

Original article

Foreign Bodies in the Esophagus in a Tertiary Center of Tunisia

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Abstract

Introduction: Esophageal foreign body (EFB) ingestion is a frequent medical emergency encountered in otorhinolaryngology, particularly in children and adults with specific risk factors. Prompt diagnosis and timely intervention are essential to prevent potentially life-threatening complications. The objective is to describe the epidemiological, clinical, radiological, and therapeutic characteristics of EFB ingestion and to identify factors associated with delayed consultation and complications.

Methods: A retrospective study was conducted from January 2006 to December 2022, including all patients with EFB ingestion. Clinical, radiological, and therapeutic data were analyzed, with statistical evaluation of factors linked to delayed consultation.

Results: A total of 360 patients were included with an incidence of 15 cases per 1,000 hospitalizations. Children accounted for 52.2% of cases (median age: 5 years), while adults represented 47.8% (median age: 58 years). Most patients (91.8%) presented within 24 hours of ingestion. The upper third of the esophagus was the most frequent site of impaction (86.1%). Esophagoscopy was performed in all patients. Extraction was successful in 93.3% of cases using rigid esophagoscopy. Surgical intervention was required in only 0.8% of cases. Mucosal injury was observed in 11.4% of patients, with major complications (2.2%) including perforation, abscesses, and mediastinitis. Most patients (96.1%) were discharged within 24 hours. Univariate and multivariate analyses identified neuropsychiatric comorbidities, vomiting, sharp-edged objects, and middle esophageal location as factors independently associated with delayed consultation, while food-related foreign bodies and hypersalivation were protective factors.

Conclusion: EFBs represent a common but potentially serious clinical situation. Early diagnosis and management via rigid esophagoscopy yield excellent outcomes. Targeted preventive strategies, particularly education of caregivers and high-risk adult populations, are essential to reduce consultation delays and prevent complications.

Keywords: Foreign Body Ingestion; Rigid Esophagoscopy; Consultation Delay; Complications; Pediatrics; Adults; Risk Factors

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1. Introduction

Esophageal foreign body (EFB) ingestion is a frequent and urgent condition, particularly in pediatric populations and certain adult risk groups such as the elderly, psychiatric patients, and individuals with dental prostheses[1,2]. It is estimated that approximately 100,000 cases of foreign body ingestion are reported annually in the United States, with children accounting for about 80% of these incidents [3]. Although most foreign bodies pass spontaneously, about 10–20% require endoscopic removal, and less than 1% necessitate surgical intervention [4]. Despite being often benign, EFBs can cause serious complications such as esophageal perforation, mediastinitis, or even fatal outcomes if not promptly addressed [5]. Despite the abundance of published data on EFB ingestion, several aspects remain insufficiently explored, particularly in low- and middle-income countries. Most available studies originate from Western or Asian settings and focus primarily on pediatric populations, with limited attention to adult risk

factors, regional epidemiological patterns, and determinants of delayed consultation. Furthermore, the impact of sociocultural factors, healthcare accessibility, and diagnostic delays on complication rates remains poorly documented in North African countries[6,7].

In Tunisia, data on EFB ingestion are scarce and fragmented, and no long-term study has comprehensively analyzed both pediatric and adult populations within a single tertiary care center. A better understanding of local epidemiological characteristics, clinical presentation, and management outcomes is essential to optimize diagnostic strategies, reduce delays in care, and prevent avoidable complications.

This study aimed to analyze the epidemiological, clinical, radiological, and therapeutic characteristics of esophageal foreign body ingestion over 17 years in a Tunisian tertiary care center and to identify factors associated with delayed consultation and the occurrence of complications.

2. Materials and Methods

Study Design and Setting

This was a retrospective, descriptive, and analytical study conducted in the Department of Otorhinolaryngology (ENT). The study included all patients admitted with suspected or confirmed esophageal foreign body (EFB) ingestion between January 2006 and December 2022, corresponding to a 17-year study period.

Inclusion Criteria

Patients of all ages admitted with intra-esophageal foreign body ingestion confirmed by esophagoscopy.

Exclusion Criteria

Patients in whom the foreign body passed spontaneously before endoscopic examination and therefore did not undergo esophagoscopy.

