



## Dynamics of Hepatic Lesions AnatomicoSurgical, Microbiological and Radiographic Considerations

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### ABSTRACT

Liver is an intraabdominal organ located in the upper abdomen and has a surgical importance in view of its position, It is also a common site for Hydatid Cysts, Hemangiomas, Hepatic Adenomas and Metastatic Secondaries from other organs. The liver is divided anatomically into two lobes, a right and a left by falciform ligament anteriorly and superiorly, by the fissure for ligamentum teres inferiorly and by the fissure for ligamentum venosum posteriorly. It is a highly vascular organ with good blood supply and infarcts are rare. The Article describes Liver as a central Organ to Various Diseases.

**KEYWORDS** : Hydatid, Sinusoids, Metastasis, Ascites, Laceration, Amebic, Pyogenic, Abscess,

### Introduction:

Liver as an Abdominal Organ has great importance and by virtue of its large size, its anatomic location and High Vascularity, it gets effected in multiple Surgical and Medical Conditions. The Anatomy, Surgery and Radiography related to Live is Unique and the Clinical Correlates of Medical and Surgical Conditions is Diverse. We try to Analyse in random sample to see the distribution of lesions pertaining to Liver.

### Methodology :

The Study was carried on 100 Radiographs from patients who had predominant abdominal complaints in 2016 till February 2017 from SKIMS Soura, SKIMS Medical College Bemina, Primary Health Centre Chanpora and Private Radiographic centers. Patients had presented with vague abdominal pain, ascites, jaundice, Vomiting, Dyspepsia, Urinary Complaints, palpable mass, weight loss, anorexia, fever or combination of symptoms and study of lesions particular to liver were analyzed. All other Findings were not included. The patients were taken irrespective of sex, age group or any other consideration. The Age Group of Patients However was from 22-80 years.

Liver Metastasis were seen in four patients, Liver Cysts were seen in 3 patients, Trauma to liver was reported in one patient and Abscess in relation to liver were reported in two patients.

### Discussion:

Three cases of Hydatid Disease liver were reported. Liver is a common site for Hydatid cyst. <sup>1,2</sup> Echinococcus granulosus Causes Hydatid cyst disease. Characteristics of Echinococcus granulosus are that it is a cestode (dog tapeworm). It has Scolex with four suckers and a double circle of hooks. Adult worm has only three proglottids. Dogs are infected when they ingest the entrails of sheep, e.g., liver, containing hydatid cysts. The adult worms develop in the gut and eggs are passed in the feces. Eggs are ingested by sheep (by humans) and hatch hexacanth larvae in the gut that migrate in the blood to various organs, especially the liver and brain. Larvae form large, unilocular hydatid cysts containing many protoscolexes and daughter cysts. Laboratory Diagnosis of Echinococcus granulosus is serologic tests, e.g., indirect hemagglutination. <sup>3,4</sup> Abdominal tenderness is the most common sign. Tender hepatomegaly signifies secondary infection of the cyst. Ascites is rare. Splenomegaly can be result of portal hypertension or splenic echinococcosis. Anaphylaxis, intrapleural rupture, intraperitoneal rupture are secondary complications. <sup>5</sup>

PAIR Technique (Percutaneous Aspiration, injection of scolicalid agents and reaspiration of cyst contents) has also been used for treatment. Albendazole is the most effective drug most commonly used. They Can Present Radiographically as Fluid Filled, pseudo solid or Calcified lesions

Amebic liver abscess follows intestinal infestation by Entamoeba histolytica. <sup>6</sup> Two forms of the protozoan may be found in stool specimens: trophozoites and cysts. Trophozoites are the invasive form and are derived from cysts. On reaching the small intestine, motile trophozoites are released they migrate to the colon, where they proliferate. <sup>7</sup> Once intestinal infection is established, amoebae migrate to the liver via the portal vein. Within the liver these organisms block small intrahepatic portal radicals, causing focal infarction of hepatocytes. A proteolytic enzyme produced by the trophozoites leads to abscess formation. Most of amoebic liver abscesses are solitary and most of them are located in the right lobe of the liver. They Characteristically are defined as having "anchovy sauce" pus. This is primarily consisting of necrotic liver tissue and blood, with a paucity of inflammatory cells. Amoebic liver abscess has a more subacute presentation than that of pyogenic liver abscess. Abdominal tenderness is the most common sign.

