Abstract:
Accidental ingestion and impaction of food or non-food foreign body in upper GIT is not uncommon. This retrospective study was undertaken at Gastroenterology department of Faridpur Medical College Hospital, Bangladesh. Data were collected from endoscopy software by computer search among patients with foreign bodies in upper GIT from January 2012 to December 2018. Total 41 patients with endoscopically proved ingested with or without impacted foreign body in the upper GIT were studied. Of them, 28 were male and 13 were female with age ranges from 15 to 85 years with a mean age of 52.66 ± 19.7 years. Meat bolus was the commonest type (12; 29.3%), followed by dental prosthesis (9; 22%). Most of them (24; 58%) were impacted between 20 to 30 cm from incisor teeth. We could successfully remove 38 cases with a success rate of 92.7% with the help of dormia basket, polypectomy snare & rat tooth foreign body grasper. We found few erosions and superficial ulcerations at the impacted site among patients with dental prosthesis, pill with strip and chicken bone. One patient with sharp flat bone of hilsa fish was impacted at esophagus like sharp cutting blade and produced incised looking wound at both esophageal walls. In 19 cases (46.34%) we found definite anatomic abnormalities and 19 cases (46.34%) no abnormalities was found. Rest 3 cases, who were referred to surgeon we failed to know the underlying pathology. Sharp foreign bodies impacted at upper esophagus were difficult to remove endoscopically.

Key words: Upper GIT foreign body, Endoscopic removal.

Introduction:
In clinical practice, foreign body ingestion and food bolus impaction in Upper Gastrointestinal Tract (UGIT) are frequently found. Though majority of population belongs to the pediatric group, adult population with impacted food bolus or ingested foreign body is not uncommon. Majority of the ingested foreign bodies (80%-90%) pass through gastrointestinal tract spontaneously without any complication but approximately 10%-20% of cases require endoscopic removal, and less than 1% require surgery for extraction or to treat complications1-7.

Ingested and/or impacted objects may be food bolus or nonfood objects (true foreign body). Swallowed foreign bodies can be classified as blunt objects (coin, button, toy batteries, magnets), sharp-pointed objects (needle, toothpick, bone, safety-pin, glass pieces), sharp irregular objects (partial denture, razor blade), long objects (string, cord, toothbrush, cutlery, screwdriver, pen, pencil), food bolus with or without bones & Others (packets of illegal drugs)8.

True foreign body ingestion in adults, either intentional or unintentional, appears more often in the elderly population, in patients with psychiatric disorders, developmental delay, or alcohol intoxication, and in prisoners seeking secondary gain1-7.

Once foreign bodies have traversed the esophagus, most objects pass within 4-6 days, or in rare cases in up to 4 weeks. Generally, objects greater than 2-2.5cm in diameter will not pass through the pylorus or ileocecal valve and objects longer than 5-6cm will not pass through the duodenal sweep8.
Foreign bodies those are impacted, battery, sharp objects, larger (>2 cm) or longer (>5 cm) usually require endoscopic retrieval. In most patients, endoscopic therapy can be offered as outpatient basis. Admission is required for observation after technically difficult extraction, extensive mucosal injury due to the foreign body or endoscopic treatment, when there are multiple foreign bodies or associated with a high risk for complications (i.e., sharp-pointed objects, batteries, magnets, objects larger than 5-6 cm).8

Perforation requires surgery. Besides perforation; there are other indications for surgical treatment like; I) bleeding that cannot be resolved endoscopically, II) failure of endoscopic removal, III) impaction out of endoscopic reach and IV) small bowel obstruction by foreign body.8

This study was undertaken among esophagastroduodenoscopy proven patients with ingested foreign bodies to discuss about their demography, nature of foreign body, site of impaction, underlying anatomic abnormalities of UGIT and outcome of endoscopic removal.

Materials and Methods:

This retrospective study was undertaken at Gastroenterology department of Faridpur Medical College Hospital, Bangladesh. Data of patients with foreign bodies in upper gastrointestinal tract (UGIT) from January 2012 to December 2018 were collected from endoscopy software by computer search. Patient’s demographic characteristics, type of foreign bodies, location of impaction, success rate of endoscopic retrieval, complication due to impaction or endoscopic retrieval and underlying anatomic abnormalities of UGIT were recorded and analyzed by computer-based software SPSS. Quantitative data were presented as mean ± standard deviation and qualitative data were presented as percentage.

Results:

Total 41 patients with endoscopically proved ingested foreign bodies in the UGIT were studied. Out of 41 patients 28 were male and 13 were female with a male to female ratio 2.15:1. Age of the studied subjects ranges from 15 to 85 years with a mean age of 52.66 ± 19.7 years.

