UPPER GASTROINTESTINAL TRACT FOREIGN BODIES IN CHILDREN: PRESENTATION AND MANAGEMENT

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ABSTRACT

Objective: To describe the presentation and outcome of upper gastrointestinal (GI) foreign bodies in children.
Study Design: Descriptive case series.
Place and Duration of Study: Department of Pediatric Gastroenterology, Hepatology & Nutrition, the Children's Hospital & the Institute of Child Health Lahore, from Jan 2016 to Dec 2016.
Material and Methods: Fifty eight children with history of foreign body ingestion were included in the study through non probability purposive sampling technique. Children underwent upper GI endoscopy flexible endoscope under general anesthesia. The data such as age, sex, mode of presentation, type of foreign body and site of impaction was recorded on a specially designed proforma. Qualitative variables including gender, type of foreign body, clinical features, site of impaction etc were expressed in term of frequencies and percentages while age was expressed as mean and standard deviation.
Results: Among 58 patients 53.4% (n=31) were male and 46.6% (n=27) were female with age range from 2 months to 15 years. Majority of cases had developed dysphagia (70.7%). Coins were the most common foreign bodies encountered (32.8%) followed by button batteries (31%). Lower esophagus was the most common site of impaction of foreign bodies (65.5%).
Conclusion: Coins and button batteries are the common upper GI foreign bodies with lower esophagus being the most common site of impaction. Commonest presenting feature was dysphagia. Endoscopic retrieval of foreign bodies under general anesthesia is a safe mode of treatment.

Keywords: Children, Management, Upper GI foreign bodies.

INTRODUCTION

Ingestion of foreign body is a common problem encountered in pediatric gastro-enterology[1]. Fortunately, most foreign bodies that reach the gastrointestinal tract pass spontaneously. About 10 to 20 percent of ingested foreign bodies require endoscopic removal, and less than 1 percent requires surgical intervention[2]. Although mortality from foreign body ingestion is extremely low, deaths have been reported[3]. Coins are the most commonly reported foreign bodies ingested in children[4]. Apart from coins batteries, magnets, safety pins, toys & their parts, bones, marbles, screws and food have been reported. Developmentally delayed children present with repeated ingestion episodes and with ingestion of multiple foreign objects[5]. Esophagus being the narrowest area within the gastrointestinal (GI) tract is the common site of foreign body impaction especially the upper third part[6,7]. Once beyond stomach, the chances of impaction of foreign body are small.

Most children with ingested foreign bodies are asymptomatic. They are brought to medical attention by their parents as they witness the ingestion. Patients may present drooling, refusal to feed or dysphagia, or respiratory symptoms including wheezing, stridor, or choking. Children presenting with food bolus impaction usually have an underlying pathology (e.g, a stricture) directly responsible for the impaction[4]. Long-standing esophageal foreign bodies may cause recurrent aspiration pneumonia and weight loss, due to aspiration of oral secretions and poor caloric intake, respectively. They can also cause damage to gastrointestinal mucosa and lead to

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strictures. Sometimes esophageal wall may be eroded, creating a fistula with the trachea or other structures[7]. Sharp objects may perforate the esophagus causing neck swelling, crepitus, or pneumomediastinum. Ingestion of gloves, foam, spray foam, bread clip, plastic wires, polystyrene, polyethylene and vinyl can lead to bezoar formation[8]. Complications caused by foreign bodies in small bowel include abdominal pain, vomiting, altered bowel movements, distension, malena, perforation, abscess formation, peritonitis and hematochezia[9].

Radiographic investigation includes a soft tissue lateral neck radiograph and a chest radiograph. Classically, coins are oriented coronally in esophagus. Diagnosis of radiolucent foreign bodies, such as plastic, glass and wooden objects involves endoscopic evaluation or contrast radiography.

Treatment for objects visible on a radiograph or not visible can involve endoscopy. Rigid endoscopy with general anesthesia is usually employed to retrieve esophageal foreign bodies[10]. For foreign bodies distal to the esophagus, surgical removal by laparotomy or laparoscopy is required only in rare cases where a foreign body cannot be retrieved by endoscopy, when a complication such as perforation or obstruction has arisen or in cases where large or sharp objects do not demonstrate progression for weeks[11].

