

# Intranasal foreign bodies: A 10-year analysis of a large cohort, in a tertiary medical center

Ofir Zavdy<sup>1</sup>, Igor Vainer<sup>1</sup>, Nataly London<sup>1</sup>, Tomer Menzely<sup>1</sup>, Roy Hod<sup>1</sup>, Eyal Raveh<sup>1</sup>, and Dror Gilony<sup>1</sup>

<sup>1</sup>Rabin Medical Center

March 7, 2021

## Abstract

**Objective:** To describe the occurrence, clinical presentation and management, of pediatric nasal foreign bodies, and to assess various risk factors for complications. **Methods:** A retrospective analysis of a computerized patient directory of 562 children admitted to the emergency department (ED) in a tertiary pediatric hospital during a 10-year period (Jan 2010-Dec 2019), with a witnessed NFB upon physical examination. **Results:** Upon admittance to the ED, most of the children (82%) were asymptomatic. Among the symptomatic children (18%), the primary symptoms were nasal discharge (10%), epistaxis (8%) and pain (4%). Younger children (under age 4 years) were more likely to insert organic materials, compared to older children. Younger children were also admitted sooner to the ED and were more likely to present with nasal discharge. The overall complication rate was 5%. None of the children had aspirated the NFB. Complications included infection (2%), necrosis (0.7%), septal perforation (0.5%), deep mucosal laceration (1.5%) and loss of NFB (1.9%). Significantly higher rates of symptoms and complications were associated with button batteries. Increased risk for complications were observed according to NFB-type, multiple attempts to remove NFB, posterior insertion of NFB and left-side insertion. **Conclusions:** NFB in children are common. Mostly, patients are asymptomatic, therefore a high index of suspicion is required, for quick diagnosis and safe removal, without complications.

## Intranasal foreign bodies: A 10-year analysis of a large cohort, in a tertiary medical center

### ABSTRACT

**Objectives:** To describe the occurrence, clinical presentation and management, of pediatric nasal foreign bodies, and to assess various risk factors for complications.

**Design:** A retrospective analysis of a computerized patient directory of 562 children admitted to the emergency department during a 10-year period, with a nasal foreign body.

**Settings:** A tertiary pediatric hospital.

**Results:** Upon admittance, most of the children (82%) were asymptomatic. Among the symptomatic children (18%), the primary symptoms were nasal discharge (10%), epistaxis (8%) and pain (4%). Younger children (under 4 years) were more likely to insert organic materials, compared to older children. Younger children were also admitted sooner to the emergency department and were more likely to present with nasal discharge. The overall complication rate was 5%. None of the children had aspirated the foreign body. Complications included infection (2%), necrosis (0.7%), septal perforation (0.5%), deep mucosal laceration (1.5%) and loss of foreign body (1.9%). Significantly higher rates of symptoms and complications were associated with button batteries. Increased risk for complications were observed according to type of foreign body, multiple attempts to remove it, posterior insertion and left-side insertion.

**Conclusions:** Nasal foreign bodies in children are common. Mostly, patients are asymptomatic, therefore a high index of suspicion is required, for quick diagnosis and safe removal, without complications.

## KEYWORDS

Foreign nasal bodies, batteries, epistaxis, organic, complications.

## Key points

- Nasal foreign bodies are a common problem in children.
- Children under 4 years insert mostly food items into the nasal cavity, contrary to older children who insert toys and batteries
- No major complication was reported in our cohort of 10-years in a pediatric tertiary medical center.
- Batteries and magnets cause significant mucosal damage, that often requires recurrent surgical debridement and long follow up periods in the clinic.
- Excellent teamwork and cooperation between pediatric ED physicians and otolaryngologists is imperative for optimal diagnosis and treatment.

**Level of evidence:** 4

## Data availability statements:

The data that support the findings of this study are available from the corresponding author upon reasonable request.

## Conflict of interest and financial disclosure:

The authors have no funding, financial relationships, or conflicts of interest to disclose.

## INTRODUCTION

Foreign bodies (FB) of the upper aerodigestive tract are among the most common emergencies for otolaryngologists, especially regarding pediatric patients. FB have been reported as the reason for admission of 10-30% of all patients to otolaryngology emergency departments (ED); of which, nasal FBs (NFB) represent 20-30%<sup>1-2</sup>.

