

Lecture 12 : Cancer of Liver & Pancreas

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Objectives

At the end of the lecture the students will be able to:

- 1- Recognize the benign tumors of the liver.
- 2- Describe hepatocellular and cholangiocarcinoma.
- 3- Understand the frequency of metastatic disease to the liver.
- 4- Recognize the rarity of primary liver neoplasms in children.
- 5- recognize all aspects of pancreatic carcinoma.

Contact us:



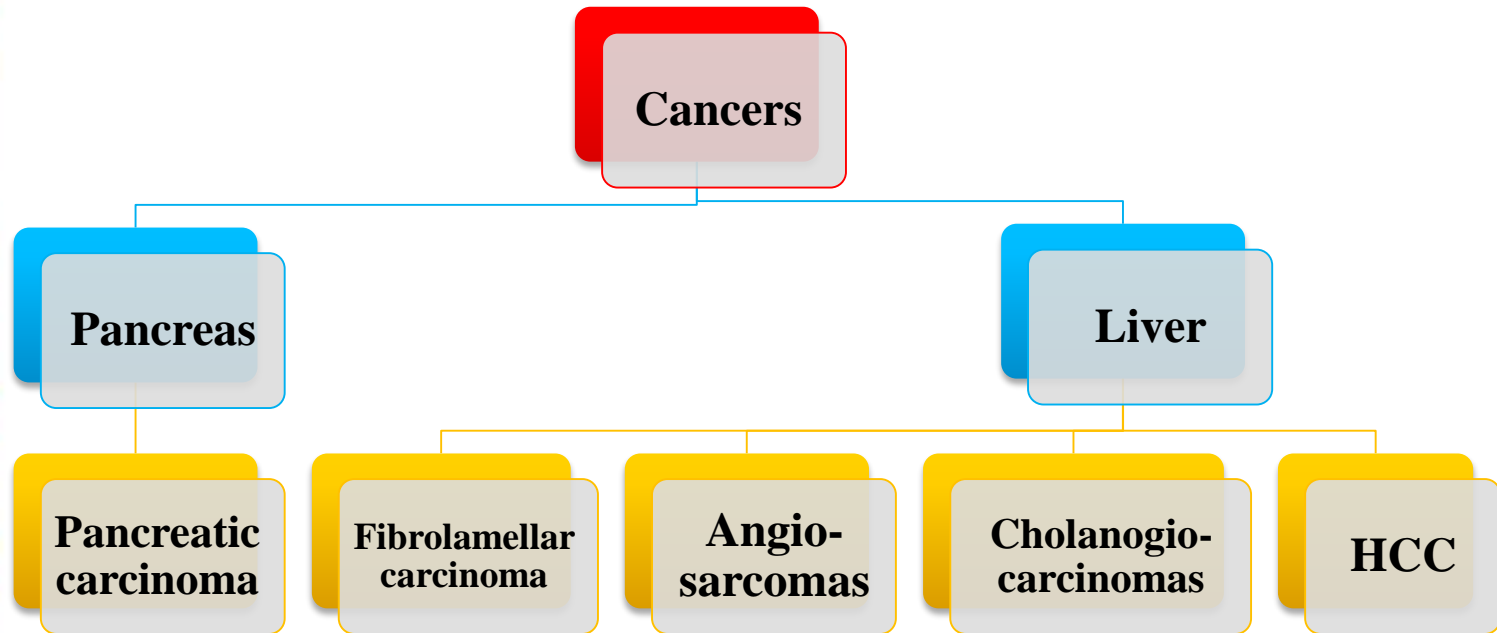
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Mind map



Malignant tumors of the liver



- **Metastatic** involvement of the liver is far **more common** than primary neoplasia. (From breast, lung, colon ...)
- **Grossly, multiple nodular metastases are found causing hepatomegaly and may replace over 80% of existent hepatic parenchyma. The liver weight can exceed several kilograms.**
- **Liver has 2 types of cells :**
 - 1- hepatocytes which give rise to Hepatocellular Carcinoma “HCC”. most common.
 - 2- bile ducts which gives rise to Cholanogiocarcinomas. Less common.
- **Benign tumors of the liver: adenoma, bile duct adenoma hemangioma & benign tumors don't happen much in liver.**
- **Oral contraceptives increase the risk of liver adenoma.**

1- Hepatocellular Carcinoma (HCC):

- **Epidemiology:**

- 1- mainly in male population.

- 2- > 85% of HCC happen in countries with ↑ rate of **chronic HBV** infection , it begins in infancy following vertical transmission* of virus from infected mothers , giving a 200 fold risk for HCC by adulthood.

- **Pathogenesis:**

- 1- viral infection: **HBV , HCV**

- 2- **cirrhosis.**

- 3- chronic alcoholism.

- 4- food contaminants: high exposure to dietary **aflatoxins from aspergillus.**

- 5- other conditions: tyrosinemia & hereditary hemochromatosis.

* An infection caused by bacteria, viruses, or in rare cases, parasites transmitted directly from the mother to the embryo, fetus, or baby during pregnancy or childbirth.





- **Morphology:** “very hard to detect “

- **Grossly :**

- 1- **unifocal mass** “one mass”.

- 2- **multifocal mass** “multiple masses”.

- 3- **diffusely infiltrative.**

- **Do a reticulin stain** (it will show rosette shape)

- **Satellite nodules** & greenish cast.

- **Intrahepatic metastases may happen and tumor may invade** (staging of tumor) and range differently (grading of tumor) as follow:

All three gross features may cause liver enlargement & all HCC have a strong chance for invasion of vascular channels .

