

Case Report

Large gastric ulcer: Result of foreign body–induced giant cell reaction

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Abstract

A granuloma is an organized and compact mass of mature mononuclear phagocytes. Granulomas are reported to form in various organs and sites of the body. Granulomas in stomach are rarely encountered. Foreign body granulomas are formed as a result of reaction of the tissues to a foreign body which is immunologically inert. Food granuloma is type of foreign body granuloma which is formed in response to food particles like vegetable matters or cereals. These granulomas can be distinguished from other types of granulomas with ease because of their characteristic morphologic features. We report the case of a 29-year-old male who developed a large gastric ulcer as a result of foreign body–induced giant cell reaction, which was probably of vegetative origin. He was treated with the regimen for *Helicobacter pylori*, rabeprazole and sucralfate. This treatment resulted in partial healing of the ulcer with persistence of food granuloma; hence, the patient was referred for surgery.

Key words

Food granuloma, foreign body, gastric ulcer

Introduction

A granuloma is an organized and compact mass which is composed of epithelioid macrophages and lymphoid cells with few neutrophils, eosinophils, giant cells, with or without accompanying necrosis.^[1] Foreign body and immune granulomas are well-known types of granulomas. Granulomas are reported to form in various organs and sites of the body. Gastric granulomas are uncommonly encountered. These can be formed in various conditions like tuberculosis, sarcoidosis, Crohn's disease, reaction to foreign material, reaction to nearby malignancy, syphilis, vasculitis, histoplasmosis, and Whipple's disease. The role of *Helicobacter pylori* infection in causation of granuloma is controversial. A foreign body granuloma is formed as a result of reaction to an inert foreign body.^[2] The onset, progression, and resolution are the three phases of foreign

body reaction. This reaction is regulated by soluble mediators such as cytokines, chemokines, and matrix metalloproteinases, which are locally produced by tissues and inflammatory cells. Foreign body leads to the development of a microenvironment around the lesion, which is usually well organized.^[3]

The formation of foreign body–induced granulomas occurs when a small defect in the gastric mucosa allows food particles of small sizes to access submucosa. Gastric acid leads to necrosis, and further increase in defect and entry of more food particles leading to more granulomatous changes and further increase in the mucosal defect, thus, a large mucosal defect or large ulcer is formed.

Food granulomas can easily be differentiated from other types of granulomas due to their distinct morphologic features.^[4] These granulomas can be easily diagnosed by the presence of palisades of histiocytes and foreign body giant cells.^[5] Vegetable matters and insoluble coating of cereals are the common food materials leading to this granulomatous reaction. Kaolin, talc, suture material, and crystalline iron are some other materials known to cause foreign body granuloma.^[6] We present a 29-year-old male who developed gastric ulcer as a result of foreign body–induced giant cell reaction, probably due to vegetative matters, which is not commonly seen.

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Case Report

A 29-year-old married male from east Sikkim (India) weighing 46 kg presented with severe pain abdomen. He was a non-alcoholic and non-smoker and was taking mixed Indian diet. The pain was localized to epigastrium and increased with meals. Other complaints included nausea and recurrent vomiting with gradual weight loss for last 3 months. On examination, he was conscious, oriented, and afebrile, pulse was 104/min and regular, and his BP was 100/70 mmHg. There was mild pallor without icterus, cyanosis, clubbing, pedal edema, or lymphadenopathy. There was no history of nonsteroidal anti-inflammatory drug (NSAID) intake and no significant past history. His abdominal examination revealed tenderness over epigastrium. Cardiovascular system, respiratory system, central nervous system, and genitourinary system did not reveal any abnormality. On further evaluation, his hemoglobin was found to be 10.6 gm%, total leukocyte count (TLC) was 6200/cmm, and differential leukocyte count (DLC) showed P 70%, L 25%, M 2%, E 3%, with normal platelet counts. His chest X-ray was normal. Other tests like liver function tests, kidney function tests, serum angiotensin-converting enzyme (ACE) level, random blood sugar, urine analysis, and stool examination were all normal. Mantoux test was negative.

