

## LIVER TUMORS

**A) Benign:** Haemangioma(commonest), Liver cell adenoma, and focal nodular hyperplasia.

**B) Malignant:**

**I) Primary:**

- a. Hepatocytes → **Hepatocellular carcinoma ( HCC).**
- b. Bile ducts → **cholangiocarcinoma.**
- c. Mixed → **cholangiohepatoma.**
- d. **Hepatoblastoma : HCC occur in children , its cells similar to fetal liver cells .**

**II) Secondary.**

### \* Primary Malignant Tumours \*

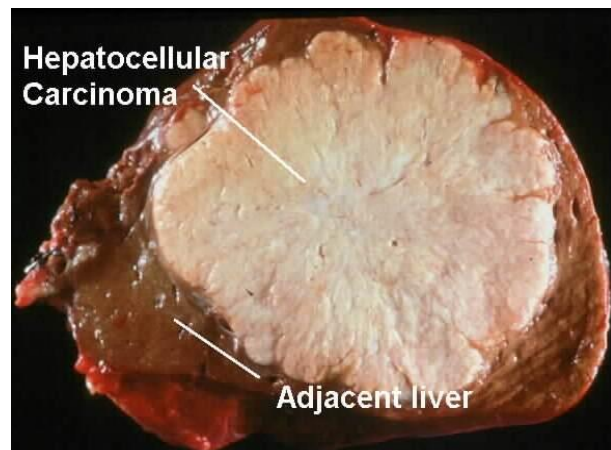
	Hepatocellular carcinoma(HCC)	Cholangiocarcinoma
<b>Incidence:</b>	❖ More in old males.	
	<ul style="list-style-type: none"> <li>▪ The <b>commonest</b> malignancy in Egypt nowadays .</li> <li>▪ <b>80%</b> of primary malignant liver tumors .</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>10 %</b> of primary malignant liver tumors.</li> </ul>
<b>Predisposing factors:</b>	<ol style="list-style-type: none"> <li>1. Infection with <b>Hepatitis B &amp; C viruses</b> <ul style="list-style-type: none"> <li>▪ Prolonged infection results in integration of viral DNA into host genome, thus starting malignant changes .</li> </ul> </li> <li>2. <b>Liver cirrhosis</b> especially post-hepatic or alcoholic cirrhosis .                             <ul style="list-style-type: none"> <li>▪ <b>90% of HCC are carriers of hepatitis B or C viruses or have cirrhosis .</b></li> </ul> </li> </ol>	<ol style="list-style-type: none"> <li>1. <b>Clonorchis sinensis</b> infestations causing cholangitis .</li> <li>2. <b>Haemochromatosis.</b></li> <li>3. Congenital <b>poly cystic liver.</b></li> <li>4. Sclerosing cholangitis.</li> <li>5. Choledochal cyst.</li> </ol>

## Hepatic Tumors

	<p>3. <b>Aflatoxins</b> formed by fungus <i>Aspergillus</i> which grows in grains due to poor storage condition .</p> <p>4. <b>Rarely liver cell adenoma</b></p>	
<b>Site:</b>	❖ Arises more in right lobe.	❖ Usually arises in <b>intra-hepatic ducts</b> or CHD .
<b>Gross picture:</b>	<p>1. <b>Nodular type:</b> Multiple nodules scattered all over the liver.</p> <p>2. <b>Massive type:</b> Forming a localized large mass.</p> <p>3. <b>Diffuse type:</b> Diffuse infiltration of the liver.</p>	<p>▪ <b>Multiple nodules</b> or <b>Solitary mass</b> with golden yellow appearance and central hemorrhage &amp; necrosis on cut section.</p>
<b>Microscopic picture:</b>	❖ Malignant hepatocytes with little stroma , high vascularity.	❖ Adenocarcinoma from epithelial lining of bile ducts inside or outside the liver.



