# Zollinger-Ellison Syndrome Disease

Zollinger-Ellison syndrome (ZES) is caused by gastrin-secreting tumors, known as gastrinomas. The sequelae of this disease are the result of excess gastric acid production, which leads to abdominal pain, heartburn, diarrhea and ulcers in patients. These ulcers present most commonly in the proximal duodenum, and less commonly in the distal duodenum and jejunum. Furthermore, these are usually solitary ulcers. Patients may present with gastrointestinal bleeding as well. Abdominal pain and heartburn occur secondary to gastroesophageal reflux disease (GERD), which develops in roughly 50% of patients with Zollinger-Ellison syndrome. The gastrinomas of this disease can be sporadic and can occur without any other disease present. However, an important correlation of this disease is that 25% of cases are associated with multiple endocrine neoplasia type 1 (MEN 1).




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## Pathophysiology

### Gastrin-Secreting Tumor

Gas-Secreting Tumor-guy

These gastrin-secreting tumors, or gastrinomas, are found in the pancreas or duodenum. These tumors arise from neuroendocrine cells, and their excessive production of the hormone gastrin leads to the overproduction of gastric acid.

### Increased Gastric Acid

Up-arrow Gas Acidic-lemon

Gastrinomas are neuroendocrine-derived tumors that secrete gastrin, leading to the growth of gastric mucosa, and increased proliferation of stomach parietal cells. These cells proliferating cells produce an excess of gastric acid.

### Recurrent Peptic Ulcers

Recurrent-clock on Pepper Ulcer-volcano

Due to excess acid production, recurrent ulcers occur in affected patients. These ulcers present most commonly in the proximal duodenum and less commonly in the distal duodenum and jejunum. Furthermore, these are usually solitary ulcers. Patients may present with gastrointestinal bleeding as well.

### MEN Type 1

Man with #1 Foam-finger

Zollinger-Ellison Syndrome (ZES) gastrinomas can be sporadic and occur without any other disease. However, an important correlation of this disease is that 25% of cases are associated with multiple endocrine neoplasia type 1 (MEN 1).

## Symptoms

### Abdominal Pain

Abdominal Pain-bolt

Patients with Zollinger-Ellison syndrome (ZES) commonly present with abdominal pain, which is a result of gastroesophageal reflux disease (GERD) or ulcerations from gastric acid hypersecretion.

### Heartburn (Pyrosis)

Heart-burning

Heartburn is another common symptom seen in patients with Zollinger-Ellison syndrome (ZES). This symptom occurs because of gastroesophageal reflux disease (GERD) that develops from gastric acid hypersecretion.

### Diarrhea

Toilet

As a result of excess acid secretion and malabsorption, patients often complain of bouts of diarrhea, which is often seen as a chronic symptom of Zollinger-Ellison syndrome (ZES).

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