

# Clinical Anatomy of the Portal System in the Context of Portal Hypertension

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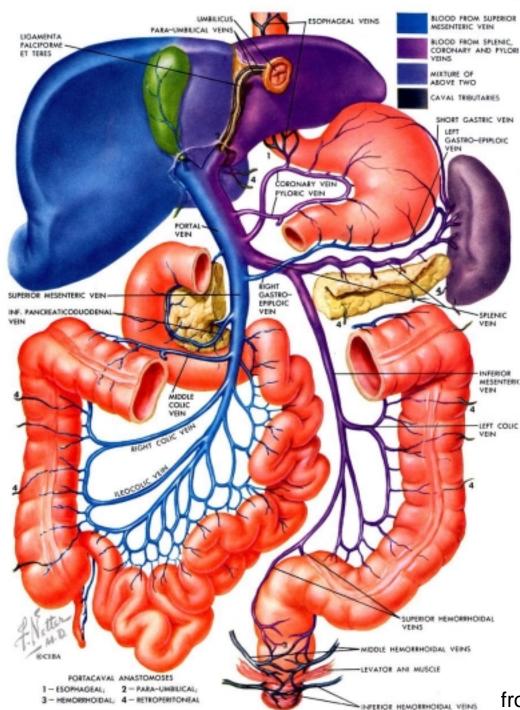
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#### (RIGHT AND LIFT DASTRIC VEINS) SHORT GASTRIC VEINS -ANASTOWOSIS BETWEEN INF. PHRENIC, GASTRIC AND SUPPLARENIAL LEFT GASTRO-EPIPLOIC VEIN DORSAL PANCREATIC PANCREATICO-INFERIOR DUCCENAL VEIN' MESENTERIC RIGHT GASTRO EPIPLOIC VEIN SUPERIOR MESENTERIC MIDDLE COLIC VEIN-CEJUNAL AND INFERIOR READ VEINS PANCREATICO-DUODENAL YEIN LEFT COLIC VEIN **BIGHT COUC VEIN** LEFT TESTICULAR (DVARIAN) VEIN REDCOUC VEIN SIGMOID VEINS MARGINAL VEIN-SUPERIOR MESENTERIC VEIN ANTERIOR CECAL VEIN SACRAI VEIN POSTERIOR RECTO-SIGMOID APPENDICULAR VEIN-COMMON BIAC SUPERIOR RECTAL VEINS-(неиовиновы) BIGHT EXTERNAL ILIAC VEIN-PERIMUSCULAR RECTAL PLEXUS RIGHT INTERNAL EJAC (HYPOGASTRIC) VEIN JEFT VESICAL, UTERINE AND VAGINAL (VESICAL PROSTATIC AND RIGHT SUPERIOR GUITEAL VEIN DEFERENTIAL) VEINS RIGHT OBTURATOR VEIN-JEFT MIDDLE RECTAL (HEMORRHOIDAL) VEIN RIGHT INFERIOR GLUTEAL VEIN LEFT INTERNAL PUDENDAL VEIN RIGHT INTERNAL PUDENDAL VEIN LEFT INFERIOR RECTAL RIGHT VESICAL, UTERINE AND (HEMORRHOIDAL) YEIN VAGINAL IVESICAL PROSTATIC AND DEFERENTIAL) VEINS-EXTERNAL RECTAL (JADIOHRROMAH) RIGHT MIDDLE RECTAL PLEXIUS (HEMORRHOIDAL) VEIN' from Netter 1957 RIGHT INTERNAL PUDENDAL VEIN

## Portal System

- Conducts venous return from gut and associated organs to the liver
- Much of the system is retroperitoneal but some tributaries are within mesentery