Initial symptoms are non-specific in the form of fever, anorexia, night sweats, malaise, anorexia, nausea and vomiting, and weight loss. <sup>8</sup> In nonendemic areas, serological testing (indirect haemagglutination test) is done. Complications of Amebic Liver Abscess can be Pleuropulmonary involvemem. Manifestations include sterile effusions, contiguous spread from the liver, and rupture into the pleural space, rupture into the pleural space, rupture into the peritoneum or Rupture into the pericardium, usually from abscesses of the left lobe of the liver. <sup>9</sup> Indications for surgical drainage include Liver abscesses in the left lobe of the liver, because of the risk of rupture into the pericardial sac, Large abscesses to facilitate more rapid healing with chemotherapy, and Lack of response to metronidazole therapy.

Liver Abscess can be the Pyogenic Liver Abscess. The incidence is higher in diabetics and immunosuppressed, with slight male predominance. They are most common in the right lobe. Pyogenic liver abscesses may be divided into two general categories. Macroscopic abscesses are usually restricted to one lobe of the liver, present subacutely with symptoms of several days to weeks duration, and require some form of primary drainage. <sup>10</sup> Microscopic abscesses are multiple, widely distributed throughout the

hepatic parenchyma, usually manifest acutely, and require primarily medical therapy. Route of infection are Biliary tract disease, Portal vein pylephlebitis-hepatic arterial infection, Secondary to bacteraemia -post-traumatic, from blunt or penetrating injuries or direct extension from a contiguous source of infection (including cryptogenic).<sup>11</sup> The most common aerobic organisms are *Escherichia coli*, *Klebsiella*, and *Enterococcus*. The most common anaerobes are *Bacteroides*, anaerobic streptococci, and *Fusobacterium* species. Patients with microscopic liver abscesses usually have an acutely septic clinical presentation, with fever, rigors, and hypotension. Presentation of macroscopic liver abscesses is more subacute, with fever, night sweats, anorexia, weight loss, and malaise. Clinical suspicion of a liver abscess (either pyogenic or amoebic) arise when a patient has fever, right upper quadrant abdominal pain and tenderness, and abnormal liver function tests. Ultrasonography is the initial procedure of choice. However, it may miss lesions in the dome of the right liver lobe or multiple microscopic abscesses. Radionuclide Scans. Technetium-99m sulfur colloid scanning has been useful in the diagnosis of abscesses. Abdominal CT can detect abscess as small as 0.5 cm in diameter and is useful in identifying multiple small abscesses or abscesses located near the hemidiaphragm.<sup>12</sup>

Metastatic Liver Lesions were reported from four patients. Three had lesions (Primary in GIT) and one had a Primary Lesion in Lung.

Liver is one of the most common sites for metastasis as the blood supply of the liver is unique in the fact that it receives most of its blood from a vein (Portal Vein). Liver receives 20% of its blood from hepatic artery and 80% from portal vein. Metastatic cancers from other parts of the body comprise the largest group of malignant tumors in the liver. Most metastatic lesions likely arise in the liver as a result of primary shedding into the vascular system. Most commonly are the bronchogenic carcinoma, tumors in the prostate, colon, breast, pancreas, stomach, kidney, and cervix. The Mean total hepatic blood flow has been estimated to be 100 to 130 ml. per kg. per minute.<sup>13,14</sup>

The liver receives blood from the arterial and portal circulation; processes nutrients and metabolizes toxins and wastes; and stores, transforms, and distributes them to the vascular, biliary, or lymphatic circulations.

About Seventy per cent to 75% of total hepatic blood flow comes from the portal vein, while the remainder comes from the hepatic artery. In addition there is a reciprocal increase in hepatic arterial flow in response to a reduction in the portal flow, but the converse does not occur. Food, bile salts, secretin, cholecystokinin, pentagastrin, epinephrine, vasoactive intestinal peptide, glucagon, and isoproterenol all increase portal blood flow. Although it is conceivable that flow would increase based on nutritional status, because of hepatic arterial flow regulation the total flow does not vary with metabolic state of the organism. Other humoral regulators of extrinsic regulation of blood flow to liver include gastrin, glucagon, secretin, and bile salts.

Metastatic disease can present as vague abdominal pain, ascites, jaundice, palpable mass, weight loss, anorexia, fever, and vague gastrointestinal complaints. Most of these symptoms generally indicate advanced disease. Therefore, a physician or a surgeon cannot rely on development of symptoms for early detection of metastases to the liver.

In any case of suspicion it is essential to mandatory to monitor Liver enzyme and CEA determinations in combination with appropriately timed imaging studies are recommended especially in the routine follow-up of patients with colorectal cancer. The CT scan is generally considered the most favored test because of its availability and overall accuracy in the detection of liver metastases. The sensitivity of CT varies widely according to the technique, the experience of the radiologist, and the generation of equipment used. The two most

common techniques involving CT are bolusdynamic CT and CT portography.

Whereas liver parenchyma normally receives 75% of its blood supply from the portal inflow, liver metastases derive nearly all their vascular inflow from branches of the hepatic artery. The same is true of most primary tumors of the liver.

