ENDOSCOPIC REMOVAL OF FOREIGN BODIES FROM GASTROINTESTINAL TRACT

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ABSTRACT

Forty two children with ingestion of foreign bodies (FB) were managed conservatively. Thirty one (74%) of them were under 5 years of age. At presentation history revealed accidental ingestion in 95% and of being put in the oral cavity by elder sibs in 5% patients. Fifty seven per cent had respiratory distress, 38% had dysphagia and 12% had hematemesis. Foreign bodies were located in the gastrointestinal tract in the stomach (40%), esophagus (26%), small intestine (19%), duodenum (12%) and rectum (2%). A large majority of the FB were constituted by household objects. All the FB above the duodenojejunal junction and one in the rectum were retrieved successfully with fiberoptic endoscopes. In 19% patients, the FB had crossed duodenojejunal junction, and had come out in the stools during 4-5 days observation and these were mostly round in shape. Endoscopic procedures were carried out under intravenous diazepam or ketamine sedation. On endoscopic examination, 21% of them showed erosions in stomach and/or esophagus. No complications of endoscopic procedure or sedation were observed and none of the patients required surgical removal. Removal of FB with flexible fiberoptic endoscopes is less invasive and the best therapeutic option to avoid preventable complications of FB ingestion. In this procedure there is need of a trained and skilled Pediatric endoscopist with lot of patience and a good team work.

Key words: *Foreign bodies, Endoscopy, Endoscopic removal, Gastrointestinal tract, Dysphagia, Hematemesis.*

Ingestion of foreign bodies (FB) is a horrifying experience for the children and also for their parents. The children by nature are usually fond of keeping the objects in their oral cavities and they derive pleasure out of it, little realizing the consequences. The FB kept in the oral cavity get swallowed accidentally. The ingested FB can arrest anywhere, but more so at the anatomically narrow areas in the gastrointestinal tract starting from cricopharynx to the rectum. Round and small foreign bodies can pass through the whole length of gastrointestinal tract and come out in feces uninerrupted(1-4). In cases of pre-existing stricture of the esophagus, the FB can obstruct the pathologically narrow area and manifest with complete dysphagia. The impaction of FB in the narrow areas requires immediate removal to avoid complications(4). The experience of endoscopic removal of FB from our centre is presented in this communication.

Material and Methods

Forty two children who had ingested FB were managed in the Division of Pediatric Gastroenterology, Department of Gastroenterology at Post Graduate Institute of Medical Education and Research, Chandigarh. All were referred to our unit for endoscopic removal of FB. Plain *X*-ray abdomen and *X*-ray chest were done in erect posture in all to see the nature, size and site of FB.

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If the FB had crossed duodenojejunal junction then fluoroscopy was done to locate its exact site. All the patients were admitted in the ward, given intravenous fluids and kept on nil orally to avoid aspiration. The endoscopy was done subsequently after 4-6 hours. After endoscopic removal of FB, these patients were observed in the ward for the next 12-24 hours to see for any evidence of perforation. In case FB had reached in the small intestine, the patients were observed in the ward till the FB were passed out in the feces.

Removal of Foreign Bodies

Foreign bodies were removed using the flexible fiberoptic uppergastrointestinal (UGI) endoscope and/or the Pediatric colonoscope. Depending upon the size and shape of FB, the FB removing forceps like rat-toothed forceps, dormia basket or a snare were used accordingly. The procedure took 5-20 minutes depending upon the site of impaction, size, shape and nature of FB. The FB were removed under direct vision and great care was undertaken to avoid trauma to the gastrointestinal mucosa and respiratory complications.

The children were sedated with intravenous diazepam or ketamine. Diazepam was given alone in dose of 0.25-0.5 mg/kg body weight. To counteract the side effects of ketamine, diazepam was used in dose of 0.02 mg/kg IV. Ketamine was given in dose in 0.75 - 1 mg/kg. The resuscitation kit was kept ready and cardiac and respiration monitoring was carried out simultaneously by the assisting team.

