



Management of cases esophageal foreign bodies in by using rigid esophagoscopy

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Abstract

Dysphagia is an important symptom, more so in children, of a foreign body in the esophagus. Throat pain, retrosternal pain and foreign body sensation in throat are diffuse symptoms, but in presence of other clinical data, make one suspect a foreign body. Excessive salivation and regurgitation are symptoms of complete esophageal obstruction. Coughing, stridor and other respiratory symptoms may quite often be the only presentation. Hence based on above reported findings the present

The present study was planned in Department of ENT, Nalanda Medical College and Hospital Patna, Bihar, India. The study was conducted from April 2018 to September 2018. Total 30 cases of the patients impacted with the Esophageal foreign bodies were enrolled in the present study.

Foreign body ingestion is a common problem. The majority of swallowed objects will pass spontaneously. Rigid endoscopy with forceps removal under general anesthesia is preferred method of removing these foreign bodies. No foreign body should be left unattended expecting it to come out spontaneously. Delay in its management can lead to life threatening complications. Prevention is ideal; increasing the public awareness, educating on age appropriate food, industrial standards for toy part sizes would help decrease fatality from choking.

Keywords: esophageal foreign bodies, rigid esophagoscopy, etc

Introduction

An esophagoscopy involves inserting a long, narrow, tube-like device with a light and a camera, known as an endoscope, into your esophagus. The esophagus is a long, muscular tube that helps get food and liquids from your mouth to your stomach.

Esophagoscopy is a procedure in which a flexible endoscope is inserted through the mouth or, more rarely, through the nares and into the esophagus. The endoscope uses a charge-coupled device to display magnified images on a video screen. The procedure allows visualization of the esophageal mucosa from the upper esophageal sphincter all the way to the esophagogastric junction (EGJ).

This procedure is one of several procedures that fall under the category of upper endoscopy, including gastroscopy, esophagogastroduodenoscopy (EGD), and enteroscopy. Esophagoscopy alone is uncommon: It is generally performed as part of a more complete upper endoscopic procedure in which the esophagus, stomach, and portions of the small intestine are explored endoscopically.

In the United States, esophagoscopy is usually performed with moderate sedation, which is achieved by administering a narcotic and benzodiazepine in combination. In Europe and Asia, however, the procedure is commonly performed without sedation. Topical anesthesia is sometimes implemented to improve patient tolerance and comfort. Very rarely, general anesthesia is used in patients who are difficult to sedate or are at higher risk of airway compromise. There is some evidence for the effectiveness of unsedated esophagoscopy in monitoring pediatric esophageal disease [1, 2].

Esophagoscopy is routinely performed in an outpatient

setting, though inpatient and emergency department management of gastrointestinal diseases often require urgent inpatient upper endoscopy including but not limited to esophagoscopy. Moreover, certain conditions necessitate routine esophageal endoscopic surveillance and therapeutics. In such cases, a procedure may be limited to esophageal exploration alone. The indications for esophagoscopy are as follows:

Food bolus or foreign object impaction. Evaluation and management of gastroesophageal reflux disease (GERD) [3], including noncardiac chest pain. Screening and surveillance of Barrett esophagus [4, 5]. Treatment and surveillance of esophageal varices [6]. Evaluation and management of dysphagia [7], including dilation of esophageal strictures. Evaluation and management of odynophagia. Evaluation and management of esophageal cancer [8, 9], including placement of esophageal stents. Evaluation of the esophagus after abnormal imaging studies. Esophagoscopy is considered a safe procedure, with a complication risk of approximately 1 per 1000 procedures [10, 11].

Absolute contraindications include the following: Hemodynamic instability, Failure to obtain consent, Possibility of perforation. Relative contraindications for esophagoscopy include the following: Anticoagulation in the appropriate setting (ie, esophageal dilation), Head and neck surgery, Pharyngeal diverticulum.