Nowadays Gadolinium-enhanced techniques are useful and used for both detection and characterization of liver lesions. MR cholangiography and New arterial and portal flow techniques are also used.

Resection, if possible, is the treatment of choice for metastatic colorectal cancer to the liver. Liver lesions detected on careful follow-up will often be resectable, and several studies have documented the unfavorable prognosis of untreated hepatic metastases from colorectal cancer. In case of Metastatic Colorectal Cancer Over 50% of patients diagnosed with colorectal cancer will develop hepatic metastases during their lifetime. Traditional teaching suggested that hepatic resection for metastatic colorectal cancer to the liver, if technically feasible, should be performed only for fewer than four metastases. Use of neo adjuvant chemotherapy, portal vein embolization, two-stage hepatectomy, simultaneous ablation, and resection of extrahepatic tumor in select patients have increased the number of patients eligible for a surgical approach. In the 20 to 40% range for resection of hepatic metastases from breast, renal, and other GI tumors.<sup>15,16</sup>

The treatment of a patient with distant metastases depends on a variety of factors such as the number and sites of metastases, the cancer type, the rate of tumor growth, the previous treatments delivered.

A liver metastasis from a colon cancer is more likely to be an isolated and thus resectable lesion than a liver metastasis from a pancreatic carcinoma.<sup>17</sup>

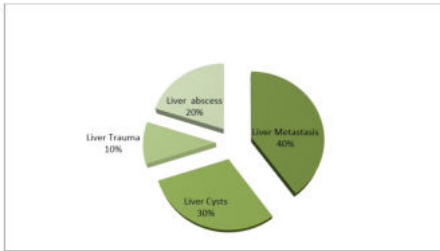
In curative surgery for distant metastases, as with surgery for primary tumors, the goal is to resect the metastases with negative margins. However this hypothetical concept is not always achievable. In patients with hepatic metastases that are unresectable because their location near intrahepatic blood vessels precludes a margin-negative resection, or because they are multifocal or hepatic function is inadequate, tumor ablation with cryotherapy or radiofrequency ablation is an effective alternative. Curative resections or ablative procedures should be attempted only if the lesions are accessible and the procedure can be performed safely.

**Liver Trauma** : Liver is one of the commonly involved organs in Abdominal trauma. Infact Spleen and liver are the most commonly traumatized organs in the most commonly injured organs in the Abdomen. It is Commonly injured in Penetrating Trauma and the second most commonly injured organ in Blunt Trauma.<sup>18,19</sup>

It can be injured by Pellet injuries, bullet shots, Social Trauma, fall from heights as well. Its large size, high vascularity and soft consistency add to the dangers of Hepatic Trauma.<sup>20,21</sup> Trauma can be in the form of Laceration, Hematoma or Hemorrhages, Parenchymal Disruption or Hepatic Avulsion. In one Patient A liver Laceration was reported.

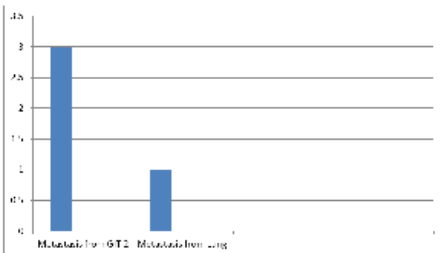
#### Conclusion:

Liver is an Important Abdominal Organ and by virtue of its large size, its anatomic location and High Vascularity, it gets effected in multiple Surgical and Medical Conditions. The status of Liver even in diseases not pertaining to liver itself is important. Liver is a common site for Cystic Lesions, Neoplastic Lesions, Traumatic Lesions as well as Non Hepatic Lesions. A detailed Knowledge of Liver Anatomy, Physiology, Surgery and Radiology is of Uptem Importance.

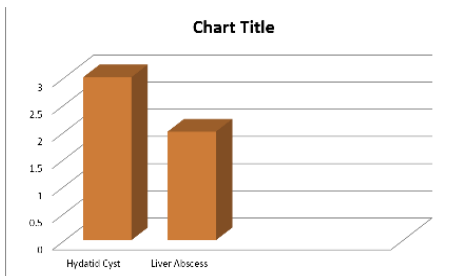


**Fig 4, 5 : CT scan Demonstrating Liver metastasis**

**Distribution of Liver Lesions in General**



**Graph 1: Showing Distribution of Metastasis to Liver**



**Graph 2: Showing Distribution of Cysts and Abscess in Liver Figures:**



**Fig 1: CT scan Demonstrating Liver abscess**



**Fig 2: CT scan Demonstrating Liver cyst**



**Fig 3: CT scan Demonstrating Liver laceration**



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