

[CASE REPORT]

Prolonged Epigastric Pain Caused by a Leaf Stem Embedded in the Gastric Wall

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Abstract:

A 67-year-old woman underwent esophagogastroduodenoscopy to determine the cause of her prolonged epigastric pain. During the examination, a sharp-pointed foreign body was observed; the edge of the object had been embedded in the gastric wall. The object was removed via an endoscope, and the patients' symptoms improved immediately. Based on a dietary history and an electron microscope examination, we identified the object as a stem of *mizuna*, a potherb mustard. Our report indicates that commonly eaten leafy green vegetables can act as sharp-pointed foreign bodies with the potential to injure the upper gastrointestinal tract.

Key words: foreign body, leaf stem, epigastric pain, electron microscopy

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Introduction

Foreign bodies can sometimes injure the upper gastrointestinal (GI) tract. In cases where sharp-pointed foreign bodies are embedded in or pierce the wall of the upper GI tract, GI bleeding or perforation can occur (1, 2). Therefore, it is necessary to remove the foreign body carefully (3). When a sharp-pointed foreign body becomes lodged in the esophagus, the removal of the object may require emergency treatment. Even though sharp-pointed foreign bodies can pass through the esophagus, the risk of complications is reported to be 35%, which is still quite high (4).

We recently experienced a patient who suffered from prolonged epigastric pain caused by a stem of *mizuna* that had become embedded in her gastric wall. *Mizuna*, which is also known as spider mustard, potherb mustard, or Japanese mustard greens, is often consumed as a vegetable in green salads in Japan. Most foreign bodies in the upper GI that are classified as sharp-pointed objects are true foreign bodies (i. e. needles, press-through-package) or bones (4-6), and it is extremely rare for a leafy green vegetable to become embedded in the gastric wall as a foreign body. We herein report that commonly consumed leafy green vegetables can

act as foreign bodies with the potential to injure the gastric wall.

Case Report

A 67-year-old woman was referred to our hospital for prolonged epigastric pain, back pain, and abdominal discomfort for more than 2 weeks, as she experienced no improvement in her symptoms despite the prescription of famotidine and mosapride citrate hydrate at the clinic. The patient felt pain particularly when she bent forward, and her epigastric pain continued regardless of whether she was hungry or full. A physical examination revealed slight tenderness in the epigastrium, but peritoneal irritation symptoms were not observed. Laboratory data showed elevated levels of inflammatory reaction markers (C-reactive protein, 6.08 mg/dL).

Abdominal ultrasonography showed two lines of linear high-echoic areas in the anterior wall of the antrum (Fig. 1A). Non-enhanced computed tomography (CT) of the abdomen showed a thickened and edematous gastric wall of the antrum (Fig. 1B), and the fat tissue around the antrum or round ligament of the liver was also edematous, suggesting inflammation in the antrum and the surrounding tissue. Based on these results, we performed esophagogastroduo-

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denoscopy (EGD) and found a foreign body that had been embedded in the anterior wall of the antrum (Fig. 2A). After the observation, endoscopic retrieval of the foreign body from the gastric wall was performed carefully using a polypectomy snare, since CT performed before EGD had shown no signs of gastric perforation, such as free air in the abdominal space or ascites. Fortunately, no bleeding from the point where the foreign body had been embedded was observed, and the foreign body was successfully removed using forceps. The length of the foreign body was 3.8 cm, and it had a long linear shape (Fig. 2B).

After the removal, the patient's epigastric and back pain improved immediately and disappeared completely. The foreign body resembled the stem of a leafy green vegetable, but it could not be identified visually. In a medical interview, she suggested that it might be a stem of *mizuna* because she had been eating *mizuna* almost every day for the

last several weeks prior to visiting our hospital. To confirm the identity of the foreign body, we examined the object using electron microscopy and compared the findings with those for *mizuna* (Fig. 3). Although *mizuna* generally shows a mildly crumpled shape, the surface of the foreign body resembled that of *mizuna*, and both of the specimens consisted mostly of fiber bundles with columnar-shaped cavities. Based on this analysis, we concluded that the foreign body was indeed a stem of *mizuna*.

