

Analysis of foreign body ingestion in childhood: Our five-year experience

Çocukluk çağı yabancı cisim yutmalarının analizi, Beş yıllık deneyimimiz

Serhat Koyuncu¹, Oğuzhan Bol², Ahmet Akbaş³, Emin Daldal⁴

¹Department of Emergency Medicine, Tokat Gaziosmanpaşa University, Faculty of Medicine, Tokat, Turkey

²Department of Emergency Medicine, Health Science University, Kayseri City Hospital, Kayseri, Turkey

³Department of General Surgery, Bağcılar Training and Research Hospital, Istanbul, Turkey

⁴Department of General Surgery, Tokat Gaziosmanpaşa University, Faculty of Medicine, Tokat, Turkey

ABSTRACT

Objectives: This study aimed to draw attention to foreign body ingestions in childhood and raise awareness based on the current literature.

Patients and Methods: This retrospective study included 133 patients aged <18 years (74 male, 59 female; mean age, 7.5±3.8 years; range 1 to 17 years) who visited the Emergency Department with obstruction in the gastrointestinal tract due to the ingestion of an FB or food impaction between January 2013 and January 2018. Their demographic data, the type and location of the ingested body, and the imaging and treatment methods were recorded.

Results: According to the history taken from the patient or their relatives, the swallowed object was metal (money, needle, battery, magnet, etc.) in 89 (66.9%) patients, non-metal (glass, plastic, etc.) in 27 (20.3%) patients, and pieces of food in 17 (12.8%) patients. The 56 patients in the first group and 18 patients in the second group underwent endoscopy under general anesthesia. Although the foreign body was successfully removed from the body in 11 patient, it was pushed to the stomach in four patients. There were no complications in the patients.

Conclusion: In most cases, foreign bodies are expected to pass spontaneously through the gastrointestinal passage, while in some, endoscopic or surgical interventions may be required. Children suspected of having this condition should be examined in detail and appropriate imaging methods should be used. Endoscopic interventions are especially important in the diagnosis and treatment of non-metal foreign bodies.

Keywords: Childhood, foreign body ingestion, gastrointestinal system.

ÖZ

Amaç: Bu çalışmada çocukluk çağındaki yabancı cisim yutmalarına dikkat çekmek ve güncel literatüre dayalı farkındalık yaratmayı amaçladık.

Hastalar ve Yöntemler: Bu retrospektif çalışma Ocak 2013 - Ocak 2018 tarihleri arasında Acil tıp kliniğine yabancı cisim yutma şikayeti ile başvuran 18 yaş altı 133 hasta (74 erkek, 59 kız; ort yaş, 7.5±3.8 yıl; dağılım 1-17 yıl) dahil edildi. Demografik veriler, yutulan yabancı cismin tipi ve yerleşim yeri görüntüleme ve tedavi yöntemleri kaydedildi.

Bulgular: Hastadan veya yakınlarından alınan öyküye göre yutulan cisim 89 (%66.9) hastada metal (para, iğne, pil, mıknatıs vb.), 27 (%20.3) hastada metal olmayan (cam, plastik vb.), 17 (%12.8) hastada ise gıda parçaları idi. Birinci gruptaki 56 hastaya ve ikinci gruptaki 18 hastaya genel anestezi altında endoskopi işlemi uygulandı. On bir hastada yabancı cisim başarı ile vücuttan çıkarılırken, dört hastada yabancı cisim mideye itildi. Hastalarda herhangi bir komplikasyon görülmedi.

Sonuç: Çoğu olguda sadece takip ile yabancı cismin gastrointestinal kanaldan spontan atılması beklenirken bazı olgularda endoskopik veya cerrahi girişimler gerekebilir. Bu durumdan şüphelenilen çocuklar ayrıntılı muayene edilmeli ve uygun görüntüleme yöntemleri kullanılmalıdır. Özellikle metal olmayan yabancı cisimlerin tanı ve tedavisinde endoskopik girişimler önemlidir.

Anahtar sözcükler: Çocukluk çağı, yabancı cisim yutmaları, gastrointestinal sistem.

