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# Gastric Eosinophilic Granuloma with Total Gastrectomy: A Case Report

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## Abstract

**Introduction:** The pathologic feature of gastric eosinophilic granuloma is eosinophil cells infiltrated into the muscular and submucous layer of the stomach. We reported a rare case of eosinophilic granuloma of mimicking gastric cancer.

**Case report:** A-48-year old man was referred to the department of surgical oncology with epigastric discomfort, vomiting and general fatigue for five years. Gastrofiberscope showed an ulcer lesion in the middle and posterior wall of the gastric body, and a circumferential ulcer lesion of the antrum, the lumen was narrowed, and the mirror could not pass. Pathology report of the section was in favor of infiltration with abundant eosinophils and intestinal metaplasia. Permanent pathology was confirmed with immunohistochemical staining, which demonstrated immune-reactivity for vimentin. In consideration of pyloric obstruction and multiple ulcers, an operation scheme of total gastrectomy was formulated by multiple disciplinary team. Postoperative immunohistochemical staining demonstrated immune-reactivity for vimentin and S-100, which established the final diagnosis for GEG.

**Discussion and Conclusion:** A rare case of gastric eosinophilic granuloma with three focus distributed at gastric fundus, body and antrum was described. Total gastrectomy was chosen due to three focus and the prognosis was favorable.

**Keywords:** Gastric eosinophilic granuloma; Biopsy; Etiology; Total gastrectomy

**Abbreviations:** GEG: Gastric Eosinophilic Granuloma; MDT: Multiple disciplinary team; ACTH: Adrenocorticotrophic Hormone

## Introduction

Gastric eosinophilic granuloma (GEG) is a rare disease with eosinophil cells infiltrated into mucosal and submucosa of the stomach [1]. The etiology and pathogenesis are still unclear.

Several hypotheses have been conceived, which consider GEG could be related to hereditary factors, inflammatory reactions, allergic reactions, fungal infections and foreign body reactions. GEG is lack of specific clinical presentation and the gastroscopy finding is similar to gastric carcinoma. Therefore, many patients were easily misdiagnosed as gastrohelcosis or even gastric cancer [2]. We reported a rare case of eosinophilic granuloma of the stomach mimicking gastric cancer.

## Case Report

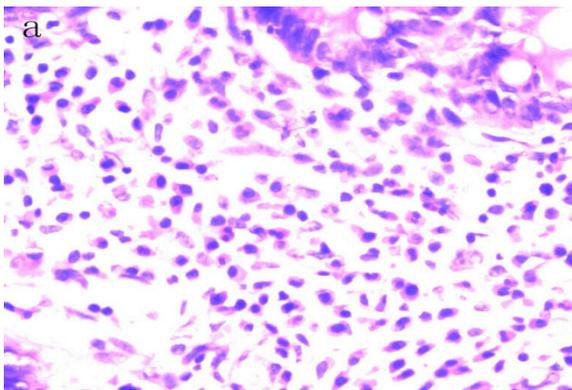
A-48-year old man was referred to the department of surgical oncology with epigastric discomfort, vomiting and general fatigue for five years. His physical examination revealed mild tenderness in the upper abdomen without rebound tenderness and muscle guarding. Inspection report was normal for peripheral eosinophils and tumor markers. Bone marrow biopsy had ruled out Eosinophilic lymphoma but diagnosed iron-deficiency anemia. Several detections of *Helicobacter pylori* were all positive. UGI viewed antral pyloric stenosis and stiff. PET-CT revealed increased sugar metabolism in gastric antrum and pars horizontalis duodeni, which was considered inflammatory disease, but malignant neoplasm was no exception. Gastrofiberscope showed an ulcer lesion in the middle and posterior wall of the gastric body, and a circumferential ulcer lesion of the antrum, the lumen was narrowed and the mirror could not pass. Pathology report of the section was in favor of infiltration with abundant eosinophils and intestinal metaplasia. Permanent pathology was confirmed with immunohistochemical staining, which demonstrated immune-reactivity for vimentin.

Since March 2013, the patient visited a number of hospitals in China and received hormone therapy. In May 2017, hormone therapy was suspended due to antral perforation, which was cured by conservative medical management. Long-term hormone therapy did not achieve the expected outcome. In consideration of pyloric obstruction and multiple ulcers, an operation scheme of total gastrectomy was formulated by multiple disciplinary team (MDT). The operation proceeds smoothly, and gross specimen had three shallow ulcers distributed at gastric fundus, body and antrum (**Figure 1**). Postoperative pathology found eosinophil aggregation in laminae propria and granulation tissue with infiltration of lymphocytes and plasmocytes (**Figure 2**). Eosinophil infiltration was visible at proximate stump. Immunohistochemical staining

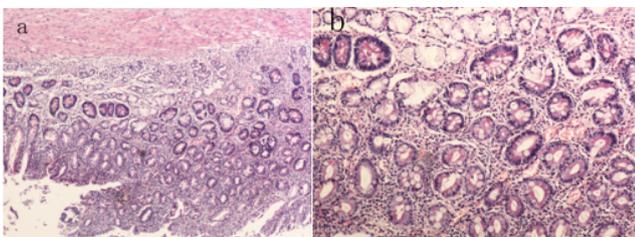
demonstrated immune-reactivity for vimentin and S-100, which established the final diagnosis for GEG (**Figure 3**).