Results

The age of children ranged from 1½ months to 12 years with a mean of 4 years. One-third of the patients were under 2 years of age, 33 (74%) were under 5 years of age and 11 (28%) were above the age of 5 years; 27 were boys. The duration between ingestion of FB and seeking of medical attention varied from 1 to 32 days with a mean of 6.1 ± 8.0 days. The clinical features are shown in *Table I.* A large majority of the children had history of accidental ingestion of the foreign bodies while keeping them in the oral cavity. Only in 2 infants the FB were put in the oral cavity by the elder sibs. After the ingestion of FB, 24 (57%) patients had history of choking followed by respiratory distress for varying periods. Nearly 38% of patients had history of dysphagia of varying degree and duration. Seven (17%) patients had pre-existing esophageal strictures in addition and presented with absolute dysphagia. History of mild or moderate hematemesis was available in 12% of the patients. Ten (24%) patients had history of pain in the upper abdomen. Endoscopic examination revealed erosions in esophagus and/or stomach in 21% of the patients.

The FB were seen in esophagus, stomach, duodenum, small bowel and rectum in

TABLE I–*Clinical Features*

Site of FB and symptoms	Number	Percentage
Esophagus		
• Respiratory difficulty	24	57.0
- Respiratory difficulty for short duration	22	52.4
- Prolonged respiratory distress	2	4.8
• Dysphagia	16	38.0
- Absolute dysphagia	9	21.4
• Hematemesis	1	2.4
Stomach		
• Epigastric pain	10	23.8
• Hematemesis	4	9.5

26, 40, 12, 19 and 2% cases, respectively. Successful endoscopic retrieval was achieved in 100% of patients, for FB located above the duodenojejunal junction. When the foreign bodies had crossed the duodenojejunal junction and were seen on fluoroscopy they came out along with the feces. Food bolus impaction in cases with stricture esophagus could be fragmented with endoscopic forceps, removed partially and the remaining part could be pushed downwards with the endoscope without any problems. There were no complications observed during the procedure. None of the patients required surgical removal.

Nature of Foreign Bodies

The ingested foreign bodies comprised coins of various sizes and other round, sharp and long foreign objects. These included coins in 10 cases, nails in 4 cases, hair pins in 4 cases, seeds in 3 cases, food bolus in 3 cases, safety pins in 3 cases, hairball, denture plate, whistle, glassball (Kancha), forceps, metallic ring, piece of pencil, stone, stitching needle, needle of sewing machine, metallic lock of telephone, broken part of spring coil, key, cycle key with two key rings and rubber tube (in the rectum) in one case each. Some of the retrieved FB are shown in *Fig. 1.*

Discussion

Foreign bodies in the esophagus or tracheobronchial trees constitute one of the commonest emergency problems in pediatric age group. Ingestion of FB outnumbers their inhalation in the respiratory passages. The preschool age group children, as a habit keep FB in the oral cavity and accidentally the FB get swallowed; whereas the older children and adults do the same due to different types of psychosomatic problems. Mental retardation and habit disorders are other common causes of ingestion of FB in children but the same were not observed in the present study. Other extreme age group is constituted by neonates and infants who do not have free access to the FB. At times parents or other family members offer loose

