

# Removal of Foreign-Bodies Under General Anaesthesia. A Review of Rigid Endoscopy for Foreign-Bodies of the Hypopharynx and Oesophagus

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## SUMMARY

A total of 36 patients with suspected foreign body (FB) of the oesophagus who underwent rigid endoscopy under general anaesthesia (GA) from January 2005 to March 2007 were reviewed. The majority of the patients were working adults in the 3rd to 5th decade of life. There was no foreign body in 33.3% of the patients. Co-morbidities were present in 33.3%. Morbidity and mortality from the procedure included one aspiration pneumonia, one lateral pharyngeal wall tear and one death (8.3%). X-ray findings were negative or inconclusive in 11(45.8%) patients with a foreign body. The majority of patients, 85.7% required 2 to 3 days of admission of which 52.7% had no foreign bodies. The most common foreign body retrieved was fishbone accounting for 13 of the 24 foreign bodies detected.

## KEY WORDS:

foreign body ingestion; rigid oesophagoscopy, fishbone

## INTRODUCTION

Rigid endoscopy under general anaesthesia has traditionally been used by otolaryngologist for diagnosis and management of a variety of disorders affecting the upper digestive tract including removal of foreign body<sup>1</sup>. The advent of flexible endoscopes confined rigid endoscopy primarily to foreign body removal. Flexible nasopharyngolaryngoscopy (FNPLS) performed by otolaryngologist in the office-setting does not allow proper visualization of the cricopharynx and cervical oesophagus which is the most common site of foreign body impaction<sup>2</sup>. Therefore patients suspected of having a foreign body of the oesophagus often require rigid endoscopy under general anaesthesia for diagnosis and removal. The procedure is not without risks especially oesophageal perforation<sup>1</sup> which has a high morbidity and potential mortality. Besides the surgical risks the patients is also subject to anaesthetic risks.

## MATERIALS AND METHODS

A retrospective review was done for patients who underwent rigid oesophagoscopy and/or direct laryngoscopy under GA for suspected foreign body ingestion. 36 records were retrieved for patients admitted between January 2005 and March 2007. Information with regards to the age, sex, race, co-morbidities, lateral neck x-ray findings, intra-operative findings, duration of

admission and complications were recorded. Children below the age of 12 were excluded.

## RESULTS

Majority of adults in this study group belonged to the third to fifth decade of life accounting for 75% of patients and this was irrespective of the intra-operative findings. Patients who were older comprised 11% of total with 3 patients past the age of 70 but none were beyond 80 years (Fig. 1). The racial and gender distribution were almost equal (Fig. 2).

Patients with co-morbidities comprised one third (33%) of the total with 3 of them suffering from more than one condition. Most of them suffered from hypertension (10 patients) while the remaining had diabetes mellitus, ischemic heart disease and bronchial asthma. One patient was obese and another had abnormal number of cervical spine (total of 8) with a receding mandible (Table I). Three out of 12 patients with negative FB had co-morbidities.

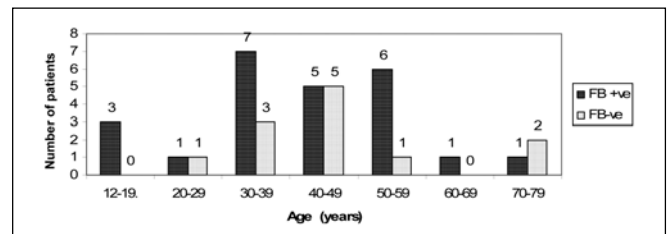


Fig. 1: Age distribution of the patients with foreign body ingestion according to the intraoperative findings.