According to nature of foreign body, meat bolus was the commonest type (12; 29.3%), followed by dental prosthesis (9; 22%) (Table I).

| Type of Foreign body | Number (%) |
|----------------------|------------|
| Bezoar               | 6 (14.6)   |
| Chicken bone         | 3 (7.3)    |
| Dental prosthesis    | 9 (22)     |
| Fish bone            | 5 (12.2)   |
| Meat bolus           | 12 (29.3)  |
| Pill strip           | 1 (2.4)    |
| Pin                  | 3 (7.3)    |
| Seed of Hog Plum     | 1 (2.4)    |
| Seed of jujube       | 1 (2.4)    |
| **Total**            | **41 (100)** |

Table II: Distribution of patients according to site of impaction (n=41)

| Site of Impaction | Number (%) |
|-------------------|------------|
| Bulb of duodenum  | 1 (2.4)    |
| Bulb of duodenum & pylorus | 6 (14.6) |
| Stomach           | 4 (9.8)    |
| Thirty cm from incisor teeth (esophagus) | 8 (19.5) |
| Thirty-five cm from incisor teeth (esophagus) | 6 (14.6) |
| Twenty cm from incisor teeth (esophagus) | 9 (22) |
| Twenty-five cm from incisor teeth (esophagus) | 7 (17.1) |
| **Total**         | **41 (100)** |
After confirmation by UGIT endoscopy, we tried to retrieve them endoscopically (or in few cases of meat bolus specially at lower end of esophagus, we gently pushed them into the stomach). Out of 41 foreign bodies we could successfully remove (or pushed into stomach in few cases of meat bolus) in 38 cases with a success rate of 92.7%. Three cases we couldn't retrieve endoscopically of them two were dental prosthesis & one was meat bolus with or without bone. All three of them were impacted at proximal esophagus (about 20 cm from incisor tooth), they were referred to ENT surgeon. For endoscopic removal we used only 10% lignocaine pharyngeal spray as local anesthetics, we didn't sedate any patient. We used dormia basket for removal of meat bolus, phytobezoar & seeds of fruits (Hog Plum & Jujubi), polypectomy snare for dental prosthesis & phytobezoar and rat tooth foreign body grasper for fish bone, chicken bone, pin & pill with strip. Of the three chicken bones, one impacted with meat. So, at first, we considered it as meat bolus, but during removal meat dislodged from bone and came out, then we found two ends of bone were impacted in both wall of esophagus. We referred him to surgeon but patient came back after one week and requested us to try again as he was unwilling to undergo surgery. We tried cautiously to dislodge relatively loose distal end by rat tooth foreign body forceps, after dislodgement we grasp the distal end and pushed toward distal esophagus to dislodge proximal end and finally removed it by holding proximal end.

After successful removal, we repeated UGIT endoscopy to all patients to see any foreign body or procedure related complications as well as to sort out primary anatomical abnormalities. We found few erosions and superficial ulcerations at the impacted site among patient with dental prosthesis, pill with strip, chicken bone. One patient with sharp flat bone of hilsa fish was impacted at esophagus like sharp cutting blade and produces incised looking wound at both esophageal walls, but other than minor bleeding no complication occurred. In one patient with big dental prosthesis we faced difficulty during retrieval, it was nearly lodged along with polypectomy snare at the level of cricopharynx but finally removed with gentle traction. In 19 cases (46.34%) we found definite anatomic abnormalities and 19 cases (46.34%) no abnormalities was found. Rest 3 cases, who were referred to surgeon we failed to know the underlying pathology. Most of the pathology were carcinoma esophagus (7; 17.1%) & pyloric stenosis (17.1%) (Table III). A young fellow of 19 years had congenital esophageal ring and suffering from recurrent foreign body impaction, we found him with impacted seed of Jujubi, after retrieval with dormie basket we dilated his ring with Savary-Gilliard dilator successfully.

Patients with esophageal foreign bodies are almost always symptomatic (dysphagia, odynophagia, or retrosternal pain; sore throat, foreign body sensation, retching, vomiting etc). Respiratory symptoms (choking, stridor, dyspnea) can occur from aspiration of saliva or from tracheal compression by the foreign body.

Once foreign bodies have traversed the esophagus, most objects pass within 4-6 days. Foreign bodies those are impacted, battery, sharp objects, larger (>2 cm) or longer (>5 cm) foreign body usually require endoscopic retrieval. If not removed, impacted esophageal foreign body may cause, esophageal perforation, mediastinitis, subcutaneous emphysema, aorto-esophageal fistula etc.

