Alqalam Journal of Medical and Applied Sciences. 2026;9(6):1533-1539
https://doi.org/10.54361/ajmas.269612

Original article

Outcomes and Complication Rates of Rigid Esophagoscopy for Foreign Body Extraction: A Comparison Between Intubated and Non-Intubated Patients

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Abstract
Ingestion of foreign bodies (FBs) is a frequent clinical emergency, often requiring endoscopic intervention. While rigid esophagoscopy (RE) is widely used for foreign body removal, the choice between intubated and non-intubated approaches remains unclear. This research aims to compare the outcomes and complication rates among intubated and non-intubated rigid esophagoscopy for esophageal foreign body extraction. This prospective cohort study involved 170 adult cases having rigid esophagoscopy for foreign body removal. Cases have been separated into 2 groups: intubated (number = 85) and non-intubated (number = 85). Demographic data, procedure duration, success rates, complications, and postoperative recovery were compared among the 2 groups. The study found no significant variances in age, sex, BMI, or comorbidities between the two groups. Both approaches had high success rates (95.3% vs. 92.9%) with low complication rates. However, the intubated group had longer procedure times (25.4 ± 7.1 minutes vs. 22.3 ± 6.8 minutes, p = 0.02) and greater postoperative pain scores (4.5 ± 2.0 against 3.5 ± 1.8, p = 0.007). Hospital stays were also longer for the intubated group (3.1 ± 1.2 days against 2.6 ± 1.1 days, p = 0.04). There were no significant differences in post-discharge complications or readmission rates. Both intubated and non-intubated rigid esophagoscopy are safe and effective for foreign body removal. While non-intubated approaches may reduce procedure time and postoperative discomfort, intubated esophagoscopy provides added safety for complex cases. The choice of method must be based on patient-specific factors and procedural complexity.
Keywords. Rigid Esophagoscopy, Intubated Approach, Non-Intubated Approach, Foreign Body Extraction, Airway Management

Introduction

FBs is a frequent clinical emergency encountered in otolaryngology and gastroenterology. Though most ingested objects pass through the gastrointestinal tract without intervention, approximately ten to twenty percent of cases need endoscopic removal, and less than 1% need surgical intervention due to complications like impaction, perforation, obstruction, or mediastinitis [1, 2]. The esophagus is the most frequent site of significant FB impaction because of its narrow lumen and anatomical angulations [3]. Prompt identification and intervention are critical, as FB retention may result in serious sequelae involving mucosal ulceration, esophageal perforation, and mediastinal infection. Endoscopic removal within the first 24 hours of ingestion has been associated with lower complication rates and shorter hospital stays [4]. Endoscopic techniques remain the mainstay of therapeutic intervention. Rigid esophagoscopy (RE), performed under general anesthesia, has been used for over a century and allows direct visualization, manipulation, and extraction of esophageal FBs. Although flexible endoscopy (FE) is increasingly used due to its convenience and potential avoidance of general anesthesia, rigid esophagoscopy retains a vital role, especially for sharp, large, or proximally impacted objects and in situations where flexible techniques are unsuccessful or unavailable [5, 6]. Multiple observational studies and systematic reviews report high success rates (≈95%) and low overall complication rates with rigid esophagoscopy [6, 7]. Comparative analyses have found no significant differences in success or safety profiles between rigid and flexible esophagoscopy, though procedural times and the need for general anesthesia differ [5]. Nevertheless, rigid esophagoscopy continues to be recommended in many clinical settings owing to its effective retrieval capabilities and utility in complex presentations, particularly for large, sharp, or proximally impacted foreign bodies that may be difficult to manage with flexible endoscopy alone [8, 9]. Despite this extensive use, differences in outcomes and complications between intubated and non-intubated approaches during rigid esophagoscopy remain underexplored. Some clinicians advocate routine endotracheal intubation for airway protection, while others reserve intubation for selected cases, citing concerns over added procedure time and anesthesia-related morbidity. This reflects ongoing uncertainty about whether general anesthesia with endotracheal intubation offers superior safety compared to conscious sedation for foreign body retrieval, with past literature showing no clear difference in adverse events between sedation and general anesthesia in endoscopic foreign body removal, and noting individualization of anesthetic strategy based on patient and procedural factors [10].

