# Endoscopic Management of Foreign Body in the Upper Gastrointestinal Tract: A Tertiary Care Center Experience

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***Background:*** *Foreign body (FB) in the upper gastrointestinal tract (UGIT) is a common clinical problem in endoscopic practice. At present, many physicians recommend endoscopy for both diagnosis and treatment. To date, few have report endoscopic findings and management of FB in UGIT.*
***Objective:*** *To report the authors' experience and outcome of the endoscopic management of foreign body ingestion at Siriraj Hospital*
***Material and Method:*** *Medical records of patients with FB ingestion in the UGIT, who underwent endoscopic management between January 2004 and January 2008 at Siriraj Hospital, were reviewed.*
***Results:*** *The analysis included 34 patients of which 58.82% were men. The mean age of the group was 18.26 years (range 10 months - 86 years). 58.82% of patients were younger than 5 years. Esophagogastroduodenoscopy (EGD) was performed in 100% of cases, under general anesthesia (GA) in 85.29%, and under transintravenous anesthesia (TIVA) in 14.71%. Endoscopic management was successful in all cases. The extractions were done with rat-tooth forceps, polypectomy snare, dormia basket, or tripods. There were no procedure related complications.*
***Conclusion:*** *The ingested FB varied widely according to the underlying medical condition and age. In a tertiary care center, endoscopic removal of FB in UGIT could be safely performed with a very good result.*

***Keywords:*** *Foreign body ingestion, Upper gastrointestinal tract, Endoscopic removal*

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Ingestion of foreign bodies in the upper GI tract is common. Most of them pass through the GI tract spontaneously, but some of them (about 20%) need endoscopic or surgical removal[1]. Foreign body ingestion can be dangerous when it leads to bowel perforation from bones, needles, and disc batteries. Several managements have been devised for the treatment of foreign body ingestion, including rigid and flexible endoscopy, Foley catheter retraction, swallowing gas-forming agents, enzymatic digestion, and watchful waiting[2]. At present, many physicians recommend endoscopy for both diagnosis and treatment. However, in Thailand, there have been only a few reports on endoscopic management of foreign bodies in the upper GI tract.

The purpose of the present study was to report the authors' experience and outcome of the endoscopic management of foreign body ingestion at Siriraj Hospital.

## Material and Method

The present research was a retrospective study. Thirty-four patients (20 men and 14 women) with a history of foreign body ingestion treated in the Siriraj GI Endoscopy Center, the Division of Trauma Surgery, Department of Surgery, Faculty of Medicine Siriraj Hospital, Bangkok, Thailand between January 2004

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and January 2008 were identified. Endoscopic removal of the foreign objects was performed in all patients. Patients with peritonitis or that refused treatment were excluded. A plain radiographic film of the neck, chest, or abdomen was obtained to locate the position of the foreign bodies and rule out suspected perforation. Alternative methods of investigation had been discussed with the patient and a consent form was obtained from the patient. All patients underwent endoscopic removal by the surgical endoscopist. Anesthesia is always used[3]. A flexible scope is used with all patients and a wide range of endoscopic devices is employed. After the endoscopic procedure, the patients' vital signs are observed for at least 1 hour before discharge[4]. Endoscopic and hospital medical records were reviewed to evaluate etiology, treatment, and outcomes for these patients. The present study was approved by the Ethic Committee of Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand.

Outcome measurements had been used for evaluating the demographic and endoscopic data, including age, sex of patients, types, number and location of foreign bodies, associated upper GI tract diseases, endoscopic methods, and accessory devices for removal of foreign bodies. Data was collected and analyzed to determine the clinical factors for the successful removal by endoscopic techniques at Siriraj Hospital.

Data management was performed using SPSS® statistical software version 12.0.

## Results

The analysis included 34 patients of which 58.82% (20/34) were men. The mean age was 18.26 years (range 10 months - 86 years). 58.82% of patients were younger than 5 years. EGD was performed, under general anesthesia 85.29% and under transintravenous anesthesia[3] 14.71% as shown in Table 1. Most cases of foreign body ingestions occur in the pediatric population, with a peak incidence for the ages < 5 years (20/34). In adults, edentulous adults are also at an increased risk for foreign body ingestion, including their dental prosthesis. One patient of these cases had schizophrenia. Foreign bodies in children, adults, and elderly patients are shown in Table 2.

