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REAL TIME ULTRASONOGRAPHY EVALUATION OF FOCAL LIVER LESIONS AT GOVT. MEDICAL COLLEGE, BETTIAH, W. CHAMPARAN, BIHAR

Radio-diagnosis

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ABSTRACT

Objective: To evaluate the role of real time ultrasonography in characterization of focal liver lesions. **Methodology:** Real time ultrasonography was performed in 40 patients with suspected of having focal liver lesions attending the Department of Radiodiagnosis, Govt. Medical College, Bettiah, W. Champaran, Bihar, over a period of one year (November 2018 to October 2019). **Results:** Of the 40 patients, 26 were male (65%) and 14 were female (35%). Focal liver lesions were common in the age group between 50 – 60 years with 10 patients (25%). Out of 40 patients Hemangioma was the most common lesion with an incidence of 25%, followed by metastases (20%), liver abscess (17.5%), hepatic cysts (15%), primary malignant liver tumor (12.5%), Hydatid lesion (7.5%) and cholangiocarcinoma (2.5%). Abdominal pain and fever were the most common clinical features, followed by loss of weight and appetite. Right lobe of liver was predominantly involved with (75%), followed by both lobes (17.5%) and left lobe (12.5%). Solitary lesions were common (75%) than multiple lesions (25%). **Conclusion:** Real time Sonography is a comprehensive, multiplanar, non invasive, safe diagnostic modality for characterization of focal liver lesions.

KEYWORDS

Ultrasonography, Focal Liver Lesions, diagnostic modality

INTRODUCTION :

Focal liver lesions are common on pathologic or imaging evaluation of the liver and include a variety of malignant and benign neoplasms, as well as congenital and acquired masses of inflammatory and traumatic nature.

Evaluation of focal liver lesions is a complex issue which is often the major focus of a cross sectional imaging study.

Next only to lymph nodes, liver is the most common site for metastases.

At death, 40 to 50% of all primary carcinomas will have metastases within the liver.

Sonography is widely accessible, relatively inexpensive, portable, noninvasive, nonionizing, allows imaging in multiple planes and can be repeated frequently. It assists in real time evaluation of organ under examination, especially the liver which is situated just below the ribcage without intervening gas, has a high sensitivity and reasonable specficity. Sonography has excellent spatial and contrast resolution, hence gray-scale morphology of a mass allows for differentiation of cystic and solid masses and in many instances, characteristic recognized appearances may suggest the correct diagnosis without further evaluation. Characterization of a liver mass on conventional sonography is based on the appearance of the mass on gray scale imaging.

Sonography is widely available and inexpensive. Based on the patients complaints like vague upper abdominal pain, jaundice, fever or unexpected abnormal liver function tests many clinicians request sonography as the initial imaging modality for clinically suspected liver pathology.

The presence of diffuse liver disease such as cirrhosis or steatosis may largely vary the gray-scale sonographic appearance of the hepatic tumors because the echogenecity of the background liver may be altered and make the characterization of the tumors difficult.

MATERIALAND METHODS :

Source of Data

This cross sectional study compromised a total of 40 patients, who arereferredfor sonography at radiology department, clinically suspected of having focal hepaticlesions and incidentally found focal hepatic lesions on patients sonography done forother reasons from both inpatient & outpatient departments in Govt. Medical College,Bettiah, W. Champaran, Bihar.

This study was conducted from November 2018 to October 2019.

SELECTION CRITERIA:

All the patients who are clinically suspected of focal hepatic lesions andincidentally detected focal hepatic lesions who were referred for sonography wereincluded in the study.

INCLUSION CRITERIA:

Patients in the age group above 18 years & focal liver lesion ofdiameter > 10.0 mm.

EXCLUSION CRITERIA:

Patients with diffuse liver disease like steatosis, cirrhosis, hepatitis, storage diseases, diffuse malignancies and also the post-operative and post-traumatic patients.

STATISTICALANALYSIS:

Data analysis was done using Rates, Ratios and Percentages of differentialdiagnosis made by the real time Sonography will be computed and compiled.

Data collection procedure:

Equipment: In the present study, gray scale real time ultrasound examination wascarried out using 3.5 to 5 MHz, curvilinear and linear array transducers.

Patient preparation and scanning technique:

Once the patient agrees to participate in the study, informed consent was takenprior to ultrasound examination, followed by detailed history and brief clinicalexamination.

Patients were kept nil by mouth for few hours prior to ultrasound examination.

