A thick black L-shaped frame is positioned on the left and right sides of the slide, framing the central text.

# RADIOLOGY OF ESOPHAGUS AND STOMACH

Practical Session (1)

Radiology

# ESOPHAGUS ANATOMY

# GROSS ANATOMY

- 23-37 cm long
- 1-2 cm transverse diameter
- divided into 3 parts:
  1. **CERVICAL:** continuous with the hypopharynx, commences at the lower border of cricoid cartilage (at level of C5/6)
  2. **THORACIC:** from superior thoracic aperture (T1) to the esophageal hiatus (T10) in the diaphragm
  3. **ABDOMINAL:** from esophageal hiatus and is continuous with the cardia of the stomach at the gastro-esophageal junction.

# GROSS ANATOMY

There are 3 normal esophageal constrictions that should not be confused for pathological constrictions:

1. **CERVICAL** : due to cricoid cartilage at the level of C5/6
2. **THORACIC** : due to aortic arch at the level of T4/5
3. **ABDOMINAL** : at esophageal hiatus at T10/11

# GROSS ANATOMY

■ The esophageal wall is composed of:

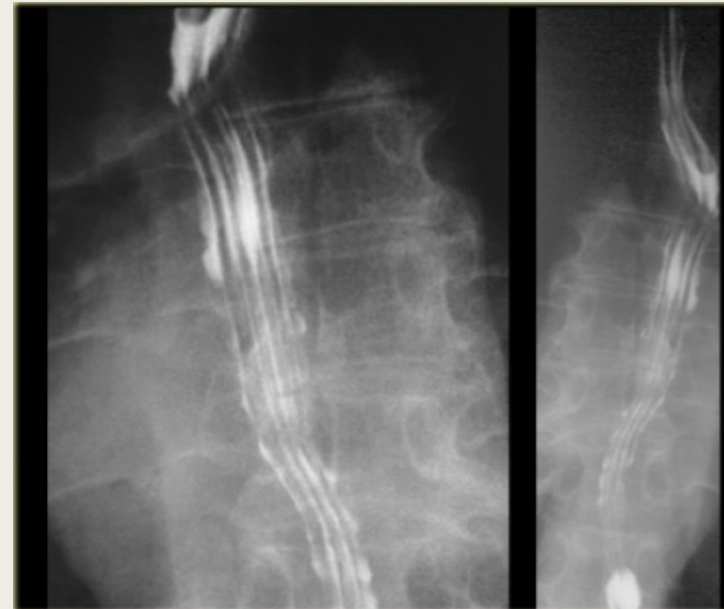
1. Mucosa:

1. *Non-keratinized, stratified squamous epithelium*
2. *Interdigitates with gastric columnar epithelium at or below diaphragm with the irregular boundary forming the Z line.*

2. Musculature:

1. *Inner circular layer*
2. *Outer longitudinal layer:*
  1. Upper 1/3 striated muscle
  2. Middle 1/3 striated and smooth muscle
  3. Lower 1/3 smooth muscle

3. No serosa



# GROSS ANATOMY

- The cervical esophagus begins at the upper esophageal sphincter, which is formed by the cricopharyngeus muscle.
- The esophagus then descends to the left of the midline through the neck and superior mediastinum, returning to the midline at T5, before coursing to the left of the midline once more, in the posterior mediastinum. The distal thoracic esophagus then curves anteriorly to pass through the diaphragm into the abdominal cavity.
- The lower esophageal sphincter, also known as the phrenic ampulla, represents a 2-4 cm long dilatation between the [A-ring](#) and [B-ring](#)<sup>7</sup>.

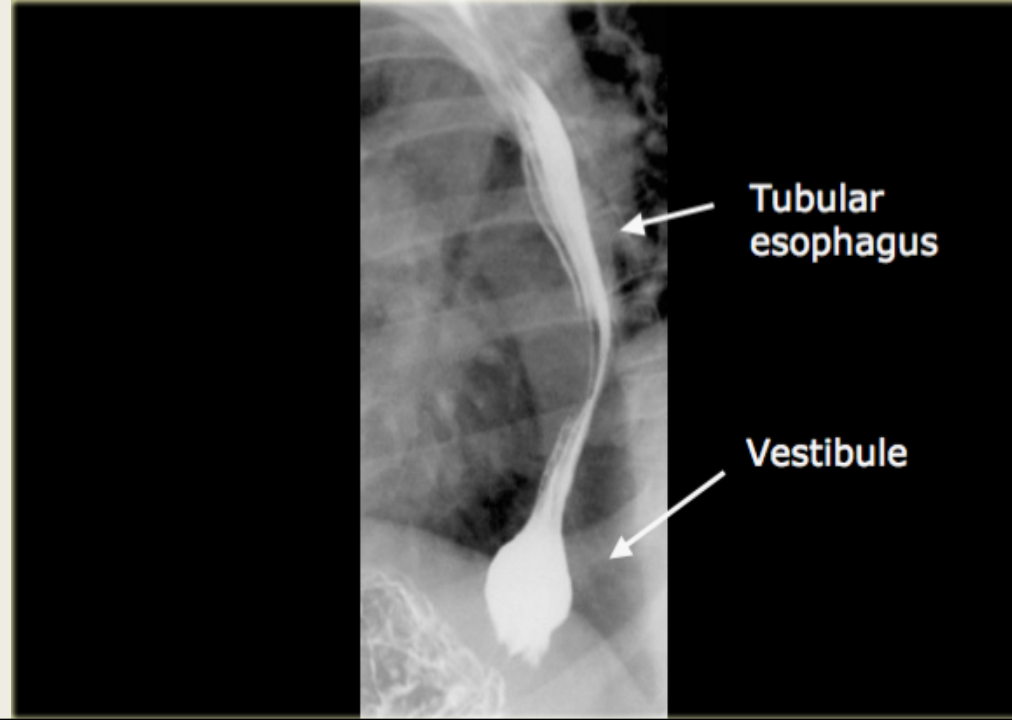
# GROSS ANATOMY

## A-Ring

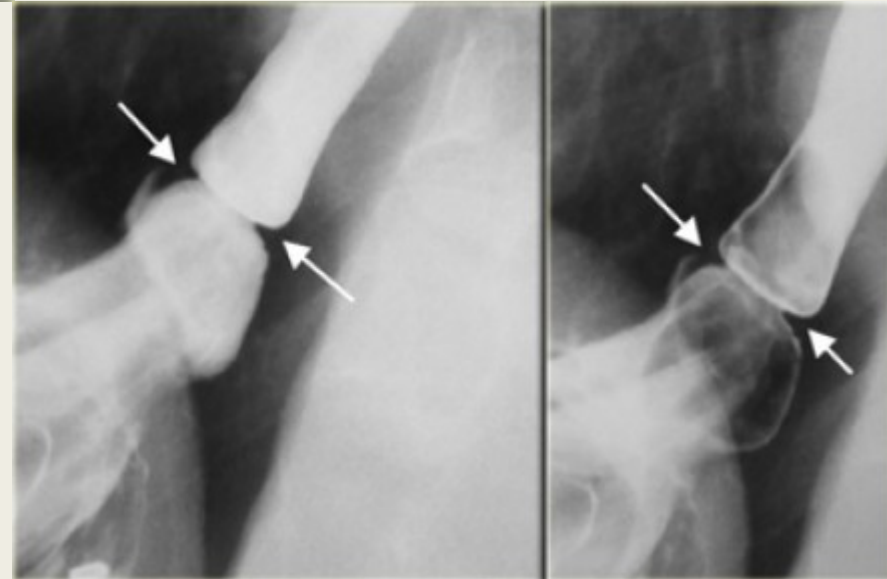
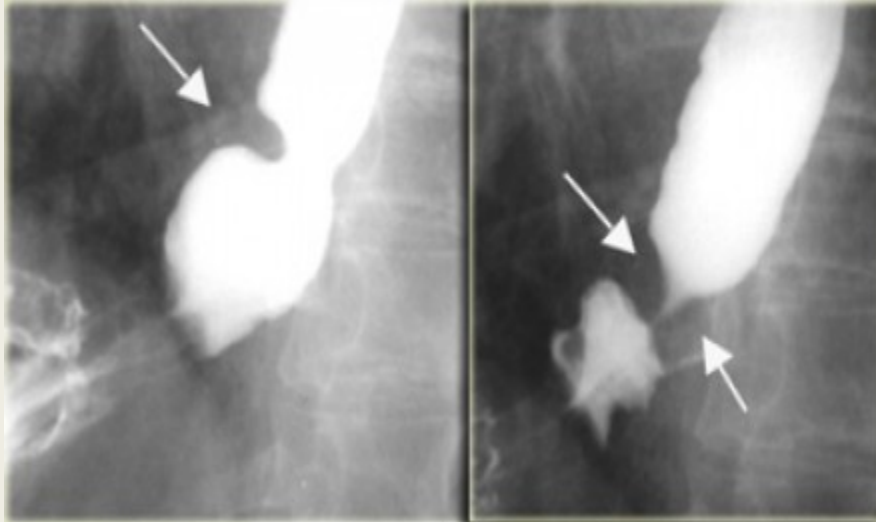
- Muscular contraction at the junction of tubular and vestibular esophagus

## B-Ring

- Mucosal ring at anatomic squamo-columnar junction (Z-line)
- Best or only seen with vestibular distension



# GROSS ANATOMY





# ESOPHAGEAL PERISTALSIS

## **NORMAL:**

- **Primary contraction:**

Propels bolus through the esophagus

- **Secondary contraction:** Follows primary contraction and propels any remaining bolus from thoracic esophagus

