

Case Report

Meckel's Diverticulum Diagnosed on Double-balloon Enteroscopy

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Background: Meckel's diverticulum is a congenital anomaly of the gastrointestinal tract and is situated 40-130 cm from the ileocecal junction. Thus, it is difficult to detect endoscopically prior to surgery. However, double-balloon enteroscopy (DBE) enables the entire small intestine to be examined.

Case Report: A 29-year-old man presented with a 4-day history of melena without abdominal pain. Upper gastrointestinal endoscopy, colonoscopy, abdominal contrast-enhanced computed tomography, radiolabeled red cell scintigraphy, and technetium(Tc) 99m pertechnetate scintigraphy did not detect the source of bleeding. However, on retrograde DBE, a Meckel's diverticulum, which had a small ulcer, was found in the distal part of the ileum. The diverticulum was resected laparoscopically. The patient's postoperative course was uneventful; the patient continues to be in complete remission.

Conclusions: This is the case of the Meckel's diverticulum that was preoperatively diagnosed using DBE.

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Keywords: Meckel's diverticulum; Double-balloon enteroscopy; Retrograde; Obscure gastrointestinal bleeding

Introduction

Meckel's diverticulum is the most common congenital anomaly of the gastrointestinal tract; the incidence of Meckel's diverticulum on autopsy ranges from 0.3% to 4% (1, 2). The diverticulum is usually situated 40-130 cm from the ileocecal junction; it is therefore difficult to detect endoscopically prior to surgery (3). However, DBE, developed by Yamamoto et al., enables the entire small intestine to be examined (4).

Case report

A 29-year-old man presented with a 4-day history of massive melena. He had a history of melena 9 years prior. His family history was noncontributory. The initial upper endoscopy done at another hospital did not identify the source of bleeding. On colonoscopy, blood clots were seen, but no source of bleeding could be identified. On admission, the patient was pale and hypotensive (systolic

blood pressure, 80 mmHg), and there were no abdominal signs. His red blood cell count was $250 \times 10^9/\text{mm}^3$, his hemoglobin was 7.4 g/dl, and his hematocrit was 22.0%. There were no other abnormal laboratory findings. The source of bleeding could not be identified on abdominal contrast-enhanced computed tomography and radiolabeled red cell scintigraphy. Retrograde DBE was done; a large diverticulum was seen in the distal part of the ileum, and a small ulcer was present at the neck of the diverticulum (Figure 1). On barium contrast radiography of the small intestine, the ileal diverticulum was evident (Figure 2). Furthermore, radiolabeled red cell scintigraphy and Tc-99m pertechnetate scintigraphy failed to detect the source of bleeding. Nevertheless, a presumptive diagnosis of Meckel's diverticulum was made, and the patient had an elective laparotomy. A Meckel's diverticulum, which measured 40x50 mm in diameter that was located approximately 50 cm proximal to the ileocecal junction, was resected laparoscopically. Histological examination of resected specimen showed erosion and ectopic gastric mucosa near the ulcer scar (Figure 3). The patient's postoperative course was uneventful, and he continues to be in complete remission six

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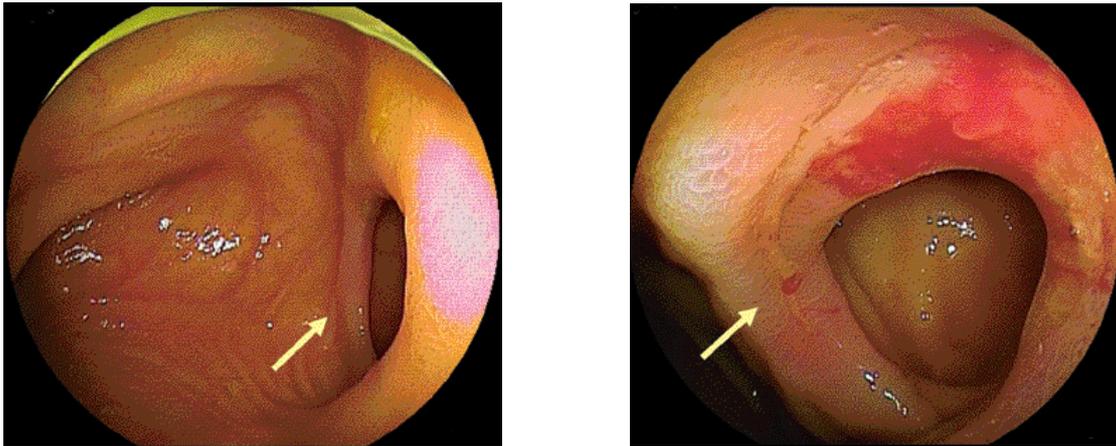


Figure 1. Double-balloon enteroscopy shows a large diverticulum(arrow) in the distal part of the ileum as well as a small ulcer at the neck of the diverticulum.

