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【 CASE REPORT 】

# Discrepancy between Abdominal Symptoms and Endoscopic Findings in Patients with Gastro-duodenal Eosinophilia: A Case Series

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**Abstract:**
Some patients present gastro-duodenal eosinophilia without abdominal symptoms. Nine cases with gastro-duodenal eosinophilia were seen at the Tohoku University Hospital between January 2011 and June 2022. Seven (78%) patients had a background of allergic or hyper-eosinophilic disease. Esophagogastroduodenoscopy showed erosions (n=6), discoloration (n=4), ulcers (n=3), erythema (n=3), muskmelon-like appearance (n=2), and cracks (n=1). Two cases were asymptomatic with eosinophilic gastroenteritis (EGE)-like endoscopic findings, and two were symptomatic with normal endoscopic findings. The discrepancy between the abdominal symptoms and esophagogastroduodenoscopy findings suggests that clinicians should assess patients for background allergic disease, regardless of abdominal symptoms.

**Key words:** eosinophilic gastroenteritis, abdominal symptoms, endoscopic findings

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## Introduction

Eosinophilic gastroenteritis (EGE) is a disease of unknown etiology, and is often associated with allergic or hypereosinophilic disease (1, 2). Recently, cases of EGE presenting with various esophagogastroduodenoscopy (EGD) findings in the stomach (e.g., erosions, erythema, ulceration, and muskmelon-like appearance) have been reported (3, 4). Abdominal symptoms, such as pain, diarrhea, and nausea/vomiting are essential for the diagnosis of EGE (5, 6). However, some patients present gastroduodenal eosinophilia without abdominal symptoms. The relationship between endoscopic findings and symptoms in EGE patients has been unclear. Furthermore, there have been few reports focusing on the differences between symptomatic EGE and asymptomatic gastroduodenal eosinophilia based on endoscopic findings.

### Methods

We summarized the background and endoscopic findings of patients with gastro-duodenal eosinophilia, defined as ≥20 cells per high power field (HPF), irrespective of abdominal symptoms. This case series was approved by the ethics committee of Tohoku University Graduate School of Medicine (CR-ER22-028).

## Case Reports

Among patients managed at Tohoku University Hospital between January 2011 and June 2022, we encountered nine patients with eosinophilic infiltration (≥20 cells per HPF), diagnosed based on biopsies of the stomach and/or duodenum. All patients are presented in Table 1. Among the nine patients, six were diagnosed with EGE and three were diagnosed with non-EGE. Two cases were asymptomatic; how-

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**Table 1.** **Case List.**

| No. | Age | Sex | Diagnosis | Abdominal symptoms | Allergic or hypereosinophilic disease | Peripheral eosinophils (%) | Serum IgE (IU/mL) | *H. pylori* status | Abnormal ascites | EGD findings (Eosinophil count: /HPF) | | | Treatment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Esophagus | Stomach | Duodenum | |
| 1 | 22 | Female | EGE | Epigastric pain, nausea, diarrhea | Seasonal allergic rhinitis | 40.2 | 83 | NA | Negative | Normal appearance (<20) | Normal appearance (50) | Normal appearance (50) | PSL, P-cab, antihistamine |
| 2 | 48 | Female | Non-EGE | No symptom | Subcutaneous angioblastic lymphoid hyperplasia with eosinophilia (Kimura's disease), food allergy | 53 | 40,397 | Negative | Negative | Normal appearance (NA) | Muskmelon-like appearance, cracks, erythema (80) | Normal appearance (NA) | PPI |
| 3 | 47 | Male | Non-EGE | Dysphagia | None | 6.6 | 69 | Negative (eradicated) | Negative | Rings (>100) | Discoloration (>100) | Discoloration (<20) | Course observation |
| 4 | 48 | Male | EGE | Epigastric pain | None | 4.1 | 303 | Negative | Negative | Normal appearance (<15) | Ulcers, erosions, erythema (50) | Discoloration (<20) | PSL, P-cab, antihistamine |
| 5 | 63 | Male | EGE | Epigastric pain, diarrhea | Urticaria, food allergy | 65.9 | 28 | NA | Negative | Normal appearance (<15) | Erosions, discoloration (60) | Normal appearance (60) | Course observation |
| 6 | 14 | Male | EGE | Epigastric pain, nausea, diarrhea | Asthma | 11.4 | 1,400 | Negative (eradicated) | Negative | Normal appearance (<15) | Normal appearance (25) | Normal appearance (<20) | PPI |
| 7 | 49 | Female | Non-EGE | No symptom | Seasonal allergic rhinitis | 2.4 | 88 | Negative (eradicated) | Negative | Normal appearance (NA) | Discoloration, erosions, erythema (30) | Normal appearance (NA) | PPI |
| 8 | 46 | Female | EGE | Epigastric pain, diarrhea | Asthma, seasonal allergic rhinitis, EGPA | 54 | 2,255 | NA | Negative | Normal appearance (20) | Muskmelon-like appearance, ulcers, discoloration (20) | Normal appearance (<20) | PSL |
| 9 | 48 | Female | EGE | Epigastric pain, nausea | Asthma, seasonal allergic rhinitis, EGPA | 23 | 1,267 | NA | Negative | Edema (50) | Erosions, ulcers (50) | Erosions, discoloration (<20) | PSL, P-cab |