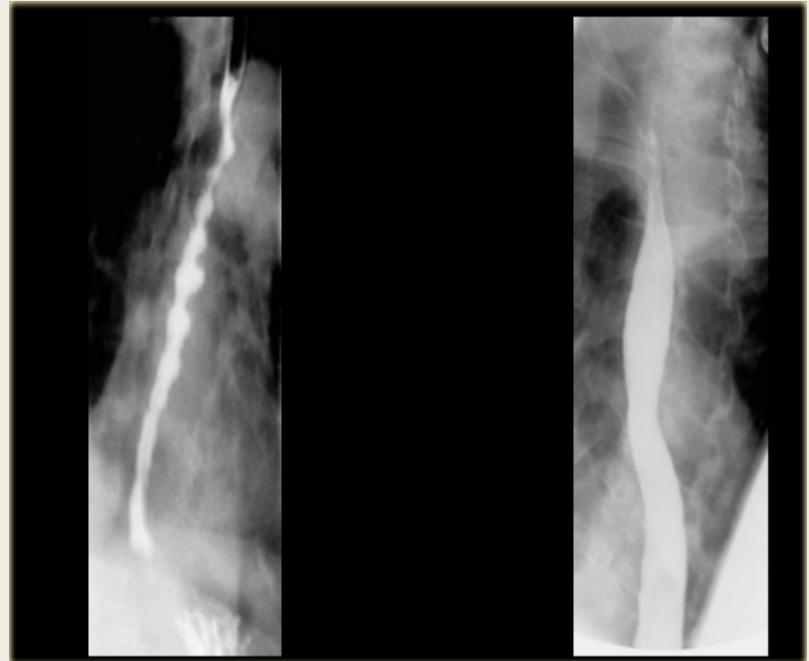
## **ABNORMAL:**

- **Tertiary contractions** (presbyesophagus):

Non-propulsive contractions

- **Diffuse esophageal spasm**

- **Decreased peristalsis** resulting from achalasia, scleroderma, dermatomyositis, polymyositis, esophagitis, and secondary to many other diseases



What are the modalities can be used in imaging the esophagus?

- A. CT scan
- B. MRI
- C. Fluoroscopy
- D. US
- E. X-ray
- F. Nuclear medicine

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B. MRI

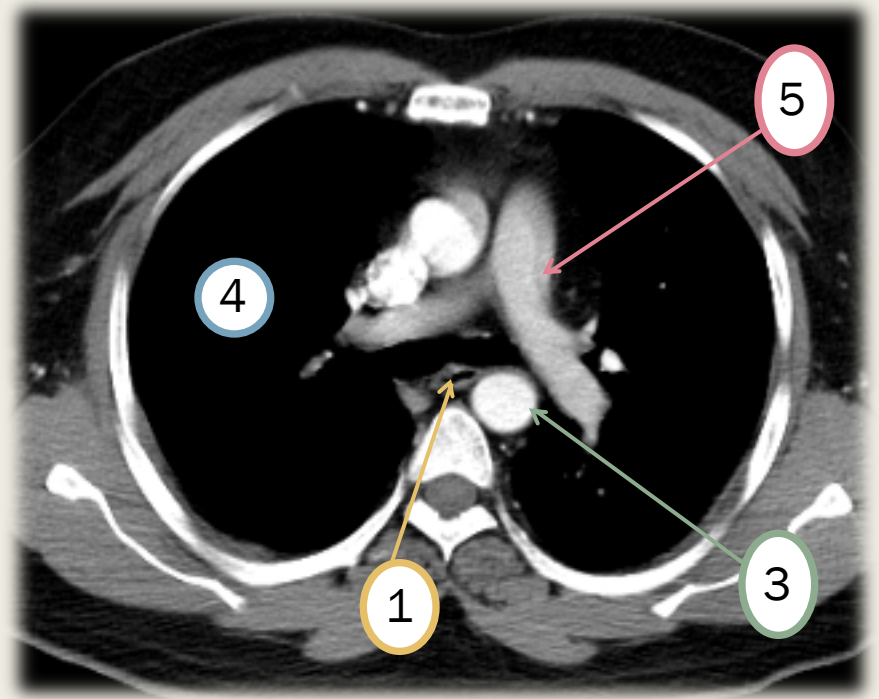
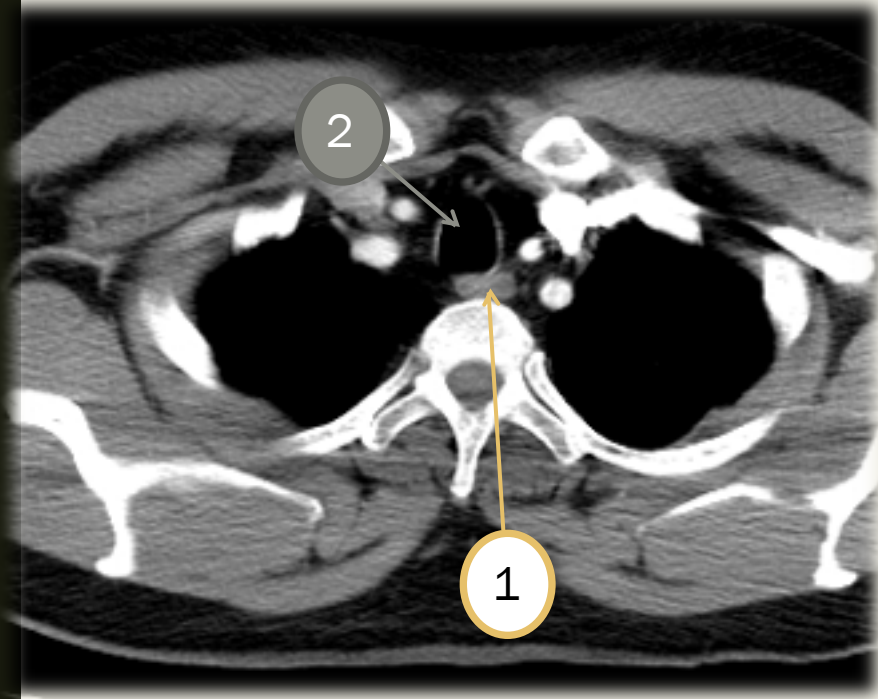
C. Fluoroscopy

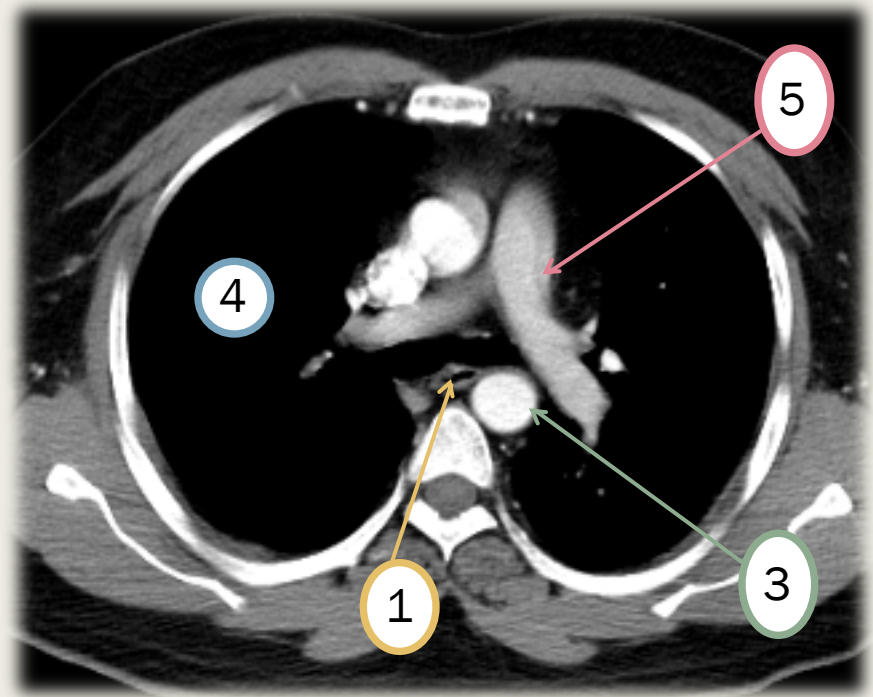
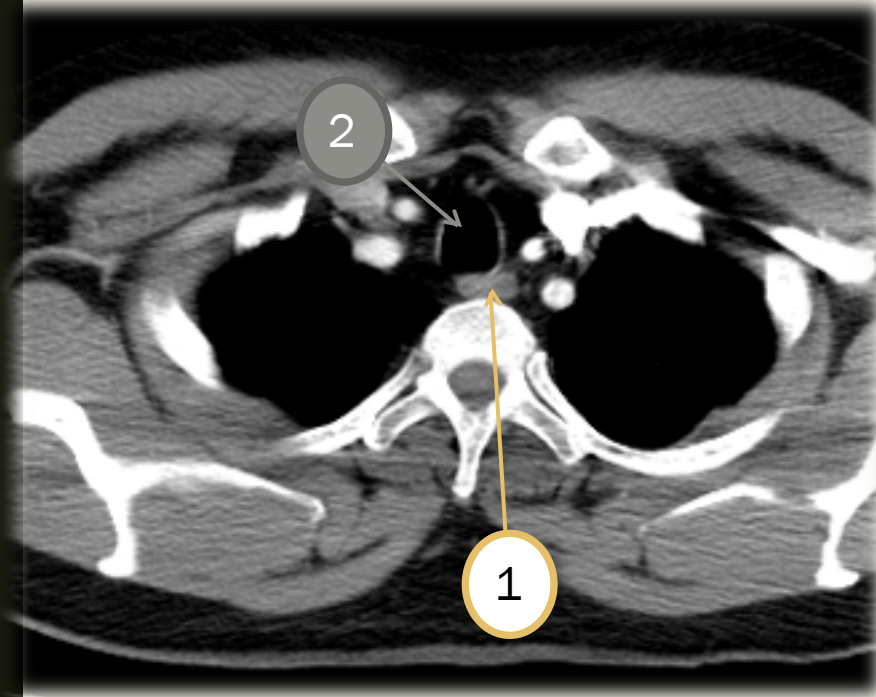
D. US

E. X-ray

F. Nuclear medicine

**CT scan**





1. Esophagus
2. Trachea
3. Aorta
4. Lung
5. Pulmonary artery

# Fluoroscopy

The double-contrast phase optimizes the ability to detect inflammatory or neoplastic diseases.