The data on clinical spectrum of upper gastrointestinal foreign bodies in children is scarce in Pakistan and limited to few case reports. Therefore this study has been carried out to deduce the clinical spectrum of this entity in children in our setting.

PATIENTS AND METHODS

After Hospital ethical committee approval and consent from parents/guardians of the patients; this descriptive case series was conducted at Department of Pediatric Gastroenterology, the Children's Hospital & the Institute of Child Health, Lahore, from January 2016 to December 2016. Sample size was calculated using WHO sample size calculator, keeping confidence internal 10%, absolute precision required 90% and anticipated proportion of foreign bodies which were coins (P) 26.23%[5]. Fifty eight children with history of foreign body ingestion were included in the study through non probability purposive sampling technique. Children underwent upper GI endoscopy by a fellow in pediatric gastroenterology, with flexible endoscope under general anesthesia. The data such as age, sex, mode of presentation, type of foreign body and site of impaction was recorded on a specially designed proforma.

All the data was analyzed using computer program SPSS version 20. Qualitative variables including gender, type of foreign body, clinical features, site of impaction etc were expressed in term of frequencies and percentages while age was expressed as mean and standard deviation.

RESULTS

Among 58 patients 53.4% (n=31) were male and 46.6% (n=27) were female with age range from 2 months to 15 years with a mean age of 4.38 ± 3.01 years. Presenting complains of the patient are shown in table-I, dysphagia being the commonest (70.7%).

Most of the patients presented to emergency department within 24 hours of ingestion. Diagnosis was made clinically and/or radiologically with type of foreign body.

Radiological investigations consisted of plain x-ray neck and chest. All the patients underwent upper GI endoscopy with flexible endoscope. Site of impaction of foreign bodies has been illustrated in table-II. Fifty six patients were discharged within 24 hours of admission while 2 were discharged within 48 hours. The common foreign bodies were coins (32.8%) followed by button batteries (31%) as shown in table-III. Complications were noted in 7% of patients as respiratory distress.

All patients were successfully managed with flexible upper GI endoscopy. Foreign body was

retrieved in 49 (84.5%) patients while it was pushed into stomach is remaining 9 (15.5%) patients. All patients were discharged in stable condition with no endoscopy related complications after the procedure.

DISCUSSION

Foreign bodies in upper gastrointestinal tract are usually swallowed accidentally or purposefully. After nose and ear, the esophagus is the commonest foreign body which present in emergency department[12]. Due to exploratory nature, foreign body ingestion is common in children and this has been narrated by many studies. While any small object is an ingestion hazard, coins, disc batteries, needles, toys parts, marbles, ornaments and bottle caps are commonly ingested by children. In our study the median age was 3.35 ± 3.01 years with more than half (62.1%) of patients under 4 years of age. A slight male predominance (53.4%) has been recorded in our study. Similar findings have been observed by Dereci and other authors regarding age and gender distribution[4,13]. A history of foreign body ingestion is extremely important to reach at a quick and definite diagnosis[14]. In our study, 78.4% of cases were witnessed by parents or siblings before presentation to emergency department.

Dysphagia has been reported as the most frequent symptom, followed by drooling and odynophagia. Foreign bodies coming just inferior to the cricopharangeus muscle produce dysphagia and pain in the suprasternal area during swallowing[15]. Children may also complain of sensation of something being stuck in the neck, pain in the neck, or chest, salivation, refusal of food, or respiratory distress after ingestion of foreign body[16]. In our study population, dysphagia (70.7%) was the most common presenting complaint followed by drooling and odynophagia in order of frequency. Respiratory distress or cyanosis was not reported in any patient.

The types of foreign bodies ingested vary from country to country and is in accordance to the culture and feeding habits of it. Several studies found that the coins are most commonly ingested[4,17]. However, ingestion of button batteries is also very common[18]. Although our study concluded coins (32.8%) as the most

Table-I: Presenting complaint.

Type	No. of patients	Percentage (%)
Dysphagia	41	70.7
Odynophagia	8	13.8
Drooling	9	15.5

Table-II: Site of impaction.

Site	No. of patients	Percentage (%)
Upper Esophagus	12	20.7
Lower Esophagus	38	65.5
Stomach	5	8.6
Duodenum	3	5.2

Table-III: Type of foreign body.