Patients who underwent esophagoscopy for suspected foreign body ingestion but in whom no foreign body was identified during the procedure (negative esophagoscopy).

Patients with foreign bodies located in the hypopharynx or tracheobronchial tree.

Data Collection

Data were collected retrospectively from patient medical records using a standardized data collection form. The following variables were recorded: Sociodemographic characteristics (age, sex); medical and Surgical History (Hx), including dental status, psychiatric disorders, esophageal disease, and prior episodes of EFB ingestion; circumstances of ingestion (accidental vs. intentional); clinical presentation at admission (dysphagia, hypersalivation, odynophagia, vomiting); radiologic and endoscopic findings, including foreign body visibility and esophageal location; foreign body characteristics (food vs. non-food, sharp vs. blunt); therapeutic management (medical treatment, rigid or flexible esophagoscopy, surgical intervention); outcomes (mucosal injury, complications, length of hospitalization, and clinical evolution). Incomplete or missing medical records were excluded from the final analysis. Variables with sporadic missing data were analyzed using complete-case analysis, without data imputation.

Statistical Analysis

All data were analyzed using IBM SPSS Statistics (version 25.0). Descriptive statistics were used to summarize patient demographics, clinical characteristics, and outcomes. Continuous variables such as age and time to consultation were analyzed as continuous variables and, when appropriate, categorized for subgroup analysis. Delayed consultation was defined as presentation more than 24 hours after ingestion, in accordance with previously published studies demonstrating increased complication risk beyond this threshold [8]. Analytical methods were employed to identify factors associated with delayed consultation and complications. Univariate analysis was performed using the Chi-square test or Fisher's exact test for categorical variables and the Student's t-test for continuous variables, as appropriate. Variables with $p < 0.05$ in univariate analysis or those considered clinically relevant

based on existing literature were included in a multivariate logistic regression model. Multicollinearity was assessed prior to model construction, and potential confounders were controlled through adjusted odds ratios. Results were expressed as odds ratios (ORs) with 95% confidence intervals (CIs).

Operational Definitions

A child was defined as any patient aged 15 years or younger, in accordance with World Health Organization criteria [9].

Medical and Surgical History (Hx) referred to any pre-existing condition predisposing to EFB ingestion or impaction, including diabetes mellitus, hypertension, neuropsychiatric disorders, esophageal stricture, gastroesophageal reflux disease, dental prostheses, or a previous history of esophageal foreign body ingestion.

Time to consultation was defined as the interval, in hours, between foreign body ingestion and presentation to a healthcare facility.

Esophageal foreign body location was classified anatomically as the upper third (above the aortic arch, vertebral level T4), middle third (between T4 and T8), or lower third (below T8 and above the gastroesophageal junction), as described in previous anatomical classifications [10].

Esophagoscopy was defined as an endoscopic procedure used for both diagnosis and extraction of esophageal foreign bodies, performed using rigid or flexible instruments according to clinical indication [11].

3. Results

Descriptive analysis

The study included 360 patients diagnosed with EFB ingestion between January 2006 and December 2022, representing an incidence of 15 cases per 1,000 hospitalizations. Of these, 188 patients (52.2%) were children aged 15 years or younger, with a median age of 5 years (interquartile range: 3–10 years), while 172 patients (47.8%) were adults, with a median age of 58 years (interquartile range: 45–68 years). There was a slight male predominance, with 205 males and 155 females (male-to-female ratio: 1.3). Dental prostheses or edentulism were present in 12.7% of cases (47 patients), and 3.1% (11 patients) had a history of psychiatric disorders or intellectual disability.

The majority of patients (91.8%, 330 cases) presented within 24 hours of ingestion, with 66.9% (241 cases) seeking medical attention within the first six hours.

The most commonly reported symptoms were dysphagia (59.4%, 214 cases), hypersalivation (46.4%, 167 cases), and a sensation of a foreign body (28.6%, 103 cases). Only 2.2% (8 patients) exhibited signs of complications at the time of admission.

All patients underwent standard radiographs, including frontal and lateral cervical spine views and frontal chest views. Radiography revealed a radio-opaque esophageal foreign body in 251 cases (69.7%) (Fig. 1 and 2). Among these, 167 were metallic objects (43.9%), 75 were organic and 9 were miscellaneous (2.4%). A single case of

pneumomediastinum (0.3%) was also detected. In 30.3% of cases, the radiograph was non-conclusive due to the radiolucency of the object or poor visibility.