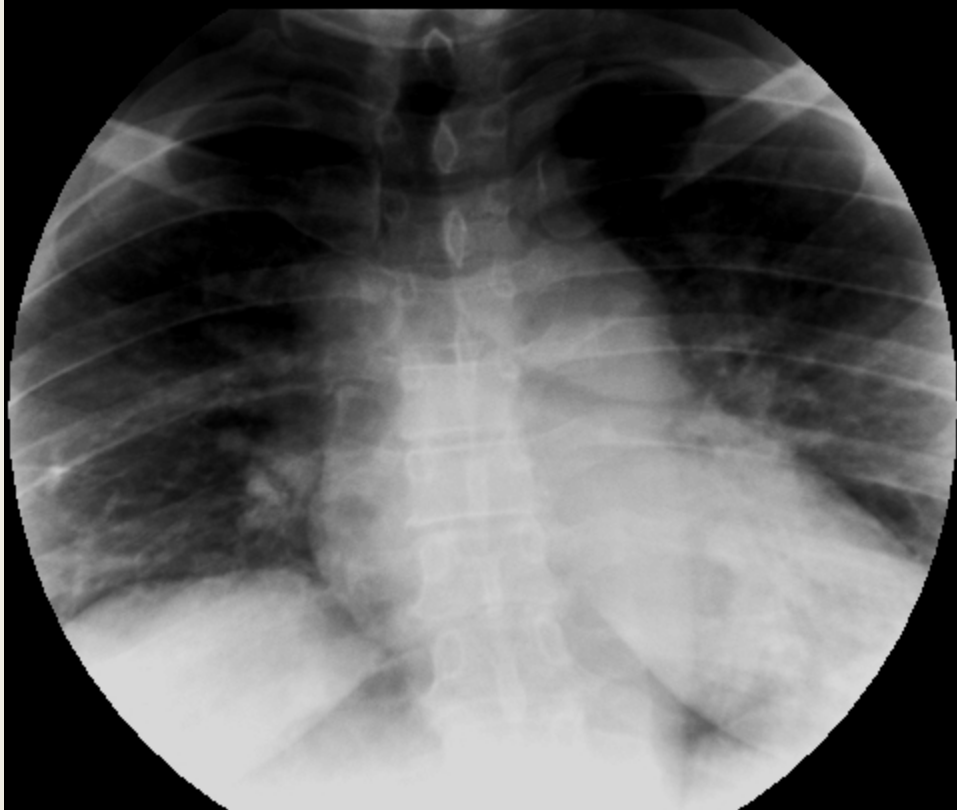
The single-contrast phase optimizes the ability to detect hiatal hernias and lower esophageal rings or strictures.



Fluoroscopic examination of the esophagus is also important for assessing motility disorders such as:

1. achalasia and diffuse esophageal spasm.
2. gastro-esophageal reflux disease.
3. esophagitis.
4. benign and malignant esophageal tumors.
5. varices.
6. lower esophageal rings.
7. diverticula.
8. esophageal motility disorders.

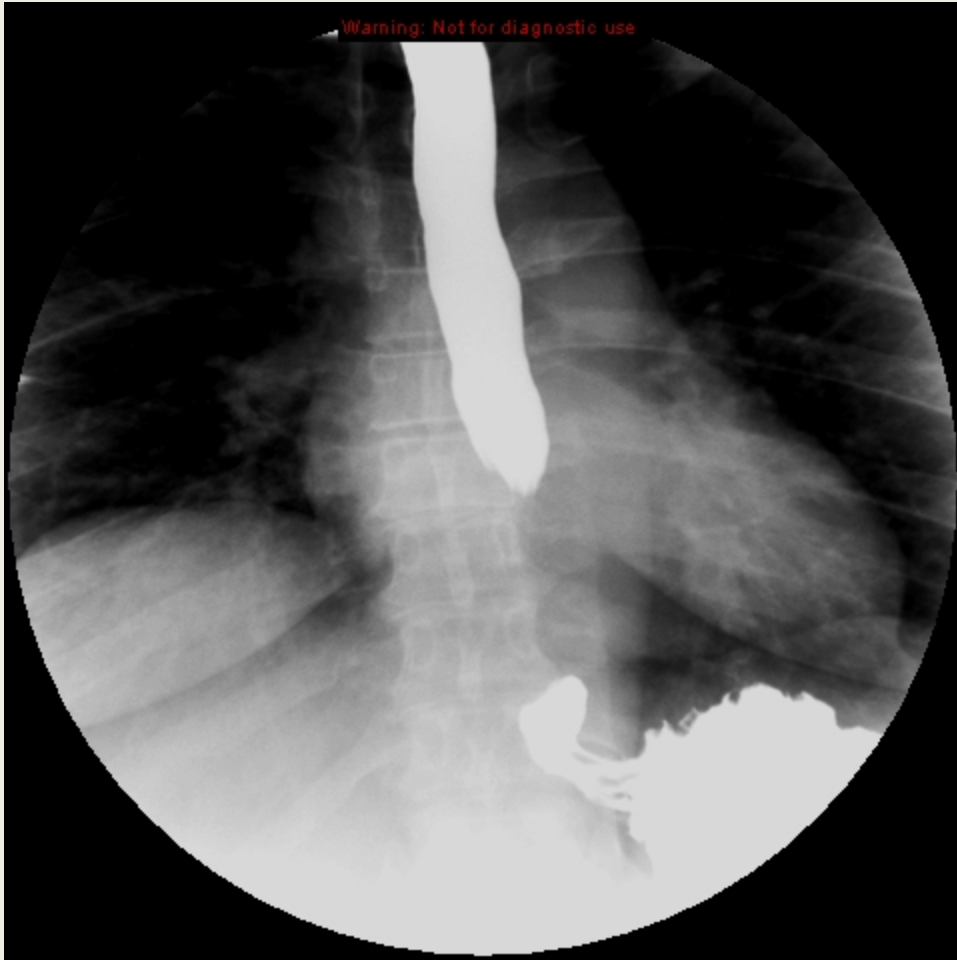
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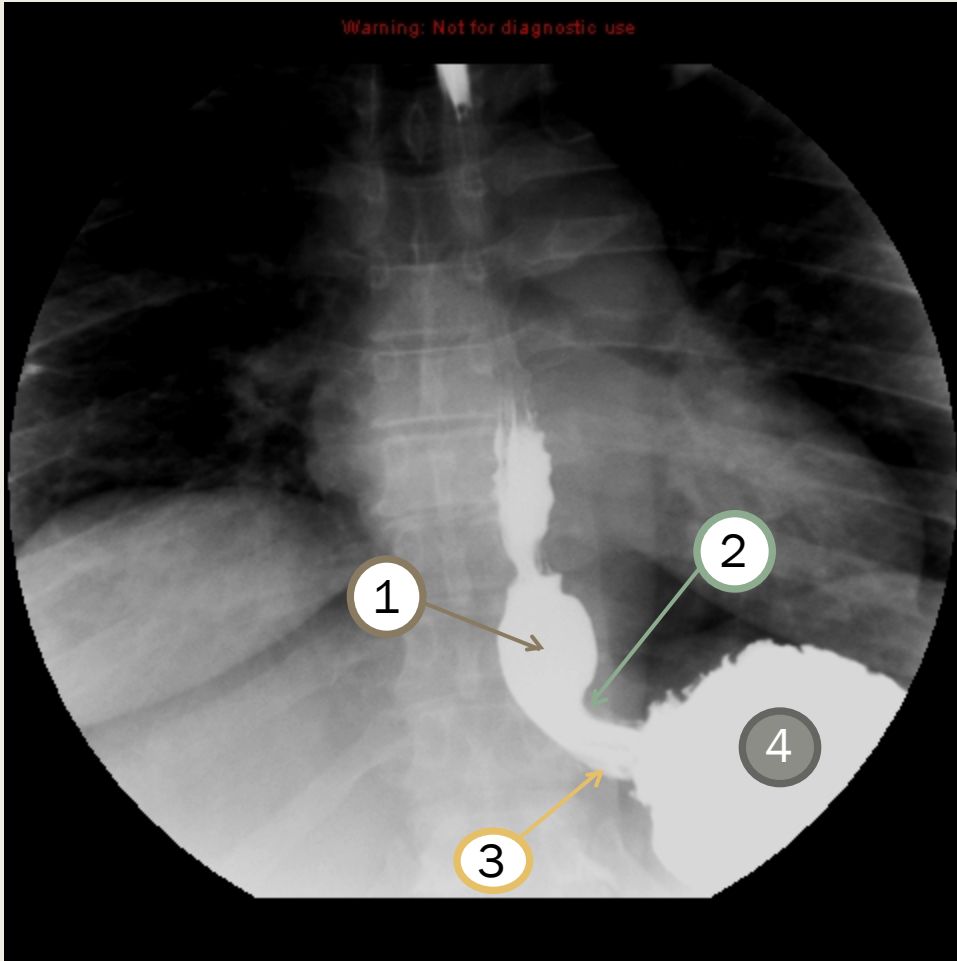
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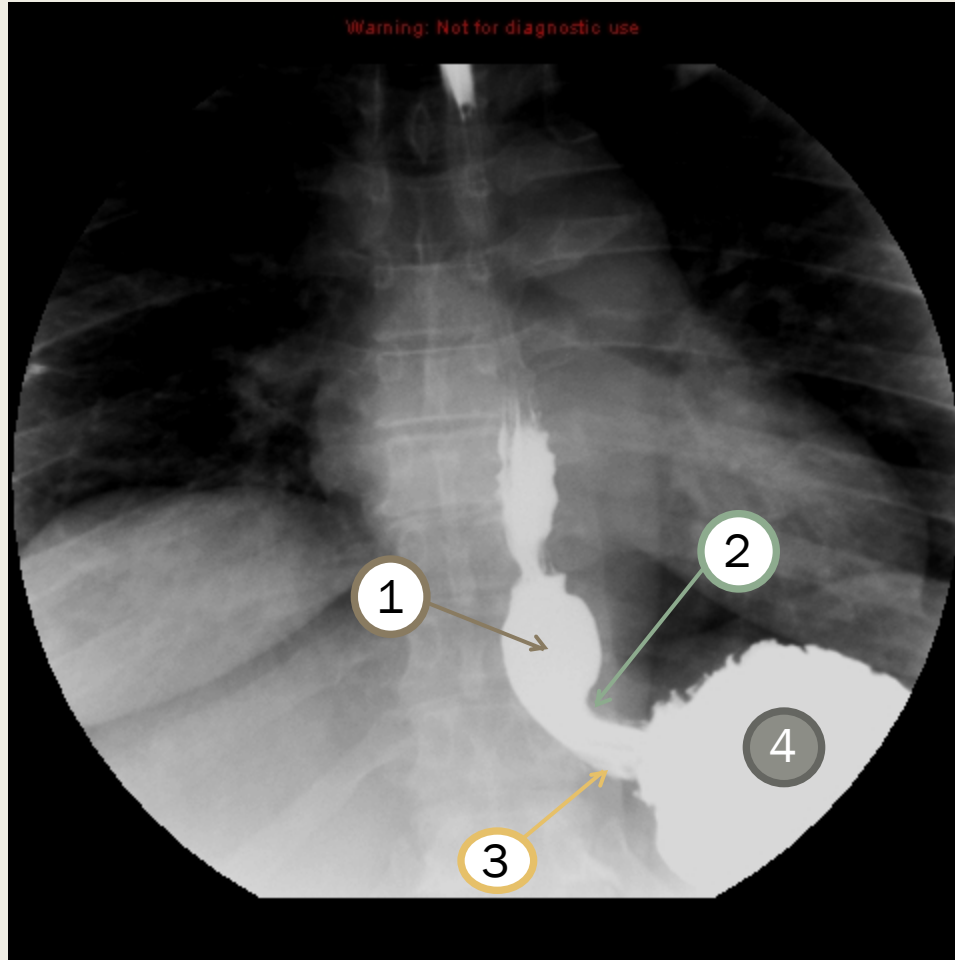
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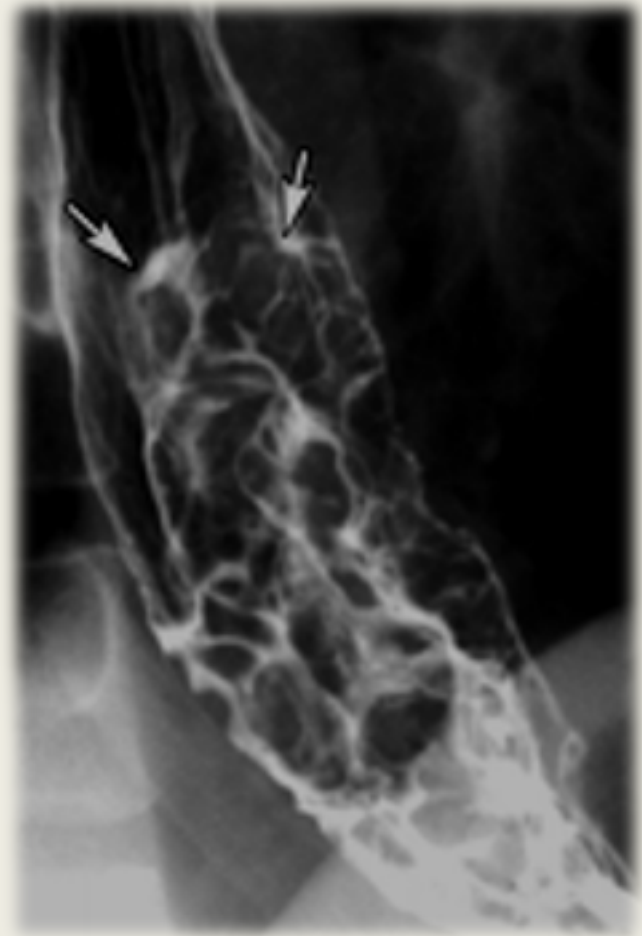
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- 1-Esophageal vestibule (ampulla).
- 2- B ring.
- 3- Gastroesophageal junction.
- 4- Stomach (gastric fundus).