EGE: eosinophilic gastroenteritis, EGD: esophagogastroduodenoscopy, EGPA: eosinophilic granulomatosis with polyangiitis, PSL: prednisolone, PPI: proton-pump inhibitor, P-cab: potassium-competitive acid blocker, HPF: high-power field

ever, they had EGE-like endoscopic findings. Two cases were symptomatic but had normal EGD findings. All six patients with EGE underwent a histological examination due to prolonged abdominal symptoms. The median age of the nine patients was 48 years, and 78% of the patients had background allergic or hypereosinophilic disease. The major symptoms were abdominal pain (67%), diarrhea (44%), and nausea (33%). Peripheral blood eosinophilia was present in 67%, and elevated serum IgE levels were observed in 56% of the patients. Erosions (67%), discoloration (44%), ulcers (33%), erythema (33%), muskmelon-like appearance (22%), and cracks (11%) were observed and occasionally overlapped in the same case (Table 2). We herein present two cases with discrepancies between abdominal symptoms and endoscopic findings.

## ＜Case 1＞

A 22-year-old woman with a history of seasonal allergic rhinitis developed epigastric pain and diarrhea followed by nausea and back pain. She underwent initial EGD at another hospital; no abnormalities were found, and she was referred to our hospital for close examination. Blood tests revealed an increase in the peripheral blood eosinophil count (40.2%). EGD revealed no abnormalities in the stomach or duodenum (Fig. 1a, b). However, a biopsy specimen revealed eosinophilic infiltration of >50 cells/HPF (Fig. 1c). Based on her symptoms and eosinophilic infiltration, EGE was diagnosed. Treatment was started with oral prednisolone

**Table 2. Summary Findings of Nine Cases.**

| | Total (n=9) |
|---|---|
| **Sex (male/female)** | 4/5 |
| **Age (median, range)** | 48 (14-63) |
| **Allergic or hypereosinophilic disease (%)** | 7 (78%) |
| **Abdominal symptom (%)** | |
| Epigastric pain | 6 (67%) |
| Diarrhea | 4 (44%) |
| Nausea | 3 (33%) |
| Dysphagia | 1 (11%) |
| No symptoms | 2 (22%) |
| **Elevated peripheral eosinophil count, >8.5%** | 6 (67%) |
| **Elevated serum IgE, >170 IU/mL** | 5 (56%) |
| **EGD findings in stomach (%)** | |
| Erosions | 6 (67%) |
| Discoloration | 4 (44%) |
| Ulcer | 3 (33%) |
| Erythema | 3 (33%) |
| Muskmelon-like appearance | 2 (22%) |
| Cracks | 1 (11%) |
| Normal appearance | 2 (22%) |

EGD: esophagogastroduodenoscopy

(30 mg/day), montelukast, and a potassium-competitive acid blocker (P-cab). Her symptoms improved two weeks after the initiation of treatment, and the corticosteroid dose was gradually tapered. Corticosteroids were administered for nine weeks in total, and the other medications were discontinued at the same time. She remained in clinical remission for one year without medication.

## ＜Case 2＞

A 48-year-old woman with a history of subcutaneous angioblastic lymphoid hyperplasia with eosinophilia (Kimura disease) was referred to our department for EGD screening. She also had food allergies, particularly in response to eggs. No abdominal symptoms were observed. Blood tests showed an elevated peripheral blood eosinophil count (53%) and IgE level (40,397 IU/mL). EGD revealed generalized erythema and edematous mucosa in the stomach (Fig. 2a). Multiple cracks with edematous mucosa were observed in the antral area (Fig. 2b). A histological examination of a gastric mucosal specimen revealed eosinophilic infiltration of >80 cells/HPF (Fig. 2c). Corticosteroids were not used because this patient had no abdominal symptoms and could not be diagnosed with EGE. Proton pump inhibitors (PPI) were

