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LAPORAN KASUS

Impacted "Button Battery" in The Nose - a Time Management Comparison

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Abstrak

Pendahuluan: Benda asing pada hidung dapat meningkatkan morbiditas jika tidak ditatalaksana dengan baik dan benar. Baterai cakram mengandung zat alkali yang dapat menyebabkan nekrosis likuefikasi yang dapat merusak mukosa hidung. Benda asing batrai cakram ditatalaksana dengan pengankatan sesegeramungkin. **Laporan kasus:** Dilaporkan dua kasus anak laki-laki berusia 4 tahun dan wanita berusia 5 tahun dengan benda asing baterai cakram masing-masing di kavum nasal kanan dan kiri, pada kedua pasien dilakukan pengangkatan baterai cakram dan debrideman dalam anestesi umum. **Kesimpulan:** Baterai cakram dalam rongga hidung dapat menimbulkan komplikasi, dapat berupa perforasi septum, ini tergantung pada lamanya kontak mukosa dengan batrai, usia batrai. Tindakan pencegahan sangat penting dilakukan untuk menhindari kejadian benda asing batrai cakram di hidung.

Kata kunci: Benda asing di rongga hidung; benda asing batrai cakaram di hidung; batrai cakram; septum perforasi

Abstract

Introduction: *Foreign body in the nose can increase morbidity if not managed properly and correctly. Button battery containing alkaline substances can cause liquefactive necrosis. Management removes the button battery immediately.* ***Case report:*** *Two cases of a 4-year-old boy and a 5-year-old girl with a foreign body button battery were reported in the right and left nasal cavity, removed the button battery and debridement under general anesthesia.* ***Conclusion:*** *Button battery in the nasal cavity can cause various complications in the form of nasal perforation, this depends on the length of mucosal contact with the battery, the age of the battery and it must be removed immediately. Prevention plays an important role in preventing foreign bodies in the nose.*

Keywords: *foreign body at nasal cavity; foreign body button battery at nasal cavity; buttonbattery; septum perforation*

INTRODUCTION

In emergency setting the foreign bodies in the ear, nose, and throat are commonly seen in the medical practice by otorhinolaryngologists, pediatricians, Emergency Department Surgeons and Physicians. Foreign body in the nose is not a very dangerous and life-threatening case that could cause mortality, but the foreign body in the nose can increase morbidity if it is not managed properly. Foreign body in the nose are often found in groups of children but do not rule out the possibility of an adult that is generally experienced by those who had mental retardation, people with mental disorders, alcohol abuse, and old age. [1,2] Cases of foreign body at nose that are often found include beads, shirt buttons, parts of toys, plasticine wax, paper, stones, nuts, lime, and battery.[3–6] The prevalence of foreign bodies in the nasal cavity is more common in men than women with a 3 : 2 ratio.7 In children the most common incident at the age of 2-5 years. Foreign body button battery in nasal cavity From M Djamil Hospital data collected in 2019, there are 6 cases foreign body in nasal cavity, 4 boys and 2 girls and the youngest patient were 3 years old and the oldest was 9 years old.[4,6,8–10]

Foreign body by type can be classified as organic and inorganic foreign objects. Inorganic foreign body as the name suggests are not organic could be in the form of plastic or metal such as beads and parts of toys. Foreign body in the nose are often asymptomatic and can be discovered by chance. Organic foreign substances such as food, rubber, wood, foam are more irritating to the nasal mucosa, causing earlier symptoms.[9,11,12]

A nasal foreign body can cause unilateral nasal discharge especially with unilateral excoriation of the nasal rim. A nasal foreign body usually required 4 days before discharge occurred unless the button battery discharged immediately. Some foreign body in the nose does not have any symptoms for several years. A lot of secretions and retained accompanied by the decay of the foreign body and the process of ulceration caused odor in the nose.[1,2,11]