To date, no dedicated prospective studies have directly compared intubated versus non-intubated approaches specifically during rigid esophagoscopy for foreign body removal. Most available literature evaluates rigid versus flexible endoscopy, confirming high success and low complication rates for both

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Received*: 05-04-2026 -* ***Accepted****: 03-06-2026 -* ***Published****: 10-06-2026*

modalities, but not addressing differences in airway management strategies. For example, Ferrari et al. found rigid esophagoscopy to be an effective technique with comparable safety to flexible endoscopy in esophageal foreign body extraction [5]. In the anesthesia literature, the choice between general anesthesia with endotracheal intubation and conscious sedation for endoscopic foreign body removal remains a topic of clinical judgment rather than evidence-based standardization, with no clear consensus on the superiority of one approach over the other [10]. Therefore, this research aims to compare the outcomes and complication rates of rigid esophagoscopy for foreign body extraction between patients managed with and without intubation, addressing an important gap in the literature and providing new evidence to inform clinical decision-making

Methodology

Study Design and Setting

This research has been performed as a prospective cohort study at Alkomes Medical Center between march 2021 and march 2026. The objective of the research was to compare the outcomes and complication rates among intubated and non-intubated groups undergoing rigid esophagoscopy for foreign body removal. All cases have been informed about the research and provided written consent.

Inclusion and Exclusion Criteria

Cases aged 3 years and older who presented with suspected esophageal foreign bodies were eligible for inclusion. The inclusion criteria for the research were as follows: patients aged ≥3 years with a radiologically confirmed esophageal foreign body, Patients scheduled for rigid esophagoscopy, and availability for follow-up and postoperative assessment, including monitoring for complications. The exclusion criteria included: Pregnant patients, due to the potential risks associated with anesthesia and radiation exposure, Cases had a history of esophageal surgery or malignancy, Severe comorbidities (e.g., cardiovascular, respiratory) that contraindicated anesthesia or sedation, and Patients unable to give informed consent.

Sample Size Calculation and Justification

The sample size for this study has been measured to compare the procedure duration between intubated and non-intubated groups during rigid esophagoscopy for foreign body extraction. Based on prior studies, an expected difference of 3 minutes in procedure duration was assumed, with a standard deviation of 7 minutes. Using an alpha level of 0.05 (α) and a power of 80% (β = 0.20), the sample size has been calculated to be 85 patients per group, yielding a total of 170 cases. This sample size ensures sufficient power to notice a clinically significant variance in procedure duration based on previous studies [7].

Patient Grouping and Airway Management Protocol

Cases have been assigned to one of two groups based on their airway management during the procedure:

Intubated Group (N=85)

Patients underwent general anesthesia with endotracheal intubation. Intubation was performed as a safety measure to secure the airway and protect against aspiration or airway obstruction, especially in patients at higher risk.

Non-Intubated Group (N=85)

Patients received conscious sedation with local anesthesia for the procedure. Propofol (1-2 mg/kg IV) and/or midazolam (1-2 mg IV) were used for sedation, and lidocaine spray was applied to the oropharynx for local anesthesia.

Procedure Details

Both groups underwent rigid esophagoscopy using the same rigid esophagoscope (KARL STORZ). All patients were positioned supine with slight neck extension to optimize visualization of the esophagus and facilitate access to the foreign body. Airway management differed between groups: in the intubated cohort, endotracheal intubation was performed following induction with general anesthesia, and vital parameters—including blood pressure, heart rate, oxygen saturation, and end-tidal CO_2—were continuously monitored throughout the procedure. In the non-intubated group, spontaneous respiration was maintained under conscious sedation, with supplemental oxygen delivered via nasal cannulas when required. The rigid esophagoscope was introduced through the oral cavity and carefully advanced through the oropharynx into the esophagus. Once the foreign body was visualized, its size, shape, and location were assessed. Removal was performed using appropriate instruments such as forceps, graspers, or baskets, with meticulous attention to minimizing mucosal trauma and avoiding perforation during extraction.

