

[ CASE REPORT ]

## Mid-esophageal Diverticular Bleeding in a Patient with Kyphosis

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### Abstract:

Mid-esophageal diverticulum is a rare disease, formed by the traction caused by inflamed bronchial lymph nodes or by pulsion induced by motility disorder. We herein report a case of mid-esophageal diverticular bleeding in a patient with kyphosis who was taking an anti-platelet drug. She was successfully treated with endoscopic hemostasis. An 80-year-old woman presented to our emergency department with hematemesis. She had kyphosis and was taking dipyridamole for her chest pain. Emergent upper endoscopy revealed bleeding from a mid-esophageal diverticulum; hemostasis was achieved via clipping. Mid-esophageal diverticula can cause upper gastrointestinal bleeding. An endoscopic examination and hemostasis are effective treatments.

**Key words:** mid-esophageal diverticula, diverticular bleeding

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### Introduction

Gastrointestinal diverticula are usually asymptomatic and need no treatment. Mid-esophageal diverticula, which are true diverticula, develop as a result of traction from inflamed bronchial lymph nodes or pulsion by motility disorder (1).

We herein report a rare case of bleeding from a mid-esophageal diverticulum in a patient with kyphosis who was taking an anti-platelet drug. An endoscopic examination and hemostasis with clipping were effective.

### Case Report

An 80-year-old woman presented to our emergency department with hematemesis. She had a medical history of chest pain and had been taking dipyridamole after a diagnosis of angina pectoris. On arrival, her blood pressure was

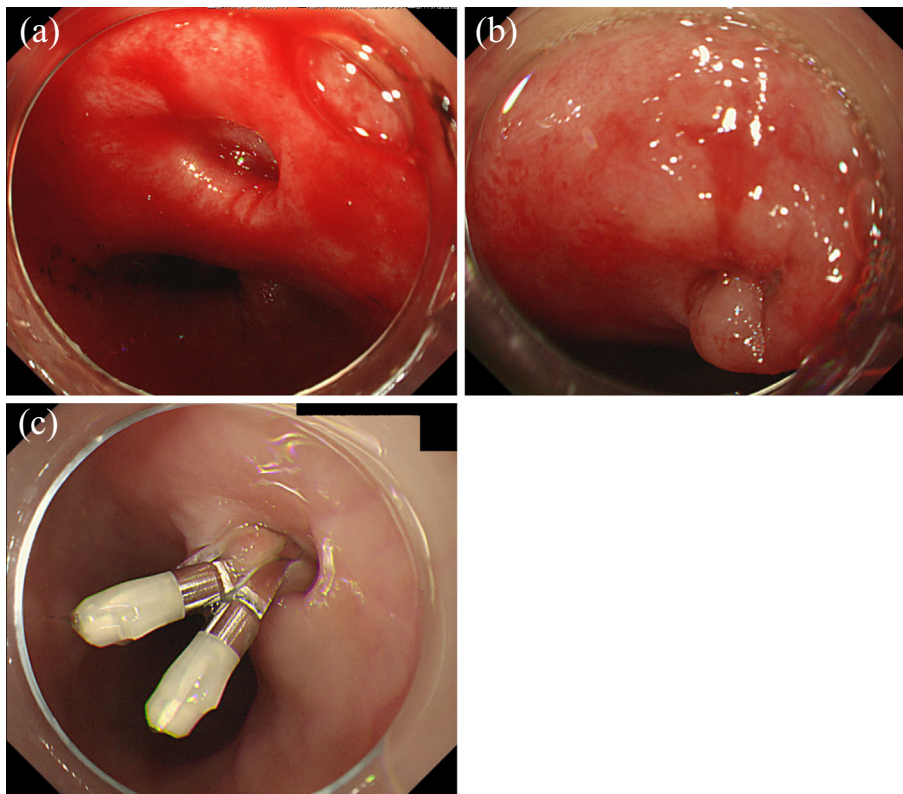
135/74 mmHg, heart rate 89 beats per minute, and body temperature 36.7°C. She complained of nausea but no abdominal pain, melena, or diarrhea. Her laboratory test results were as follows: hemoglobin, 8.4 g/dL; hematocrit, 27.1%. Leukocyte and platelet counts were within normal ranges.

