



Nasal Foreign Bodies in Children: A 36-Month Prospective Analysis

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Abstract

Background: Nasal foreign bodies (FBs) are a common pediatric emergency, particularly in young children. This study analyzes the characteristics, management, and outcomes of nasal FB cases in children treated at Almahawil Hospital, Babylon Governorate, Iraq. **Patients and Methods:** A prospective study was conducted on 213 children aged 1–12 years who presented with nasal FBs over 36 months (January 2022–December 2024). Data collected included demographic details, FB characteristics, duration of FB presence, location, prior removal attempts, method of removal, and complications. **Results:** Of the 213 children, 112 (52.6%) were male and 101 (47.4%) were female. Ages ranged from 1–12 years, with most cases in children aged 3–4 years (42.3%). FBs were removed within 24 hours in 38% of cases, while 30% had an unknown duration. Most FBs were found in the right nasal cavity (54.9%), and multiple FBs were noted in 8% of cases. The most common FBs included plastic bullets (34.7%), sponge fragments (20.7%), and beads (10.3%). Removal was performed in the outpatient clinic in 95.8% of cases, with 4.2% requiring general anesthesia. Complications were reported in 36.6% of cases, including nasal vestibulitis, rhinosinusitis, epistaxis, and nasal tissue necrosis. No long-term sequelae were observed.

Conclusion: Younger children are more prone to inserting foreign bodies, which are typically objects found at home. Unilateral nasal discharge in children is highly suggestive of a foreign body. Education for caregivers and healthcare providers on early detection and proper handling is crucial.

Keywords: Nasal foreign bodies, Pediatric foreign bodies, Foreign body removal

الأجسام الغريبة في الأنف عند الأطفال: دراسة مستقبلية لمدة 36 شهرًا

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المستخلص

الخلفية: تُعد الأجسام الغريبة في الأنف من الحالات الطارئة الشائعة في طب الأطفال، خاصةً بين الأطفال الصغار. تهدف هذه الدراسة إلى تحليل خصائص الحالات وطرق التعامل معها ونتائج علاج الأطفال المصابين بأجسام غريبة أنفية في مستشفى المحاول، محافظة بابل، العراق.

المرضى والطرق: أجريت دراسة مستقبلية على 213 طفلًا تتراوح أعمارهم بين 1-12 عامًا والذين راجعوا المستشفى بسبب أجسام غريبة أنفية خلال 36 شهرًا (من يناير 2022 إلى ديسمبر 2024). تضمنت البيانات التي تم جمعها التفاصيل الديموغرافية، وخصائص الجسم الغريب، ومدة بقائه، وموقعه، والمحاولات السابقة للإزالة، وطريقة الإزالة، والمضاعفات الناتجة.

النتائج: من بين 213 طفلًا، كان 112 (52.6%) ذكورًا و101 (47.4%) إناثًا. تراوحت أعمار المرضى بين 1-12 عامًا، وكانت النسبة الأكبر في الفئة العمرية 3-4 سنوات (42.3%). تم إزالة الأجسام الغريبة خلال أول 24 ساعة في 38% من الحالات، بينما كان 30% مجهولي المدة. وجدت أغلب الأجسام الغريبة في التجويف الأنفي الأيمن (54.9%)، ولوحظت أجسام غريبة متعددة في 8% من الحالات. أكثر الأجسام الغريبة شيوعًا كانت الرصاص البلاستيكي (34.7%)، تليها قطع الإسفنج (20.7%)، ثم الخرز (10.3%). أُجريت إزالة الأجسام الغريبة في 95.8% من الحالات في العيادة الخارجية، بينما تطلبت 4.2% من الحالات التخدير العام. وُجدت مضاعفات في 36.6% من الحالات، بما في ذلك التهاب دهليز الأنف، التهاب الجيوب الأنفية، الرعاف، وتخرر أنسجة الأنف، ولم يتم تسجيل أي مضاعفات طويلة الأمد.