**Abnormal esophagus (masses)**



# STOMACH ANATOMY

X RAY

# GROSS ANATOMY

The stomach is divided into distinct regions:

- **CARDIA:** the area that receives the esophagus (Gastroesophageal junction)
- **FUNDUS:** formed by the upper curvature
- **BODY** (corpus): the main central region of the organ
- **PYLORUS** (antrum): the lower section of the stomach that facilitates emptying into the small intestine

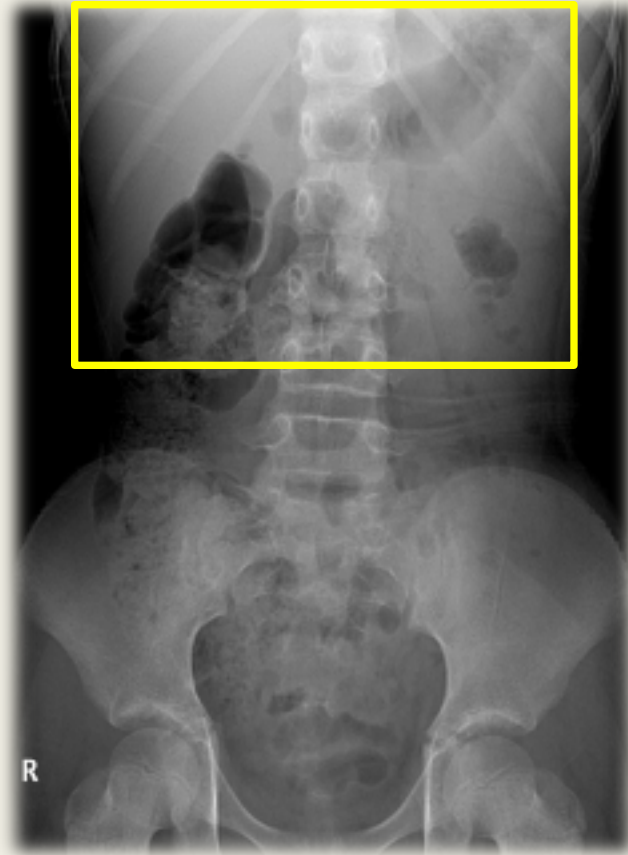
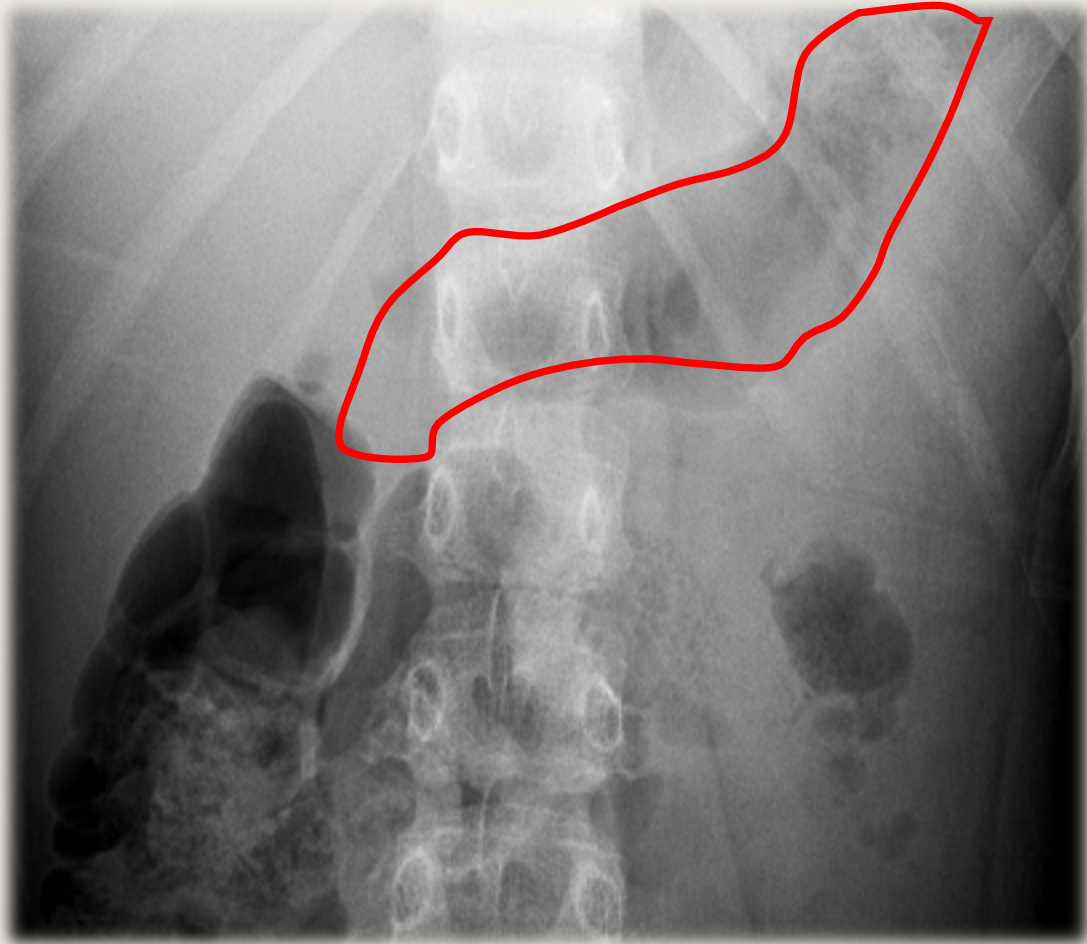
# GROSS ANATOMY

