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## Clinical profile of patients with mass lesions in hepatobiliary system undergoing CT

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### Abstract

Various types of tumors may be found inside liver, either benign or malign. First, benign liver tumors are quite common; such lesions are indeed found in 1% of population. The most common benign tumors are the hemangioma and cysts. Then, many malign lesions may be found inside the liver. These tumors are deadly; liver cancer is indeed the 4th deadliest cancer worldwide after lungs, stomach and not far from colorectal cancers. Several primary cancers may be found such as Hepatocellular Carcinoma (HCC) or Cholangiocarcinoma (CCC). The blood flow inside the liver is indeed second only to the lungs and its location favors the apparition of metastases from digestive cancers. The prospective study included 50 patients of hepato-biliary malignancies being treated at Tertiary care Hospital. The mean age was 55yrs with age range of 35-85yrs. Male to female ratio was 1:2.1. Hepatic metastatic disease in the single most common malignant tumor in our study (28 patients out of 53) accounting for 52% of cases. Next most common malignant tumor is gall bladder carcinoma, which accounts for 34% (18 patients out of 53). Pain abdomen (72%), weight loss (28%) and mass per abdomen (23%) are the most common symptoms in order of frequency. Abdominal tenderness is the most common clinical finding (53%), followed by hepatomegaly (23%).

**Keywords:** Mass lesions, hepatobiliary system, CT

### Introduction

Several liver pathologies are found with diverse symptoms. In particular, these symptoms often include a jaundice caused by a dysfunction of the hepatic function, and an increase of the liver volume named hepatomegaly. Several of these diseases will be presented when they play a role related with the liver tumors. More precisely, pathologies with an impact on the CT images will be reviewed as well as diseases that may induce an oncogenesis. Several diseases indeed induce a malignant transformation, causing higher chances of tumor emergence <sup>[1]</sup>. First, pathologies with an impact on the CT images will be presented, namely steatosis and hemochromatosis. Then, a short introduction of the liver tumors will be given, as this subject will be the topic of a subsequent section. Finally, cirrhosis and its causes will be reviewed because this chronic disease leads to several cancers. One may note that only CT modality is mentioned <sup>[2]</sup>. This choice of modality is consistent with clinical routine, as the CT modality remains the best modality for the follow-up and the characterization of most lesions. Hepatic steatosis or fatty liver is a chronic disease of the liver that modifies the liver appearance on CT images and may sometimes give tumors. First, fatty liver is a reversible pathology caused by an excess of triglyceride fat inside the liver cells <sup>[3]</sup>. This pathology is the most common chronic disease of the liver; 31% of adults in USA indeed suffers from hepatic steatosis. Then, fatty liver induces important changes of the appearance of the liver on CT images. Indeed, the density of the liver on CT images decreases for fatty livers and heterogeneities may appear. Moreover, some atypical appearances may be obtained for some lesions such as hemangiomas. Finally, without treatment the hepatic steatosis may induce the appearance of cirrhosis in around 10% of cases that may later evolve with hepatocellular carcinomas. Hemochromatosis or iron overload is a disease caused by an excess of iron inside the liver <sup>[4]</sup>. This pathology has mostly a genetic cause and induces a hyperdensity of the liver on CT images. Consequently many tumors will appear as hypodense on CT images and hypervascular lesions may disappear after injection. This pathology might also evolve with cancers. This thesis focuses on liver tumors, which will be detailed in a subsequent section. Various types of tumors may be found inside liver, either benign or malign.

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First, benign liver tumors are quite common; such lesions are indeed found in 1% of population. The most common benign tumors are the hemangioma and cysts. Then, many malign lesions may be found inside the liver. These tumors are deadly; liver cancer is indeed the 4th deadliest cancer worldwide after lungs, stomach and not far from colorectal cancers. Several primary cancers may be found such as Hepatocellular Carcinoma (HCC) or Cholangiocarcinoma (CCC). The blood flow inside the liver is indeed second only to the lungs and its location favors the apparition of metastases from digestive cancers. Several chronic liver diseases induce cirrhosis that causes important changes of appearance on CT images. Besides, cirrhosis may evolve in tumors [5]. First, cirrhosis induces important changes of appearance and shape of the liver. Cirrhosis is indeed characterized by a fibrosis of the liver tissues and the apparition of scar tissues and regenerative nodules where healthy tissues are regenerated. Moreover, cirrhosis modifies the shape of the anatomical segments and impacts the CT images [6]. Cirrhotic livers indeed appear with heterogeneities on CT images and with abnormal appearances for every phase. Then, cirrhosis is mostly caused by chronic diseases in particular the Hepatitis B and C (HBV and HCV) as well as chronic alcoholism. Finally, patients with cirrhosis are in a high risk population for HCC. Thus, cirrhotic livers are followed up by M.D. because 1-7% of cirrhosis cases leads to HCC each year. Moreover 70-90% of HCCs develop on cirrhotic livers, thus a follow-up of these patients contributes to better survival because lesions will be detected at an early stage. Some infections such as hepatitis B and C viruses play a particular role for the liver, as they often induce an oncogenesis [7, 8].

**Methodology**

**Selection of Case**

The prospective study included 50 patients of hepato-biliary malignancies being treated at Tertiary care Hospital.

**Examination procedure**

Before commencing for CT examination all procedure, historical, clinical, laboratory data will be recorded

**Computed Tomography Examination**

**Equipment**

SOMOTOM ART 3<sup>rd</sup> generation rotate-rotate type whole body CT scanner from Siemens.

**Computed Tomographic Examination**

CT scanning was performed on patient in two phases.

