

(a) Three-dimensional view of layers of stomach

# ACCESSORY ORGANS OF THE GASTROINTESTINAL TRACT

### Liver

#### **General features**

The liver is the largest gland and organ in the body
 Location: The greater part of the liver is situated
 primarily in the right hypochondrium and epigastric
 region, extending into the left hypochondrium

Has two surfaces: A- <u>Diaphragmatic surface</u>. ≻It is smooth B- <u>Visceral surface (inferioposterior)</u> in the it is irregular



### A-The diaphragmatic surface of the liver

is smooth and domed, lies against the inferior surface of the diaphragm ≻Associated with it are

The subphrenic recess
 The hepatorenal recess





## **B-The visceral surface of the liver**

Related to the visceral organs which leave impressions on it:



 Is found on the posteroinferior (visceral) surface
 The porta hepatis serves <u>as the point of entry into the liver for the</u> <u>hepatic arteries and the portal vein, and the exit point for the hepatic</u> <u>ducts</u>

➢ lies between the caudate and quadrate lobes

Falciform ligament Caudate lobe **Contents of porta hepatis** Inferior vena cava **1-The right and left hepatic** Bare area Anterior coronary ligament Left triangular ligament ducts Posterior coronary ligament 2- The right and left branches of the hepatic **Right triangular** artery ligament **3-The portal vein** Right lobe of liver Left lobe of liver **4-** Sympathetic and Neck Body parasympathetic nerve fibers Gallbladder Porta hepatis **5-A few hepatic lymph nodes** Fundus Quadrate lobe lie here

≻The liver may be divided
(anatomically) into a large right lobe
and a small left lobe by the
attachment of the peritoneum of the
falciform ligament

The right lobe is further **divided by the presence** of the gallbladder, the fissure for the ligamentum teres, the inferior vena cava, and the fissure for the ligamentum venosum into:

- 1- Quadrate lobe
- 2- Caudate lobe

Experiments have shown that, in fact, the quadrate and caudate lobes are functional part of the left lobe of the liver.



#### Note

Functionally (structurally) the liver is divided on the basis of interhepatic distribution of hepatic artery, portal vein and biliary duct into two nearly equal lobes right and lift



In the fetus, oxygenated blood is brought to the liver in the umbilical

vein (ligamentum teres)

The greater proportion of the blood by passes the liver in the ductus

venosus (ligamentum venosum) and joins the inferior vena cava

At birth, the umbilical vein and ductus venosus close and become fibrous

cords

The blood vessels conveying blood to the liver are: **1-The hepatic artery (30%) 2-Portal vein (70%)** 

The hepatic artery brings oxygenated blood to the liver

The portal vein brings **venous blood** rich in the products of digestion,

Blood from the liver

Through the right and left hepatic veins

Which leave the posterior surface of the liver and <u>open directly into</u> <u>the inferior vena cava.</u>

### **Blood Circulation through the Liver**



## Gallbladder

≻The **gallbladder is a pear-shaped sac** lying on the undersurface of the liver

It has a capacity <u>of 30 to 50 mL</u>
Stores bile, which it concentrates by absorbing water

**>The gallbladder is divided into**:

1-The fundus

2-Body

3- Neck—

➤ The fundus projects below the inferior margin of the liver, it comes in contact with the anterior abdominal wall <u>at the level of the</u> <u>tip of the ninth right costal</u> <u>cartilage</u>

➤The neck of the gallbladder becomes continuous with the cystic duct.



# Cystic Duct ≻The cystic duct is about (3.8 cm) long

➤Connects the neck of the gallbladder to the common hepatic duct to form the bile duct



Blood supply of the gallbladder

The cystic artery **a branch of the right hepatic artery** 



## **Acute Cholecystitis**

≻Acute cholecystitis produces discomfort in the epigastrium

Inflammation of the gallbladder may cause irritation of the subdiaphragmatic parietal peritoneum, which is supplied in part by the phrenic nerve

## (C3, 4, and 5)

➤This may give rise to referred pain over the shoulder, because the skin in this area is supplied by the

supraclavicular nerves

(C3 and 4)





### **Bile Duct**

The bile duct (common bile duct) is about (8 cm) long

**On the basis of its relationship to the duodenum** 

It can be divided into three parts:

THE FIRST PART (SUPRADUODENAL),

lies in the right *free margin of the lesser omentum*, in front of the right margin of the portal vein and on the right of the hepatic artery.

THE SECOND PART (RETRODOUDENAL),

> is situated behind the first part of the duodenum

THE THIRD PART (INFRADUODENAL),

*lies in a groove on the posterior surface of the head of the* 

pancreas Here, the bile duct comes into contact with the

*main pancreatic duct* 





Occasionally, the bile and pancreatic ducts open separately into the duodenum The terminal parts of both ducts and the ampulla are surrounded by circular muscle, known as the sphincter of the hepatopancreatic ampulla:

### (SPHINCTER OF ODDI)





➤The head of the pancreas is disc shaped and lies within the concavity of the duodenum

The neck lies *in front of the beginning of the portal vein and the origin of the superior mesenteric artery from the aorta* 

The tail passes forward and comes in contact with the hilum of the spleen

# Pancreatic Ducts

> The main duct of the pancreas begins in the tail and runs the length of the gland, receiving numerous tributaries on the way

>It opens into the second part of the duodenum at about its middle with the bile duct on the major duodenal papilla

> The accessory duct of the pancreas, when present, drains the upper part of the head and then opens into the duodenum a short distance above the main duct <u>on the minor duodenal papilla</u>



## Cancer of the Head of the Pancreas and the Bile Duct

Because of the close relation of the head of the pancreas to the bile duct, cancer of the head of the pancreas often causes OBSTRUCTIVE JAUNDICE