

Management of Esophageal Foreign Body

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ABSTRACT

Foreign body ingestion is a common clinical problem. Objects such as coin, safety pin, meat bolus, bone, denture, etc. are often ingested. They lodge in certain part of esophagus, which may be asymptomatic or develop some symptoms of esophagus or respiratory tract. Plain radiography is indicated for every patient with a known or suspected foreign body. It may appear as radiopaque or radiolucent images. A number of methods can be used to remove esophageal foreign bodies, including: observation, endoscopy, rigid esophagoscopy, Foley catheter extraction, bougienage and sometimes administration of LES relaxant or surgery. Application of those strategies is selected based on the type and location of foreign bodies. Five cases had been managed by different strategies, i.e. two cases were successfully managed by endoscopy; a case was managed through careful observation; another case was managed by pushing object into stomach using endoscopic approach; and the other case was fail when it was managed by Foley catheter but then it was successfully managed by rigid esophagoscopy at ENT Department. All of cases had been managed without any complication.

Keywords: *esophageal foreign body, foreign body ingestion, procedure removal*

INTRODUCTION

In the United States, thousands of children per year have experienced esophageal foreign bodies and 1,500 people die annually because of ingested foreign body in upper gastrointestinal tract.^{1,2} Most esophageal foreign bodies are radiopaque. Frequently-ingested items include small metal, plastic toys, coin, button, batteries, fish bones, safety pin, thumbtacks, needles, wire, wood or glass objects, denture, meat bolus, and razor blades.^{3,4,5} The most common location of foreign body lodgment includes the 3 areas of physiologic esophageal narrowing. The first and most common location is proximal esophagus, which lies at the level between neck and thoracic junction. The second location is mid esophagus, which lies at the level of carina and aortic arch; and the third location is distal esophagus, which lies slightly proximal to gastro-esophageal junction.^{6,7} Manifested clinical symptoms are varied and 20% of patients are asymptomatic.^{4,5} It is preferred to begin examination with radiographic evaluation. Current strategies to remove the retained foreign bodies include endoscopy, observation (which allows the foreign body to pass into stomach by its own effort), rigid esophagoscopy, Foley

catheter extraction, bougienage, lower esophagus sphincter (LES) relaxant, or surgery.^{2,7} Button and batteries usually do not cause any problem, unless they become lodged in the gastrointestinal tract. Esophageal damage may occur in a relative short period of time when a disk of battery is lodged in esophagus.^{2,4}

This article presents series of case reports in: an eight years old boy with a nail ingestion, a 52 years old man who accidentally swallowed a safety pin, a young man with 30 years of age who had a history of swallowed denture while sleeping, a 53 years old female who swallowed an onion and it lodged, and a 71 years old man with meat bolus lodgment.

CASE REPORT

Case 1

A boy 8 years old, had complained for heartburn, dysphagia and epigastric pain after swallowing a nail with 2 inches length. His physical examination was normal; but the plain chest X-ray revealed a radiopaque image of a nail in near upper diaphragm with vertical position and the sharp point was pointed into stomach. Endoscopic approach was performed and the nail was

not found. However there was severe erosive condition without any bleeding in nearly all of stomach mucosa until the second part of duodenum. A week later the nail was found in patient's stool

Case 2

A man, 52 years old, was admitted to the emergency room with history of dysphagia, sore throat and heartburn after accidentally swallowing a safety pin several hours before admission. His physical examination was normal, but plain chest X-ray anteroposterior and lateral view revealed a safety pin with open position, and the sharp point was facing up (figure 1).



Figure 1. Plain chest X-ray of anteroposterior view reveals a safety pin with open position, and the sharp point was facing up, while endoscopy find the object in a distance of 25 cm from teeth

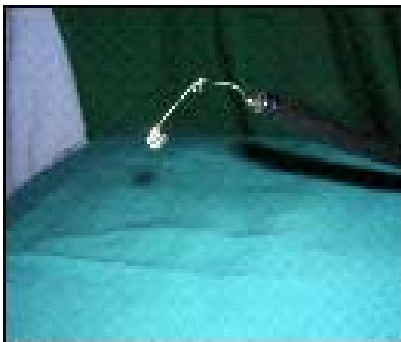


Figure 2. The object (safety pin) is successfully to extracted without any complication

