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ORIGINAL ARTICLE

Assessment of hepatic masses using Computed Tomography scan

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ABSTRACT

Background: The accurate and reliable determination of the nature of the liver mass is critical, not only to reassure individuals with benign lesions but also, and perhaps more importantly, to ensure that malignant lesions are diagnosed correctly. The present study was conducted to assess hepatic masses using CT scan. **Materials & Methods:** 52 patients diagnosed with different hepatic masses of both genders. CT examination were performed in all patients on Siemens-Somatom Emotion 6 slice third generation spiral CT. **Results:** Out of 52 patients, males were 32 and females were 20. Hepatic masses were abscess in 12, cholangio carcinoma in 7, hemangiomas in 4, focal nodular hyperplasia in 3, hepatocellular carcinoma in 6, hydatid cysts in 4, metastasis in 2 and simple cysts in 14 cases. The difference was significant ($P< 0.05$). CT has the sensitivity of 100%, specificity of 97.2%, PPV of 97.0% and NPV of 100%.

Conclusion: CT has high diagnostic value in detection of hepatic masses.

Key words: Hepatic masses, CT scan, Malignant lesions.

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INTRODUCTION

Detecting and characterization of focal liver lesions is one of the most confusing and controversial challenges in imaging today.[1] A major problem is that all standard non-invasive imaging modalities are less sensitive than generally perceived. These sensitivity problems are no surprise to radiologists experienced in hepatic imaging, since focal hepatic lesions are frequently missed with one modality, then detected with another.[2]

The accurate and reliable determination of the nature of the liver mass is critical, not only to reassure individuals with benign lesions but also, and perhaps more importantly, to ensure that malignant lesions are diagnosed correctly.[3] This avoids the devastating consequences of missed diagnosis and the delayed treatment of malignancy or the unnecessary treatment of benign lesions With appropriate interpretation of the clinical history and physical examination, and the judicious use of laboratory and imaging studies, the majority of liver masses can be characterized noninvasively.[4] Accurate characterization of liver masses by cross-sectional imaging is particularly dependent on an understanding of the unique phasic vascular perfusion of the liver and the characteristic behaviors of different lesions during multiphasic contrast imaging. When non-invasive characterization is indeterminate, a liver biopsy may be necessary for definitive diagnosis.[5] Standard histologic examination is usually complemented by immunohistochemical analysis of protein biomarkers. Accurate diagnosis allows the appropriate selection of optimal management, which is frequently reassurance or intermittent follow up for benign masses. For malignant lesions or those at risk of malignant transformation, management depends on the tumor staging, the functional status of the uninvolved liver and technical surgical considerations. Unresectable metastatic masses require oncologic consultation and therapy.[6] The present study was conducted to assess hepatic masses using CT scan.

MATERIALS & METHODS

The present study comprised of 52 patients diagnosed with different hepatic masses of both genders. All were enrolled after they agreed to participate in the study.

Data such as name, age, gender etc. was recorded. CT examination were performed in all patients on Siemens-Somatom Emotion 6 slice third generation spiral CT. A Triphasic liver CT was performed. The entire liver was scanned successively, in arterial, portal and equilibrium phases. Serial CT slices was obtained at a distance of every 8 mm. Patients were given I/V contrast of 1.5 ml/Kg with overall dose ranging from 80-100 ml according to protocol. Enhancement of each lesion in each phase was evaluated, and the lesions were described according to hyper enhancement, hypo enhancement, iso-dense to liver parenchyma and mixed enhancement pattern. Contrast material- Non–ionic contrast (e.g. iohexol) was used in present study. Results thus obtained were recorded and subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of cases

Total- 52		
Gender	**Males**	**Females**
Number	32	20

Table I shows that out of 52 patients, males were 32 and females were 20.

Table II Type of hepatic masses

Lesions	Number	P value
Abscess	12	0.01
Cholangio Carcinoma	7	
Hemangiomas	4	
Focal nodular hyperplasia	3	
Hepatocellular carcinoma	6	
Hydatid cysts	4	
Metastasis	2	
Simple cysts	14	

Table II, graph I shows that hepatic masses were abscess in 12, cholangio carcinoma in 7, hemangiomas in 4, focal nodular hyperplasia in 3, hepatocellular carcinoma in 6, hydatid cysts in 4, metastasis in 2 and simple cysts in 14 cases. The difference was significant (P< 0.05).

