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ROLE OF COMPUTED TOMOGRAPHY IN THE EVALUATION OF HEPATIC MASSES

Radio-Diagnosis

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KEYWORDS

INTRODUCTION:

Hepatocellular carcinoma (HCC) is the most common cancer in liver[1]. HCC is more common in males and incidence is higher than other hepatic masses.

The liver is largest organ and important gland. It has following function 1) Metabolization of the nutrients. 2) Excretion of the waste 3) Detoxification. 4) Metabolization of bilirubin and secretion of bile. Liver is 2 % of all body weight. In male it is of 1800 gm and in female 1400 gm[2]. The liver is imaged in three phases. First phase is arterial taken at 35 - 40 sec after contrast injection.

Hepatic veins are well seen in this phase. Second phase is portal phase taken after 60 second which shows hepatic parenchyma very well and hypo vascular lesions. Third phase is delayed or equilibrium phase which is obtained after 2-10 minutes of the contrast injection. Some tumors visible on delayed phases. After 10 minutes, the contrast is washed out swiftly[3]. The prevalence of various liver lesions has different geographic distribution[4]. Liver metastases is more prevalent in Europe and the United States[5]. Benign hepatic tumors prevalence 52% of the overall population[6]. Other imaging studies are difficult to categorize the benign and malignant lesions.

Histopathology is the gold standard for hepatic lesions. Biopsy is invasive technique and sometime not possible. The liver masses get 80-95% of their blood from the hepatic artery. The common benign liver lesions are cysts, hemangiomas, and focal nodular Hyperplasia. Their characterization is important to diagnose[7]. HCC is hyper vascular tumor mostly occurred in arterial segment. Hypo vascular metastatic lesions can become conspicuous in Porto venous segment. Hence presently multiphasic dynamic CT of the whole liver has shown promise in the higher characterization of the morphology of hepatic tumors. The aim of the protocol is that the portal segment is the most sensitive segment for lesion detection, while the arterial and equilibrium levels can provide information of the vascularity of the lesion so they can be categorized. Triphasic CT is characterizing and differentiates benign and malignant lesions. The twin vascular delivery of the liver is essential for neoplasm selection. Before surgery characterization of liver as benign and malignant is essential[8,9]. MRI has an efficacy in detection and classification of focal liver lesions, but, speedy availability and short scanning time made CT a perfect imaging approach[10,11,12]. Vascular hemodynamics is the key to detect the characterization of hyper vascular lesions[13,14,15].

AIMS AND OBJECTIVES

Aim of the study is to assess the diagnostic performance of CT scans in the detection of hepatic masses.

MATERIAL AND METHODS:

Cross-sectional study includes 80 patients with complaints and clinical & biochemical features suggestive of hepatic masses referred to the Department of Radiology Government Medical College & Superspeciality Hospital Nagpur from June 2022 to December 2022. All the relevant information of patients including age, sex and characterization of liver lesions were recorded. Contrast was given to the patients and images of masses were taken in arterial, Portal venous and delayed phase to evaluate the diagnostic accuracy of CT to identify liver lesions. Images were taken on Toshiba Medical System Corporation model – Aquilion CXL equipment G – XL – 47796.

OBSERVATIONS AND RESULTS

Table 1: Age wise and gender wise distribution.

AGE (YRS)	N (%)
30-40	10 (12.5)
41-60	30 (37.5)
> 60	40 (50.0)
GENDER	
Male	57 (71.25)
Female	23 (28.75)

Table 2: Complaint wise distribution of patient.

COMPLAINTS	N (%)
Abdominal pain	110 (88)
Abdominal distension	105 (84)
Hemaetemesis	040 (32)
Juandice	092 (73)
Renal colic	033 (27)
Vomiting	108 (87)

Table 3: Masses wise distribution including multiple and single lesions

MASS	N (%)
HCC (Malignant)	56 (70)
Abscess (Benign)	27 (34)
Cyst (Benign)	20 (25)
FNH (Benign)	06 (7.5)
Hemangioma (Benign)	05 (6.0)
Hydatid cyst (Benign)	02 (2.5)
Lymphoma (Malignant)	01 (1.2)

Table 4: Distribution of liver lesions.

LIVER LESIONS	N (%)
Single liver lesions	62 (77)
Multiple liver lesions	18 (23)

Table 5: Malignant and benign masses distribution including multiple and single lesions.

LESIONS	N (%)
MALIGNANT	57 (71.2)
BENIGN	60 (75)

