

CASE REPORT

Delayed Recognition of an Intranasal Button Battery in a Child with Autism Spectrum Disorder: A Case Report.

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Abstract

Intranasal foreign bodies (IFBs) are common in children, and button battery impactions represent a surgical emergency due to the risk of rapid tissue destruction via electrochemical burns and liquefactive necrosis. Diagnosis is challenging in children with neurodevelopmental disorders, where unreliable clinical histories and difficult physical examination are common. We report a 9-year-old Malay boy with autism spectrum disorder (ASD) and communication limitation who presented with a two-month history of alternating, foul-smelling, greenish nasal discharge. The symptoms developed after an episode of being punched by a classmate, leading to epistaxis. There was no reported foreign body insertion. Initial assessments at the health clinic and the emergency department attributed the rhinosinusitis and the epistaxis to unknown causes respectively. Subsequent otorhinolaryngology (ORL) assessment was initially limited by patient distress and poor tolerance of the examination, showing only inferior turbinate hypertrophy and old blood clots. Persistent symptoms prompted a nasal endoscopy during a subsequent visit, which identified bilateral purulent discharge and a suspicious foreign body. An X-ray confirmed a button battery. The diagnosis was revised to intranasal button battery impaction with suspected septal perforation, and urgent foreign body removal under general anaesthesia was arranged. The child underwent successful removal of the battery, revealing a 5 x 10 mm nasal septal perforation and right inferior turbinate absence with granulation tissue. This case highlights the importance of maintaining a high index of clinical suspicion for IFBs in children presenting with chronic foul-smelling nasal discharge in the absence of witnessed or reported foreign body insertion. In patients with ASD, where communication barriers may mask clinical presentation, clinicians should prioritize definitive imaging or bedside endoscopy to ensure early recognition and prevent complications such as septal perforation.

Keywords: *Button battery, case report, intranasal foreign body, septal perforation.*



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Introduction

Intranasal foreign bodies are common in children especially aged 1-5 years. While most foreign objects (such as beads or organic seeds) cause localized mucosal inflammation and can be safely managed in an outpatient setting, a button battery generates an electrical circuit that produces hydroxide ions, which create a strongly alkaline local environment and cause liquefactive necrosis. Pressure, local dehydration, and leakage of battery contents may further contribute to injury. For this reason, an intranasal button battery should be treated as an emergency as it can penetrate mucosal and cartilaginous tissues within a few hours [1-3].

The usual presentation of an impacted nasal foreign body is unilateral nasal obstruction or foul-smelling purulent rhinorrhoea, sometimes accompanied by epistaxis. Nevertheless, the diagnosis may be missed when insertion is not witnessed, symptoms are atypical, or examination is incomplete. Children with developmental or communication difficulties may be especially vulnerable to delay because they may be unable to describe the event or tolerate nasal endoscopy [4,5].

We report a complex case of an unwitnessed intranasal button battery in a 9-year-old child with autism spectrum disorder who presented with chronic bilateral malodorous nasal discharge. The case is notable for the uncertainty surrounding the duration of impaction, the limitations of outpatient assessment, and the extensive septal and turbinate injury found at surgery.

Case report

A 9-year-old Malay boy, previously diagnosed with ASD with a communication limitation, was referred to the Otorhinolaryngology clinic. For approximately two months, the child had been experiencing intermittent greenish, foul-smelling nasal discharge, alternating between the right and left nostrils. Parents reported that the child had been punched by a classmate prior to the symptoms, which resulted in an episode of epistaxis. Furthermore, they were firm in their