The most common anatomical site for NFB is below the inferior turbinate<sup>3</sup>. Only small fractions, approximately 30% of NFB, are radiopaque. Therefore, NFB are not usually seen in plain radiographs performed in the ED setting<sup>4</sup>. Most patients with NFB are successfully managed in the ED by pediatricians<sup>5</sup>. Only a small fraction requires assistance of otolaryngologists, usually due to more posterior positioning of the NFB inside the nasal cavity or to lack of patients' cooperation, which sometimes necessitates anesthesia<sup>6</sup>. Overall complication rates for NFB removal, as reported in the literature, are estimated between 5-22%<sup>7-8</sup>.

## OBJECTIVES

The aim of our study was to review the demographic and medical characteristics, treatment modalities and outcomes of all the patients with NFB in a tertiary pediatric medical center. We sought to analyze potential risk factors associated with adverse effects and unfavorable results.

## METHODS

### Design and Settings

After receiving institutional review board approval, we reviewed all the electronic database charts of pediatric patients, under age 18 years, who were admitted to the ED with a diagnosis of NFB during 2010-2019.

### Data Collection and Main Outcomes

The data collected included demographic characteristics and medical history, presenting symptoms in the ED and information related to NFB upon physical examination. Outcome measures included treatment

modalities and outcomes, including complications. A posterior nasal location was defined as an NFB that was visible with fiber-optic nasal examination, and not with anterior rhinoscopy.

## Statistical analysis

All statistical analyses were performed using IBM SPSS Statistics for Windows, Version 25.0 (IBM Corp, Armonk, NY, USA). A p-value cut-off point of 0.05 at 95% confidence interval (CI) was used to determine statistical significance. A univariate analysis was conducted using the Pearson chi-square test and independent-samples t-test to compare various descriptive variables with outcome measures. Post-hoc multivariate logistic regression analysis was used to assess the outcome measures according to the risk factors examined in the prediction model.

## Reporting guidelines:

von Elm E, Altman DG, Egger M, Pocock SJ, Gøtzsche PC, Vandenbroucke JP. The Strengthening of Reporting of Observational Studies in Epidemiology (STROBE) Statement: guidelines for reporting observational studies. *Ann Intern Med.* 2007;147(8):573-577.

## RESULTS

### Patient Characteristics and Symptoms

During 2010-2019, a total of 847 children with suspected NFB were admitted to the ED at our medical center. On physical examination, a NFB was found in 562 (66%); these represented the study cohort. Sixty percent of the patients were recorded as arriving within 24 hours following the insertion, 7.5% within one week, and 5% after more than one week. For 27% of the patients, the time of arrival to the ED was unknown. Most of the children (82%) were asymptomatic upon arrival to the ED, i.e. without any signs of nasal blockage or infection, such as fever, foul odor, rhinorrhea, epistaxis or pain. The most common cause for ED admittance among asymptomatic patients was a witnessed NFB insertion (38%), followed by self-reported insertion by the child (26%). The remaining asymptomatic patients (18%) were referred to the ED by a caregiver (either a kindergarten teacher or a family doctor), after the NFB was seen in the nose (usually with no knowledge of the time of insertion). Among the symptomatic children (18%), the primary symptoms were nasal discharge (10%), followed by epistaxis (8%) and pain (4%). Fever was noted in only 2% of the patients, and nasal blockage in 1.5%. All the children were hemodynamically and respiratory stable upon arrival; none of them demonstrated respiratory symptoms.

NFB were recorded as inserted to the right nostril in 56% and to the left in 25% ( $p < 0.05$ ), while in 19% of the children, the side of insertion was not mentioned. Five percent of the patients had comorbidities (asthma, allergy, cardiac abnormalities, developmental delay and psychiatric disorders). Sixty-seven percent of the patients (377 patients) were referred to examination by otolaryngologists during the ED visit after first being treated by ED pediatricians. For 18% (68 patients), this was after failure to remove the NFB on the first attempt. Twenty-six patients (4.5%) required general anesthesia for NFB removal, which was always performed by otolaryngologists in the operating room. None of the patients required ventilatory or pressure support, nor the need for transfer to the intensive care unit following the removal of the NFB. This suggests that none of the children had aspirated the NFB. The overnight hospitalization rate was 5%. The recurrence rate, i.e., more than a single episode of NFB, was 2%. Characteristics of the cohort are presented in table 1.