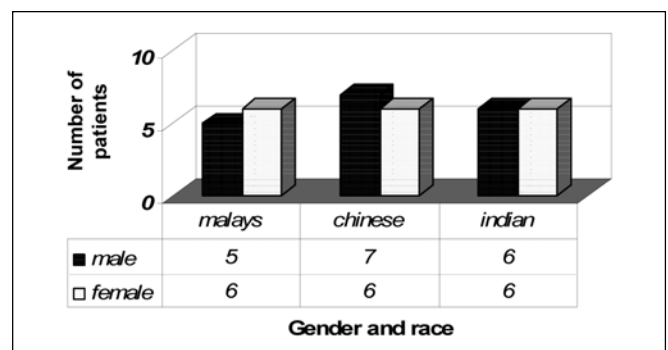


Fig. 2: Gender and racial distribution of patients with foreign body ingestion who underwent endoscopy.

This article was accepted: 12 July 2010

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Lateral neck X-rays were analyzed for signs indicating presence of foreign body eg. radio-opaque materials in the upper aero-digestive tract, increased prevertebral space/soft tissue swelling and abnormal air columns in the upper oesophagus. Twelve out of 13 positive lateral neck X-rays correlated with positive intra-operative findings. X-rays with no features indicative of FB were seen in 13 patients of which 5 had foreign body (false negative X-ray findings) and the remaining did not. It was not possible to conclude with certainty regarding the X-ray features of 9 (25%) of them. This led to examination under anaesthesia which revealed presence of FB in two thirds of them (Fig. 3).

The most common foreign body retrieved was fishbone accounting for 13 of the 24 foreign bodies detected, followed by chicken bone (5/24), mutton bone (2/24), dentures (2/24), prawn shells (1/24) and nutshells (1/24). Cervical oesophagus was the common site of foreign body impaction in this group of patients (15/24) followed by vallecula (5/24), tonsil (2/24), base of tongue (1/24) and posterior pharyngeal wall (1/24).

There was a mortality of a patient with negative intra-operative findings who died of a silent myocardial infarction, one patient sustained tear of the lateral pharyngeal wall and another patient who developed aspiration pneumonia. The duration of admission ranged from 1 to 5 days. The majority stayed between 2 days (58%) and 3 days (27.7%). One of the patients underwent procedure under GA twice after initial negative endoscope findings but subsequent retrieval of foreign body.

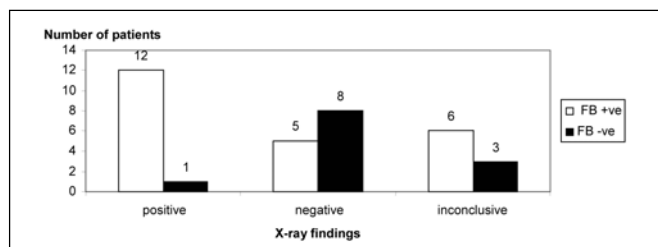


Fig. 3: Correlation between X-ray findings and intraoperative findings.

Table I: Co-morbidities present in patients undergoing rigid endoscopy for foreign body ingestion

Co-morbidities	Number of patients
Diabetes mellitus	2
Hypertension	10
Ischaemic heart disease	1
Bronchial asthma	1
Others (receding mandible, abnormal number of cervical spine)	1

**DISCUSSION**

Patients with ingested foreign bodies are often seen in an outpatient setting in an ENT clinic. The oropharynx is examined and if necessary followed by an indirect laryngoscopy (IDL) or a rigid 70 degree endoscope. An obvious foreign body is removed directly under local anaesthesia. However in some patients visualisation by these methods

may be difficult due to excessive gagging and secretions. In others despite an apparent normal finding there may be strong symptoms from the patient or radiological evidence suggestive of a foreign body which may be embedded into the mucosa. These patients require better visualisation of the potential anatomic sites of impaction under general anaesthesia. In some patients with mild symptoms, normal examination and radiological investigations a watch and wait approach is taken. If there is persistence of symptoms further investigations are considered.

This study revealed negative findings during rigid endoscopy in 33.3% of patients suspected with foreign body ingestion. Other authors with larger series of patients have reported negative findings in about 10-28% of patients<sup>2,3,4</sup>.