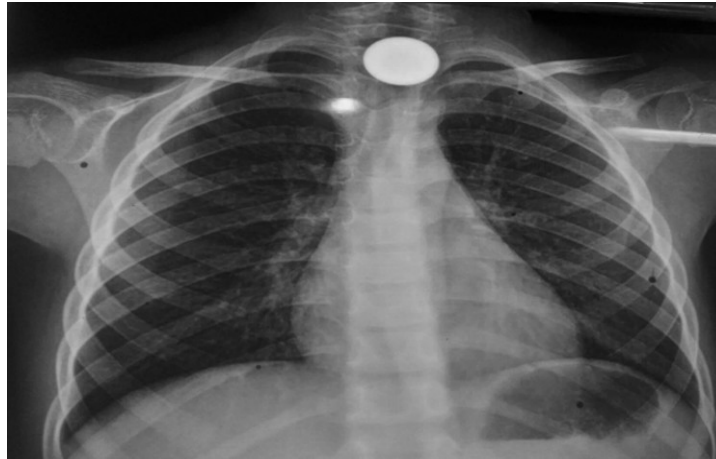


Fig. 1. Frontal chest X-ray showing a rounded, metallic-density foreign body located at the level of the esophageal inlet.



Fig. 2. Lateral chest X-ray showing a metallic-density foreign body consistent with a pin in the cervical esophagus (blue arrow).

Cervico-thoracic CT was performed in 10 patients with clinical suspicion of esophageal perforation. Among them, six cases showed confirmed perforation, often associated with complications such as pneumomediastinum, peri-esophageal or prevertebral abscesses, and mediastinal air

collections (Fig. 3). One case involved a newborn with an intra-esophageal foreign body but no perforation. Two patients had uncomplicated foreign bodies, and one patient underwent CT after a one-week delay in consultation, which revealed no signs of perforation

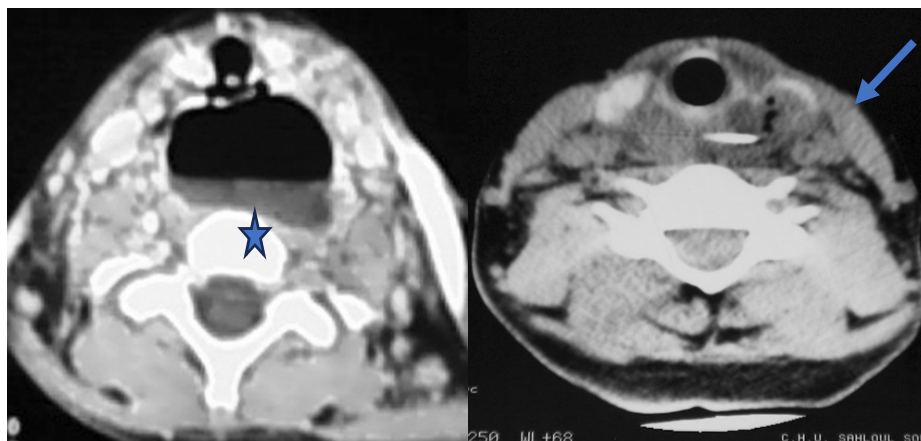


Fig. 3. Axial cervico-thoracic CT scan showing features of mediastinitis (a) and a peri-esophageal abscess (b).

In the pediatric group, non-food items accounted for 91.5% of cases (172 out of 188 patients), with coins representing the most frequently ingested objects. In the adult group, food-related foreign bodies were present in 91.9% of cases (158 patients), mainly consisting of bones and meat (Fig. 4). The upper third of the esophagus was the

most common site of foreign body impaction, recorded in 58.6% of cases (211 patients), followed by the middle third in 27.2% (98 patients) and the lower third in 14.2% (51 patients). Table 1 explains the distribution of foreign bodies according to their nature and patient age group (Table 1).



Fig. 4. Examples of esophageal foreign bodies retrieved in our department.