Type	No. of patients	Percentage (%)
Coin	19	32.8
Button Battery	18	31
Bone	4	6.9
Ornament	6	10.3
Food Bolus	5	8.6
Miscellaneous	6	10.3

common foreign body retrieved, button batteries (31%) were not much far behind. Button batteries are small, coin-shaped batteries used in toys, videogames, hearing aids, watches, and calculators. As the use of this small electronic gadget has increased, the problem of disk battery ingestion has increased significantly.

Lin et al states that the diagnosis of foreign body is based upon three elements: eye-witness, x-ray and endoscopic findings[19]. Variable use of radiology has been documented in diagnosis of foreign body. Imaging studies are commonly employed for diagnosis of foreign body ingestion in children, though negative radiology findings are also common, especially for inorganic foreign bodies. Alternatively, there have been reports that have suggested the use of a metal detector to locate an ingested coin[20]. In cases of non radio opaque foreign bodies, widening of prevertebral space is suggestive of foreign body on radiograph of neck lateral view[21]. Plain radiology does not have any influence on management of non opaque foreign body, except in delaying endoscopy. In older children and adults posteroanterior and lateral chest radiograph provide better localization. In this study we diagnosed all our patients clinically or on plain radiographs of neck/chest.

The upper esophagus is the narrowest portion of gastrointestinal tract and is, therefore, the most common site for lodging foreign bodies[6,7]. However in contrary to most of studies, 65.5% of foreign bodies were found in lower esophagus in our study. Jafari and colleagues also documented similar findings to our study[18].

Management of an esophageal foreign body depends on its type and location. Any sharp, rigid, or long (>5-6 cm) object should be removed with endoscope as they are associated with a high incidence of esophageal and lower GI tract perforation[22]. Objects in the proximal and mid esophagus should also be removed since they usually do not pass into the stomach spontaneously. Asymptomatic single blunt object located in the distal esophagus for less than 24 hours, in an otherwise healthy patient may be allowed to pass spontaneously into the stomach. However the object should be removed if there is no progression on radiograph after 24 hours, to prevent local inflammation. Patients with respiratory difficulties or those having signs of esophageal perforation should be referred for endoscopy.

Several other removal techniques have been employed for retrieval of esophageal foreign bodies. The Foley catheter method involves inserting the deflated catheter orally, past the object. The balloon is then inflated and the catheter is slowly withdrawn, pulling the foreign body ahead of it. Glucagon relaxes the smooth muscle of the lower esophageal sphincter allowing passage of the object into the stomach. Success rates using glucagon ranges from 30-50%[22]. Glucagon causes nausea and vomiting. These techniques are cost effective as compared to endoscopy but these do not allow direct visualization and also airway is not protected while employing these techniques[21].

Complications of foreign body ingestion can occur throughout the GI tract. These include abrasions, perforation, abscess formation, obstruction, ulceration, fistula formation, vascular injuries or airway compromise. With the advent of endoscopy, more foreign bodies are successfully removed resulting in lesser complications.

The best method of removal of an esophageal foreign body remains controversial[23]. In our country due to lack of pediatric gastroenterologists, adult otolaryngologists and gastroenterologists perform endoscopies employing rigid endoscopes, which carry a higher complication rate[24,25]. However due to lack of prospective, multicenter trials regarding use of flexible endoscope in pediatric patients, evidence based guidelines have still not been formulated. The purpose of this study was to present our experience with flexible endoscope in removal of ingested foreign bodies. We note 89% success rate in our study whereas 11% were pushed down

into the stomach. Some interesting foreign bodies were encountered like safety pin, ring, earring, hair pin, slider body of zipper, amulet and spool of sewing machine. All of them were removed uneventfully.

CONCLUSION

Coins and button batteries are the common upper GI foreign bodies with lower esophagus being the most common site of impaction. Commonest presenting feature was dysphagia. Endoscopic retrieval of foreign bodies under general anesthesia is a safe mode of treatment.

Author's Contributions

Aftab Anwar: Data collection, Article writing. Muhammad Almas Hashmi: Statistical analysis, Technical review. Samia Khaliq: Result preparation, Reference writing.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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