Post-Procedure Care

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Following the removal of the foreign body, the esophagus was inspected for any mucosal damage or perforations. A contrast study or swallowing test has been carried out, if required, to validate the integrity of the esophagus. Patients in the intubated group were extubated once they regained consciousness, and patients in the non-intubated group were monitored in the post-anesthesia care unit (PACU).

Data Collection

Data were collected prospectively, and several categories of variables were included to ensure comprehensive analysis. Demographic information encompassed age, sex, body mass index (BMI), and relevant comorbidities such as hypertension, diabetes, and asthma. Procedural details were recorded, including the type of sedation administered, duration of the procedure, characteristics of the foreign body (organic versus inorganic, size, and location), and the method of airway management (intubated versus non-intubated). Complications were systematically documented and classified as minor or major. Minor complications included post-procedure discomfort, bleeding, hypotension, and arrhythmia, whereas major complications comprised esophageal perforation, significant bleeding, or the need for additional surgical intervention. This structured approach to data collection allowed for both descriptive and comparative analyses of patient outcomes.

Outcomes

Include the success rate of foreign body retrieval, Pain scores (assessed using a 1-10 scale immediately after the procedure, Length of hospital stay, readmission rates, and time to oral intake.

Follow-Up

Patients were monitored for 48 hours post-procedure to assess for any immediate complications. Follow-up visits were scheduled at 7 days and 30 days after the procedure to assess for long-term complications, recurrence of symptoms, or sequelae.

Statistical Analysis

The collected information has been examined utilizing SPSS version 26. Continuous parameters, like age, BMI, procedure duration, and pain scores, have been presented as mean ± standard deviation (SD) and compared by applying the independent t-test for normally distributed information. For non-normally distributed information, the Mann-Whitney U test has been applied. Categorical parameters like complication rates and success rates have been represented as frequencies and percentages and compared utilizing Fisher's exact test or Chi-square test where appropriate. p-values of < 0.05 were deemed statistically significant.

Ethical Considerations

This research has been performed in compliance with the Declaration of Helsinki and adheres to ethical standards for medical research. Informed consent has been gained from all participants following clarifying the risks and benefits of the procedure. The confidentiality of cases has been sustained throughout the research in accordance with HIPAA regulations.

Results

The demographic and preoperative characteristics of the studied groups are presented in (Table 1). An insignificant variance has been found among the intubated and non-intubated groups in terms of age (45.2 ± 19.4 against 46.5 ± 20.2, $p = 0.46$), gender distribution (64.7% vs. 58.8% male, $p = 0.52$), or BMI (27.4 ± 4.1 vs. 26.9 ± 3.8, $p = 0.58$). The comorbidity rates, including hypertension ($p = 0.45$), diabetes ($p = 0.71$), and asthma ($p = 0.54$), were also similar between the groups. There was non-significant variance in the type of foreign body (organic vs. inorganic, $p = 0.79$) or the duration of foreign body impaction (4.3 ± 2.1 vs. 4.5 ± 2.3 days, $p = 0.77$). However, the sedation type differed significantly, with 80% of the intubated group receiving propofol compared to 50.6% in the non-intubated group ($p < 0.001$). Additionally, the fasting duration was slightly longer in the intubated group (8 ± 2 hours vs. 7.5 ± 2 hours, but the difference was non-significant ($p = 0.11$). In terms of procedural outcomes, as shown in (Table 2), the intubated group had a significantly longer procedure period (25.4 ± 7.1 min vs. 22.3 ± 6.8 min, $p = 0.02$), indicating that intubation may contribute to increased procedure time. However, the success rates were high and similar between both groups (95.3% vs. 92.9%, $p = 0.42$), with non-significant variances in failed attempts ($p = 0.41$) or repeated procedures ($p = 0.49$). The use of additional tools during the procedure was slightly higher in the intubated group (52.9%) in comparison with the non-intubated group (47.1%); nevertheless, this variance wasn't statistically significant ($p = 0.64$). Regarding complication rates and intraoperative events, detailed in (Table 3), an insignificant variance has been observed in minor complications, like difficulty with foreign body removal (5.9% vs. 4.7%, $p = 0.82$) and post-procedure discomfort (5.9% vs. 3.5%, $p = 0.54$). The major complications were rare in both groups, with 2.4% of the intubated group and 3.5% of the non-intubated group experiencing perforation or bleeding ($p = 0.72$ and p

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= 0.62, respectively). Similarly, the rates of hypotension (5.9% vs. 3.5%, p = 0.60) and arrhythmia (3.5% vs. 2.4%, p = 0.78) weren't significantly different among the groups.