His upper gastrointestinal (GI) endoscopy showed large ulcer over the greater curvature of body of stomach with irregular edematous margins suggestive of malignancy, and scattered slough along with embedded food material [Figure 1]. Rapid urease test was positive. There was no gastric outlet obstruction. Multiple biopsies were taken from the ulcer margins and sent for histopathological examination, which reported them as foreign body giant cell reaction [Figure 2a and 2b] they were positive for *H. pylori* and negative for acid-fast bacilli (AFB) with Ziehl–Neelsen (ZN) stain. Repeat biopsy was also done to rule out missed malignancy, but again the report revealed the same findings. Computed tomography (CT) scan of the abdomen [Figure 3] with contrast showed thickened and nodular gastric wall with few mesenteric lymph nodes. Colonoscopy was performed to rule out inflammatory bowel disease and was normal.

His detailed dietary history revealed that he had been taking mixed Indian diet consisting of cereals, rice, green leafy vegetables, and pulses. On the basis of endoscopy and histopathologic report, a diagnosis of foreign body–induced gastric ulcer was made and he was treated symptomatically with *H. pylori* eradication regimen, i.e., clarithromycin 500 mg BID, amoxicillin 1 g BID with rabeprazole 20 mg BID for 14 days; he received sucralfate also. He was advised dietary modification in the form of avoidance of leguminous seeds and high-fiber diet. Rabeprazole 20 mg BID was continued. After 6 weeks, he was reviewed with upper GI endoscopy which revealed partial improvement in the ulcer with a clear demarcation of the ulcer margin and a marginal

decrease in the ulcer size [Figure 4]. The patient was again reviewed with endoscopy at 12 weeks which showed not much improvement as compared to previous endoscopy [Figure 5]. Again, multiple biopsies were obtained which revealed similar food granulomas with much intense giant cell reaction and multiple foreign bodies [Figure 6a and b]. Barium meal [Figure 7] was also done on follow-up which

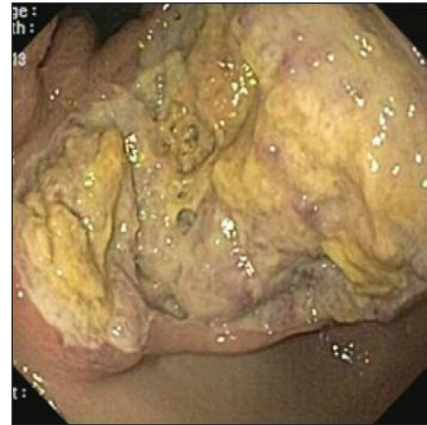


Figure 1: First upper GI endoscopic picture (large ulcer over the greater curvature of body of stomach)

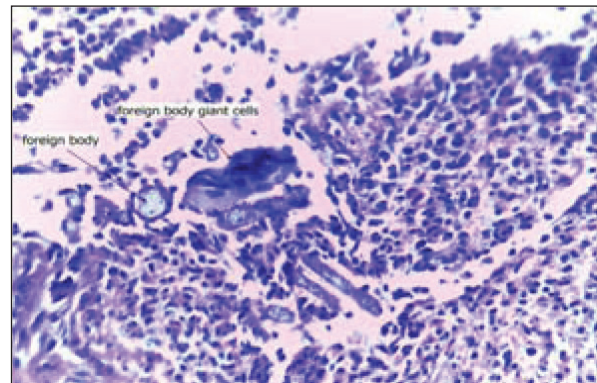


Figure 2a: First biopsy shows foreign body giant cells with multiple foreign bodies probably of vegetative origin (hematoxylin and eosin staining)

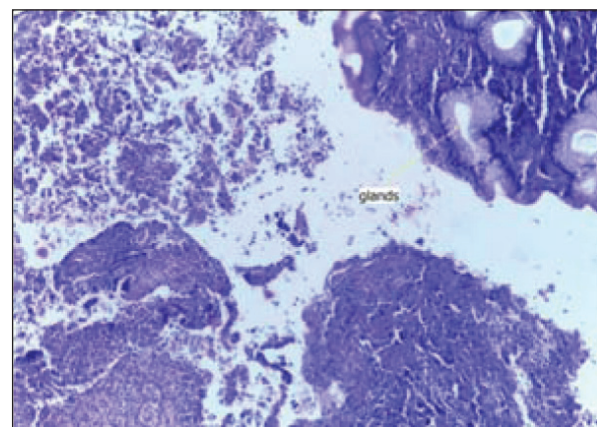


Figure 2b: First biopsy shows gastric glands (hematoxylin and eosin staining)

showed moderately large filling defect over the middle of greater curvature with hypertrophied rugae. In view of only partial healing of the ulcer (food granuloma) and persistence of foreign body reaction, the need of surgical intervention was explained and he was referred for surgery. Later on, it came

to our knowledge that he refused any surgical intervention and is continuing the same medical treatment.

