ORIGINAL RESEARCH

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Emergency Endoscopic Management of Upper Gastrointestinal Foreign Bodies During On-Call Hours

Şeref ORAY[1], Esin ŞAİR[1]

[1] Başakşehir Çam and Sakura City Hospital, Department of General Surgery, İstanbul, Türkiye

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Abstract

Objective

Foreign body impaction in the upper gastrointestinal tract is a common indication for emergency endoscopy and may lead to serious complications if not managed promptly. International guidelines recommend early endoscopic intervention; however, data regarding urgent procedures performed during on-call hours remain limited. To evaluate clinical characteristics and procedural outcomes in adult patients who underwent emergency upper gastrointestinal endoscopy for foreign body ingestion during on-call hours.

Material and Method

This retrospective observational study included adult patients who presented to the emergency department and underwent urgent upper gastrointestinal endoscopy between April 2021 and February 2024. Demographic variables, imaging modalities, time to endoscopy, sedation strategies, characteristics and locations of foreign bodies, spontaneous distal passage, and procedural success were analyzed. Multivariable logistic regression models were used to identify factors associated with spontaneous passage and endoscopic success.

Results

A total of 63 patients were included (mean age 43.3 ± 16.4 years; 52.4% male). Pre-procedural imaging was performed in 90.5% of cases, most commonly plain radiography. The mean time to endoscopy was 1.17 hours, and 95.2% of patients underwent the procedure within six hours of admission. Foreign bodies were detected endoscopically in 45 patients, whereas spontaneous distal passage occurred in 18 (28.5%). Sharp/pointed objects accounted for 60% of detected cases, and the esophagus was the most frequent location (55.6%). Endoscopic treatment was successful in 91.1% of patients, with only one patient requiring surgical intervention. The proportion of sharp/pointed objects was lower in the spontaneous-passage group, whereas pre-procedural imaging was significantly more frequent in these patients.

Conclusion

Emergency upper gastrointestinal endoscopy performed during on-call hours demonstrated high success rates and a low incidence of major complications. Early intervention within the first 6 hours was associated with favorable outcomes. The relatively high rate of spontaneous distal passage suggests that selected low-risk patients may benefit from imaging-guided evaluation and close clinical observation. These findings support guideline-based management strategies and provide a foundation for future multicenter prospective studies.

Keywords: Emergency endoscopy, Esophageal impaction, Foreign body ingestion, Upper gastrointestinal tract

Correspondence: Ş.O. / orayseref@gmail.com
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ORCID IDs of the Authors: Ş.O: 0000-0002-5733-9772; E.Ş: 0009-0001-1116-1016

Introduction

Foreign body impaction in the upper gastrointestinal tract is a common clinical presentation in emergency departments, and appropriate management is critical for reducing morbidity and mortality. In most cases, endoscopy is the first-line therapeutic approach and is associated with high success rates. Early diagnosis and selection of appropriate techniques play an important role in minimizing complication rates.

The esophagus is the most frequent anatomical site of upper gastrointestinal foreign body impaction, a finding thought to be related to physiological narrowing zones within the esophageal lumen. In addition, the presence of esophageal strictures, malignancy, or other structural abnormalities may further increase the risk of foreign body impaction (1, 2).

Esophageal obstruction caused by foreign bodies or food boluses represents one of the most common indications for urgent gastroenterology consultation (3). The spectrum of ingested foreign bodies is broad and can be classified according to morphological characteristics as sharp/pointed or blunt/soft objects. Sharp/pointed foreign bodies-including needles, chicken bones, fish bones, glass fragments, screws, and hooked dental prostheses-carry a high risk of mucosal injury and perforation. In contrast, blunt foreign bodies have a lower risk of perforation but may result in luminal obstruction; typical examples include food residues, fruit pits, and bottle caps.

