# Original Research

## Role of CT scan in evaluation of hepatic masses

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**ABSTRACT:**
**Background:**Focal liver lesions are discrete abnormality arising within liver and are increasingly being discovered with the widespread use of diagnostic imaging modalities. The present study evaluated hepatic masses with the help of CT scan. **Materials &Methods:**75 adult patients of age 25- 65 years of both gendersunderwent CT scan using Siemens 3rdgeneration spiral CT scan machine. **Results:**The age group 25- 35 years had 18 patients, 35- 45 years had 32, 45- 55 years had 27 and 55-65 years had 8 patients. The difference was non- significant (P> 0.05). The common hepatic masses were liver abscess in 22, cholangiocarcinoma in 8, metastasis in 5, hemangiomas in 7, focal nodular hyperplasia in 13, simple cysts in 10, hepatocellular carcinoma in 6 and hydatid cysts in 4 cases. The difference was significant (P< 0.05). The sensitivity of CT in detecting hepatic masses was 97.5%, specificity was 94.1%, positive predictive value (PPV) was 98.2% and negative predictive value (NPV) was 100%. **Conclusion:**The study unequivocally demonstrated that CT is a very useful diagnostic technique for hepatic mass diagnosis.
**Key words:**CT scan, Focal liver lesions, hepatic masses

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## INTRODUCTION

Focal liver lesions are discrete abnormality arising within liver and are increasingly being discovered with the widespread use of diagnostic imaging modalities. Differentiation of various liver lesions is considered to be critical for determining the treatment options.[1]The differential diagnosis (malignant and non-malignant lesions) in patients presenting with a focal liver lesion is broad. The high frequency of benign focal liver lesions such as Cysts, Hemangiomas, and focal nodular hyperplasia etc. make detection and characterization of these lesions essential.[2,3]

Imaging-based characterization of liver masses is largely dependent on understanding the unique phasic vascular perfusion of the liver and the characteristic characteristics of different lesions during multiphasic contrast imaging. In cases where non-invasive characterisation proves unsatisfactory, a liver biopsy becomes essential for making the final diagnosis.[4] Furthermore, immunohistochemical assessment of protein biomarkers and histologic analysis are essential. Selecting the appropriate course of action for hepatic abnormalities requires accurate diagnosis.[5] The stage of the tumor and the functional state of the unaffected liver are two aspects that influence the treatment of malignant masses or those that carry a high risk of developing cancer.[6]The present study evaluated hepatic masses with the help of CT scan.

## MATERIALS &METHODS

The present study comprised 75 adult patients of age 25- 65 years of both genders. All patients gave their written consentto participate in the study.

The baseline parameters such as name, age, gender, address etc. were recorded. A careful history and clinical examination was conducted. All patients underwent CT scanusing Siemens 3rdgeneration spiral CT scan machine. A Triphasic liver CT scan was performed. Serial CT slices was taken at aninterval of 5 mm. Lesions were mentioned as hyper enhancement, hypo enhancement, iso-dense and mixed enhancement pattern. Data thus found were subjected to statistical analysis. P value less than 0.05 was considered significant.

**RESULTS**
**Table I Age-wise distribution of patients**

| Age group (years) | Number | P value |
|---|---|---|
| 25-35 | 18 | 0.71 |
| 35-45 | 32 | |
| 45-55 | 27 | |
| 55-65 | 8 | |

Table I shows that the age group 25- 35 years had 18 patients, 35- 45 years had 32, 45- 55 years had 27 and 55-65 years had 8 patients. The difference was non- significant (P> 0.05).

**Table II Assessment of type of hepatic lesions**

| Hepatic lesions | Number | P value |
|---|---|---|
| Liver abscess | 22 | 0.04 |
| Cholangiocarcinoma | 8 | |
| Metastasis | 5 | |
| Hemangiomas | 7 | |
| Focal nodular hyperplasia | 13 | |
| Simple cysts | 10 | |
| Hepatocellular carcinoma | 6 | |
| Hydatid cysts | 4 | |

Table II, graph I show that common hepatic masses were liver abscess in 22, cholangiocarcinoma in 8, metastasis in 5, hemangiomas in 7, focal nodular hyperplasia in 13, simple cysts in 10, hepatocellular carcinoma in 6 and hydatid cysts in 4 cases. The difference was significant (P< 0.05).
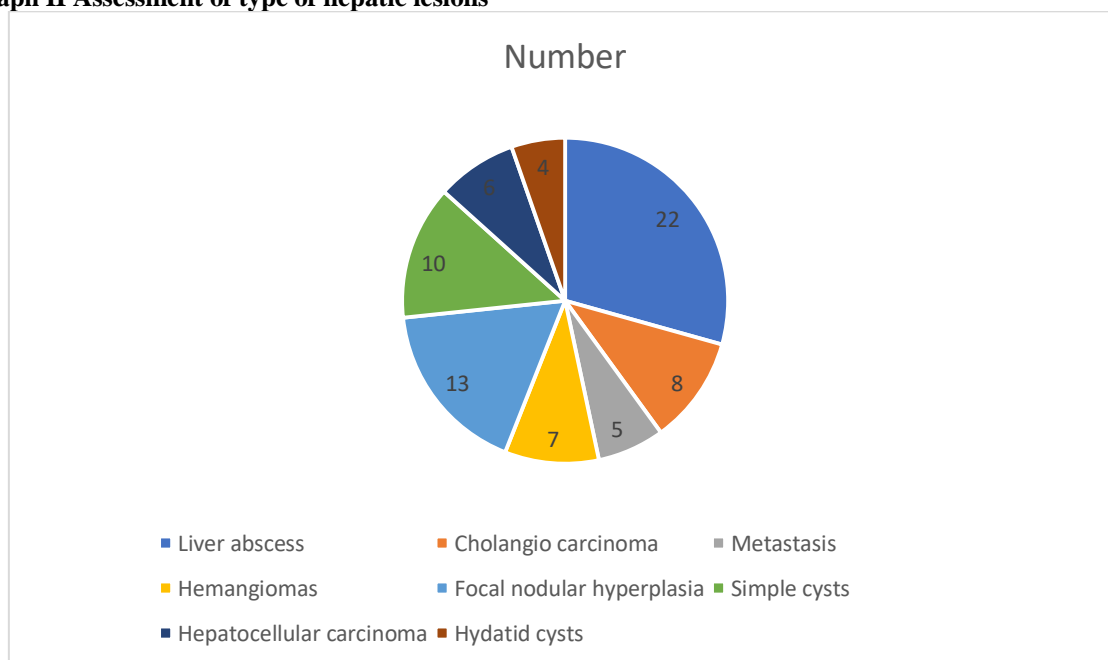
**Graph II Assessment of type of hepatic lesions**



