

## CASE REPORT

## GRANULOMATOUS GASTRITIS INDUCED BY CHRONIC PEANUT INGESTION

YOUNG SUB LEE<sup>1</sup>, INJU CHO<sup>1</sup>, SUNG HAK LEE<sup>2</sup>, EUN SUN JUNG<sup>1</sup><sup>1</sup>Department of Hospital Pathology, Eunpyeong St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea<sup>2</sup>Department of Hospital Pathology, Seoul St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Seoul, Korea

---

Granulomatous gastritis (GG) is a rare condition, with incidence between 0.08 and 0.35% in gastric biopsies. Various infectious and non-infectious aetiologies can be considered to cause granulomatous gastritis. Foreign bodies are a rare aetiology of GG and may result from foods, suture materials, or medications. We report a 59-year-old woman who had eaten large amounts of peanuts for more than 10 years and presented with epigastric discomfort. Esophagogastroduodenoscopy revealed multiple nodular lesions with ulcer scars at the stomach, which was diagnosed as GG probably caused by chronic peanut ingestion on endoscopic mucosal resection.

**Key words:** granuloma, esophagogastroduodenoscopy, gastritis, endoscopic mucosal resection, foreign bodies.

---

## Introduction

Granuloma in gastric biopsy is very rare. In Western countries, more than half is associated with Crohn's disease [1]. Several other diseases, such as lymphoma, infection, adenocarcinoma, Whipple's disease, Langerhans cell histiocytosis, gastric perforation, and vasculitis, are considered as aetiologies of granulomatous gastritis (GG) [2]. Additionally, foreign body-induced and even idiopathic GG have been documented [3, 4].

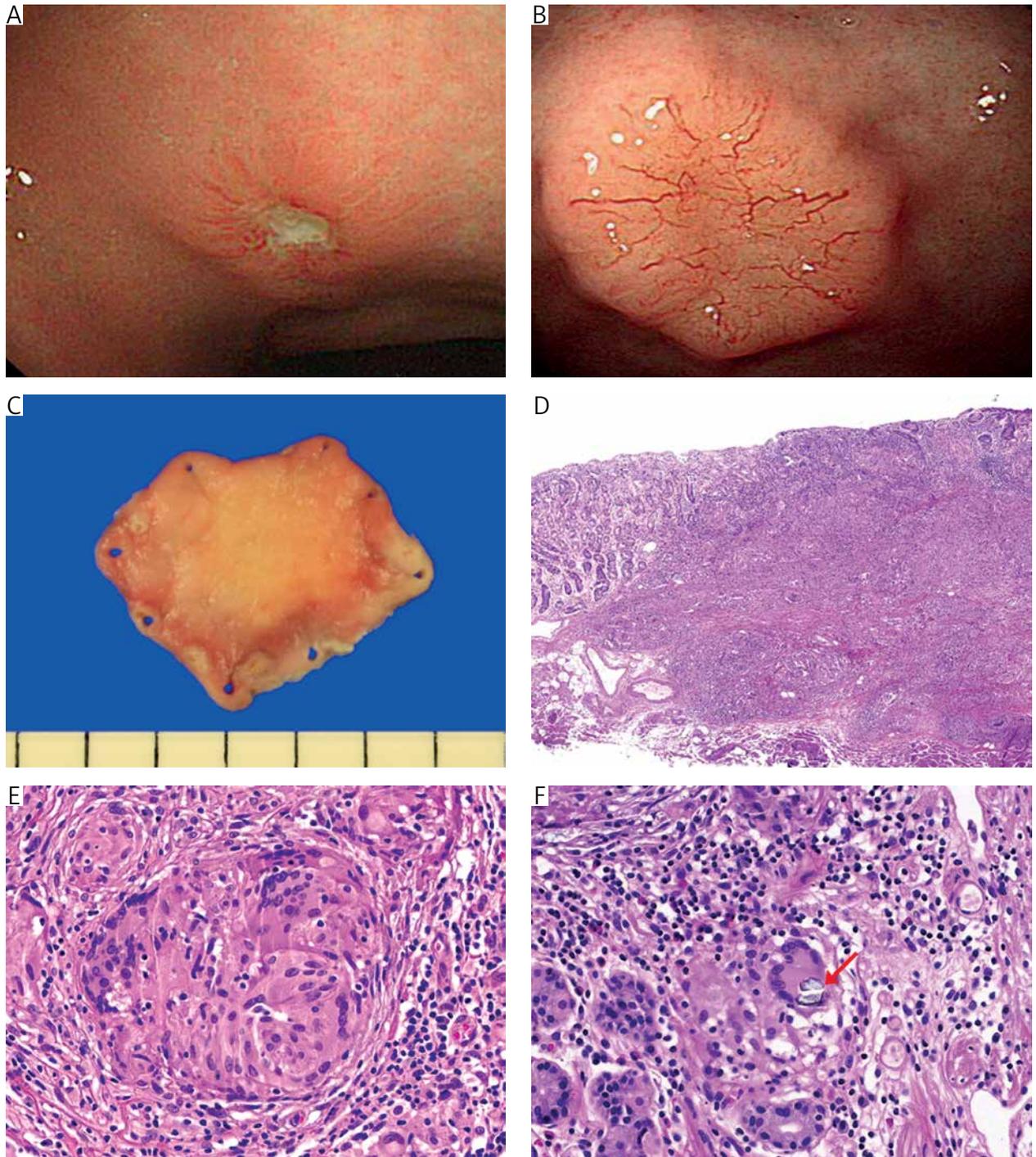
Foreign body-induced GG is rarely documented. Several case reports have verified unexpected foreign materials such as cyanoacrylate [5], embedded fish-bone [4], and fingernail (onychophagia) [6]. They emphasized thorough evaluation of medical history and examination to exclude possible underlying aetiologies.