denial of any possibility of foreign body insertion. The child did not present with other common sino-nasal symptoms, such as fever, cough, sneezing, snoring, noisy breathing, or facial pain. Initially, the family sought medical attention at a local health clinic, where the child was reportedly treated with antibiotics and antihistamines. Approximately one month later, the family sought further medical attention at the emergency department due to persistent symptoms. At this visit, the clinical history was focused primarily on recurrent epistaxis. The child was reported to have intermittent right-sided epistaxis for one month following an episode of being punched in the nose. Local examination revealed a right nasal polyp, with no foul-smelling discharge, active bleeding, or other signs of infection. The child was subsequently referred to the ORL department for outpatient assessment and definitive nasal endoscopy, which was scheduled one month later. During the initial visit to the ORL clinic, the child was understandably unable to tolerate the examination due to distress. A simple anterior nasal inspection was attempted, which noted left inferior turbinate hypertrophy and what appeared to be an old blood clot. However, a complete and thorough nasal endoscopy could not be performed at that time because the child could not tolerate the procedure. The child was treated as having allergic rhinitis with traumatic nasal mucosal injury and was prescribed a one-week course of oral amoxicillin-clavulanate 612mg twice daily, oxymetazoline nasal spray twice daily for five days, and loratadine syrup 5 mg as required. One month later, due to the persistent purulent and malodorous nasal discharge, the ORL team successfully performed nasal endoscopy for further evaluation. The procedure revealed copious purulent discharge in both nasal cavities and a suspicious, partially obscured foreign body within the nasal passage. This finding shifted the diagnostic consideration towards an intranasal foreign body rather than a trauma-related complication. A radiograph (occipito-mental view) was subsequently performed on the same day, which demonstrated the characteristic step-

off profile of a button battery, confirming the diagnosis of a retained button battery in the nasal cavity (Figure 1). In view of the suspected nasal septal injury, the child was directly admitted for urgent examination under anaesthesia and removal of the foreign body.

The procedure was performed approximately 11 hours after the diagnosis was established. Intraoperatively, a 0-degree rigid nasoendoscope revealed that the button battery was positioned perpendicular to the nasal septum and embedded within the cartilaginous portion of the perforated nasal septum. The button battery was successfully removed, revealing a nasal septal perforation measuring approximately 5x10 mm in diameter. The right inferior turbinate was absent, with multiple friable granulation tissue noted within the right nasal cavity. These granulation tissues obscured the right posterior choana, preventing further endoscopic examination. On the left side, the inferior turbinate was minimally eroded, and the scope was advanced to the posterior left choana. The affected nasal cavity was thoroughly irrigated with warm water, followed by achievement of haemostasis and application of Surgicel.

On postoperative day 1, the child remained well with no further episodes of epistaxis. He was discharged with a one-week course of oral amoxicillin-clavulanate 612mg twice daily, saline nasal irrigation 120 mL three times daily for two weeks, and oxymetazoline 0.05% nasal spray twice daily for five days. Follow-up was scheduled for two weeks later; however, the child did not attend the scheduled appointment and was subsequently lost to follow-up. Three attempts were made to contact the parent by telephone. During the last successful contact, the patient reported being asymptomatic and parents stated that there was no intention to attend further follow-up unless new symptoms developed. The parent was advised of the importance of continuing the recommended follow-up and was provided with appropriate safety-netting advice to seek medical attention if any new or worsening symptoms occur.

The sequential clinical course, including the multiple healthcare encounters and the cumulative diagnostic delay of approximately three months from symptom onset to definitive diagnosis, is summarised in Figure 2.

Discussion

IFBs are common in children, but button batteries account for only a small proportion. In a 2024 retrospective series of 176 children with nasal button battery impaction, these cases represented 1.16% of all nasal foreign bodies seen at the authors' institution. Almost all affected children were between one and five years of age, and most batteries were identified within 24 hours [1]. Despite their relative rarity, button batteries carry a disproportionate risk of major tissue injury and should be removed immediately once suspected. The principal mechanism of button battery injury is electrochemical rather than simple leakage. Contact between the battery poles and moist mucosa completes an electrical circuit, hydrolysing water and generating hydroxide ions (OH⁻) at the negative pole. The resulting rise in local pH causes liquefactive necrosis of mucosa, perichondrium and cartilage [2,3]. Pressure necrosis, desiccation and leakage of alkaline contents may add to the damage. The severity of injury is influenced not only by contact time but also by battery diameter, residual voltage, orientation and the degree of mucosal contact [6]. Thus, even apparently brief exposures can be harmful, while delayed recognition permits progressive destruction.

