Blood supply of Gastrointestinal Tract
Abdominal Aorta

• It begins at the aortic hiatus of the diaphragm, anterior to the lower border of vertebra T7.
• It descends to the level of vertebra L4 it is slightly to the left of midline.
• The terminal branches of the abdominal aorta are the two common iliac arteries.
Branches of Abdominal Aorta

Visceral Branches
- Celiac.
- Superior Mesenteric.
- Inferior Mesenteric.
- Middle Suprarenals.
- Renals.
- Internal Spermatics.
- Gonadal

Parietal Branches
- Inferior Phrenics.
- Lumbars
- Middle Sacral.
Anterior Branches of The Abdominal Aorta

• Celiac Artery.
• Superior Mesenteric Artery.
• Inferior Mesenteric Artery.

• The three anterior branches supply the gastrointestinal viscera.
Basic Concept

• Fore Gut
  – Coeliac Trunk

• Mid Gut
  – Superior Mesenteric Artery

• Hind Gut
  – Inferior Mesenteric Artery
Celiac Trunk

• It arises from the abdominal aorta immediately below the aortic hiatus of the diaphragm anterior to the upper part of vertebra L1.
• It divides into the:
  – *left gastric artery*,
  – *spleenic artery*,
  – *common hepatic artery*. 
Celiac Trunk

- Left gastric artery
- Splenic artery
  - Short gastric vessels
  - Lt. gastroepiploic artery
- Common hepatic artery
  - Hepatic artery proper
    - Left hepatic artery
    - Right hepatic artery
  - Gastroduodenal artery
    - Rt. Gastroepiploic (gastro-omental) artery
    - Sup pancreatoduodenal artery
    - Supraduodenal artery
oesophagus

- Cervical oesophagus
  - branches from inferior thyroid artery
- Thoracic oesophagus
  - branches from bronchial arteries and aorta
- Abd. oesophagus
  - branches from Lt. gastric & inferior phrenic A
Superior Mesenteric Artery

- It arises from the abdominal aorta immediately below the celiac artery anterior to the lower part of vertebra L1.
Superior Mesenteric Artery

- It is crossed anteriorly by the splenic vein and the neck of pancreas.
- Posterior to the artery are the *left renal vein, the uncinate process of the pancreas, and the inferior part of the duodenum.*
Branches of Superior Mesenteric Artery

- Inferior pancreaticoduodenal artery
- Jejunal and ileal arteries
- Middle colic artery
- Right colic artery
- Ileocolic artery
Inferior Mesenteric Artery

- It is the smallest of the three anterior branches of the abdominal aorta and arises anterior to the body of vertebra L3.
- Initially, the inferior mesenteric artery descends anteriorly to the aorta and then passes to the left as it continues inferiorly.
Branches of Inferior Mesenteric Artery

- Left colic artery
- Several sigmoid arteries
- Superior rectal artery.
Venous Drainage of Gastrointestinal Tract
Venous Drainage of Gastrointestinal Tract

- Veins of portal venous system
- Systemic veins
  - Blood from GIT enter the liver via portal vein and leave the liver via hepatic veins to enter the inferior vena cava
Venous Drainage of Gastrointestinal Tract

• Venous drainage of the abdominal part of the gastrointestinal tract, spleen, pancreas and gallbladder except for the inferior part of the rectum, is through the **portal system of veins**.
Portal Vein

- It is formed by the union of the **spleenic vein** and the **superior mesenteric vein** posterior to the neck of the pancreas at the level of vertebra L2.
- It is the final common pathway for the transport of venous blood from the spleen, pancreas, gallbladder, and the abdominal part of the gastrointestinal tract.
• It divides into **right** and **left branches**, which enter the liver parenchyma.
Tributaries to The Portal Vein

- **Right** and **left gastric veins** draining the lesser curvature of the stomach and abdominal esophagus
- **Cystic veins** from the gallbladder
- The **para-umbilical veins** are associated with the obliterated umbilical vein and connect to veins on the anterior abdominal wall.
Splenic Vein

• It forms from numerous smaller vessels leaving the hilum of the spleen.
• It passes to the right, passing through the splenorenal ligament with the splenic artery and the tail of pancreas.
• It crosses the posterior abdominal wall.
Tributaries to The Splenic Vein

• **Short gastric veins** from the fundus and left part of the greater curvature of the stomach
• **Left gastro-omental vein** from the greater curvature of the stomach
• **Pancreatic veins** draining the body and tail of pancreas
• **Inferior mesenteric vein.**
Superior Mesenteric Vein

- It drains blood from the small intestine, cecum, ascending colon, and transverse colon.
- It begins in the RIF as veins draining the terminal ileum, cecum, and appendix.
- It ascends in the mesentery to the right of the superior mesenteric artery.
Tributaries to The Superior Mesenteric Vein

- **Right gastro-omental vein**, draining the right part of the greater curvature of the stomach;
- **Anterior and posterior inferior pancreaticoduodenal veins**
- **Anterior superior pancreaticoduodenal vein** usually empties into the right gastro-omental vein, and the posterior superior pancreatico duodenal vein usually empties directly into the portal vein.
Inferior Mesenteric Vein

- It drains blood from the rectum, sigmoid colon, descending colon, and splenic flexure.
- It begins as the **superior rectal vein** and ascends, receiving tributaries from the **sigmoid veins** and the **left colic vein**.
- It joins the splenic vein posterior to the body of the pancreas.
Portosystemic Anastomosis

- Lower end of oesophagus
- Upper part of anal canal
- Umbilicus
- Retroperitoneal
  - Bare area of liver
Portosystemic Anastomosis

• The gastroesophageal junction around the cardia of the stomach—where the left gastric vein and its tributaries form a portosystemic anastomosis with tributaries to the azygos system of veins of the caval system.
• The anus—the superior rectal vein of the portal system anastomoses with the middle and inferior rectal veins of the systemic venous system.
• The anterior abdominal wall around the umbilicus—the para-umbilical veins anastomose with veins on the anterior abdominal wall.
Clinical Applications

- **Hemorrhoids** at the anorectal junction
- **Esophageal varices** at the gastroesophageal junction;
- **Caput medusae** at the umbilicus.
Thank You