

Clinical Outcome in Patients with Negative Rigid Oesophagoscopy for Suspected Foreign Body Ingestion

Dear Editor,

Foreign body (FB) ingestion, fishbones in particular, is commonly encountered in the emergency setting in Singapore.^{1,2} While most are removed in the clinic, small percentages with oesophageal FBs require removal under general anaesthesia. Prompt removal avoids potential lethal complications like mediastinitis and aorto-oesophageal fistula.³⁻⁶

While imaging modalities like computed tomography (CT) have been instrumental in selecting patients for rigid oesophagoscopy, false-positive results are still evident, translating to unnecessary rigid oesophagoscopy. However, the prevalence and reasons of negative rigid oesophagoscopy are not well-reported.

This study aims to address the prevalence and reasons of negative rigid oesophagoscopy and evaluate the clinical outcomes of these patients.

Materials and Methods

Retrospective chart review was performed for patients with negative rigid oesophagoscopy following suspected FB ingestion over a 12-year period (1998 to 2010). This study was approved by the Institutional Review Board (IRB). Patients with negative rigid oesophagoscopy were classified into 3 categories—spontaneous passage of the FB, false-positive radiographic findings and migrated FB.

False-positive radiographic findings were defined by the presence of abnormal features on imaging which led to rigid oesophagoscopy. These patients had persistent findings on repeated imaging after negative rigid oesophagoscopy despite symptom resolution.

Spontaneous passage of FB included patients who had initial positive findings on imaging, which were no longer present on repeated imaging; or those with persistent symptoms despite negative imaging. These patients typically had resolution of their symptoms.

Migrated FB was defined by the migration of the FB out of the aerodigestive tract lumen confirmed by surgical exploration and retrieval. The classification of each case was independently reviewed by the resident and verified with both senior authors.

Clinical Evaluation of Patients with Suspected FB Ingestion

Patients with suspected FB ingestion underwent complete examination of the oropharynx and hypopharynx at the emergency department. Patients with negative findings were assessed with a lateral neck x-ray. Those with negative x-rays who were still symptomatic underwent non-contrasted CT of the neck and thorax. This was our preferred imaging protocol given its reported high sensitivity and specificity of 100% and 73% to 100% respectively.⁷⁻⁹ Patients with suspicious imaging were consented for rigid oesophagoscopy under general anaesthesia.

Clinical Outcomes

Symptom resolution, complications and mortality secondary to intervention or FB ingestion were recorded. Data analysis was performed using SPSS version 21 (SPSS, Chicago, IL, USA); the ANOVA test and the chi-square test were used to compare the variables between patient groups. *P* value of less than 0.05 was considered significant.

Results

A total of 723 patients underwent rigid oesophagoscopy for FB ingestion and 88 (12.1%) had negative rigid oesophagoscopy. Table 1 summarises the demographics of negative rigid oesophagoscopy patients.

Table 1. Characteristics of Patient Population with Negative Rigid Oesophagoscopy

	Patients with Negative Rigid Oesophagoscopy
Age range (mean)	18 – 90 (46.5)
Gender (%)	
Male	37 (42.0)
Female	51 (58.0)
Ethnicity (%)	
Chinese	70 (79.5)
Malay	9 (10.2)
Indian	3 (3.4)
Others	6 (6.8)

Table 2. Characteristics of Patients from the 3 Cohorts

	Reasons for Negative Rigid Oesophagoscopy		
	Passed FB	Migrated	False-Positive
n (% of negative rigid oesophagoscopy)	75 (85.2)	2 (2.3)	11 (12.5)
Age (mean)	18 – 90 (46.1)	56 – 80 (68.0)	22 – 75 (43.8) <i>P</i> = 0.181
Gender (%)*			
Male	32 (42.7)	1 (50.0)	5 (45.0)
Female	43 (57.3)	1 (50.0)	6 (54.0) <i>P</i> = 0.998
Clinical indication for rigid oesophagoscopy (%)*			
X-ray	51 (68.0)	0	4 (16.0)
CT scan	11 (18.0)	2 (100.0)	7 (28.0)
Barium swallow	2 (3.2)	0	0
Clinical symptoms	11 (14.8)	0	0

CT: Computerised tomography; FB: Foreign body

*Percentages in parentheses correspond to percent of patients for each reason.

A total of 85.2% (75/88) of patients had spontaneous passage of their FB, 12.5% (11/88) had false-positive radiological findings, and 2 had migrated FBs. The group characteristics are summarised in Table 2. All patients were reviewed postoperatively following negative rigid oesophagoscopy and no mortality was identified.

Clinical Outcomes

Spontaneous FB Passage

Seventy-five patients (85.2%) had spontaneous symptom resolution. Five had mucosal injuries on rigid oesophagoscopy requiring nasogastric tube feeding for 5 days and prolonged hospitalisation (9.25 days). All were able to resume oral feeding on discharge.

False-Positive Radiological Findings

Eleven patients had persistent abnormal radiological findings. After a review of the repeat images taken after negative rigid oesophagoscopy, 8 (72.7%) had persistent abnormal calcifications along the aerodigestive tract. Three of these anomalies were visible on lateral neck radiographs, and 5 on CT.