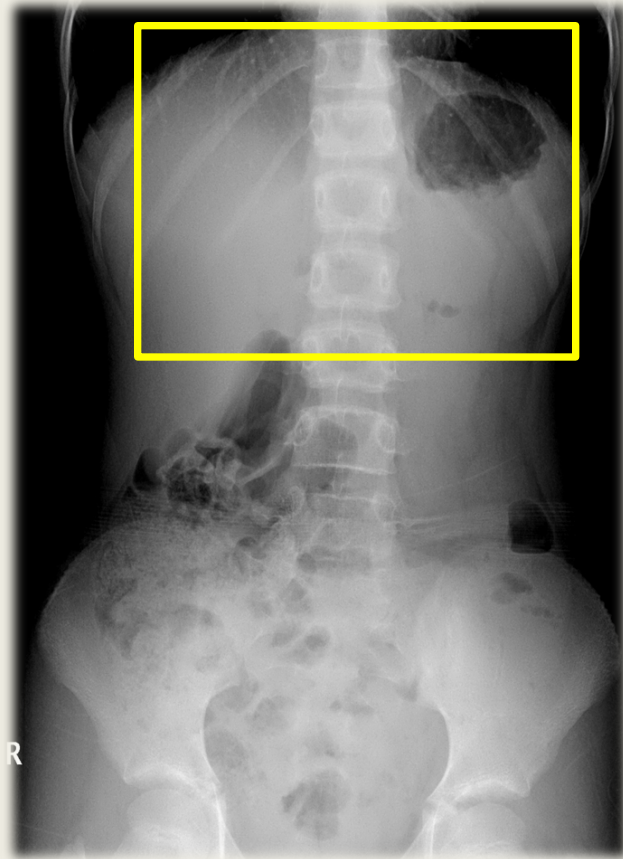
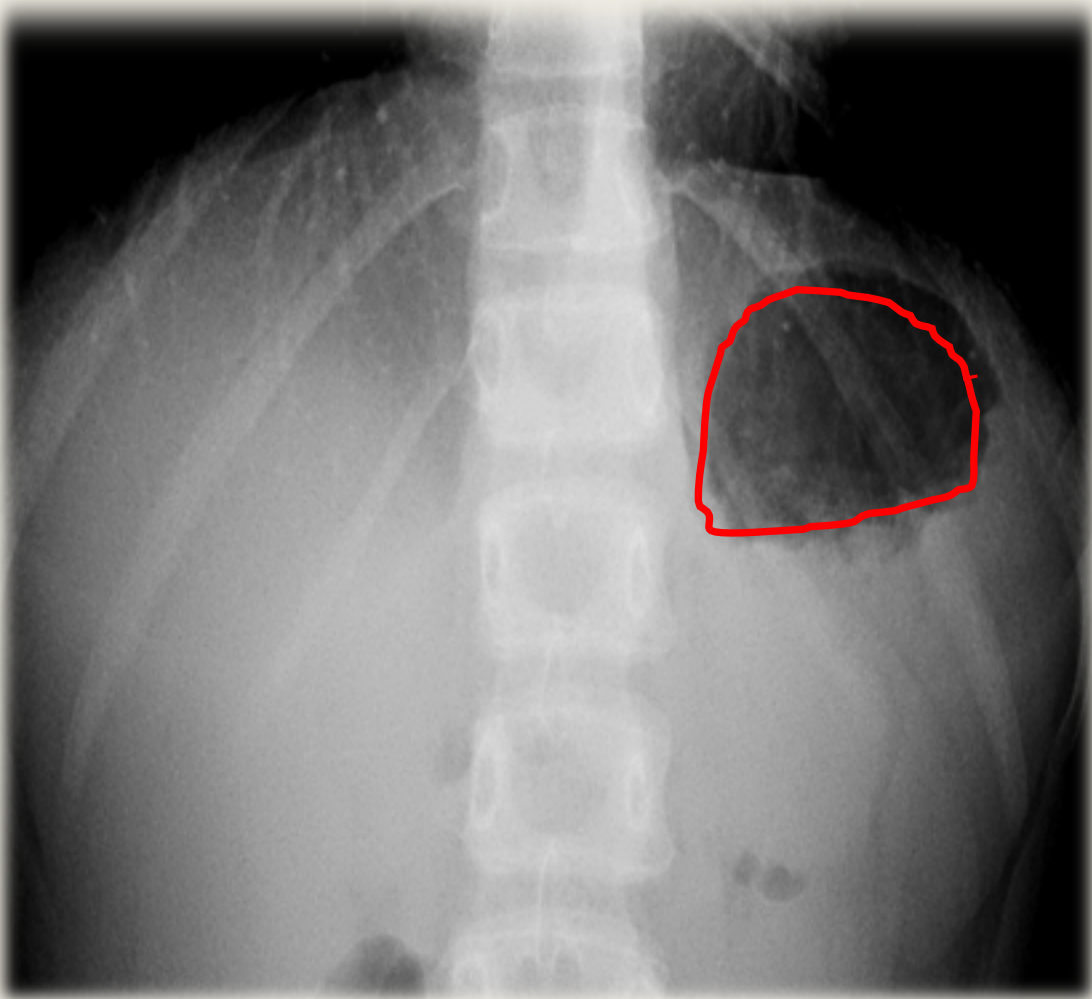
## HISTOLOGY

The stomach walls are composed of the following layers:

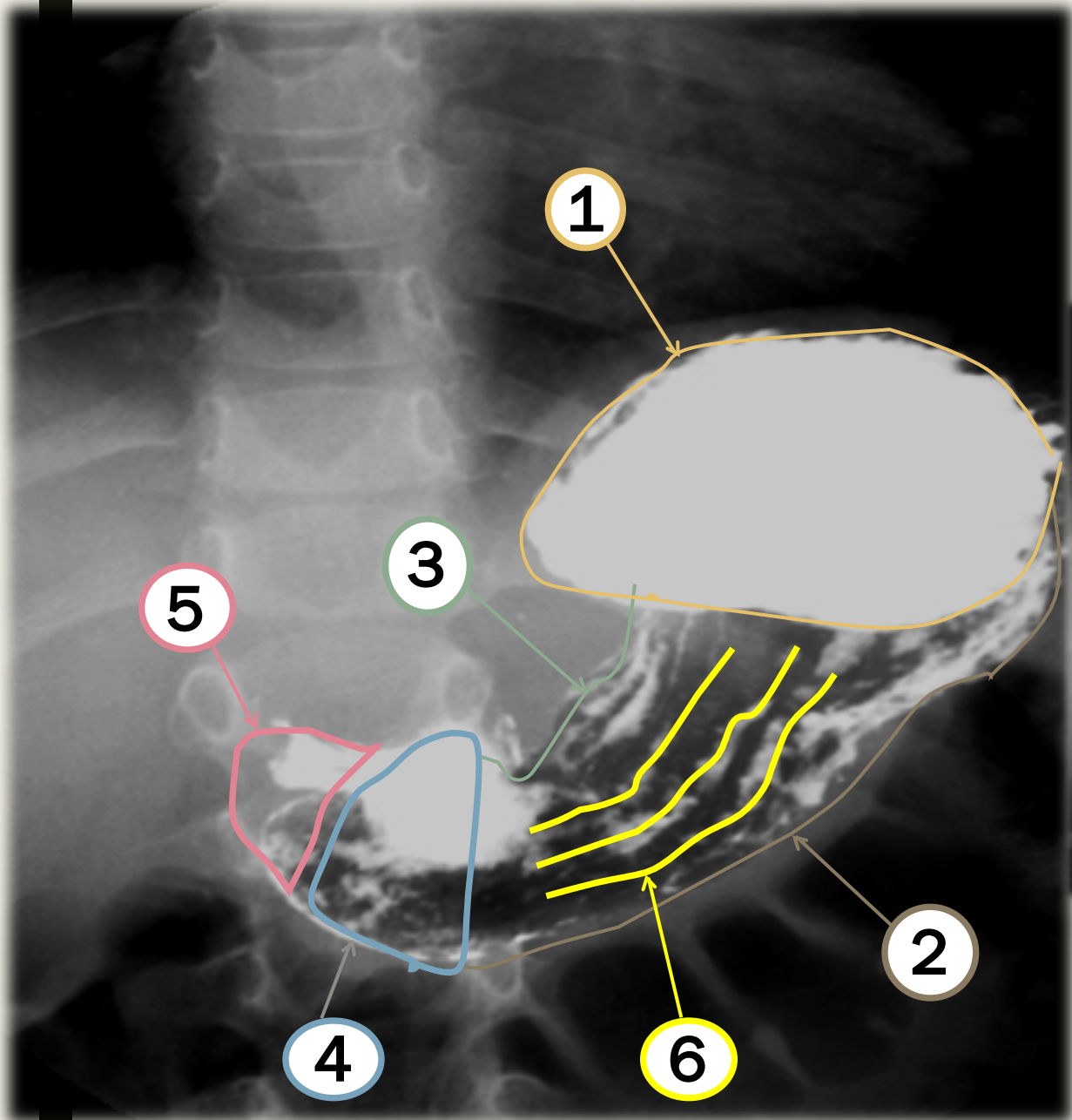
- **Mucosa:** gastric glandular tissue
- **Submucosa:** fibrous layer of connective tissue under mucosa
- **Muscularis externa:** this is the muscular layer of the stomach wall, there are three layers (inner oblique, middle circular and outer longitudinal).
- **Serosa:** the outermost layer of the stomach wall consisting of connective tissue which is continuous with the peritoneum



