



- What is the difference between an ulcer and an erosion?

- **Ulcer:** a knockout of mucosa and part of the submucosa.
- **Erosion:** Restricted to mucosa only (an especially the epithelium).  
Notice that peptic ulcers occur in any portion of gastrointestinal tract exposed to the aggressive action of acid-peptic juices.

- What are the most common complications of peptic ulcer disease?

- **Gastric ulcer:** hemorrhage in lesser sac and injury to the left gastric artery.
- **Duodenal ulcer:** acute pancreatitis and injury to gastroduodenal artery.

- Pathogenesis of peptic ulcer disease:

- Imbalance between gastro-duodenal mucosal defense mechanisms and damaging forces of gastric acid and pepsin, combined with superimposed injury from environmental or immunologic agents.

Defensive forces	Damaging forces
Surface mucus secretion	Gastric acidity
Bicarbonate secretion into mucus	Peptic enzymes
Mucosal blood flow	H. pylori infection
Epithelial regenerative capacity	NSAIDs and aspirin
Elaboration of prostaglandins	Alcohol and smoking

- Sites of peptic ulcer:

- **Duodenum:** first portion; anterior wall is more often affected.
- **Stomach:** antrum and lesser curvature (more common).

Notes:

- ✓ There are multiple ulcers in the duodenum, stomach or jejunum of patients with Zollinger-Ellison syndrome.
- ✓ There are ulcers adjacent to a Meckle’s diverticulum that contains ectopic gastric mucosa.

- Gastritis:

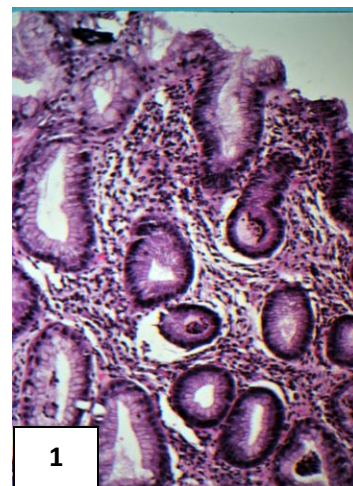
• **Acute (erosive):**

- ✓ Disruption of mucosal barrier leading to inflammation.

✓ Caused by:

- ❖ Stress.
- ❖ NSAIDs (reduced prostaglandins leads to decreased gastric mucosa protection).
- ❖ Alcohol.
- ❖ Uremia.
- ❖ Burns (known as curling ulcer: due to decreased plasma volume which leads to sloughing of gastric mucosa).
- ❖ Brain injury (known as cushing ulcer: due to increased vagal stimulation leading to increased Ach thus increasing acid production).

- ✓ Morphology (see image-1): there is prominent neutrophil infiltration.



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• **Chronic (non-erosive):**

✓ Type A (fundus/ body):

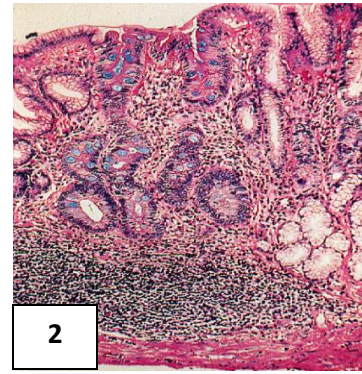
❖ *It is an autoimmune disorder characterized by:*

- Autoantibodies to parietal cells of the stomach.
- Pernicious anemia.
- Achlorhydria.

Notice that it is associated with other autoimmune disorders.

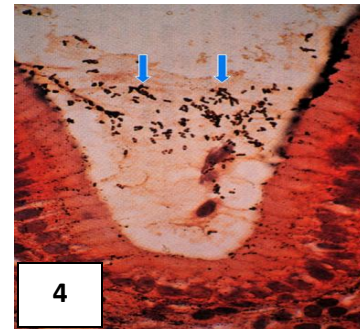
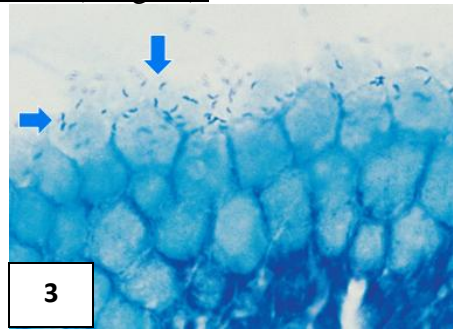


- ✓ Type B (antrum):
  - ❖ It is the most common type.
  - ❖ Caused by H.pylori infection.
  - ❖ There is increased risk of MALT lymphoma and gastric adenocarcinoma.
  - ❖ *Morphology (see image-2):*
    - Chronic inflammatory cell infiltration.
    - Mucosal atrophy.
    - Intestinal (goblet cell) metaplasia.