The classical clue to a retained nasal foreign body is unilateral foul-smelling rhinorrhoea, with or without obstruction or epistaxis [4]. However, reliance on unilateral symptoms alone can be misleading. Our patient had bilateral malodorous discharge. The battery lay transversely across the septum and had produced a large perforation; communication between both nasal cavities and widespread inflammation provide a plausible explanation for the bilateral presentation. The reported nasal trauma and absence of a witnessed

insertion also created competing explanations for the symptoms.

Alternative diagnoses that may present with chronic bilateral foul-smelling nasal discharge in children include chronic rhinosinusitis, allergic rhinitis with secondary infection, nasal polyposis, and, rarely, granulomatous disease or malignancy. In this case, the persistent unilateral predominance of symptoms, the history of trauma, and the failure to respond to initial medical management all contributed to the eventual diagnosis. Clinicians should maintain a broad differential and consider imaging when symptoms persist despite appropriate treatment.

The child's autism spectrum disorder and associated communication difficulties added complexity to the clinical assessment. The history of possible foreign body insertion could not be readily established, and attempts at rigid nasal endoscopy in the clinic were limited by the child's ability to tolerate the procedures. These factors contributed to the difficulty in obtaining a complete history and performing an adequate initial examination. Developmental disability is recognised as a context in which nasal foreign bodies may be overlooked, particularly when history and examination are limited [5]. In this context, radiographic imaging or examination under anaesthesia was not initially undertaken. This case highlights a practical approach to children with communication or behavioural difficulties who present with persistent offensive nasal symptoms when the initial examination is limited. In such circumstances, early consideration of imaging and examination under anaesthesia may facilitate timely identification of an intranasal foreign body and guide appropriate management.

Plain radiography is not required for every nasal foreign body, particularly when a clearly visible inert object can be removed safely. It becomes valuable when the nature or location of the object is uncertain, when a metallic foreign body is suspected, or when examination is incomplete. Button batteries may show a double-rim or halo appearance on frontal imaging and a step-off

profile on a lateral view. In this case, a step off profile radiopaque object crossing the nasal septum established the need for urgent operative assessment. While plain radiography is often sufficient to confirm a radiopaque foreign body, computed tomography (CT) may be considered when the extent of tissue injury, the presence of complications, or the precise anatomical location of the object needs further clarification. However, CT carries additional radiation exposure and should be reserved for selected cases. In our patient, the diagnosis was confirmed by plain radiography, and the extent of injury was assessed intraoperatively.

The findings intraoperatively were consistent with severe local injury. Septal perforation is a well-recognised complication of nasal button batteries. A 2012 series reported 10 children with septal perforation, while a larger study of impacted button batteries reported preoperative septal perforation in 21.6% of nasal cases [7,8]. In the 2024 series, only a minority required general anaesthesia, but severe mucosal injury and septal perforation remained important complications [1]. Our patient had a septal perforation with marked septal erosion and obstructing granulation tissue. The exact duration of impaction cannot be estimated from these findings, but they indicate substantial electrochemical injury and prolonged local inflammation.

Immediate removal is the essential intervention. Repeated blind attempts should be avoided because they may push the object posteriorly and worsen mucosal injury or increase the risk of aspiration [4,5]. Removal under general anaesthesia is appropriate when the child is uncooperative, the battery is deeply embedded, significant tissue injury is expected, or outpatient removal has failed [1].