Discussion

There are various case reports of foreign body reactions leading to granuloma formation in different organs such as lung, peritoneum, liver, kidney, and others.^[7-9] The search of the English literature revealed a case report on foreign body granuloma in peritoneum mimicking disseminated gastric cancer.^[10] Granuloma of the peritoneum induced by activated charcoal from intraperitoneal chemotherapy in a patient with gastric ulcer, which mimicked peritoneal metastasis, has also been reported.^[11]

Food starch granuloma of the appendix and peritoneum after perforation of gastric ulcer has also been reported.^[12] Gastric granulomas are relatively uncommon, and food granulomatous reaction involving stomach is less commonly described. Food granulomas can be diagnosed on histopathologic examination of the biopsy tissue, as they have palisades of histiocytes and foreign body giant cells.^[4] Vegetable matters in the granuloma are birefringent and are better visualized in polarized light.



Figure 3: CT scan of the upper abdomen shows thickened and nodular gastric wall



Figure 4: Second upper GI endoscopic pictures taken 6 weeks after treatment (ulcer over the greater curvature of the body of stomach, partial improvement)



Figure 5: Third upper GI endoscopic pictures taken 12 weeks after treatment (partial healing, ulcer size is decreased but persisting food granuloma)

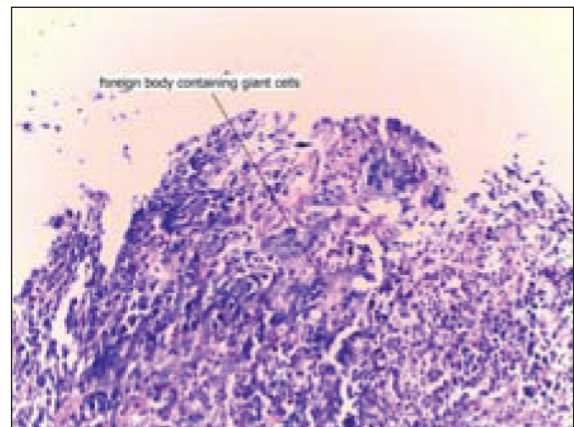


Figure 6a: Second biopsy at third endoscopy shows foreign body containing giant cells (hematoxylin and eosin staining)

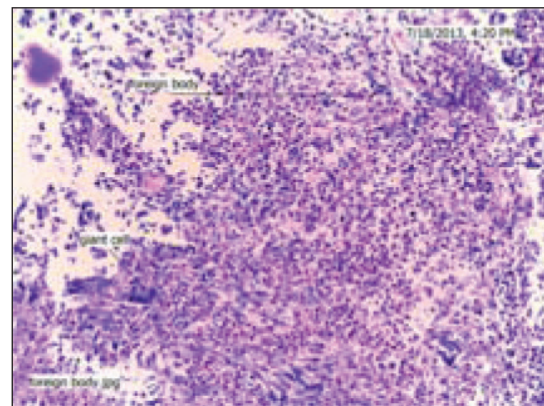


Figure 6b: Second biopsy at third endoscopy shows more foreign body giant cells with multiple foreign bodies probably of vegetative origin (hematoxylin and eosin staining)



Figure 7: Barium meal shows moderately large filling defect over the middle of greater curvature with hypertrophied rugae

^[5] Leguminous seeds like peas, beans, and lentils (pulses) can cause food granuloma formation in stomach and other organs.^[7,13] Cellulose present in plants can also induce a granuloma.^[14] These are known as vegetable granulomas.^[15] Pulse granuloma of the stomach wall and peritoneal cavity has been reported in a case where there was injury to the muscles and fibrous tissues of the wall of stomach.^[12] Foreign body reaction can be associated with active or healed peptic ulcer. It can undergo fibrosis or calcification which can produce pyloric stenosis.^[2] Gastric ulcer as a result of foreign body reaction, complicated by pyloric stenosis and idiopathic gastric granuloma with multiple aphthoid ulcers has been reported.^[16,17] Most of the case reports show that the granulomas of the stomach were diagnosed after gastric resection procedures.^[10,18] A few other reports have suggested causal role of *H. pylori* infection in the pathogenesis of granulomas.^[19]

