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Case Report

Ulcerative gastric MALT lymphoma with marked eosinophilic infiltration: a case report

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Abstract: Primary gastric lymphoma (PGL) is a rare form of non-Hodgkin lymphoma, mainly comprising mucosa-associated lymphoid tissue (MALT) lymphoma and diffuse large B-cell lymphoma (DLBCL). The clinical significance of marked eosinophilic infiltration in gastric MALT lymphoma remains unclear. We report a 50-year-old male with a two-year history of recurrent abdominal pain. Endoscopy revealed a large ulcerative lesion in the middle of the greater curvature of the gastric corpus. Histopathology showed *Helicobacter pylori (H. pylori)* infection with marked eosinophilic infiltration, leading to initial diagnostic uncertainty. The patient underwent *H. pylori* eradication therapy, but persistent symptoms required further evaluation with magnifying endoscopy and repeat biopsy. Immunohistochemistry confirmed gastric MALT lymphoma. After a second course of eradication therapy, the lesion size decreased, mucosal healing was observed, and symptoms resolved. This case highlights that gastric MALT lymphoma should be considered in patients with ulcerative lesions accompanied by prominent eosinophilic infiltration, and emphasizes the importance of combined endoscopic and histopathological evaluation for accurate diagnosis.

Keywords: Gastric MALT lymphoma, eosinophilic infiltration, *Helicobacter pylori*, endoscopic diagnosis, Hp eradication therapy

Introduction

Primary gastric lymphoma (PGL) is the most common extranodal form of non-Hodgkin lymphoma and is mainly classified into mucosa-associated lymphoid tissue (MALT) lymphoma and diffuse large B-cell lymphoma (DLBCL) [1, 2]. Gastric MALT lymphoma arises from marginal zone B cells and is closely associated with chronic *Helicobacter pylori (H. pylori)*-induced inflammation [3]. Due to its indolent nature and confinement to the mucosa, the diagnostic yield of initial biopsy is relatively low (11-22%), and endoscopic manifestations are variable, which may lead to misdiagnosis [2, 4]. Magnifying endoscopy can improve diagnostic accuracy, and most patients achieve remission after Hp eradication [5].

Recent studies suggest that eosinophils may participate in the tumor microenvironment of MALT lymphoma, potentially through inflammatory signaling and APRIL production [6]. However, the clinical significance of eosinophilic infiltration in gastric MALT lymphoma remains unclear. Here, we report a case of gastric MALT lymphoma with marked eosinophilic infiltration, which initially caused diagnostic uncertainty, aiming to highlight this potential diagnostic pitfall and improve clinical recognition.

Case presentation

Patient history and initial presentation

A 50-year-old male presented with a two-year history of recurrent abdominal pain, aggravated postprandially. He had a history of intermittent omeprazole use, smoking, and occasional alcohol consumption. Routine laboratory tests were unremarkable.

Initial endoscopy and findings

Upper gastrointestinal endoscopy revealed edematous mucosa with thickened gastric folds and a large ulcerative lesion (3 × 3.5 cm) located in the middle portion of the greater curva-

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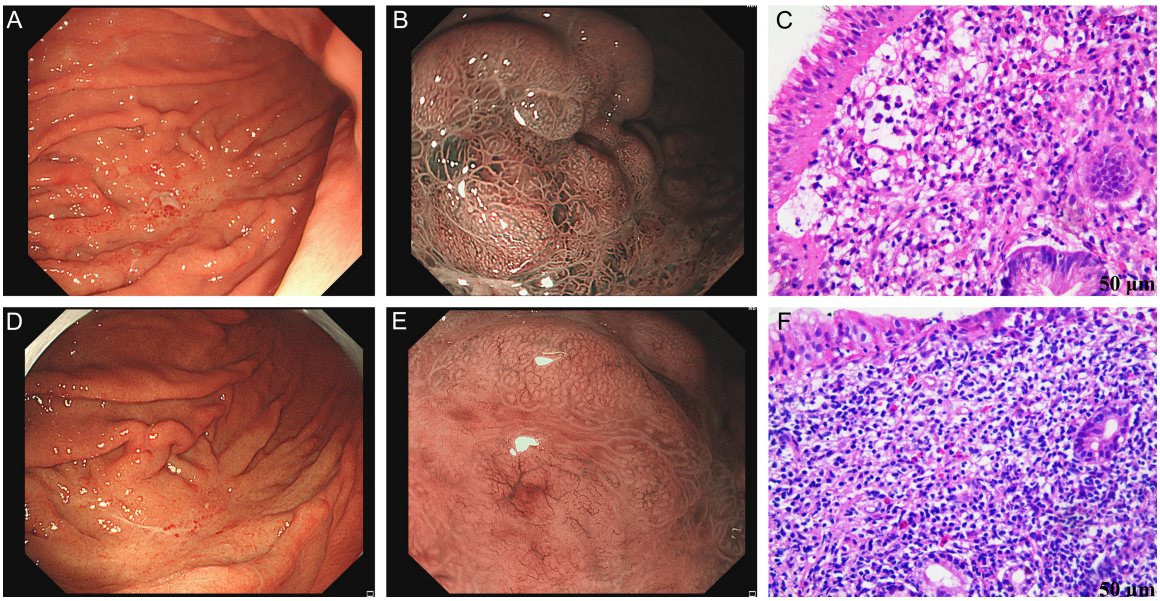