Discussion

The accidental ingestion of a foreign body or food bolus is commonly observed in clinical practice. Pediatric patients account for the majority of cases of foreign body ingestion (7), and true foreign bodies or fish bones are the main objects of foreign body ingestion in adult patients (3). To our knowledge, this is the first report that describes the stem of a leafy green vegetable being embedded in the upper GI as a sharp-pointed foreign body. Initially, it seemed unlikely that such an event would occur in the normal gastric mucosa of a healthy woman, so we assumed the symptoms were caused by an organic disease. Therefore, we performed a second-look examination using EGD but could not identify any signs of an organic disease, such as gastric cancer, ulcer or an aberrant pancreas. A laboratory examination also showed no elevation in the carcinoembryonic antigen (CEA) or carbohydrate antigen 19-9 (CA 19-9) levels. A rapid urease test was performed at the same time as the removal of the foreign body, but *Helicobacter pylori* was not detected. While the fact that the stem of the *mizuna* was not digested and maintained its shape within the stomach for more than two weeks is surprising, an electron microscopy analysis confirmed that the foreign body was indeed *mizuna*. We therefore ultimately diagnosed the patient with a foreign body (a *mizuna* stem) in the stomach.

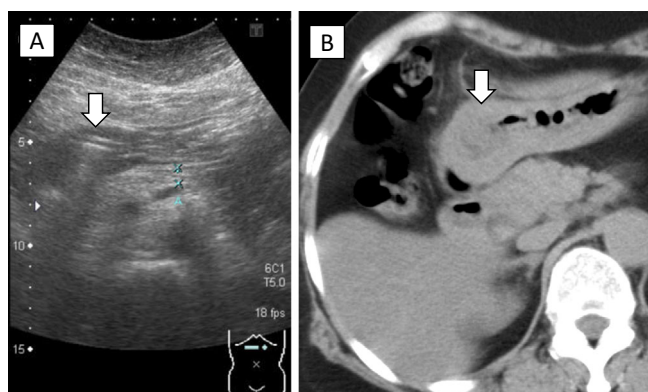


Figure 1. Imaging study before the removal of the foreign body. (A) Abdominal ultrasonography findings. Two lines of high echogenic areas were shown in the anterior wall of the antrum (arrow). (B) Representative image of non-enhanced CT of the abdomen. The anterior wall of the pylorus antrum was thickened and edematous (arrow).