Table 1. Distribution of Cases According to the Nature of the Foreign Body

Nature of Foreign Body	Children n (%)	Adults n (%)	Total n (%)
Non-food Foreign Body			
Coin	162 (86.2)	3 (1.74)	165 (45.8)
Denture	0 (0.0)	8 (4.65)	8 (2.2)
Pin	1 (0.53)	1 (0.58)	2 (0.55)
Stone	1 (0.53)	0 (0)	1 (0.27)
Earring	1 (0.53)	0 (0)	1 (0.27)
Battery	3 (1.59)	0 (0)	3 (0.83)
Staple	0 (0)	1 (0.58)	1 (0.27)
Bottle cap	1 (0.53)	1 (0.58)	2 (0.55)
Jewelry	1 (0.53)	0 (0)	1 (0.27)
Plastic	2 (1.06)	0 (0)	2 (0.55)
Food Foreign Body			
Piece of meat	4 (2.12)	74 (43.02)	78 (21.6)
Bone fragment	9 (4.78)	82 (47.67)	91 (25.27)
Chickpeas	2 (1.06)	1 (0.58)	3 (0.83)
Fish scale	1 (0.53)	0 (0)	1 (0.27)
Vegetable	0 (0)	1 (0.58)	1 (0.27)
Total	188 (100)	172 (100)	360 (100)

Percentages in the “Children” and “Adults” columns may not total 100% due to rounding. All patients underwent rigid esophagoscopy: complete extraction was achieved in 93.3% of cases (336 patients), while fragmentation was necessary in 5.3% (19 cases). Surgical intervention was required in only 0.8% (3 patients) due to severe complications.

Mucosal lesions were observed in 11.4% (41 cases), and serious complications—such as perforation, abscess formation, or mediastinitis—were documented in 2.2% (8 patients).

The upper third of the esophagus was the most frequent site of impaction, observed in 86.1% of patients (310 cases) followed by the middle third (9.4%) and the lower third (4.4%). Of the total cases recorded, 51.6% of foreign bodies (FBs) were non-food items (186 cases), with coins representing the majority (n=165).

In the pediatric population, non-food objects accounted for 91.5% of ingestions (172 cases), and coins alone represented 86.2% (162 cases). In contrast, adults were more likely to ingest food-related foreign bodies, which constituted 91.9% of cases (158 cases). Additionally, dentures were ingested in 2.2% of adult cases (n=8).

Following FB extraction, the duration of hospitalization varied between 1 and 30 days, with a median hospital stay of 0.5 days (IQR: 0.5–0.5).

The vast majority of patients (96.1%, n = 346) were discharged within 24 hours, reflecting the overall favorable prognosis of promptly managed cases. Prolonged hospitalization (>24 hours) was required in only 14 patients (3.9%), predominantly males (64.3%) and individuals presenting more than 24 hours post-ingestion (78.8%).

Most of these cases involved sharp or hazardous foreign bodies (78.6%), and radiographic findings revealed radio-opaque objects in 85.7%. Esophageal lesions such as perforations (14.3%), mediastinitis (14.3%), and abscesses were identified in several cases, necessitating medical management with nasogastric tube placement, cessation of oral intake, and broad-spectrum intravenous antibiotics. Surgical interventions—including drainage, suture repair, and tracheotomy—were performed in selected patients. Despite the severity of these complications, clinical outcomes were favorable in all cases.

Univariate Analysis

Several factors were significantly associated with a consultation delay exceeding 24 hours. Patients aged over 15 years were more likely to present late ($p < 0.001$), as were those with neuropsychiatric comorbidities (OR = 10.00; 95% CI: 2.59–38.66; $p < 0.001$) and edentulism (OR = 4.31; 95% CI: 2.26–8.21; $p < 0.001$).

Ingestion of food-type foreign bodies was inversely associated with delay (OR = 0.07; 95% CI: 0.04–0.15; $p < 0.001$), whereas sharp-edged objects were positively associated (OR = 2.41; 95% CI: 1.44–4.05; $p = 0.001$). The absence of hypersalivation (OR = 0.17; 95% CI: 0.09–0.32; $p < 0.001$), and location of the FB in the middle (OR = 7.85) or lower third (OR = 5.56) of the esophagus were also associated with longer delays.

