



Button battery in the nasal cavity: A case report

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GSC Biological and Pharmaceutical Sciences, 2025, 31(03), 035–039

Publication history: Received on 23 April 2025; revised on 01 June 2025; accepted on 04 June 2025

Article DOI: <https://doi.org/10.30574/gscbps.2025.31.3.0212>

Abstract

Background: Button batteries represent a hazardous nasal foreign body encountered in otorhinolaryngology due to their electrochemical properties. Their small size and accessibility make accidental insertion into the nasal cavity common among children. Rapid tissue damage can occur, making early detection and intervention critical.

Case Description: A 3-year-old female patient was brought to the hospital approximately one hour after she had inserted a foreign item into her left nasal passage. Clinical and radiological assessments identified the object as a button battery. Due to the patient's lack of cooperation, removal was postponed and ultimately carried out under general anesthesia 11 hours after insertion. During surgery, necrotic tissue was identified in the anterior region of both the inferior turbinate and the nasal septum, but without evidence of septal perforation. Postoperative management included antibiotics, corticosteroids, and nasal irrigation. Regular follow-up was advised. The patient recovered well, with residual mucosal necrosis noted on the inferior turbinate.

Conclusion: Prompt diagnosis and removal of intranasal button batteries are essential to prevent severe complications. Radiographic imaging, endoscopic-guided extraction, and proper postoperative care are key components of management. Caregiver education is vital to prevent similar incidents.

Keywords: Button Battery; Nasal Foreign Body; Nasal Trauma; Otorhinolaryngological Emergency

1. Introduction

Button batteries represent one of the most hazardous foreign bodies encountered in otorhinolaryngology, particularly in pediatric patients. It is rare and it is an otorhinolaryngological emergency. Due to their small size and widespread use in household items and children's toys, these batteries are easily accessible and often inserted into the nasal cavity by curious children. Once lodged in the nose, button batteries can rapidly cause significant mucosal damage through a combination of electrical discharge, pressure necrosis, and leakage of alkaline contents, leading to corrosive tissue injury [1–4].

The clinical presentation can vary depending on the duration of impaction but commonly includes irritation of the nose, pain, a sensation of burning, foul-smelling brown nasal drainage, along with nasal bleeding. In delayed cases, signs of tissue necrosis may also be observed. Prompt recognition and urgent removal by an experienced otorhinolaryngologist are critical to prevent serious complications, including septal perforation or saddle nose deformity [1–4].

We report a rare and instructive case of a button battery retained in the nasal cavity, highlighting the importance of early diagnosis, the characteristic clinical features, and the approach to management.

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2. Case report

A 3-year-old girl was brought by her parents to the emergency room at Sanjiwani Public Hospital on May 4th, 2025 with the chief complaint of inserting a foreign object into the left nostril 1 hour before admission. According to her parents, she consciously inserted the foreign object to her nostril and was luckily seen by his older brother. Her brother immediately informed their parents. The mother then saw what looked like a shiny metallic object in her left nose. Her parents immediately took her to the emergency room. The child did not report pain, nasal bleeding, choking, shortness of breath, nausea, or vomiting.

The child remained conscious and alert with stable vital signs on examination. No chest retraction or wheezing was found on chest examination. Anterior rhinoscopy examination was performed, a shiny metallic object was nearly visible between the left inferior turbinate and septum, it was obscured by serous nasal discharge. Water's and lateral view of skull X-ray was done showed a circular radiopaque foreign body a resemblance of a button battery on left nostril (Figure 1).



Figure 1 Waters view of plain nasal radiograph showing a step-off sign (A) and lateral view showing a circular radiopaque foreign body (B)

Due to the child's lack of cooperation, further examination was challenging. The child was hospitalized and was scheduled for foreign body removal under general anesthesia approximately 11 hours after insertion. Left nasal cavity evaluation was performed using 0o rigid endoscopic scope and showed a brownish nasal discharge, the discharge then cleaned using suction, embedded button battery was visible between the left turbinate and septum. Button battery then extracted with a hook extractor under scope guidance (Figure 2). After successfully extracted, the nasal cavity then irrigated as much as possible by using saline solution.

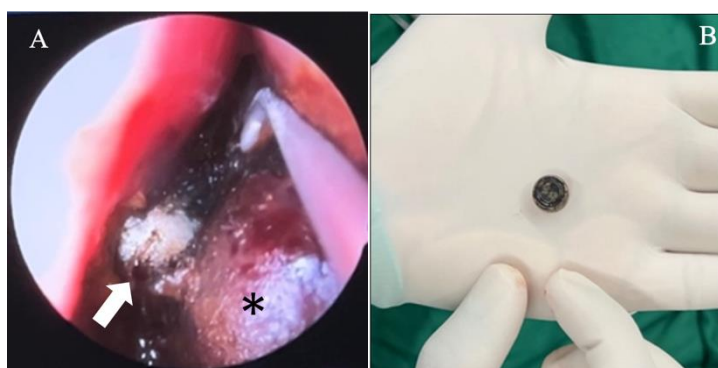


Figure 2 Extraction of button battery using a hook; left anterior part of inferior turbinate (*), a button battery (arrow) (A), Button battery retrieved from the nasal cavity (B)

Final evaluation was done before the end of operation and showed there was necrosis tissue and inflammation of the anterior part inferior turbinate, and also the anterior part of the septum, no septal perforation was seen (Figure 3). An anterior nasal packing was placed in the left nasal cavity.