**Nodular type**

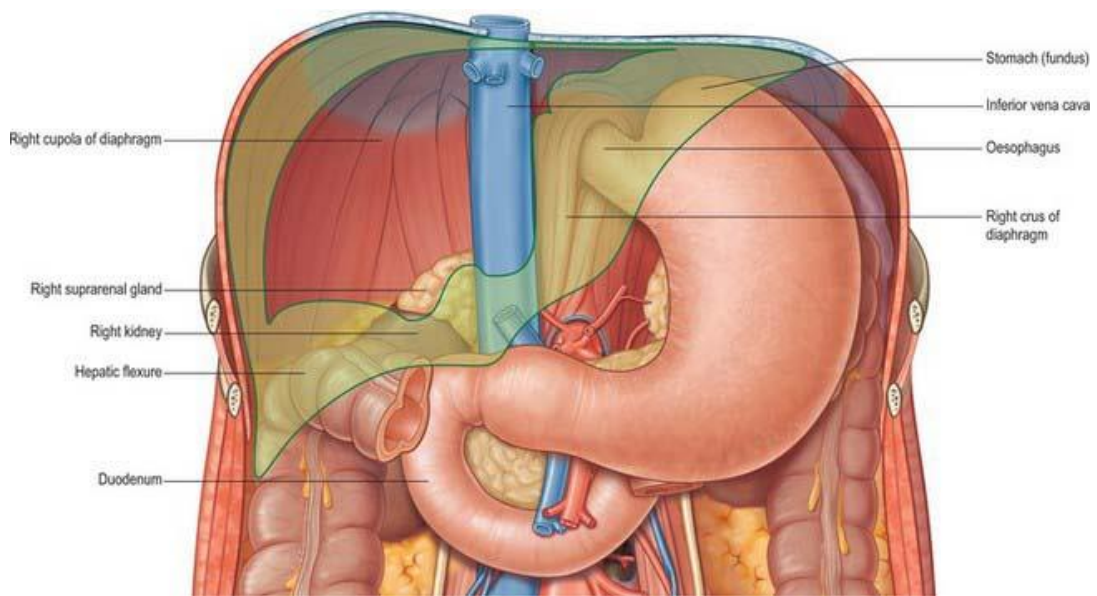


**Massive type**

**Diffuse type**

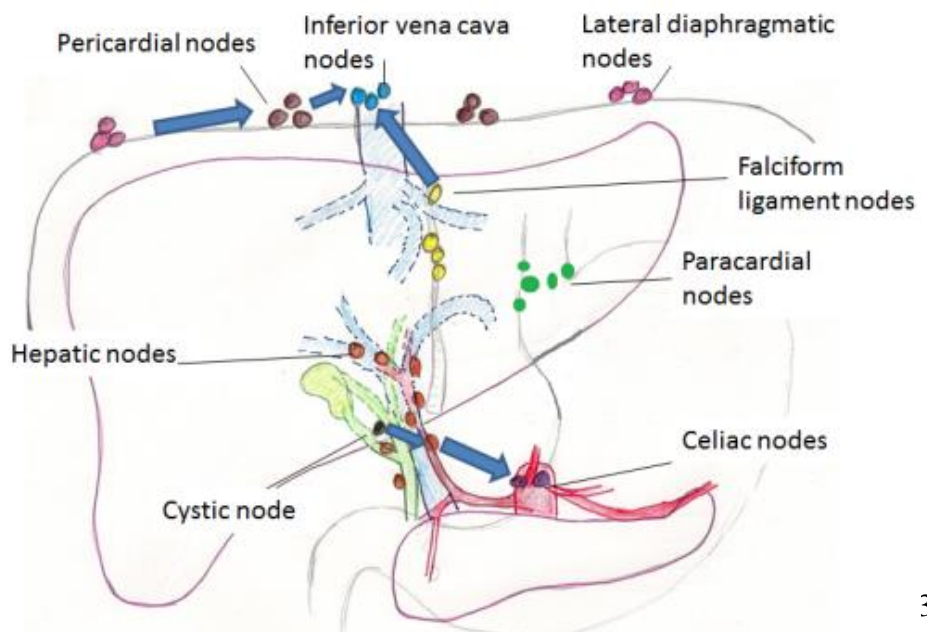


# Hepatic Tumors



## Direct spread of liver malignancy

### Lymphatic spread

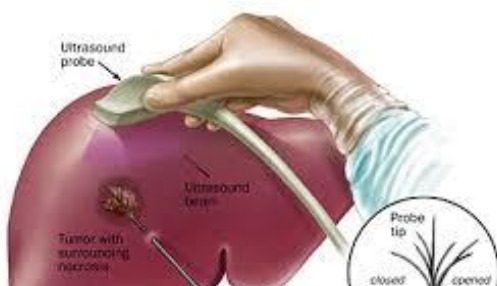


<p><b>Complications</b></p>	<ol style="list-style-type: none"> <li>1. <b>Direct spread direct:</b> Within the liver substance then to the surrounding structures eg. Diaphragm , stomach , .....etc</li> <li>2. <b>Lymphatic spread :</b> mainly to <b>hepatic LNs</b> in the porta hepatis and along hepatic artery <b>then to:</b> <ul style="list-style-type: none"> <li>▪ Mainly lymphatics around hepatic artery → <b>coeliac</b> LNs → thoracic duct → <b>Virchow's</b> gland.</li> <li>▪ Some lymphatics pass around ligamentum teres → umbilicus sister → sister Joseph nodule.</li> <li>▪ Some lymphatics pass from the bare area of liver through the diaphragm to diaphragmatic LNs</li> <li>▪ Some lymphatics pass with IVC in its opening in the diaphragm to IVC nodes → mediastinal lymph nodes .</li> </ul> </li> <li>3. <b>Blood spread :</b> → portal or IVC thrombosis, lung, bone &amp; brain.</li> <li>4. <b>Trasperitoneal :</b> ( as general )</li> <li>5. <b>Obstructive jaundice</b> with all its pathological sequelae.</li> <li>6. Spontaneous <b>rupture</b> leading to subcapsular hematoma or intraperitoneal haemorrhage .</li> <li>6.Cachexia, weight loss, hge, infections &amp; <b>death.</b></li> </ol>
<p><b>Clinical picture:</b></p>	<ol style="list-style-type: none"> <li>1. In areas where HCC is common , <b>screening programe</b> is recommended to all cirrhotic and hepatitis patients by annual U/S and alpha fetoprotein , to detect the tumor early .</li> <li>2. Small tumor may be <b>accidentally</b> discovered by abdominal U/S during follow up of cirrhotic or hepatitis patients .</li> <li>3. <b>Commonest presentation</b> is recent rapid <b>deterioration</b> of general health &amp; loss of weight of known <b>cirrhotic</b> patient.</li> <li>4. Slight to moderate <b>jaundice</b> with low grade fever.</li> <li>5. Right hypochondrial or epigastric <b>mass ( mention).</b></li> <li>6. <b>In late cases :</b> anorexia , pain , hepatomegaly , malignant ascites .</li> <li>7. Manifestations of <b>distal metastases</b> ( mention as usual )</li> </ol>

