

Management of Gastrointestinal Foreign bodies using Flexible Endoscopy: an experience from Addis Ababa, Ethiopia

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Background: Foreign body (FB) ingestion is a common surgical emergency that often requires prompt intervention before complications occur. A total of 25 patients with a history of accidental foreign body ingestion were treated in our medical center. The aim of this study is to present our experience of gastrointestinal foreign body extractions under light conscious sedation using flexible video endoscopes in children and adults at Adera Medical center in Addis Ababa, Ethiopia.

Methods: A total of 25 patients were admitted to Adera Medical center for removal of ingested FB using flexible video endoscopes. The patients were observed and followed up for anticipated complications and discharged after stabilization with analgesics and counseling. History of FB ingestion, dysphagia, odynophagia, drooling of saliva, vomiting, and vague sensation of FB were used as diagnostic criteria. Lateral and PA neck, chest, and abdominal plain x-rays were also taken as appropriate for diagnosis as well as follow up of passage of disimpacted FB per rectum. After informed consent was obtained, light sedation and anesthesia were provided using IV diazepam, and oral xylocaine spray, flexible Esophagogastroduodenoscopy (EGD) was performed using standard procedure. Once identified, the FB was removed by FB grasper/forceps.

Results: A total of 25 patients, 10 children & 15 adults with a mean age of 14.7 years (range 2 – 34) were treated for FB ingestion upon presentation to the Adera Medical Center. The mid intra-thoracic esophagus was the commonest site of FB impaction followed by the stomach. Dysphagia, odynophagia, and drooling of saliva were the commonest presenting symptoms. Hair pins and pieces of bone were the commonest FB encountered. Nearly all (98%) presented within 24 hours of accidental FB ingestion and all of the FBs were removed successfully without any complication.

Conclusion: Flexible Endoscopy is a very safe and efficient method of timely diagnosis and removal of ingested FBs in children and adults in trained hands to prevent life threatening complications. Our finding is similar to other international reports.

Introduction

The presence of a foreign body in the gastrointestinal tract, particularly in the esophagus is a challenging problem^{1, 2, 3}. The management depends on a number of factors, such as anatomic location of the object, shape and size of the foreign body and the availability of removing facilities^{2, 3}. Unless removed with a certain degree of urgency, retained esophageal foreign bodies can lead to many complications, with the potential progression to death^{2, 3, 4}. Which method of extraction is the best remains to be contentious, however rigid and flexible endoscopy techniques have been used in many centers^{3, 4}. However, over the past decade, the flexible fiberoptic Endoscope has gained great popularity, mainly owing to its safety^{1, 3, 4}. Rigid endoscopy may be best for objects that are located in the hypopharynx and cricopharyngeus areas⁴ while for objects located in other areas along the GI tract, flexible endoscopy is better because it allows the visualization of the esophagus, stomach, and duodenum^{2, 3, 4}. Flexible endoscopy is also associated with a lower rate of complications, increased patient comfort, and a lack of requirement for general anesthesia^{3, 4}. Report from Ethiopia has shown that esophageal foreign bodies are not so rare and were usually managed by rigid esophagoscopy⁵.

The main objective of this report is therefore to describe our experience of gastro-intestinal foreign body extractions using a flexible endoscope. We believe this is the first such report from Ethiopia and our experience can be duplicated to other centers.

Patients and Methods

This was a prospective study of all patients admitted for foreign body extraction from the upper gastrointestinal tract at the Adera Higher Clinic over a three years period from July 2009 to June 2012. The clinic is a specialized gastro-intestinal clinic equipped with all sizes of flexible scopes, retraction and biopsy forceps and a well-experienced gastroenterologist. Parameters recorded for the study included age and sex of the patient, time elapsed before presenting to the center, location of the foreign body, diagnostic tools employed, the material impacted, management techniques employed, treatment outcomes, and complications seen if any.

Foreign body location was recorded as being proximal (cricopharyngeus muscle to 28 cm from the upper incisor teeth), middle (between 28 cm and 34 cm), or distal (34 cm to the lower esophageal sphincter), and gastric, duodenal or colonic according to endoscopic localization. Extraction techniques utilized exclusively was flexible esophago-gastroscopy or colonoscopy with conscious sedation using valium and/or pethidine. The endoscopes were used to confirm the diagnosis, grasp and remove the foreign objects where feasible or disimpacted and pushed the objects to the lower GIT if extraction proved to be difficult or FB slipped off. After each procedure, patients were kept in the clinic for few hours to see whether complications occurred or not. Data was collected using a structured questionnaire and analysis done by using SPSS statistical software.