Timing of endoscopic retrieval depends upon site of impaction and nature of foreign body. Battery, sharp pointed foreign bodies and food bolus with complete obstruction in the esophagus require emergent retrieval (within 6 hours, preferably within 2 hours). Not emergent but urgent retrieval within 24 hours is needed for battery in stomach and small bowel, magnet in esophagus, stomach or small bowel, sharp pointed objects in stomach or small bowel, food bolus in esophagus with no symptoms, blunt foreign body in esophagus (any size), larger blunt foreign body (>5cm) in stomach or small bowel. Whereas blunt, small foreign body (2-2.5cm) in stomach or small bowel requires non urgent retrieval (within 72 hours).

In our study, among 41 foreign bodies 29.3% were meat bolus followed by 22% dental prosthesis and 14.6% phytobezoar. In different studies conducted worldwide found different types foreign bodies, Chaves DM et al found 37.1% of foreign body as food and 62.9% were not food-related. Geraci G et al stated that, foreign bodies were chiefly meat boluses, fishbones or cartilages, button battery and dental prostheses. Llompart A et al stated that most frequent type of foreign body was meat bolus (32.8%). According to Mosca S et al foreign bodies were chiefly food boluses, bones or cartilages.

### Table III: Distribution of patients according to underlying pathology (n=41)

| Underlying pathology         | Number (%) |
|-----------------------------|------------|
| Carcinoma esophagus         | 7 (17.1)   |
| Esophageal ring             | 1 (2.4)    |
| Normal                      | 19 (46.3)  |
| Not known                   | 3 (7.3)    |
| Pyloric stenosis            | 7 (17.1)   |
| Esophageal Stricture        | 4 (9.8)    |
| Total                       | 41 (100)   |

Discussion:

Patients with esophageal foreign bodies are almost always symptomatic (dysphagia, odynophagia, or retrosternal pain; sore throat, foreign body sensation, retching, vomiting etc). Respiratory symptoms (choking, stridor, dyspnea) can occur from aspiration of saliva or from tracheal compression by the foreign body.
In our study, 30 patients had foreign bodies impacted in esophagus of them 24 were in upper & mid esophagus. Geng et al. found almost all foreign bodies in the esophagus. Zhou LQ et al. stated that, 75.1% of foreign bodies were located in the esophagus, especially in the upper esophagus (85.5%). According to Hong KH et al. 57.2% of impacted foreign bodies were in the upper esophagus, 28.4% in mid esophagus, 10.8% in stomach, and 3.6% were in lower esophagus. Mosca S et al. found almost all foreign bodies in the esophagus.

Regarding underlying pathology, in 46.34% cases we found definite anatomic abnormalities; of them 17.1% were carcinoma esophagus, another 17.1% had pyloric stenosis (17.1%) & about 10% had esophageal stricture. An underlying esophageal pathology is found in more than 75% of patients presenting with food bolus impaction. The most frequently associated abnormalities are esophageal (mainly peptic) strictures (more than 50%) and eosinophilic esophagitis (about 40%). Less frequently, esophageal cancer or esophageal motility disorders, such as achalasia, diffuse esophageal spasm, and nutcracker esophagus, are causes of food bolus impaction. Llompart A et al. found underlying disease in 38.9% patients, and peptic stenosis was the most frequent. Geraci G et al. found 8.9% had underlying esophageal disease, such as a narrowing, dismotility or achalasia. Underlying esophageal disease was found in 30.7% and 35.2% patients by Mosca S et al. and Katsinelos P et al. respectively.

Out of 41 foreign bodies we could successfully remove in 38 cases (success rate of 92.7%). Three cases we couldn't retrieve endoscopically, all of them were impacted at proximal esophagus (about 20 cm from incisor tooth), they were referred to ENT surgeon. Study by Geraci et al. showed success rate 100% in endoscopic removal. According to other studies, successful endoscopic removal rate was 94.7% (95.35%)1, 96.6%16, 97.4%15, 98.0%9, (98.6%)17 and 98.912. In above mentioned studies, remaining patients were managed surgically. In comparison to worldwide study, our success rate was a bit lower. As our center is relatively newer one and we didn't have thoracic surgery department here, so didn't take risk to retrieve difficult foreign body impacted at upper esophagus.

In all patients we used topical pharyngeal anesthesia. According to Geng C et al., endoscopic management under general anesthesia didn't improve the success rate or lower the complication rate compared with topical pharyngeal anesthesia.

We faced procedure related complication in 3 patients (7.3%), all were with dental prosthesis. Complications were ulcerations in esophageal mucosa with minor bleeding during retrieval through esophagus and all were resolved with conservative treatment. We didn't have endoscope overtube in our center. If we could manage overtube probably esophageal injury could be avoided. Study by Mosca S et al. and Katsinelos P et al. faced no complications related to the endoscopic procedure, but other faced different rates of complications. According to Geng C et al., nearly half of the patients (49.9%) developed complications. Park YK et al. found complications among 8.3% patients and perforation was the most common. Zhou LQ et al. stated that, 18.9% developed complications, including ulcers and perforations. Complications related to the endoscopic procedure in studies done by Chaves DM et al. and Geraci G et al. were 8.6% and 7% respectively.

