

## ROLE OF ULTRASOUND AND CT SCAN IN EVALUATING FOCAL LIVER LESIONS

Rajesh Rathore<sup>1</sup>, Rajesh Kumar<sup>2</sup>, Sayal Choudhary<sup>3</sup>

<sup>1</sup>Assistant Professor, Department of Radiology, R. D. Gardi Medical College, Ujjain.

<sup>2</sup>2<sup>nd</sup> Year PG Resident, Department of Radiology, R. D. Gardi Medical College, Ujjain.

<sup>3</sup>2<sup>nd</sup> Year PG Resident, Department of Radiology, R. D. Gardi Medical College, Ujjain.

### ABSTRACT

The liver plays several complex but essential roles in the metabolism of amino acids, carbohydrates, and lipids as well as synthesis of proteins. The basic pathophysiology of parenchymal hepatic diseases usually represents a failure in one of these metabolic pathways.<sup>1</sup> Diagnosis of liver pathology rests on physical examination, laboratory investigation, newer imaging techniques, radio isotope scanning,<sup>2</sup> etc. Radiological techniques like ultrasonography and CT scan have roles in evaluation of these liver diseases. Ultrasound plays an important role in evaluation of liver pathology. It helps by detecting lesions, gives clue about its internal structure giving idea about its exact extent: it also gives opportunity to evaluate other abdominal organs. Correlation of ultrasonographic findings with clinical data, laboratory investigations and other radiological investigations lead to make a definite and accurate diagnosis. Thus appropriate management of patients can be done. Present study includes focal and pathology. In present years ultrasonography is widely accepted as first line radiological investigation for liver pathology detection. It is non-invasive cheap, quick free of radiation hazards, comfortable for patients.<sup>3</sup> easy to re-perform and very accurate in hands of skilled operator. With Colour Doppler it is possible to evaluate vascularity of lesion. Ultrasonographic contrast media helps in determination of exact extent of lesion and vascularity of lesion. CT scan is very helpful to evaluate focal as well as diffuse liver pathology.<sup>4</sup> Other investigations like MRI, radionuclide scanning, DSA.<sup>5</sup> etc. are also helpful in liver pathology.

### KEYWORDS

Focal Liver Lesion, Ultrasound, CT Scan, Characterization, Lobe Predominance.

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### INTRODUCTION

#### Statement of Study

CT scan is the imaging modality of choice for diagnosis and staging of liver pathologies.<sup>6</sup>

### MATERIAL AND METHODS

This study aims at following up patients with liver lesion presenting at Radiology Department by using USG and CT scan so as to achieve aims and objective outlined.

All the patients presented to hospital for the purpose of diagnosis and treatment.

### Selection of Patients

#### Inclusion Criteria

1. Only those patients who are willing to participate in study will be included.
2. Patients referred to the radiology department for ultrasonography and/or CT scan abdomen investigation and found to have liver disease, will be included in this study.
3. Already diagnoses cases of such liver disease which need follow up radiological investigations and are referred to our radiology department will be included in study.
4. Patients coming for ultrasonography and CT scan for diseases other than liver disease, and are accidentally found liver to have liver lesion, will be included in this study.

### Exclusion Criteria

1. Patients presenting to radiology department having liver in past and are cured completely will be excluded from the study.

### Description of Tools

1. USG Machine: Mindray DN-C3.
2. CT scan Machine: GE health care 128 slice spiral.

### RESULTS

A total 70 patients were examined and comparison done with operative and histopathological diagnosis. The salient observations are as follows.

Age Group	No. of Patients	Percentage (%)
00 - 10	02	2.85
11 - 20	03	4.28
21 - 30	10	14.28
31 - 40	13	18.57
41 - 50	18	25.71
51 - 60	12	17.14
61 - 70	08	11.42
71 - 80	03	4.28
81 - 90	01	1.42

**Table I: Age Distribution**

The youngest patient was 2 months old and the oldest was 85 years old. Maximum numbers of patients were in age group 41-50 years (25.71%), minimum numbers of patients were in age group 81-90 years (1.42%).

Sex	No. of Patients	Percentage (%)
Male	48	68.57
Female	22	31.42

**Table II: Sex wise Distribution**

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Corresponding Author:

Dr. Rajesh Kumar,

Room No. 511, RMO Hostel,

R. D. Gardi Medical College,

Ujjain.

E-mail: tokasrajesh@gmail.com

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In the present study, male patients (68.57%) were more as compared to female patients (31.42%).

Lobe Involvement	No. of Patients	Percentage (%)
Right	30	42.85
Left	12	17.14
Both	28	40.00

**Table III: Lobe Wise Distribution**

In focal liver pathology evaluation right lobe more commonly involved accounting for (42.85%) compared to both (40.00%) and left lobe involved in (17.14%) of cases.

