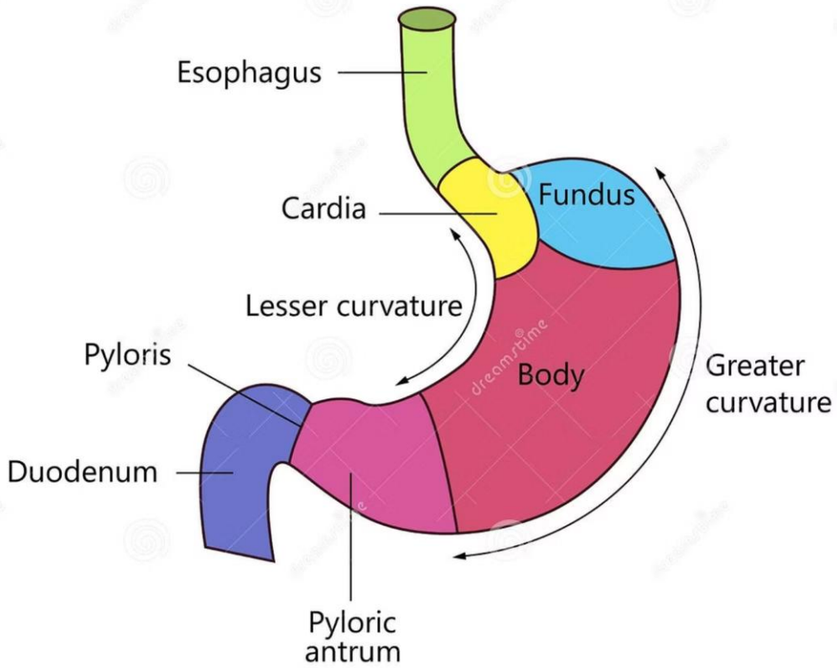
Diseases of the Duodenum and Stomach

The stomach and duodenum form the proximal part of the gastrointestinal tract. Diseases may be inflammatory, structural, functional, or neoplastic.

Anatomy & Physiology Overview

Understanding the Stomach and Duodenum

The stomach includes the cardia, fundus, body, antrum, and pylorus. The duodenum has four parts and receives bile and pancreatic secretions. Functions include mechanical digestion, acid secretion, and nutrient absorption.



Diseases of the Stomach

Gastritis

Acute (NSAIDs, alcohol, stress) or chronic (H. pylori, autoimmune)