الاستنتاج: الأطفال الصغار أكثر عرضة لإدخال الأجسام الغريبة إلى أنوفهم، وغالبًا ما تكون هذه الأجسام أشياء متوفرة في البيئة المنزلية. يُعد سيلان الأنف من جهة واحدة مؤشرًا قويًا لوجود جسم غريب. يُعد تثقيف مقدمي الرعاية الصحية والأهل حول الاكتشاف المبكر والتعامل الصحيح أمرًا ضروريًا للوقاية وتقليل المضاعفات.

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معلومات البحث

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Introduction

Nasal foreign bodies (NFBs) account for approximately 0.1% of pediatric emergency room visits [1]. While less urgent than inhaled or ingested foreign bodies [2–5], NFBs can lead to complications such as mucosal laceration, aspiration, septal necrosis, infection, and psychological distress [6]. Young children often insert objects into their noses impulsively or accidentally, driven by curiosity, imitation, boredom, or developmental factors such as intellectual disabilities or attention deficit hyperactivity disorder. The availability of small objects and inadequate supervision further contribute to this issue [7], [8]. NFBs represent 19–49% of foreign bodies encountered in ENT clinics [9]. NFBs can be inorganic (e.g., beads, buttons, plastic toys) or organic (e.g., sponge, rubber, seeds). Inorganic FBs are often asymptomatic and may be discovered incidentally, while organic FBs can trigger inflammation, causing unilateral nasal discharge. Over time, mineral deposits may form around the FB, leading to rhinoliths that require surgical removal [10]. Diagnosis is typically made through anterior rhinoscopy, with additional methods like radiographs (for metallic FBs) or nasal endoscopy (rigid or flexible) used as needed [11], [12]. Most FBs are located in the anterior nasal cavity, making removal relatively straightforward in experienced hands [13]. However, general anesthesia may be necessary for complex cases. Although rare, the risk of FB aspiration into the tracheobronchial tree should be considered, particularly in children with neurological impairments [11]. There is no universal method for

NFB removal, with treatment approaches varying based on patient age, compliance, and physician discretion. Over twenty extraction techniques have been described, each with its own advantages and limitations [14], [15].

The aim of this study is to address a significant gap in the literature on the management of nasal foreign bodies (FBs) in children within our region. Despite the high prevalence and potential complications of this condition, no large-scale studies have been conducted in Iraq. This study analyzes data from 213 pediatric cases of nasal FBs treated at Almahawil Hospital in Babil Governorate, offering valuable insights into demographic trends, clinical presentations, management strategies, and outcomes.

Patients and Methods

This prospective study was conducted at Almahawil Hospital in Babylon Governorate, Iraq, over a 36-month period from January 1, 2022, to December 31, 2024. A total of 248 children, aged 1 to 12 years, who were identified as having nasal foreign bodies (FBs), were included in the study. The patients were either received directly at the hospital or referred from other healthcare centers.

Inclusion Criteria:

Children with confirmed nasal FBs diagnosed via anterior rhinoscopy or plain x-ray.

Patients presenting with nasal symptoms such as obstruction, discharge, epistaxis, halitosis, or other related complaints.

Diagnostic Approach

The diagnosis of nasal FBs was achieved primarily through anterior rhinoscopy, which facilitated direct visualization of most FBs. In cases where

the presence of metallic FBs was suspected, plain radiographs were utilized for confirmation and localization as shown in Figure (1).