Timely and safe endoscopic intervention is crucial for relieving obstruction, preventing serious complications such as aspiration and perforation, and improving patient outcomes. Early endoscopic removal of foreign bodies or food boluses has been associated with a more favorable prognosis compared with delayed procedures and prolonged procedural times (3, 4).

Different sedation strategies have been adopted for esophageal foreign body removal. While shorter procedures are commonly performed under procedural sedation, some centers prefer general anesthesia to optimize airway protection and reduce the risk of aspiration (5).

The most frequently used endoscopic approach is gentle advancement of the obstructing material into the stomach; when this strategy fails, retrieval with endoscopic accessories-either en bloc or in a piecemeal fashion-may be required.

The present study aimed to evaluate clinical characteristics and procedural outcomes in adult patients who underwent emergency upper gastrointestinal endoscopy for foreign body ingestion during on-call hours.

Material and Method

Study Design

This retrospective observational study was conducted at a tertiary referral center between April 2021 and February 2024. The study included adult patients who presented to the emergency department with suspected foreign body ingestion during on-call hours and subsequently underwent upper gastrointestinal endoscopy. The choice of sedation strategy was based on clinical judgment, taking into account patient cooperation, airway protection needs, and procedural complexity. Procedures were performed without sedation in selected cooperative patients with anticipated short duration. All procedures were performed by surgeons experienced in gastrointestinal endoscopy.

Ethical Approval

Ethical approval was obtained from the Başakşehir Çam ve Sakura Clinical Research Ethics Committee (dated 24 April 2024; decision no. 264; reference number E-96317027-514.10-242629601). The study was conducted in accordance with the Declaration of Helsinki.

Patient Selection
Inclusion criteria:
• Age ≥18 years
• Undergoing emergency endoscopy for suspected foreign body ingestion
Exclusion criteria:
• Age <18 years
• Elective endoscopic procedures
• Cases with inadequately documented endoscopic findings

Definitions

On-call hours were defined as periods outside regular working hours (17:00–08:00), including weekends and public holidays. Time to endoscopy was defined as the interval between presentation to the emergency department and the initiation of the endoscopic procedure. Spontaneous distal passage was defined as the absence of a radiologically detected foreign body at endoscopy, with presumed migration beyond the duodenum. Procedural success was defined as complete endoscopic removal of the foreign body without the need for surgical intervention or patient transfer. Foreign bodies were classified according to morphology as sharp/pointed or blunt/soft objects. Procedure-related complications were recorded descriptively and

were not included in multivariable regression analyses because of their low frequency.

Statistical Analysis

Categorical variables were expressed as counts and percentages and were compared using the chi-square test or Fisher's exact test, as appropriate. Continuous variables were reported as median (minimum–maximum) or mean ± standard deviation, depending on data distribution, and were analyzed using parametric or nonparametric tests. The normality of continuous variables was assessed using the Kolmogorov–Smirnov test and visual methods (histograms and Q–Q plots).

Multivariable logistic regression analyses were performed to identify factors associated with spontaneous distal passage and endoscopic procedural success. A p-value <0.05 was considered statistically significant. Statistical analyses were conducted using IBM SPSS Statistics version 21.0 (IBM Corp., Armonk, NY, USA)

Results

Patient Flow and Baseline Characteristics

During the study period, a total of 63 adult patients who underwent emergency upper gastrointestinal endoscopy for suspected foreign body ingestion during on-call hours were evaluated. The mean age was 43.3 ± 16.4 years, and 52.4% of the patients were male. Pre-procedural imaging was performed in 90.5% of cases, most commonly plain radiography. The median time from emergency department presentation to endoscopy was 1.17 hours (IQR: 0.6–2.4), and 95.2% of patients underwent the procedure within the first six hours.

Approximately two-thirds of patients underwent the procedure under sedation, whereas only one patient required general anesthesia with endotracheal intubation. Twenty patients underwent the procedure without any sedative medication. Foreign bodies were identified endoscopically in 45 patients, while spontaneous distal passage before endoscopy was observed in 18 cases (Table 1).