In some cases clinical condition of patient demanded an ultrasound examinationwithout prior preparation.

Patients were examined in the supine position to begin with and then indecubitus (right or left) and sitting position if needed.

Liver was scanned in various planes like sagittal, parasagittal, transverse,oblique, subcostal, intercostal and coronal planes. Comprehensive scanning of otherupper abdominal organs was done.

Various ultrasonographic features of focal liver lesions were observed, which include:

1. Number of lesions – single or multiple
2. Location within liver – Lobar distribution (right lobe, left lobe, bothlobe).
3. Echogenicity –(by comparing with that of normal liver parenchyma),hyperechoic, hypoechoic, anechoic or mixed echogenic.
4. Size, shape and margins: Exact size of lesion was measured with a note onshape of lesion like round, oval or irregular. Margins of lesion werestudied whether well defined, poorly defined, regular or irregular.
5. Acoustic characteristics of lesions.

Apart from the above observations related to lesion several other importantobservations were made which include overall assessment of liver size, portal andhepatic veins involvement, biliary tract and gall bladder, lymphadenopathy andascites.

RESULTS:

In the present study, 40 patients suspected of having focal liver lesions were studied for a period of one year and were subjected to detailed ultrasonographic examination in the department of Radio-diagnosis, Govt. Medical College,Bettiah, W. Champaran,Bihar. Some of these patients underwent CT examinationand USG guided aspiration later.

Table 1 : Age distribution of focal liver lesion

Age group (years)	No. of cases	Percentage
18-20	1	2.5
21-30	2	5
31-40	5	12.5
41-50	9	22.5
51-60	10	25
61-70	9	22.5
>70	4	10
Total	40	100

Table-2: Sex distribution of focal liver lesion

Sex	No. of cases	Percentage
Male	26	65
Female	14	35
Total	40	100

Table-3: Age distribution of Individual Focal Liver Lesions

Age group (years)	Liver abscess	PMLT	Metastases	Hemangioma	Cystic lesion	Hydatid lesion	Cholangioca	Total
18-20	1							1
21-30				1		1		2
31-40	1			1	2	1		5
41-50	2	1		4	2			9
51-60	1		5	2	1	1		10
60-70	2	2	3	2				9
>70		2			1		1	4
Total	7	5	8	10	6	3	1	40

Table-4: Sex distribution of Individual Focal Liver Lesions

Agegroup(years)	Liver abscess	PMLT	Metastases	Hemangioma	Cysticlesion	Hydatidlesion	Cholangioca	Total
Male	6	4	6	5	3	2	-	26
Female	1	1	2	5	3	1	1	14
Total	7	5	8	10	6	3	1	40

CLINICAL FEATURES:

Out of the 40 patients, 24 (60%) patients had abdominal pain, 18 (45%) patients had fever, 16 (40%) had loss of weight and appetite, 14 (35%) patients complained of mass per abdomen,9 (23%) had jaundice and 7(18%) patients complained of abdominal distension and urticaria.

ULTRASOUND DIAGNOSIS:

Out of 40 patients, 10 (25%) had haemangiomas, 8 (20%) had metastases, 7 (17.5%) had abscess,6 (15%) had cystic lesion, 5 (12.5%) had primary malignant liver tumor, 3 (7.5%) had Hydatid cyst and 1(2.5%) had cholangiocarcinoma.

LOCATION :

In 28 (70%) patients the lesions were in right lobe, in 7(17.5%) involved both lobes and in 5 (12.5%) in the left lobe.

NUMBER OF LESIONS:

In 30 (75%) patients had solitary lesions and 10 (25%) had multiple lesions.

HEMANGIOMA:

Out of 40 (100%), there were 10 cases of hemangioma in the age range of 29-70 years with a mean age of 49.6 years. There were 5 (50%) males and 5 (50%) females. The right lobe was involved in 7(70%) patients, left lobe in 2(20%) and 1 (10%) patient with both lobes.

Fig. 1: USG showing well defined hyperechoic lesion in right lobe of liver. S/o Hemangioma

METASTASES :

Out of the 40 patients (100%), 8 (20%) cases were diagnosed as hepatic metastses in the age group of 51 – 68 years, with a mean age of 58.2 years. Out of 8 patients 6 (75 %) were male and 2(25%) were female. Both the lobes were involved in 6(75%) patients and right lobe in 2(25%) patients.