**Table III Efficacy of CT scan**

| Efficacy | Value |
|---|---|
| Sensitivity (%) | 97.5% |
| Specificity (%) | 94.1% |
| PPV (%) | 98.2% |
| NPV (%) | 100% |

Table III shows that the sensitivity of CT in detecting hepatic masses was 97.5%, specificity was 94.1%, positive predictive value (PPV) was 98.2% and negative predictive value (NPV) was 100%.

**DISCUSSION**
Hepatic masses are commonly encountered in middle age. A clinical examination and history may be useful in the assessment of lesions.[7] Even so, hepatic mass diagnosis remains a difficult undertaking. It causes a lot of discussion and misunderstanding. To guarantee

precise and reliable evaluation, a range of imaging modalities are used, such as magnetic resonance imaging and CT scanning.[8] The main objective of any modality is to diagnose lesions that are both benign and malignant. Every modality has its advantages and disadvantages. Everyone may be able to identify a limited number of lesions, whereas other imaging techniques may miss them. [9,10]

The appearance of localized liver lesions during the portal venous phase of enhancement largely dictated how they were described on a CT scan before the development of helical CT. Hepatic liver masses are a major concern to human health due to their high risk of morbidity and mortality.[11,12] Newer generation CT scanners are very useful for diagnosis and help detect lesions. When classifying lesions into three distinct clinical groups, it is essential. First group includes benign mass lesions; second category includes other benign mass lesions; and third category includes malignant hepatic lesions, which is always in need of treatment if possible.[13,14]The present study evaluated hepatic masses with the help of CT scan.

We found thatage group 25- 35 years had 18 patients, 35- 45 years had 32, 45- 55 years had 27 and 55-65 years had 8 patients. Ahirwar et al[15]studied the characteristic features of various hepatic lesions using triple phase CT as diagnostic modality, differentiating benign hepatic lesions from malignant and correlating findings of triple phase CT with clinical, histopathology or post-operative findings for calculation of its efficacy.All patients underwent triple phase CECT examination and its accuracy, sensitivity and specificity was calculated.Triple phase CT be excellent diagnostic modality for characterisation and better evaluation of hepatic masses with sensitivity of 91.3%, specificity 97.8%, PPV 91.3% and NPV 97.8%. Malignant hepatic lesions can be diagnosed by triphasic CT with accuracy of 93 %, sensitivity and specificity of 93.3% and 92.5% respectively and with PPV and NPV of 94.9% and 90.2% respectively

We observed that common hepatic masses were liver abscess in 22, cholangiocarcinoma in 8, metastasis in 5, hemangiomas in 7, focal nodular hyperplasia in 13, simple cysts in 10, hepatocellular carcinoma in 6 and hydatid cysts in 4 cases. Minami et al[16]studied 22 cases of liver metastasis. All cases were detected by CT scan. Breast, head and neck, lung and gastrointestinal (GI) tract were common primary sites. In CT scan images, cluster sign was the main feature of multiple metastasis. There was variation in shape, size, growth and vascularity in metastasis cases. It was seen than 15 cases, arterial enhancement was main feature whereas 1 case showed delayed enhancement. Enhancement of wall was evident in 14 patients. Hyperdense area was found in 2 cases and hypodense in 15 cases and in 5 cases, hetergenous enhancement was seen. Target appearance was seen in 4 lesions. In 5 cases, USG incorrectly diagnosed them as pyogenic abscesses.

We found that the sensitivity of CT in detecting hepatic masses was 97.5%, specificity was 94.1%, positive predictive value (PPV) was 98.2% and negative predictive value (NPV) was 100%. Choi et al[17]compared the capability of arterial, portal venous, and delayed phases of helical CT with that of iodized-oil CT for revealing nodular hepatocellular carcinomas.In 48 patients, 79 hepatocellular carcinomas were seen with iodized-oil CT. Using helical CT, the arterial phase revealed 68 lesions (86%), the portal venous phase revealed 53 lesions (67%), and the delayed phase revealed 57 lesions (72%). The arterial phase proved superior to the portal venous and delayed phases for revealing lesions (p = .0025). The portal venous phase showed no significant difference for revealing lesions compared with the delayed phase. When combined, helical CT of the arterial and portal venous phases revealed 73 lesions (92%); a combination of the arterial and delayed phases revealed 72 lesions (91%); and a combination of the portal venous and delayed phases revealed 63 lesions (80%). Any combination of two phases that included the arterial phase proved superior to the combination of the portal venous and delayed phases (p = .0033). Overall, the combination of the arterial and portal venous phases (92%) or the combination of all three phases (92%) proved best at revealing lesions.

## CONCLUSION
The study unequivocally demonstrated that CT is a very useful diagnostic technique for hepatic mass diagnosis.

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