### Complications

Complications included infection (3.5%), necrosis (0.7%), septal perforation (0.5%), deep mucosal laceration (1.5%) and the loss of NFB during removal (1.2%). The overall complication rate was 5%. In multivariate analysis, increased risk for complications was associated with NFB-type ( $OR = 6.5$ ,  $p = 0.01$ ), multiple attempts to remove NFB ( $OR = 6.4$ ,  $p = 0.01$ ), posterior insertion of NFB ( $OR = 2.4$ ,  $p = 0.02$ ) and left side insertion ( $OR = 1.8$ ,  $p = 0.02$ ). Characteristics of the cohort are presented in table 2.

### Subgroup Analysis According to Age

The younger age-group, age <4 years, comprised 328 patients, representing 58% of the cohort. The older age-group, age > 4 years, comprised 237 patients, representing 42% of the cohort. No differences were found between these age-groups in the male-to-female ratio; or in the proportions with comorbidities, anterior versus posterior insertions, right-side versus left-side insertions, or treatment with antibiotics (Table 3). A statistically significant difference was found between the groups in the nature of the NFB. In children under age 4 years, 39% of NFB were organic, compared to only 19% in older children (OR=2.75,  $p<0.001$ ). Younger patients were also more likely to insert NFB into the right nostril (OR=1.43,  $p=0.04$ ). In older children, magnets and buttons were more common (OR=3.3,  $p=0.03$ ), as well as non-organic substances, although not significant., as were magnets and buttons, Older patients were admitted earlier to the ED, within the first 24 hours (OR=1.9,  $p=0.03$ ). Other differences, without statistical significance, were observed between the age groups (Table 3 and Figure 1). Younger compared to older children were more likely to present with nasal discharge (14% vs 8%) and were less likely to undergo general anesthesia (2.8% vs 5.5%). Characteristics of the patients according to age group are presented in table 3 and in figure 1.

### Subgroup Analysis of Outcomes According to NFB

Batteries and magnets were significantly more hazardous than all other NFB. Epistaxis and nasal discharge were significantly more common in children who inserted batteries and magnets than other NFB (OR= 14.3 and 10.4 for epistaxis and discharge, respectively, compared to other NFB). The risk for nasal discharge was significantly higher in non-organic than in organic NFB (OR=1.86,  $p=0.02$ ).

## DISCUSSION

Most patients with NFB are aged nine months to six years, and older children with mental illnesses<sup>7,9</sup>. Most NFB are non-organic, including beads, toys, batteries and magnets<sup>10</sup>. Seventy-five percent of NFB are asymptomatic. Chronic nasal discharge with foul smell is the most common presenting symptom, while epistaxis, nasal blockage, high fever and swelling of the face are less common presenting symptoms<sup>11</sup>. A long-standing NFB may result in the formation of granulation tissue and rhinoliths<sup>12</sup>. NFB removal more than 72 hours following insertion was assessed as four times more likely to fail and become complicated, compared to early removal<sup>13</sup>.

Our 10-year cohort comprised 562 children who attended the ED with a documented NFB upon physical examination. There was a slight predisposition of female to male ratio of 1.2, as was shown in previous studies. Most of the patients (85%) were aged 2-5 years. A possible explanation for the high incidence rates among 2-year-olds is the development of the pincer grasp milestone<sup>14</sup>. Right-side insertion was more common (56%), presumably due to right-handed predominance in the population<sup>15</sup>. In accordance with the literature<sup>16</sup>, most of the NFB were nonorganic (65%). Organic NFB accounted for 30%, and 5% were batteries and magnets. Most patients who presented with NFB were asymptomatic (82%), regardless of age and gender, as reported in previous studies<sup>17</sup>.

### Characteristics and Outcomes According to Age Groups

Age was the prognostic factor examined that most strongly associated with presenting symptoms, the type of NFB material, failure rates, the use of general anesthesia and overall complications. In children under age 4 years, 39% of NFB were organic, compared to only 19% in older children (OR=2.64,  $p<0.05$ ). This difference may be partially explained by lesser exposure of younger children to small nonorganic toys, beads and batteries due to safety reasons. In contrast, organic materials (seeds, fruits, etc.) are more commonly within toddlers' reach. For 70% of older patients, medical attention was sought within the first 24 hours, compared to only 55% of younger patients (OR=1.9,  $p=0.03$ ). Older children can better express themselves to their parents and are more capable of conveying discomfort due to NFB. In our cohort, younger patients were more prone to insert NFB into the right nostril (OR=1.43,  $p=0.04$ ). Insertion of NFB to the ipsilateral rather than the contralateral side presumably requires less coordination abilities, and is thus easier for younger children. The overall complication rate did not differ according to the duration of NFB in the nasal cavity (data not presented). Nasal discharge, which was the most common presenting symptom, was more common in younger than older patients (14% vs. 8%), although the difference was not statistically significant.