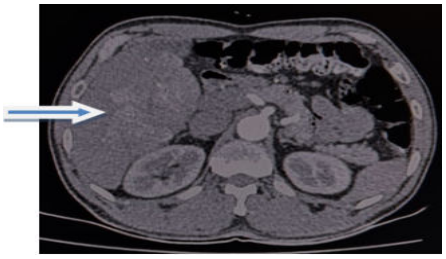

Image 1 HCC

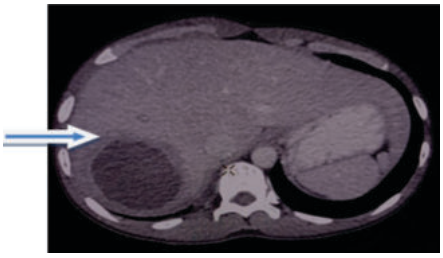

Image 2 Liver Abcess

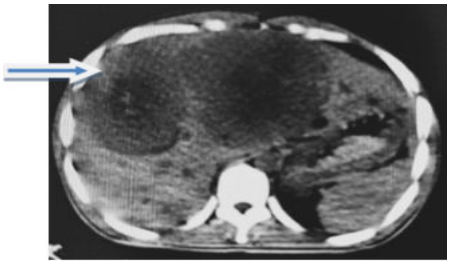

Image 3 FNH

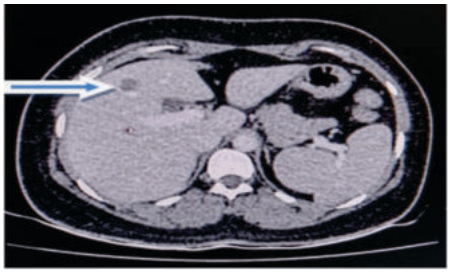

Image 4 Hemangioma

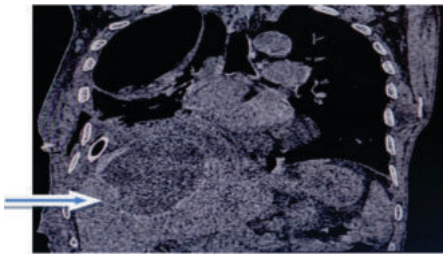

Image 5 Hydatid Cyst

The mean and SD for age were 60.5 ± 13.06 years. Male patients were 57 and female were 23. (Table 1)

Most common clinical presentation was abdominal pain and distension (88% and 84 %), Second most common was jaundice (73%), Then in decreasing order was hematemesis (32%), Vomiting and renal colic. (Table 2)

Out of total 56 (70%) patients were suffering from HCC (Table 3). Among these patients, 21 (26.5%) patients were suffering from a cyst, abscess, and HCC, and 34 (42.5%) patients were having only HCC in the liver. 27 (34%) patients were suffering from abscesses (Table 3). Among these patients, 20 (25 %) patients were having abscess, cyst, and HCC. 7 (8.5 %) patients were having only abscesses. 20 (25 %) patients were suffering from multiple cysts (Table 3). Among these patients, 13 (16%) patients were having cysts, abscesses, and HCC. 7 (8.8%) patients were having only cysts. 6 (7.5 %) patients were suffering from FNH, 5 (6%) patients were suffering from hemangioma, 2 (2.5%) patients were suffering from hydatid cyst and 1 (1.2%) patient was suffering from lymphoma (Table 3).

The study results showed that the percentage of HCC is more as compared to the other liver masses. In our study, out of 80 patients, 62 (77%) patients were having single lesions in their liver and (23%) patients were detected with multiple lesions in the liver (Table 4). The occurrence of male patients with hepatic masses was high as compared to female patients (Table 1).

DISCUSSION: -

Triphasic computed tomography is now a standard procedure for detection of different focal hepatic lesions in liver. Computed tomography provide information for various types of hepatic lesion so they can be treated accordingly. With triple phase CT liver parenchyma is best assessed and fast data acquisition provides better images of liver masses at arterial, venous, and delayed phase [16]. HCC is the most common liver cancer and its prevalence is high in males as compared to females. On NCCT eight lesions have been hypodense (61.5%). All these lesions confirmed early enhancement (100%) in the arterial phase and fast washout in the Porto venous phase. All lesions were hypodense is not on time phase (100%). Comparable findings have been defined with the aid of Lee et al.[17] In our study, 56 (70%) patients were detected with HCC, they showed better enhancement during the arterial phase. Lesions were hypodense during the delayed phase and showed capsular enhancement in the delayed phase. HCC is the most common hepatic mass but another lesion such as abscess also has high prevalence in patients. It is presenting as dark fluid in the liver on CT. In our study we find 27 (34%) patients with abscesses. Abscess appears as hyper dense fluid in the arterial phase, venous and delayed phase and only show peripheral enhancement. Hepatic cyst are well marginated and anechoic structures with posterior acoustic enhancement on ultrasound. On CT they are homogenous hypoattenuating of 0 to 10 HU. In our study 20 (25%) patients were diagnosed with multiple benign cysts appeared as homogenous hypoattenuating on NCCT. The lesion was misdiagnosed as other benign lesions, as the central scar was not well appreciated in very small- sized FNH[18]. In our study 6 (7.5%) patients were find with FNH, it shows bright contrast enhancement in arterial phase and mild enhancement in the delayed phase of central scar. In our study 5 (6%) patients diagnosed with hemangioma which shows discontinuous, peripheral enhancement on late arterial phase, peripheral enhancement on portal venous phase and in the delayed phase, they were hypoattenuating to liver parenchyma[19]. Hydatid cysts are very rare. On NCCT they appeared as hypo dense with high attenuation of wall and internal septae. When walls are calcified it appears as calcification of cystic walls. In our study we found 2 (2.5%) patients with hydatid cyst. They were consisting of septations. They appeared as hypodense thin-walled structure in the arterial, venous, and delayed phase. They are benign lesions in the liver without any symptoms unless pressure effects occur. They are diagnosed when people go for other imaging testing such as CT and USG. In our study only one patient detected for lymphoma. It was solitary, hypoechoic to nearly anechoic mass on USG. On NCCT was hypodense and shows mild enhancement on arterial phase. We diagnosed this lesion as metastatic on imaging but on biopsy it was lymphoma. Triple – section CT has a high accuracy of diagnosing hepatic masses – 96.5%, a cost corresponding with Chauhan U et al, study[20]. In our study, 18 (23%) were detected with multiple lesions of the liver. Some patients were having HCC and multiple cysts and some patients were having abscesses, cyst, and HCC. 62 (77%) were detected with single lesions in the liver.

CONCLUSION

Triple phases CT helps in better diagnosis of different types of hepatic masses and our study concludes that the prevalence of HCC is higher than other masses.

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