Endoscopic approach found the object in a distance 25 cm from teeth. The sharp part of opened safety-pin was grasped by biopsy forceps and was slowly pulled together with the endoscope. Observation was continued to look for any impaction or bleeding and the object was successfully extracted without any complication

Case 3

A man, 30 years old, had history of swallowing a denture during sleep and suffering from odinophagia. He went to a hospital in hours. On clinical examination, there was no problem, but plain chest X-ray revealed a radiopaque object (figure 3). Later, endoscopy was



Figure 3. Plain chest X-ray reveals radiopaque object and the wire part of denture



Figure 4. The whole denture was successfully extracted by endoscope procedure

performed and it revealed a denture in a distance of 25 cm from teeth. When we tried to pull it with biopsy forceps through the endoscope, we felt an obstacle, and then the denture was pushed into stomach. Subsequently, we used biopsy forceps, directed it to the wire part of denture and we tried again to pull the whole denture with endoscope. At last, the object was successfully extracted (figure 4).

Case 4

A woman, 53 years old, was admitted to hospital after swallowing an onion (a traditional medicine for her breast cancer treatment). She suffered from sore throat and choking. Physical examination (heart and lung) revealed normal result and plain chest X-rays revealed no radiopaque object. Further management was performed by endoscopic approach and at mid esophagus we found the onion with tip of sharp part impacted to the esophagus mucosa. Later, the onion was pushed into stomach by endoscope. In addition, we observed the esophageal mucosa and there were no bleeding, it only revealed slight erosion. We continued to follow-up. On the next day, she already felt good and was discharged from the hospital

Case 5

An old man, 71 years old, had swallowed a meat bolus during breakfast and the meat was lodged. Therefore, he suffered from heartburn and choking.

On the physical examination, he looked pain and there was cold sweat but his vital signs were normal. The heart and lung examination also revealed normal results. Plain chest X-rays revealed no radiopaque object as well as normal heart and lung images. At noon, endoscopic examination was conducted with sedation and we found the meat bolus at lower esophagus, but it cannot be pushed into stomach by the endoscope. Later, a Foley Catheter No.14F was introduced orally; the catheter tip was placed at the distal of object through endoscopic guidance and was inflated with 30 cc water. However, after the Foley catheter was pulled-out, the object still cannot be removed. Subsequently, the patient was referred to ENT Department of another hospital and rigid esophagoscopy was performed, which successfully removed the meat bolus.

DISCUSSION

We have no data of esophageal foreign body cases in Indonesia; but in the US, there are 1500 people who die annually because of ingested foreign body in upper gastrointestinal tract.^{1,2} Foreign body ingestion is common in children and it occurs accidentally. In adult, three types of underlying mechanisms were detected (88%), including: esophageal (stricture), neuromuscular (myasthenia gravis) as well as extrinsic and mechanical (ankylosing spondylitis) mechanisms.³ Most esophageal foreign bodies are radiopaque. Frequently-ingested items include: small metal, plastic toys, coin, buttons, fish bones, batteries, safety pin, thumbtacks, needles, wire, wood or glass objects, denture, meat bolus, and razor blade.^{3,4,5} Buttons and batteries lodged in esophagus are emergency cases and it should be removed without any delay. Esophageal damage may occur in a relatively short period of time. Liquefaction necrosis may occur because of direct corrosive action, low voltage burns, and pressure necrosis.^{2,4}

The most common location of foreign body lodgment includes the 3 areas of physiologic esophageal narrowing. The first and most common location is proximal esophagus, which lies at the level between neck and thoracic junction. The second location is mid esophagus, which lies at the level of carina and aortic arch; and the third location is distal esophagus, which lies slightly proximal to gastro-esophageal junction.^{6,7} Our case reports occur at these locations. Manifested clinical symptoms are varied and 20% of patients are asymptomatic.^{4,5} Dysphagia and odinophagia are usual symptoms of foreign body lodgment in the esophagus, which are associated with other respiratory symptoms such as coughing, choking and stidor.^{2,4,6} Complications occur more frequently in adults, mainly because of the underlying condition. The other complications include abrasions, lacerations, and punctures, with associated

abscesses, perforation and soft tissue infections, pneumothorax, peritonitis, cardiac tamponade.^{2,3,4}

