

MAGILL FORCEPS EXTRACTION OF FOREIGN BODIES: ANESTHETIST EXPERIENCE

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ABSTRACT

Objective: To present the experience of foreign body extraction from the pharynx and upper end of the esophagus.

Methods: A retrospective study of 92 patients with a foreign body at the pharynx or upper end of the esophagus managed by five anesthetists between January 1990 and April 2003, under general anesthesia using the Magill forceps technique.

Results: Ninety-two patients were referred from the emergency department and otorhinolaryngology clinic at Prince Rashed Bin Al-Hassan Hospital. Two patients were excluded before extraction procedure as the foreign body had slipped down to the stomach. Ninety patients (47 males and 43 females) underwent extraction procedure. The most common foreign bodies found were coins in children and food bolus in adults. All foreign bodies were successfully removed without any complication. Most patients were discharged within 2 to 4 hours after extraction.

Conclusions: A Foreign body lodged immediately below the cricopharyngeus muscle or above can be safely, easily, and quickly removed under direct vision with the laryngoscope and Magill forceps.

Key words: Foreign body, pharynx, upper end of the esophagus, general anesthesia, Magill forceps.

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Introduction

A foreign body (FB) ingested and food bolus impaction occurs commonly. The majority of FBs that reach the gastrointestinal tract will pass spontaneously, 10% to 20% will require non-operative intervention, and less than 1% will require surgery^(1,2). Death caused by FB ingestion has rarely been reported⁽³⁾. Unintentional FB ingestion is common in children, and coins are the most common FB ingested⁽⁴⁾. In adults FBs are mostly meat and bones and it is common in edentulous, prisoners, and psychiatric patients⁽²⁾. Objects remaining in the esophagus may be associated with mucosal ulceration or esophageal obstruction and can potentially lead to significant morbidity and even mortality^(1,2). Removal of esophageal FBs is therefore generally recommended. The aim of this study is to present our experience of FBs extraction from the pharynx and upper end of the esophagus utilizing the Magill forceps under general anesthesia.

Methods

We retrospectively reviewed 13 years of experience

in which 92 patients (15 adults and 77 children) had undergone FB extraction from pharynx and upper end of the esophagus, done by five anesthetists, at Prince Rashed Bin Al-Hassan Hospital between January 1990 and April 2003. Patients diagnosed at the emergency department or otorhinolaryngology clinic with FB at or above the first thoracic vertebrae were referred to the anesthetist for management. Patients with FBs below this level were referred to the gastroenterologist. Older children and adults were able to identify the material swallowed and point to the location of discomfort. Delayed presentation of symptoms was seen only in two patients. Signs and symptoms were in decreasing order dysphagia, drooling of saliva, anorexia, cough, cervical pain, hemoptysis, choking, and cyanosis. Radiography was done in two projections to neck and thorax repeated in cases of radio-opaque objects just before arrival to the anesthetic room to confirm the site of FB. All patients underwent FB extraction within 4-8 hours of admission. All patients or their parents in case of children were asked to give their informed consent. Two children were excluded as the FB (coin) slipped down into the stomach

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before the extraction procedure.

The anesthetic technique used

1. For coins: After 4-6 hours of fasting, mask inhalational anesthesia using 60% nitrous oxide in 40% oxygen with gradual introduction of 1-4% halothane. Extractions of FBs were done in Trendelenburg's position to keep the coin out of trachea.
2. For other types of FBs: The patients were dealt with as high risk for aspiration into the tracheobronchial tree whilst protective laryngeal reflexes are obtunded and where anesthetized with standard endotracheal technique using crash induction; pre oxygenation is carried out by administration of 100% oxygen via face mask for 3 minutes followed by the intravenous injection of thiopentone 3-5 mg/kg or propofol 2-3 mg/kg, cricoid pressure applied and followed by suxamethonium 1.5 mg/kg to facilitate endotracheal intubation. Endotracheal tube taped to the left side of the mouth, intermittent positive pressure ventilation using 60% nitrous oxide in 40% oxygen with 2%-3% enflurane or isoflurane until the end of the procedure. Suxamethonium 0.5 mg/kg was given if necessary as a muscle relaxant.

The breathing system used was the Magill system for adults and Ayre's T-Piece with the Jackson-Rees modification system for children. After the patient was anesthetized the blade of a Macintosh laryngoscope was advanced over the surface of the tongue until it reaches the vallecula. The tip is rotated upwards to lift the larynx and the pharyngeal FB was removed easily under direct vision using the Magill forceps. If the FB is in the esophagus lifting the larynx will expose the esophageal opening, a Magill forceps was inserted gently into the esophageal opening, and the FB grasped under direct vision and removed gently. If the esophageal orifice was closed, the closed Magill forceps was inserted gently one centimeter and then opened to see the FB, which is then grasped and removed. Once the FB was removed, the patients were awakened from anesthesia in the head-down lateral position and the tracheal tube removed. Oxygen by facemask was given to all patients until recovery. Oxygen saturation was not allowed to drop below 94% at any time during the procedure.