The American Society for Gastrointestinal Endoscopy (ASGE) recommends understanding of indications, limitations, contraindications, alternatives, principles of conscious sedation, and correct interpretation of endoscopic findings to achieve competency in performing upper endoscopic procedures.

Furthermore, ASGE has determined that a minimum of 100 upper endoscopic procedures are required for trainees to attain competency in diagnostic upper endoscopy. Therapeutic upper endoscopy poses further challenges and complexities and therefore requires additional training.

The esophagus is the most common site of foreign body impaction. Food impactions are the most common cause of esophageal foreign bodies. Large, smooth food pieces (eg, steak, hot dogs) are particularly easy to swallow inadvertently before being chewed sufficiently. Bones, particularly fish bones, may be swallowed if the meat in which they are embedded is not chewed sufficiently.

Infants and toddlers do not have fully mature oropharyngeal coordination and often inadvertently swallow small, round foods (eg, grapes, peanuts, candies), which may become impacted. In addition, infants and toddlers often swallow a wide variety of inedible objects (eg, coins, batteries) accidentally or because they are curious, and some of these objects become impacted in the esophagus. Impacted disc batteries are particularly worrisome because they may cause esophageal burns, perforation, or tracheoesophageal fistula. Foreign bodies in the esophagus usually lodge in areas where physiologic or pathologic luminal narrowing exists. Luminal narrowing may be caused by sphincters (lower esophageal sphincter, upper esophageal sphincter), external vascular structures (eg, aortic arch, aberrant subclavian artery), webs, rings, strictures, benign tumors, cancerous tumors, achalasia, diffuse esophageal spasm, previous surgery, and eosinophilic esophagitis.

Obstruction may be partial (eg, patient can swallow liquids or at least their oral secretions) or complete. Partial obstruction is less emergent unless it involves a sharp object embedded in the wall, which can lead to perforation. Complete obstruction is poorly tolerated clinically, and even a smooth object, if tightly impacted, may cause pressure necrosis and risk of perforation if allowed to remain in the esophagus for more than about 24 hours.

Complications also depend on the nature of the object involved. Despite their small size, impacted disk or button batteries are objects of particular concern because liquefaction necrosis and perforation can occur rapidly.

The main presenting symptom is acute dysphagia. Patients with complete obstruction of the esophagus hypersalivate and are unable to swallow oral secretions. Other symptoms include retrosternal fullness, regurgitation, odynophagia, blood-stained saliva, and gagging and choking. Hyperventilation resulting from anxiety and discomfort often gives the appearance of respiratory distress, but actual dyspnea or auscultatory findings of stridor or wheezing strongly suggest the foreign body is in the airway rather than the esophagus.

Sometimes, foreign bodies scratch the esophagus but do not become lodged. In such cases, patients may report a foreign body sensation even though no foreign body is present.

Many patients give a clear history of ingestion; those with significant symptoms suggesting complete obstruction should have immediate therapeutic endoscopy. Patients with minimal symptoms who are able to swallow normally may not have an impacted foreign body and can be observed for resolution of symptoms. Other patients may require imaging studies.

Some patients, such as young children, mentally impaired adults, older people, and those with psychiatric illness, may not be able to give an adequate history of ingestion. These

patients may present with choking, refusal to eat, vomiting, drooling, wheezing, blood-stained saliva, or respiratory distress. Imaging studies also may be needed in these patients.

Some foreign bodies can be detected with plain x-rays (2 views preferred). These x-rays are best for detecting metallic foreign objects and steak bones as well as for detecting signs of perforation (eg, free air in the mediastinum or peritoneum). However, fish bones and even some chicken bones, wood, plastic, glass, and thin metal objects can be difficult to identify on plain x-rays. If there is any suspicion of a foreign body or of intentional or dangerous (eg, packets of illicit drugs) foreign body ingestion, imaging studies, such as CT, should be done, sometimes before endoscopy, to confirm and localize the foreign body. Endoscopic evaluation is typically required in patients with suspected foreign body ingestions and ongoing symptoms despite negative imaging results.