Conclusion

Although small ulcer formation as a result of foreign body reaction is common, our patient developed large gastric ulcer as a result of foreign body giant cell reaction, which is an uncommon occurrence and is rarely seen. Such giant ulcers may not completely heal with medical therapy. The causal role of *H. pylori* infection in its causation remains undefined.

References

1. Adams DO. The granulomatous inflammatory response: A review. *Am J Pathol* 1976;84:164-92.
2. David WD, Jass JR, Price AB, Shepherd NA. *Morson and Dawson's Gastrointestinal pathology*, 4th ed. Malden MA: Blackwell Sciences; 2003. p. 128.
3. Luttikhuisen DT, Harmsen MC, Van Luyn MJ. Cellular and molecular dynamics in the foreign body reaction. *Tissue Eng* 2006;12:1955-70.
4. *Textbook of Gastrointestinal Pathology*. Ch. 4, 3rd ed. Philadelphia: Lippincott Williams and Wilkins; 2007. p. 165.
5. *Atlas of Pathology, Chronic inflammation*, 2nd ed. Mihai dancui, Maria sultana Mihailovici. Available form: <http://www.pathologyatlas.ro> 2010 Romania [Last accessed on 12th Dec 2014]
6. Abraham SC, Yardley JH, Wu TT. Erosive injury to the upper gastrointestinal tract in patients receiving iron medication. *Am J Surg Pathol* 1999;23:1241-7.
7. Head MA. Foreign body reaction to inhalation of lentil soup: Giant cell pneumonia. *J Clin Pathol* 1956;9:295-9.
8. Roberts WC. Pulmonary talc granulomas, pulmonary fibrosis, and pulmonary hypertension resulting from intravenous injection of talc containing drugs intended for oral use. *Proc (Bayl Univ Med Cent)* 2002;15:260-1.
9. Poyanli A, Bilge O, Kapran Y, Guven K. Foreign body granuloma mimicking liver metastasis. *Br J Radiol* 2005;78:752-4.
10. Akita H, Watanabe Y, Ishida H, Nakaguchi K, Okino T, Katubo T. A foreign body granuloma after gastric perforation mimicking peritoneal dissemination of gastric cancer: Report of a case. *Surg Today* 2009;39:795-9.
11. Kim YK, Park HS. Foreign body granuloma of activated charcoal. *Abdom Imaging* 2008;33:94-7.
12. Veress B, Alafuzoff I, Juliusson G. Granulomatous peritonitis and appendicitis of food starch origin. *Gut* 1991;32:718-20.
13. Sherman FE, Moran TJ. Granulomas of stomach. Response to injury of muscle and fibrous tissue of wall of human stomach. *Am J Clin Pathol* 1954;24:415-21.
14. Knoblich R. Pulmonary granulomatosis caused by vegetable particles so called lentil pulse granuloma. *Am Rev Respir Dis* 1969;99:380-9.
15. Brown AM, Theaker JM. Food induced granuloma--An unusual case of a submandibular mass with observation on the pathogenesis of hyaline bodies. *Br J Maxillofac Surg* 1987;25:433-6.
16. Gruk M, Rudzki J. Gastric ulcer caused by a foreign body and complicated by pyloric stenosis. *Wiad Lek* 1968;21:53-5.
17. Koyama S, Nagashima F. Idiopathic granulomatous gastritis with multiple aphthoid ulcers. *Intern Med* 2003;42:691-5.
18. Gueller R, Shapiro HA, Nelson JA, Bush R. Suture granulomas simulating tumors: A preventable post gastrectomy complication. *Am J Dig Dis* 1976;21:223-38.
19. Maeng L, Lee A, Choi K, Kang CS, Kim KM. Granulomatous gastritis: A clinicopathologic analysis of 18 biopsy cases. *Am J Surg Pathol* 2004;28:941-5.

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