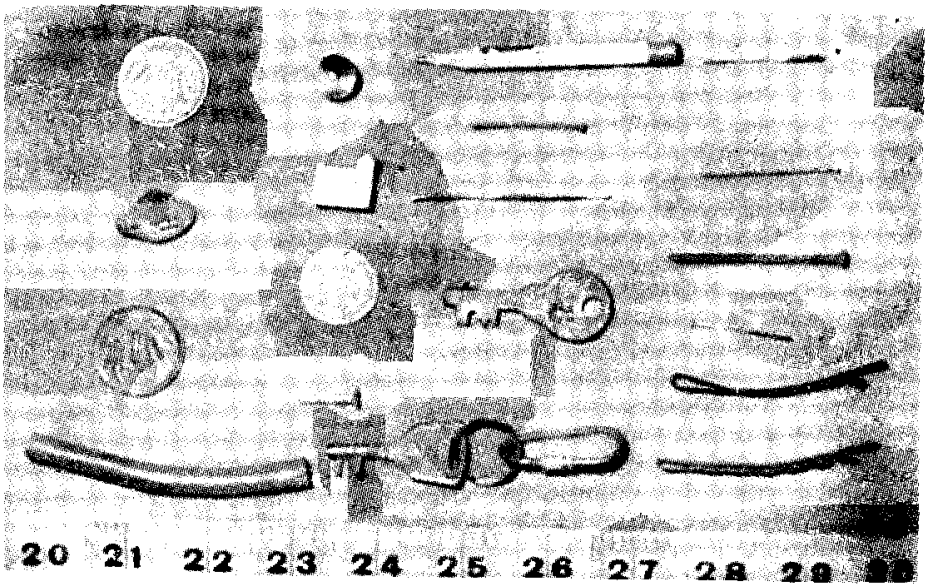

Fig. 1. Endoscopically retrieved foreign bodies (measure inches).

toys and other household things to infants. In the nuclear families the elder sibs put FB in the mouths of neonates and infants while playing with them. This was observed in two infants in the present study. Majority of the ingested FB are encountered in preschool age group as was observed in 74% patients in the present study. After ingestion of FB, children suffer from severe choking sensations and respiratory difficulty. The respiratory distress depends upon the age of the child, size, shape and nature of the foreign bodies. In the present study, 24 (57%) children had initial severe choking for a short-while but two infants out of them had severe and prolonged respiratory distress and subsided after removal. Respiratory distress has been described by some authors(5-7).

Dysphagia noted in 16 (38%) patients, was absolute in 9 (21%) subjects. Seventeen per cent of them had underlying strictures of the esophagus in addition. History of hematemesis was noted only in 12% of the patients even though endoscopy showed that 21% patients had ulcerations in stomach and/or esophagus and one of them required blood transfusion. Hematemesis was attributed to ulcerations and/or erosions caused by the passage and pressure due to the foreign bodies. These findings have not been stressed in the literature especially in children. On the contrary, massive hemorrhages have been reported in adult patients.

About 80-90% of ingested FB travel through the whole length of the gastrointestinal tract and come out per-rectum in the stools after variable periods(2-4). The impaction in any one of the physiologically and pathologically narrow areas in the gastrointestinal tract can lead to complications. The usual complications of the FB in the gastrointestinal tract include ulcerations/erosions, hemorrhage, impaction, obstruction, perforation and fistula formation. Complications like respiratory distress, dysphagia and hematemesis warrant immediate removal of the FB. Till recently, surgical removal of the FB was in practice(7,8) but surgery as such gives an additional traumatic experience and prolongs hospitalization time. With the advent of endoscopic removal the indications for surgery have been limited to massive hemorrhage, impaction in small or large bowel, perforation and fistula formation. Foley's catheter has been used to remove esophageal FB(9) at times but it cannot be used when there are narrow strictures, sharp pointed, and large sized FB. The endoscopic removal of FB has not been practised often in children. There are only a handful of brief reports(4,10,11). Endoscopic removal of FB requires lot of patience, team work and a highly skilled pediatric endoscopist. To begin with, endoscopies in pediatric age group were done under general anesthesia(4,10). All the FB were removed using fiberoptic endoscopes under adequate sedation and we did not encounter any complications. Almost all the foreign bodies could be identified with the help of *X*-rays of the chest and abdomen before the procedure. All the FB lying above the duodenojejunal junction were successfully retrieved by using flexible rat toothed forceps, dormia basket or a snare passed through the endoscope channel under direct vision to avoid injury. Overtube or sheath was not required to be used. Some endoscopists have stressed upon the use of overtubes to remove sharp and pointed FB to avoid gut trauma.