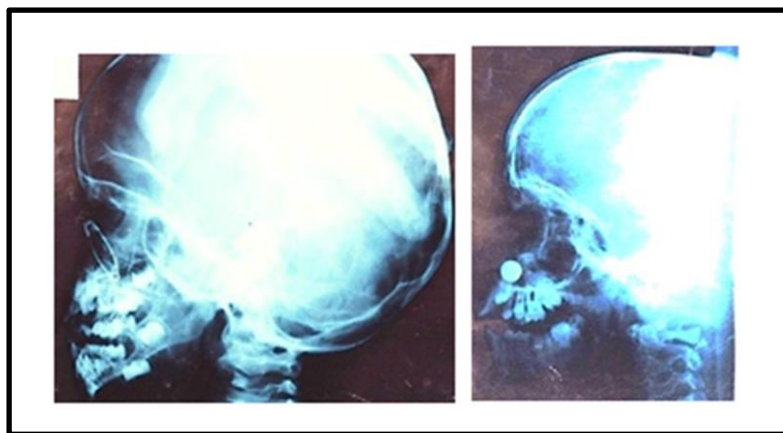


Figure (1): Plain x-rays are useful for metal FB

Patient Classification

Patients were categorized into three groups based on caregiver reports and clinical findings:

Group 1: Patients whose caregivers suspected the presence of an FB, and FBs were detected and removed upon examination (n = 147).

Group 2: Patients with nasal symptoms (e.g., obstruction, discharge, or foul smell) whose caregivers were unaware of the presence of an FB, (as shown in Figure 2) but FBs were identified and removed upon examination (n = 66).



Figure (2): A unilateral nasal discharge is nearly always due to a FB

Group 3: Patients whose caregivers suspected the presence of an FB but no FB was identified upon examination (n = 35).

Group 3 was excluded from the analysis, leaving 213 patients in Groups 1 and 2 for further evaluation.

Data Collection

The following data were recorded at the time of each patient's visit:

Demographics: Age and sex of the child.

Duration: Time elapsed between FB insertion and removal.

Laterality: Affected nasal cavity (right or left).

Characteristics of FBs: Type, size, and material.

Management Attempts: Previous attempts to remove the FB before hospital presentation.

Intervention Setting: Removal performed in the outpatient examination room or under general anesthesia in the operating theater.

Complications: Any complications arising during or after FB removal.

FB Removal Techniques

FB removal was performed using appropriate instruments such as forceps, blunt hooks, or angled suction devices, as shown in Figure (3) depending on the FB's shape and location.



Figure (3): The instruments used for removal of nasal FBs

The majority of FBs (204 cases) were removed in the outpatient setting under local measures. However, in nine cases, general anesthesia was required for safe removal in the operating theater.

Ethical Considerations

The study was conducted in compliance with ethical standards. Verbal consent was obtained from caregivers before including their children in the study. The research was approved by the institutional review board of Almahawil Hospital.

Results

A total of 213 nasal foreign body (FB) removals were performed during the study period. The patients included 112 males (52.6%) and 101 females (47.4%). The age range was 1 to 12 years, with the following distribution: 62 children (29.1%) aged 1–2 years, 90 children (42.3%) aged 3–4 years, 40 children (18.8%) aged 5–8 years, and 21 children (9.9%) aged 9–12 years (as shown in Figure (4)).

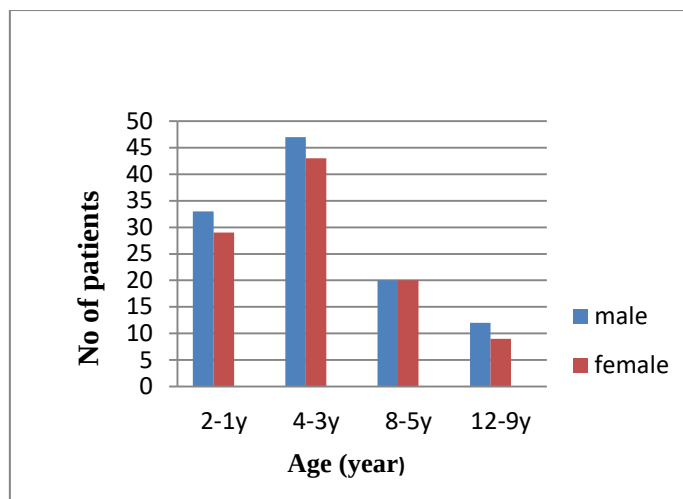


Figure (4): Age and sex distribution

Regarding the duration between FB insertion and removal, 81 cases (38.0%) were managed within the first 24 hours of FB insertion, 55 cases (25.8%) within 2–4 days, and 13 cases (5.2%) within 5–7

days. In 64 cases (30.0%), the time elapsed between FB insertion and removal was unknown as shown in Figure (5).