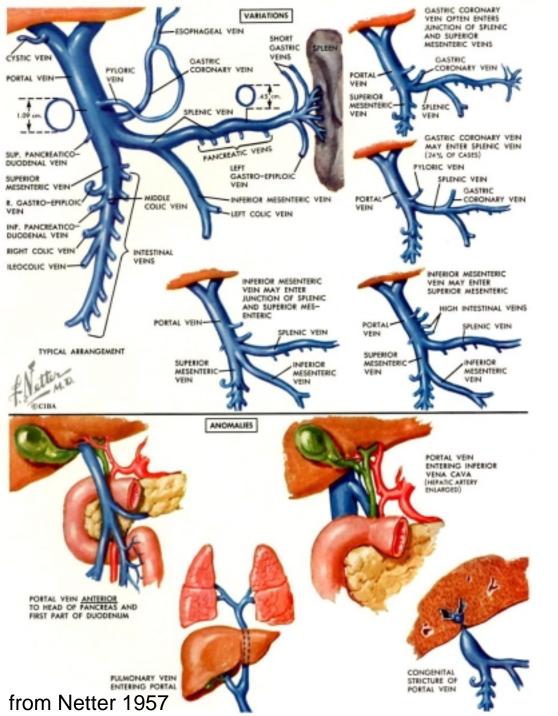


# Portal System (extrahepatic tributaries)

#### Portal vein

- Superior mesenteric V.
  - Intestinal veins
  - Ileocolic vein
  - Right colic vein
  - Middle colic vein
  - Inferior pancreaticoduodenal
  - Right gastroepiploic vein
- Splenic vein
  - Inferior mesenteric vein
    - Left colic vein
    - Sigmoid veins
    - Superior hemorrhoidal veins
  - Pancreatic veins
  - Left gastroepiploic vein
  - Short gastric veins
- Coronary vein
- Cystic vein
- Paraumbilical veins

from Netter 1957



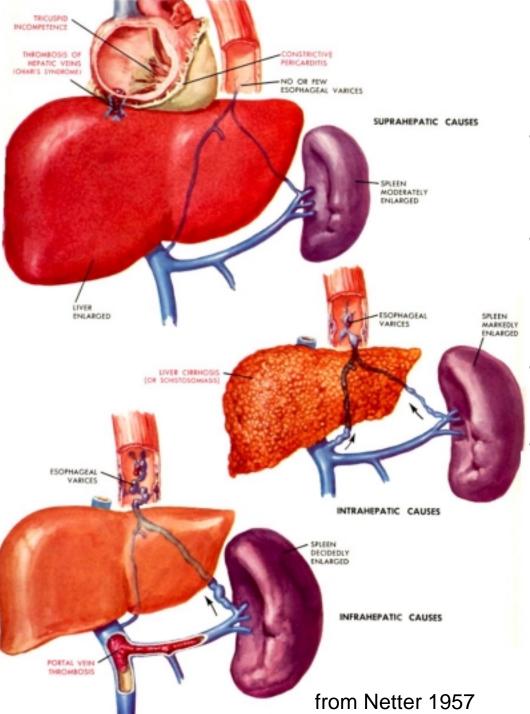
### Portal System

#### variations

- Variations are relatively rare
- Length of main portal stem: 55-80 mm
- Diameter: 11 mm, more in cirrhosis
- Main variations involve connections of gastric coronary vein and IMV

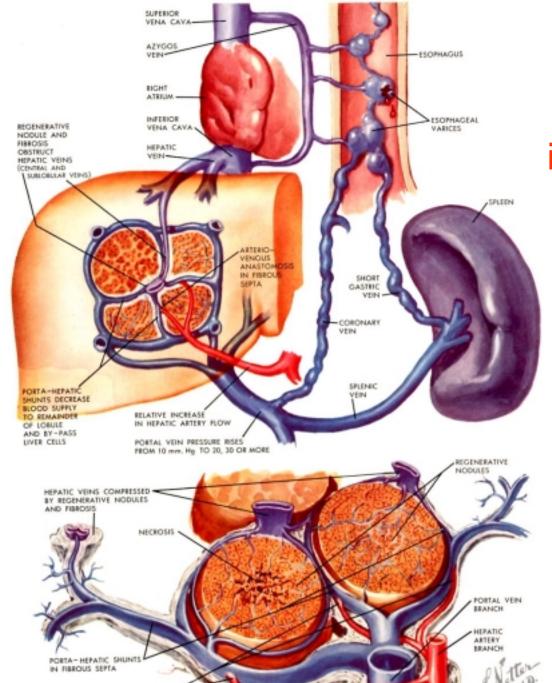
#### anomalies

- Anomalies are rare
- Anterior position of portal vein relative to pancreas and duodenum
- Portal vein bypassing liver and draining into IVC



# Portal Hypertension Etiology

- Classification systems
  - Presinusoidal, sinusoidal, postsinusoid.
  - Extrahepatic vs. intrahepatic
  - Suprahepatic, intrahepatic, infrahepatic
- Suprahepatic (outflow obstruction)
  - Right-side heart failure, constrictive pericarditis, Budd-Chiari syndrome
  - Often portal hypertension is matched by systemic (caval) hypertensions
- Intrahepatic (90% of cases)
  - Cirrhosis most common but others too
  - Typical pathologic anatomical findings
- Infrahepatic
  - Obstruction of extrahepatic portal system
  - Portal (or splenic) v. thrombosis
  - Cavernomatous transformation of portal vein
  - Tumor, infection, compression
  - Typical pathologic anatomical findings