In the First phase scan was obtained with oral contrast only. 20 ml of water soluble iodine based agent diatrizoate meglumine (Gastrograffin) diluted in 1 liter of water was given orally 3-4 hr. before the study to ensure good colonic opacification. An additional 20ml contrast agent in 1 liter was given 20 min. before CT study to opacify bowel.

In the second phase scans was obtained with non-ionic intravenous contrast, A bolus of 50 to 70 ml of non-ionic 300mg/ml of iodine concentration contrast material was used intravenously and scanning was started immediately.

**Results**

The mean age was 55 yrs with age range of 35-85yrs. Male to female ratio was 1:2.1. Hepatic metastatic disease in the single most common malignant tumor in our study (28

patients out of 53) accounting for 52% of cases. Next most common malignant tumor is gall bladder carcinoma, which accounts for 34% (18 patients out of 53). Pain abdomen (72%), weight loss (28%) and mass per abdomen (23%) are the most common symptoms in order of frequency. Abdominal tenderness is the most common clinical finding (53%), followed by hepatomegaly (23%).

**Table 1: Age Group**

Age group	No. of Patients	Percentage
31 – 40	4	8.00
41 – 50	9	17.00
51 – 60	18	34.00
61 – 70	13	24.00
71 – 80	7	13.00
81 – 90	2	4.00
Total	53	100

**Table 2: Gender**

Gender	No. of Patients	Percentage
Male	17	34.0
Female	36	66.0
Total	53	100.00

**Table 3: Clinical presentation**

Presentation	No. of Patients	Percentage
Pain abdomen	38	72.0
Weight loss	15	28.0
Mass per abdomen	12	23.0
Jaundice	5	9.0
Altered bowel habits	4	8.0
Fever	3	6.0
Distension	3	6.0
Bleeding PR	3	6.0
Abdominal discomfort	2	4.0
Vomiting	1	2.0
Asymptomatic	6	12.0

**Table 4: Clinical Signs**

Signs	No. of Patients	Percentage
Abdominal tenderness	28	53.0
Hepato/splenomegaly	12	23.0
Mass per abdomen	11	21.0
Icterus	5	10.0
Ascites/pleural effusion	7	13.0

**Discussion**

This was a hospital based prospective study which included 53 patients. We evaluated the patients who are already diagnosed or suspected of hepato-biliary malignancies using computed tomography. Anatomical extent and nature of the tumors was studied. The diagnosis in these patients was obtained either by ultrasound or CT guided FNAC/ Biopsy, by histopathologic or clinical data, were excluded from the study. Patients were followed wherever necessary. In our study females are double the males (sex ratio was 1:2.1). Most common age group affected was 51-60 years and the mean age was 55Yrs. Pain abdomen (72%), weight loss (28%) and mass per abdomen (23%) are the most common symptoms in order of frequency. Abdominal tenderness (53%) and hepatomegaly are the most common signs (23%). Our study comprised of 58% of hepatic malignant tumors and 42% of biliary malignant tumors. We shall discuss them separately.

Out of 53 patients 31 had hepatic malignant tumors (58%). Most commonly occurring tumors like hepatic metastasis, hepatocellular carcinoma were noted in our study. We did not find hepatoblastoma, fibrolamellar carcinoma in this study. Hepatic metastatic disease noted in 28 out of 31 Patients i.e 90% of cases. Metastasis is the most common hepatic tumor. Hepatocellular carcinoma forms the next most common malignant hepatic neoplasm.

We studied 28 cases of metastatic lesions of liver from varying sites. Age of the cases ranged from 35Yrs to 77Yrs with mean age being 56 Yrs.

Female preponderance noted in our study. Female patients almost double the number of male patients. This female preponderance is due increased number of gynecological and breast cancer patients included in our study.

Out of 28 cases of metastases, most common primary was from colorectal malignancy constituting 11 (39%) cases, followed by gastric carcinoma (6 cases, 21%), pancreatic malignancy (3 cases, 11%), and breast cancer (3 cases, 11%). Other primaries which have given secondaries to liver were gynecological malignancies like ovarian and cervical cancer, lung carcinoma. Cervical carcinoma (2 cases, 7%), ovarian carcinoma (2cases, 7%) and breast carcinoma all together made up 35% of hepatic metastatic disease. Hence female preponderance noted in our study. females showed slightly higher incidence of metastatic colorectal and stomach carcinoma in our study. The mean size of metastatic lesions encountered in our study was 4.2cm with a size range of 0.5-5-10 cm. Majority of the metastatic nodules are solitary (64%). Multiple metastatic nodules noted especially with colorectal carcinoma. Right lobe is the most commonly involved site accounting for 72 % of cases. Both lobe involvement is noted in 21% of cases. The results of this study are similar to other studies <sup>[9, 10]</sup>.

### Conclusion

In the present study computed tomography proved to be a valuable tool in the radiological evaluation of liver and biliary system. It enabled detection and characterization of various neoplasms in the normal and abnormal liver. Nature, origin, consistency (necrosis) and borders of the tumors can be studied in detail. Anatomical extent, lymphadenopathy status and distant metastasis can also be delineated. Almost complete information of the primary tumor can be assessed in the same sitting in suspected or known cases of hepatic metastasis. Thus computed tomography is an indispensable modality for staging of hepatobiliary malignancies. It is a must for treating physician to choose an appropriate therapeutic option which suits best for individual patient. Further contrast enhanced computed tomography demarcates the exact extent of the tumor and adjacent vascular and other important structures. This helps oncosurgeon for proper planning and approach of surgical procedure either curative or Debulking Operation.

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