## Hepatic Tumors

<p><b>Investigations</b></p> <p><b>1. Laboratory</b></p>	<ol style="list-style-type: none"> <li><b>Blood picture:</b> anaemia.</li> <li><b>Liver functions:</b> Increased serum alkaline phosphatase and other liver functions show cirrhosis .</li> <li><b>Alpha-fetoprotein</b> as tumour marker, useful for diagnosis ( level above 200 ng/ml is suggestive ) and follow up . (normal 0-10 ng/ ml )</li> </ol>
<p><b>2. Radiology</b></p>	<ol style="list-style-type: none"> <li><b>U/S , CT scan, and MRI:</b> show site , size &amp; extent of spread.</li> <li>IV injection of contrast with <b>triphasic CT</b> ( arterial , portal and hepatic ) Show <b>tumour circulation</b> and vascular anatomy of the liver for <b>resection</b>.</li> <li><b>Intra-operative U/S</b> may show missed small lesions &amp; allow save liver dissection by identification of major vessels and bile ducts .</li> <li><b>PET and PET-CT scan</b> show the tumor , local and distal spread .</li> <li>Investigations to detect <b>metastasis</b>. (Mention)</li> </ol>
<p><b>3. Instrumental</b></p>	<ol style="list-style-type: none"> <li><b>Preoperative ultrasonic or CT guided biopsy</b> is <b>not desirable</b> for the risk of bleeding , spread along the needle track or seeding of tumor cells .</li> <li><b>Diagnostic Laparoscopy and laparoscopic U/S.</b></li> <li><b>ERCP:</b> Both diagnostic and therapeutic by placing a stent through the obstruction.</li> </ol>
<p><b>D.D</b></p>	<ul style="list-style-type: none"> <li><b>Causes of hepatic focal lesions :</b> <ol style="list-style-type: none"> <li>Hepatocellular carcinoma.</li> <li>Cholangiocarcinoma .</li> <li>Single metastasis</li> <li>Benign lesions : hemangioma , adenoma &amp; focal nodular hyperplasia .</li> <li>Cyst : non-parasitic ( blood or lymph ) or parasitic ( hydatid or amoebic )</li> </ol> </li> </ul>