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Correspondence: Serhat Koyuncu, MD. Tokat Gaziosmanpaşa Üniversitesi Tıp Fakültesi, Acil Tıp Anabilim Dalı, 60500 Tokat, Türkiye.
e-mail: ercanpinar@yahoo.com

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Foreign body ingestion (FBI) is mostly encountered in childhood and causes high rates of morbidity and mortality. In the USA, 79,738 children were admitted to hospital due to FBI in 2012. Children between the ages of six months and six years were reported as the most frequently exposed to FBI.^[1-3] Although 80-90% of the cases are not affected from FBI since the specimen can pass through the gastrointestinal tract, 10-20% require endoscopic or surgical intervention.^[4] Foreign body ingestion mostly occur in physiologically occurring stenoses, namely the upper esophageal sphincter, the aortic arch, the left main bronchus, and the lower esophageal sphincter. Due to the existence of these stenoses, foreign bodies (FBs) are mostly detected in the esophagus in about half of the cases.

The objects that children swallow are mostly coins; however, small toys, keys, crayon pieces, marbles, and batteries can also be encountered.^[5-7] In non-witnessed cases, most children may be asymptomatic and non-specific findings such as restlessness and nutritional disorder may be present. The objects in the esophagus may lead to clinical findings such as dysphagia, drooling, near-drowning, and nutritional rejection, as well as breathing problems such as wheezing and coughing when the object is in the middle esophagus.^[8,9] A good history should be taken from the parents and a complete physical examination should be performed for the diagnosis. Plain anteroposterior and lateral radiographs may yield useful findings in the case of radiopaque bodies. However, it should be remembered that objects such as pieces of meat, thin bones, aluminum, glass, or plastic objects may not be visible on the radiographs. A barium swallow can be applied to limited regions. Computed tomography can be used to detect the objects that are not visible on the plain radiographs and determine the complications. Under general anesthesia, endoscopy is an effective method not only for the diagnosis but also for the treatment.^[7,10] While 80-90% of FBs leave the body spontaneously, endoscopic interventions are needed in 10-20% of the cases, and surgical interventions in 1% of cases. However, it is important to remove substances such as batteries to prevent morbidity and mortality, for as long as they remain in the body, they have high corrosion potential.^[11,12]

Our aim in this study is to draw attention to FBI, which is frequently encountered in childhood and to raise awareness about the management of these patients in the light of current literature.

PATIENTS AND METHODS

This retrospective study included 133 patients aged <18 years (74 males, 59 females; mean age 7.5±3.8 years; range 1-17 years) who presented to the

Emergency Department (ED) of Tokat Gaziosmanpaşa University, Faculty of Medicine, with obstruction in the gastrointestinal tract due to the ingestion of an FB or food impaction between January 2013 and January 2018. It was conducted with the approval of the Tokat Gaziosmanpaşa University, Faculty of Medicine Ethics Committee (Approval No: 20-KAEK-100). The patients' data were scanned electronically according to the ICD-10 codes. Additionally, the electronic records of the endoscopy unit were examined. We aimed to establish a management algorithm in patients presenting with FBI in childhood in this study. Therefore, we only included patients who were under the age of 18 and had complete data.

To determine the demographic and clinical features of the patients, we recorded their age, sex, complaints, and the type of the ingested object (metal, non-metal, food) from their patient records. We also recorded the imaging methods to determine how the patients were managed in the ED and follow-up, the type of endoscopy performed for diagnostic and treatment purposes, and the outcome of the FB. The location of the radiopaque FBs was determined by imaging methods.

Endoscopy was performed under general anesthesia to remove FBs that were detected in the esophagus and, despite exceeding the esophagogastric junction, that had a potential corrosive effect on the body, such as batteries. The FBs were removed from the body. Other cases with FBs detected in the imaging methods and past the esophagogastric junction were followed. As for the management of FBs that could not be detected by imaging methods, the patients underwent endoscopy when they had a clinical complaint or when the FB was, according to their history, too large to exceed three anatomical stenoses in the esophagus. Cases that could not be detected by endoscopy and past the esophagogastric junction were followed up. We monitored the outcome of FBs in the gastrointestinal tract with daily radiographs in both groups of patients who were followed up.

