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CASE REPORT | ENDOSCOPY

Duodenal Duplication Diagnosed by Computed Tomography-Duodenography and Treated by Endoscopy

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ABSTRACT

A 21-year-old man with a developmental disability presented for management of upper abdominal pain and vomiting. He was diagnosed by endoscopy and computed tomography-duodenography as having duodenal obstruction due to duodenal duplication. He underwent endoscopic resection of the blind end of the duplication and was discharged on the ninth postoperative day. In a follow-up endoscopy 6 weeks after treatment, the scope passed smoothly and it was found that an iatrogenic ulcer postendoscopic resection had healed. Duodenal duplication is rare, and few cases have been diagnosed preoperatively in detail with imaging and undergone successful endoscopic treatment, as in the present case.

KEYWORDS: computed tomography-duodenography; duodenal duplication; endoscopic window opening technique

INTRODUCTION

Gastrointestinal duplications are relatively uncommon congenital anomalies, duodenal duplication being particularly rare, reportedly accounting for 2%–12% of all gastrointestinal duplications.[1,2] The terminal ileum is the most common site, followed by the esophagus and duodenum.[3] Most are diagnosed in infancy and childhood, fewer than 30% being identified at the age of 12 years or older.[4] It is difficult to make a preoperative diagnosis.[4] Treatment of duodenal duplication has classically included surgical resection. Recently, endoscopic treatment has also become more common, particularly in patients at high surgical risk, such as those with duplication located near the papilla of Vater.[2,5] To the best of our knowledge, there are no previous reports of cases diagnosed by computed tomography-duodenography (CT-D) imaging before endoscopic treatment.

In this study, we describe a case of duodenal duplication that was diagnosed by CT-D and successfully treated by endoscopic resection.

CASE REPORT

A 21-year-old man with a developmental disability presented with epigastric pain and vomiting. He had not previously had similar symptoms. Laboratory tests showed a high serum lipase concentration (6,051 U/L), and he was urgently referred to a previous physician. His abdominal symptoms and pancreatic enzyme concentrations showed a tendency to improve with fasting and fluid, and he was transferred to our hospital for close examination and treatment. By then, he had no abdominal symptoms and his serum lipase concentration had decreased to 154 IU/L. A CT scan showed thickened walls in the second and third portions of the duodenum, and part of the duodenum appeared to be superimposed. Neither contrast enhancement in the pancreas nor inflammatory spillover to the surrounding area was detected. Upper gastrointestinal endoscopy revealed a dilated duodenal bulb, with a sac-like dilated blind end. In addition, a small orifice was detected on the oral side of the blind end (Figure 1). A CT-D showed

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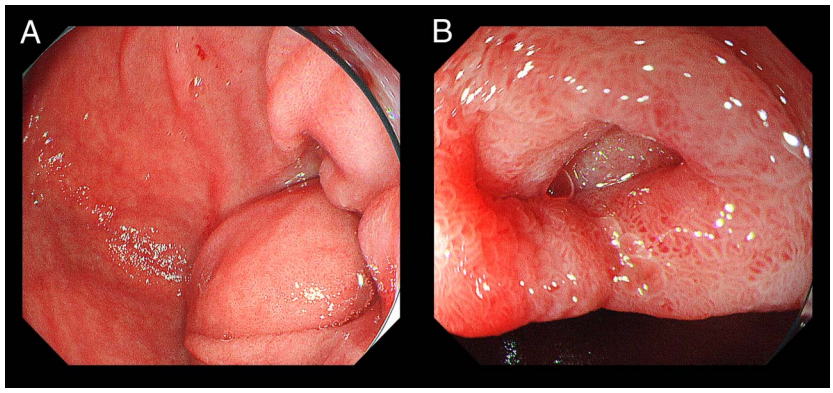

Figure 1. Endoscopy images showing (A) the blind end of the duodenum and (B) a small orifice in the blind end of the duodenum.

a saccular septum in the second part of the duodenum and a small orifice connecting this with the anorectal side. We therefore deduced that the papilla of Vater was located on the anorectal side of that orifice (Figure 2).