Results

A total of 25 patients (10 males and 15 females) were included in to the study. Their mean age was $14.7.1 \pm 12.08$ (range, 2–34) years. Ten (40%) of patients were aged 10 years or younger and the majority 16 (64%) were from Addis Ababa (Table 1). In most patients 18 (72%), the duration of foreign body impaction before presentation to the center was earlier than 24 hrs. Three (12%) came after 24 hours and 3(12%) after 48 hours. One patient presented after 4 days. All patients presented with mixture of symptoms and none were asymptomatic. All the 25 had dysphagia and 1 complained of odynophagia. The most common presentations of the 10 children below 10 years were drooling of saliva and dysphagia in 10 (100%) each, followed by vomiting in 6,

Hair pin (Muslim Hijab Pins) and pieces of chicken bones were the most common foreign bodies diagnosed, occurring in 6 (24%) and 4 (16%) respectively, followed by leech infestation, metal pieces (one of which being a soft drink cork) and coins in 3(12%) each. Other impacted foreign bodies included fish bones, disk batteries, shirt buttons and school stationary supplies (Figure 1 and Figure 2). The majority of the foreign bodies 19 (76%) were located in the middle third of the esophagus, 4 (16%) in the stomach and 2 (8%) were in the duodenum (Figure 3).

All patients were x-rayed to localize the object and 12 (48%) were radio opaque, including 3/6 of the Hijab pins, 2/4 of the chicken bones, 3/3 of the metal pieces, 3/3 of the coins and 1/2 of the disc batteries (Figure 4). The remaining 13 (52%) were radiolucent and diagnosed during endoscopy (Figure 5).

Flexible endoscopy was used in all the 25 patients and successful foreign body removal was accomplished in 20 (80%) patients including one hairpin found stuck in to ascending colon removed by colonoscopy forceps. This case presented 24 hours after ingestion of Hijab hair pin was found to have negative EGD and colonoscopy discovered the Hijab pin stuck to the ascending colon and removed smoothly without any complication using forceps via colonoscopy at the time of diagnosis and the patient was discharged in stable condition after observed for few hours.

Table 1. Socio demographic features of patients who underwent endoscopic foreign body extraction in Addis Ababa: 2009-2010

| Characteristics | Frequency (N=25) | Percentage (100%) |
|---------------------|------------------|-------------------|
| Age in years | | |
| 2-10 | 10 | 40 |
| 11-20 | 5 | 20 |
| 21-30 | 8 | 32 |
| 31-34 | 2 | 8 |
| Sex | | |
| Male | 10 | 40 |
| Female | 15 | 60 |
| Address | | |
| Addis Ababa | 16 | 64 |
| Out of Addis Ababa | 9 | 36 |
| Occupation | | |
| Child | 10 | 40 |
| Student | 6 | 24 |
| Employee | 5 | 20 |
| House wife | 3 | 12 |
| Unknown | 1 | 4 |

