

Massive Duodenal Perforation: Brunner's Gland Hyperplasia

Caroline Gearin, PA-S¹, Ashley E. Vitale, DHSC, MPAS, PA-C², Victoria Louwagie, DMSc, MS, PA-C³

¹Mayo Clinic School of Health Science, ²Mayo Clinic Health System, Division of General Surgery, ³Mayo Clinic Health System, Division of Gastroenterology

ABSTRACT

BACKGROUND

This case study features a 61-year-old male with past medical history of multiple comorbidities including stage IV lung cancer on chronic prednisone therapy, atrial fibrillation on chronic warfarin therapy, chronic kidney disease (CKD) stage 5 requiring dialysis 3 times per week, and cardiomyopathy with an ejection fraction of 55% who presented to the ER with abdominal pain and bloating.

IMAGING

A computed tomography (CT) of the abdomen and pelvis revealed a large perforated duodenal ulcer.

HOSPITAL/SURGICAL COURSE

The patient was immediately transferred to facility with surgical capabilities and taken emergently for exploratory laparotomy. Intra-operatively, the perforated duodenal ulcer was found to be nearly 3 cm in size complicating the original plan of proceeding with an antrectomy and Billroth I procedure. Ultimately, the decision was to proceed with an antrectomy and Billroth II procedure, including removal of the gastric antrum and subsequent gastrojejunal anastomosis.

FINDINGS

Due to the nodularity and concern for malignancy, a segment of the duodenum was sent to pathology with results indicating Brunner's gland hyperplasia – a rare benign duodenal tumor, with a prevalence of approximately 0.008% of all duodenal tumors, and 10% of all benign duodenal tumors.

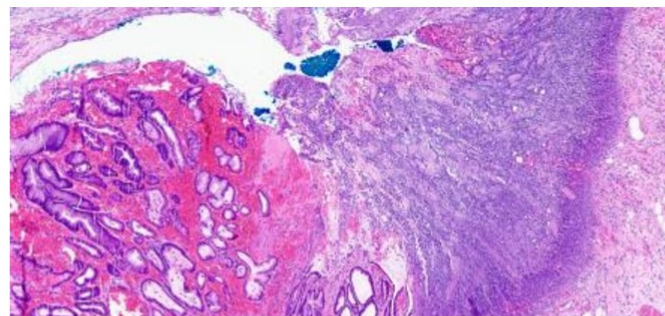


FIGURE 1

Gastric mucosa with peptic ulcer, showing hemorrhage and necrosis extending from the mucosa, down through the muscularis propria; grossly perforated.

IMAGING



FIGURE 2 and 3

Coronal (A) and Axial (B) CT cuts reveal large perforated duodenal ulcer with free fluid and surrounding edema

PRESENTATION

PERTINENT FACTORS/LABS

- Severe distress
- Tachycardic and tachypneic
- Acute peritonitis
- Severe abdominal distention
- Normal WBC, yet with a left shift of 91.6%
- Elevated C-reactive protein at 8.34
- Lactate was normal at 1.8

OPERATIVE FINDINGS

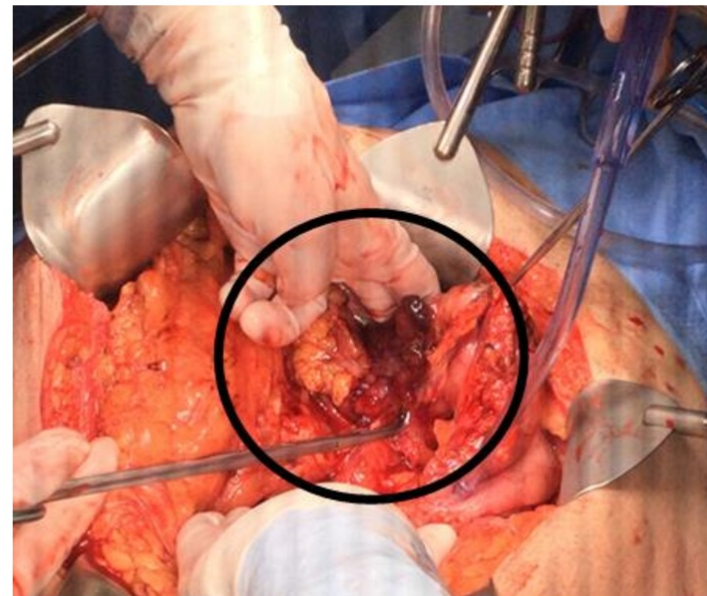
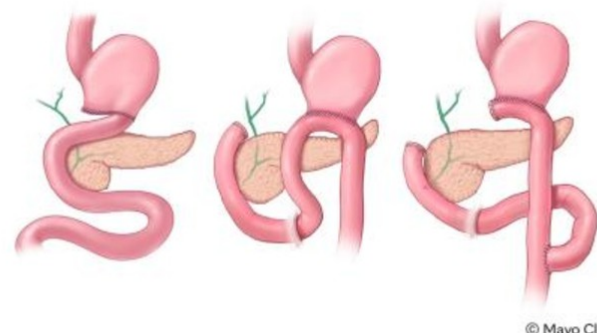