This is especially important for the general practitioner who may encounter a child with a unilateral nasal discharge. In younger patients who are not always able to express their complaints, a chronic unilateral nasal discharge can be a crucial diagnostic sign. Notably, nasal blockage and fever were both rare in our cohort. In younger children, the nasal cavity is anatomically smaller, which increases the challenge of removing NFB in the first attempt. In our cohort, failed attempts were more common among younger patients (11% vs 7.5%). Older children, on the other hand, are more difficult to hold while they resist physical examination, which lower the likelihood of safe removal in the ED. Among our older patients, the risk for removal under general anesthesia was higher (5.5% vs 2.8%), as was the overall rate of complications (5.5% vs. 4.6%). Although these age-related differences were not statistically significant, a trend was demonstrated.

### Removal of NFB

NFB can be removed by various means, including exertion of positive oronasal pressure<sup>18</sup> and the use of various medical instruments, such as suction, forceps, hooks and a Fogarty catheter<sup>19</sup>. Kadish et al.<sup>20</sup> previously published successful NFB extraction rates of 98% among pediatricians. Removal failure was defined in our study as an attempt to extract the NFB, which ultimately required further intervention (by a second physician, usually an otolaryngologist, or by general anesthesia). All 26 patients who required anesthesia were examined primarily by an otolaryngologist (either as a first or a second attempt). Altogether, 69% of the patients were seen by otolaryngologists. The failure rate among otolaryngologists was 6.7%. Pediatricians in the ED treated 172 children without referral to an otolaryngologist. The failure rate among pediatricians was 24% ( $p=0.01$ ). Nonetheless, complicated NFB (28 patients, 5%) were always seen by otolaryngologists; this demonstrates proper clinical assessment and referral by ED pediatricians. X-ray radiographs were rarely (1%) used in our cohort.

### Complications

Several risk factors were associated with increased risk for complications (NFB-type, multiple attempts to remove NFB, posterior insertion of NFB and left-side insertion). These risk factors, when presenting, should alert clinicians in their assessment and management of patients with a NFB, and should be considered in the treatment plan regarding preparation for removal. The complications found in our study are presented in table 2. The overall complication rate was 5%, which concurs with other reports<sup>8,11,13</sup>. The loss of NFB during a failed attempt can potentially compromise the airway. In 11 (2%) of our patients, the objects were ingested following a failed attempt. Among these, eight occurred after attempts by primary pediatricians, and three after attempts by an otolaryngologist. None of these patients exhibited signs of dyspnea or dysphagia, suggesting that none of the children had aspirated the NFB.

Nasal insertion of batteries and magnets poses a particularly high risk. In our cohort, perforation or significant mucosal lacerations occurred in 13 (2.2%) patients, among whom nine were a direct result of batteries and magnets. The risks for nasal perforation in children who inserted magnets and batteries were extremely high ( $OR=22$  and  $OR=8.4$ , respectively,  $p<0.001$ ). Mucosal necrosis was observed almost entirely in patients with nasal batteries ( $OR=38$ ,  $p<0.001$ ). All children who inserted nasal batteries or magnets were treated with systemic antibiotics, on admission or discharge, compared to those who inserted all other materials ( $OR=7.9$ ,  $p<0.05$ ). One patient exhibited necrosis of the middle turbinate within 3 hours after the insertion of a button battery. Two patients underwent surgical debridement one month after the incident and one patient had intermittent epistaxis due to septal perforation and had to undergo septo-rhinoplasty surgery years later. The overall risk for complications was significantly higher among patients with inserted batteries or magnets than with all other materials (organic and nonorganic),  $OR=12.3$ ,  $p<0.001$ . This is consistent with previous studies<sup>21-22</sup>. Small magnets are most commonly found in the nasal cavity of female teenagers, as they are usually a part of jewelry hinged to the ala nasi. Damage to the nose can result from decubitus, leading to ulcers and perforations<sup>23</sup>. Button batteries have positively and negatively charged poles, on either side. When a negatively charged pole adheres to the nasal septum, the chemical reaction that results in electrolysis can cause rapid septal perforation in up to 4 hours<sup>24-25</sup>. To this date, follow-up publications that assess long-term nasal damage are lacking.