Additionally, dysphagia or odynophagia (OR = 2.01;

$p = 0.010$), a history of foreign body ingestion ($p = 0.047$), and the presence of complications ($p = 0.018$) were significantly linked to delayed consultation. Other variables such as sex, esophageal stenosis, GERD/hiatal hernia, and sensation of a FB were not significantly associated with consultation delay. Full statistical details are presented in Table 2.

Multivariate Analysis

Multivariate analysis revealed that several factors were independently associated with a consultation delay of more than 24 hours. Notably, the presence of neuropsychiatric comorbidities significantly increased the risk of delay (adjusted OR = 10.69; $p = 0.006$), while ingestion of food-type FBs was a protective factor (adjusted OR = 0.09; $p < 0.001$). The absence of hypersalivation (adjusted OR = 0.25; $p < 0.001$), the presence of vomiting (adjusted OR = 3.24; $p = 0.033$), and localization of the FB in the middle third of the esophagus (adjusted OR = 3.52; $p = 0.005$) were also independently associated with delayed consultation. Complete results are detailed in Table 3.

4. Discussion

This study provides one of the largest long-term analyses of esophageal foreign body ingestion in Tunisia, offering valuable insight into regional epidemiological patterns, determinants of consultation delay, and clinical outcomes in both pediatric and adult populations. By integrating demographic, clinical, radiological, and therapeutic data over 17 years, it addresses an important gap in North African literature, where data on EFB ingestion remain scarce and fragmented.

The bimodal age distribution observed in our cohort— young children and older adults—is consistent with international reports, particularly large series from Europe and Asia [12–14]. Children remain highly vulnerable due to oral exploratory behavior, while edentulism, dental prostheses, and swallowing disorders predispose adults. However, the proportion of adult cases in our study (47.8%) is higher than that reported in many pediatric-dominated series, suggesting a regional epidemiological profile where adult risk factors may be under-recognized. The predominance of coins in children and food-related foreign bodies in adults aligns with existing data [1,15]. The high frequency of meat and bone impaction among adults likely reflects regional dietary habits, emphasizing the importance of contextualizing EFB patterns within local cultural practices.

Regarding anatomical distribution, the upper third of the esophagus was the most frequent site of impaction, as reported elsewhere [16]. This finding supports the anatomical vulnerability of the cricopharyngeal region and reinforces the need for early endoscopic evaluation in suspected proximal impaction. A major contribution of this study is the identification of independent predictors of delayed consultation through multivariate analysis. This is clinically important, as delayed presentation is a well-recognized determinant of severe morbidity, including esophageal perforation and mediastinitis [14,17].

Table 2. Results of Univariate Analysis of Factors Influencing the Delay in Consultation