It is important to ask if there are any witnesses when the children inserted it in diagnosing a foreign body in the nose. The frequent diagnosis of nasal foreign bodies is late because there were no witnesses saw it. In a late cases, the most common symptom is unilateral nasal discharge. [11-13]

For foreign body button battery can cause severe damage to the nasal septum, this is due to the composition of heavy metals, stealing, zinc, silver, nickel, cadmium, and lithium if interacting with the mucosa, will cause reactions that could cause mucosal damage, septal perforation, synechiae, constriction, and nasal cavity stenosis. [11,12]

Button battery is a common household items, powering many electronic devices and toys. Its small and shiny surface make it attractive to the children and easily inserted into various orifices such as the nose, ears, and mouth, as foreign bodies. Button battery is made of metal and contains a variety of corrosive chemicals when contaminated with a humid environment such as the nasal cavity. Button battery in the nasal cavity must be removed immediately and evaluated for complications.[14–16]

The impact of foreign body buttons battery in the nose associated with the length of foreign body in the nose, location of the foreign body attached, the size of foreign body, the power that is still stored in the battery, age of the battery and the

possibility of absorption of heavy metals contained in the battery. Besides the surface of the mucosa attached to the battery anode causes mucosal damage, some septal perforation findings occur due to contact with the anode (negative pole) surface of the button's battery.[4,15]

Early diagnosis and removal of button a battery from the nose are important. Radiological examination in most cases is not required. Most foreign body are radiolucent except metal foreign objects. The other possible diagnoses (such as sinusitis or tumors) it is necessary to consider a computerized tomography (CT scan). [11,17,18]

Debridement, irrigation, and stenting in the operation theatre should be done if there is any evidence of battery leakage or extensive tissue damage. Patients with evidence of secondary infection, mucosal damage, congestion and granulation should receive antibiotics and oral anti-inflammatory drugs.[13]

The purpose of this case report is to provide information on proper management of the case of foreign button battery body in the nasal cavity and to describe how harmful the button battery impacted in the upper airway.

CASE REPORT

Case 1

Reported a case of 5-year-old gilr was brought by her parents to the emergency room at Dr. M. Djamil Padang Hospital on April 22nd, 2019 at 20.00 PM with the chief complaint of inserting button battery into the left nostril 8 hours before admission. The patient was taken to medical facilities and tried to remove the foreign body but was unsuccessful and then she was referred to Dr. M. Djamil Hospital Padang. There are blackish-brown secretions from the patient's right nostril since 6 hours ago. There was no bleeding from the nose, no history of choking, no shortness of breath and no nausea-vomiting.

On physical examination found the general condition was moderately ill, composimentis. In anterior rhinoscopy examination, in the right nasal cavity was wide, inferior and middle turbinate were eutrophy, no secretions, and no foreign objects, in the left nasal cavity, was narrow, visible blackish-brown secretions, necrotic tissue in the inferior turbinate, middle turbinate was difficult to assess, there was foreign body silvery coloured between inferior turbinate and septum.

The patient was diagnosed with a foreign body (suspected button battery) on the left nasal cavity and was performed extraction foreign body with hook extractor and succeeded (Figure. 1) and then patients are planned for debridement of necrotic tissue under general anaesthesia.

Figure. 1. Foreign body button battery after removal

The operation was performed at 01:45 AM on April 23rd, 2019. Patient in the supine position on the operating table under general anesthesia. Performed aseptic and antiseptic procedures in the operation area. Performed adrenaline : lidocaine nasal packing 1:4 on the nasal cavity. Performed evaluation by 0^0 scope. Evaluation of the left nasal cavity, nasal

was narrow, inferior turbinate was edema, middle turbinate was difficult to assess, there was discharge, blackish crusts and necrotic tissue at 2/3 anterior of the inferior turbinate, septum and nasal cavity floor and septal cartilage expose. Necrotic tissue was removed by using nasal curettage and irrigated with isotonic saline. Evaluation before the end of operation at the left nasal cavity showed no necrotic tissue, no septal perforation and exposed cartilage. An anterior nasal packing was placed in the left nasal cavity. Operation completed.

