx, larynx and oesophagus. With the majority being located in the oesophagus accounting for 40 % of the cases. Complications arising from lodgement of these foreign bodies include strictures and obstructive airways.*

Conclusion: *Presence of button batteries as foreign bodies in the various mentioned orifices are dangerous and pose serious morbidity and even mortality if not quickly removed. Healthcare providers/parents should be aware of dangers of button battery foreign bodies lodged in any orifice.*

Keywords: *Button battery, Oesophagus, Anesthesia.*

Introduction

Children explore their environment and sometimes may insert foreign objects into their ears, nose or into their mouth. A child may insert a foreign body into his/her orifice or insert into another child.

A foreign body is any object which is situated in a place it should not be seen. There are different types of foreign bodies which can be living or nonliving, organic or inorganic. Inorganic foreign bodies seen in the Ear, Nose and Throat (ENT) clinic ranges from toy parts, stones, beads, erasers, safety pins and button batteries just to mention a

few¹. The severity of the foreign body depends on the location and type.

Button batteries range between 5-25mm in diameter and 1-6mm in thickness. It contains a metal oxide cathode of silver oxide or mercury oxide with an alkaline solution usually 45% potassium hydroxide.

The button batteries can be found in wrist watches, remote controls, toys and electronics. Due to their shiny nature, they are attractive to children who explore their environment, or to the mentally impaired individuals, who later insert them into their ears, nose or make an attempt to

swallow these foreign bodies. This results in an increased morbidity and possible mortality especially in the paediatric age group^{2, 3}.

With the knowledge of button batteries in the ENT which cause increased morbidity and can lead to mortality, it is important health care workers know the urgency of management of these patients and adequate education should be given to health caregivers of children.

The **Aim** of this study is to highlight the dangers arising from the presence of button batteries in the ear, nose and throat, as well as laryngo-tracheal airways, especially in children.

Method

This is a 4 year retrospective study on Pediatric otolaryngologic emergencies involving button batteries. The study involved the review of cases between January 2011 to January 2015 in the Ear Nose and Throat (ENT) Department of University of Portharcourt Teaching Hospital (UPTH), situated in the South-South region of Nigeria with patient load from neighboring states.

Information was retrieved from patient's notes in the medical and theater records of the hospital, after sorting from the departmental register and obtaining permission from the relevant hospital authorities. All relevant cases involving button batteries were reviewed and information analyzed by a simple descriptive method.

Data recorded were gender, site of lodgement, complications and method of anesthesia presented on tables as shown in results.

Results

There were a total of 25 cases of button batteries (as foreign bodies) during the period under review. These Foreign bodies were located in the ear, nose, hypopharynx, oesophagus and the larynx. The most common site was the oesophagus which accounts for 40% of the cases, with the least area located in the ear and hypopharynx both recording 8% each. There were more males (17) (68%) than females (8) (32%) in

this review on button batteries in the ENT department of UPTH.

Majority of the foreign bodies in the nose were removed in the clinic, however 2 cases located in the nose and button batteries located in the other sites were removed under general anesthesia. The types of complications as a result of the button batteries were noted (table 3)

Table I: Total no. of cases

Site	No. of cases (%)	Male (n)	Female (n)
Nose	7 (28%)	5	2
Larynx	4 (16%)	3	1
Oesophagus	10 (40%)	7	3
Ear	2 (8%)	1	1
hypopharynx	2 (8%)	1	1
Total no. of cases	25 (100%)	17(68%)	8(32%)

Table II: Site and method of removal

Site	Removed under anaesthesia	Removed in consulting room
Nose	2	5
Larynx	4	-
Oesophagus	10	-
Ear	2	-
Hypopharynx	2	-

Table III Complications associated with button batteries

Septal perforation	2
Laryngeal stenosis	3
Oesophageal stricture	2
Tympanic membrane perforation	1
Mucosal ulceration/necrosis	4
No complications observed	13
Total	25

Discussion

Button batteries (bb) have different sizes, which can be inserted in various parts of the body². This can get impacted resulting in pressure necrosis, fistula formation, increased morbidity and death from complications. In our study, two cases had esophageal stricture (Table III)^{3,4,5,6}. The destructive natures of the button batteries on tissues make it an emergency and requires urgent removal.

Bhosale et al in a case report had tracheoesophageal fistula in a two month old child.

Button batteries when exposed to moisture may cause leakage of electrolytes which penetrates deep into the tissue producing liquefactive necrosis. This results in dissolution of proteins and collagen, saponification of lipids, dehydration of tissue cells and consequential extensive tissue damage⁷⁻¹¹. We did not record any case of perforation, however, Shabino et al in their study recorded cases of esophageal perforation^{7,9,11}. Majority of the button batteries were located in the oesophagus (table I).

These findings were also noted by Mohamed et al in their button battery foreign bodies in children, hazard, management and recommendations^{13,14,15}. These could be explained by poor swallowing reflexes in children.

In this review the button battery foreign bodies reported in the ENT clinic of UPTH, majority of this foreign body were located in the oesophagus. This is probably due to the habit of children putting things in their mouth while they explore their environment and majority of the foreign bodies can be easily inserted into their mouth, which may accidentally get aspirated or swallowed^{12,13}.

When the foreign body gets impacted it becomes more difficult to remove and may result in foreign body removal in the theater under general anaesthesia¹⁴⁻¹⁷. The administration of general anaesthesia with endotracheal intubation is important with impacted foreign body removals in the nose and the throat as adequate protection of the airway is important to prevent bleeding and secretions into the airway resulting in laryngeal spasm, as well as the foreign body being accidentally dislodged into the airway¹⁴⁻¹⁷.

Thus, the majority of these foreign bodies were removed under GA with adequate precautions taken to protect the airway. This may involve having a tracheostomy done in the case of an upper airway obstruction for a foreign body in the larynx. In the present study, tracheostomy was

performed for laryngeal button battery foreign bodies. Methods of removal were through rigid endoscopes, under anesthesia as recorded in table II. Same methods were used in the various reports compared with present study, especially in esophageal foreign bodies where endotracheal intubation became mandatory^{17,18,19}.

Complications due to the foreign body may arise, more so because of the nature of the foreign body (ref 1) which may require an esophagram to assess esophageal stenosis and fistula formation¹⁸.

In this review, there were a total of 12 complications accounting for 48% of the total number of cases reviewed. This may be due to the destructive nature of the foreign body involved or pressure on the surrounding structures¹⁹⁻²².

With the knowledge of button batteries in the ENT which cause increased morbidity and can lead to mortality, it is important health care workers know the urgency of management of these patients and adequate education should be given to caregivers of children.

In **Conclusion**, the presence of button batteries as foreign bodies in various orifices is dangerous and urgent removal is mandatory to prevent morbidity and mortality. Healthcare providers/parents must be educated on dangers of button batteries as foreign bodies. Toys and various instruments of recreation powered by button batteries should be removed from children.

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