Statistical analysis

All data were analyzed using the IBM SPSS statistics 26 (IBM Corp., Armonk, NY, USA) package program. Quantitative and qualitative values were evaluated as mean ± standard deviation (SD), median (min-max), and percentage (%). Qualitative values were also evaluated with chi-square test. In all statistical analyses, the p-value of <0.05 was considered statistically significant.

RESULTS

When evaluated according to the ingestion time, 96 patients presented to the ED within the first 24 hours,

34 patients within 24-48 hours, and three patients after 48 hours. As for the patients' complaints: 39 patients were asymptomatic, 40 patients had nausea, 37 patients had abdominal pain, two patients had hypersalivation, 15 patients had FB sensation in the throat, and one patient had shortness of breath. According to the history taken from the patient or their relatives, the ingested body was metal (money, needle, battery, magnet, etc.) in 89 (66.9%) patients, non-metal (a piece of glass, plastic, etc.) in 27 (20.3%) patients, and pieces of food in 17 (12.8%) patients (Table 1, Figure 1).

Patients were divided into two groups according to the presence and absence of FBs on direct radiography taken at admission. When the FB could be detected, it was managed according to its location and followed up the patients. In undetectable cases, the procedures were based on the type and size of the FB according to the clinical findings and the information provided by the patient or their relatives. Foreign bodies were detected on direct radiography in 90 patients in the first group. Fifty-six patients underwent endoscopy under general anesthesia. As FBs were located in the stomach and

intestine in 34 patients, they were followed up without any operation. FBs were removed from the body in all patients who underwent endoscopy. The second group consisted of 43 patients and FBs could not be detected on direct radiography in this group. Based on the clinical features of the patients and the type and size of the FBs, we decided endoscopy was required in 18 patients. Twenty-five patients were followed up. During endoscopy, FBs were removed from the body in 11 patients and were pushed to the stomach in four patients. Foreign body was not found in three patients (Figure 2).

Localization of foreign bodies

In the first group of patients, FBs were located in the esophagus in 56 patients, in the intestines in 25 patients, and in the stomach in nine patients. Forty-two of the FBs located in the esophagus were in the first stenosis, seven were in the second stenosis, and seven were in the third stenosis (Figure 3). In the second group, in which FBs were not detected on direct radiography, endoscopy was considered necessary in 15 patients. The locations of the FBs in these patients were as follows: in the esophagus first stenosis in seven patients, in the second stenosis in three patients, in the third stenosis in two patients, and in the stomach in three patients.

Foreign bodies were detected with imaging methods and endoscopy in 105 patients in total. The FBs were classified as metal, non-metal, and pieces of food. There were metal objects in 90 patients, non-metal objects in seven patients, and food pieces in eight patients. When metal objects were evaluated within themselves, the most common object was coins (n=57).

Table 1
Demographic and clinical features of the patients

	n	%	Mean±SD
Age (year)			7.5±3.8
Sex			
Male	74	55.6	
Female	59	44.4	
Total	133	100	
Admission time to hospital			
Within 24 hours	96	72	
24-48 hours	34	25	
After 48 hours	3	3	
Total	133	100	
The type of FB			
Metal	89	66.9	
Nonmetal	27	20.3	
Pieces of food	17	12.8	
Total	133	100	
Symptoms			
Asymptomatic	39	29.3	
Nausea	40	30	
Abdominal pain	37	27.8	
FB sensation in the throat	15	11.2	
Hypersalivation	2	1.7	
Total	133	100	

SD: Standard deviation.

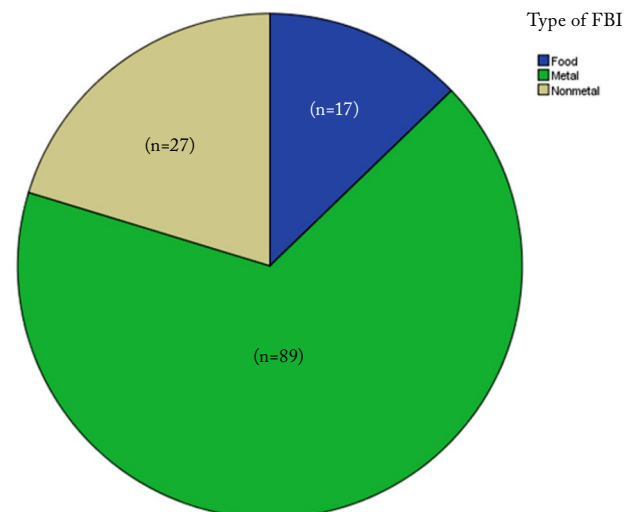


Figure 1. The type of foreign body ingestions.
FBI: Foreign body ingestion.