**Intra-operative U/S**



**Laparoscopic U/S**



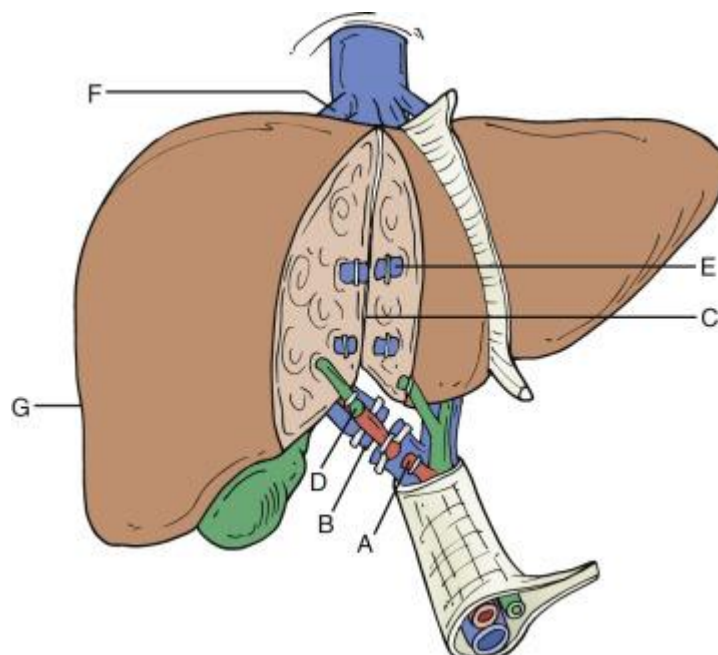
## ★ Treatment :

### I. Operable : (minority of cases)

- Features : ( mention as usual )
- ***Cirrhotic patient has the following problems to undergo resection :***
  - a) **Bleeding** tendency.
  - b) **Poor function** of the remaining liver.
  - c) Diminished capacity of liver **cells regeneration.**
- **Methods :** Surgical resection is the only hope for cure .there are 2 options

	<b>2.Hemihepatectomy (Lobectomy)</b>	<b>2.Liver transplantation</b>
<b>Indications</b>	a) Child class A patient . b)Tumor localized to one lobe c) No vascular invasion or thrombosis .	a) Child class C patient . b) Single lesion less than 5cm or 3 nodules each less than 3cm .

**Lobectomy**

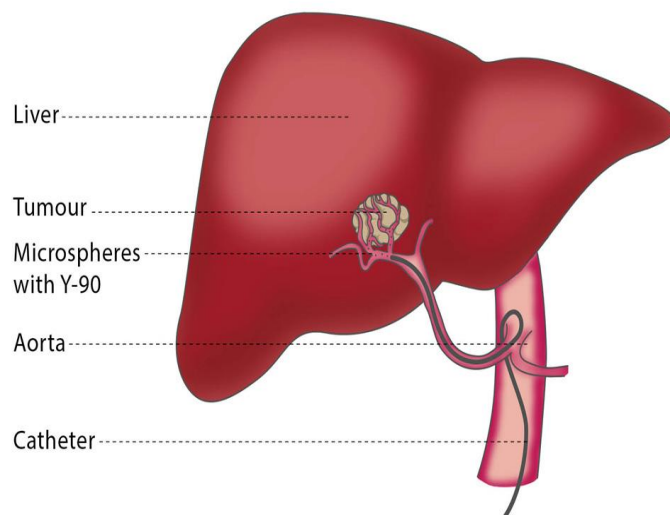


## II. Inoperable: (most of cases)

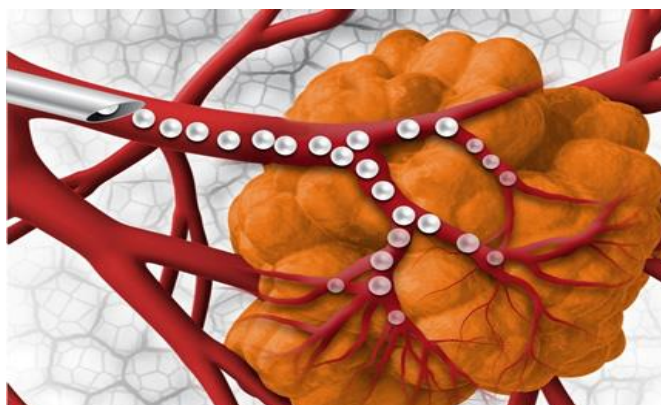
- The following palliative options are available :
  1. Systemic **chemotherapy** .
  2. **Intra-arterial selective chemotherapy** via catheter inserted in the hepatic artery by angiographic technique .
  3. **Chemo-embolisation** : as selective chemotherapy but the chemotherapy is combined with gelfoam to selectively block the arterial supply of the tumor
  4. **Percutaneous U/S** guided **tumor ablation** by intra-lesional ethanol ,radiofrequency , microwave or lazer → Tumor necrosis.
  5. **Insertion of stent** to relieve obstructive jaundice