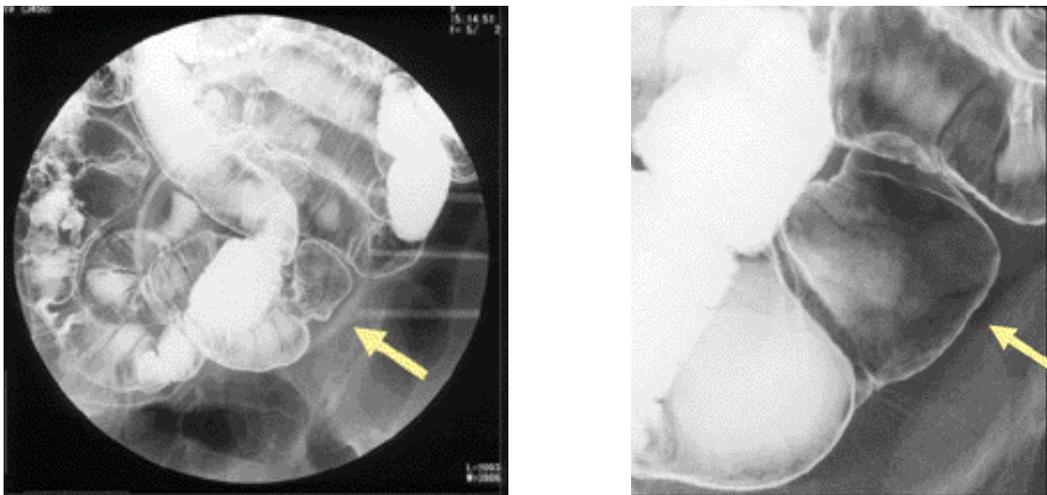


Figure 2. On double-contrast study of the small intestine, the ileal diverticulum is evident(arrow).

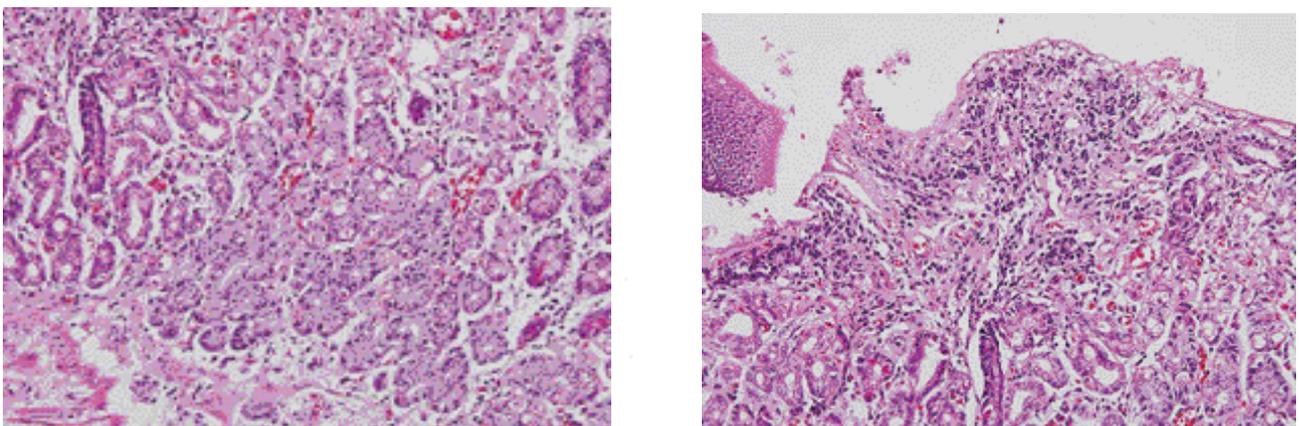


Figure 3. Histological examination (hematoxylin-eosin stain) of resected specimen shows erosion and ectopic gastric mucosa near the ulcer scar.

months after resection.

Discussion

We detected the Meckel's diverticulum with DBE but not with any other examinations. We searched pubmed sites for keywords "Meckel's diverticulum, double-balloon enteroscopy", and 11 articles including 17 cases fulfilled the conditions. The inclusion record of domestic proceedings increased 18 articles including 29 cases in *Japana Centra Revuo Medica*.

Meckel's diverticulum is generally asymptomatic; 80% of patients who develop complications related to the diverticulum do so during the first 5 years of life (3, 5, 6). In patients less than 18 years of age, the most frequent complication is bleeding (>50%); in the vast majority of such cases, the diverticulum contains heterotopic gastric mucosa (7). Meckel's diverticulum is difficult to detect nonsurgically.

In most of the last 18 reports, DBE were performed after various combinations from examinations such as upper gastrointestinal endoscopy, colonoscopy, abdominal CT, video capsule endoscopy (VCE), Tc-99m pertechnetate scintigraphy and radiolabeled red cell scintigraphy. Although Tc-99m pertechnetate scintigraphy is useful, particularly in patients with ectopic gastric tissue, its sensitivity has been reported to be no more than 60% in a study of 235 patients with Meckel's diverticulum and anemia (8). In our patient, the lesion included ectopic gastric mucosa, but it was not identified on the scintigraphy. Radiolabeled red cell scintigraphy was performed in only 3 cases. These reports were published from 2003 when DBE became commercially available. Probably, high-priority examinations are changing because endoscopic technologies are evolving.

There are several reports in the literature dealing with the detection of Meckel's diverticulum using VCE(9, 10, 11), which is a noninvasive technique that allows the entire alimentary tract to be visualized (12). DBE allows the visualization of the entire small intestine and allows detailed examination of an area of interest; it is quicker and less painful than previous endoscopic techniques (4, 13). DBE has been reported to be useful for detecting certain diseases of the small intestine, which are very rarely observed using conventional techniques. Indeed, there are reports dealing with the preoperative diagnosis of Meckel's diverticulum using DBE(4, 14). According to an another report, comparison of overall detection

rate of abnormalities in the small bowel between VCE (65%) and DBE (53%) was not significantly different, nor was that of overall diagnostic yield between VCE (50%) and DBE (53%). Thus, there is not a significant difference in the amount of diagnostic ability between VCE and DBE in use of these procedures independently (15). After DBE launched on the market, it is important that we estimate the outline of the bleeding. Therefore VCE is being more useful in combination with DBE.

Conclusions

This is the case of the Meckel's diverticulum that was preoperatively diagnosed using DBE. With the increase use of DBE, more cases with Meckel's diverticulum will be detected.

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