Results

Ninety-two patients were referred from the emergency department and otorhinolaryngology clinic with the diagnoses of FB impacted on the pharynx or upper end of the esophagus. Two were excluded before the extraction procedure as the FB had slipped down to the stomach. Of the ninety patients, 47 were males and 43 were females. The age distribution is presented in Table I with 75 (83.3%) being children. Children were defined as patients up to the age of 13 years. The

majority of FBs ingestion occurs in the pediatric population with a peak incidence between the age of 8 months and 6 years, and the mean age was 4.2 years. Coins were the most common FB found in the pediatric group (90.7%) and were found at the cricopharyngeus or just below cricopharyngeus muscle. Meat impaction represented the most common offender in the adult group (33.3%). Two adults arrived to the emergency room with cough, choking, and cyanosis. Direct laryngoscopy was done immediately and revealed a 10-centimeter meat lump; small part of it was in the pharynx and the remaining was in the esophagus in one patient and a grape in the hypopharynx was found in the other patient. Two other patients were suffering from blood-tinged sputum for a few weeks and found to be due to leech in the pharynx. The time between ingestion and reporting to hospital range from 1 hour to 12 hours (mean 4 hours), except for the two cases of leech where the time of ingestion was unknown, however they were symptomatic since 4-6 weeks. Details of FBs and site of impaction are demonstrated in Table II and III. The mean time for the removal of coins was 30 seconds, ranging from 13 to 80 seconds but for other FBs was 50 seconds ranging from 15 seconds to 2.5 minutes. Most of patients went home 2 to 4 hours after FB extraction; none remained more than 24 hours. No complications either from FB or from the procedure have been reported.

Discussion

Material retained in the esophagus generally falls into two categories FB and food bolus. Children most often ingest coins and toys, whereas adults commonly tend to have problems with meat and bones⁽⁵⁾. Various factors can be responsible for FB ingestion. The increased incidence in small children could be due to their natural propensity to gain knowledge by putting things in the mouth, inability to masticate well and inadequate control of deglutition, as well as the tendency to cry, shout, laugh or play during eating. Edentulousness, poor masticating habits, decreased airway reflexes and poor visions are the main predisposing factors in old age⁽⁶⁾. The majority of pediatric patients had FBs lodged at the level of the cricopharyngeus muscle while in adults; the lower third of the esophagus was the most common site of esophageal impaction⁽⁷⁾. For this reason, children benefit more than adults from Magill forceps technique.

Early recognition and treatment of esophageal FB is imperative because the complications are serious and can be life threatening; mucosal ulceration, inflammation, and infections can result in serious complications such as esophageal abscess, mediastinitis, empyema, perforation or aorto-esophageal fistula⁽⁸⁾. The best modality of FB removal has been a subject of controversy^(1,2,4,9). The choice of treatment is influenced by many factors, such as the patient's age and clinical condition, the size and shape of the ingested FB, the anatomic location and the skills of the physician.

Radiography to the neck and thorax done prior to the procedure will exclude cases not accessible with the Magill forceps and in this way we could exclude two cases before anesthesia. We could extract all FBs and had a 100% success rate. Any modality allowing direct visualization of the FB may be used for removal. Direct laryngoscopy is preferred for objects lodged at or above the cricopharyngeus muscle, rigid or flexible endoscopy may be used for objects below this area ⁽⁵⁾. Both flexible and rigid esophagoscopy have been associated with 2%-10% risk of perforation during FB removal ^(2,8).

Foley's catheter extractions have some disadvantages; epistaxis, vomiting, transient airway compromise, esophageal mucosal injury or perforation ⁽⁸⁾, and needs patient cooperation ^(8,10).

Ideally, any procedure that has a lower perforation rate should be preferred for FB extraction. The Magill forceps technique described in this study satisfies this goal for FBs impacted in the pharynx and upper end of the esophagus ⁽⁵⁾. The rate of perforation for this procedure in our study was zero. Two studies one by Janik and the other by Mahafza described esophageal coins removal with Magill forceps ^(11,12), both studies and ours use Magill forceps with minimal manipulation on the esophagus, however, our technique differs. First, Mahafza as well as Janik limit their technique to coins and to children only, but we could use Magill forceps technique for extraction of different types of FBs within the reach of the Magill forceps and in any age group.

Second, coins not visualized in 64% of Janik study were removed blindly. Although this was successful this could cause trauma to the esophagus or cause the FB to be pushed further down. Third, the trachea of all patients in Janik group was intubated to protect airway. Coin extraction in our study as well as Mahafza study was done without tracheal intubation. As the patients were fasting for 4-6 hours and anesthetized in a Trendelenburg position, we feel the airway is protected during mask inhalational anesthesia and also the procedure is quicker taking 13 to 40 seconds. Tracheal intubation is not without complications such as sore throat, hoarseness of voice, hypertension, tachycardia, and laryngospasm ⁽¹³⁾.

Conclusion

Impacted FB in the pharynx or upper end of the esophagus should be removed as soon as possible and should not be left alone with the hope that it will pass spontaneously.

Objects lodged immediately below the cricopharyngeus muscle or above can be safely easily and quickly removed under direct vision with the laryngoscope and Magill forceps. An FB at this level could be referred to the anesthetist for extraction.

The anesthetic technique of choice in our view is mask inhalational anesthesia in Trendelenburg's position for coins extraction and standard endotracheal technique using crash induction for other types of FBs extraction.

Table I. Age distribution of the study group

Age (years)	No. of patients
8/12 - 3	26
4 - 6	22
7 - 9	17
10 - 13	10
14 - 60	8
61 - 85	7

Table II. Types of foreign bodies in adults

Types of foreign body	No. of patients (15)	Pharynx (5)	Esophagus (10)
Meat lump	5	0	5
Meat bone	1	0	1
Chicken bone	2	0	2
Fish bone	1	0	1
Leech	2	2	0
Scarf pin	2	2	0
Grape	1	1	0
Dental prosthesis	1	0	1

Table III. Types of foreign bodies in children

Types of foreign body	No. of patients (75)	Pharynx (5)	Esophagus (70)
Coin	68	0	68
Wood	2	2	0
Metallic ring	1	1	0
Metallic spring	1	1	0
Ear ring	1	0	1
Whistle	1	0	1
Wheat spike	1	1	0

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