- **Helicobacter pylori infection:**

- Adapted to live in association with surface epithelium beneath mucus barrier.
- Causes cell damage and inflammatory cell infiltration.
- **Important stains to confirm H.pylori infection:**
  - ✓ Giemsa stain (image-3).
  - ✓ Silver stain (image-4).



• **Helicobacter gastritis: there are two patterns of the infection**

- ✓ Diffuse involvement of body and antrum (pan-gastritis associated with diminishing acid output).
- ✓ Infection confined to antrum (antral gastritis associated with increased acid output).

- **Peptic ulcer disease:**

	<b>Gastric ulcer</b>	<b>Duodenal ulcer</b>
<b>Pain</b>	Can be greater with meals- weight loss	Decreases with meals- weight gain
<b>H.pylori infection</b>	In 70%	In almost 100%
<b>Mechanism</b>	↓ mucosal protection against gastric acid	↓ mucosal protection or ↑ gastric acid secretion
<b>Other causes</b>	NSAIDs	Zollinger-Ellison syndrome
<b>Risk of carcinoma</b>	↑	Generally benign
<b>Other</b>	Often occurs in older patients	Hypertrophy of Brunner glands

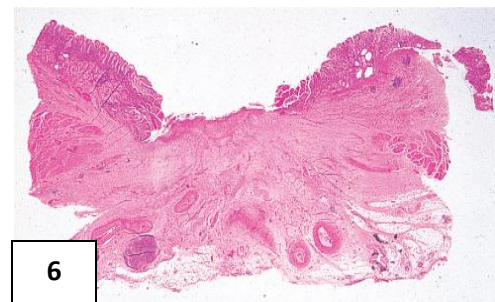
• **Gross features of gastric ulcer (see image-5):**

- ✓ Single; well-delineated lesion.
- ✓ Shape: Round, oval or linear.
- ✓ Size: usually less than 2cm in diameter. Notice that size does not differentiate benign from malignant ulcers.



• **Microscopic features of gastric ulcer (see image-6):**

- ✓ Clean, non-elevated edges.
- ✓ Inflammatory granulation tissue at the base.
- ✓ Disruption of muscularis propria.
- ✓ Underlying fibrosis.





- **Biopsy of peptic ulcer:**

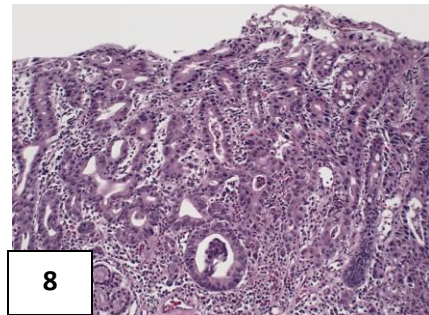
- **Aim:** to distinguish between benign and malignant ulcers.
- Biopsy should be taken from the ulcer edge, at least from each quadrant.
- Up to 10-12 biopsies may be taken to exclude cancer.
- Repeat endoscopy may be needed if biopsies are negative and there is high index of suspicion.

- **Ulcer complications:**

<b>Hemorrhage</b>	<ul style="list-style-type: none"><li>• Occurring in gastric and duodenal ulcers (more common on the posterior wall)</li><li>• Ruptured gastric ulcer on the lesser curvature of the stomach → bleeding from left gastric artery</li><li>• An ulcer on the posterior wall of the duodenum → bleeding from gastroduodenal artery</li></ul>
<b>Perforation</b>	<ul style="list-style-type: none"><li>• occurring in duodenal ulcer (more common on the anterior wall).</li><li>• You may see free air under the diaphragm with referred pain to the shoulder.</li></ul>

- **Stomach cancer:**

- Almost always adenocarcinoma.
- Early aggressive local spread and lymph node/ liver metastasis.
- Often presents with acanthosis nigricans.
- **There are two types:**
  - ✓ Intestinal adenocarcinoma:
    - ❖ Associated with Hpylori infection, dietary nitrosamines (smoked foods), tobacco smoking, achlorhydria and chronic gastritis.
    - ❖ Commonly on lesser curvature.
    - ❖ Looks like ulcer with raised margins (see image-7). Microscopically, forming glands (see image-8).



- ❖ *Virchow node:* involvement of left supraclavicular node by metastasis from stomach.

✓ Diffuse adenocarcinoma:

- ❖ Not associated with H.pylori.
- ❖ *Histologically:* characterized by signet ring cells (see image-9).
- ❖ Stomach wall grossly thickened and leathery (linitis plastica).