Peptic Ulcer Disease

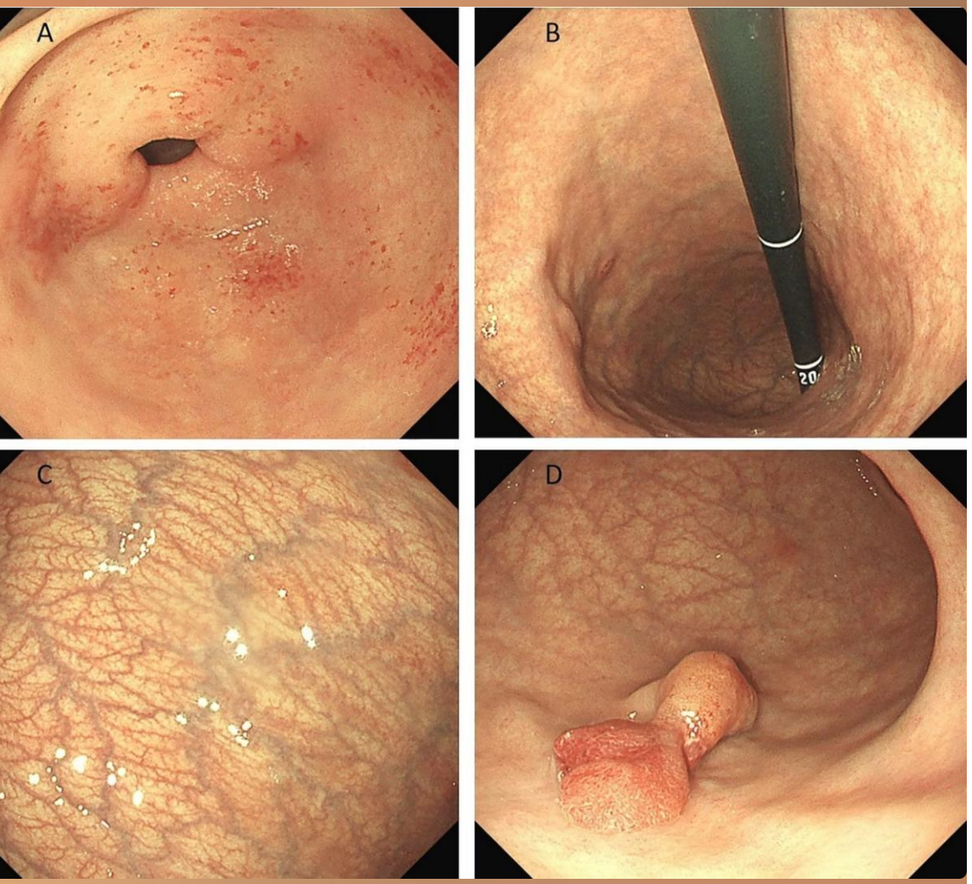
H. pylori and NSAIDs are common causes

Gastric Carcinoma

Associated with chronic gastritis

Gastric Outlet Obstruction

Due to ulcers or cancer



1. Gastritis

Types

Acute (NSAIDs, alcohol, stress) or chronic (H. pylori, autoimmune).

Clinical Presentation

Symptoms: epigastric pain, nausea.

Diagnosis: Diagnose by endoscopy and biopsy.

Treatment: Treat with PPIs and eradication therapy.

2. Peptic Ulcer Disease

H. pylori and NSAIDs are common causes. Duodenal ulcers are relieved by food; gastric ulcers worsen.

H. pylori infection

Primary causative agent

NSAID use

Damages protective mucosa

Endoscopy diagnosis

Gold standard for detection

PPI + antibiotics

Standard treatment protocol

Diagnose by endoscopy and treat with PPI and antibiotics.

3. Gastric Carcinoma

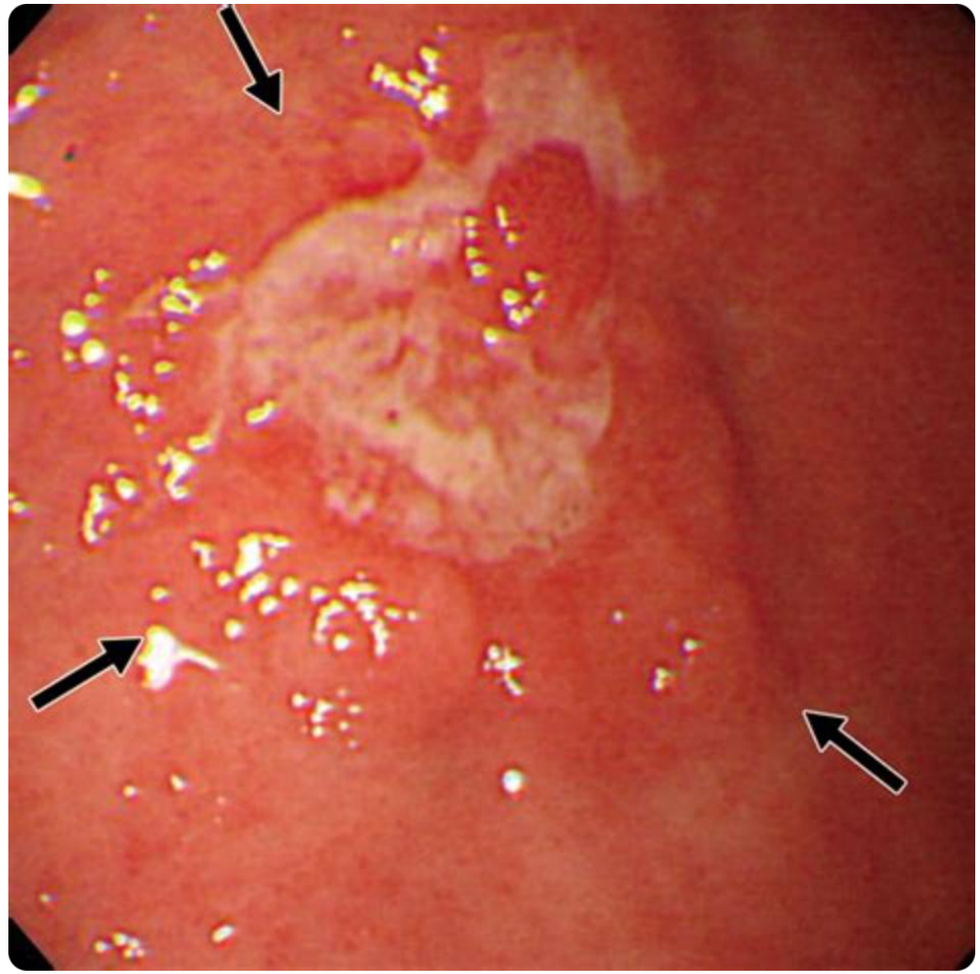
Associated with chronic gastritis and nitrosamines and alcohol .