An oral contrast imaging study typically should not be done because of the risk of aspiration and of contrast leakage in patients with perforation. Also, the presence of residual contrast material can make subsequent endoscopic retrieval more difficult.

Some foreign bodies pass spontaneously into the stomach, after which they typically pass completely through the gastrointestinal tract and are expelled. Patients without symptoms of high-grade obstruction and without ingestion of sharp objects or disk or button batteries typically can safely be observed for up to 24 hours to await passage, which is indicated by relief of symptoms. Administration of glucagon 1 mg IV is a relatively safe and acceptable option that sometimes allows for spontaneous passage of a food bolus by relaxing the distal esophagus. Other methods, such as use of effervescent agents, meat tenderizer, and bougienage, are not recommended.

Foreign bodies that do not pass within 24 hours [12] should be removed because delay increases the risk of complications, including perforation, and decreases the likelihood of successful removal.

Endoscopic advancement of the bolus into the stomach or removal is the treatment of choice. Endoscopic advancement is preceded by trying to pass the endoscope around the food bolus and examining the esophagus distal to the bolus (eg, for luminal narrowing or obstructing lesions) and then accomplished by applying gentle pressure to the middle of the food bolus. To minimize the risk of perforation, this procedure should be done only by an experienced endoscopist. Removal is best achieved using a forceps, multiprong graspers, net, basket, or snare, preferably with an overtube placed in the esophagus or orotracheal intubation to prevent aspiration and protect the airway [13].

Emergency endoscopy is required for sharp-pointed objects, disk or button batteries, and any obstruction causing significant symptoms. Follow-up care for the evaluation of structural and functional abnormalities is recommended for patients with esophageal food impaction.

Both children and adults experience problems caused by foreign objects becoming lodged within their bodies. Young children, in particular, are naturally curious and may intentionally put shiny objects, such as coins or button batteries, into their mouths. They also like to insert objects into their ear canals and nostrils. The severity of a foreign body can range from un concerning to a life-threatening

emergency. For example, a coin causes local pressure on the tissue but generally is not a medical emergency to remove. A button battery, which can be a very similar size to a coin, generates hydroxide ions at the anode and causes a chemical burn in two hours. An ingested button battery that is stuck in the esophagus is a medical emergency. In 2009, Avolio Luigi and Martucciello Giuseppe showed that although ingested nonmagnetic foreign bodies are likely to be passed spontaneously without consequence, ingested magnets (magnetic toys) may attract each other through children's intestinal walls and cause severe damage, such as pressure necrosis, perforation, intestinal fistulas, volvulus, and obstruction^[14].

Most objects that are swallowed will, if they have passed the pharynx, pass all the way through the gastrointestinal tract unaided. However, sometimes an object becomes arrested (usually in the terminal ileum or the rectum) or a sharp object penetrates the bowel wall. If the foreign body causes problems like pain, vomiting or bleeding it must be removed. Swallowed batteries can be associated with additional damage, with mercury poisoning (from mercury batteries) and lead poisoning (from lead batteries) presenting important risks.

Endoscopic foreign body retrieval is the first-line treatment for removal of a foreign body from the alimentary tract. Glucagon has been used to treat esophageal foreign bodies, with the intent that it relaxes the smooth muscle of the lower esophageal sphincter to allow the foreign body to pass into the stomach. However, evidence does not support a benefit of treatment with glucagon, and its use may result in side effects.

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Methodology

The present study was planned in Department of ENT, Nalanda Medical College and Hospital Patna, Bihar, India. The study was conducted from April 2018 to September 2018. Total 30 cases of the patients impacted with the Esophageal foreign bodies were enrolled in the present study.

In all patients, rigid esophagoscopy was carried out under general, anesthesia. The presence of stricture or foreign body was noted. Benign strictures were dilated with gum elastic bougies. In benign strictures the scope was negotiated distal to the lesion after complete dilatation. Procedure was abandoned in cases where perforation was suspected by sudden give away sensation, during negotiation, visible mucosal tag due to rupture, large amount of blood stained over gauze piece used to clean bougies for dilatation.