An emergency upper endoscopic examination revealed active esophageal bleeding from a small diverticulum at the anterior wall, 25 cm from the incisors (Fig. 1a). A small ulcer at the bottom of the diverticulum was revealed after endoscopic suctioning and inverting the diverticulum into the cap attachment. A hemostatic clip was immediately applied directly to the point of bleeding, the small ulcer at the bottom of the diverticulum. In addition, two hemostatic clips were applied, and the diverticulum opening was sutured (Fig. 1b). Bleeding was stopped with clipping, after which thrombin was sprayed around the diverticulum. A large hiatal hernia was observed. Reflex esophagitis was not observed. The stomach and duodenum appeared normal. Gastric atrophy was not observed on an endoscopic examina-

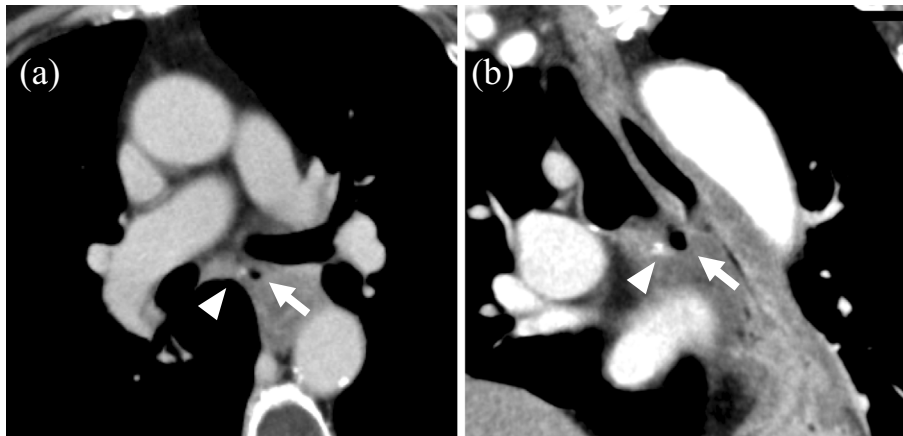
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**Figure 1.** (a) An endoscopic examination revealed bleeding from the mid-esophageal diverticulum in the anterior wall. (b) Inverted diverticula during endoscopic hemostasis. (c) A clipping procedure at the bottom and opening of the diverticulum resulted in hemostasis.



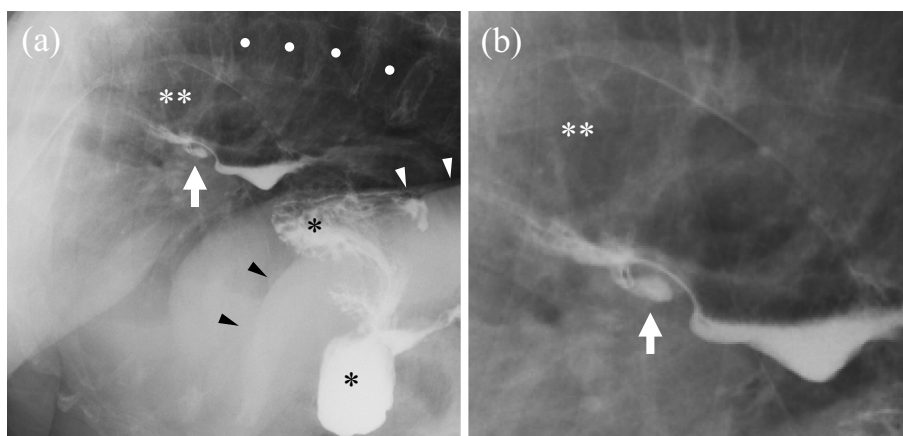
**Figure 2.** Computed tomography (CT) revealed the mid-esophageal diverticulum (arrows) close to the tracheal bifurcation. Adjacent the diverticulum, a lymph node with small calcification (arrowheads) was revealed. (a) Horizontal sectional view, (b) sagittal sectional view.

tion, and serum anti *Helicobacter pylori* IgG antibody was negative. Following the endoscopic hemostasis, the patient was treated with fasting and administered the proton pump inhibitor omeprazole 20 mg by injection 2 times a day.

Contrast-enhanced computed tomography (CT) showed a mid-esophageal diverticulum close to the tracheal bifurcation. Adjacent to the diverticulum, a lymph node with a small calcification was seen, suggesting a cicatrix of tuberculous lymphadenitis (Fig. 2). Diverticula usually develop due to traction from the lymph node. An esophagogram re-

vealed retention of the contrast medium in the diverticulum of the anterior wall (Fig. 3). Because of significant kyphosis in the patient, her esophagus was approximately parallel to the ground in a standing position. There was a large hiatal hernia, and a large quantity of backflow from the stomach was seen. Eight days after admission, upper endoscopy showed three hemoclips on the diverticulum with no bleeding or blood clots.

After endoscopic hemostasis, the patient remained well with no hematemesis or nausea, and anemia gradually im-



**Figure 3.** An esophagogram, left lateral view, revealed retention of the contrast medium in the diverticulum of the anterior wall (arrows). (a) A large quantity of backflow from the stomach (asterisk) to the esophagus (double asterisk) was shown because of kyphosis and a large hiatal hernia. Vertebrae (dots) and diaphragm (arrowheads) are also shown. (b) Magnifying view of the mid-esophageal diverticulum. A hemoclip remained at the opening of the diverticulum.

proved without the need for blood transfusion. The administration of dipyridamole was stopped, and omeprazole 20 mg orally once a day was continued. Medical guidance was provided to prevent gastroesophageal reflux. The patient was discharged and continues to be well three years after treatment with no recurrence of gastrointestinal bleeding.