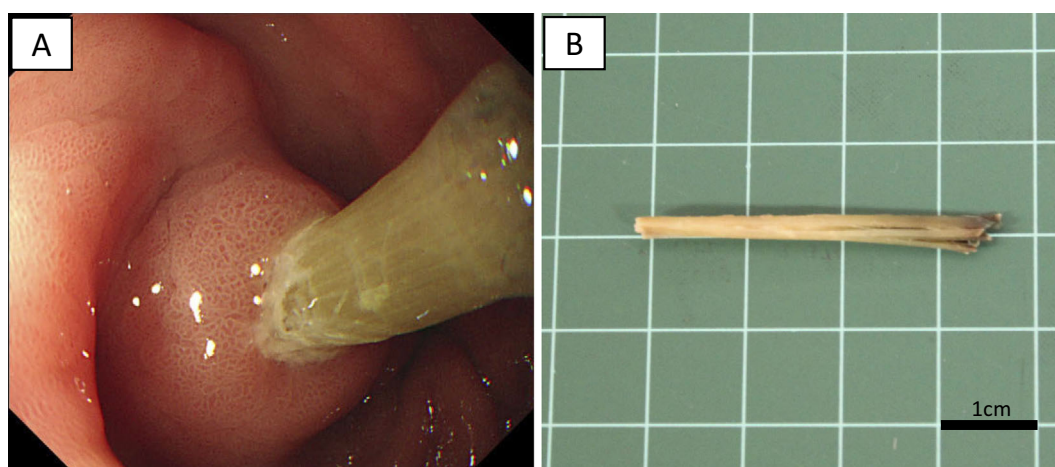


Figure 2. Esophagogastroduodenoscopy images and photograph of the foreign body. (A) Close-up view of the foreign body. The foreign body was embedded in the gastric wall, and the mucosa around the point of embedment was edematous and swollen. (B) The photograph of the foreign body. Scale bar: 1 cm.

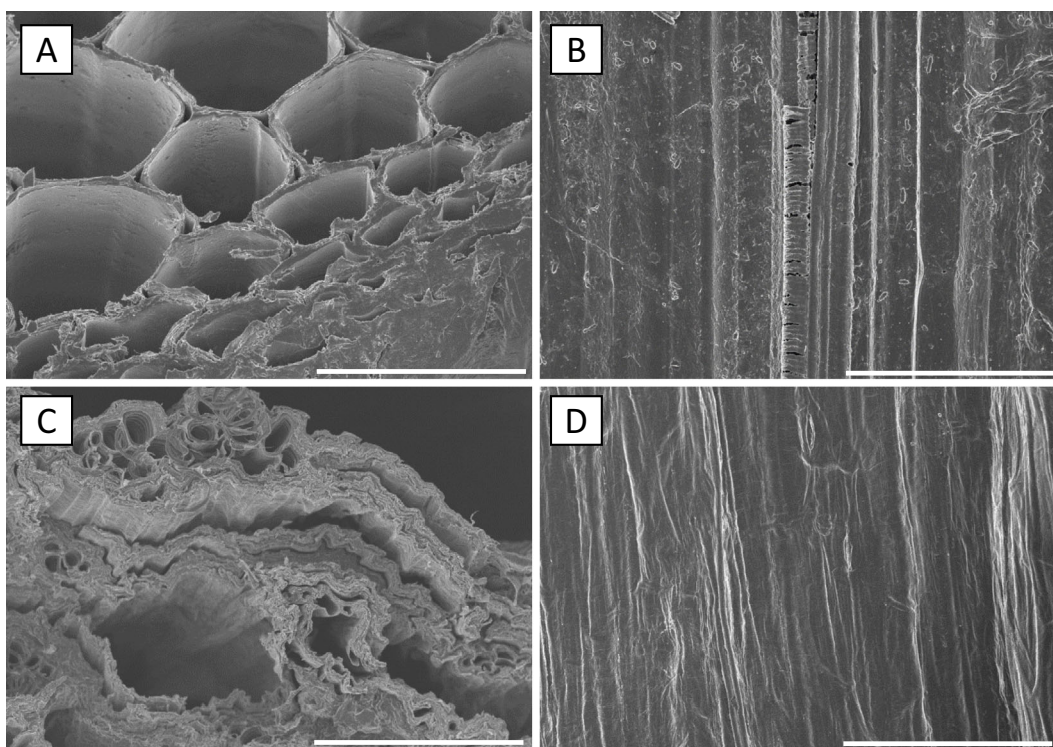


Figure 3. Representative scanning electron microscopic images. Section and surface images of the foreign body (A: section, B: surface) and *mizuna* (C: section, D: surface). Scale bar: 1000 μ m. Both the foreign body and *mizuna* consisted of fiber bundles with internal columnar-shaped cavities.

The detailed mechanism underlying the phenomenon in the present case is unclear, but there have been some cases in which sharp-pointed objects injured the antrum, as in the present case (8-11). Usually, peristaltic movement of the stomach attempts to deliver food into the duodenum through the pylorus. However, if the shape of the food or foreign body is long and sharp-pointed, the point may not be able to pass directly through the pylorus, instead becoming embedded near the pylorus by peristaltic movement. Given the present findings, we suspect that *mizuna* taken during dinner may have become embedded in the antrum due to peristaltic movement at night, when the parasympathetic nerve system was activated, without the patient noticing.