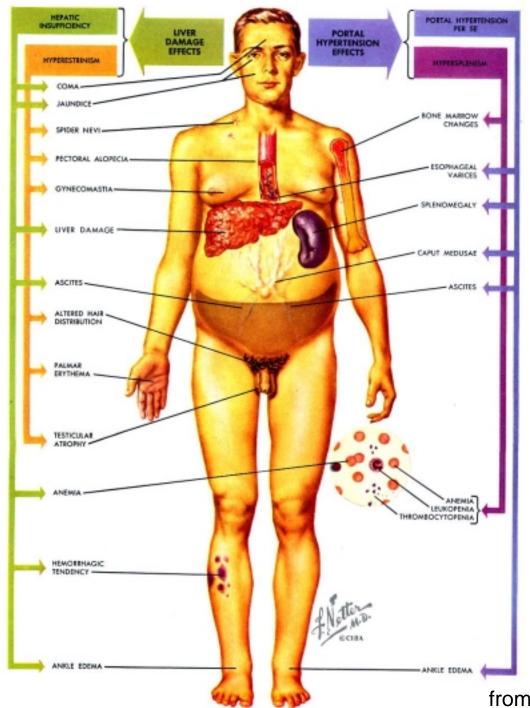
ARTERIOVENOUS ANASTO

IN FIBROUS SEPTA

# Vascular Changes in Cirrhosis Leading to Portal Hypertension

- Compression of hepatic veins
  - Regen. nodules and connective tissue septa compress veins
  - Decreased outflow, increased upstream portal pressure
- Formation of portahepatic AVAs
  - Direct anastomoses between hepatic a. branches and portal vein tributaries
  - Increased flow into portal system via AVAs increases portal hypertension

from Netter 1957



# Pathological Anatomy Associated with Portal Hypertension

- Esophageal varices
- Splenomegaly
- Caput medusae
- Ascites

from Netter 1957

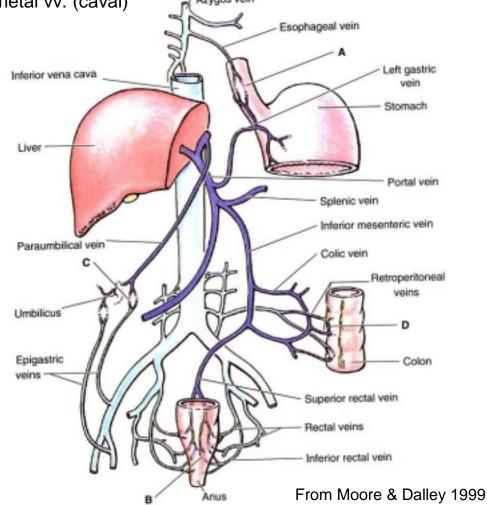
## NOOD FROM SUPERIOR ESOPHAGEAL VEINS PARA-SABELICAL VEINS **ESSENTERIC YEAR** LOCO FROM SPLENIC, OBORNARY AND PYLOSIC ADCTURE OF CAYAL TRIBUTABLES GASTRO-IPPIOC NF. PANCKEATICODUCEDNA MESENTERIC 1-ESOPHAGEAL: 2-PARA-UNBUICAL 3 - HEMORRHOIDAL, 4 - RETROPERSONEAL NEERICK HEMORRHOIDAL VEINS