The postoperative outcomes are summarized in (Table 4). The intubated group had a significantly longer hospital stay (3.1 ± 1.2 days vs. 2.6 ± 1.1 days, p = 0.04) and reported higher pain scores (4.5 ± 2.0 vs. 3.5 ± 1.8, p = 0.007) compared to the non-intubated group. However, there were no significant differences in readmission rates (2.4% vs. 3.5%, p = 0.72) or post-discharge complications (3.5% vs. 4.7%, p = 0.64). The time to oral intake was slightly longer in the intubated group (5.4 ± 2.3 hours vs. 4.8 ± 2.1 hours, p = 0.22), this variance wasn't statistically significant.

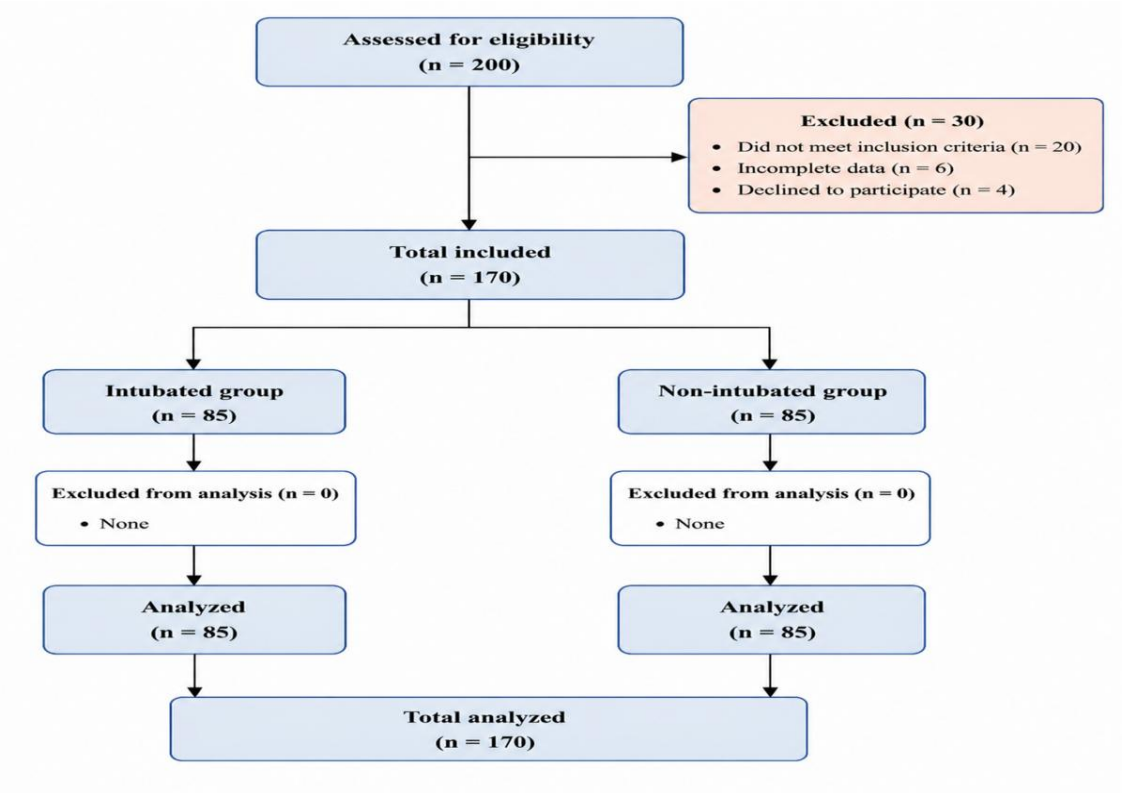

Fig (1. Flow chart for studied cases

Table 1. Demographic and Preoperative Characteristics among the studied cases

Characteristic	**Intubated Group (number=85)**	**Non-Intubated Group (number=85)**	**p-value**
Age (mean ± SD)	45.2 ± 19.4	46.5 ± 20.1	0.46
Gender, Male (%)	55 (64.7%)	50 (58.8%)	0.52
BMI (mean ± SD)	27.4 ± 4.1	26.9 ± 3.8	0.58
Comorbidities			
Overall (%)	25 (29.4%)	27 (31.8%)	0.74
Hypertension (%)	15 (17.6%)	20 (23.5%)	0.45
Diabetes (%)	10 (11.8%)	12 (14.1%)	0.71
Asthma (%)	5 (5.9%)	8 (9.4%)	0.54
Type of Foreign Body			
Organic	60 (70.6%)	58 (68.2%)	0.79
Inorganic	25 (29.4%)	27 (31.8%)	
Duration of Foreign Body Impaction (days)	4.3 ± 2.1	4.5 ± 2.3	0.77
Sedation Type (Propofol)	68 (80.0%)	43 (50.6%)	<0.001
Fasting Duration (hours)	8 ± 2	7.5 ± 2	0.11

Overall comorbidity refers to unique patients with ≥1 comorbidity. The individual comorbidity categories were analyzed separately and were not mutually exclusive, as some patients had multiple comorbidities; therefore, their sum may exceed the overall number.