Variable (Category)	≤24h n(%)	>24h n(%)	p-value	OR	95% CI
Age (<15 yrs)	170 (93.4)	12 (6.6)	<0.001	9.49	[4.91–18.36]
Age (>15 yrs)	103 (59.9)	69 (40.1)			
Sex (Male)	154 (74.4)	53 (25.6)	0.148	-	-
Sex (Female)	119 (81.0)	28 (19.0)			
Neuropsych. Hx (No)	270 (78.9)	72 (21.1)	<0.001	10.00	[2.59–38.66]
Neuropsych. Hx (Yes)	3 (27.3)	8 (72.7)			
Prev. FB (No)	271 (77.7)	78 (22.3)	0.047	5.21	[1.86–31.74]
Prev. FB (Yes)	2 (40.0)	3 (60.0)			
Stricture (No)	266 (76.7)	81 (23.3)	0.145	-	-
Stricture (Yes)	7 (100.0)	0 (0.0)			
GERD/Hiatal (No)	271 (77.3)	78 (22.7)	0.066	-	-
GERD/Hiatal (Yes)	0 (0.0)	1 (100.0)			
GI Surgery (No)	271 (77.1)	78 (22.9)	0.585	-	-
GI Surgery (Yes)	1 (100.0)	0 (0.0)			
Edentulous (No)	250 (81.2)	58 (18.8)	<0.001	4.31	[2.26–8.21]
Edentulous (Yes)	23 (50.0)	23 (50.0)			
FB Type (Food)	101 (58.4)	72 (41.6)	<0.001	0.07	[0.04–0.15]
FB Type (Non-food)	172 (95.0)	9 (5.0)			
Sharp FB (No)	154 (82.0)	53 (18.0)	0.001	2.41	[1.44–4.05]
Sharp FB (Yes)	119 (65.4)	28 (34.6)			
Battery (No)	210 (77.2)	58 (22.8)	0.665	-	-
Battery (Yes)	8 (66.7)	4 (33.3)			
Emphysema (No)	270 (77.3)	72 (22.7)	0.066	-	-
Emphysema (Yes)	0 (0.0)	1 (100.0)			
Resp. Distress (No)	270 (77.3)	72 (22.7)	0.066	-	-
Resp. Distress (Yes)	0 (0.0)	1 (100.0)			
Odyno/Dysphagia (No)	230 (84.0)	40 (16.0)	0.010	2.01	[1.17–3.44]
Odyno/Dysphagia (Yes)	124 (72.4)	47 (27.6)			
Hypersalivation (No)	123 (64.7)	67 (35.3)	<0.001	0.17	[0.09–0.32]
Hypersalivation (Yes)	150 (91.5)	14 (8.5)			
Vomiting (No)	205 (75.1)	68 (24.9)	0.064	-	-
Vomiting (Yes)	140 (85.5)	24 (14.5)			
FB Sensation (No)	210 (78.5)	58 (21.5)	0.339	-	-
FB Sensation (Yes)	10 (73.8)	6 (26.2)			
Retro. Pain (No)	271 (77.1)	78 (22.9)	0.585	-	-
Retro. Pain (Yes)	1 (100.0)	0 (0.0)			
FB Location (Upper)	253 (83.0)	52 (17.0)	<0.001	-	-
FB Location (Middle)	13 (38.2)	21 (61.8)	<0.001	7.85	[3.70–16.69]
FB Location (Lower)	7 (46.7)	8 (53.3)	0.001	5.56	[1.93–16.00]
Complications (No)	269 (78.0)	76 (22.0)	0.018	4.42	[1.16–16.88]
Complications (Yes)	4 (44.4)	5 (55.6)			

Table 3. Results of Multivariate Analysis of Factors Influencing the Delay in Consultation

Variable	Unadjusted p-value	ORb [95% CI]	Adjusted p-value	ORa [95% CI]
Neuropsychiatric Hx	<10 ⁻³	10.00 (2.59–38.66)	0.006	10.69 (1.95–58.57)
FB Type (Food)	<10 ⁻³	0.07 (0.04–0.15)	<0.001	0.09 (0.04–0.22)
Hypersalivation	<10 ⁻³	0.17 (0.09–0.32)	<0.001	0.25 (0.12–0.52)
Vomiting	0.064	0.51 (0.25–1.05)	0.033	3.24 (1.10–9.51)
FB Location (Upper 1/3)	<10 ⁻³	-	0.012	-
FB Location (Middle 1/3)	-	-	0.005	3.52 (1.47–8.43)

Neuropsychiatric comorbidities emerged as the strongest independent predictor of delayed consultation. Patients with psychiatric disorders or intellectual disability often have impaired symptom perception and communication, as well as a higher risk of repetitive ingestion behaviors, which may

contribute to delayed presentation and more severe complications [14]. These findings underscore the need for targeted preventive strategies, including caregiver education and a low threshold for early medical evaluation in this vulnerable population.

Foreign body type also significantly influenced consultation timing. Food-related foreign bodies were a strong protective factor against delay, likely because food bolus impaction frequently causes acute, high-grade obstruction with distressing symptoms such as dysphagia and hypersalivation, prompting immediate medical attention [13,18]. In contrast, many non-food foreign bodies may cause partial obstruction or minimal initial symptoms, leading to delayed or underestimated presentation[19].

The absence of hypersalivation was independently associated with delayed consultation, probably because its absence provides false reassurance in cases of partial or distal obstruction [17]. Vomiting was likewise associated with delay, as it may be misinterpreted as a benign gastrointestinal condition, particularly in adults, resulting in postponed referral [14]. Additionally, foreign body localization in the middle third of the esophagus was linked to delayed presentation, as mid-esophageal impactions often produce less pronounced symptoms than cervical esophageal foreign bodies [12,13].