We report herein another rare cause for granuloma in the stomach: peanuts, which might have been overlooked without careful evaluation. Peanuts are a well-known health food which can be easily eaten

every day. Peanuts are a common cause for bronchial aspiration, and, additionally, bronchial granuloma may be induced [7]. However, chronic overexposed peanuts and nutshell may elicit foreign body granuloma in the stomach as well. This is a brief case of a long-lasting GG induced by peanuts.

## Case report

A 59-year-old Korean female first presented with a 10-month duration of epigastric discomfort and pain. The patient had no other medical or family history of malignancy. Loose stools were not accompanied by vomiting or weight loss. Physical examination and routine laboratory test showed no abnormalities. The patient had a healthy diet, but peanuts were over-ingested as a health supplement, over a period of 10 years. Abdominal sonography was unremarkable. The patient had an esophagogastroduodenoscopy (EGD), which revealed multiple nodular lesions with ulcer scars at the fundus, body, and antrum (Fig. 1A, B). Under the impression of submucosal tu-



**Fig. 1.** A, B) Esophagogastroduodenoscopy showing multiple nodular lesions with central ulceration at antrum and body; C) gross appearance of endoscopic mucosal resection (EMR) specimen; D) low-power view of the EMR specimen showing multiple granulomatous inflammation at mucosa and submucosa (H&E, 40×); E) high-power view of the EMR specimen showing non-caseating granulomas with foreign body-type multinucleated giant cells (H&E, 400×); F) an amorphous foreign body (arrow) found in a multinucleated giant cell (H&E, 400×)

mour, a biopsy was performed. Histopathological examination showed regenerative foveolar epithelium. Follow-up EGD was recommended, and the patient returned 3 years later with persistent epigastric and low abdominal discomfort. Subsequent EGD revealed an elevated lesion of approximately 1.8 cm at the lower body. Additionally, multiple slightly elevated

lesions with a whitish colour change at the antrum were noted.

After repeated biopsy, the patient received endoscopic mucosal resection (EMR) for further evaluation (Fig. 1C). An EMR specimen showed chronic active gastritis with marked *Helicobacter pylori* infection in the mucosa and multiple non-caseating granulomas

in the lamina propria and submucosa (Fig. 1D, E). There were lymphoid aggregates, foreign body-type multinucleated giant cells, and a few giant cells containing amorphous foreign bodies (Fig. 1F). Special stains for fungal organism and acid-fast bacilli were negative. Polymerase chain reaction for detection of *Mycobacterium tuberculosis* was also negative. After further evaluations to rule out other medical causes, the patient was diagnosed as GG probably induced by chronic peanut ingestion. Regular follow-up EGD with antacid treatment showed the continual presence of multiple non-caseating granulomas.

## Discussion

Granulomatous gastritis is a rare condition, with an incidence rate reported to be between 0.08 and 0.35% in gastric biopsies [1, 8]. Granulomas are an organized collection of activated macrophages as a result of chronic inflammatory processes to a persistent antigen stimulus [1, 8]. Various infectious and non-infectious aetiologies can be considered, and GG is often associated with Crohn's disease, sarcoidosis, foreign bodies, infections (tuberculosis, syphilis, histoplasmosis), or underlying malignancy. Isolated or idiopathic GG is diagnosed when any of the aetiologies remains unclear [1–4, 6, 8–10]. In developed countries, up to half of all GG are associated with Crohn's disease, followed by sarcoidosis [11, 12]. However, the most common aetiology of GG is infection, of which tuberculosis is the most important [13]. In addition, *Helicobacter pylori* may contribute to the development of GG, especially in idiopathic or undetermined cases [14]. It has been suggested that GG with concurrent *Helicobacter pylori* may represent a histological response to inflammatory injury if cryptolytic granulomas are excluded [14].

A foreign body is a rare aetiology of GG, which may result from food, suture material, or medication [8, 15]. In particular, antacids that become impacted in an ulcer may cause GG because magnesium, aluminium, and silicon have been detected within granulomas by X-ray spectrometry [16]. Various unexpected foreign materials, such as cyanoacrylate [5], embedded fishbone [4], and fingernail (onychophagia) [6] have also been reported. Because the symptoms and signs are non-specific, the accurate diagnosis remains challenging for clinicians. Differential diagnosis includes gastric cancer, submucosal tumour, such as gastric intestinal stromal tumour, leiomyoma, or neurofibroma, and gastric tuberculosis [4]. Examination under polarized light for the detection of foreign materials may be helpful at times for a definitive diagnosis. However, in most instances, clinical, endoscopic, radiological, and serological correlation are needed to identify the aetiology [15].