Children with major septal injury require continued ORL follow-up. Possible sequelae include chronic crusting, recurrent epistaxis, nasal obstruction, infection, enlargement of the perforation and external nasal deformity [9]. Reconstructive repair may be deferred until

inflammation has settled and symptoms, perforation size, nasal growth and deformity can be assessed. Successful repair using cartilage grafting has been reported, but large defects may require more than one procedure [10]. In this case, a planned repeat examination under anaesthesia and irrigation at two weeks was appropriate because the right posterior nasal cavity was initially obscured by friable granulation tissue.

In this case, the parents preferred to seek further medical attention only if symptoms recurred. Although follow-up with the ORL team was recommended for direct assessment of the septal perforation and evaluation of its healing, primary care has an important role in ensuring continuity of care through ongoing monitoring. The primary care team can monitor for recurrent epistaxis, persistent or recurrent nasal discharge, signs of infection, or other nasal symptoms, and facilitate timely re-referral to the ORL team if concerning symptoms develop. This highlights the importance of an integrated primary care and ORL follow-up approach in ensuring appropriate ongoing care following the removal of an intranasal button battery.

The loss to follow-up in this case is a significant limitation. Without continued ORL surveillance, the long-term outcomes of the septal perforation—such as enlargement, chronic crusting, or nasal deformity—remain unknown. This underscores the importance of clear communication with families about the rationale for follow-up and the potential consequences of non-attendance. Primary care providers should be aware of their role in monitoring these patients and facilitating re-referral when necessary.

This case differs from the usual presentation in several respects. The patient was 9 years old, whereas contemporary series predominantly involve preschool children [1]. The insertion was unwitnessed and its timing could not be established. Bilateral rather than unilateral rhinorrhoea was prominent. Finally, the child's autism spectrum disorder and associated communication difficulties presented additional challenges in obtaining a complete history and

performing outpatient nasal endoscopy. Definitive examination under anaesthesia subsequently demonstrated extensive septal and turbinate damage. These features make the case relevant not only to ORL team but also to primary care, emergency and paediatric clinicians who may first assess chronic malodorous nasal symptoms.

Persistent foul-smelling rhinorrhoea should prompt active exclusion of a nasal foreign body, even when the child is older, symptoms are bilateral or no insertion has been witnessed. When examination is inadequate because of distress, developmental disability or behavioural limitations, repeated inconclusive visits may be more harmful than early imaging and definitive assessment under anaesthesia. Once a button battery is suspected, removal should proceed urgently because tissue injury is rapid and may be irreversible.

Conclusion

An unwitnessed intranasal button battery may present with chronic and atypical nasal symptoms. In this 9-year-old boy with autism spectrum disorder, limited history and poor tolerance of outpatient examination contributed to diagnostic difficulty, while operative assessment revealed extensive septal and turbinate injury. The exact duration of impaction was unknown and should not be equated with the duration of symptoms. This case highlights the importance of maintaining a high index of suspicion for intranasal button battery injury, particularly when the initial examination is incomplete. Where clinical assessment remains limited, timely imaging and, when indicated, examination under appropriate anaesthesia may facilitate early diagnosis and removal of the foreign body. Long-term ORL follow-up is essential to monitor for sequelae such as septal perforation enlargement, chronic crusting, and nasal deformity, and primary care providers play a key role in ensuring continuity of care.

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Ethics

Written consent was obtained from the patient's parent for publication of this case report and the accompanying radiographic image.

Conflict of interest

All authors declare no conflicts of interest.

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Authors' contributions

MA contributed to manuscript preparation, data collection and revision. NHA contributed to the manuscript, review, editing and final approval.



Figure 1. Plain occipito-mental view radiograph demonstrating a clear posteroanterior (PA) view of the facial skeleton. The patient's chin is raised, showing dense petrous ridges of the temporal bone below the maxillary sinuses. A well-circumscribed, radiopaque (bright white/metallic density) foreign object is lodged centrally within the nasal cavity across the septal region. The maxilla and mandible display an unerupted and mixed dentition phase typical of a paediatric patient.

