Acute appendicitis caused by foreign body ingestion

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Foreign bodies usually do not cause complications and pass through the gastrointestinal tract spontaneously. Usually endoscopic intervention is recommended within 24 hours. Cases of acute appendicitis caused by foreign bodies are very rare. In our case, we experienced successful endoscopic and surgical treatment of a patient with ingestion of razor blade and some unrecognizable foreign bodies. A 22-year-old soldier was admitted with a small quantity of hematemesis and epigastric pain. We performed emergent endoscopy and successfully removed several foreign bodies. After 17 days, we performed appendectomy to remove the remaining foreign body and to relieve the symptoms. There is no doubt that endoscopic intervention is definitely useful method to remove foreign bodies. If there is no spontaneous drainage of the foreign body from the appendix, an appendectomy must be considered to remove the foreign body and prevent surgical complications such as appendicitis, periappendiceal abscess, and perforation.

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Key Words: Foreign bodies, Appendicitis, Appendectomy

INTRODUCTION

Foreign body ingestion occurs more than one hundred thousand patients annually in the United States [1]. More than 80% of these patients are children and 98% of these patients are accidental [2]. Foreign bodies usually do not cause complications and pass through the gastrointestinal tract spontaneously, but bleeding, perforation, erosion, and ulceration of gastrointestinal tract can occur by sharp or pointed foreign bodies. Because of these complications, endoscopic intervention is recommended within 24 hours [3]. However, surgical treatment is required up to 16% to remove foreign bodies, because some foreign bodies cannot remove completely by endoscopic intervention [4].

Cases of acute appendicitis caused by foreign bodies are very rare. The prevalence of acute appendicitis due to foreign bodies is approximately 0.0005% [5]. Some studies and case reports show various kinds of foreign bodies such as needle, tongue piercing, screw, crown post, tooth root, and pin can occur acute appendicitis [5].

In our case, we experienced successful endoscopic and surgical treatment of a patient with ingestion of razor blade and unrecognizable some foreign bodies. So, we want to report this case with literatures review.

CASE REPORT

A 22-year-old soldier who has histories of conversion disorder and small bowel segmental resection due to incarcerated inguinal hernia was admitted with a small quantity of hematemesis and epigastric pain. The patient visited military hospital near his unit, and abdomen plain x-ray was performed that showed several pieces of foreign bodies (Fig. 1). But, the patient could not remember the fact of the foreign body ingestion. Then the patient was transferred to The Armed Forces Capital Hospital for further treatment. On physical examination, mild tenderness was found on deep palpation of only epigastric area and rebound tenderness was not present on whole abdomen. The patient did not have a fever. Laboratory

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test revealed WBCs were $8,440 \times 10^3/\mu\text{L}$, Hemoglobin were 16.0 g/dL and other tests were all normal. Abdominal CT showed multiple scattered metal fragments in stomach, appendix, ascending colon, and sigmoid colon without evidences of

Fig. 1. Abdomen plain x-ray reveals several pieces of foreign bodies.

perforation (Fig. 2). We performed emergent endoscopy and successfully removed four pieces of white plastic fragments, five pieces of metal fragments, and one piece of small black plastic fragment in the stomach body and prepyloric area. Also, we removed a white and black plastic fragment in the duodenum (Fig. 3). Esophagogastroduodenoscopy showed multiple erosions in the esophagus, stomach, and duodenum without perforation and active bleeding. We observed the patient closely and expected other foreign bodies passed through gastrointestinal tract spontaneously. Only one metallic round foreign body in the right lower quadrant was found upon serial abdomen plain x-ray at hospital day 5. Mild right lower quadrant pain started to present at hospital day 5. Mild right lower quadrant pain started to present at hospital day 16. This pain aggravated at hospital day 17 and physical examination showed mild right lower quadrant tenderness and rebound tenderness. Abdominal CT was taken at hospital day 17 showed a remained round foreign body in appendix, dilated appendix (approximately 7.5 mm in diameter), and wall thickening of appendix midportion (Fig. 4). According to patient's clinical symptoms, signs, and CT, we decided to perform an appendectomy. Due to the patient's abdominal operation history, we performed an open appendectomy at hospital day 17. Operation findings revealed a mild dilated appendix (7 mm in diameter), mild redness around midportion of appendix and a round shaped metallic

Fig. 2. Abdominal CT finding reveals multiple, scattered metal fragments in stomach (A), appendix (B), ascending colon (C), and sigmoid colon (D).

Fig. 3. Esophagogastroduodenoscopy finding reveal multiple foreign bodies in stomach. (A) Metallic foreign bodies in stomach. (B) A white and black plastic foreign body in stomach.

Fig. 4. Abdominal CT finding reveals a remained round foreign body in appendix, dilated appendix.

foreign body in appendix (Fig. 5). According to these findings, we could consider early appendicitis clinically. There were no postoperative complications and the patient was discharged 21 days after surgery. Pathologic evaluation was reported as a 12-cm-long and 0.7-cm-wide macroscopically, subserosal congestion with inflammation microscopically.