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Received*: 05-04-2026 -* ***Accepted****: 03-06-2026 -* ***Published****: 10-06-2026*

Table 2. Comparison of Outcomes of Rigid Esophagoscopy between the studied groups

Outcome Measure	Intubated Group (number =85)	Non-Intubated Group (number=85)	p-value
Procedure Duration (min)	25.4 ± 7.1	22.3 ± 6.8	0.02
Success Rate (%)	81 (95.3%)	79 (92.9%)	0.42
Failed Attempts (%)	4 (4.7%)	6 (7.1%)	0.41
Repeated Procedures (%)	2 (2.4%)	4 (4.7%)	0.49
Use of Additional Tools (%)	45 (52.9%)	40 (47.1%)	0.64

Table 3. Comparison of Complication Rates and Intraoperative Events between the studied groups

Complication Type	Intubated Group (number=85)	Non-Intubated Group (number=85)	p-value
Minor Complications (%)	10 (11.8%)	7 (8.2%)	0.48
Difficulty with Foreign Body Removal	5 (5.9%)	4 (4.7%)	0.82
Post-procedure Discomfort (%)	5 (5.9%)	3 (3.5%)	0.54
Major Complications (%)	3 (3.5%)	5 (5.9%)	0.54
Perforation (%)	1 (1.2%)	2 (2.4%)	0.72
Bleeding (%)	2 (2.4%)	3 (3.5%)	0.62
Other complication			
Hypotension (%)	5 (5.9%)	3 (3.5%)	0.60
Arrhythmia (%)	3 (3.5%)	2 (2.4%)	0.78

Table 4. Comparison of Postoperative Outcomes and Recovery between the studied groups

Postoperative Outcome	Intubated Group (number=85)	Non-Intubated Group (number=85)	p-value
Length of Hospital Stay (days)	3.1 ± 1.2	2.6 ± 1.1	0.04
Readmission Rate (%)	2 (2.4%)	3 (3.5%)	0.72
Postoperative Pain Score (1-10)	4.5 ± 2.0	3.5 ± 1.8	0.007
Post-Discharge Complications (%)	3 (3.5%)	4 (4.7%)	0.64
Time to Oral Intake (hours)	5.4 ± 2.3	4.8 ± 2.1	0.22