Odynophagia was the most common symptom (29%); others included nausea, vomiting, drooling, and dysphagia. Physical examination was generally not helpful. Radiological studies, however, revealed the foreign body in most cases but they were often negative in nonradiopaque objects. Many kinds of objects were ingested: a paper clip (Fig. 1A), a coin (Fig. 1B), an edentulous tooth (Fig. 1C), and a disc battery (Fig. 1D). Coins were the most common foreign body determined as an object ingested and entrapped

**Table 1.** Clinical features associated with foreign bodies in the upper gastrointestinal tract

| | No./total | % |
|---|---|---|
| Sex | | |
| Men | 20/34 | 58.82 |
| Women | 14/34 | 41.18 |
| Odynophagia | 10/34 | 29.41 |
| Anesthesia | | |
| GA | 29/34 | 85.29 |
| TIVA | 5/34 | 14.71 |
| Instruments | | |
| Rat-tooth forceps | 25/34 | 73.53 |
| Dormia basket | 4/34 | 11.76 |
| Snare | 2/34 | 5.88 |
| Associated diseases | | |
| Cleft lip with trachea-esophageal fistula | 1/34 | 2.94 |
| Suspected esophageal cancer | 1/34 | 2.94 |
| Bed-ridden | 2/34 | 5.88 |
| Schizophrenia | 1/34 | 2.94 |
| Success rate | 31/31 | 100.00 |
| Complication | 0/34 | 0.00 |

**Table 2.** Foreign bodies in children, adult, and elderly patients

| Age, yr | Total | Foreign bodies | No. | % |
|---|---|---|---|---|
| 0-5 | 20 | | | 58.8 |
| | | Coin | 12 | 60.0 |
| | | Fruit seed | 1 | 5.0 |
| | | Earring | 1 | 5.0 |
| | | Battery | 4 | 20.0 |
| | | Not seen | 2 | 10.0 |
| 6-15 | 5 | | | 14.7 |
| | | Coin | 3 | 60.0 |
| | | Pin | 1 | 20.0 |
| | | Paper clip | 1 | 20.0 |
| 16-60 | 7 | | | 20.6 |
| | | Coin | 1 | 14.3 |
| | | Edentulous teeth | 5 | 71.4 |
| | | Molar tooth | 1 | 14.3 |
| > 60 | 2 | | | 5.9 |
| | | Food | 1 | 50.0 |
| | | PEG | 1 | 50.0 |

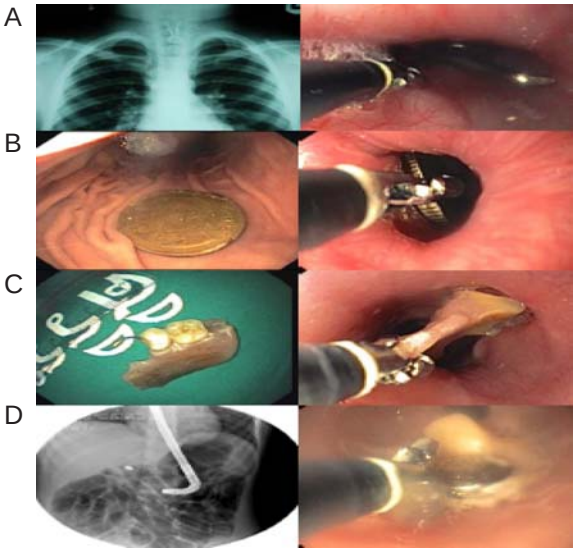


**Fig. 1** Illustrations of endoscopic management from the upper GI tract A) paper clip, B) coin, C) edentulous teeth, D) disc battery

in GI tract (47%). Five cases were observed and repeat film was performed. Stationary coins that were found and resulted in an endoscopic removal. The foreign bodies were located in the esophagus (13), the esophagogastric junction (1), the stomach (16), and the small bowel (1) (Table 3).

Flexible endoscopy was successful in extracting the foreign body in almost all (31/34) patients.