Figure 3 The anterior part of the inferior turbinate appears to be more severely damaged compared to the septum. No septal perforation was seen

The child was hospitalized for one day and treated with Antibiotic injection, analgetic injection, oral decongestant. The child then discarded and was prescribe with an oral antibiotics, oral decongestant, oral corticosteroids, nasal sprays, and vitamins. The nasal packing was removed on the second day after discharged.

Patients were advised to have a regular follow-up. Two weeks postoperatively, evaluation revealed mucosal crusting and slight discoloration in the left nasal cavity. We also found mucosal necrosis of inferior turbinate. No evidence of synechiae or septal perforation was observed (Figure 4). The patient was advised to perform routine nasal irrigation at home using 0.9% NaCl solution, and a nasal spray was prescribed.



Figure 4 The left nasal cavity showed no sign of synechiae or septal perforation. Mucosal necrosis of the inferior turbinate was seen

3. Discussion

Foreign bodies in the nasal cavity are frequently seen in pediatric patients within otorhinolaryngology and emergency settings. Children's natural curiosity often results in accidental insertion of objects into their noses. Although button batteries lodged in the nasal passage are uncommon, they represent a medical emergency in this specialty. The age group most affected by button battery ingestion ranges from infancy to early childhood (0–5 years), with the highest occurrence among toddlers aged 1 to 2 years. There is a slight predominance of males over females, with a reported ratio of approximately 3 to 2. Failure to promptly remove these batteries can result in serious tissue injury and complications [4,5].

While cases of witnessed or suspected insertion or ingestion should always prompt immediate referral for further evaluation, occult ingestions often present with vague, non-specific symptoms and may only be diagnosed retrospectively. The clinical signs of a nasal foreign body can be subtle and are frequently overlooked by clinicians. Thorough history-taking and careful physical examination are essential and may offer vital clues to the presence of a foreign object. Clinicians must maintain a high index of suspicion, particularly when assessing young children or individuals with intellectual disabilities. The signs and symptoms can vary widely, ranging from nasal irritation, discomfort, and a burning feeling in the nose to foul-smelling, abundant brownish nasal discharge and nosebleeds. Some children might show no symptoms if the presentation is delayed, whereas others may exhibit non-specific symptoms such as pain, coughing, vomiting, irritability, fever, and an increased heart rate [4,5]. In this case, the patient was

asymptomatic at presentation, with no nasal bleeding, discharge, or pain. Although no specific clinical signs were observed, a clear history of foreign body insertion was reported by the patient's brother.

Foreign bodies in the nasal cavity are frequently identified through anterior rhinoscopy. Accurate diagnosis relies heavily on a thorough history, preferably witnessed, along with nasal endoscopy and imaging studies. Radiographs taken in both anteroposterior and lateral views typically show a circular, radiopaque object exhibiting characteristic signs such as a 'halo' or 'double ring' appearance, or a 'step-off' at the junction between the anode and cathode [4,6]. In our case, the 'step-off' sign was clearly observed.

The position of the battery within the nasal cavity plays a significant role in the extent of injury. When the narrower negative pole of the battery contacts the mucosal tissue, it elevates the local pH by producing hydroxide ions through electrical discharge. This results in tissue damage caused by alkaline liquefactive necrosis. Consequently, the most severe damage typically occurs on the anode side of the battery. Determining the battery's orientation is therefore crucial for anticipating which nasal structures might be affected and at risk for complications [4,6–8]. In this case we found that the anode side of the battery was facing the inferior turbinate, causing more severe tissue damage to the inferior turbinate. No septal perforation was found.

Several proposed mechanisms explain how these batteries cause mucosal injury, including the spontaneous leakage of electrolytes leading to liquefactive necrosis and progressive tissue damage, corrosive effects from mercury oxide release, pressure necrosis caused by the lodged foreign object, and electrical burns resulting from the generated electric current [1,9].

The presence of a button battery lodged in the nasal cavity can result in various complications, including ulceration of the mucosa and septum, inflammation of the cartilage (chondritis), atrophic rhinitis, saddle nose deformity, and collapse of the nasal ala. Studies have indicated that the longer the battery remains impacted, the higher the risk of serious damage. Ulceration of the mucosa, turbinate, and nasal septum can develop within 3 to 6 hours of impaction. The timing of removal is crucial. Literature suggests mucosal injury may begin within 3–4 hours, with full-thickness necrosis occurring as early as 7–12 hours, depending on battery orientation and contact site. Necrosis of the inferior turbinate may happen within 24 hours. Previous reports have documented mucosal damage as early as 3 hours, with perforation possible after 7 hours. Additionally, secondary infections affecting surrounding areas such as sinusitis, periorbital cellulitis, otitis media, and meningitis may occur [1–4].