With informed consent, endoscopic treatment was initiated. Ultrasound from the duplicated duodenum revealed a hypoechoic area, suggesting shared muscular layers between the true and duplicated duodenum. A high-echoic area indicated the border between the true and duplicated lumens (Figure 3). A biopsy of the bifurcation mucosa showed no malignancy. Saline was injected through an endoscopic needle into the blind end, showing no resistance or wall bulging. Injection of water-soluble contrast confirmed its appearance on the anorectal side of the true lumen. The blind end was resected with the grasp-and-snare technique through a double-channel endoscope.[6] The grasping forceps were inserted through one channel of the endoscope and the snare through the other. After passing the grasping forceps inside the open snare, the shaft of the open snare was pulled snugly against the endoscope to close it. The blind end was grasped and pulled toward the oral side with the grasping forceps, and snaring was performed (Figure 4). The blind end was then resected and opened as wide as possible (Figure 4). There was no thermal degeneration of the papilla of Vater. The patient resumed eating on the fifth postoperative day and was discharged on the ninth. Follow-up endoscopy and CT-D performed 6 weeks after the endoscopic resection indicated that the area of incision had healed with some scarring, and the lumens were adequate. Eight months after treatment, the patient is still doing well with no abdominal pain, vomiting, or complications of pancreatitis.

DISCUSSION

Gastrointestinal duplication is defined as the presence of a lumen covered by gastrointestinal mucosa that is connected to the gastrointestinal tract and shares a muscle layer with it.[3] Duodenal duplication can be classified as tubular or cystic and communicating or noncommunicating, cystic and noncommunicating being the most common.[3,4,7] Duodenal duplication is most commonly located in the second and third parts of the duodenum. Cholangitis or pancreatitis can develop when the bile or pancreatic ducts open into overlapping intestinal tracts.[2,8] A meta-analysis found that the most common symptoms are abdominal pain and

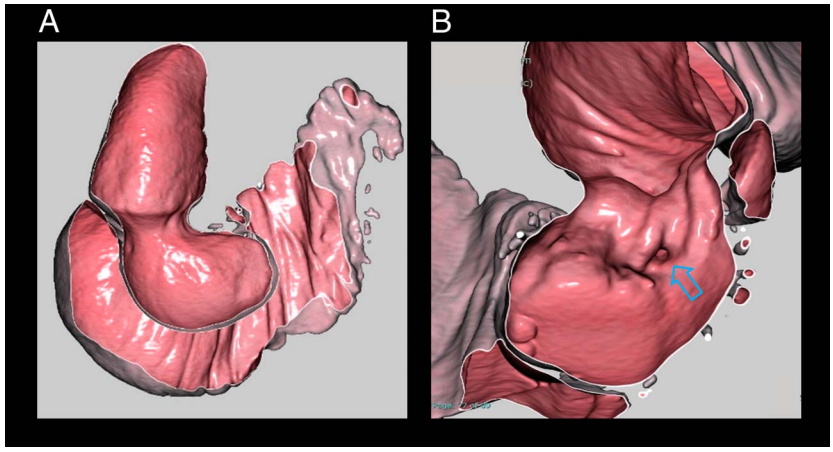

Figure 2. Computed tomography-duodenography images showing (A and B) the second portion of the duodenum is dilated and appears saccular: This proved to be the blind end of the duodenum. (B) A small orifice (arrow) is evident.