FIGURE 4

Intraoperative image: exposure of the duodenal perforation (surgeon hand to the top of the perforation, surgical clamp at the bottom edge)



SURGICAL ANATOMY

A Billroth II procedure: resection of the distal stomach (antrectomy) and proximal duodenum with creation of gastro-jejunal anastomosis (middle image above)

DISCUSSION

BGH PATHOLOGY

- Brunner's glands are located in the proximal duodenum
- Alkaline secreting tissue
- Protects the duodenal lining from gastric acid production

BGH ETIOLOGY

- Rare benign duodenal tumor
- Prevalence of 10% of all benign duodenal tumors
- Approximately 0.008% of all duodenal tumors

BGH TYPICAL PRESENTATION

- Typically asymptomatic and found incidentally
- +/- GI bleed
- +/- Dyspepsia
- +/- Abdominal Pain
- +/- Obstruction

BGH DIAGNOSIS/TREATMENT

- Diagnostic endoscopy
- Tissue biopsy
- +/- gland/ulcer resection

HISTOLOGY

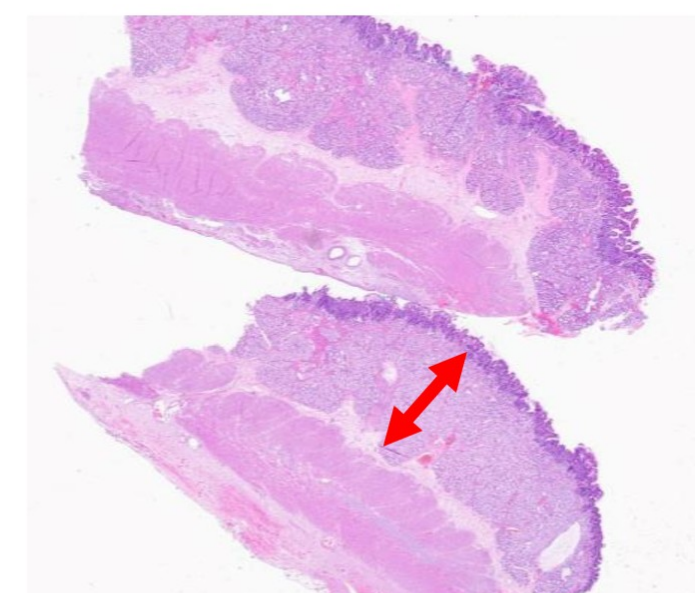


FIGURE 5

Histology from duodenum showing Brunner's gland hyperplasia

LESSONS LEARNED

- Understand what uncommon pathologies that may be "behind the perforation". It is important to maintain a high level of suspicion for BGH and to consider pharmacologic intervention for prevention of PUD in patients with advanced age, prior history of acid related GI conditions and we are on medications associated with GI mucosal damage.
- Describes a rare occurrence of BGH with symptoms and complications.
- Explore the clinical course and diagnostic approach to a massive, perforated duodenal ulcer with underlying BGH.
- The evolution of GERD treatment including PPI use and into the advent of P-CABS has impacted the prevalence and complication rate of peptic ulcer disease

REFERENCES

1. Vakil N. Peptic Ulcer Disease: A Review. JAMA. 2024;332(21):1832-1842. doi:10.1001/jama.2024.19094
2. Bakir MA, AlYousef MY, Alsohaibani FI, Alsaad KO. Brunner's glands hamartoma with pylorus obstruction: a case report and review of literature. J Surg Case Rep. 2020;2020(8):rjaa191. doi:10.1093/jscr/rjaa191
3. Bhatti S, Alghamdi M, Omer E. Brunner's Gland Hyperplasia: A Massive Duodenal Lesion. Cureus. 2020;12(4). doi:10.7759/cureus.7542
4. Hernandez-Diaz S. Steroids and Risk of Upper Gastrointestinal Complications. American Journal of Epidemiology. 2001;153(11):1089-1093. doi:10.1093/aje/153.11.1089
5. Tseng CL, Chen YT, Huang CJ, et al. Short-term use of glucocorticoids and risk of peptic ulcer bleeding: a nationwide population-based case-crossover study. Aliment Pharmacol Ther. 2015;42(5):599-606. doi:10.1111/apt.13298
6. Chun HJ, Park SJ, Lim YJ, Song SY. Surgical Treatment. In: Chun HJ, Park SJ, Lim YJ, Song SY, eds.
7. Gastrointestinal Cancer: A Comprehensive Guide to Diagnosis and Management. Springer Nature; 2023:43-50. doi:10.1007/978-981-99-0815-8_7