Fig. 2: USG showing multiple well defined Iso/hypoechoic lesion of varying sizes in either lobe of liver, most of them show peripheral halo around

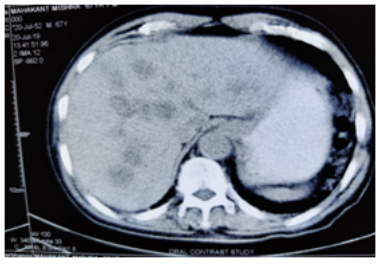

Fig. 3 (NCCT)

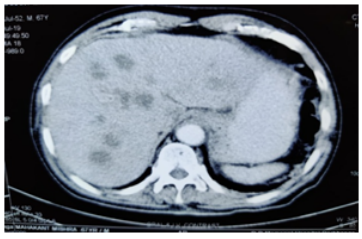

Fig. 4 (CECT)

NCCT+ CECT Abdomen shows Multiple well defined Iso/hypodense lesion varying sizes in either lobe of liver

HEPATIC ABSCESS:

Out of the 40 patients (100%), 7(17.5%) cases were diagnosed as hepatic abscess, in the age group of 19 – 63 years with a mean age of 47 years. Six (85.7%) patients were male and one (14.3%) female patient. In all seven (100%) patients right lobe was involved.

Fig. 5: USG showing Two well defined hypo/anechoic lesion with low level echoes within in right lobe of liver

Fig. 6: USG showing well defined hypo/anechoic lesion with low level echoes within in right lobe (segment 6) of liver

HEPATIC CYSTS:
Out of the 40 patients (100%), 6 (15%) patients had hepatic cysts. Hepatic cysts were found in both sexes equally, 3 each. The age distribution was between 36 -75 years of age with mean age of 48.3 years. Right lobe was involved in 5 (83.3%) patients and left lobe in 1(16.7%) patient.

PRIMARY MALIGNANT LIVER TUMOR:
PMLT was found in 5 patients (12.5%) in the study group with age distribution of 49 – 84 years with a mean age of 66.8 years. Four (80%) were men and one (20%) female patient. Right lobe was affected in 4(80%) and left lobe in 1(20%) patient.

HYDATID CYSTIC LESION:
There were 3 (7.5%) cases of echinococcal cyst, in the age group of 28-54 years of age with a mean age of 38.6 years. Two male (66.6%) and one (33.3%) female patient were affected. Right lobe was involved in 2 (66.6%) and left lobe was involved in 1(33.3%) patient.

CHOLANGIOCARCINOMA:
There was one (2.5%) case of intrahepatic cholangiocarcinoma in a female patient aged 75 years involving the right lobe with associated dilated intrahepatic biliary radicles.

DISCUSSION:
A total of 40 patients, clinically suspected of having focal space occupying lesions in the liver who underwent Sonography were chosen for the study during a period of 1 year.

The mean age of the patients in the sample study was 53.4 years with an age range of 19 to 84 years.

Majority of the patients were males.
The most common complaints were abdominal pain and fever.
The most common lesions were hemangioma followed by hepatic metastases.

In this study, out of 40 cases, hemangioma was present in 10 pateints, metastases in 8 patients, abscess in 7 patients, hepatic cysts in 6 patients, primary malignant liver tumor in 5 patients, hydatid cyst disease in 3 patients and 1 patient with cholangiocarcinoma.

Complimentary studies like laboratory investigations and chest radiographs were undertaken with special emphasis on ultrasonography.

Ultrasonography serves as an important diagnostic tool in imaging and characterization of focal liver lesions.

CONCLUSION:
Ultrasonography is a safe and effective method of detecting focal liver lesions. It's easy availability, portability, flexibility, lack of dependence on organ function and lack of ionizing radiation makes it ideal for imaging the liver.

Ultrasonography also serves a vital role in guided FNAC, which avoid unnecessary repeated trauma to the patient and also help to yield productive specimen for histopathological evaluation. It also helps the operating surgeon in planning in the pre-operative approach to the lesions.

With ultrasonography as an initial imaging modality, time and cost to arrive at an diagnosis was significantly reduced.

Its multiplanar imaging ability and portability has a significant advantage in sick patients to detect lesions, to locate lesion and to identify solid from the cystic nature of lesion, thereby aid in characterization of lesions.

Information regarding the secondary features of liver disease such as ascites, primary source of malignancy, secondaries in the abdomen, splenomegaly, pleural effusion can be evaluated.

As ultrasonography is safe, repeatable and low cost as compared to newer modalities CT and MRI , it is still one of the most effective imaging modality for characterization and for overall assessment of abdomen.

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