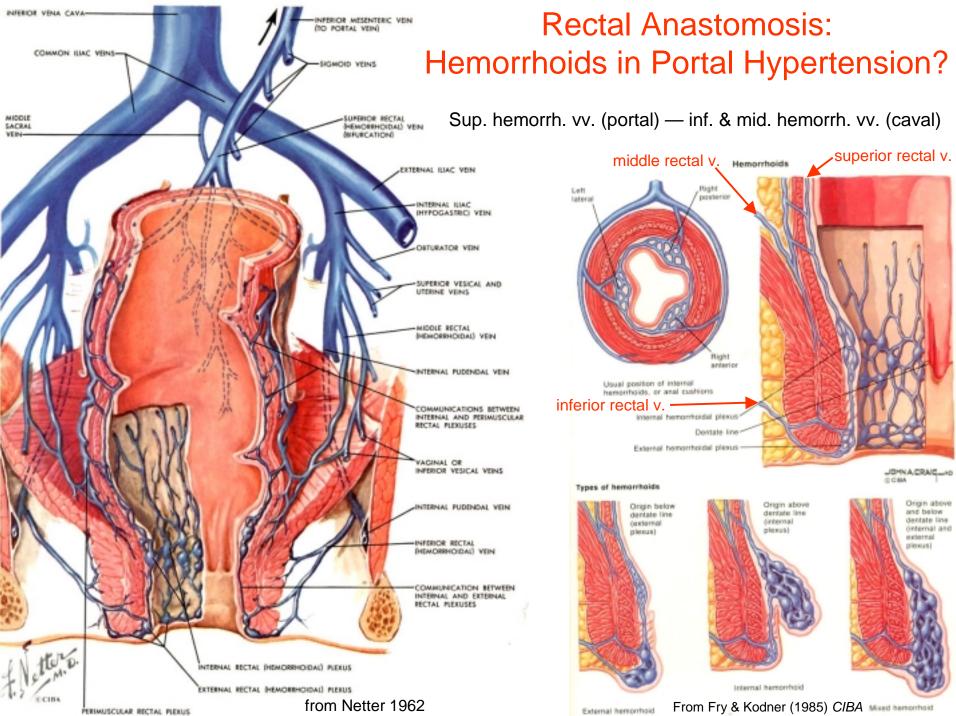
from Netter 1957

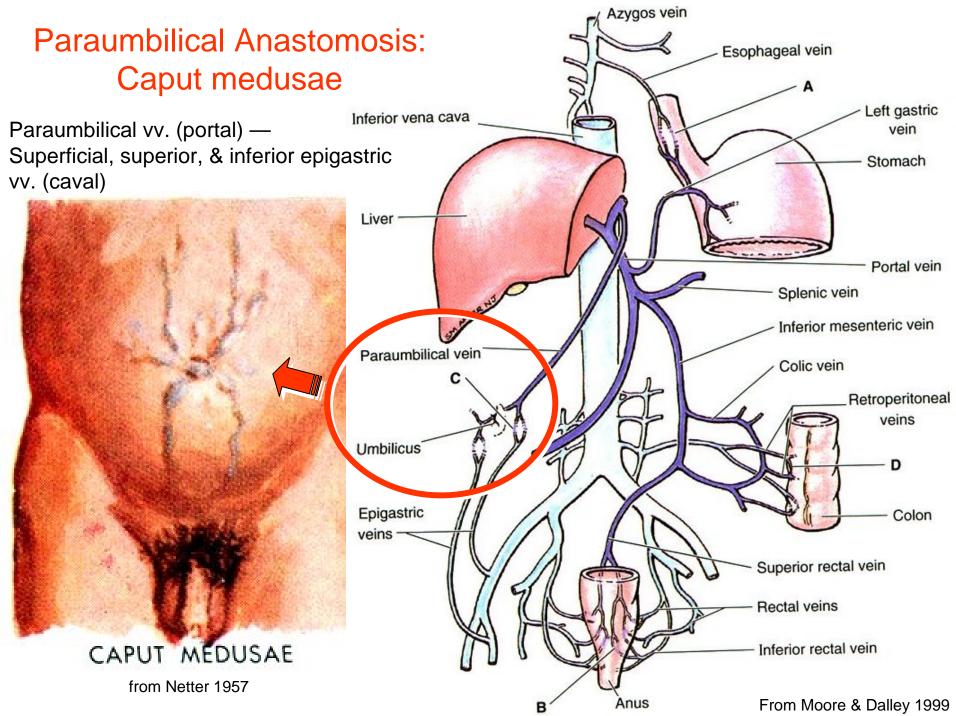
#### Portacaval Anastomoses

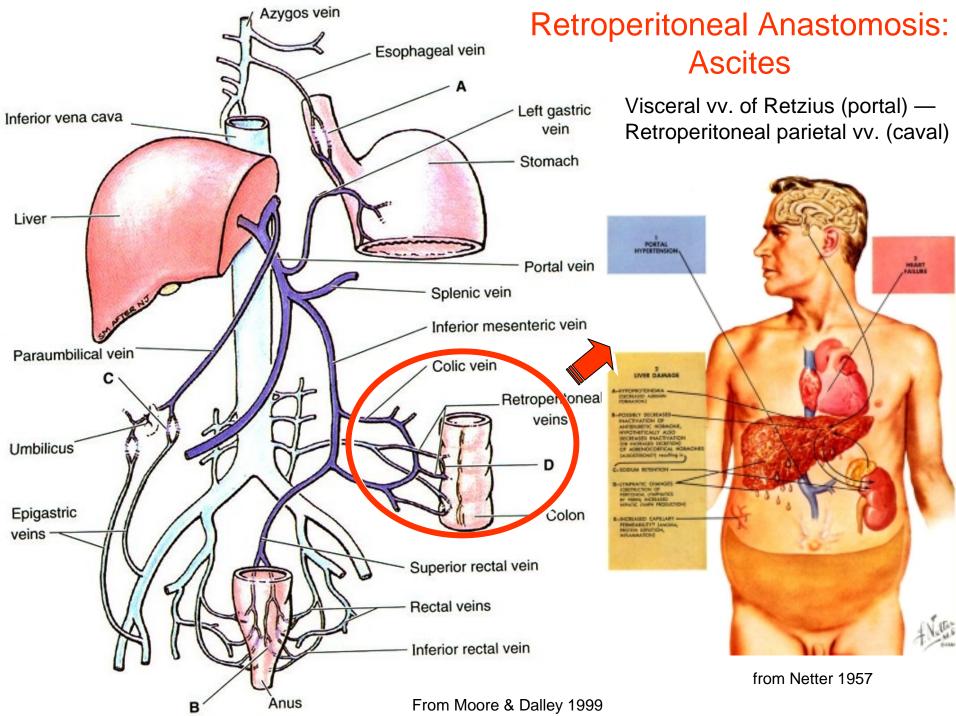
- Esophageal anastomosis: azygos (caval) coronary or short gastric (portal)
- Paraumbilical anastomosis: paraumbilical vv. (portal) epigastric vv. (caval)