DISCUSSION

Most foreign bodies that enter the gastrointestinal tract pass in four to six days. Not only most blunt foreign bodies, but also even sharp foreign bodies can pass gastrointestinal tract without serious complications except disk batteries, magnets, foreign bodies longer than 6 cm, and more than 2.5 cm in diameter [6]. The approach to manage depends on the type of foreign bodies ingested, the location of foreign bodies. In this case, CT showed multiple foreign bodies in stomach, appendix, ascending colon, and sigmoid colon. We could remove multiple foreign bodies in stomach by endoscopic intervention.

Fig. 5. Macroscopic findings of specimen show a mild dilated appendix (7 mm in diameter), mild redness around midportion of appendix and a round shaped metallic foreign body.

Ingesting foreign body is a rare in adults. Especially, foreign body in appendix is very rare. When the weight of the foreign body is greater than that of the bowel fluid content, its movement is arrested in the cecum during transit where it gravitates towards the lower portion [7]. The appendiceal orifice expands and allows enter into its lumen. Foreign bodies could hardly enter into the appendix in case of retrocecal type of appendix while other type of the appendix allows enter into appendix [8]. If once a foreign body enters in the appendix lumen, peristalsis is insufficient to expel a foreign body into the cecum [7]. This is the reason why, in our case, the round foreign body stayed in the appendix during several days. Ingested foreign body may remain in the appendix without stimulating an inflammatory response for extended periods or an inflammatory reaction with or without perforation. The clinical

presentation can vary from hours to years [9]. Antonacci et al. [2] suggested the formation of a fecal coat around a foreign body probably can control development of inflammatory process, therefore, beginning and severity of inflammation of appendix may various.

The symptoms may vary from asymptomatic to abdominal pain, with or without vomiting or diarrhea. Low grade pyrexia possibly includes these symptoms. Abdominal tenderness may vary from mild to severe tenderness with or without rebound tenderness on physical examination. Therefore, CT would be required to confirm the diagnosis [10]. In our case, a symptom of the patient at hospital day 17 was only mild right lower quadrant pain. Physical examination showed mild direct tenderness and rebound tenderness. Therefore, we had to use CT to confirm the diagnosis. Complicated conditions of appendix usually depend on the size and shape of the foreign bodies, blunt foreign bodies cause appendicitis by inflammatory process or obstruction of the appendiceal lumen. Elongated, sharp foreign bodies (75% of foreign bodies in the appendix) are more likely to cause perforation, periappendiceal abscess, and peritonitis.

Finally, open or laparoscopic appendectomy must be considered to remove foreign bodies and prevent these surgical these surgical problems when serial abdomen plain x-ray was taken for the follow-up, and there is no spontaneous drainage of the foreign bodies [2,10].

In conclusion, endoscopic intervention will be useful method to remove foreign bodies. Also, close observation will be necessary in cases of a foreign body in gastrointestinal tract that cannot be removed endoscopically because the emergence of nonspecific symptoms may be the early symptoms of acute problems in the abdomen. Especially, foreign bodies in appendix can cause simple appendicitis, perforations, peri-appendiceal abscess, and peritonitis. An appendectomy must be considered to remove the foreign body and prevent these surgical problems, if there is no spontaneous drainage of the foreign body from the appendix.

CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

REFERENCES

1. Kay M, Wyllie R. Pediatric foreign bodies and their management. *Curr Gastroenterol Rep* 2005;7:212-8.
2. Antonacci N, Labombarda M, Ricci C, Buscemi S, Casadei R, Minni F. A bizarre foreign body in the appendix: a case report. *World J Gastrointest Surg* 2013;5: 195-8.
3. Wu WT, Chiu CT, Kuo CJ, Lin CJ, Chu YY, Tsou YK, et al. Endoscopic management of suspected esophageal foreign body in adults. *Dis Esophagus* 2011;24:131-7.
4. ASGE Standards of Practice Committee, Ikenberry SO, Jue TL, Anderson MA, Appalaneni V, Banerjee S, et al. Management of ingested foreign bodies and food impactions. *Gastrointest Endosc* 2011; 73:1085-91.
5. Simkovic D, Hladík P, Lochman P. Unusual cause of the acute appendicitis. *Rozhl Chir* 2004;83:365-7.
6. Park JM, Kim SY, Chung IY, Kim WS, Shin YC, Kim YC, et al. A case of successful endoscopic and conservative treatment for intentional ingestion of sharp foreign bodies in the alimentary tract. *J Trauma Inj* 2013;26:304-7.
7. Klingler PJ, Seelig MH, DeVault KR, Wetscher GJ, Floch NR, Branton SA, et al. Ingested foreign bodies within the appendix: a 100-year review of the literature. *Dig Dis* 1998;16:308-14.
8. Wakeley CP. The position of the vermiform appendix as ascertained by an analysis of 10,000 cases. *J Anat* 1933;67(Pt 2):277-83.
9. Benizri EI, Cohen C, Bereder JM, Rahili A, Benchimol D. Swallowing a safety pin: Report of a case. *World J Gastrointest Surg* 2012;4:20-2.
10. Ozkan Z, Kement M, Kargı AB, Censur Z, Gezen FC, Vural S, et al. An interesting journey of an ingested needle: a case report and review of the literature on extra-abdominal migration of ingested foreign bodies. *J Cardiothorac Surg* 2011;6:77.