**Table 3.** Anatomical location of foreign bodies

| Anatomic location | Most common foreign bodies | No./ total | % |
|---|---|---|---|
| Esophagus | | 13/34 | 38.24 |
| | Coin | 6 | 46.16 |
| | Edentulous teeth | 3 | 23.08 |
| | Molar tooth | 1 | 7.69 |
| | Food | 1 | 7.69 |
| | Paper clip | 1 | 7.69 |
| | Fruit seed | 1 | 7.69 |
| EGJ | | 1/34 | 2.94 |
| | Coin | 1 | 100.00 |
| Stomach | | 16/34 | 47.06 |
| | Coin | 9 | 56.25 |
| | Battery | 4 | 25.00 |
| | Needle | 1 | 6.25 |
| | Earring | 1 | 6.25 |
| | PEG | 1 | 6.25 |
| Not seen | | 3/34 | 8.82 |

Accessories were used to remove the foreign bodies included rat-tooth forceps, tripod forceps, polypectomy snare, or a dormia basket. A rat-tooth forceps and a snare were the most frequently used accessory devices. The foreign bodies were found in 91.18% (31/34) of the cases during endoscopic procedure. One patient was found with a coin in the small bowel using fluoroscopy. All extractions were done with rat-tooth forceps, polypectomy snare, or dormia basket as shown in Table 1. In our endoscopy center, rat-tooth forceps were the most frequently used accessory device (25/34 or 73.53%) in our study. Dormia basket (4/34 or 11.76%) and snare (2/34 or 5.88%) were also used. Our success rate for removal with a flexible endoscope was 100%. Foreign bodies were not found in two cases. Histories were taken, endoscopic procedure and fluoroscopy were performed, but no foreign bodies were found. There were no procedure related complications or mortalities.

## Discussion

In our center, most cases were referred from other trauma centers. Patients that swallowed foreign body typically were younger and more often male. Odynophagia was the most common symptom. However, this cannot be assessed in children. The endoscopic procedure was performed within 24 hours. The type, location of the foreign body, and the likelihood of associated complications were the reasons for the speed of the procedure and case management. Button battery ingestion is a true emergency situation and should be removed as soon as possible. Button batteries act as a corrosive agent, and could lead to GI tract necrosis, perforation, and death. The authors' policy is to remove button batteries as soon as possible, if they are located in a position that a flexible upper GI scope can reach. Although the American Society for Gastrointestinal Endoscopy suggested that only 10% to 20% of foreign bodies may need to be removed endoscopically [1], similar studies to the authors' including those from groups in China, Korea and Italy, reported a higher percentage of patients with foreign bodies were successfully treated by endoscopic procedure.

Endoscopic management of foreign bodies in the upper GI tract had a success rate for removal of 94% on 1,088 cases in a China report[5]. The endoscopic procedure was a successful technique that allowed the removal of the foreign bodies in almost all cases without significant complications in Naples, Italy[6]. A prospective study shows the flexible endoscope is an

effective and safe device for removing foreign bodies from the upper GI tract. If foreign body impaction lasts for more than 24 hours, there is a significant increase in the incidence of complications[7]. Most upper GI foreign bodies are related to food impaction, with meat most often found. Underlying pathology is the rule and should be dealt with immediately[8].

The 31 reviewed medical records of healthy patients with acute (less than 24 hours) coin ingestions over four years in Florida, USA concluded that the patients with acute esophageal coin ingestions may experience spontaneous coin passage. There are no complications in any of the patients who undergo delayed coin removal either due to the procedure itself or to a delay in therapy[9]. Most of ingested foreign body cases at Siriraj Hospital are watchful waiting. At present, endoscopic procedures are frequently performed in selected cases[10]. This is because there are few case reports of experience and outcome of endoscopic management of ingested foreign bodies in the upper GI tract in Thailand data.

In the present study, five patients (14.71%) were found to have some underlying disease that was associated with a history of foreign body ingestion; in one case a psychiatric problem, one case a cleft lip with trachea-esophageal fistula, one patient with suspected esophageal cancer, and two patients bed-ridden. The types of foreign bodies were significantly age related. Children most often ingested coins and button batteries, whereas adults tended to have edentulous teeth (Table 2). A plain radiographic film of the neck, chest, or abdomen was obtained to locate the location of foreign bodies and rule out suspected perforation. The patients who presented with small, round object ingestion but without symptoms and complications were made aware of treatment options. Such patients had to have a follow up clinical and film within 24 hours. If the object remained, endoscopic treatment was offered. For sharp object ingestion, prompt evaluation and treatment with endoscopy was indicated and the endoscopists suggested that a repeat endoscopy be carried out after extraction of the foreign bodies to check for complication.