Characteristics of Foreign Bodies Detected at Endoscopy

Among the 45 patients in whom foreign bodies were identified endoscopically, 27 had sharp/pointed objects, and 18 had blunt/soft objects. The most frequent location was the esophagus (n = 25), followed by the stomach. Multiple foreign bodies were detected in 15.6% of patients.

Table 1 Baseline Characteristics of the Study Population (n = 63)

Variable	Value
Age, mean ± SD	43.3 ± 16.4
Male sex	33 (52.4%)
Female sex	30 (47.6%)
Imaging performed	
- CT scan	30 (47.6%)
- X-ray	57 (90.5%)
Time to endoscopy, hours (median, IQR)	1.17 (0.6–2.4)
≤6 h to endoscopy	60 (95.2%)
6-24 h	3 (4.8%)
Sedation used	42 (66.7%)
Awake / no sedation	20 (31.7%)
Intubation + GA **Spontaneous distal passage**	1 (1.6%) 18 (28.5%)

IQR = Interquartile Range, GA: General Anesthesia

Among patients who underwent pre-procedural imaging, foreign bodies were radiologically visualized in 68.9%. Of the 45 patients with endoscopically confirmed foreign bodies, 34 (75.6%) underwent successful endoscopic retrieval, 7 experienced symptom relief after advancement of the bolus into the stomach, and in 3 patients the object was observed to have migrated into the duodenum. Only one patient required surgical referral because of failed endoscopic therapy. Accordingly, the overall endoscopic treatment success rate was calculated as 91.1% (Table 2).

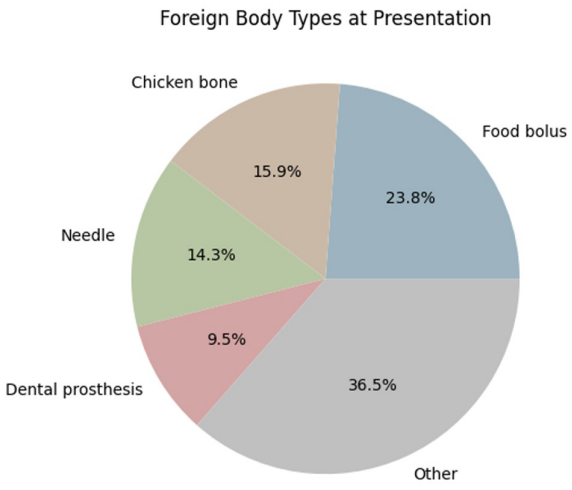

Figure 1
Distribution of foreign body types at presentation

The distribution of foreign body types identified at presentation is shown in Fig 1. Food bolus impaction was the most common finding, followed by chicken bones, needles, and dental prostheses. Other foreign bodies included batteries, glass fragments, screws, and razor blades.

Spontaneous Distal Passage

When patients with spontaneous distal passage were compared with those in whom a foreign body was detected at endoscopy, suspicion of a sharp/pointed object was significantly lower in the spontaneous-passage group ($p = 0.04$).

The rate of pre-procedural imaging was significantly higher among patients with spontaneous passage ($p = 0.01$). Time to endoscopy also tended to be longer in this group; however, the difference did not reach statistical significance (Table 3).

Procedure Safety

The rate of major complications in the study cohort was very low. No cases of perforation or serious adverse events requiring surgical intervention were observed. Mild adverse events, including mucosal injury and minor bleeding during the procedure, were recorded in four patients. Owing to their low frequency, complications were not included in advanced statistical analyses and were reported descriptively.