## Limitations

This study is a retrospective analysis, with data limited to the computerized patients' files. Most of the patients had no follow-up after the initial ED admission, thus long-term complications are rarely documented.

## Conclusions

To the best of our knowledge, this study represents one of the largest pediatric cohorts of NFB. Most patients with NFB are asymptomatic; thus, a high index of suspicion of the possibility of a foreign body is important. Button batteries and magnets in the nasal cavity are extremely hazardous and can cause rapid tissue damage to the nasal mucosa. Posterior location of NFB, left-sided insertion, multiple failures of removal and older age were found to be associated with the need of general anesthesia, and with consequent infections and complications. With regards to previous publications, it is worth mentioning that none of the patients in our cohort present with any major complications, including respiratory distress nor signs of sepsis or hemodynamic instability. This is in contrary to other reports. Although aspiration of the NFB is a potential life-threatening complication, we did not have such cases in our cohort. We believe that our favorable results represent the outstanding cooperation between pediatric ED physicians and otolaryngologists in our medical center. Excellent teamwork is crucial for treating all patients, especially children with NFB.

## REFERENCES

1. Silva BSR, Souza LO, Camera MG, Tamiso AGB, Castanheira LVR. Foreign bodies in otorhinolaryngology: a study of 128 cases. *Int Arch Otorhinolaryngol.* 2009;13(4):394-9.
2. Bressler K, Shelton C. Ear. Foreign-body removal: a review of 98 consecutive cases. *Laryngoscope.* 1993;103(4 Pt 1):367-70.
3. François M, Hamrioui R, Narcy P. Nasal foreign bodies in children. *Eur Arch Otorhinolaryngol.* 1998;255(3):132-4.
4. Glynn F, Amin M, Kinsella J. Nasal foreign bodies in children: should they have a plain radiograph in the accident and emergency? *Pediatr Emerg Care.* 2008;24(4):217-8.
5. Mackle T, Conlon B. Foreign bodies of the nose and ears in children. Should these be managed in the accident and emergency setting? *Int J Pediatr Otorhinolaryngol.* 2006;70(3):425-428.
6. Shunyu NB, Akhtar H, Karim HM, Lyngdoh NM, Yunus M, Jamil M. Ear, Nose and Throat Foreign Bodies Removed under General Anaesthesia: A Retrospective Study. *J Clin Diagn Res.* 2017;11(2):MC01-MC04.
7. Cetinkaya EA, Arslan IB, Cukurova I. Nasal foreign bodies in children: Types, locations, complications and removal. *Int J Pediatr Laryngol.* 2015;79(11):1881-5.
8. Lou ZC. Analysis of nasal foreign bodies in 341 children. *J Laryngol Otol.* 2019;133(10):908-912.
9. Celenk F, Gokcen C, Celenk N, Baysal E, Durucu C, Kanlikama M. Association between the self-insertion of nasal and aural foreign bodies and attention-deficit/hyperactivity disorder in children. *Int J Pediatr Otorhinolaryngol.* 2013;77(8):1291-4.
10. Awad AH, ElTaher M. ENT Foreign Bodies: An Experience. *Int Arch Otorhinolaryngol.* 2018;22(2):146-51.
11. Hira I, Tofar M, Bayram A, Yaşar M, Mutlu C, Özcan I. Childhood Nasal Foreign Bodies: Analysis of 1724 Cases. *Turk Arch Otorhinolaryngol.* 2019;57(4):187-90.
12. Sakin YF, Gedik M. Rhinolithiasis: Clinic symptoms, diagnosis, treatment options, radiologic findings. *Medeni. medical J.* 2009;24:95-100.
13. Figueiredo RR, Azevedo AA, Kós AO, Tomita S. Complications of ent foreign bodies: a retrospective study. *Braz J Otorhinolaryngol.* 2008;74(1):7-15.
14. Tasche KK, Chang KE. Otolaryngologic Emergencies in the Primary Care Setting. *Med Clin North Am.* 2017;101(3):641-56.
15. Leopard DC, Williams RG. Nasal foreign bodies: a sweet experiment. *Clin Otolaryngol.* 2015;40(5):420-1.
16. Rizk H, Rassi S. Foreign body inhalation in the pediatric population: lessons learned from 106 cases. *Eur Ann Otorhinolaryngol.* 2011;128(4):169-74.