Discussion

In this study comparing intubated and non-intubated rigid esophagoscopy for esophageal foreign body extraction, our results showed non-significant variances in baseline demographic or clinical characteristics among the 2 groups (Table 1). Age, sex distribution, body mass index (BMI), comorbidities, and type or duration of foreign body impaction were similar across groups ($p > 0.05$). These findings are consistent with prior research that demonstrates patient demographics alone do not significantly influence the success or safety of endoscopic management of foreign bodies when applied appropriately by experienced clinicians. A systematic review on esophageal foreign body management reported similar patient characteristics across different cohorts undergoing rigid esophagoscopy, reinforcing that demographic factors typically do not confound procedural outcomes [4]. Our comparison of procedural outcomes (Table 2) indicated significantly longer procedure duration in the intubated group in comparison with the non-intubated group (25.4 ± 7.1 vs. 22.3 ± 6.8 minutes, $p = 0.02$). This aligns with the general understanding that airway management under general anesthesia adds complexity and time to endoscopic procedures. Despite this difference, the overall success rates were high and comparable (95.3% vs. 92.9%, $p = 0.42$), indicating that rigid esophagoscopy maintains a consistently high efficacy regardless of airway strategy. The complication profile of our study (Table 3) revealed low overall risks, with non-significant variances in minor or major complications among groups ($p > 0.05$). Although minor issues such as discomfort or difficulties in removal were slightly more frequent in the intubated group, these didn't reach statistical significance. Importantly, rates of perforation and bleeding were similarly low in both cohorts. Although direct comparative studies of intubated versus non-intubated rigid esophagoscopy remain limited, available evidence from esophagoscopy and emergent foreign body endoscopy supports an individualized airway strategy. Wang et al. demonstrated that esophagoscopy could be performed under general anesthesia without endotracheal intubation when adequate alveolar ventilation was maintained [11]. Similarly, Cha et al. found no significant variance in complication rates among monitored anesthesia care, conscious sedation, and general anesthesia during emergent endoscopy for foreign bodies, although deeper anesthesia was associated with higher hospitalization rates [12]. More recent pediatric evidence also suggests that natural airway management can be feasible in carefully selected cases undergoing endoscopic removal of esophageal foreign bodies. Therefore, the choice of intubation must be guided by aspiration risk, foreign body characteristics, fasting status, and expected procedural difficulty rather than applied routinely to all patients [10, 13]. Although the safety and efficacy of rigid esophagoscopy have been

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Received: *05-04-2026* - ***Accepted***: *03-06-2026* - ***Published***: *10-06-2026*

supported in previous literature, the present study addresses a different clinical question: whether endotracheal intubation affects outcomes among patients undergoing rigid esophagoscopy. Since both groups in this study underwent the same endoscopic procedure, the observed differences should be interpreted mainly in relation to airway management rather than endoscopic modality. This distinction is important because intubation may improve airway protection in selected high-risk cases, but it may also prolong procedure time and postoperative recovery. This interpretation is supported by previous evidence showing that rigid esophagoscopy is a safe and effective method for esophageal foreign body removal, while anesthesia and airway management should be individualized according to aspiration risk, foreign body location, patient condition, and expected procedural difficulty [5, 10]. In our postoperative outcomes (Table 4), the intubated group exhibited longer hospital stays and higher mean postoperative pain scores than the non-intubated group ($p = 0.04$ and $p = 0.007$, respectively). These findings are clinically plausible, as general anesthesia and airway manipulation can prolong recovery and increase discomfort compared with sedation techniques, similar to observations in other endoscopic and surgical contexts. Although direct comparisons of intubated versus non-intubated rigid esophagoscopy are limited in the literature, studies comparing rigid versus flexible esophagoscopy support the notion that anesthesia depth and method influence postoperative experience without markedly affecting procedural success [7]. Readmission rates, post-discharge complications, and time to oral intake did not differ significantly between groups, indicating that long-term recovery is comparable regardless of airway strategy. This finding suggests that while an anesthesia approach may influence immediate post-procedure recovery characteristics, such as pain and length of stay, the overall convalescence trajectory remains similar when esophagoscopy is performed in a timely and standardized manner, as recommended in clinical guidelines [14]. Our findings are also congruent with existing evidence emphasizing the importance of timely intervention. Studies have demonstrated that delays in endoscopic removal beyond 24 hours—whether due to delayed presentation or prolonged impaction—are associated with increased complication risk and longer hospital stays, underscoring the need for prompt management to optimize outcomes. In many reports, early removal correlated with lower rates of mucosal erosion, edema, and perforation [4, 15]. Collectively, this body of evidence supports the continued use of rigid esophagoscopy as a reliable technique for foreign body removal. While flexible endoscopy remains a preferred first-line approach in many centers due to its convenience and ability to be performed under sedation, rigid esophagoscopy continues to play a critical role, particularly for sharp, large, or proximally impacted foreign bodies. This approach is widely endorsed in otolaryngology practice and remains effective even when flexible modalities are unsuccessful or unavailable [4, 5, 9].