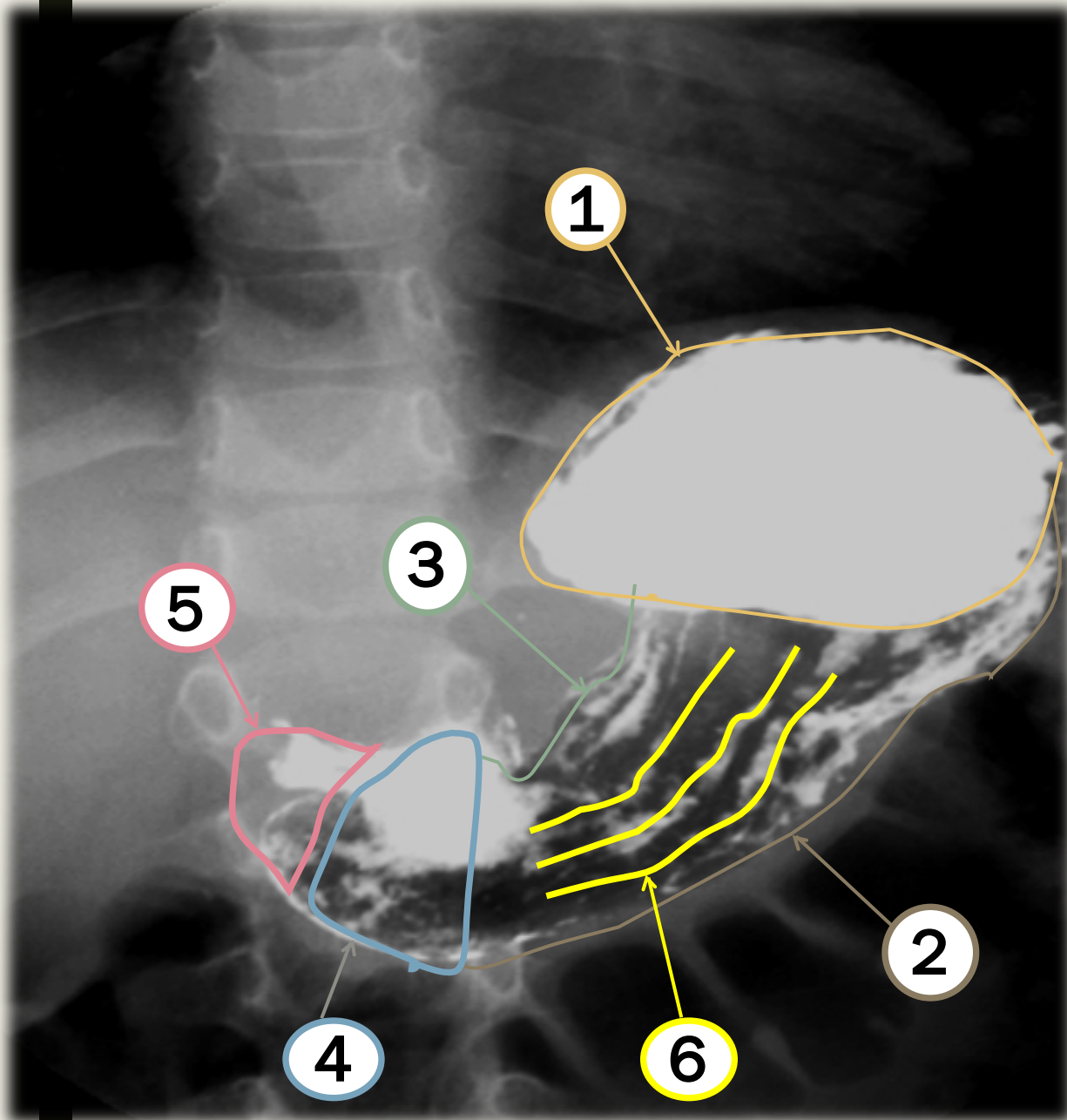




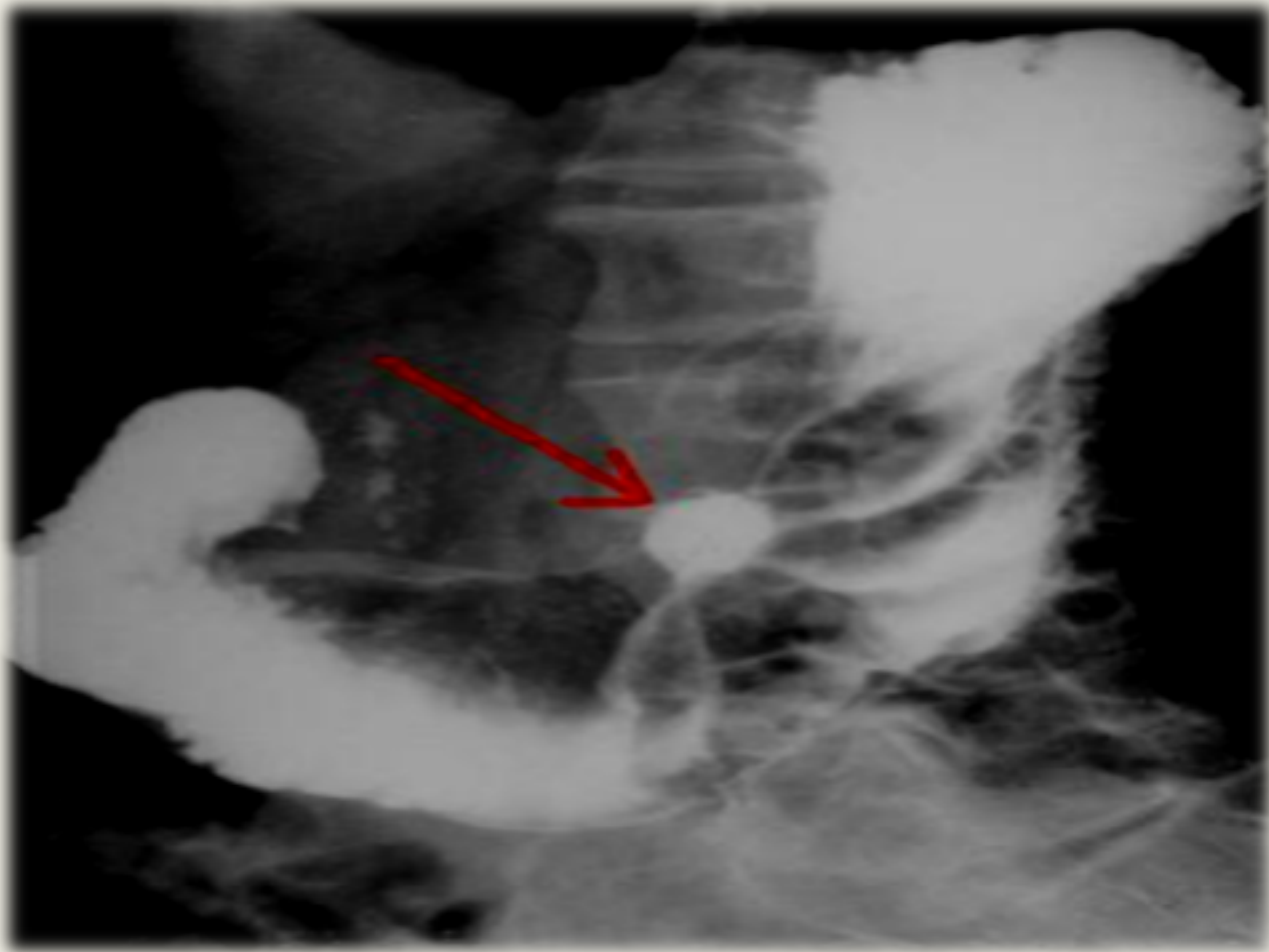
# Fluoroscopy





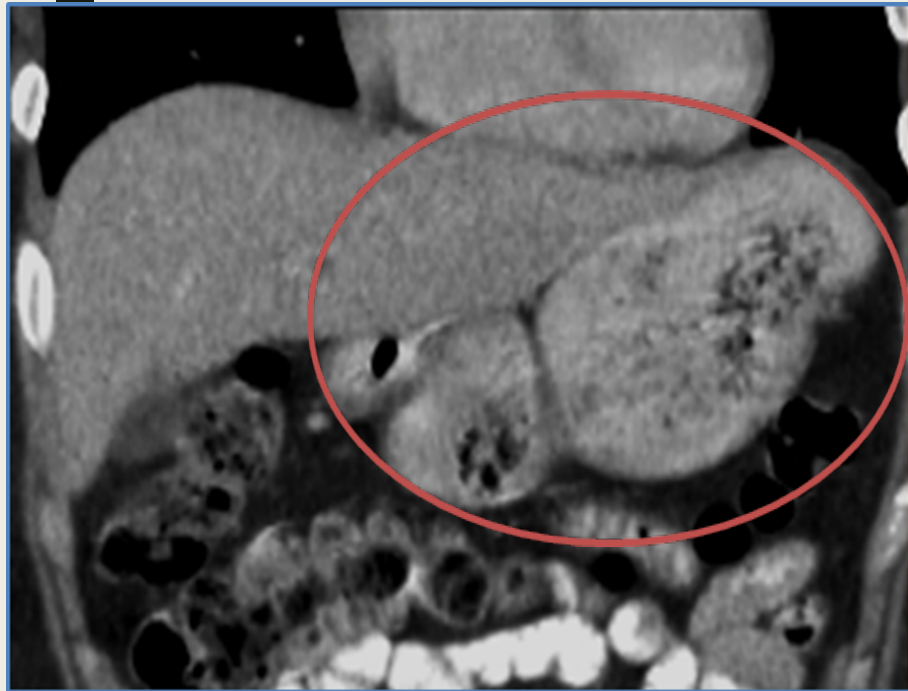


1. Stomach fundus
2. Greater curvature
3. Lesser curvature
4. Antrum
5. Pylorus
6. Mucosal folds