Figure 1. Endoscopic and histopathological findings before and after *H. pylori* eradication. (A, B) Pre-treatment: Conventional endoscopy showing a 3 × 3.5 cm ulcerative lesion at the greater curvature with mucosal edema and fold thickening (A); NBI demonstrating widened intervening parts and irregular microsurface patterns (B); (C) Pre-treatment H&E staining (×40) showing marked eosinophilic infiltration in the lamina propria (~50 eosinophils per high-power field; scale bar = 50 μm); (D, E) Post-treatment: Endoscopy showing reduced lesion size and mucosal healing (D); NBI-ME demonstrating attenuation of abnormal vascular and microsurface patterns (E); (F) Post-treatment H&E staining (×40) showing diffuse lymphocytic infiltration with markedly decreased eosinophils (scale bar = 50 μm). *H. pylori*, *Helicobacter pylori*; NBI, narrow-band imaging; NBI-ME, magnifying narrow-band imaging; H&E, hematoxylin and eosin.

ture (**Figure 1A**). The lesion showed an irregular ulcer base with erosions and central exudates. Narrow-band imaging (NBI) demonstrated widening of the intervening part (IP), with irregular glandular structures and disorganized microsurface architecture, indicating abnormal mucosal patterns (**Figure 1B**).

Microscopic and pathological analysis

The endoscopic findings raised suspicion for a malignant lesion, and multiple biopsies were obtained for further evaluation. Computed tomography (CT) demonstrated slight mucosal enhancement along the greater curvature without evidence of lymphadenopathy or distant involvement. Histopathology revealed chronic active gastritis with *H. pylori* infection, glandular atrophy, intestinal metaplasia, and marked eosinophilic infiltration (~50 eosinophils per high-power field) (**Figure 1C**).

Treatment and follow-up

The patient was treated for 14 days with an appropriate clinical regimen (bismuth 220 mg b.i.d., amoxicillin 1000 mg b.i.d., clarithromycin 500 mg b.i.d., and esomeprazole 20 mg b.i.d.). At 3-month follow-up, the rapid urease test (RUT) was negative, but reactive atypical changes (RAC) were still present. The lesion decreased in size to 2 × 2.5 cm, with a flatter and less prominent central area. NBI showed clearer lesion boundaries with resolution of central white spots and pits, and residual irregular dendritic microvessels without a corkscrew pattern (**Figure 1D**, **1E**).

Confirmation and final diagnosis

Based on these findings, lymphoma was suspected, requiring differentiation from undifferentiated gastric cancer and atrophic gastritis. Biopsy revealed diffuse lymphocytic infiltration of the gastric mucosa (**Figure 1F**). Immunohistochemistry showed strong CD20 positivity, indicating B-cell lineage, with scattered CD3-positive T cells and an expanded CD21-positive follicular dendritic cell network. The absence of CD5 and Cyclin D1 excluded mantle cell lymphoma and other CD5-positive lym-