A button battery impacted in the nasal cavity requires immediate removal. If the foreign body is visible and the patient is cooperative, extraction through the anterior nares may be performed without anesthesia. However, untrained attempts to remove the object can result in complications such as displacement into the nasopharynx with risk of aspiration. Therefore, prompt endoscopic removal under general anesthesia is recommended in the following situations: (1) if the patient is uncooperative or highly apprehensive; (2) if significant bleeding is anticipated, for example, when the battery is firmly embedded in granulation tissue; (3) if the foreign body is located posteriorly, posing a risk of being pushed into the nasopharynx; and (4) if the foreign body is suspected but not visualized, necessitating comprehensive nasal cavity examination and management.

In instances where the button battery remains lodged in the nasal cavity for an extended period, its presence may be obscured by serosanguinous discharge and crust formation, complicating the removal process. In such cases, extraction under general anesthesia becomes necessary. Following removal, thorough irrigation with normal saline is advised to eliminate any residual alkaline substances that may have leaked from the battery. Continued follow-up is crucial to monitor for potential long-term complications, including septal perforation, formation of nasal synechiae, mucosal ulceration, and tissue necrosis. The length of follow-up should be determined based on the extent of mucosal injury and the presence of any subsequent complications. Clinicians are encouraged to educate families about the importance of keeping button batteries out of children's reach to prevent such incidents [4,6,10,11].

In the case presented, endoscopic removal was performed under general anesthesia due to several factors: the child's lack of cooperation, limited visualization caused by serosanguinous secretions, and the potential risk of battery displacement into the nasopharynx, which could result in more severe outcomes. Post-removal, saline irrigation was conducted, and the patient was scheduled for routine follow-up. Mucosal necrosis of the inferior turbinate was observed in this case.

4. Conclusion

The presence of a button battery in the nasal cavity constitutes a medical emergency with potentially life-threatening consequences due to its electrochemical characteristics and the significant risk of rapid and extensive tissue damage. Early recognition supported by a detailed patient history, comprehensive clinical examination, and appropriate radiologic evaluation followed by prompt extraction is critical to ensure optimal outcomes. Any delay in intervention may lead to serious complications, including perforation of the nasal septum, formation of nasal adhesions (synechiae), mucosal erosion, and necrosis. Therefore, raising awareness among parents and caregivers regarding the severe hazards posed by button batteries is of paramount importance.

Compliance with ethical standards

Disclosure of conflict of interest

The authors declare that there are no conflicts of interest regarding the publication of this case report.

Statement of informed consent

Written informed consent was obtained from the patient's parents for the publication of this case report and all accompanying images.

References

- [1] Soumick Ranjan Sahoo. Button Battery Nose A Case Report. RGUHS Journal of Medical Sciences. 2025;15(1):72–4.
- [2] Shaffer AD, Jacobs IN, Derkay CS, Goldstein NA, Giordano T, Ho S, et al. Management and Outcomes of Button Batteries in the Aerodigestive Tract: A Multi-institutional Study. Laryngoscope. 2021 Jan 1;131(1):E298–306.
- [3] P. Sebastian G, Kaliyan R, Devadason P. Button battery foreign body among children: a case series. International Journal of Otorhinolaryngology and Head and Neck Surgery. 2020 Apr 21;6(5):978.
- [4] Wan Draman WNA, Ismail H, Ismail H, Nik Mohamad NK, Mohamad I. Intranasal button battery: A case series. Pediatria i Medycyna Rodzinna. 2019;15(1):88–92.
- [5] Tuang GJ, Hussin NRN, Abidin ZAZ. Unilateral rhinorrhoea and button battery: a case report. Fam Med Community Health. 2019 Jun 1;7(3).
- [6] Park SJ, Burns H. Button battery injury: An update. The Australian Journal of General Practice (AJGP). 2022;51(7).
- [7] Sancaktar ME, Bayraktar C, Bakirtaş M. Injury Mechanism of Button Batteries in the Nasal Cavity and Possible Mitigation Strategies During Impaction. Laryngoscope. 2020 Oct 1;130(10):2487–93.
- [8] Sethia R, Gibbs H, Jacobs IN, Reilly JS, Rhoades K, Jatana KR. Current management of button battery injuries. Vol. 6, Laryngoscope Investigative Otolaryngology. John Wiley and Sons Inc; 2021. p. 549–63.
- [9] Sahoo SR, Datta N. Button battery: a case of neglected foreign body nose. International Journal of Otorhinolaryngology and Head and Neck Surgery. 2022 Feb 24;8(3):270.
- [10] Bakshi SS. A button battery in the nose. Intern Emerg Med. 2019 Jan 24;14(1):185–6.
- [11] Irfandy D, Budiman B. Impacted “Button Battery” in The Nose - a Time Management Comparison. Majalah Kedokteran Andalas [Internet]. 2023; Available from: <http://jurnalmka.fk.unand.ac.id>