After the foreign body extraction procedure, the patient is treated with ceftriaxone injection 2 x 400 mg (iv), dexamethasone injection 2x3mg (iv), Paracetamol 3 x 150 mg (orally). On the second day, the anterior nasal packing was removed. Evaluation of nasal cavity there was narrow, no clotting, no active bleeding, no necrotic tissue, and there were erosion and hyperemic mucosa of septal without septal perforation. Patients were discharged and were given Paracetamol 3 x 150 mg (orally) and Cefixime 2 x 80 mg (orally) and nasal irrigation with 0.9% saline.

Control 5 days after the operation. Evaluation of nasoendoscopy left nasal cavity founded postoperative wound at 2/3 to anterior of inferior turbinate nasal cavity and nasal septum, with yellowish crust and mucoid secret. Patients are advised to control in one week and got cefixime 2 x 80 mg (oral) and nasal irrigation with 0.9% saline.

One week after evaluation there were founded perforation of septum 2/3 anterior of left nasal cavity and synechia on inferior turbinate left nasal cavity. The synechia released and patient suggested to control one week after. The patient suggest to performed nasal irrigation with 0,9% saline.

Evaluation at the 3rd weeks after operation founded perforation on 2/3 nasal septum and the synechia was released (Figure.2). And the patient was suggested to control 3 months later to evaluate the septal perforation and any complaint caused by septal perforation.

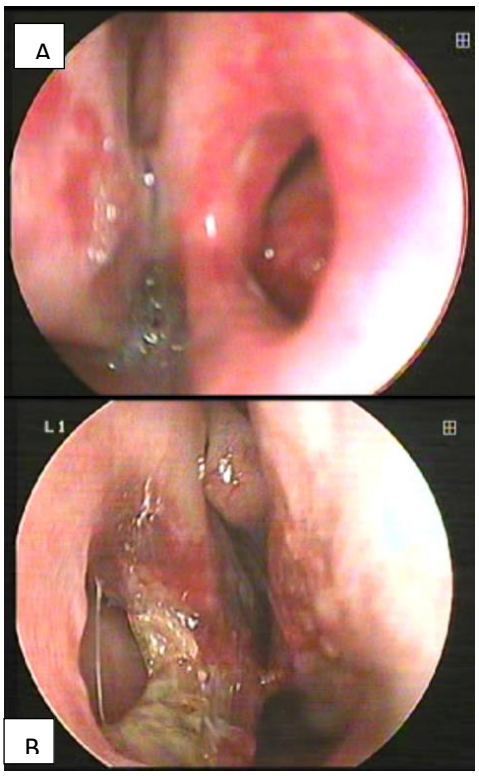

Figure 2. Nasoendoscopy 3rd weeks after surgery show perforation on the septum A. Right nasal cavity B. Left Nasal cavity

Case 2

It was reported that a 4-year-old male patient was brought by his parents to the emergency department at Dr. M. Djamil Padang General Hospital on April 25th, 2019 at 00.30 AM with the chief complaint of inserting a button battery into his right nasal cavity since two and half hours before admission. The patient's mother saw there was a foreign body in the patient's right nasal cavity, then the patient was taken to a clinic and tried to

remove the foreign body but was unsuccessful and then referred to Dr. M. Djamil Hospital. There is no bleeding from the nose, no history of choking, no shortness of breath and no nausea-vomiting.

On physical examination, the general condition was moderately ill, composmentis non-cooperative, At the ENT examination, no abnormalities were found in the ear and throat. On anterior rhinoscopy examination. The right nasal cavity was narrow there was silvery-colored foreign body between inferior turbinate and septum, media turbinate was difficult to evaluate, there were blackish-brown secretions. The left nasal cavity was wide, no secretions and no foreign body.