All the patients were informed consents. The aim and the objective of the present study were conveyed to them. Approval of the institutional ethical committee was taken prior to conduct of this study.

Following was the inclusion and exclusion criteria for the present study.

Inclusion Criteria: Foreign body of cricopharynx and oesophagus done under general anaesthesia.

Exclusion Criteria: Nasal foreign body. Oropharyngeal foreign body like fish bone removed as office procedure.

Results & Discussion

Worldwide, most commonly ingested FB in the pediatric population is coin. Other foreign bodies those are commonly ingested are food related, such as seeds and nuts, bone, and meat bolus and also pins magnets, and toys. The most common ingested FB in the elderly is dentures. Children within the age group of 6 months to 5 years and risk group in adult population such as prisoner, alcoholics, psychiatric patient, and old age edentulous person are found to be more prone to FB ingestion^[15].

Clinically, esophageal FB ingestion may be asymptomatic, especially in children and may go unnoticed due to the lack of proper history. Usually asymptomatic, but it may present with subtle symptoms such as dysphagia, odynophagia, chest pain, and laryngeal irritation. Emphasis must be given to seek the history as presentation may be varied. Cricopharyngeal ring, aortic arch indentation, and esophago-gastric junction are three anatomical narrow areas where lodgment of FB may occur in the esophagus^[16].

After ear and nose esophagus is the commonest site for foreign body impaction^[17]. 80% of impacted foreign body of the digestive tract are held up in cricopharynx^[18] as reported in literature, which is similar to the finding our study. Common signs and symptoms in the digestive tract foreign body are dysphagia, drooling, vomiting. Major respiratory symptoms are more common within weeks or months after ingestion such as coughing, fever, chest pain, stridor^[19]. Although most foreign bodies pass of spontaneously 10-20% of these patients need treatment and approximately 1% will require surgery^[20].

Oesophagoscopy has been in vogue since the middle of the 19th century as a means of visualizing and treating certain oesophageal disorders. A number of instruments were designed with this purpose in mind, the most successful of which was the rigid oesophagoscope, later followed by the flexible oesophagoscope^[21]. Currently both instruments are in use, with their own indications and efficacies for similar or different oesophageal conditions. The major indication for oesophagoscopy is dysphagia, which can be due to a number of causes such as foreign bodies, tumors (benign and malignant) and strictures (reflux / peptic, corrosive, anastomotic, etc.). The use of rigid or flexible oesophagoscopy may be determined by the suspected or actual anatomic lesion or condition in the oesophagus, with various studies favouring the use of rigid or flexible oesophagoscopy for oesophageal foreign body extraction, biopsies of tumors or suspected lesions, and strictural disorders requiring dilatation. Rigid esophagoscopy is a well-established endoscopic procedure for both diagnostic and therapeutic indications. Ritchie *et al* studied the efficacy and safety of rigid esophagoscopy in diagnostic and therapeutic settings in a consecutive series of 404 patients with oesophageal carcinoma and compared these to flexible esophagoscopy in the same group^[22]. They concluded that rigid esophagoscopy in the presence of carcinoma retains an important diagnostic and therapeutic role which can be achieved with a low incidence of perforation in high-risk

patients.