**Figure 1** Gross specimen: three shallow ulcers distributed at gastric fundus, body and antrum.



**Figure 2** Postoperative pathology: eosinophil aggregation in laminae propria and granulation tissue with infiltration of lymphocytes and plasmacytes (a: HE\*400, b: HE\*100).



**Figure 3** Immuno-histochemical staining demonstrated immune-reactivity for vimentin and S-100, which established the final diagnosis for GEG (a: \*40, b: \*100).

## Discussion

In 1937, Kaijser first described GEG with a patient who had been allergic to onions since youth, developed an eosinophilic granuloma of the pyloric antrum [3]. From that time, an

increasing number of patients with eosinophilic granuloma were reported and its research was also increasing. However, the etiological factors of GEG are still unclear. Disturbance of oestrogen-progesterone metabolism was considered likely by Sison [4]. Simultaneously, Sherman felt that eosinophilic granuloma were probably associated to foreign-body reaction [5].

Most patients with GEG are young adults, predominantly male [2]. This observation suggests that GEG is potentially associated to sex hormones. GEG is thought to be associated to local allergic reaction, according to a phenomenon that large amount of mast cells, eosinophils, lymphocytes and lymphoid follicles in the affected tissue [6]. However, the patient denied a typical history of allergy. Specific immunological response of the gastric mucosa to *H. pylori* infection is closely correlated with formation of lymphatic follicles, which may lead to the increase of mast cells and increased release of granules of these cells, and finally increased the infiltration of eosinophils [7]. The increase of peripheral eosinophilia is not absolute in previous reports, which means peripheral eosinophilia is not the specific index for GEG.

GEG is lack of specific clinical presentation. The usual symptoms are epigastric pain, belching, abdominal distention, sour regurgitation and pyloric obstruction [8]. Severe and chronic abdominal pain will cause bleeding and perforation. Iron deficiency anemia (IDA) was found in this patient, and he also had a history of perforation, which was cured by conservative therapy. The clinical manifestations above are very similar to those of gastric cancer. Therefore, GEG is easily misdiagnosed. Gastroscopy and biopsy diagnosis are the major means of preoperative diagnosis of this disease. The characteristics of the gastroscopy of GEG include gastric peristalsis slowing, hyperemia of the gastric antrum or pylorus area, edema, hypertrophy of protrusions, superficial erosion, sometimes can form a larger ulcer, irregular gray fur, hard tissue and not brittle, biopsy is not easy bleeding. In order to improve the positive rate of biopsy, it is necessary to make a mining biopsy on the edge of the ulcer and take the submucosa tissue to improve the preoperative diagnostic rate. Gastroscopy of this patient found three shallow ulcers distributed at gastric fundus, body and antrum, which was extremely rare. The pathological criteria Vanech proposed were as follows: the interstitium is made up of fibroblasts and collagen fibers, and infiltrated by eosinophilic cells and lymphocytes, occasionally having lymphatic follicle formation. There are small arteries, capillaries and lymphatic vessels in the interstitium. Infiltration of the gastric mucosa at the focus of the lesion is possible. Malignant change must be carefully excluded. Moreover, when massive plasma cells and Russell bodies are found in pathological lesions of some GEG patients, it should be differentiated from gastric plasma cell granuloma. Other exceptional granulomatous lesions should also be precluded, such as mycetes, parasite, etc. [9].

Subtotal gastrectomy is the major treatment for localized GEG, and postoperative recurrence is extremely rare. For diffuse type with increased peripheral blood eosinophils,

hormone therapy is a feasible option, which bring long-term remission of symptom. Moreover, ACTH and corticosteroid is effective for individual postoperative recurrence cases. In this case, the patient had yearlong hormone therapy at various hospitals, and no obvious treatment effect. Therefore, total gastrectomy was considered duo to three focus. Trimestral follow-up revealed favorable recovery after operation.

## Conclusion

A rare case of gastric eosinophilic granumola with three focus distributed at gastric fundus, body and antrum was described. Postoperative pathology with eosinophil cells infiltrated and positivity for S-100 and Vimentin are standard of diagnosis. From the literature report, subtotal gastrectomy is the major treatment for localized GEG. However, total gastrectomy was chosen due to three focus and the prognosis was favorable. This case report was adjusted according to SCARCE guidelines [10].

## Acknowledgements

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