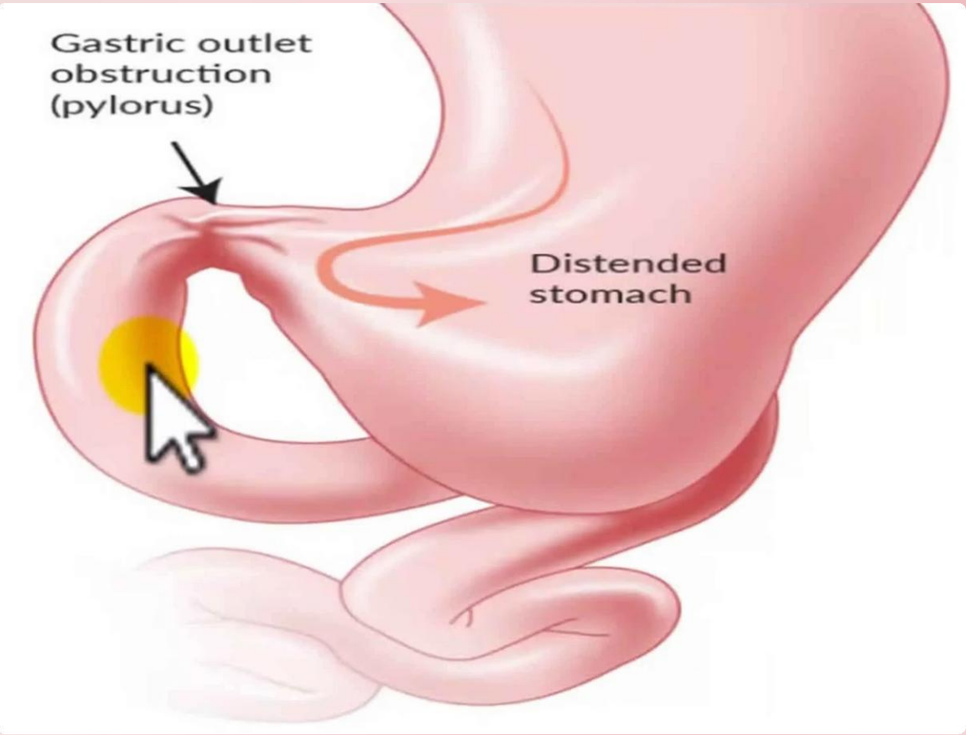
Clinical Features

Symptoms: weight loss, anemia.

Management

Diagnose by endoscopy and biopsy; treat surgically.





4. Gastric Outlet Obstruction

Etiology

Due to ulcers or cancer.

Presentation & Management

Causes vomiting and fullness; manage with decompression and surgery.