The patient was diagnosed with a foreign body (suspected button battery) on the right nasal cavity, and then the foreign body was extracted successfully (Figure. 3). The nasal cavity was wide the inferior turbinate appeared necrotic tissue, middle turbinate was edema, necrotic tissue in the anterior septum. Patients are planned for exploration and debridement of necrotic tissue under general anesthesia.

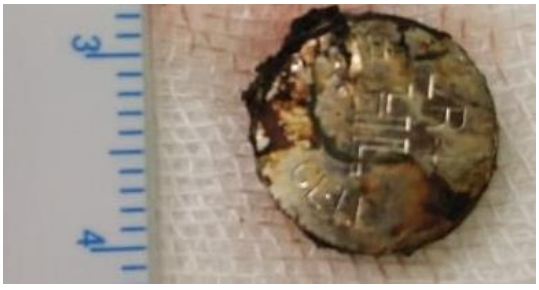

Figure. 3. Foreign body button battery after removal

Debridement of necrotic tissue is performed on April 25th, 2019 at 06.00 AM. Patient in a supine position on the operating table under general anesthesia. Performed aseptic and antiseptic procedures on the operation area. Performed adrenaline and lidocaine nasal packing 1:4 on the right nasal cavity. Performed evaluation by 0^0 scopes. Evaluation of the right nasal cavity showed inferior turbinate there was necrotic tissue blackish colored at 1/3 anterior, middle turbinate was eutrophic, there were secretions, black crusts and necrotic tissue blackish colored from 1/3 anterior septum. No septal perforation was seen. The left nasal cavity was wide, inferior and middle turbinate was eutrophic, with no secretions, no perforated septum. Necrotic tissue was cleaned as much as possible by using nasal curettage and irrigated with isotonic saline. Evaluation before the end of operation at the right nasal cavity showed no necrotic tissue, no septal perforation, and exposed cartilage. An anterior nasal packing were placed in the right nasal cavity.

The patient was treated and given ceftriaxone injection 2 x 250 mg (iv), Paracetamol 3 x 120 mg (orally). On the second day, the anterior tampon was removed. Evaluation of nasal cavity there was narrow, no clotting, no active bleeding, no necrotic tissue, and there were erosion and hyperemic mucosa of septal, no septal perforation. Patients were discharged and were given Paracetamol 3 x 120 mg (orally) and Cefixime 2 x 60 mg (orally) and nasal irrigation with 0.9% saline.

Control 5 days after the operation. Evaluation on nasoendoscopy founded middle turbinate and inferior turbinate were eutrophy and found erosion on 1/3 anterior of the nasal septum (Figure. 4). Evaluation of the right nasal cavity at one week later, founded healing wound on septum without perforation, middle turbinate and inferior turbinate were

eutrophy. Patient was discharged from the ORL-HNS outpatient clinic.

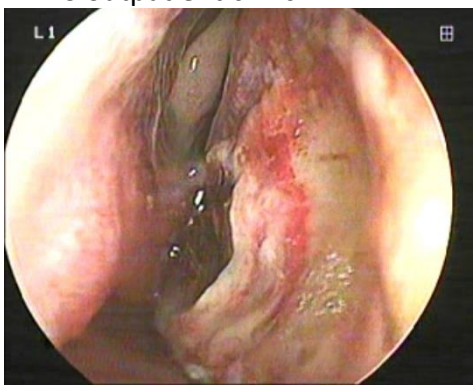

Figure 4. Nasoendoscopy 5 day after surgery

DISCUSSION

Reported cases of 2 foreign body button batteries in the nasal cavity. The first patient was 4-year-old boy patient with a foreign body button battery and the second patient 5-year-old-girl with a foreign body button battery at the right nasal cavity. There was septal perforation complication founded during follow-up in one case. The first case of a foreign body button battery was in 1977 and involved a child who swallowed a camera battery that lodged in the proximal esophagus.15 Button battery in the nose are being reported in the literature in 1981.[19]