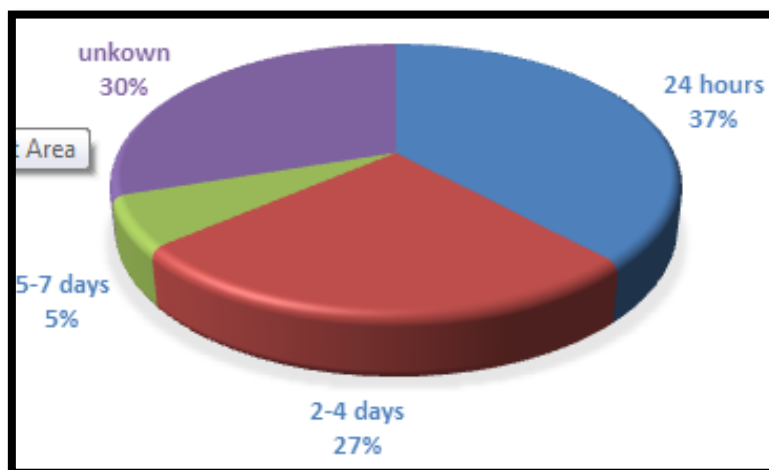


Figure (5): TIME ELAPSED BETWEEN INSERTION AND REMOVAL OF THE FB

The distribution of FBs in the nasal cavity showed that 117 cases (54.9%) involved the right nasal cavity, 85 cases (39.9%) involved the left nasal cavity, and 11 cases (5.2%) had bilateral

involvement. Multiple FBs were detected in 17 cases (8.0%).

Various objects were removed, as outlined in Table (1).

Table (1): All types of removed NFBs

Type of NFB	Number of Cases	Percentage (%)
Plastic bullets (air guns)	74	34.7%
Sponge fragments	44	20.7%
Beads	22	10.3%
Corn seeds	15	7.0%
Date seeds	14	6.6%
Erasers	10	4.7%
Pieces of cotton	10	4.7%
Paper fragments	8	3.8%
Button batteries	8	3.8%
Safety pins	2	0.9%
Screws	2	0.9%
Pebbles	2	0.9%
Matchsticks	2	0.9%

The most commonly retrieved FBs included plastic bullets used with air guns (74 cases, 34.7%), fragments of sponge (44 cases, 20.7%), beads (22 cases, 10.3%), corn (15 cases, 7.0%), and date seeds (14 cases, 6.6%). Less common FBs included erasers (10 cases, 4.7%), pieces of cotton (10 cases, 4.7%), paper fragments (8 cases, 3.8%), button batteries (8 cases, 3.8%), and two cases each (0.9%) of safety pins, screws, pebbles, and matchsticks.

A total of 58 cases (27.2%) had a history of failed previous attempts to remove the FBs, typically by hospital staff or the patients' caregivers. The majority of FB removals (95.8%) were successfully performed in the ENT outpatient examination room, while nine cases (4.2%) required intervention under general anesthesia in the operating theater.

Complications were observed in 78 cases (36.6%), including unilateral nasal vestibulitis and rhinosinusitis (64 cases, 30.0%), epistaxis (12

cases, 5.6%), and nasal tissue necrosis (2 cases, 0.9%). None of the complications resulted in long-term sequelae. Importantly, no mentally retarded patients were included in this study.

Discussion

Nasal foreign body (FB) insertion is a frequent occurrence, particularly among children, yet comprehensive studies on this condition remain limited in the literature [16], [17]. This study analyzed 213 cases of nasal FB removal, providing updated insights into the demographic distribution, clinical presentation, management, and outcomes of this condition. Although nasal FBs can lead to significant complications, no severe or long-term sequelae were observed in our cohort.