Anomalies on repeat x-rays following negative rigid oesophagoscopy included 2 patients with calcifications along the posterior border of the cricoid and 1 with calcifications anterior to C7 vertebrae. Two patients were asymptomatic following negative rigid oesophagoscopy and declined CT. The last patient had persistent mild

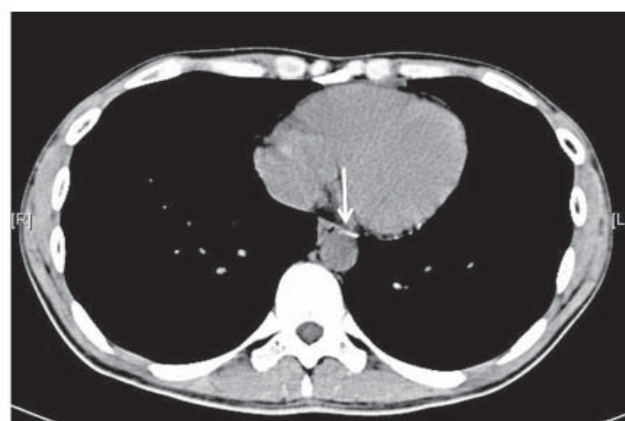


Fig. 1. Calcification in the aortopulmonary window. The arrow indicates the area of false-positive foreign body.

symptoms and underwent a repeat CT, which did not identify any possible FB.

Five patients had persistent calcifications on repeat CT; 2 had calcifications in the C5-6 region, which were attributed to dystrophic calcification while 3 had calcifications in the region of the aortopulmonary window (Fig. 1). Two of the later 3 patients underwent thoracic exploration and no FBs were identified. Both patients made an uneventful recovery with no postoperative complications. They did however require longer hospitalisation stay (mean of 10 days).

The remaining patient declined thoracic exploration. He was monitored and symptoms gradually subsided after 6 days. He remained asymptomatic and declined further CT at 1-month follow-up.

The other 3 patients had persistent abnormal imaging, namely soft tissue swelling or possible extra-luminal air suspicious of perforation. They were admitted for intravenous antibiotics and were discharged following resolution of their symptoms. All remained asymptomatic on their 1-month review upon discharge.

Migrated FB Group

Two patients were found to have FB migration on CT. Both underwent neck exploration and removal of FB from the trachea-oesophageal groove, adjacent to the cervical esophagus. They required prolonged hospitalisation and nasogastric tube feeding for 5 days, but both were discharged well and none had vocal cord palsy postoperatively.

Discussion

The paucity of studies on negative rigid oesophagoscopy questions the reasons for and clinical outcomes of these

patients. This study aims to evaluate factors to identify situations where close observation may suffice without compromising patient safety.

Our data demonstrated that negative rigid oesophagoscopy were mostly secondary to spontaneous passage of the FB. This could be due to muscle paralysis during general anaesthesia or elevation of the laryngeal complex during intubation. Relaxation of pharyngeal or oesophageal musculature could result in passage of FB into the stomach. In fact, oesophageal relaxation using agents like glucagon have been used as adjuncts in patients with food bolus impaction.¹⁰ Laryngeal elevation during intubation may also disimpact FBs, thus accounting for spontaneous passage of FB.

However, we acknowledge that some patients may have already disimpacted their FB prior to anaesthesia. As such, active review prior to induction may minimise unnecessary oesophagoscopy.

False-positive radiological findings constituted 12.1% of negative rigid oesophagoscopy. These findings were largely due to aberrant calcifications of the laryngeal framework. Cricoid calcifications on lateral neck x-rays are known to be mistakenly classified as FBs.¹¹⁻¹³ In our study, 4 negative rigid oesophagoscopy patients had abnormal findings on x-ray; 75% were secondary to aberrant calcifications in the laryngeal complex. Clinical correlation with suspected radiological finding is essential to minimise unnecessary intervention.

False-positive findings on CT are especially problematic in the aortopulmonary window. In our series, 2 patients underwent unnecessary thoracic exploration, highlighting the difficulty in distinguishing migrated FBs versus aortopulmonary window calcifications in lymph nodes. In retrospect, a period of close monitoring may be warranted rather than a reflex approach towards exploration. While there are no guidelines pertaining to duration of observation, our practice is to review the symptoms over a 48-hour period to determine if patients should undergo further investigations or procedures.

Migration of FB is uncommon.^{14,15} Both our cases presented early, approximately 1 day following ingestion. This is unusual, as FB migration is thought to occur after protracted impaction. The sharpness of the bone could lead to early migration in these cases. A transcervical approach to the tracheo-oesophageal groove was successful in the removal of the migrated FBs. In these cases, the risk to the recurrent laryngeal nerve should be discussed with patients prior to surgery.

While it is impossible to eliminate all negative rigid oesophagoscopies, this study reports the possible reasons and highlights pitfalls where over-dependence on radiological findings may result in unnecessary interventions.

Conclusion

The prevalence of negative rigid oesophagoscopy in patients with suspected FB is low. While spontaneous passage of impacted FBs accounts for most of these cases, abnormal calcified shadows on imaging can result in unnecessary intervention, especially for calcifications seen in the aortopulmonary window.

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