- Rectal anastomosis: sup. hemorrhoidal (portal) inf. & middle hemorrhoidal vv. (caval)

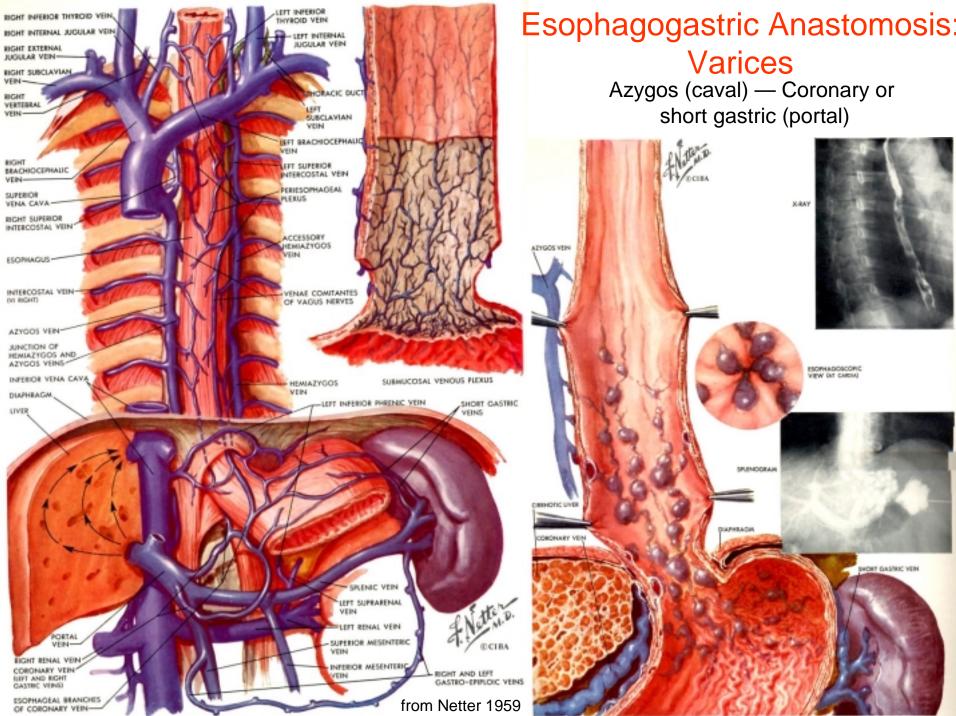
Retroperitoneal anastomosis: visceral vv. of Retzius (portal) —
parietal vv. (caval)











# **References**

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