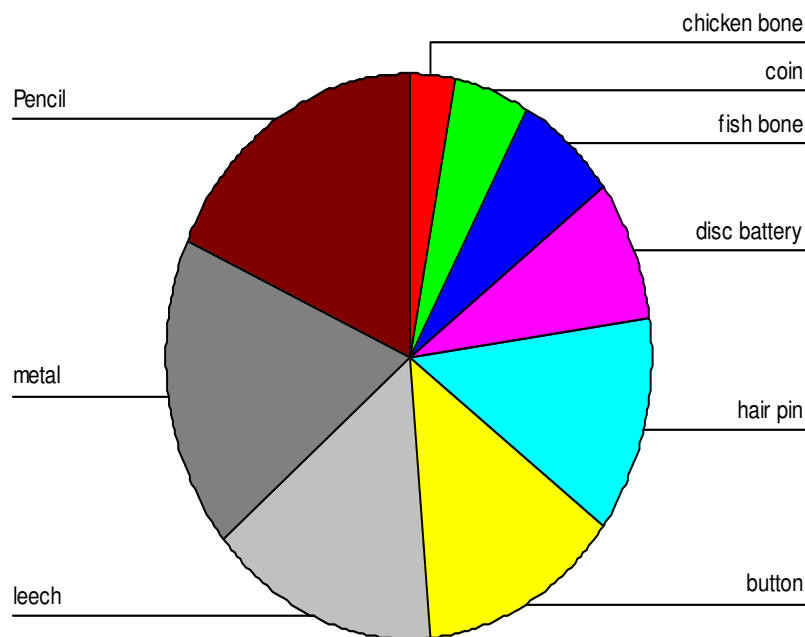


Figure 1. Patterns of foreign bodies extracted from patients who underwent endoscopic foreign body extraction in Addis Ababa: 2009-2010

Table 2. Patterns of foreign bodies extracted from patients who underwent endoscopic foreign body extraction in Addis Ababa: 2009-2010

| Foreign bodies extracted | Frequency (25) | Percentage |
|--------------------------|----------------|------------|
| Hair (Hijab) pins | 6 | 24 |
| Chicken bone | 4 | 16 |
| Leech | 3 | 12 |
| Metal pieces | 3 | 12 |
| Coin | 3 | 12 |
| Fish bone | 2 | 8 |
| Disk battery | 2 | 8 |
| Pencil | 1 | 4 |
| Button | 1 | 4 |



Figure 2. Some of the foreign bodies extracted in patients that underwent endoscopic foreign body extraction in Addis Ababa: 2009-2010

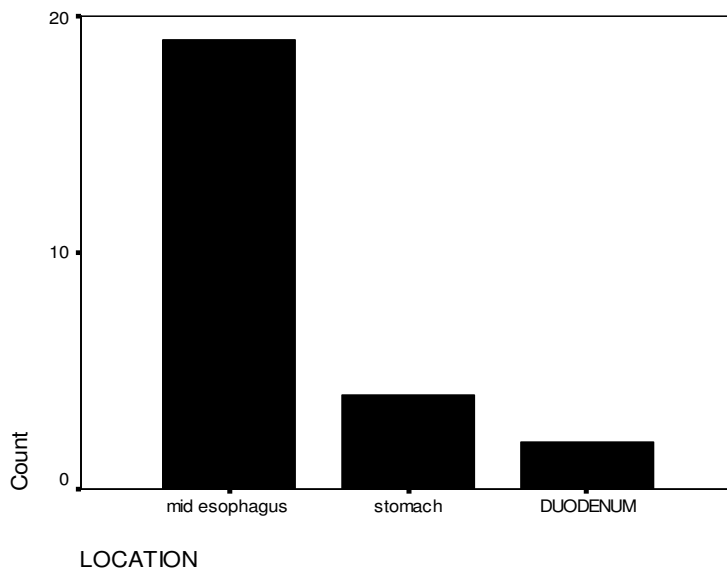


Figure 3. Location of foreign bodies in patients who underwent endoscopic foreign body extraction in Addis Ababa: 2009-2010 (N=25)

Table 3. Modes of management of foreign bodies in patients that underwent endoscopic foreign body extraction in Addis Ababa: 2009-2010

| Foreign body | Extraction | Dislodged and pushed | Total |
|-------------------|------------|----------------------|-------|
| Hair (Hijab) pin. | 6 | - | 6 |
| Chicken bone. | 4 | - | 4 |
| Metal pieces | 2 | 1 | 3 |
| Coin. | 3 | - | 3 |
| Leech. | 3 | - | 3 |
| Fish bone. | 2 | - | 2 |
| Disc battery. | - | 2 | 2 |
| Button. | - | 1 | 1 |
| Pencil. | - | 1 | 1 |
| Total | 20 | 5 | 25 |



Figure 4. Xray showing FB (Coin) in Oesophagus.



Figure 4. Endoscopic coin extraction from the Esophagus at Adera Medical center in Addis Ababa 2009-2012

Discussion

In the literature, the majority of foreign body ingestions occur in the pediatric population with a peak incidence between ages 6 months and 6 years like our cases. In adults, true foreign object ingestion occurs more commonly among those with psychiatric disorders or severe development delay^{6, 7}. The symptoms of foreign body ingestion in our patients were similar to those reported in other series⁸, the most frequent signs and symptoms being drooling, vomiting, chest discomfort, difficulty breathing and dysphagia. However unlike large scale series in which coin ingestion predominate, Muslim Hijab pin ingestion is the most common, encountered in adolescent girls. This may be due to the fact that our patients were not exclusively pediatric. Young girls have the habit of holding the pins between their teeth when adjusting their Hijab and this pins can be accidentally swallowed.