### ***Intra-arterial selective chemotherapy***

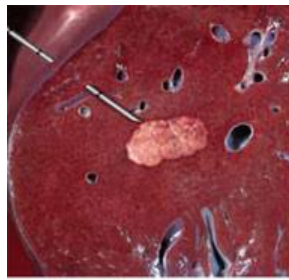
Y-90 embolisation



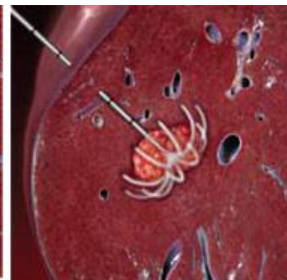
### ***Chemo-embolisation***



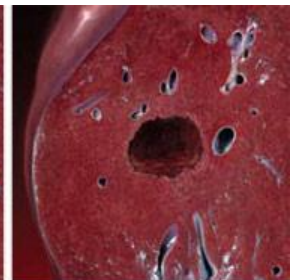
### ***U/S* guided tumor ablation**



*The radiofrequency probe is inserted into the liver tumor.*



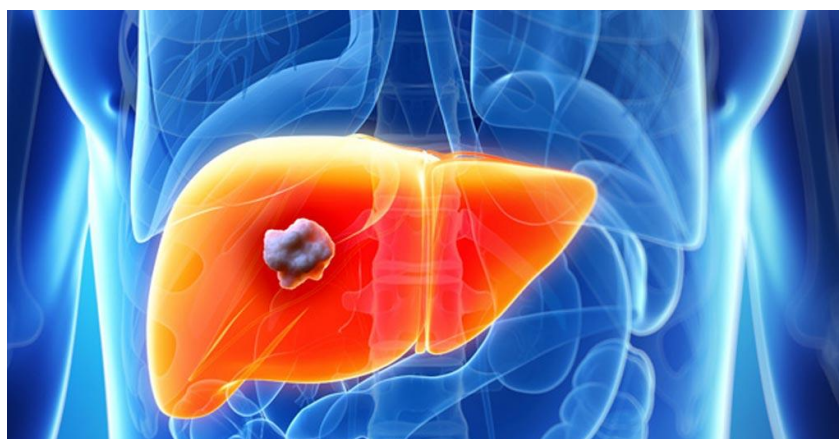
*The surgeon deploys electrodes from the probe which deliver radiofrequency energy. This high heat causes death of tumor cells.*



*Following the procedure, the tumor cells are destroyed and will eventually be replaced by scar tissue.*

### **\* Liver Metastasis \***

- \* **Incidence:** 20 times **more common** than 1ry liver tumors.
- \* **Routes:**
  1. **Portal Circulation:** From carcinomas of GIT.
  2. **Hepatic artery:** From any tumor e.g. breast, lung, kidney, ovaries.
  3. **Lymphatics:** retrograde spread from malignant hepatic L.Ns .
  4. **Direct:** from gall bladder, stomach, colon.
- \* **Pathology:**
  - Liver metastases may be **synchronous** ( discovered with the 1ry tumor ) or **meta-synchronous** (discovered during follow up of the patient after resection of the 1ry tumor ) .
  - Multiple , white , immediately subcapsular **nodules** .
  - **Umbilicated** because of central necrosis and hemorrhage.





### \* **Clinical Picture:**

- Usually picture of the **advanced primary** tumour but 10-20 % of liver metastases may be with **occult 1ry** .
- Weight loss, fatigue, cachexia.
- **Pain and swelling** in the right hypochondrium & epigastrium
- Jaundice, ascites, **hepatomegaly** ( hard , nodular , tender liver ) .

\* **Investigations:** (As 1ry liver tumors) + investigation for the 1ry tumor .