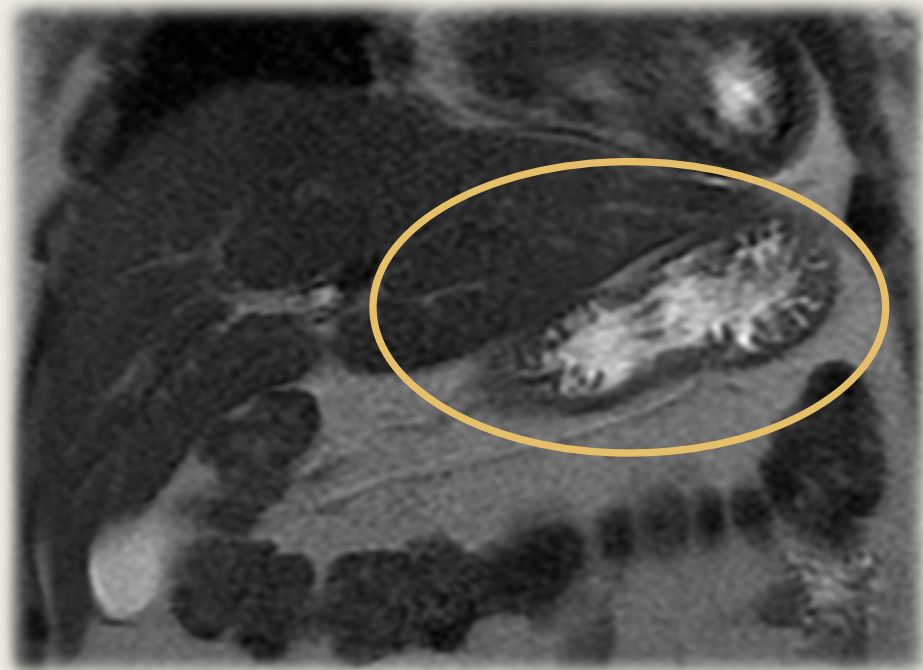


**Gastric ulcer**

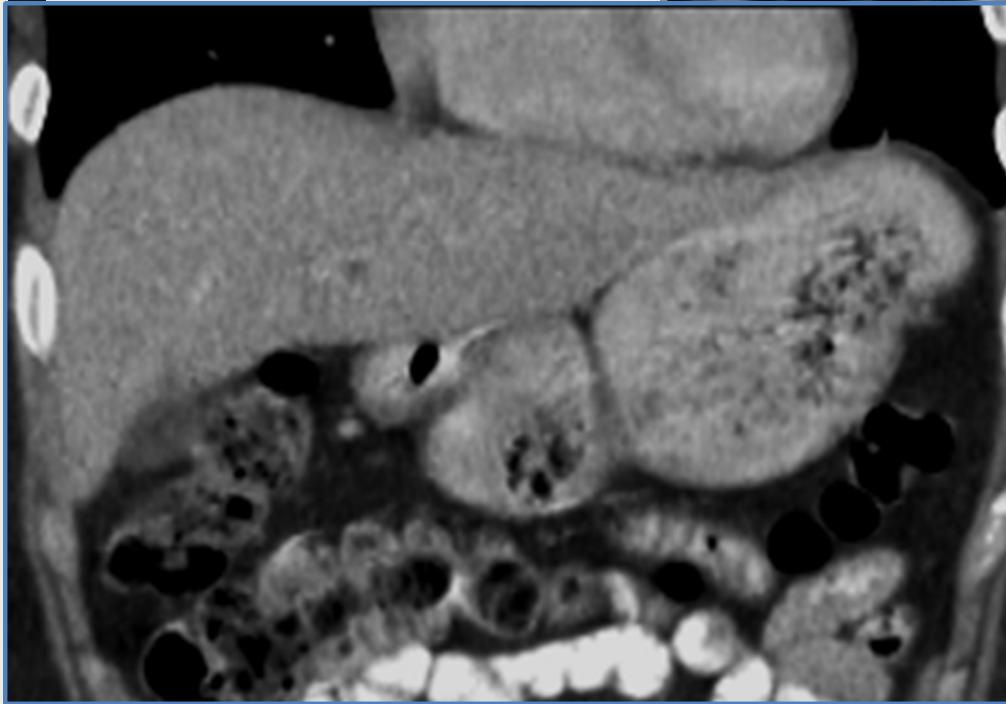
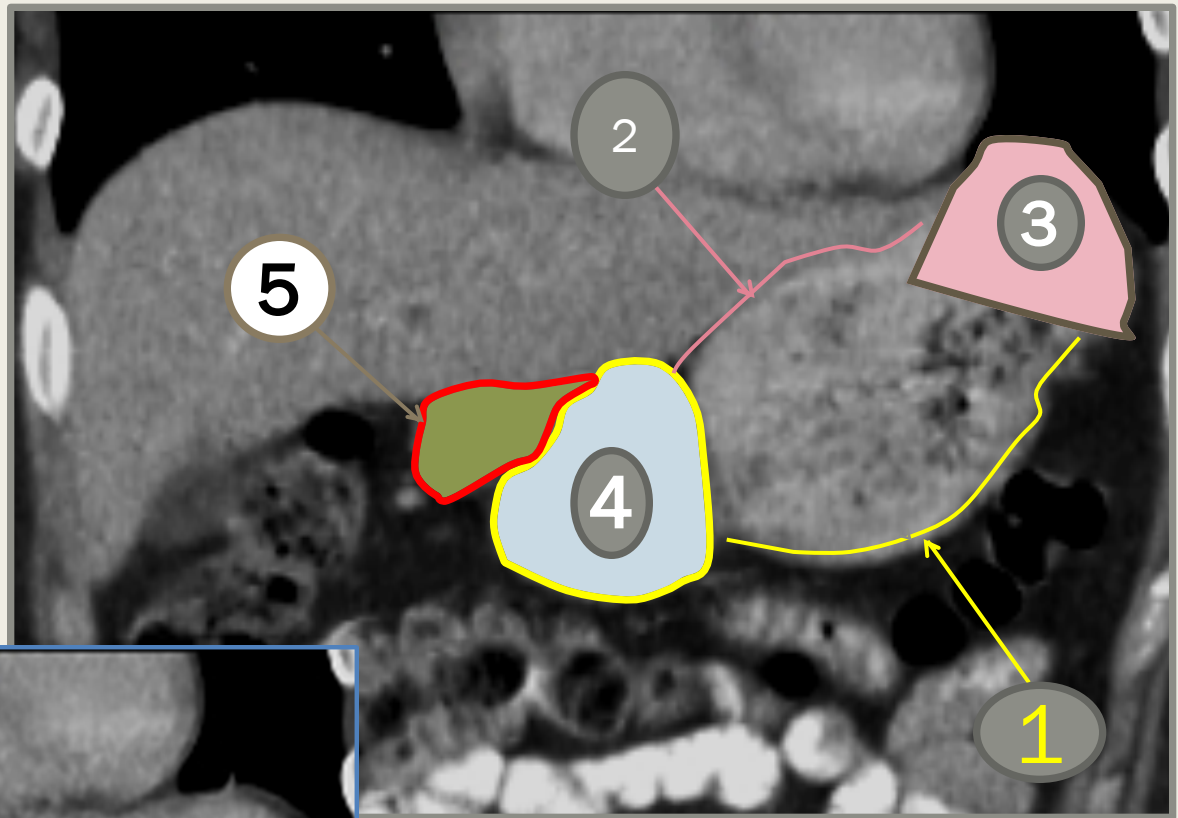
CT Scan vs MRI

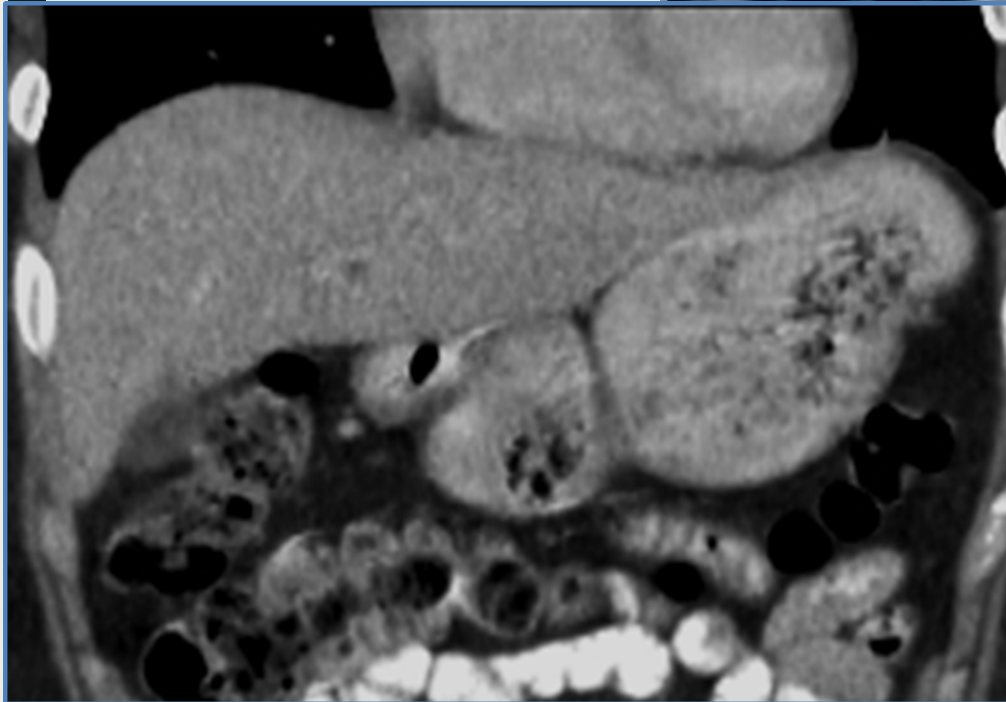
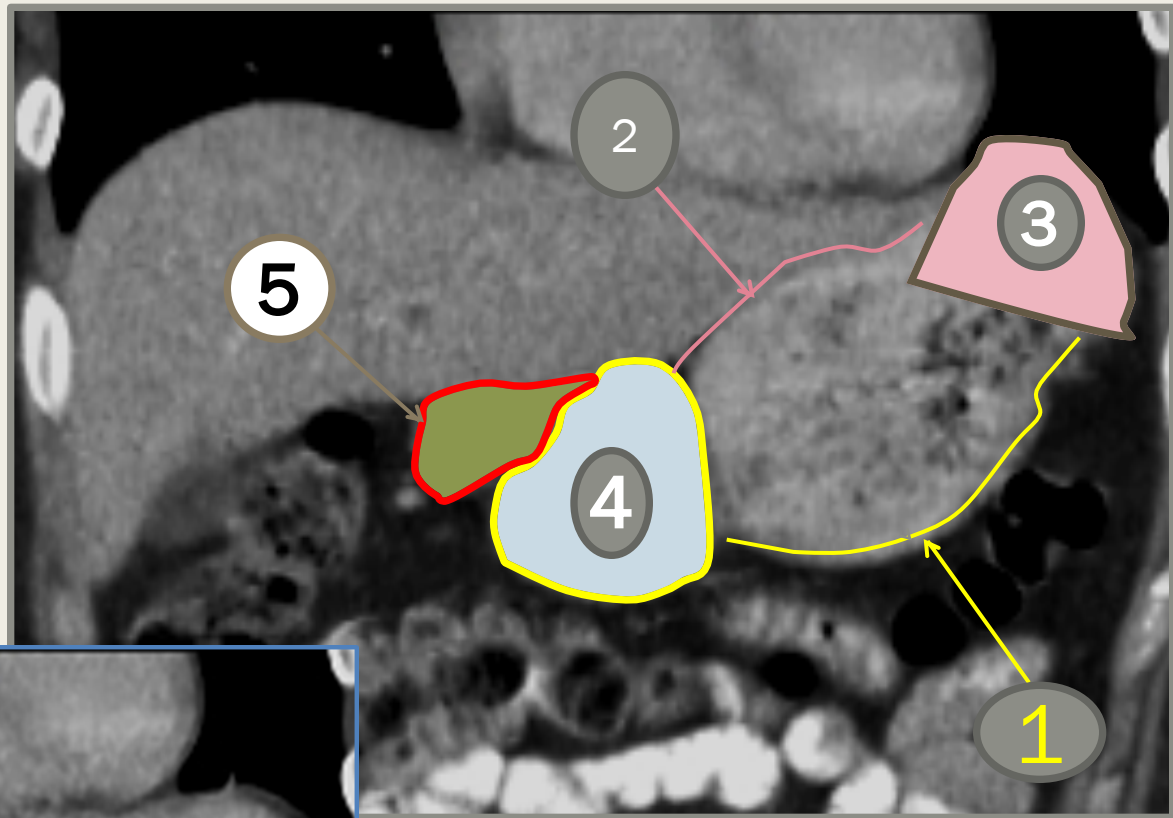


