

Review Article

Bilateral Intranasal Button Batteries

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Insertion of foreign body in ear, nose and aero digestive tract is a common condition encountered in ENT practice. Toddlers and young children are often the victims. The presentation of a child with bilateral insertion of alkaline button batteries into nasal cavities resulting into delayed septal perforation, and its optimal management has been discussed here.

Key words: Foreign body, aero digestive tract, nasal cavities, batteries.

In the way of discovering their world, small children find it indispensable to explore their own orifices. Ear, nose, throat and even vagina can have room for a perplexing range of foreign bodies¹. Patients with insertion of foreign bodies are commonly encountered by general practitioner (GPs), paediatricians, accident and emergency doctors as well as by otolaryngologists².

Foreign body aspiration and ingestion are liable for considerable morbidity and mortality. Toddlers are always the most common age group involved³. Early diagnosis is essential to a successful and uncomplicated management of these incidents to prevent any significant morbidity and mortality⁴.

Disc or button batteries are the frequent household objects needed to power a number of electronic devices such as watches, cameras, calculators, toys, pagers, musical greeting cards and hearing aids. They demand special attention for the reason that they cause damage by direct corrosive effects, voltage burns and pressure necrosis. Battery size and type may influence management and result².

We are reporting a case of bilateral insertion of button batteries into the nose resulting in delayed septal perforation.

A 4 year old boy presented to ENT out patient department with a week history of bilateral purulent nasal discharge along with fever. The discharge was copious in amount yellowish in colour and thick in consistency. On examination, there was granulation tissue in both nasal cavities. Plain X-ray of sinuses showed well aerated sinuses with haziness in both the nasal cavities. A diagnosis of acute rhinitis was made. An examination of nose under anaesthesia (EUA) was carried out using 0 degree rigid nasoendoscope. Alkaline batteries of 5mm X 5mm (Fig.) were found on each side of the septum at the level of middle turbinates. There was also present some chary black coloured slough over the mucosa of the septum. The batteries were removed and both nasal cavities were thoroughly cleaned. The septum was found intact with only mild inflammation of septal mucosa. The patient received intravenous antibiotics post-operatively for seven days. A week later, a perforation of about 1cm X 1cm was noted in the cartilaginous part of the nasal

septum. There was no crusting or granulation tissue around the perforation.

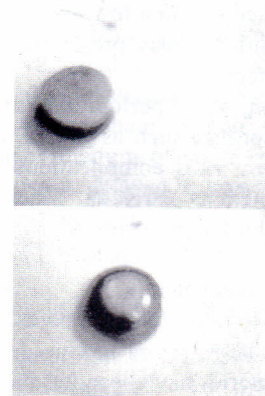


Fig.
Button
batteries

Discussion

Patients frequently report to the Accident and Emergency department for removal of foreign bodies from ear, nose and aero digestive tract. A majority of them are children in the 2 to 8 age group⁵. Batteries left loose or left over in child's reachable places are apparent sources. The children are also at threat of ingesting batteries they have separated from the device themselves for instance the child's own hearing aid⁶.

Button batteries vary in size (4.8 to 23mm in diameter), voltage (1.2 to 3 volts) and chemical components. Each of these factors may be responsible for potential complications a button battery may cause. There are five major chemical varieties of button batteries: mercury, lithium, alkaline-manganese, silver and zinc-air⁶.

Tissue destruction from button batteries is probably a combination of all of the following various methods described in the literature⁷:

1. Chemical burns resulting from leakage of alkaline substance from the battery in the moist surrounding produces a liquefying necrosis of the surrounding tissues⁸.
2. Voltage burns as a result of discharge of current to the surrounding tissue when a battery comes in contact with a moist tissue liberating intracellular potassium

leading to cell death⁹. The electrical current also causes production of hydroxyl ions. The accumulation of these ions result into severe caustic injury^{10,11}.

3. Direct currents flowing through the tissue may produce thermal injury¹².
4. Alkaline battery, like any other foreign body may cause pressure necrosis when impacted into a narrow space¹³.

More over mercury batteries may also cause acute mercury poisoning¹⁴. In the literature, there are several published reports of extensive local corrosive damage of ear^{7,15,16} and nose^{11,17,18} as a result of insertion of button batteries in these places. Children may report without a history of button battery exposure^{6,18} as in our case, and this can delay removal. In contrast to usual foreign bodies in the nose and ears, button batteries corrosive damage may commence within a few hours of insertion in the nose or ear and children may present with or without signs of secondary infection⁶.

Infection, septal perforation, intranasal adhesions and cosmetic deformity such as saddle nose and alar collapse are the known nasal complications^{6,19}. Septal perforation has been noted as early as 7 hours from the time of insertion of button batteries in the nose¹⁹. In our patient, the septal perforation was not noted per-operatively but was found a week later.

Similar to other foreign bodies, majority of the button batteries can be removed in emergency room. In cases in which the batteries have been left in the nasal cavities for a longer duration, serosanguinous discharge and crusting may obscure these foreign bodies, making their removal difficult. Removal of batteries under general anaesthesia (GA) will then become necessary. In our patient, the child presented a week later after the insertion of foreign bodies in the nose and hence removed under GA.

After removal, irrigation of the impacted site with sterile water is required to remove precipitate and to dilute the remaining alkali. The site should thereafter be kept dry and the patient closely followed up in case further debridement of the necrotic tissue is indicated and to keep an eye on healing¹⁵. Localised infection is treated with antibiotics⁷.

Nose and ear drops must be avoided before removal of button battery foreign bodies as they will initiate battery electrolysis and electrolyte escape²⁰.

It is essential that doctors and other health-care personnel involved in the initial detection of such foreign bodies in the primary care or emergency room sites be fully conversant of the dangers of these objects⁷.

In view of the early tissue injury and prevent the likelihood of long term complications, it is recommended that such foreign bodies should be removed as soon as possible^{7,15,18,21,22}.

Parents should be educated to minimise the contact of children to potential foreign bodies²³. The education of children to avoid the insertion of foreign bodies into the

ear and nose and proper training of junior doctors and a common sense to remove them are of supreme importance²⁴.

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