In the present series, the overall complication rate was low (2.2%); however, these complications occurred predominantly in patients presenting more than 24 hours after ingestion or in those with sharp foreign bodies, directly supporting the association between delayed consultation and increased morbidity. Rigid esophagoscopy achieved a high success rate (93.3%) and remains the cornerstone of EFB management in our institution, reflecting real-world practice in many low- and middle-income settings where resource availability and expertise guide clinical decision-making [17,18].

Overall, delayed consultation was associated with both patient-related and foreign body-related factors, all of which are recognized predictors of severe complications. Early identification of these high-risk profiles is therefore essential to reduce morbidity through timely referral and intervention [19,20].

The findings of this study have direct implications for clinical practice in Tunisia and similar settings. Early recognition of high-risk patients—particularly adults with neuropsychiatric disorders, edentulism, or non-specific symptoms—should prompt expedited referral for endoscopic evaluation. Public health strategies should prioritize caregiver education for children and targeted counseling for elderly patients and denture users [18]. Improving awareness among primary care providers about atypical presentations may further reduce consultation delays and prevent severe complications[20].

The strengths of this study include its large sample size, long follow-up period, and comprehensive analytical approach, allowing identification of independent predictors of delayed consultation.

However, its retrospective design and temporal heterogeneity may introduce information bias, particularly given evolving imaging and endoscopic practices over time. Despite these limitations, the consistency of our findings with recent international data supports their validity.

To our knowledge, this is the first Tunisian study to specifically analyze determinants of delayed consultation in EFB ingestion using multivariate modeling. While prior North African studies have primarily focused on pediatric

populations or descriptive outcomes, this work extends existing regional data by integrating both pediatric and adult cohorts and identifying independent predictors of delayed presentation.

By highlighting region-specific risk factors and real-world management constraints, this work contributes meaningful data to the global literature and supports the development of context-adapted preventive and clinical strategies.

5. Conclusion

This study demonstrates that early consultation and prompt rigid esophagoscopy are decisive factors in achieving favorable outcomes in esophageal foreign body ingestion, with a high success rate and a low incidence of major complications. Delayed presentation—particularly among adults with neuropsychiatric comorbidities, sharp foreign bodies, vomiting, or middle esophageal impaction—significantly increases the risk of mucosal injury and severe complications. These findings highlight the need for targeted preventive strategies, including caregiver education, early recognition of warning symptoms, and improved access to specialized endoscopic services. Strengthening public awareness and reinforcing referral pathways to tertiary care centers remains a key element in reducing consultation delays and preventing avoidable morbidity.

Patient Consent

Patient consent was waived due to the retrospective nature of the study. All data were collected from medical records and analyzed anonymously, with no direct patient contact.

Authors' Contributions

All authors contributed to the study conception and design. All authors read and approved the final version of the manuscript.

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Ethical Considerations

This study was conducted in accordance with the principles of the Declaration of Helsinki. Ethical approval was obtained from the local institutional ethics committee. Given the retrospective design of the study and the use of anonymized data, the requirement for informed consent was waived.

Conflict of Interest

The authors declare that they have no competing interests.