The study included 112 males (52.6%) and 101 females (47.4%), with a slight male predominance. The age distribution revealed that the majority of cases occurred in children aged 1–4 years, accounting for 71.4% of cases (29.1% aged 1–2

years and 42.3% aged 3–4 years). Older children were less frequently affected, with 18.8% aged 5–8 years and 9.9% aged 9–12 years. This age distribution aligns with the developmental curiosity and exploratory behavior typical of toddlers and preschoolers [18].

The duration between FB insertion and removal varied significantly. In 38.0% of cases (n=81), FBs were removed within 24 hours of insertion, while 25.8% (n=55) were managed within 2–4 days, and 5.2% (n=11) within 5–7 days. However, in 30.0% of cases (n=64), the exact duration between insertion and removal was unknown, highlighting the need for improved parental awareness and timely medical consultation.

The right nasal cavity was more frequently involved (54.9%, n=117) compared to the left (39.9%, n=85), with bilateral FBs observed in 5.2% of cases (n=11). Multiple FBs were detected in 8.0% of cases (n=17), emphasizing the importance of thorough examination of both nasal cavities to avoid missed diagnoses.

In 27.2% of cases (n=58), previous attempts at FB removal by caregivers or non-specialist medical staff were unsuccessful, underscoring the importance of skilled management by otolaryngologists. These results align with studies such as [19], [20].

The types of FBs removed varied widely, reflecting the diversity of objects accessible to children in household and outdoor environments. Plastic bullets from air rifles were the most common FB (34.7%, n=74), likely due to the popularity of such toys in the region, especially during social and religious occasions. Sponge fragments (20.7%, n=44), beads (10.3%, n=22),

corn seeds (7.0%, n=15), and date seeds (6.6%, n=14) were also frequently encountered.

Button batteries are increasingly popular household items that power numerous electronic devices and toys. Their small and shiny surface appeals to children and allows them to be easily inserted as a foreign body into the nose. When a button battery is exposed to a humid environment, such as the nasal cavity, it releases a range of corrosive compounds [21], [22]. The button battery in the nasal cavity, though rare, is particularly concerning due to their potential to cause rapid tissue necrosis and should be removed urgently and checked for complications [23], [24]. In our study, we had 8 cases (3.8%).

The majority of FBs (95.8%, n=204) were effectively removed at the ENT outpatient clinic utilizing instruments such as forceps, blunt hooks, or angled suction, depending on the FB's form and position. Only nine patients (4.2%) required general anesthesia in the operating room, typically involving complex or firmly lodged FBs.

When cases of nasal FB were missed (by parents and/or physicians), the child presented with the complication of nasal FB as unilateral nasal vestibulitis and rhinosinusitis, and the features of secondary bacterial infection like thick nasal discharge, obstruction, or offensive smell were the chief complaints [25]. In our study, this was the most common complication (30.0%, n=64). In fact, we've noticed complications in 36.6% of cases (n=78), epistaxis occurred in 5.6% of cases (n=12), while nasal tissue necrosis was rare (0.9%, n=2) and associated with delayed removal of button batteries. Notably, no long-term sequelae were observed, and all complications were managed effectively. The absence of mentally

retarded patients in this study limits the generalizability of findings to that specific population.

Conclusion

The findings of this study highlight the consistent patterns in the types of nasal foreign bodies among children, emphasizing the influence of regional and cultural factors. FBs could be overlooked in routine daily practice. Nasal one-sided mucopurulent discharge with a foul odor in a child, unless proven otherwise, is highly diagnostic of FBs. The cases of button battery insertion must be referred at once for a specialist opinion, to avoid potentially significant complications. We can significantly reduce the burden of this common pediatric issue by public health initiatives aimed at educating parents and caregivers, as timely and skilled removal is critical to prevent complications.

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