Diseases of the Duodenum

Four Major Conditions

1. Duodenal Ulcer

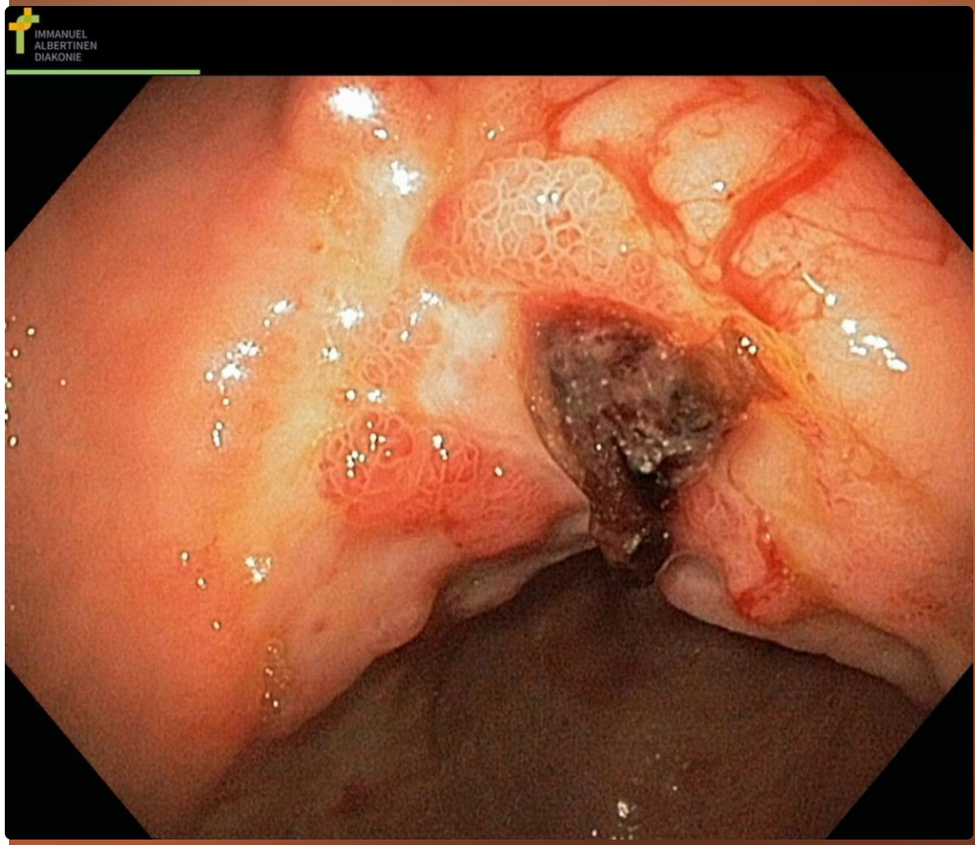
The most common peptic ulcer disease (PUD) form, characterized by a break in the duodenal mucosa extending through the muscularis mucosae. It is strongly linked to **Helicobacter pylori** infection and NSAID use.

Pathophysiology

Duodenal ulcers result from an imbalance between aggressive factors (acid and pepsin secretion) and protective factors (mucosal barrier, bicarbonate secretion, prostaglandins, and blood flow). *H. pylori* infection weakens the mucosal defense, leading to increased acid secretion and inflammation. NSAIDs inhibit prostaglandin synthesis, compromising mucosal protection.

Clinical Presentation

- **Epigastric pain:** Often described as burning, gnawing, or aching. Typically occurs 2-5 hours after meals or in the middle of the night, and is frequently relieved by food or antacids.
- **Nausea and vomiting:** Less common but can occur.
- **Weight loss:** Due to fear of eating or early satiety in some cases.



Complications

- **Bleeding:** The most common complication, presenting as melena, hematemesis, or anemia.
- **Perforation:** A life-threatening event leading to peritonitis and severe abdominal pain.
- **Penetration:** Ulcer extends into adjacent organs (e.g., pancreas).
- **Gastric outlet obstruction:** Caused by edema or scarring, leading to recurrent vomiting.