Table 1: Demographic Details

Parameters	No. of Cases
Sex	
Male	18
Females	12
Age	
Less than 10 years	10
11 – 20 years	4
21 – 30 years	5
31 – 40 years	4
41 – 50 years	3
51 – 60 years	2
60 & above years	2
Total	30

Table 2: Types of esophageal foreign bodies

Foreign bodies	Number of cases
Coins	9
Dentures	7
Toy parts(plastic)	1
Fish bones	5
Button batteries	2
Ornaments	3
Mutton bones	3
Total	30

Table 3: Duration of symptoms with esophageal foreign bodies before presentations to hospital

Duration of symptom	Number of cases
Less than 24 hours	24
More than 24 hours but less than 72 hours	3
More than 72 hours but less than 1 week	2
More than 1 week	1

Table 4: Site wise distribution of esophageal foreign bodies

Site	Number of cases
Cervical	19
Upper thoracic	5
Mid thoracic	3
Lower thoracic	3
Total	30

Now, regarding preprocedural investigation and diagnosis, radiography, though important, was much more useful when the foreign body was radiopaque. So, it could be identified on the film or if there was a suspected complication that could be identified on the film such as lung collapse. Digoy also concluded that radiography in aerodigestive foreign bodies is much more important when dealing with oesophageal foreign bodies than airway foreign bodies [23]. Foreign body ingestion is common in children, but frequently seen among adults also. Foreign body is ingested accidentally but occasionally homicidal or suicidal. Most common foreign bodies in children are coins [27], but marbles, button, batteries, safety pins and bottle tops are also reported. In adults common foreign bodies are bones, dentures and metallic wires [24]. Foreign bodies which have gone beyond the oesophagus will pass uneventfully through intestinal tract in 70-80% cases [25]. The level at which progress is impeded are cricopharynx, pylorus, duodenum, duodenojejunal flexure etc [26], Radiological localization is mandatory for decision making regarding the removal.

A detailed history, clinical examination and investigative findings often lead to easy diagnosis. On the contrary an improper history with no objective clinical findings and a negative radiological result can lead to an uncertain situation and may even miss the foreign body. A lateral soft tissue neck radiograph is a cheap readily available investigation tool that is of clinical value in assessing patients with pathology of the upper digestive tract. Prevertebral soft tissue is of variable thickness depending on the level and the age of the patient. In younger children prevertebral tissue can be up to the width of a vertebral body [28].

In case of a doubtful situation endoscopic clarification should be undertaken. Successful retrieval of impacted foreign body requires a coordinated team work between the endoscopist and the anesthesiologist. A well ventilated and relaxed patient offers the best prospects of a successful retrieval. In recent years either flexible or rigid endoscopes has been the most common approach for removal of impacted esophageal foreign body [29].

Usually, most of the foreign bodies, especially coins, pass through the esophagus without any complication and does not require any treatment medically or surgically. However, rarely, it gets impacted. In impacted cases, majority of cases require endoscopic intervention and in only 1% cases surgical intervention is required. Coins should be removed when blocking the esophagus and when size is larger than 25 mm or retained for >3 weeks in the stomach. Although most of the time it can be removed by esophagoscope, surgical exploration may be needed rarely and includes involvement of ENT surgeon, thoracic surgeon, and gastro surgeon [30, 31].

Further assessment regarding the management depends on the level of lodgment and type of foreign body, following the algorithm, appropriate treatment modalities are ensured. Children with upper GI FB ingestion can be effectively treated by an experienced endoscopist with safe and uncomplicated removal of such FBs using pediatric and appropriate ancillary endoscopic equipment. If rigid endoscopy is chosen, direct laryngoscopy done before intubation allows tracheobronchial involvement to be ruled out. Assisted firm upward retraction of the overlying neck skin helps in better visualization of proximal esophagus in small children < 3 years. Endoscopic expertise often prevent complications. Repeat endoscopy may be used to evaluate any associated mucosal trauma. Contrast swallow studies are recommended to rule out perforation before a normal diet is resumed.

Conclusion

Foreign body ingestion is a common problem. The majority of swallowed objects will pass spontaneously. Rigid endoscopy with forceps removal under general anesthesia is preferred method of removing these foreign bodies. No foreign body should be left unattended expecting it to come out spontaneously. Delay in its management can lead to life threatening complications. Prevention is ideal; increasing the public awareness, educating on age appropriate food, industrial standards for toy part sizes would help decrease fatality from choking.

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