Symptoms	No. of Patients	Percentage (%)
Pain in right hypochondrium	30	42.85
Lump in abdomen	08	11.42
Fever	12	17.14
Jaundice	09	12.85
Weight Loss	04	5.71
Abdominal distention	13	18.57
Dyspnea	10	14.28
Vomiting	05	7.14
Diarrhoea	01	1.42
Dysphagia	02	2.85
Menorrhagia	02	2.85
Heamatemesis	01	1.42
Melena	01	1.42
Testicular swelling	01	1.42
Difficulty in micturition	02	2.85
Per vaginal discharge	01	1.42
Leg swelling	01	1.42

**Table IV: Clinical Presentation**

Pain in the right hypochondrium was the most common presentation with (42.85%) of cases followed by abdominal distention with (18.57%) of patients.

Series	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	81-90
Dalsania et al.	1.43	10.0	20.0	14.28	17.14	22.86	7.14	7.14	0.0
Vasani et al.	1.42	4.28	15.77	14.28	21.45	27.14	11.42	4.28	0.0
Present series	2.85	4.28	14.28	18.57	25.71	17.14	11.42	4.28	1.42

**Table 1: Comparative Study for Sex Distribution**

In both Dalsania et al. and Vasani et al. series maximum number of patients was I (51-60 years) age group. In the present study maximum number of patients was in (41-50 years) age group (25.71% of total patients followed by (31-40 years) age group (18.57% of total patients). Above comparative study shows that liver pathologies are more common in middle age as compared to paediatrics and old age.<sup>7</sup>

Series	Male	Female	Ratio of (M:F)
Dalsania et al.	61.42	38.58	1.5:1
Vasani et al.	80.00	20.0	4:1
Present series	69.01	30.99	2.2:1

**Table 2: Comparative Study for Age Distribution**

From above table it is evident that male were seem to be more affected than female. In Dalsania et al series male: female was 1.5:1. In Vasani et al series male: female ratio 4:1 while in present study male: female ratio was 2.2:1.

Minimum number of patients presents with swelling in neck, testicular swelling Menorrhagia, per vaginal discharge.

Sl. No.	Echo Pattern	No. of Patients	Percentage (%)
1.	Anechoic	10	14.28
2.	Hypo echoic	22	31.42
3.	Echogenic	09	12.85
4.	Mix echogenic	12	17.14
5.	Coarse echo pattern	10	14.28
6.	Target lesions	05	7.14

**Table V: Ultrasound Pattern**

Hypo echoic lesions were common with (31.42%) of patients to be followed by mix echogenic lesion with (17.14%) of patients. The last common target lesions with (7.14%) of patients.

Sl. No.	Type of Lesions	No. of Patients	Percentage (%)
1.	Benign	45	64.28
2.	Malignant	25	35.71
	<b>Total</b>	<b>70</b>	<b>100</b>

**Table VI: Incidence Base on Benign and Malignant Lesions**

(Total number of patients = 70)

Benign lesions were more common than malignant lesions. Benign lesions were found 64.3% and malignant lesions were found 35.7% of the total patients.

**DISCUSSION**

In the present study, 70 cases of liver pathology were studied by using various radio-imaging modalities and the results were compared with the previous studies.

Series	Right Lobe	Left Lobe	Both Lobe
Mahajan et al.	77.00	22.0	03.00
Dalsania et al.	65.72	07.14	27.14
Vasani et al.	45.72	14.28	40.00
Present series	42.85	17.14	40.00

**Table 3: Comparative Study for Lobe Distribution**

In the study of Mahajan et al. right lobe was most commonly affected to be followed left lobe, while in Dalsania et al. and Vasani et al. and present study right lobe is most commonly affected followed by both lobes and left lobe involvement was least common. One possible reason for right lobe predominance could be large surface area and greater blood supply to right than left lobe.<sup>8</sup>

Series	Benign	Malignant
Dalsania et al.	55.72	44.28
Vasani et al.	57.14	42.86
Present study	64.28	35.71

**Table 4: Comparative Study for Incidence of Benign and Malignant Lesions**

From above comparison it is evident that benign (64.28%) are more common as compare to malignant lesion (35.71%) in Dalsania et al., Vasani et al. and present study.

#### CONCLUSION

1. Ultrasound by the virtue of non-invasiveness, lack of radiation and by ability to demonstrate structural changes in organ is investigation of choice in liver pathology.
2. Ultrasound can easily detect solid to cystic lesions and characterize the size, shape and extent of lesion.
3. Computerized tomography is particularly useful to know the enhancement pattern of the lesion, i.e. centripetal and delayed enhancement pattern of haemangioma can be differentiated from metastatic and focal fatty changes.<sup>9</sup>
4. Computerized tomography is useful to determine density of a particular lesion. So useful in detection of calcification, hemorrhage, fatty changes clear and purulent fluid.<sup>10</sup>
5. Computerized tomography is useful exact determination of the extent of particular lesion and useful to determine staging of malignant lesions.<sup>11</sup>
6. Computerized tomography having radiation exposure, so cannot be safely used in pregnant ladies and children.

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