## Discussion

We describe two important clinical findings in this case. First, mid-esophageal diverticular bleeding can occur in a patient with kyphosis on an anti-platelet drug; and second, emergent endoscopic hemostasis is effective.

Esophageal diverticulum is classified according to its location into three categories: pharyngoesophageal (Zenker), mid-esophageal (Rokitansky), and epiphrenic. Mid-esophageal diverticulum is a true diverticulum, as it comprises all of the layers of the esophageal wall. Mid-esophageal diverticulum develops due to traction from inflamed bronchial lymph nodes. A recent study that reported the high coexistence ratio of motor disorder and mid-esophageal diverticulum suggested that the increase in intraluminal pressure by motility disorder secondarily induces the pulsion mechanism by which the diverticulum develops (1). We did not evaluate the esophageal function in this case. Based on the CT findings, we speculated that the diverticulum of this patient developed due to traction from inflamed bronchial lymph nodes. Esophageal diverticula are usually asymptomatic and rarely come to medical attention. If large or inflammatory diverticula occur associated with dysphagia or odynophagia, surgical resection may be required. Esophageal diverticular bleeding is very rare, and only six cases have been reported to date (2-7).

Kyphosis increases the risk of gastroesophageal reflux disease (GERD). GERD is induced by a decrease in the lesser esophageal sphincter (LES) pressure and regurgitation of

gastric contents into the esophagus. Hiatal hernia is a major cause of decreased LES pressure and has a positive correlation with the severity of kyphosis (8, 9). In this case, as represented by a contrast X-ray examination, the reflux and retention of gastric acid or dietary constituents stimulated mucosal injury in the diverticulum. In a study of seven cases of mid-esophageal diverticular bleeding, four cases, including our own, had coexisting hiatal hernia (Table). Furthermore, in the present case, acid secreted from non-atrophic gastric mucosa might have induced mucosal injury in the diverticulum. Therefore, the administration of a proton-pump inhibitor helped keep the patient well-maintained without recurrence of bleeding for three years.

Use of aspirin, other non-steroidal anti-inflammatory drugs (NSAIDs), or anti-platelet drugs increases the risk of diverticular bleeding in the colon (10). NSAIDs, including aspirin, are thought to damage the colonic mucosa via a direct topical effect and/or impaired prostaglandin synthesis, thus compromising the mucosal integrity, increasing the permeability, and enabling the influx of bacteria and other toxins (10). Although the risk factors for esophageal diverticular bleeding are not known, the use of dipyridamole might have induced mucosal injury and bleeding in our patient. In the study mentioned earlier, two patients had been on anti-platelet drugs (Table).

A hemostatic approach for mid-esophageal diverticular bleeding has not yet been established. Three cases, including our own, were treated with an endoscopic approach, one was treated with injection therapy, and one was treated with injection therapy and clipping and subsequently with the Sengstaken-Blakemore double (S-B) tube (Table). Endoscopic hemostatic procedures for diverticular bleeding are mostly practiced in the colon. Colonic diverticula are usually small pseudo-diverticula, and colonic diverticular bleeding is the main cause of lower gastrointestinal bleeding. Endoscopic clipping provides a high hemostatic rate, relatively

**Table. Clinical Features of Mid-esophageal Bleeding.**

No.	Reference	Age/ sex	Hiatal hernia	NSAIDs	Size	Number	Hemostatic therapy
1	2	55/F	Yes	No	NA	2	No (spontaneous hemostasis)
2	3	56/F	Yes	No	small	1	Surgery
3	4	82/F	Yes	Yes	large	1	Endoscopic (epinephrine injection)
4	5	56/F	No	No	small	multiple	No (spontaneous hemostasis)
5	6	63/M	No	No	giant	1	Endoscopic (injection therapy + clipping) S-B tube
6	7	61/M	No	Yes	large	1	PEG
7	This case	83/F	Yes	Yes	small	1	Endoscopic (clipping)

NA: not available, S-B: Sengstaken-Blakemore, PEG: percutaneous endoscopic gastrostomy

few complications, and a low re-bleeding rate for colonic diverticular bleeding. Endoscopic clipping is divided into two procedures: direct placement, which involves clipping to the bleeding vessel; and indirect placement, which involves clipping and suturing of the opening of the diverticulum. Direct placement reduces the re-bleeding rate from the colonic diverticulum more than indirect placement (11).

This is the first case of mid-esophageal diverticular bleeding that was successfully treated with the endoscopic clipping procedure. In our case, kyphosis and the administration of antiplatelet drugs may have induced the mid-esophageal diverticular bleeding, which was effectively treated using the endoscopic hemoclip procedure by direct placement.

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

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