17. Tong MC, Ying SY, van Hasselt CA. Nasal foreign bodies in children. *Int J Pediatr Otorhinolaryngol*. 1996;35(3):207-11.
18. Backlin, S.A. Positive-pressure technique for nasal foreign body removal in children. *Ann Emerg Med*.1995;25(4):554-5.
19. Giourgos G, Matti E, Pagella F. Endoscopic removal of a nasal foreign body with the “hook-scope” technique. *Eur Arch Otorhinolaryngol*. 2009;266(10):1663-5.
20. Kadish HA, Corneli HM. Removal of nasal foreign bodies in the pediatric population. *Am J Emerg Med*. 1997;15(1):45-6.
21. Guidera AK, Stegehuis HR. Button batteries: the worst-case scenario in nasal foreign bodies. *N Z Med J*. 2010;123(1313):68-73.
22. McCormick S, Brennan P, Yassa J, Shawis R. Children and mini magnets: an almost fatal attraction. *Emerg Med J*. 2002;19(1):71-3.
23. Lancaster J, Mathews J, Sherman IW. Magnetic nasal foreign bodies. *Injury*. 2000;31(2):123.
24. Loh WS, Leong JL, Tan HK. Hazardous foreign bodies: Complications and management of button batteries in nose. *Ann Otol Rhinol Laryngol*. 2003;112(4):379–83.
25. Bakshi SS, Coumare VN, Priya M, Kumar S. Long-term complications of button batteries in the nose. *J Emerg Med*. 2016;50(3):485–7.

**Table 1**

**Characteristics of children who presented with nasal foreign bodies (N=562)**

Variable	Number (%) or mean
<b>Boys</b>	248 (44.1%)
<b>Age, years (mean)</b>	4.1
<b>Asymptomatic presentation</b>	460 (81.9%)
<b>Comorbidities</b>	30 (5%)
Asthma	16 (2.7%)
Congenital anomalies	9 (1.5%)
Allergies	18 (2.8%)
Psychiatric	5 (0.8%)
<b>Treated by otolaryngologists</b>	360 (64%)
<b>NFB type</b>	
Organic	170 (30%)
Nonorganic	368 (65%)
Batteries and magnets	30 (5%)
<b>Symptoms</b> Nasal discharge Epistaxis Pain	45 (8%) 48 (8.5%) 24 (4%)
<b>Failure rate (Multiple removal attempts)</b>	68 (12%)
<b>X-ray demonstrating NFB</b>	6 (1%)
<b>Hospitalization</b>	28 (5%)
<b>Recurrence (&gt;1 episode of NFB)</b>	11 (2%)
<b>General anesthesia</b>	26 (4.5%)
<b>Antibiotics</b> Topical Systemic	58 (10%) 34 (6%) 27 (4.8%)
<b>Complications</b> Infection Necrosis Septal perforation Deep mucosal laceration Loss of NFB	28 (5%) 19 (3.5%) 4 (0.7%) 3 (0.5%) 9 (1.5%) 11 (1.9%)

**Table 2.**

**Factors that were associated with increased risk of complications**

Factor	OR, P value	Comparison group
Factor	OR, P value	Comparison group
NFB type (batteries and magnets)	OR= 6.5, P=0.01	All other NFB together
More than one removal attempt	OR= 6.4, P=0.01	Removal in the first attempt
Posterior insertion of NFB	OR= 2.4, P=0.02	Anterior insertion
Left-side insertion of NFB	OR= 1.8, P=0.02	Right-side insertion

Table 3.

Statistically-significant characteristics of children who presented with nasal foreign bodies according to age

	Age <4 years	Age >4 years	P value
Right-side insertion	60%	50%	P=0.04
Organic NFB	39%	19%	P<0.001
Batteries and magnets	1.5%	6.5%	P=0.03
Time from insertion until arrival to ED			
Less than 24 hours	55%	70%	P=0.03
Less than one week	10%	7%	
More than one week	35%	23%	

Legends to figures.

Figure 1 : Patients Data

Figure 1: Patient Data