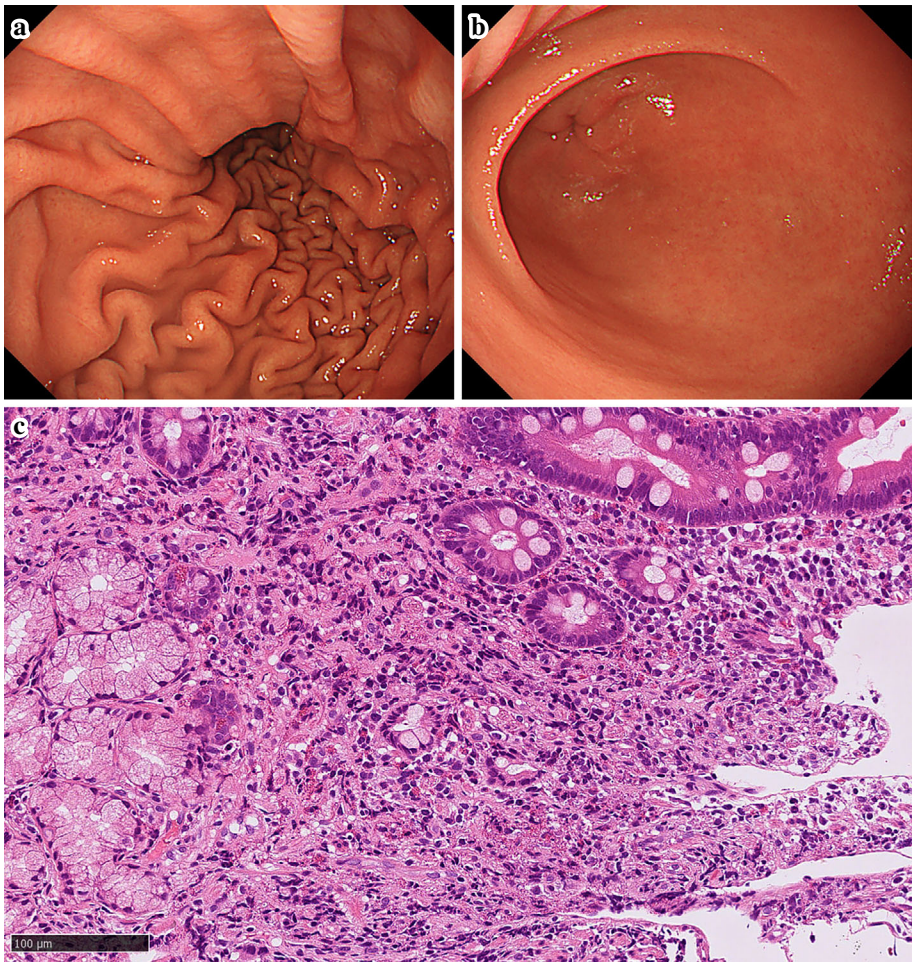


**Figure 1. Esophagogastroduodenoscopy showed no abnormalities in either the body (a) or the antral area (b) of the stomach. The histological examination of a biopsy specimen from the duodenal bulb revealed marked submucosal eosinophilic infiltration with 50 eosinophils/high-power field (c).**