Peanuts are a common cause of bronchial foreign body aspiration. It is reported to comprise 91% of inhaled organic materials among Western patients, and peanuts account for half of that [7]. Furthermore, recurrent irritation and longstanding inflammation lead to various complications including bronchial granulomas [7]. However, it is exceedingly rare for it to cause granulomatous inflammation in the stomach. Nevertheless, as Salih *et al.* previously stated that lipophilic materials (such as peanuts) stimulate intense chemo-inflammation in response to their fatty acid content [7]. Our patient ingested peanuts every day on a regular basis for more than 10 years. Therefore, this longstanding repetitive irritation by peanuts or peanut hull may have induced gastric granulomatous inflammation.

## Conclusions

In conclusion, chronic peanut ingestion can rarely cause GG. The diagnosis of foreign body-related GG was eventually made after thorough evaluation of the patient's history and studies to exclude other possible aetiologies. This case underlines the need to search aggressively for a foreign body in the absence of other organic causes.

## Acknowledgements

The authors wish to thank the patient involved for her collaboration in this research. The study was conducted in accordance with the Declaration of Helsinki and approved by the Institutional Review Board of Seoul St. Mary's Hospital (KC20ZISI0457). Informed consent was obtained from the patient for publication of this case report and the accompanying images.

*The authors declare no conflict of interest.*

## References

1. Maeng L, Lee A, Choi K, et al. Granulomatous gastritis: a clinicopathologic analysis of 18 biopsy cases. *Am J Surg Pathol* 2004; 28: 941-945.
2. Shapiro JL, Goldblum JR, Petras RE. A clinicopathologic study of 42 patients with granulomatous gastritis. Is there really an "idiopathic" granulomatous gastritis? *Am J Surg Pathol* 1996; 20: 462-470.
3. Yamasaki T, Nebiki H, Kurai O. A case of isolated granulomatous gastritis that spontaneously resolved without *Helicobacter pylori* eradication. *Clin J Gastroenterol* 2009; 2: 17-21.
4. Shan GD, Chen ZP, Xu YS, et al. Gastric foreign body granuloma caused by an embedded fishbone: a case report. *World J Gastroenterol* 2014; 20: 3388-3390.
5. Guner G, Kurtulan O, Kav T, et al. Cyanoacrylate associated foreign body granulomatous gastritis: a report of three cases. *Case Rep Pathol* 2017; 2017: 2753487.

6. Morais R, Nunes ACR, Rios E, et al. Granulomatous gastritis induced by onychophagia: first case report. *Gastroenterol Hepatol* 2018; 41: 498-500.
7. Salih AM, Alfaki M, Alam-Elhuda DM. Airway foreign bodies: a critical review for a common pediatric emergency. *World J Emerg Med* 2016; 7: 5-12.
8. Brown I, Kumarasinghe MP. Granulomas in the gastrointestinal tract: deciphering the Pandora's box. *Virchows Arch* 2018; 472: 3-14.
9. Almadi MA, Aljebreen AM, Sanai FM, et al. New insights into gastrointestinal and hepatic granulomatous disorders. *Nat Rev Gastroenterol Hepatol* 2011; 8: 455-466.
10. Miyamoto M, Haruma K, Yoshihara M, et al. Isolated granulomatous gastritis successfully treated by *Helicobacter pylori* eradication: a possible association between granulomatous gastritis and *Helicobacter pylori*. *J Gastroenterol* 2003; 38: 371-375.
11. Renault M, Goodier A, Subramony C, et al. Age-related differences in granulomatous gastritis: a retrospective, clinicopathological analysis. *J Clin Pathol* 2010; 63: 347-350.
12. Ectors NL, Dixon MF, Geboes KJ, et al. Granulomatous gastritis: a morphological and diagnostic approach. *Histopathology* 1993; 23: 55-61.
13. Kamani L, Mumtaz K, Azad NS, et al. Granulomatous gastritis: a diagnostic dilemma? *Singapore Med J* 2008; 49: e222-224.
14. Liang Y, Cui S, Polydorides AD. Clinicopathological characteristics and aetiological factors of granulomatous gastritis. *Histopathology* 2021; 79: 1040-1050.
15. Srivastava A, Lauwers GY. Pathology of non-infective gastritis. *Histopathology* 2007; 50: 15-29.
16. Gumaste VV, Janowitz HD, Waye JD. Granulomatous gastritis: a case report and review of the literature. *Am J Gastroenterol* 1989; 84: 1315-1318.

### Address for correspondence

**Eun Sun Jung, MD, PhD**  
Department of Hospital Pathology  
Eunpyeong St. Mary's Hospital  
1021 Tongil-ro, Eunpyeong-gu  
Seoul 03312, Korea  
Phone: +82-2-2030-3146  
Fax: +82-2-2030-3145  
e-mail: esjung@catholic.ac.kr