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Reference

- [1] Gatto A, Capossela L, Ferretti S, Orlandi M, Pansini V, Curatola A, et al. Foreign body ingestion in children: epidemiological, clinical features and outcome in a third level emergency department. *Children (Basel)*. 2021;8(12):1182. <https://doi.org/10.3390/children8121182>
- [2] Manfredi MA, Alvarez RP, Arai K, Cheema HA, Darma A, Elawad M, et al. Global insights on the diagnosis, management, and prevention of pediatric ingestions: a report from the FISPUGHAN expert panel. *JPGN Rep*. 2025;6(3):274–87. <https://doi.org/10.1002/jpr3.70025>
- [3] Ikenberry SO, Jue TL, Anderson MA, Appalaneni V, Banerjee S, Ben-Menachem T, et al. Management of ingested foreign bodies and food impactions. *Gastrointest Endosc*. 2011;73(6):1085–91. <https://doi.org/10.1016/j.gie.2010.11.010>
- [4] Telford JJ. Management of ingested foreign bodies. *Can J Gastroenterol Hepatol*. 2005;19(10):599–602.
- [5] Zhang X, Jiang Y, Fu T, Zhang X, Li N, Tu C. Esophageal foreign bodies in adults with different durations of time from ingestion to effective treatment. *J Int Med Res*. 2017;45(4):1386–93. <https://doi.org/10.1177/0300060517706828>
- [6] Trabelsi I, Kbaier S, Daoued Y, Lachiheb A, Brini I, Khalsi F, et al. Ingestion de corps étranger chez l'enfant: aspects cliniques et évolutifs. *Tunis Med*. 2024;102(12):1040–3.
- [7] Mejri A, Yaacoubi J, Mseddi MA, Omry A. Gastrointestinal perforations by ingested foreign bodies: a preoperative diagnostic flowchart-based experience. A case series report. *Int J Surg Case Rep*. 2022;95:107216. <https://doi.org/10.1016/j.ijscr.2022.107216>
- [8] McMahon K, Connors GP, Mohseni M. Pediatric foreign body ingestion. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025.
- [9] Market Research Society. MRS guidelines for conducting data collection activities with children [Internet]. London: Market Research Society.
- [10] Mahadevan V. Anatomy of the oesophagus. *Surg (Oxf)*. 2020;38(11):677–82. <https://doi.org/10.1016/j.mpsur.2020.08.005>
- [11] Ferrari D, Aiolfi A, Bonitta G, Riva CG, Rausa E, Siboni S, et al. Flexible versus rigid endoscopy in the management of esophageal foreign body impaction: systematic review and meta-analysis. *World J Emerg Surg*. 2018;13:42. <https://doi.org/10.1186/s13017-018-0200-7>
- [12] Zhang S, Cui Y, Gong X, Gu F, Chen M, Zhong B. Endoscopic management of foreign bodies in the upper gastrointestinal tract in South China: a retrospective study of 561 cases. *Dig Dis Sci*. 2010;55(5):1305–12. <https://doi.org/10.1007/s10620-009-0859-5>
- [13] Liu B, Kuang S, Cao M, Li X. Esophageal foreign bodies: a retrospective analysis of 275 cases. *J Thorac Dis*. 2025;17(6):4136–44.
- [14] Ambe P, Weber SA, Schauer M, Knoefel WT. Swallowed foreign bodies in adults. *Dtsch Arztebl Int*. 2012;109(50):869–75. <https://doi.org/10.3238/arztebl.2012.0869>
- [15] Waltzman ML, Baskin M, Wypij D, Mooney D, Jones D, Fleisher G. A randomized clinical trial of the management of esophageal coins in children. *Pediatrics*. 2005;116(3):614–9. <https://doi.org/10.1542/peds.2005-0073>
- [16] Alexandre PL, Pinto JV, Costa L, Marques P, Moura CP. Rigid esophagoscopy for foreign body extraction: results and complications in the endoscopic era. *Cureus*. 2024;16(1):e53040. <https://doi.org/10.7759/cureus.53040>
- [17] Sung SH, Jeon SW, Son HS, Kim SK, Jung MK, Cho CM, et al. Factors predictive of risk for complications in patients with oesophageal foreign bodies. *Dig Liver Dis*. 2011;43(8):632–5. <https://doi.org/10.1016/j.dld.2011.02.018>
- [18] Kay M, Wyllie R. Pediatric foreign bodies and their management. *Curr Gastroenterol Rep*. 2005;7(3):212–8. <https://doi.org/10.1007/s11894-005-0042-7>
- [19] Denney W, Ahmad N, Dillard B, Nowicki MJ. Children will eat the strangest things: a 10-year retrospective analysis of foreign body and caustic ingestions from a single academic center. *Pediatr Emerg Care*. 2012;28(8):731–4. <https://doi.org/10.1097/PEC.0b013e318262491f>
- [20] Asmare WM, Ayen AA, Lashitie ZM, Endalew AZ, Teshome BG, Bezie GA. Delayed presentation of foreign body ingestion in resource-limited setting managed with endoscopy: case report and literature review. *Int J Surg Case Rep*. 2025;133:111620. <https://doi.org/10.1016/j.ijscr.2025.111620>

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