Graph I Type of hepatic masses

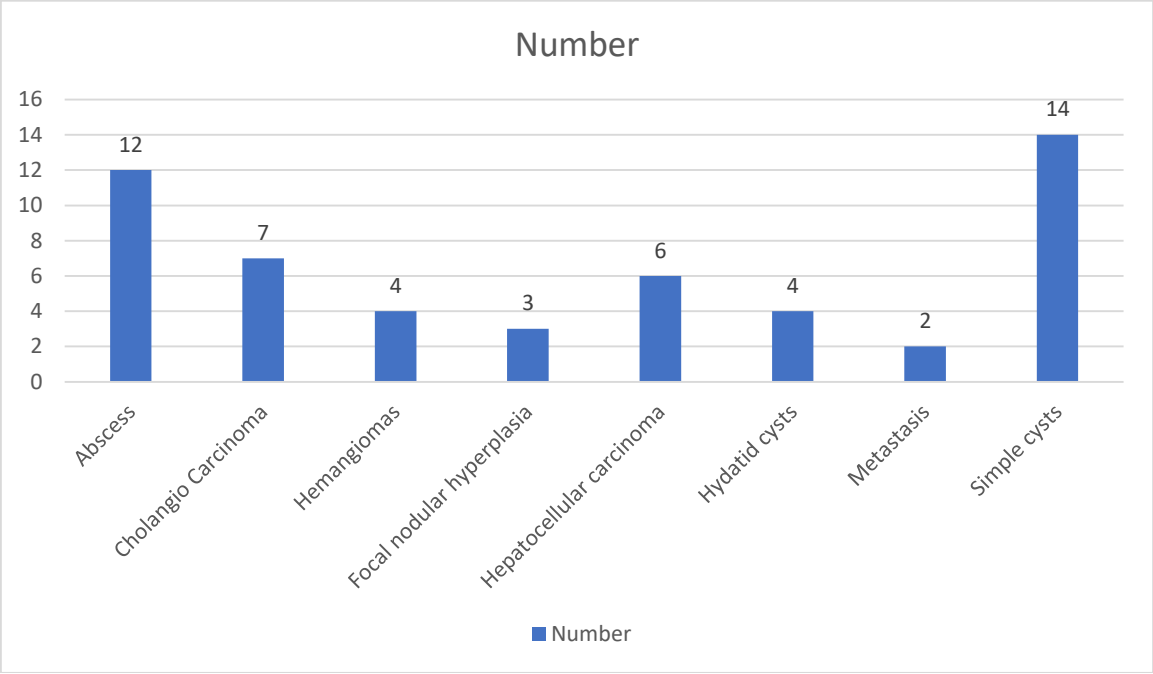

Table III Efficacy of CT in detection of cases

Statistics	Value
Sensitivity (%)	100%
Specificity (%)	97.2%
PPV (%)	97.0%
NPV (%)	100%

Table III shows that CT has the sensitivity of 100%, specificity of 97.2%, PPV of 97.0% and NPV of 100%.

DISCUSSION

It is helpful to subclassify lesions into three clinical categories. First are benign mass lesions for which no treatment is needed; second are benign mass lesions for which treatment is required; and third are malignant mass lesions for which treatment is always required if feasible.[7] A careful review of the personal history and physical examination findings often helps in narrowing the differential diagnoses of liver masses. A history of chronic hepatitis or the features or complications of liver cirrhosis identifies individuals at risk for HCC and intrahepatic cholangiocarcinoma. [8]Similarly, a history of primary sclerosing cholangitis alerts to the significant risk for cholangiocarcinoma while long-term oral contraceptive use predisposes certain women to hepatic adenoma. The family history is also of value in the initial clinical evaluation. A family history of young-onset diabetes mellitus, for example, may predispose to hepatic adenomatosis. Physical complaints such as abdominal pain are often non-specific but may be the reason to seek medical attention. Other physical symptoms are more suggestive of the underlying disease, for example the pruritus, dark urine and pale stools observed in biliary obstruction. A history of constitutional symptoms such as fever may be useful in the diagnosis of hepatic abscesses; fever can also be associated with malignancy. Constitutional features of malignancy also include anorexia, weight loss, and fatigue.[9] The present study was conducted to assess hepatic masses using CT scan.

In present study, out of 52 patients, males were 32 and females were 20. Gupta et al[10] evaluated the role of ultrasound and computed tomography in diagnosis of focal hepatic masses and compare the ultrasound and CT findings of focal hepatic masses and correlate with histopathological and surgical findings. USG and CT were performed on 40 focal hepatic mass patients. The diagnostic value of ultrasound was compared to those of CT. Final diagnosis was made after correlation with surgical findings, serological findings and histopathological examination. Final diagnosis of focal hepatic masses was simple cysts (n=5), polycystic liver (n=1), metastasis (n=22), hydatid cysts(n=5), hemangioma (n=6), hepatocellular (n=11), focal nodular hyperplasia (n=1), abscess (n=16), cholangiocarcinoma (n=1). The sensitivity, specificity positive and negative likelihood ratio were 84.38%, 67.74%, 2.62 and 0.23 respectively, for USG and 100%, 97.14%, 35 and 0 respectively, for CT.

We found that hepatic masses were abscess in 12, cholangio carcinoma in 7, hemangiomas in 4, focal nodular hyperplasia in 3, hepatocellular carcinoma in 6, hydatid cysts in 4, metastasis in 2 and simple cysts in 14 cases. In a study conducted by D'Onofrio et al[11] showed it is the sixth most common neoplasm and most common primary liver malignancy. In most cases, HCC develop victim an established background of chronic liver disease. USG is most common imaging modality for HCC surveillance in high risk patients because of its efficacy, availability, non-invasiveness and low cost. However, Doppler applied to B-mode USG has low sensitivity in studying blood flow features within a newly discovered lesion

In a study conducted by Minami et al[12], the liver is the organ second most commonly affected by metastatic disease. The most common primary sites are the gastrointestinal (GI) tract, lung, breast and head and neck. Therefore, liver metastasis varies in size, shape, vascularity, and growth pattern. However, most liver metastasis are multiple and show the so-called "cluster sign". In present study 22 lesion of metastasis detected on CT, arterial enhancement was seen in 15 lesions, while delayed enhancement was seen in 1 case. 14 lesions showed enhancement of wall. 15 lesions were found to be hypodense while 2 were found to be hyperdense and 5 showed hetergenous enhancement. Target appearance was seen in 4 lesions. USG incorrectly diagnosed 5 metastatic lesions as pyogenic abscesses.

CONCLUSION

CT has high diagnostic value in detection of hepatic masses.

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