Differential Diagnosis

It's crucial to differentiate duodenal ulcers from other causes of epigastric pain, including gastroesophageal reflux disease (GERD), gastritis, gallstone disease, pancreatitis, and functional dyspepsia. Gastric cancer must always be excluded, especially in older patients with new onset dyspepsia.

Treatment Approaches

- **H. pylori Eradication:** First-line treatment involves triple therapy (proton pump inhibitor + two antibiotics like amoxicillin and clarithromycin) or quadruple therapy (PPI + bismuth + two antibiotics).
- **Acid Suppression:** Proton pump inhibitors (PPIs) are the cornerstone of treatment, reducing acid production and allowing the ulcer to heal. H2-receptor antagonists are an alternative.
- **Lifestyle Modifications:** Avoiding NSAIDs, reducing alcohol intake, quitting smoking, and managing stress are important adjuncts.
- **Endoscopic Intervention:** For bleeding ulcers, endoscopic therapies (e.g., injection, cautery, clipping) are used.
- **Surgery:** Rarely required, typically reserved for refractory ulcers or severe complications like perforation.

2. Celiac Disease

01

Pathophysiology

Autoimmune reaction to gluten causing malabsorption.

02

Diagnosis

Diagnose by anti-tTG and biopsy.

03

Treatment

Treat with gluten-free diet.

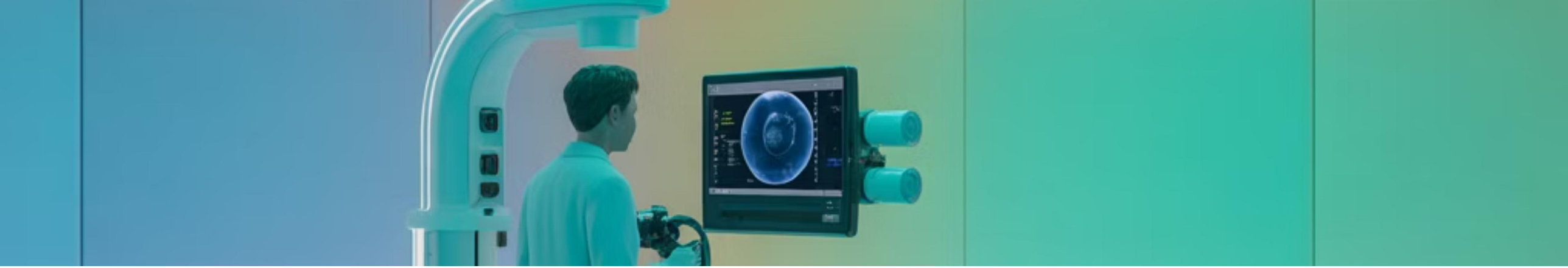
3. Duodenitis & 4. Tumors

Duodenitis

Due to H. pylori, NSAIDs, Crohn's. Treat underlying cause.

Tumors

Adenocarcinoma, lymphoma, or carcinoid. Symptoms: obstruction, bleeding. Treat surgically.



Diagnostics

1

Endoscopy

Endoscopy is the gold standard.

2

Imaging

Imaging (barium meal, CT) are useful adjuncts.

3

Laboratory Tests

Lab tests (CBC, H. pylori, celiac serology) are useful adjuncts.

General Management

- Eradicate H. pylori
- Avoid NSAIDs
- Use PPIs
- Maintain diet
- Manage complications surgically if needed

Summary Table

Disease	Main Cause	Key Symptom	Diagnostic Tool	Main Treatment
Acute Gastritis	NSAIDs, alcohol	Epigastric pain	Endoscopy	Stop cause, PPI
Chronic Gastritis	H. pylori	Dyspepsia	Biopsy	Eradicate H. pylori
Peptic Ulcer	H. pylori, NSAIDs	Burning pain	Endoscopy	PPI + antibiotics
Celiac Disease	Gluten	Diarrhea, weight loss	Serology, biopsy	Gluten-free diet
Gastric Cancer	H. pylori, diet	Weight loss	Endoscopy + biopsy	Surgery
Duodenal Tumor	Adenocarcinoma	Obstruction	CT, endoscopy	Surgery