Tumor staging	Tumor grading
Portal vein ”occlusion of portal circulation”	Well differentiated lesion “cells are recognizable as hepatocytic & bile pigment are present”. malignant cells are positive for alpha-fetoprotein
IVC “extending into right side of the heart”	Highly anaplastic undifferentiated lesions “pleomorphic appearance with numerous anaplastic giant cells”.
Lymph node metastases: perihilar , peripancreatic , para aortic “nodes above & below diaphragm”	

2- Fibrolamellar Carcinoma :

fibro = fibrosis
lamellar = lamina

- It's a hepatocellular cancer
- Occurs in young male & female (20-40 years).
- **No association with HBV or Cirrhosis.**
- Has good prognosis.
- Usually present as single large hard **scirrhus** tumor with fibrous bands crossing through it.

• **Clinical features of HCC:**

- Ill-defined **upper abdominal pain**, malaise, fatigue, weight loss, and feeling of abdominal fullness.
- In many cases, the **enlarged liver** can be felt on palpation. Jaundice and fever are uncommon.
- Laboratory studies: **Elevated levels of serum α -fetoprotein** are found in 50% to 75% of patients with HCC.

• **Overall in HCC:** “death usually occurs from”

- (1) **cachexia** “very thin (malnutrition)”
- (2) **gastrointestinal or esophageal variceal bleeding.**
- (3) **liver failure with hepatic coma.**
- (4) **rupture of the tumor with fatal hemorrhage.**



3- Cholanogiocarcinomas :

- Its malignancy of biliary tree . This type of cancer can be inside or outside the liver. (adenocarcinoma)
- **Predisposing factor:**
 - (1) **Sclectrosing cholangitis.**
 - (2) Congenital fibropolycystic diseases of the biliary system (particularly Caroli disease and choledochal cysts).
 - (3) Previous exposure to Thorotrast (formerly used in radiography of the biliary tract).
 - (4) In the Orient, the incidence rates are higher, and it is due to chronic infection of the biliary tract by the liver fluke *Opisthorchis sinensis*.
- **Morphology:**
 1. Isn't associated with cirrhosis.
 2. May spread through biliary system > tree like tumor mass or a massive tumor nodule.
 3. Lymphatic & vascular invasion are common.
 4. Cholangiocarcinoma **are rarely bile stained.** (It doesn't produce bile)
 5. Mixed variants occur (elements of both HCC & Cholangiocarcinoma are present).
 6. Hematogenous metastases to the lung, bones or brain.
 7. **Glandular appearance.**





- **Clinical features :**

1. **Detected late.**
2. **Prognosis is poor.**
3. **Alpha-fetoprotein is NOT elevated.** (this differentiates it from HCC).

4- Angiosarcomas :

“malignancy of endothelial cells”

- **Rare**
- These have also been linked to **vinyl chloride** and **thorotrast** exposure.
- Consists of pleomorphic endothelial cells, hyperchromatic nuclei, giant cells and frequent mitosis.
- Irregular anastomosing vascular channels.
- Cells may appear spindle.
- Cirrhosis is present in 20-40% of the cases.

5- Hepatoblastoma :

- **Rare primary tumor that occurs in children**

Pancreatic Carcinoma :

- **Epidemiology:**

1. Highest mortality rates of any cancer.
2. It occurs in the 6th to 8th decade. “60-70 year old”
3. In Males > females.
4. In Diabetics > non-diabetics.
5. Eventually patient dies.

- **Morphology:**

1. Mainly pancreas arise in the head of the gland.
2. Usually **hard , poorly defined** masses. “Desmoplastic response is the reason behind its hardness”.
3. Majority of are ductal adenocarcinomas. with 2 characteristic features :
 - A) Highly invasive.
 - B) Non-neoplastic reaction called a "desmoplastic response".
4. Lymph nodes are frequently involved. And may metastasis to lungs or bones.
5. Less common variants of pancreatic cancer include acinar cell carcinomas, adenosquamous carcinomas, and undifferentiated carcinomas.

- **Clinical features:**

1. Jaundice , weight loss , pain and massive metastasis to liver.
2. Migratory thrombophlebitis. “in lower leg”





SUMMARY

Summary from Robbins

Liver Tumors

- The most common malignant tumors of the liver are metastatic carcinomas, most often from colon, lung, and breast.
- The main primary malignancy is hepatocellular carcinoma. It is common in regions of Asia and Africa, and its incidence is increasing in the United States.
- The main etiologic agents for hepatocellular carcinoma are hepatitis B and C, alcoholic cirrhosis, hemochromatosis, and, more rarely, tyrosinemia and α_1 -antitrypsin (AAT) deficiency.
- In the Western population, about 90% of hepatocellular carcinomas develop in cirrhotic livers; in Asia, almost 50% of cases develop in noncirrhotic livers.
- The chronic inflammation and cellular regeneration associated with viral hepatitis may be predisposing factors for the development of carcinomas.
- Hepatocellular carcinomas may be unifocal or multifocal, tend to invade blood vessels, and recapitulate normal liver architecture to varying degrees.



SUMMARY

Pancreatic Neoplasms

- Pancreatic cancer probably arises from noninvasive precursor lesions (most commonly, PanINs), developing by progressive accumulation of characteristic mutations of oncogenes (e.g., *KRAS*) and tumor suppressor genes (e.g., *CDKN2A/p16*, *TP53*, and *SMAD4*).
- Typically, these neoplasms are ductal adenocarcinomas that produce an intense desmoplastic response.
- Most pancreatic cancers are diagnosed at an advanced stage, accounting for the high mortality rate.
- Obstructive jaundice is a feature of carcinoma of the head of the pancreas; many patients also experience debilitating pain.