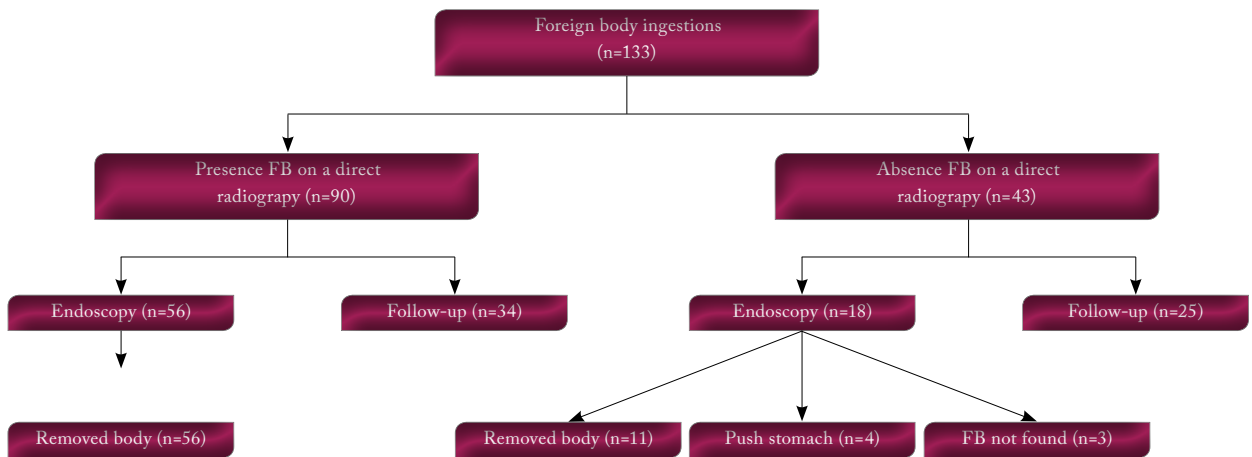


Figure 2. Summary of the management of patients with foreign body ingestions.

FB: Foreign body.

