Single Case

Endoscopic Removal of a Denture Lining Material Stuck in the Duodenum

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Foreign bodies in the gastrointestinal tract • Denture lining material • Endoscopic removal

Abstract
A 52-year-old woman visited our hospital with a complaint of upper abdominal pain. Abdominal computed tomography did not show any lesion responsible for the pain. However, esophagogastroduodenoscopy identified a pale, pink-colored, U-shaped foreign body stuck in the descending part of the duodenum. We removed it by gently pulling forward in an antegrade fashion with the use of a snare. Duodenography after the removal did not show any sign of leakage to the abdominal cavity or to the retroperitoneum. The foreign body was found to be a denture lining material equipped 3 days previously.

Introduction

Foreign bodies in the gastrointestinal tract may cause bleeding, mucosal ulcerations, and perforations, all of which may require urgent treatment [1–3]. There are various types of foreign body in the gastrointestinal tract such as press-through-pack medications, food, bones, and metals [4–7]. They often remain in the gastrointestinal tract, predominantly in the esophagus, followed by the stomach. However, there are only a few reports of foreign bodies in the duodenum [4–7]. Furthermore, a certain proportion of foreign bodies in the gastrointestinal tract cannot be removed endoscopically because of their size, hardness, and sharpness [2, 5]. We herein
report a case of a denture lining material stuck in the descending part of the duodenum, which could be removed endoscopically without any complication.

**Case Presentation**

A 52-year-old woman visited our hospital with a complaint of upper abdominal pain. Physical examination revealed tenderness in the epigastric region without rebound tenderness. Laboratory data showed no abnormalities except for mild anemia. Abdominal computed tomography (CT) did not show any lesion responsible for the pain (Fig. 1). However, esophagogastroduodenoscopy identified a pale, and pink-colored, foreign body stuck in the descending part of the duodenum (Fig. 2a). Because CT did not show any sign suggestive of perforation, we decided to remove it endoscopically. We first grabbed the center of the foreign body by an electrocautery snare and gently pulled out. EGD, esophagogastroduodenoscopy.
cavity or to the retroperitoneum (Fig. 3). The removed foreign body was a 70 mm-sized, pale, and pink hard resin, which was bent like a hairpin (Fig. 4).

A detailed checkup of her illness revealed that she had been visiting a dentist and that she ingested something hard a few days before her abdominal pain occurred. We thus consulted the dentist, who testified that the foreign body was a denture lining material.

**Discussion**

It has been well known that foreign bodies in the gastrointestinal tract can cause serious complications. They often are retained in the esophagus and may be endoscopically removable, according to their hardness and sharpness [2, 5].

In our case, the denture lining material was found as a foreign body in the duodenum. The material is routinely used to fill the gap when the denture does not fit the gingiva [8].
It is made of a fluorine-based methacrylic acid-based monomer, and the clay-like composition transforms to a resin after approximately 5 min at room temperature [9, 10].

Dentures and dental instruments are often found as foreign bodies in the gastrointestinal tract [4–7]. It has been reported that the ingestion of dentures and dental instruments is triggered by dental procedures, accidental swallowing, and tracheal intubation [11]. Among dentures and dental instruments, crowns and bridges are the most common foreign bodies. Those foreign bodies often remain in the esophagus and the stomach, and they are found as radiopaque substances [11].

Saltiel et al. [6] reported that radiographic visibility is associated with the high success rate of endoscopic removal for foreign bodies. In our case, however, CT failed to identify the foreign body, probably because of radiolucency of the material. Our case suggests that it may be important to confirm a history of the ingestion of dentures and dental instruments to diagnose gastrointestinal foreign bodies even if CT fails to indicate signs of foreign bodies.

Intestinal perforation due to gastrointestinal foreign body occurs predominantly in the terminal ileum and in the sigmoid colon [12]. The small intestine is thought to be at a higher risk of perforation induced by sharp and hard foreign bodies than the remaining gastrointestinal tract because of its narrow lumen and thin wall [13]. With regards to dental materials, Mizuno et al. [11] reported that immediate intervention and appropriate selection of devices, such as forceps, snare, and nets, are essential for the removal. In our case, we applied a snare for the removal of stuck denture lining material without adverse event. While the foreign body was apparently penetrating the duodenal wall, there was not any clinical, endoscopic, or radiographic sign of duodenal perforation.

The uneventful clinical course may partly be explained by the anatomical specificity of the duodenum, which is surrounded by firm retroperitoneum. Time duration for a few days from the ingestion until removal of the material may also account for the less severe retroperitoneal inflammation.

In conclusion, we encountered a case of a denture lining material stuck in the duodenum, which could be removed endoscopically without adverse events. Foreign bodies in the duodenum may be candidates for endoscopic removal even if they are stuck in the duodenal lumen.

**Statement of Ethics**

As this paper is a single case report, it has not been approved by the Ethics Committee. Written informed consent was obtained from the patient for the publication of this case report and any accompanying images. Research complies with the guidelines for human studies and was conducted ethically in accordance with the World Medical Association Declaration of Helsinki. This study protocol was reviewed, and the need for approval was waived by the IRB at Iwate Medical University.

**Conflict of Interest Statement**

The authors declare that they have no conflicts of interests.

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Author Contributions

E.M. and T.Y. contributed to writing this manuscript. M.M. and T.H. were involved in the patient’s treatment. T.M. contributed to supervising the writing of the manuscript. All the authors contributed to the diagnosis, the treatment, and the clinical management of the patient. All the authors read and approved the final manuscript.

Data Availability Statement

The authors confirm that the data supporting the findings of this study are available within the article.

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