Conclusion:

In conclusion, upper GIT foreign body is not uncommon in clinical practice. Endoscopic removal with local pharyngeal anesthesia is effective in most of the cases. Sharp foreign body located in the proximal esophagus are difficult to retrieve endoscopically and they may require surgery.

References:

1. Ambe P, Weber SA, Schauer M. Swallowed foreign bodies in adults. Dtsch Arztebl Int. 2012; 109:869-75.
2. ASGE Standards of Practice Committee, Ikenberry SO, Jue TL, Andersen MA, Appalaneni V, Banerjee S, Ben-menachem T, et al. Management of ingested foreign bodies and food impactions. Gastrointest Endosc. 2011; 73:1085-91.
3. Dray X, Cattan P. Foreign bodies and caustic lesions. Best Pract Res Clin Gastroenterol. 2013; 27:679-89.
4. Ko HH, Enns R. Review of food bolus management. Can J Gastroenterol. 2008; 22:805-08.
5. Pfau PR. Removal and management of esophageal foreign bodies. Tech Gastrointest Endosc. 2014; 16:32-39.
6. Sugawa C, Ono J, TalebM. Endoscopic management of foreign bodies in the upper gastrointestinal tract: A review. World J Gastrointest Endosc. 2014; 6:475-81.
7. Telford JJ. Management of ingested foreign bodies. Can J Gastroenterol. 2005; 19:599-601.
8. Birk M, Bauerfeind P, Deprez PH, Häfner M, Hartmann D, Hassan C, et al. Removal of foreign bodies in the upper gastrointestinal tract in adults: European Society of Gastrointestinal Endoscopy (ESGE) Clinical Guideline. Endoscopy 2016; 48(5):489-96.
9. Chaves DM, Ishioka S, Félix VN, Sakai P, Gama-Rodrigues J. Removal of a foreign body from the upper gastrointestinal tract with a flexible endoscope: a prospective study. J Endoscopy 2004; 36(10):887-92.

10. Geraci G, Sciume’ C, Di Carlo G, Picciurro A, Modica G. Retrospective analysis of management of ingested foreign bodies and food impactions in emergency endoscopic setting in adults. BMC Emerg Med. 2016; 16(1):42.

11. Llompart A, Reyes J, Ginard D, Barranco L, Riera J, Gayà J, et al. Endoscopic management of foreign bodies in the esophagus. Results of a retrospective series of 501 cases. Gastroenterol Hepatol. 2002; 25(7):448-51. [Article in Spanish].

12. Mosca S, Manes G, Martino R, Amitrano L, Bottino V, Bove A, et al. Endoscopic management of foreign bodies in the upper gastrointestinal tract: report on a series of 414 adult patients. Endoscopy 2001; 33(8):692-6.

13. Geng C, Li X, Luo R, Cai L, Lei X, Wang C. Endoscopic management of foreign bodies in the upper gastrointestinal tract: a retrospective study of 1294 cases. Scand J Gastroenterol. 2017; 52(11):1286-91.

14. Park YK, Kim KO, Yang JH, Lee SH, Jang BI. Factors associated with development of complications after endoscopic foreign body removal. Saudi J Gastroenterol. 2013; 19(5):230-4.

15. Hong KH, Kim YJ, Kim JH, Chun SW, Kim HM, Cho JH. Risk factors for complications associated with upper gastrointestinal foreign bodies. World J Gastroenterol. 2015; 21(26):8125-31.

16. Zhou LQ, Zhao H, Peng KR, Tang LJ, Luo YY, Yu JD, et al. [Endoscopic management of ingested foreign bodies in the upper gastrointestinal tract in childhood: a retrospective study of 1334 cases]. [Article in Chinese]. Zhonghua Er Ke Za Zhi. 2018; 56(7):95-99.

17. Katsinelos P, Kountouras J, Paroutoglou J, Zavos C, Mimidis K, Chatzimavroudis G. Endoscopic techniques and management of foreign body ingestion and food bolus impaction in the upper gastrointestinal tract: a retrospective analysis of 139 cases. J Clin Gastroenterol. 2006; 40(9):784-9.

18. Lee HJ, Kim HS, Jeon J, Park SH, Lim SU, Jun CH, et al. Endoscopic foreign body removal in the upper gastrointestinal tract: risk factors predicting conversion to surgery. Surg Endosc. 2016; 30(1):106-13.