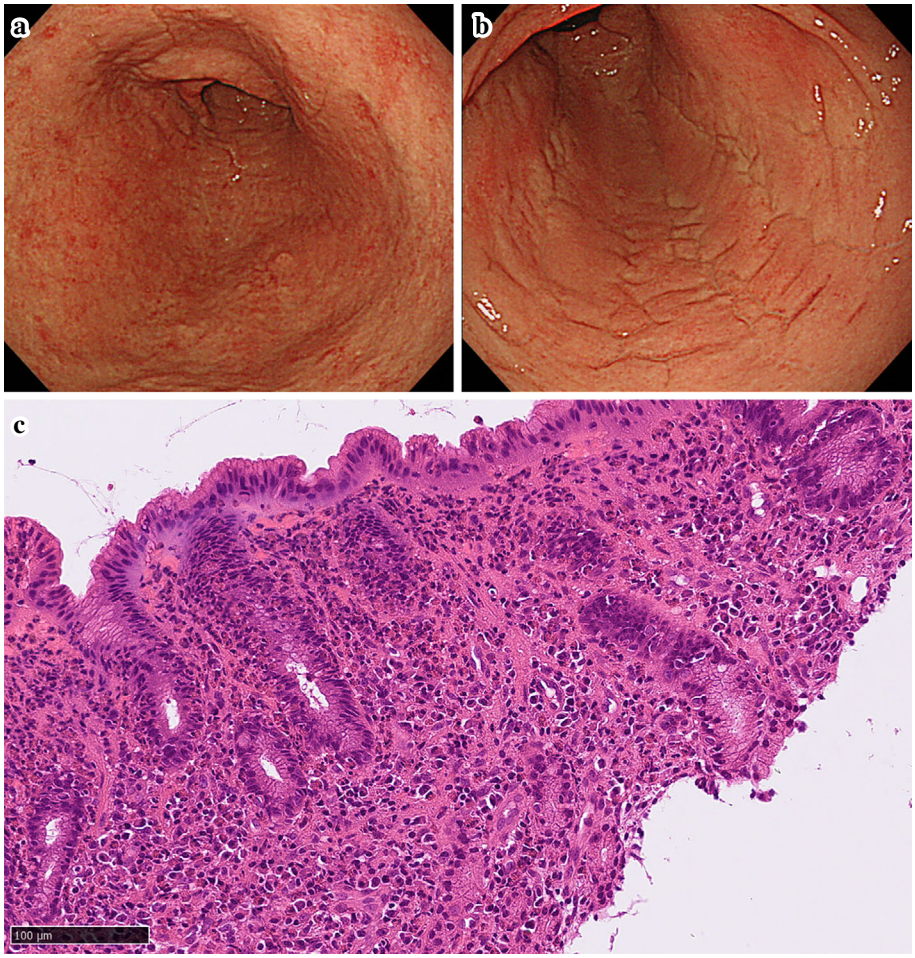


**Figure 2.** **Generalized erythema and edematous mucosa were apparent in the stomach (a). Multiple cracks with edematous mucosa were observed in the antral area (b). Biopsy specimens from the stomach revealed eosinophilic infiltration with 80 eosinophils/high-power field, with an abscess-like appearance in some sites (c).**

used to reduce the patient's gastric mucosal inflammation. However, the endoscopic edematous appearance and eosinophilic infiltration did not improve, even after the initiation of PPI administration. Therefore, PPI administration was stopped after EGD at the one-year follow-up examination.

As shown in Table 1, another asymptomatic case was Case 7, which involved a patient with seasonal rhinitis. Endoscopy at the diagnosis was not performed during the season in which the patient experienced allergy symptoms, and EGD showed discoloration, erythema, and erosion in the stomach. PPI treatment was tried for one year and discontinued. She remained free of symptoms for the whole observation period, irrespective of the administration of PPI.

## Discussion

While reports on EGE are accumulating, there is limited information on asymptomatic patients with EGE-like endoscopic findings and eosinophilic infiltration. This case series showed that there was a discrepancy between symptoms and endoscopic findings in some cases, indicating that EGE-like endoscopic findings and allergic mechanisms may be involved, even in patients with asymptomatic gastroduodenal eosinophilic infiltration. Itawaki et al. reported two cases of eosinophilic granulomatosis with polyangiitis (EGPA) that were initially diagnosed as EGE (7). Similarly, there were two cases of EGPA and one case of subcutaneous angioblastic lymphoid hyperplasia with eosinophilia in our report. The two cases of EGE in our report showed a normal appearance; however, they presented eosinophilic infiltration in the histological examination. The reported prevalence of EGE patients with a normal appearance on EGD was 11-62% in previous reports (3, 4, 8), and this may be affected by each clinician's decision to obtain biopsy specimens from an area with a normal appearance. Therefore, when patients present with prolonged abdominal symptoms, clinicians should assess the patient for background allergic disease, peripheral blood eosinophilia, or elevated serum IgE. If the patient has one or more features, irrespective of the endoscopic findings, clinicians should consider obtaining biopsy specimens from multiple sites (e.g., the greater curvature of the body, lesser curvature of the body, and duodenal bulb) to definitively diagnose EGE. Random biopsies in cases with a normal appearance on EGD are probably acceptable because

no difference between targeted and random biopsies has been reported when eosinophilia exceeds 20 cells/HPF (3). The need for treatment of EGE is generally determined according to the severity of symptoms (9). Corticosteroids are the most commonly recommended drug therapy for EGE. However, treatment resistance is an important issue. Havlichek et al. reported that 63% of 18 severe EGE cases had chronic symptoms that required chronic medical therapy (6). Other immunosuppressive agents, acid-suppressive agents such as PPIs or P-cab, and anti-interleukin agents have been used as novel drugs for EGE; however, none has demonstrated greater efficacy than that of corticosteroids (9, 10). There is a lack of information on background factors, epidemiology, and the management of patients with asymptomatic gastroduodenal eosinophilia. Further cohort or interventional studies investigating the difference between EGE and asymptomatic gastroduodenal eosinophilia may be needed, because both may have the same background, regardless of symptoms.

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

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