

Beyond the Pancreas: A Lesson in Lipase Elevation

Ryan Threadgill MD, Adam Obley MD
Portland VA Medical Center

Introduction

This is a case of an elderly man with gastrointestinal bleed from duodenal ulcerations and an elevation in lipase >600 in which the elevated lipase is thought to be from his duodenal ulcers. It serves as an opportunity to review the differential diagnosis of an elevated lipase and as a reminder that not all elevations in lipase are due to pancreatitis.

Case Description

A 76 year-old man presented to the hospital with an acute gastrointestinal bleed and was found to have ulcers of the duodenal bulb not requiring endoscopic intervention. He was treated with an intravenous proton pump inhibitor and once he was found to be hemodynamically stable he was discharged home.

PMH and Medications

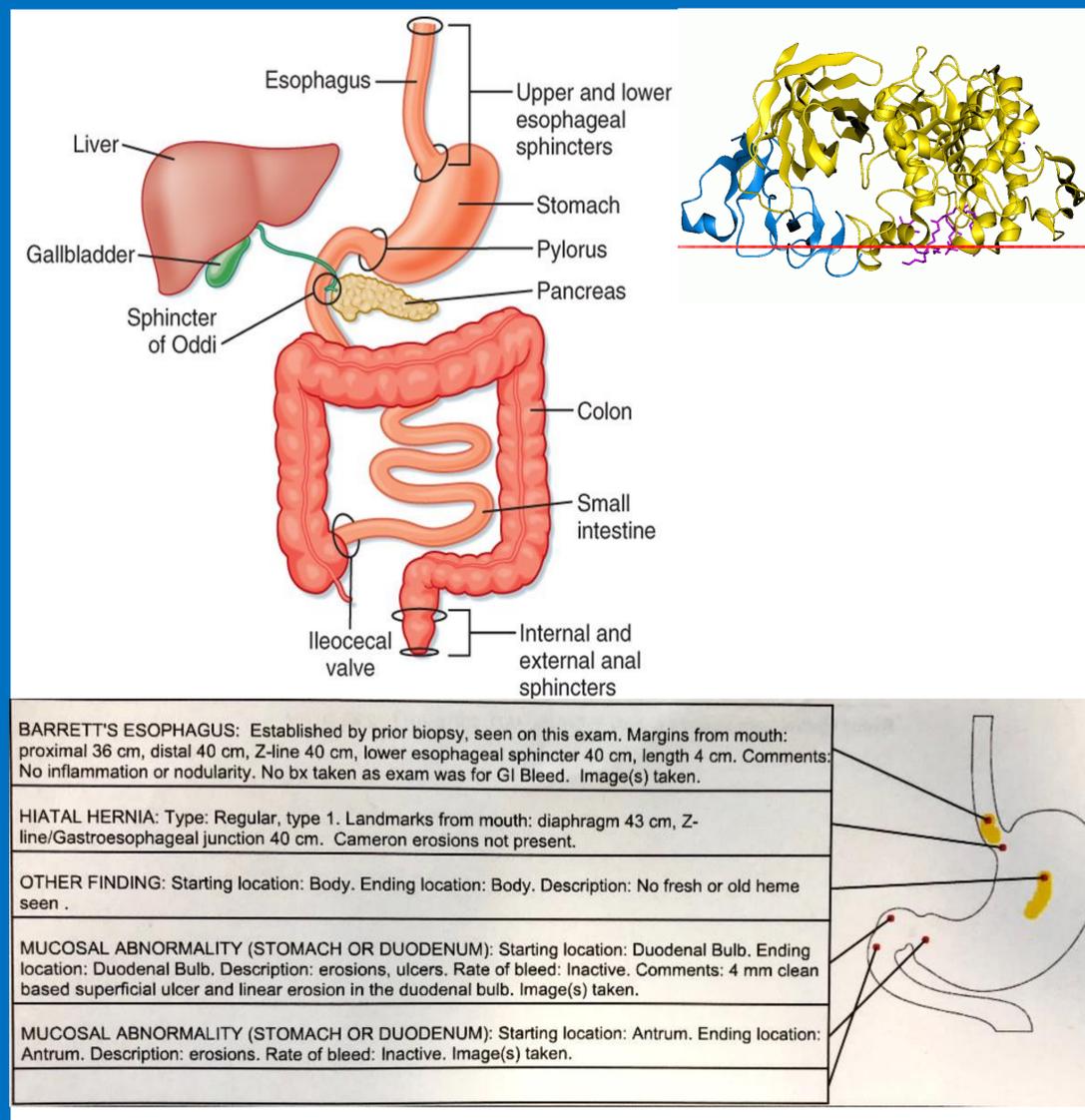
Stage 3 chronic kidney disease,
Type 2 diabetes, diet controlled
Atrial fibrillation, on aspirin
Heart failure with preserved ejection
fraction, on furosemide

Labs:

CBC: Hg 6.7 g/dL (baseline 15),
WBC 14,000/mm³
Lipase >600 IU/L (no prior)

Imaging:

CT scan was performed 2 months
after discharge given continued
elevation in lipase and did not reveal
any evidence of pancreatitis



Pancreatitis Diagnostic Criteria

- Has to meet 2 of 3 criteria
- Lipase >3x the upper limit of normal
- Imaging findings consistent with pancreatitis
- Mid-epigastric abdominal pain, classically radiating straight through to back

How good is lipase in pancreatitis?

- Sensitivity: 64-100%
- Specificity: 99-100%
- +LR: 87
- -LR: 0.13

Where is Lipase Made?

- Pancreas
- Liver – in hepatocytes and endothelial cells
- Intestine – gastric chief cells of stomach, epithelial cells of the esophagus, gastro-esophageal junction, duodenal bulb, and colon

Where is Lipase Cleared?

- Kidneys

What are the relative concentrations of lipase?

- The concentration of lipase is 100 times greater in the pancreas than in the liver or the bowel

Discussion

When one encounters an elevation in lipase, especially one that is greater than 3 times the upper limit of normal it is natural to jump to pancreatitis or other pancreatic pathology as the primary cause. However, it is important to remember that lipase is also produced in the hepatobiliary system and in many parts of the intestine. Especially in patients with chronic kidney disease, any hepatobiliary pathology (cholecystitis, liver injury) or intestinal injury (enterocolitis, inflammatory bowel disease, celiac disease, and peptic ulcer disease) can produce a clinically significant elevation in lipase. There are other rarer causes such as macrolipasemia, sarcoidosis, and drug-induced elevations (DPP4 inhibitors, GLP1 agonists) that should be considered as well.

Teaching Points

- 1) Not all lipase is from the pancreas
- 2) Lipase is cleared by the kidney, so in patients with chronic kidney disease maintain a broader differential
- 3) All that being said, lipase has good sensitivity, specificity, and likelihood ratios in the diagnosis of pancreatitis

References

Hameed AM, Lam VWT, Pleass HC. Significant elevations of serum lipase not caused by pancreatitis: a systematic review. *HPB : The Official Journal of the International Hepato Pancreato Biliary Association*. 2015;17(2):99-112. doi:10.1111/hpb.12277.

Chao C-T, Chao J-Y. Furosemide and pancreatitis: Importance of dose and latency period before reaction. *Canadian Family Physician*. 2013;59(1):43-45.

Tietz NW, Shuey DF. Lipase in serum – the elusive enzyme: an overview. *Clin Chem*. 1993;39:746–756

McGee, Steven. *Evidence-Based Physical Diagnosis*. Philadelphia, PA: Elsevier Saunders; 2012.