Duodenal Diverticulitis Due to Impacted Foreign Body: Enteroscopic Diagnosis and Treatment

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INTRODUCTION

The duodenum is the second most common site for the development of gastrointestinal diverticula after the colon and the prevalence of the duodenal diverticulum ranges from 5% to 22% but varies depending on the mode of diagnosis. Although the majority of duodenal diverticula are asymptomatic and clinically insignificant, approximately 10% of patients develop clinical symptoms. Duodenal diverticulitis is rare. Case reports of diverticulitis of the third and fourth portion of the duodenum are very rare, because most duodenal diverticula are found in the second portion of the duodenum.

Signs and symptoms of duodenal diverticulitis are nonspecific, and a definite diagnosis is very difficult. In a 1992 review of the literature, Duarte et al. found that only 13 of 101 patients were correctly diagnosed pre-operatively by radiographic imaging. Therefore, adequate treatment can be delayed frequently. We present a case of duodenal diverticulitis of the third portion, caused by impaction of a foreign body (seaweed stalk), which was diagnosed and treated with enteroscopy.
**CASE REPORT**

A 54-year-old woman, with no significant medical history, presented to the outpatient gastroenterology department complaining of sudden onset epigastric pain and vomiting which had begun the day before. Mild tenderness was seen in the epigastrium on physical examination, but Murphy’s sign was not present. We initially considered a peptic ulcer disease, so an esophagogastro-duodenoscopy was performed. Superficial erosions on the greater curvature of the body and minimal mucosal breaks of the lower esophagus were observed, but the duodenum appeared normal up to the second portion. Because a recently performed abdominal ultrasound was normal, she was discharged from the hospital with medication. The next day, she visited again because of persistent pain. Laboratory data revealed leukocytosis (white blood cell count, 17,240/mm³), aspartate aminotransferase of 81 IU/L, and an elevated CRP level (2.5 mg/dL). Abdominal ultrasonography was performed, which revealed mild dilatation of the extrahepatic duct without any obstructive lesions and a normal gall bladder and liver. When she returned a few days later, the abdominal pain had improved slightly but she complained of a mild febrile sensation. Oral antibiotics were prescribed, as *E. coli* was cultured in a urine sample. One week later, she complained of aggravated abdominal pain, and abdominal CT was performed immediately. CT images showed severe thickening and inflammation of the duodenal wall localized within the third portion (Fig. 1). Enteroscopy was performed carefully with minimal air insufflation on the second hospital day. The duodenum was normal up to the second portion. However, a foreign body stained the color of bile was impacted in the duodenal wall of the third portion and the wall was narrowed due to edematous changes. When we approached the distal part of the duodenum, a pouch-like diverticulum with a narrow neck and edema, flare, and exudates was observed. The most distal part revealed a normal duodenal lumen. We retracted the foreign body using forceps and capturing it with a net. It was a hard seaweed stalk sized about 5 cm (Fig. 2). We diagnosed the patient with duodenal diverticulitis of the third section with a suspicious microperforation due to the impact of the seaweed stalk. The epigastric pain improved quickly after removing the foreign body. Thereafter, she was treated with bowel rest and broad-spectrum intravenous antibiotics. A follow-up enteroscopy showed remarkable improvement of the inflammation (Fig. 3). The patient was discharged and has received follow-up care in the outpatient department without recurrence.

**DISCUSSION**

Duodenal diverticula are common, with varying prevalence according to the mode of diagnosis. The prevalence is 0.016-6% in upper gastrointestinal series, 22-23% in autopsy series, and 9-23% on endoscopic ret-

![Fig. 1. Contrast-enhanced CT scan showed severe thickening and inflammation of the wall localized within the third portion of the duodenum (arrows). (A) Transverse section, (B) Coronal section.](image-url)
Fig. 2. Enteroscopic findings. (A) A foreign body stained the color of bile impacted the duodenal wall. (B) A pouch-like diverticulum with a narrow neck and edema, flare, and exudates was seen. (C) The foreign body was retracted with forceps and removed with a net. (D) The seaweed stalk was 5 cm in length.

Fig. 3. Follow-up enteroscopy showed remarkable improvement.

Although most duodenal diverticula remain asymptomatic, 10% of patients develop clinical symptoms.\textsuperscript{5} This is most commonly caused by ulcerations, hemorrhage, obstruction of the duodenum or the common bile duct, pancreatitis, fistula formation, malignant degeneration, diverticulitis, or a perforation of the retroperitoneum.\textsuperscript{9} Duodenal diverticulitis is very rare because of the large size of the duodenum and the fluent intraluminal flow of relatively sterile, liquid duodenal contents.\textsuperscript{1} Duodenal diverticulitis can be caused by stasis of contents, particularly when the diverticular neck is small, which limits efflux of the intraluminal contents from the diverticulum. Stasis causes a perforation of the diverticulum in nearly 60% of patients.\textsuperscript{6,9} Other reported predisposing factors include the presence of foreign bodies, gallstones or enterolithiasis, ulcerations within the diverticulum, blunt trauma, or ingestion of carbonated beverages.\textsuperscript{9} A perforation rarely arises from a complication of duodenal diverticulitis. Perforated duodenal diverticulitis has mortality rates of 13-34%.\textsuperscript{6,10,11} Based on the CT and enteroscopic features of our case, a micro-perforation of the duodenal wall to the diverticulum by a seaweed stalk was suspected. The clinical presentation includes abdominal pain, fever, and leukocytosis, and symptoms are nonspecific often mimicking acute cholecystitis,
acute pancreatitis, peptic ulcer disease, retrocecal appendicitis, or colitis. Therefore, it is difficult to make an accurate diagnosis. CT scans are more useful than an upper gastrointestinal series or ultrasonography. The CT features of duodenal diverticulitis appear to be similar to diverticulitis at other gastrointestinal locations, which may include wall thickening and stranding of the surrounding soft tissues and adjacent mesenteric or retroperitoneal fat. Therapeutic management depends on the patient’s clinical condition and stability. Patients with high fever, acute abdominal pain, peritoneal irritation signs upon examination, and an impending septic condition clearly require surgical exploration. However, when a patient presents with mild abdominal symptoms without evidence of impending sepsis, nonoperative management, including bowel rest, intravenous hydration or total parenteral nutrition, and broad-spectrum antibiotics may be sufficient. We performed enteroscopy directly in our case, because the symptoms were aggravated and focal inflammation of the duodenum was noted on the abdominal CT. However, as the endoscopic procedure may cause a catastrophic perforation through a very weak bowel wall due to inflammation, it was performed very carefully with gentle maneuvers and minimal air insufflation. As a result, the endoscopic management was very effective not only for the diagnosis but also for treatment. We have performed follow-up CT scans after removing the foreign body and observed the patient closely because of concerns about the possibility of perforation or worsening inflammation. No deteriorative signs were seen, and she was managed non-operatively.

Two cases of duodenal diverticulitis have been reported in Korea recently. Both arose from the second portion of duodenum where duodenal diverticulitis is commonly found and mimics cholangitis or pancreatitis, which is a common complication of duodenal diverticulitis. But in our case, the diverticulitis arose from the third portion of the duodenum due to impaction of a seaweed stalk.

In conclusion, duodenal diverticulitis is very rare and a difficult disease to diagnose clinically, so complications such as perforation may occur, which may lead to sepsis. Therefore, early diagnosis and adequate management is very important. We report this case, because duodenal diverticulitis that occurred due to an impacted foreign body was properly managed and diagnosed by enteroscopy.

REFERENCES