Besides history and physical examination, radiological examination is a very important diagnostic tool to identify the foreign body location⁹. Antero – posterior and lateral cervical, plain abdomen and chest radiographs are basic imaging for foreign body detection. For non-opaque objects, indirect findings such as larynx tomography, can aid in the diagnosis¹⁰. Barium swallow or meal should not be used as it causes aspiration and obscure subsequent Endoscopy¹¹.

The site of impaction of foreign bodies differs with age. In children, it is usually impacted in the upper esophagus at the level of the cricopharyngeus muscle, which is the narrowest part of the esophagus. This is followed by the mid esophagus where it is crossed by the aortic arch and left bronchus, In adults, the foreign body is usually impacted in the mid-lower third of the esophagus or stomach as seen in this series¹²⁻¹⁴. The majority of the foreign bodies in our patients were found to be located in the mid Esophagus (77.2%). This is in agreement with most other series showing that 60 – 70% impact in the Esophagus¹⁴.

The local effects of ingested foreign bodies are also variable. Sharp foreign bodies, such as needles, pins, and hairpins can perforate and lead to pneumo- mediastinum/peritoneum, and must be removed urgently. Also smooth foreign bodies such as coins may become tangentially oriented and encroach on the trachea, causing biphasic stridor and requiring urgent removal¹⁵. Impacted button battery may cause mucosal injury in as little as 4 hours. Injury can extend transmurally within hours creating the potential for perforation, bleeding, infection, mediastinitis, aorto-esophageal fistula and possible fatal outcomes¹⁶.

It is found that the risk of perforation to be higher in children who had swallowed coins more than 6 days prior to admission¹⁷. Impacted esophageal foreign bodies can also cause mucosal ulceration, esophageal strictures, mediastinitis, abscess, and aorto- esophageal fistula^{9,16-17}. The longer the foreign body remains in the Esophagus, the greater the incidence of respiratory symptoms such as cough, fever, stridor perforation, and mediastinitis.

Flexible Endoscopy is more cost effective as it can be done as outpatient without anesthesia⁹. Many alternative methods for removal of GI foreign bodies have been described such as dislodgement by a Foley catheter, advancement with bougie, papain or carbonate fluid treatment, glucagon therapy, balloon extraction during fluoroscopy and removal using magnet⁹. Although endoscopy has been the mainstay of management of GI foreign bodies, it has risks like bleeding, aspiration, hypoxia or stridor due to laryngo-bronchospasm, perforation and mediastinitis.

Different endoscopic techniques were described like push in to the stomach, push-plus frag-mentation, pull with retrieval forceps, and pull with dormia basket¹⁸. We have used alligator-jaw forceps, biopsy forceps, and Dormia basket according to the shape and size of the foreign bodies to be removed while few disimpacted and slipped down during the procedures. Endoscopic protector hood is reportedly useful for difficult removal of sharp or pointed foreign bodies after pushed into the stomach¹⁹⁻²². However it was not required in our series. Surgical treatment is required in cases of irretrievable foreign body or GIT rupture. The approach may be cervicotomy, thoracotomy, gastrostomy, or Enterostomy according to the location of the foreign body⁹. In this series, we have not encountered any complication like perforation or difficult impaction and hence surgical management was not required.

Conclusion and recommendations

Based on our experience, timely diagnosis and removal of accidentally ingested foreign body by flexible Endoscopes can be practiced in Ethiopia. As rigid oesophagoscopy requires general anesthesia and is associated with its own complications, we recommend that ingested foreign bodies should be tried with flexible scope before patients are subjected to the invasive rigid scope. We would also like to recommend continuous public health education at schools and through public media to reduce the incidence of foreign body ingestion and related complications.

Acknowledgement

We are grateful to Sr Rahel Tesfaye and Sr Kume Nigusu for assisting in Endoscopy and data collection. We also thank the victims and guardians for providing the required data. Miss Tirubir Belihu also deserves appreciation for her excellent secretarial works.

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