Foreign bodies from esophagus are difficult to remove as esophagus is a tubular structure and the FB tend to slip down into the stomach. The strictures in the esophagus sometimes make it more difficult when there is obstruction due to a food bolus or rounded hard objects like glassballs or seeds as observed in present series. The food

bolus is difficult to remove as a whole and we removed them partially with the forceps and the remaining part was pushed into the stomach. Rest of the FB were removed successfully. Many endoscopists feel that by pushing the esophageal FB in stomach, it becomes easy to catch when it comes to lie on the dependent wall. It is easy to catch FB in the stomach through change of patient's position and also by applying pressure on the abdomen to facilitate identification and firm grip of the FB. Removal of FB from the duodenum is also difficult because it is a narrow tubular structure with folds and curves but in present series 12% patients had FB in duodenum and all of them could be removed successfully. One child had a long rubber tube in the rectum which had slipped inside while dilating the anal stenosis. It was removed endoscopically from a large congenital rectal pouch filled with feces. Foreign bodies present in the small intestine (jejunum and ileum) can not be removed with UGI endoscope or a colonoscope. In the present series, 19% patients had FB in small intestine, came out in feces on high fibre diet. Enteroscopy may be of use to remove FB from small intestine but experience is lacking in children.

The nature of FB varied from coins, round FB, seeds, keys, nails, hair pins, *etc.* Small, round and blunt FB after crossing the esophagus and pylorus can come out on their own but take variable time periods. The sharp, pointed and long FB are likely to create problems and to avoid complications endoscopic removal should be contemplated as soon as possible. Esophageal FB should be removed immediately to prevent aspiration pneumonia, dysphagia and respiratory distress.

The endoscopic removal of all sorts of FB in skilled hands is quite rewarding and not a difficult procedure. Usually no complications are encountered if done with optimum care to avoid mucosal injury and aspiration. There are very few specialized centres, where this is practised in children at the present juncture. With data available till date, the endoscopic removal of FB is the treatment of choice and should be carried out without much delay to avoid complications. In expert hands this technique is the best therapeutic option. This is much more cost effective and at the same time avoids surgery and exposure to general anesthesia.

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NOTES AND NEWS

INTERNATIONAL CONFERENCE ON THALASSEMIA

An International Conference on Thalassemia will be held on *November 27-28, 1994* at S.P. Jain Auditorium, Bombay Hospital, Marine Lines, Bombay 400 020 under the joint auspices of Thalassemia and Sickle Cell Society of Bombay and Bombay Hospital P.G. Institute of Medical Sciences. This conference is being held after an interval of 3 years, and it would cover 4 major aspects of thalassemia, *viz.,* oral iron chelation, bone marrow transplantation, butyrate therapy, growth and puberty development. Distinguished experts from Italy, UK and USA have been invited to be on the panel including Dr. Susan P. Perrine, California, USA; Dr. Patricia Giardina, New York, USA; Dr. Vicenzo De Sanctis, Ferrara, Italy; Dr. C. Vullo, Ferrara, Italy; Dr. Vilma Gabutti, Torino, Itlay; Dr. Guido Lucarelli, Pesaro, Italy; Prof. Victor Hoffbrand, London, UK; Dr. B. Wonke, London, UK; and Dr. George Kontoghiorghes, London, UK.

The conference is open to medicos, para-medicos, patients, parents, social workers and others. The last date for delegate registration with concessional rate is 15th October, 1993. Delegate fee of Rs. 300/- by DD in favour of "Thalassemia and Sickle Cell Society of Bombay" may be sent to :

Dr. M.B. Agarwal,
Organizing Secretary,
International Conference on Thalassemia,
Hematology Centre,
Vijay Sadan, Ground Floor, Flat No. 1,
168-B, Dr. B. Ambedkar Road, Dadar T.T.,
Bombay 400 014.
Tel.: 4142272/4144453
Fax: 91-22-4140058

Delegate fee after that would be Rs. 400, while the same for spot-registration would be Rs. 500/-. Registrations are limited to the first 300 delegates, due to limited seating capacity.