Early recognition and treatment of esophageal foreign bodies are important because it may cause serious and life-threatening complications. Radiology plays an important role for early diagnosis, early recognition of complications, and treatment. Chest radiography may detect a radiopaque object or suggests soft tissue swelling with a radiolucent foreign body, but upper endoscopy usually provides the diagnosis. Gold standard evaluation for diagnosis is rigid or flexible oesophagoscopy as it allows visualization and foreign body retrieval.^{2,4,7}

Over 80% of ingested foreign bodies pass through gastrointestinal tract without any complication. Sharp (bones, pins, needles, wire) or long (greater than 6.5 cm) foreign bodies most commonly cause perforation. Foreign bodies less than 2.5 cm in diameter usually pass through gastrointestinal tract without any difficulty. Once the foreign body has reached stomach, it has an 80-90% change of passage. Objects longer than 6 cm may become entrapped by either pylorus of duodenal sweep, and objects larger than 2 cm in diameter may also fail to pass the pylorus. After the foreign body has reached small bowel, the only structural passage impediment is ileocecal valve.^{4,6,8} In our case reports series, the objects of case 1 and case 4 has been pushed stomach. The nail object in case 1 passed the pylorus and management through observation was suitable for him; and a week later the nail was found in the patient's stool. In case 4, after the onion had been pushed by the endoscope into stomach, the patient has no longer problem.

Observation for up to 24 hours probably is a safe and appropriate treatment method, but it must be carefully selected according to the patient's age, the type of the lodged foreign body, the location of lodgment, the duration of lodgment, as well as available medical resources and skills.⁹

Various methods can be used to remove an esophageal foreign body. The selected strategy depends on the type and location of foreign body, the length of time of it occupancies in esophagus and the relative degree of experience with different techniques at given facility. The success rate for removing esophageal foreign bodies is 95-100% regardless of the technique used.

Current strategies to remove the retained foreign bodies include endoscopy, observation (which allows the foreign body to pass into stomach by its own effort), rigid or flexible esophagoscopy, balloon catheter extraction with radiographic guidance, bougienage technique, which push the foreign body into stomach. The last technique is appropriate only for object lodged in distal esophagus. An over tube should

be used to prevent tracheal aspiration.^{2,7} Foreign bodies lodged at LES can be managed by LES relaxation. The most frequently used medication is glucagon, a smooth muscle relaxant that significantly reduces lower esophageal sphincter pressure with doses as low as 0.25 mg. Glucagon has been reported to have a success rate of 12% to 58% in treating esophageal food lodgment. Glucagon does not work out if a fixed obstruction occurs, which is usually found in esophageal foreign bodies and food lodgment cases. Finally, glucagons may be helpful when used together with endoscopy because it may decrease the lower esophageal sphincter pressure and facilitate the endoscope to push the food lodgment into the stomach. Nitrate agents such as sublingual nitroglycerin and nifedipine have been used less widely because of a risk of hypotension and it does not work in patients with structural abnormalities.^{2,7} The success rate of rigid esophagoscopy is 100% and for flexible endoscopy is 76-98.5%. In general, rigid esophagoscopy has a higher complication rate than flexible endoscopy (10% versus 5.1%). Endoscopic removal of foreign bodies in the upper gastrointestinal tract is an effective and safe procedure. The Foley catheter technique is suitable only for proximally located blunt objects, and its routine use is not recommended although the success rate is 87%.^{10,11,12}

Meat lodgment resulting in esophagus obstruction is an emergency problem and the meat should be removed within hours.⁸ In case 5 of our case report series, extraction failed although endoscopic approach and Foley catheter had been performed. The patient was referred to the ENT Department of another hospital where rigid esophagoscopy was performed and the meat bolus was successfully removed.

Sharp objects can also be removed safely by endoscopic techniques to avoid open surgical methods. There are different techniques for removing opened safety pins with pointed edges facing up, i.e. by rotating them in the stomach, engaging the pointed edge into the endoscope and withdrawing it.² In case 2 of our case report series, the object was successfully removed by endoscopic biopsy forceps through grasping the sharp part of the safety pin and carefully pulling or performing extraction of the biopsy forceps, endoscope and the object. However, in case 3, the denture must be pushed into the stomach by endoscopy, the wire part of the denture was grasped by biopsy forceps and then was extracted. Later, a careful observation was performed to evaluate any lodgment, impaction or bleeding. In our case series, all cases did not show any complications and the patients were discharged from hospital the next day after object removal.

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