**CT SCAN**



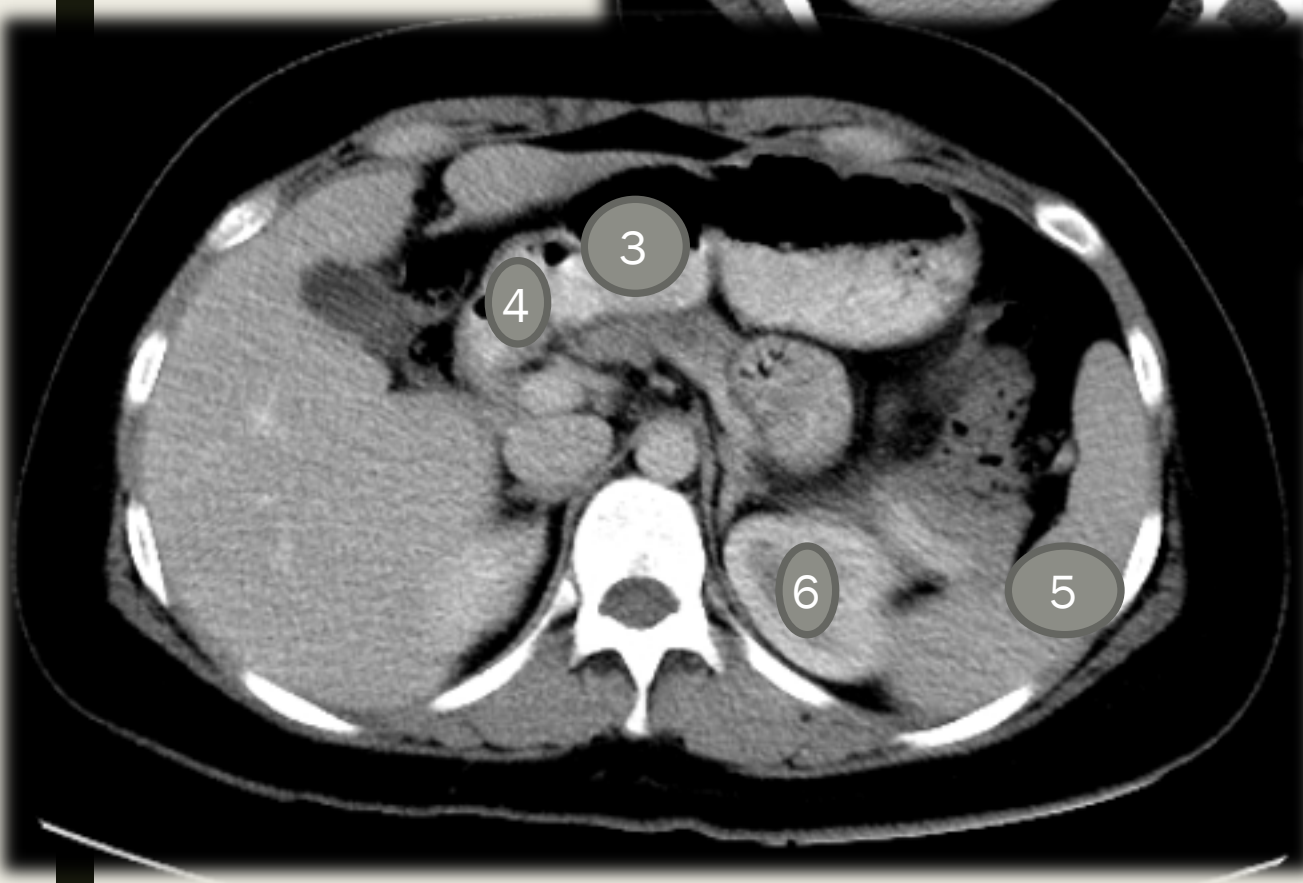
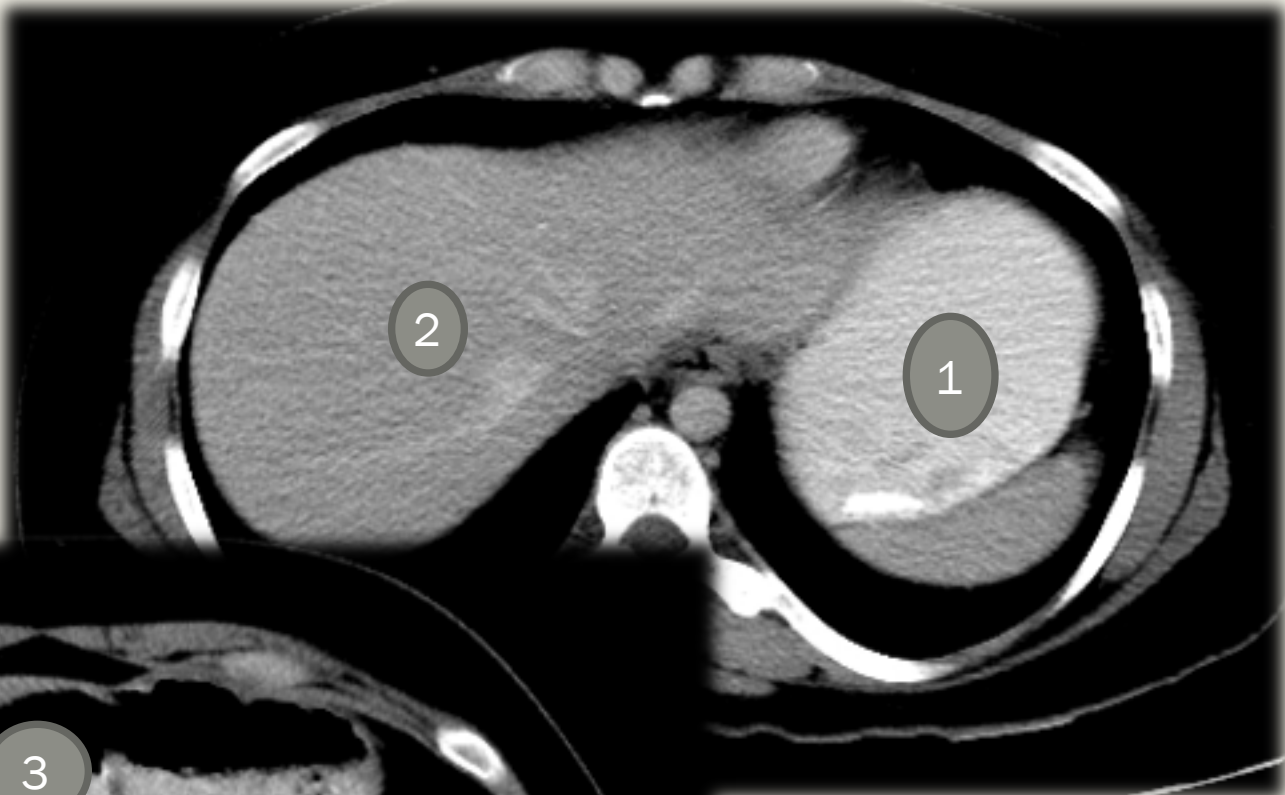
**MRI**





- 1-Greater curvature**
- 2-Lesser curvature**
- 3-Stomach fundus**
- 4-Antrum**
- 5-Pylorus**





1. Stomach
2. Liver
3. Antrum
4. Pylorus
5. Spleen
6. Kidney





**Thank you**