Among patients in whom a foreign body was detected endoscopically, symptom profiles differed significant-

Table 2 Characteristics of Foreign Bodies and Procedures (n = 45 detected at endoscopy)

Variable	Value
Sharp/pointed object	27 (60.0%)
Blunt/food bolus	18 (40.0%)
Location	
- Esophagus	25 (55.6%)
- Stomach	17 (37.8%)
- Other	3 (6.6%)
Multiple objects	7 (15.6%)
Successful endoscopic removal	41 (91.1%)
Imaging positive before endoscopy	31 (68.9%)

ly according to anatomical location (Fisher's exact test, p = 0.031). Dysphagia and odynophagia were the most frequently reported symptoms in cases with esophageal foreign bodies, whereas nausea and vomiting were more prominent in gastric localization. The proportion of asymptomatic presentations was higher in the gastric group, while hypersalivation was more commonly observed in patients with esophageal impaction. In cases involving other locations, symptom distribution was heterogeneous (Table 4).

Foreign body morphology was significantly associated with anatomical location (overall Fisher's exact test, p = 0.048), with sharp/pointed objects more frequently identified in the esophagus and blunt objects more commonly found in the stomach (Table 5).

Table 3 Comparison Between Spontaneous Distal Passage and Detected Foreign Body

Variable	Spontaneous (n=18)	Detected (n=45)	P değeri
Age (mean ± SD)	39.6 ± 14.8	44.7 ± 17.0	0.21
Male sex	9 (50%)	24 (53.3%)	0.81
Sharp/pointed object suspected	6 (33.3%)	27 (60.0%)	**0.04**
Imaging performed	16 (88.9%)	25 (55.6%)	**0.01**
Time to endoscopy (h, median)	1.6	1.1	0.09
Sedation used	10 (55.6%)	32 (71.1%)	0.23

Table 4 Symptoms according to foreign body location (n = 45 detected at endoscopy)

Symptom at presentation	Esophagus (n=25)	Stomach (n=17)	Other (n=3)
Dysphagia / odynophagia	14 (56.0%)	3 (17.6%)	0
Chest/throat pain	8 (32.0%)	4 (23.5%)	1
Nausea/vomiting	2 (8.0%)	6 (35.3%)	1
Hypersalivation	4 (16.0%)	1 (5.9%)	0
Asymptomatic	1 (4.0%)	3 (17.6%)	1

Table 5 Association between foreign body type and location (n = 45)

Location	Sharp/Pointed n (%)	Blunt n (%)
Esophagus	18 (66.7)	7 (38.9)
Stomach	7 (25.9)	10 (55.6)
Other	2 (7.4)	1 (5.6)

Overall p = 0.048 (Fisher's exact test)

Discussion

In this study, emergency endoscopic management of upper gastrointestinal foreign bodies during on-call hours was evaluated, and several clinically relevant findings were identified. The European Society of Gastrointestinal Endoscopy (ESGE) recommends urgent therapeutic esophagogastroduodenoscopy within 2–6 hours for sharp/pointed objects and batteries causing complete esophageal obstruction, and within 24 hours for other esophageal foreign bodies not resulting in complete obstruction (4). In our cohort, 95.2% of patients underwent endoscopy within the first six hours. We believe that this rapid intervention may have contributed to the low complication rate observed. Similarly, early endoscopic management has been shown to reduce the risk of perforation and the need for surgical intervention (3, 6).

Large retrospective case series have reported endoscopic success rates exceeding 90%, which is consistent with the overall endoscopic success rate of 91% observed in our study (7–9).

Symptom profiles in our cohort varied according to foreign body morphology and anatomical location. Esophageal impaction caused by sharp/pointed objects was associated with prominent symptoms such as dysphagia, odynophagia, chest pain, and hypersalivation, whereas gastric impaction by blunt objects tended to present with milder clinical manifestations. The association between sharp/pointed objects and mucosal injury and early symptomatology further supports the need for rapid intervention in these cases (10).