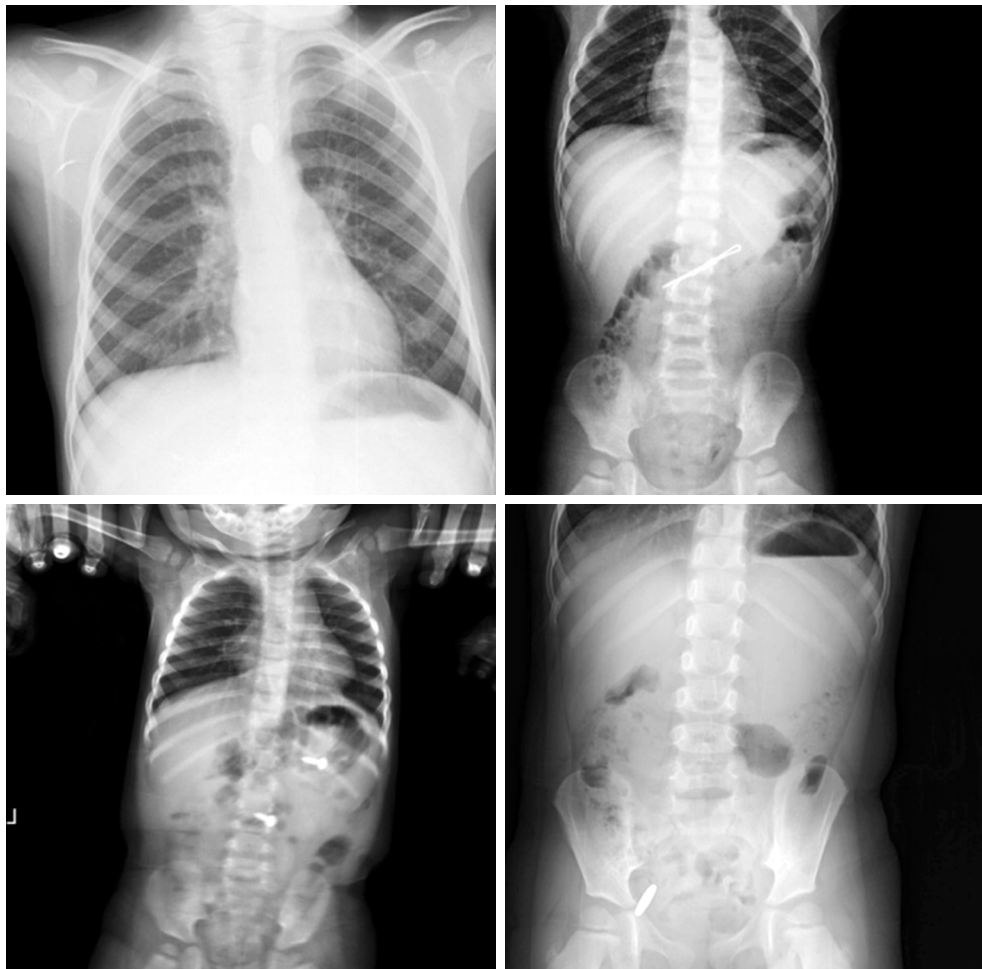


Figure 3. X-ray view of the placement of different foreign bodies in different localizations.

Non-metal objects were mostly pieces of glass (n=3) and fruit seeds were the most common in food items (n=5) (Figure 1).

DISCUSSION

Foreign body ingestion in childhood is a common problem in EDs that can cause morbidity and mortality when unnoticed. Most cases only require follow-up as the FB is expected to pass the gastrointestinal tract spontaneously. However, some cases may require endoscopic or surgical intervention. This study included 133 patients aged <18 years who visited the ED with complaints of FBI between 2013 and 2018. The patients were between 1-17 years of age and the mean age was 7.5±3.8 years. The mean age in our study was slightly higher compared to that of the cases in previous studies.^[13-16] Ninety-six (72%) of the patients presented to the ED in the first 24 hours. This was an expected result, considering the pediatric age range of the patients.

In terms of patient complaints: 39 patients were asymptomatic, 40 patients had nausea, 56 patients had abdominal pain, two patients had hypersalivation, 15 patients had a sensation of FB in the throat, and one patient had shortness of breath. These findings were comparable to the patients' complaints in the studies of Diaconescu et al.^[14] and Jafari et al.^[17]

We observed that patients most frequently swallowed metal pieces, mostly coins. It is a known fact that small toys and coins are accidentally or deliberately swallowed by children in childhood. This finding in our study was consistent with the literature.^[4,8]

The treatment modality varies depending on two main factors, the localization and type of foreign specimen.^[18-20] Endoscopy was performed in approximately half of the patients. In these patients, FBs were either removed or attempted to be removed naturally by pushing them into the stomach. The endoscopy process plays a very important role when dealing with FBs. In some cases, the FB cannot be removed due to its shape, despite the peristaltic movements of the digestive tract. In this situation, it is important to remove or move the object with an invasive method. Emergency intervention may be provided, especially in cases in which contact with tissues is undesired, as in the case of batteries. The number of patients who underwent endoscopic intervention was similar to the rates in other studies.^[13,14,21]

No FB was detected outside of the digestive system in our study. However, both our clinical experience and literature demonstrate that FBs should also be

investigated in the respiratory system, especially in children with long-term cough complaints.

Parental attention is very important in FBI in childhood, as the child's account may be insufficient. Children suspected of having this condition should be examined in detail and plain radiographs should be also examined. The team should be warned at an early stage if there is an opportunity for endoscopy in the hospital. If there is no such possibility, the relevant units should be immediately contacted for a referral.

Declaration of conflicting interests

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