### \* **Treatment:**

**A) Liver metastasis usually mean inoperable 1ry. tumor for palliative treatment of the 1ry tumor with one of the followings to the liver metastases :(as inoperable 1ry liver malignancy)**

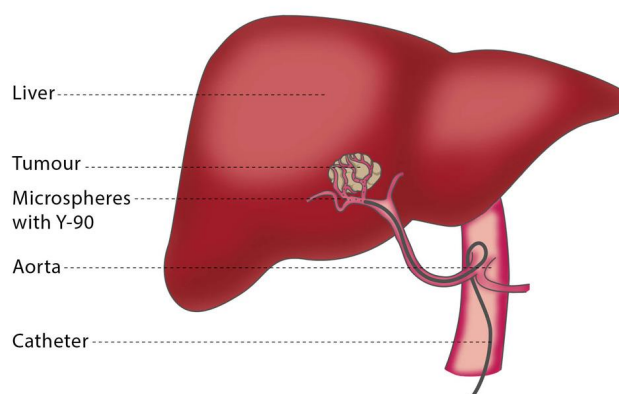
1. Palliative systemic **chemotherapy** .

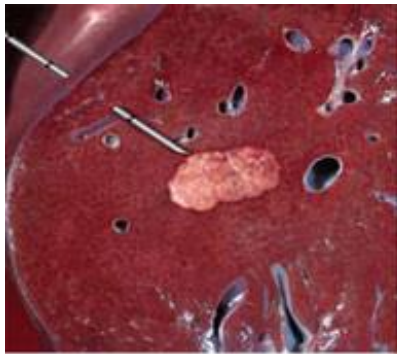
2. Palliative **Intra-arterial selective chemotherapy** via catheter inserted in the hepatic artery by angiographic technique .

3. Palliative **Chemo-embolisation** : as selective chemotherapy but the chemotherapy is combined with gelfoam to selectively block the arterial supply of the tumour

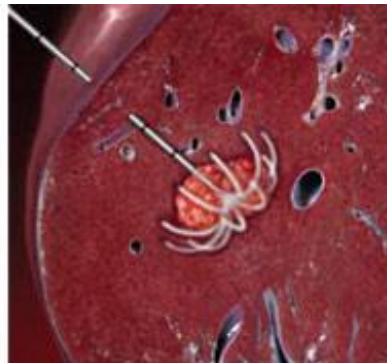
4. Palliative **Percutaneous U/S** guided **tumor ablation** by intra-lesional ethanol radiofrequency , microwave or lazer → tumour necrosis.

Y-90 embolisation

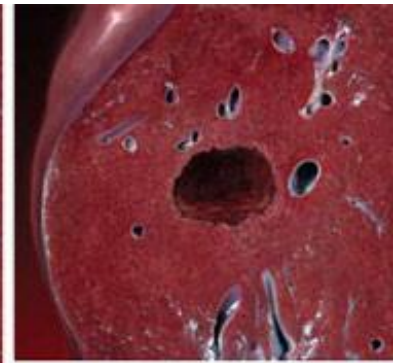




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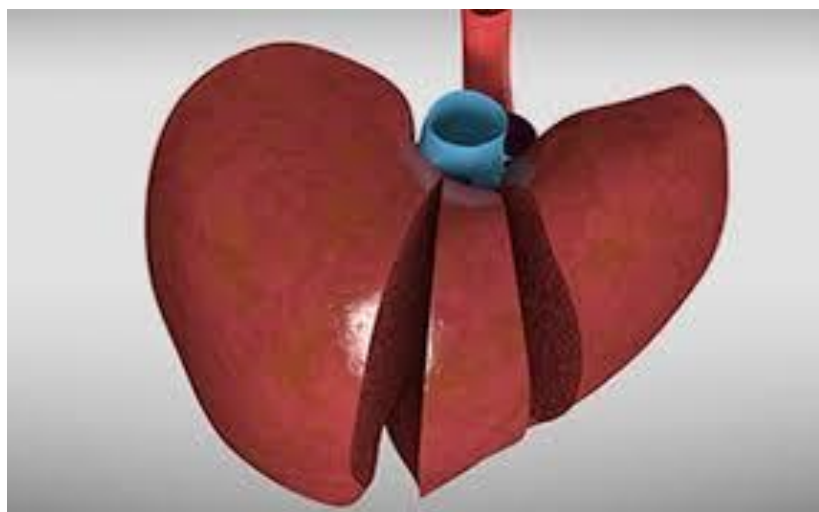
### ***B) Liver resection may be curable in few cases of:***

- a. Completely resectable 1ry tumor.
- b. No extrahepatic metastasis.

### ***c. Resectable liver metastases with safety margin are:***

- Solitary nodule can be removed by wedge resection .
- Multiple nodules confined to one lobe of the liver can be removed by hemihepatectomy .

### **Wedge resection**



## Hemihepatectomy