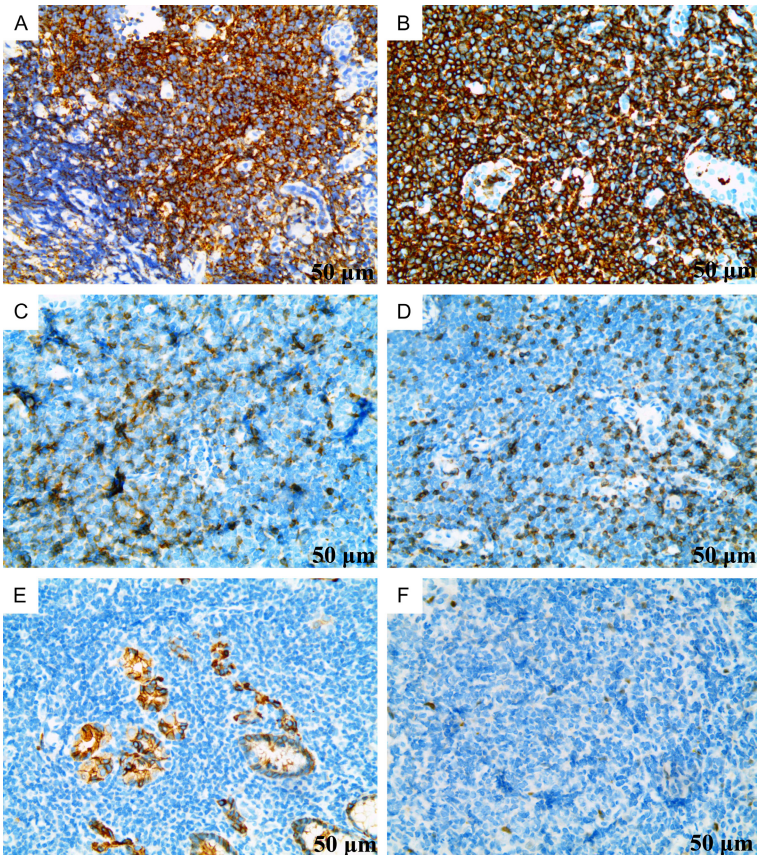

Figure 2. Immunohistochemical findings (×40; scale bar = 50 μm). A. CD21 staining showing expansion of the follicular dendritic cell meshwork; B. CD20 staining demonstrating diffuse membranous positivity in lymphoid cells; C. CD5 negativity in neoplastic cells; D. CD3 staining highlighting scattered background T cells; E. Cytokeratin positive in residual epithelial glands but negative in lymphoid cells; F. Cyclin D1 negative.

phoproliferative disorders. Cytokeratin staining was limited to epithelial structures. These findings supported a diagnosis of gastric MALT lymphoma (**Figure 2A-F**). Endoscopic ultrasound demonstrated thickening of the mucosa, muscularis mucosa, and submucosa (maximum 14.78 mm), with preservation of the muscularis propria and serosa. Enlarged hypoechoic lymph nodes (5.26 × 3.27 mm) were observed along the greater curvature.

Imaging results

Positron emission tomography/CT showed irregular thickening of the gastric corpus with mild uptake (standardized uptake value [SUV] 2.0) and mildly active perigastric lymph nodes (maximum SUV 0.8; largest 5 × 11 mm), without distant metastasis. Combined with endoscopic ultrasound findings indicating disease confined to the mucosa, muscularis mucosa, and submucosa with preserved deeper layers, the tumor was staged as modified Ann Arbor IIE and Lugano IIE1.

Post-diagnosis management and follow-up

Following the diagnosis, the patient received a second 14-day bismuth-based *H. pylori* eradication regimen, resulting in symptom relief and endoscopic improvement. Follow-up biopsy showed lymphoid hyperplasia with residual follicular structures and lymphoepithelial lesions, with markedly reduced eosinophils. Immunohistochemistry confirmed a MALT phenotype (CD20/PAX5 positive; CD10, Cyclin D1, CD23 negative; focal CD3; Ki-67 ~10%). These findings indicated early histologic remission, although histologic response may lag behind *H. pylori* eradication. The patient remained asymptomatic under ongoing endoscopic surveillance.

Discussion

MALT lymphoma is an indolent B-cell lymphoma associated with chronic Hp-induced inflammation and antigenic stimulation [3, 7]. Inflammatory cell infiltration may contribute to oxidative stress and genomic instability, promoting lymphomagenesis. In this case, marked eosinophilic infiltration was observed in the lamina propria prior to treatment, which initially complicated the diagnosis. Although eosinophilic gastritis (EG) was considered, negative allergen and parasite tests, together with histopathological findings, did not support this diagnosis. Unlike EG, which is typically treated with corticosteroids, gastric MALT lymphoma is managed according to *H. pylori* status, and repeat biopsy after *H. pylori* eradication confirmed the diagnosis in this patient.

Eosinophilic infiltration has been reported to interfere with pathological interpretation in

gastric biopsy specimens, particularly in differential diagnosis between EG and MALT lymphoma. Rare cases have also described overlapping eosinophilic inflammatory conditions with MALT lymphoma [8]. However, well-documented reports of confirmed gastric MALT lymphoma with prominent eosinophilic infiltration remain limited, suggesting that this presentation is uncommon.

Endoscopic evaluation plays an important role in diagnosis. Magnifying endoscopy with narrow-band imaging (NBI-ME) can assess microvascular and microsurface patterns, including features such as tree-like appearance (TLA), which may help distinguish MALT lymphoma from other gastric lesions [9]. In this case, repeated endoscopic and histopathological evaluation was essential for accurate diagnosis.

Hp eradication is recommended as first-line therapy for gastric MALT lymphoma, with many patients achieving long-term remission [1, 10]. In the present case, Hp eradication resulted in ulcer regression and symptom improvement, supporting its therapeutic efficacy.

In summary, this case highlights that prominent eosinophilic infiltration may obscure the diagnosis of gastric MALT lymphoma. Careful integration of endoscopic findings and histopathological evaluation is essential. Limitations include the absence of peripheral eosinophil and IgE assessment, preventing evaluation of systemic involvement. Further studies are needed to clarify the clinical significance of eosinophilic infiltration in MALT lymphoma.

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Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Disclosure of conflict of interest

None.

Abbreviations

MALT, mucosa-associated lymphoid tissue; NBI, narrow-band imaging; NBI-ME, magnifying narrow-band imaging; EG, eosinophilic gastritis; *H. pylori*, *Helicobacter pylori*; TLA, tree-like appearance.

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