In children the most common foreign body incident at the age of 2-5 years. The common sites of impacted of foreign body include ear canal, nasal cavity, and upper aerodigestive tract. The nose is an easily accessible anatomic region. Children are particularly attracted and deceived by its smooth and glossy appearance, therefore parents and caregivers should take extra care in looking after their children. There are so many devices use button battery such as watches, digital planners, hearing aids, electronic games, and new electronic gadgets. [7,15,20]

Most authors agree with the need for the urgent removal of batteries lodged in the nasal cavity. Some authors emphasized that unskilled attempts to remove the foreign body in the emergency department, by personnel without appropriate training, may result in disaster, the foreign body may be displaced backward and may even reach the nasopharynx with a risk of inhalation.14 In this case, we can perform immediate removal of the foreign body to reduce the battery duration on the nasal cavity.

The septal perforation incident is multifactorial. The increased time interval between insertion and removal, increases the risk of a septal perforation. Ongoing electrical and thermal burning will occur as long as the electrical circuit is intact and, as the length of time increases, the chemicals released by erosion of the metal part of the battery may also contribute to further morbidity. The thickness of the battery may be important. The orientation of the battery in the nasal cavity is also reported to be important, with tissue at the anode pole (negative) more likely to be damaged, if the anode pole is against the septum, perforation is more likely.[21] In this case report both patient the anode position contact with the nasal septum that caused damage on the septum. Because of the several damage that occurred caused by impacted button battery, the mechanism that explains the damage are : [3,4,13,15]

1. Burns due to electricity caused by low voltage electrical current that occurs between the anode and the cathode in the mucosa
2. Liquefactive necrosis caused by leakage of alkaline electrolytes that react to proteins and saponification effects on fluids and necrotic effects on tissues

3. Toxicity caused by the absorption of heavy metals contained in batteries.
4. Necrosis caused by pressure from a foreign body against the surrounding tissue, especially in the narrow nostrils.

Loh14 in his report founded variation of complication from nasal mucosa necrosis to large septal perforation. He found septal perforation complication in more than 7 hours duration battery in the nasal cavity, severe complication large septal perforation and facial cellulitis found in 3 days of duration battery in nose. Nadhim17 reported such variation complications in 15 patients that evaluated. He found variation complication like mucosal edema and ulceration, synechia, septal perforation, saddle nose base on duration battery on nasal cavity, septal perforation was noted in 4 children, nasal adhesion in 2 boys, saddle nose in 1 boy, nasal stenosis in 1 boy, and 7 children without complications. According to Tuang7 nasal mucosa injury ensues as early as 3 hours following an embedded button battery.7 In this case, the first patient with battery contact duration in 2 ½ hour we already founded mucosal injury on the septum and turbinate and the second patient with 8-hour battery contact we found a mucosal injury on turbinate and the cartilage septal expose due to this injury. The septum perforation and synechia occur in the second patient that founded in 2 weeks after the operation. The synechia treated with release synechia in the outpatient clinic and the patient got nasal irrigation. A week after, the synechia healed.

From this case, we have difficulty in finding the age of battery that can be a serious aspect of mucosal injury due to the potential power in the battery.Medical professionals, especially general practitioners and ENT specialists, must not only have the ability to manage these cases, the availability of their personnel at service centers in remote areas is also very important so that these cases are handled quickly and have an impact on reducing the resulting complications.

CONCLUSION

The button battery should be treated as a life-threatening foreign body because of electrochemical content and rapid tissue damage. Button battery in the nasal cavity can cause various complications in the form of nasal perforation, this depends on the length of mucosal contact with the battery, the age of the battery. Immediate diagnosis and detection of accidental foreign body impaction are the key in the management of foreign bodies. General anesthesia is used if there are complications or if the patient is not cooperative. Prevention plays an important role in preventing foreign bodies button battery in the nose.

Medical professionals, especially general practitioners and ENT specialists, must not only have the ability to manage these cases, the availability of their personnel at service centers in remote areas is also very important so that these cases are handled quickly and have an impact on reducing the resulting complications.

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CONFLICT OF INTEREST

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