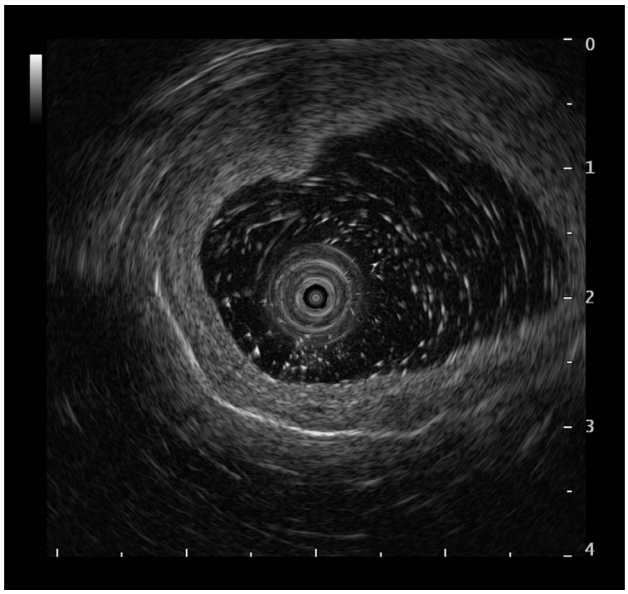

Figure 3. Endoscopic ultrasound images showing that the true and blind portions of the duodenum share a muscular layer.

nausea/vomiting; furthermore, pancreatitis occurs in 53% of patients.[1] In the present case, no factors such as gallstones or dyslipidemia that would normally cause acute pancreatitis could be noted, and acute pancreatitis was thought to have developed as a result of pressure on the papilla of Vater caused by accumulation of food residue in the blind end of the duplication of the duodenum. We chose endoscopic treatment because our patient's duodenal duplication was of the tubular type, and we had accurately evaluated the anatomy by CT-D. This choice resulted in earlier discharge than would have been possible after surgery. Traditionally, evaluation of the duodenum by imaging has been undertaken by hypotonic duodenography using barium solution. CT-D is superior to conventional methods, in that it enables diagnostic assessment from a variety of angles and shows the position of the anomaly regarding surrounding organs. Sata et al reported that CT-D imaging with the duodenum fully dilated depicts duodenal stenosis, protruding lesions, and small tumors and ulcers in the papilla of Vater.[9] It is very important to clarify the structure of the affected part of the gastrointestinal tract before embarking on endoscopic treatment, and a CT-D appears to be the best means of characterizing morphological abnormalities of duodenum, as in the present case.

DISCLOSURES

Author contributions: K. Ota wrote the manuscript and treated the patient and is the article guarantor. T. Nagasue edited the manuscript, performed the endoscopies, and treated the patient. D. Tsurumaru contributed to imaging studies. N. Imazu, S. Kawatoko and Y. Matsuno conceived and prepared the manuscript. S. Fujioka and K. Kawasaki contributed to the drafting and critical revision of the manuscript. J. Umeno and T. Torisu critically evaluated and gave final approval for the version to be published. T. Yoshihara and H. Kobayashi treated the patient and contributed to the diagnosis. All authors provided important intellectual input and critically revised the manuscript. All authors have approved the final version of the manuscript.

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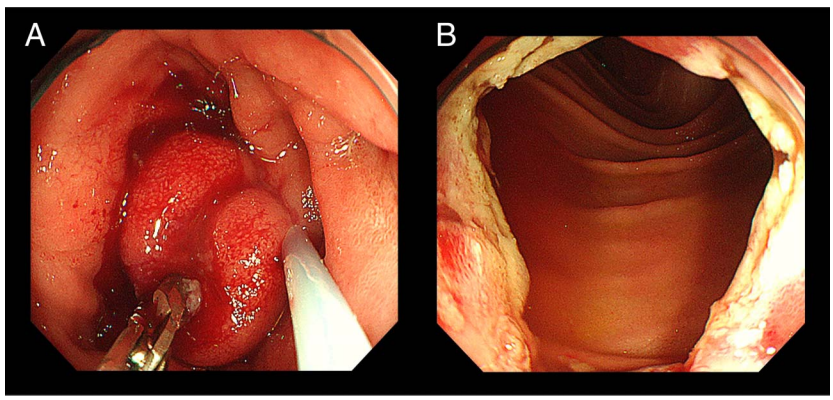

Figure 4. (A) The snaring of the blind end was performed with the grasp-and-snare technique. (B) The blind end was excised and opened.

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