Limitations

The research has been performed at a single center with a relatively small sample size, which can limit the generalizability of the results. Potential confounding factors like operator experience and foreign body characteristics were not fully accounted for. Additionally, the study did not assess long-term outcomes like esophageal stricture formation. Future investigation must address these limitations with larger, multicenter research and longer follow-up periods.

Conclusion

This study compared intubated and non-intubated rigid esophagoscopy for foreign body removal, showing both approaches had high success rates and low complications. Non-intubated rigid esophagoscopy offered a less invasive approach with quicker recovery, while intubated rigid esophagoscopy provided added safety for complex cases. Both methods are safe and effective, but the choice of method must be based on individual patient needs and procedural complexity.

References

1. Negoita LM, Ghenea CS, Constantinescu G, Sandru V, Stan-Ilie M, Plotogea OM, et al. Esophageal food impaction and foreign object ingestion in gastrointestinal tract: a review of clinical and endoscopic management. Gastroenterol Insights. 2023;14(1):131-43.
2. Sugawa C, Ono H, Taleb M, Lucas CE. Endoscopic management of foreign bodies in the upper gastrointestinal tract: a review. World J Gastrointest Endosc. 2014;6(10):475-81.
3. Valentino WL, Sharifi-Amina S. Esophageal food impaction. Radiol Case Rep. 2022;17(9):2979-82.
4. 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.
5. 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(1):42.
6. Yang W, Milad D, Wolter NE, Propst EJ, Chan Y. Systematic review of rigid and flexible esophagoscopy for pediatric esophageal foreign bodies. Int J Pediatr Otorhinolaryngol. 2020;139:110397.
7. Tseng CC, Hsiao TY, Hsu WC. Comparison of rigid and flexible endoscopy for removing esophageal foreign bodies in an emergency. J Formos Med Assoc. 2016;115(8):639-44.

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Received*: 05-04-2026 -* ***Accepted****: 03-06-2026 -* ***Published****: 10-06-2026*

8. Chirica M, Kelly MD, Siboni S, Aiolfi A, Riva CG, Asti E, et al. Esophageal emergencies: WSES guidelines. World J Emerg Surg. 2019;14:26.
9. Adjeso T, Issaka A, Yabasin IB. Review of rigid esophagoscopy in a tertiary hospital in Ghana. Pan Afr Med J. 2021;39:64.
10. George Tewfik M, Rangrass G, James Dierkes M, Uma Munnur M. Preoperative evaluation and selection of anesthesia technique for endoscopic treatment of a patient with food bolus impaction or foreign object ingestion. 2023.
11. Wang JK, Dawson B, Sanderson DR. Adequacy of alveolar ventilation during esophagoscopy under general anesthesia without endotracheal intubation. Dis Chest. 1969;55(6):462-4.
12. Cha MH, Sandooja R, Khalid S, Lao N, Lim J, Razik R. Complication rates in emergent endoscopy for foreign bodies under different sedation modalities: a large single-center retrospective review. World J Gastrointest Endosc. 2021;13(2):45-55.
13. Lonsdale H, Rodriguez K, Shargo R, Ekblad M, Brown JM, Dolan I, et al. Natural airway as an alternative to intubation for pediatric endoscopic esophageal foreign body removal: a retrospective cohort study of 326 patients. Paediatr Anaesth. 2024;34(7):628-37.
14. Ashraf O. Foreign body in the esophagus: a review. Sao Paulo Med J. 2006;124(6):346-9.
15. Khorana J, Tantivit Y, Phiuphong C, Pattapong S, Siripan S. Foreign body ingestion in pediatrics: distribution, management and complications. Medicina (Kaunas). 2019;55(10):686.

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Received*: 05-04-2026 -* ***Accepted****: 03-06-2026 -* ***Published****: 10-06-2026*