Large case series have reported that the esophagus is the most frequent site of impaction and that sharp/pointed foreign bodies are associated with more pronounced clinical presentations (1,11,12). Yoo and colleagues similarly demonstrated earlier presentation among patients with sharp/pointed objects and more frequent delays in those with blunt objects (2). Our findings-showing more prominent pain in sharp/pointedobject impaction and a predominance of dysphagia in blunt-object cases-are in line with the existing literature.

In our study, multiple foreign bodies were identified in 15.6% of patients. Although our dataset did not allow for detailed subgroup analysis, previous studies have associated such cases with specific populations, including individuals with psychiatric disorders or incarcerated patients. However, in our cohort, these findings may also reflect accidental ingestion of multiple small objects, such as fish bones.

Early endoscopic intervention has previously been reported to reduce complication rates (1,11), and large retrospective studies have identified delayed intervention, the presence of sharp objects, and underlying esophageal pathology as major risk factors for adverse outcomes (13, 14). The high proportion of early procedures and the absence of major adverse events in our cohort are consistent with these observations.

The ESGE does not recommend routine radiologic evaluation in cases of uncomplicated non-bony food bolus impaction; however, plain radiography is advised when radiopaque objects are suspected or when the nature of the ingested material is unknown, whereas computed tomography is recommended in the presence of suspected perforation or complications requiring surgical intervention (strong recommendation, low-quality evidence).

Computed tomography has been shown to provide high diagnostic accuracy for localizing foreign bodies and predicting spontaneous distal passage (15), and the higher rate of tomographic imaging among patients with spontaneous passage in our study supports these findings.

Observation of spontaneous distal passage in approximately one third of patients before endoscopy highlights the dynamic nature of foreign body migration and suggests that, in carefully selected low-risk patients, close clinical monitoring and short-term radiologic reassessment in accordance with guideline-based urgency criteria may represent an appropriate management strategy.

Guidelines recommend close clinical observation rather than routine endoscopic retrieval in asymptomatic individuals who have ingested drug packets, with surgical consultation advised in cases of suspected packet rupture, failure of progression, or intestinal obstruction. In line with this approach, similar cases presenting to our center were managed conservatively with surgical referral when necessary and were therefore not included in the present study cohort.

Limitations

The main limitations of this study include its retrospective, single-center design and the relatively small sample size. Heterogeneity in imaging modalities, sedation strategies, and endoscopic techniques may also have influenced the results. Nevertheless, the inclusion of a real-world on-call cohort and demonstration of outcomes consistent with guideline-based management represent important strengths of the study.

Conclusion

This single-center retrospective study demonstrates that emergency upper gastrointestinal endoscopy performed during on-call hours is a safe and effective approach, with high success rates and a low incidence of major complications. Early endoscopic intervention reflects clinical practice aligned with international guidelines. The relatively high rate of spontaneous distal passage suggests that, in appropriately selected low-risk patients, imaging-guided assessment and close clinical follow-up may help reduce unnecessary emergency procedures. Our findings indicate that foreign body type and anatomical location play a central role in guiding management strategies.

Conflict of Interest Statement

The authors declare that there is no conflict of interest.

Ethical Approval

Ethical approval was obtained from the Başakşehir Çam ve Sakura Clinical Research Ethics Committee (dated 24 April 2024; decision no. 264; reference number E-96317027-514.10-242629601). The study was conducted in accordance with the Declaration of Helsinki.

Consent to Participate and Publish

Informed consent was waived by the local ethics committee because of the retrospective nature of the study and the use of anonymized data.

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Availability of Data and Materials

Data is available on request due to privacy or other restrictions.

Artificial Intelligence Statement

The authors declare that they have not used any type of generative artificial intelligence for the writing of this manuscript, nor for the creation of images, graphics, tables, or their corresponding captions.

Authors Contributions

ŞO: Conceptualization; Data curation; Formal analysis; Investigation; Methodology; Validation; Visualization; Project administration; Resources; Writing-original draft

EŞ: Supervision; Writing-review & editing.

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