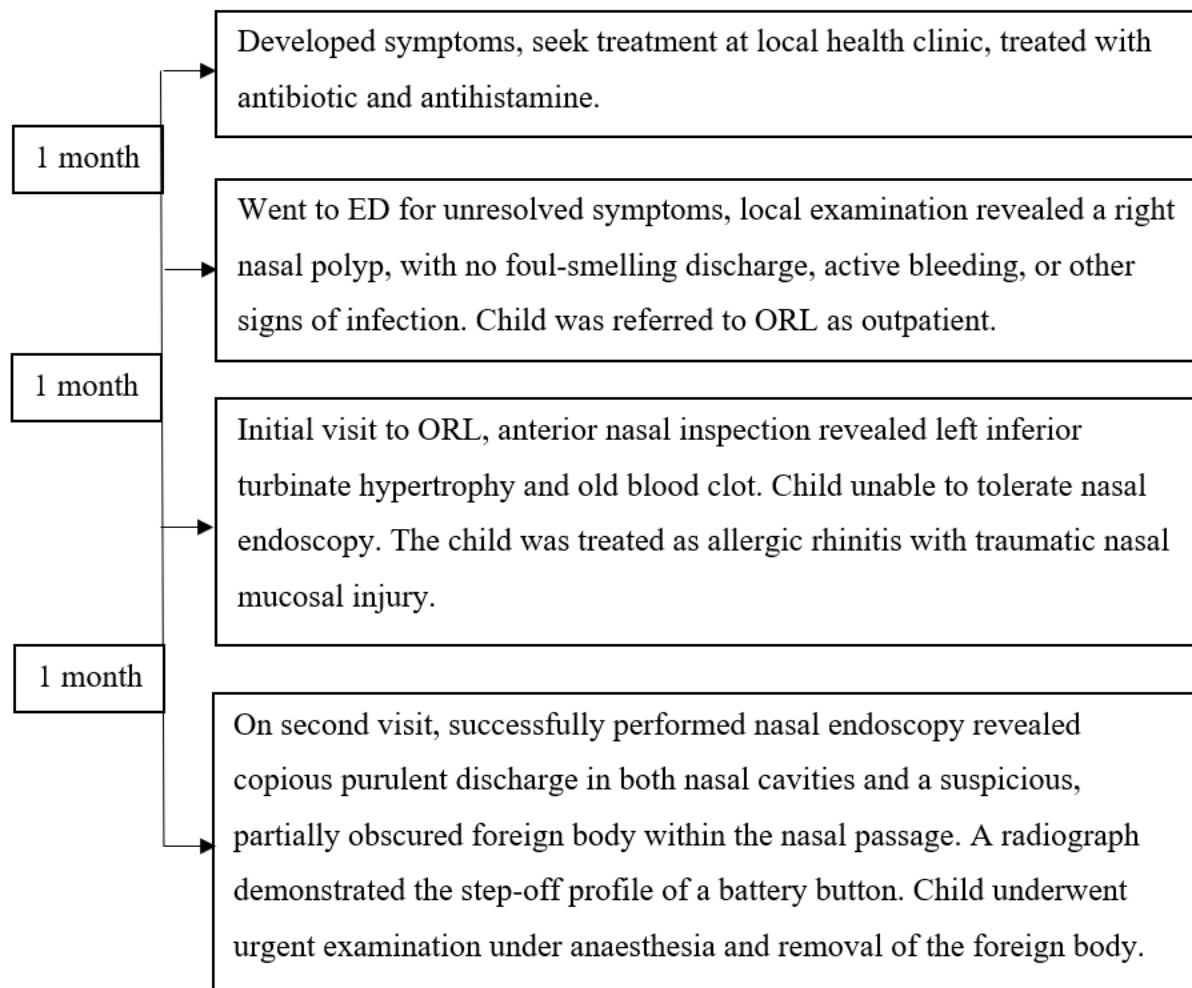


Figure 1. Sequential clinical course and diagnostic delays (timeline).

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