Among diseases of the digestive system caused by food ingestion, small bowel obstruction is familiar to clinicians. In addition to food-induced ileus or esophageal obstruction, the development of hepatolithiasis, enterolith, or gastric per-simmon phytobezoar has also been reported to be caused by meal intake (12-14). In most cases, a diagnosis of foreign body ingestion can be made based on a medical interview and X-ray examination, including CT. However, we were unable to determine the condition of the patient based on a medical interview of CT findings in the present case, because we did not consider that a leafy green vegetable could act as a foreign body. Although the present case is extremely rare, clinicians should consider the possibility of the stem of a leafy green vegetable being a foreign body in the stomach when examining patients with epigastric pain.

The authors state that they have no Conflict of Interest (COI).

References

- Henneman D, Bosman WM, Ritchie ED, van den, Bremer J. Gastric perforation due to foreign body ingestion mimicking acute cholecystitis. *BMJ Case Rep* **2015**: 2015.
- Tan Y, Chu Y, Liu D, Huo J. Delayed massive bleeding caused by an ingested fish bone. *Endoscopy* **47**(Suppl 1): E569-E570, 2015.
- Mosca S, Manes G, Martino R, et al. Endoscopic management of foreign bodies in the upper gastrointestinal tract: report on a series of 414 adult patients. *Endoscopy* **33**: 692-696, 2001.
- Webb WA. Management of foreign bodies of the upper gastrointestinal tract: update. *Gastrointest Endosc* **41**: 39-51, 1995.
- Birk M, Bauerfeind P, Deprez PH, et al. Removal of foreign bodies in the upper gastrointestinal tract in adults: European Society of Gastrointestinal Endoscopy (ESGE) Clinical Guideline. *Endoscopy* **48**: 489-496, 2016.
- Lai AT, Chow TL, Lee DT, Kwok SP. Risk factors predicting the development of complications after foreign body ingestion. *Br J Surg* **90**: 1531-1535, 2003.
- Cheng W, Tam PK. Foreign-body ingestion in children: experience with 1,265 cases. *J Pediatr Surg* **34**: 1472-1476, 1999.
- Shan GD, Chen ZP, Xu YS, et al. Gastric foreign body granuloma caused by an embedded fishbone: a case report. *World J Gastroenterol* **20**: 3388-3390, 2014.
- Uehara M, Tada S, Eguchi H, et al. Foreign bodies in the upper gastrointestinal tract removed by flexible endoscopy: retrospective analysis of 104 cases. *Gastroenterol Endosc* **52**: 1243-1249, 2010 (in Japanese, Abstract in English).
- Takahashi K, Kato K, Kasamatsu S, Aminaka M, Tsuchiya S, Shirai Y. A case of successful endoscopic treatment of a fish bone perforation of the stomach. *Prog Dig Endosc* **90**: 88-89, 2017 (in

- Japanese, Abstract in English).
11. Chong LW, Sun CK, Wu CC, Sun CK. Successful treatment of liver abscess secondary to foreign body penetration of the alimentary tract: a case report and literature review. *World J Gastroenterol* **20**: 3703-3711, 2014.
12. Iwamuro M, Miyashima Y, Yoshioka T, et al. Ultrastructural analysis of an enterolith composed of deoxycholic acid. *Acta Medica Okayama* **68**: 369-374, 2014.
13. Lv GY, Qiu W, Yu Y, Li T. Development of hepatolithiasis due to a celery stalk retained within the bile ducts of the liver. *Ann R Coll Surg Engl* **98**: e77-e78, 2016 (in eng).
14. Iwamuro M, Urata H, Furutani M, et al. Ultrastructural analysis of a gastric persimmon phytobezoar. *Clin Res Hepatol Gastroenterol* **38**: e85-e87, 2014 (in eng).

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