Because of an age in the population and those at higher risk for aspiration, the present study showed anesthesia was mainly endotracheal intubation (29/34) 85.29%. Therefore, these patients could be discharged from the hospital after they were conscious. Just one patient who underwent failed endoscopic removal at another hospital was admitted for clinical observation. Although the rigid endoscopic technique has been useful in the past, the flexible endoscopy proves more diagnosis, removal, and assessing the underlying pathology. In Siriraj Hospital endoscopy center, rat-tooth forceps (25/34) 73.53% were the most frequently used accessory devices. Dormia basket (4/34) 11.76% and snare (2/34) 5.88% were used. The authors' success rate for removal with a flexible endoscope was 100%. The foreign bodies were not identified in two cases, and one object was found in the small bowel under fluoroscopy. There was no mortality associated with the endoscopic procedures of removing foreign bodies in Siriraj Hospital.

In conclusion, ingestion of foreign bodies is a common clinical problem. In a tertiary care center, endoscopic removal of foreign bodies in upper gastrointestinal tract is an effective and safe procedure with a high success rate using only the rat-toothed forceps or dormia basket as accessories. Surgery is rarely required.

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## *การรักษาผู้ป่วยที่กลืนสิ่งแปลกปลอมในทางเดินอาหารส่วนต้นโดยการส่องกล้องนำสิ่งแปลกปลอมออกมา: ประสบการณ์ของโรงพยาบาลระดับตติยภูมิ*

***สุภาพร โอภาสานนท์, ธวัชชัย อัครวิพุธ, อัษฎา เมธเศรษฐ, จตุพร ศิริกุล, มงคล เลาหเพ็ญแสง***

***ภูมิหลัง**: การกลืนสิ่งแปลกปลอมในทางเดินอาหารส่วนต้นเป็นปัญหาที่พบได้บ่อย ปัจจุบันแพทย์จำนวนมากแนะนำการส่องกล้องเพื่อวินิจฉัยและให้การรักษา อย่างไรก็ตามปัจจุบันยังมีการรายงานการรักษาผู้ป่วยที่กลืนสิ่งแปลกปลอมในทางเดินอาหารส่วนต้นโดยการส่องกล้องนำสิ่งแปลกปลอมออกมาจำนวนไม่มากนัก*

***วัตถุประสงค์**: เพื่อรายงานประสบการณ์และผลการรักษาของโรงพยาบาลศิริราชในการรักษาผู้ป่วยที่กลืนสิ่งแปลกปลอมในทางเดินอาหารส่วนต้นโดยการส่องกล้องนำสิ่งแปลกปลอมออกมา*

***วัสดุและวิธีการ**: การศึกษาย้อนหลังระหว่างปี พ.ศ. 2547 ถึง พ.ศ. 2550 ในผู้ป่วยที่กลืนสิ่งแปลกปลอมในทางเดินอาหารส่วนต้นที่มาโรงพยาบาลศิริราช และได้รับการรักษาโดยการส่องกล้องนำสิ่งแปลกปลอมออกมา*

***ผลการศึกษา**: มีผู้ป่วยในการศึกษานี้จำนวน 34 คน ร้อยละ 58.82 เป็นเพศชาย อายุเฉลี่ย 18.26 ปี (อายุตั้งแต่ 10 เดือน ถึง 86 ปี) โดยร้อยละ 58.82 เป็นผู้ป่วยอายุน้อยกว่า 5 ปี ผู้ป่วยทุกรายได้รับการส่องกล้องทางเดินอาหารส่วนต้น, ผู้ป่วยร้อยละ 85.29 ทำการส่องกล้องภายใต้การระงับความรู้สึกโดยดมยาสลบ และร้อยละ 14.71 ทำการส่องกล้องภายใต้การฉีดยาระงับความรู้สึกทางหลอดเลือดดำ การรักษาโดยการส่องกล้องนำสิ่งแปลกปลอมออกมาประสบความสำเร็จในผู้ป่วยทุกราย เครื่องมือที่ใช้ในการดึงสิ่งแปลกปลอมออก ได้แก่ rat-tooth forceps, polypectomy snare, dormia basket และ tripods ไม่พบภาวะแทรกซ้อนจากการรักษาวิธีนี้*

***สรุป**: การกลืนสิ่งแปลกปลอมมีความหลากหลายในผู้ป่วยแต่ละรายขึ้นอยู่กับโรคเดิมและอายุของผู้ป่วย ผลการรักษาผู้ป่วยที่กลืนสิ่งแปลกปลอมในทางเดินอาหารส่วนต้นด้วยการส่องกล้องนำสิ่งแปลกปลอมออกมาในโรงพยาบาลระดับตติยภูมิ นับเป็นการรักษาที่สามารถทำได้อย่างปลอดภัยและได้ผลดี*