Lateral neck X-rays were ordered by the primary referring doctor from the emergency or outpatient department. It is not always helpful in confirming the diagnosis or to rule out FB. This is due to various reasons including calcification of laryngeal cartilages which sometimes causes confusion; small foreign bodies eg. fish-bones that are not generally well visualized on the X-ray and radio-lucent substances<sup>5,6</sup>. In this study two thirds (66.6%) of the X-rays done was either negative or inconclusive with 5 (22%) false negatives and another 6 (27.2%) inconclusive X-rays which eventually led to retrieval of FB. There was one false positive X-ray. Akazawa *et al* reported that 17 of the 31 patients (54.8%) with fish bone impaction had normal X-ray but FB was evident on CT scan<sup>6</sup>. Other authors reported indicative X-rays only in 81.2% of patients and false negative X-rays in 10% of patients<sup>2</sup>.

Routine clinical examination does not always reveal the subtle signs of a possible foreign body impaction in the hypopharynx or oesophagus. Some of these signs includes pooling of saliva, congestion, oedema, neck tenderness etc<sup>2</sup>. Observing the patients with suspicion of FB for resolution of symptoms may not be favoured in light of the knowledge of dangerous complications that can ensue due to migration of foreign bodies. Reported complication includes retropharyngeal abscess, oesophageal rupture and mediastinitis, oesophageal stenosis, erosions, aortooesophageal fistula and empyema thoracis<sup>2,3,7</sup>. Therefore rigid oesophagoscopy is usually carried out to rule out the presence of foreign body.

General Anaesthesia and rigid oesophagoscopy also carries its own risk. The most feared complication of rigid oesophagoscopy is oesophageal perforation which has a high morbidity and potential mortality<sup>1</sup>. Kubba *et al* reported perforation rate of 4.5% after therapeutic procedures and 1.2% after diagnostic procedures<sup>1</sup>. In this study there was a complication rate of 8.3% which included one mortality, one aspiration pneumonia and one oesophageal tear. Two of these patients had associated co-morbidities. One hypertensive patient with negative intra-operative findings died of myocardial infarction and another hypertensive and asthmatic patient had aspiration pneumonia.

In this study there were no significant differences between the gender or race but most of the patients belonged to a productive working group aged between 30 and 60 (75%). The majority of patients were admitted for 2 to 3 days (85.7%) of which almost half the patients (52.3%) had no foreign bodies. Hospital admission together with current

routine investigations and procedures would lead to loss of productive working time; increase the cost of healthcare not only for the patient but the health system in general. In addition one third of the patients in this study had comorbidities such as hypertension, diabetes mellitus, ischaemic heart disease and bronchial asthma. This group of patients need extra investigations and peri-operative care. These too results in additional cost.

In view of the potential complications and costs involved with rigid endoscopy under general anaesthesia for the management of suspected foreign bodies, an alternative procedure or technology which is safer and more cost effective could complement or change current clinical practise. Advances in flexible endoscopy technology, has lead to the introduction of transnasal-oesophagoscopy (TNE). It is an office based procedure that does not require general anaesthesia. It has been used widely by otolaryngologist since the late 90's in leading Western and regional medical institutions as a screening tool for a wide range of oesophageal disorders including screening and removal of foreign bodies<sup>8-11,12-15</sup>. Being an office-procedure it does not require special preparation of the patients and reported complications are few<sup>9-11,16</sup>. It would also be a suitable method for those patient who may not be fit enough to undergo GA. With no intravenous sedation given during this procedure sedation complication can be avoided and patients can be allowed to return to work the same day. The cost benefit of TNE as compared to OGDS was found to be greater than USD2,000.00 per procedure in the United States<sup>16</sup>. In addition it could be used to investigate other oesophageal disorders and confirmatory diagnoses could be made earlier<sup>8</sup>.

## CONCLUSION

Rigid endoscopy is a useful method to diagnose and remove foreign bodies of the oesophagus or hypopharynx. It however does carry risks. It will continue to play a role in removal of foreign bodies especially in children as in these patients the nature of foreign bodies eg. coins and the lack of cooperation will require GA.

## ACKNOWLEDGEMENT

The authors express their thanks to the Director-General of Health, Malaysia, Tan Sri Dato' Seri Dr Mohd Ismail Merican, for his permission to allow this article to be published.

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