

Study of histopathologic spectrum of hepatic lesions with clinicoradiological correlation

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Introduction

Liver is rightly called as “The custodian of milieu interior”. Hepatic core needle biopsies are most accurate method for diagnosing hepatic lesions by far. Liver is a primary organ for various metabolic activities of the body. It is exposed to various metabolic, toxic, infectious and neoplastic insults.¹ Thus, a spectrum of various primary as well as secondary diseases can affect liver. The common primary liver diseases are hepatitis, non-alcoholic fatty liver disease (NAFLD), alcoholic liver disease (ALD) and hepatocellular carcinoma (HCC). Secondary hepatic involvement can be due to alcoholism, extrahepatic infections or metastatic spread of various primary malignancies.² Liver biopsy is an essential tool in the diagnosis and management of liver diseases as liver function tests (LFT) alone are not diagnostically specific.³ Any significantly abnormal LFT and/or radiological finding with clinical findings of anaemia, jaundice, hepatomegaly, ascites and splenomegaly warrants a liver biopsy. The ease as well as it being a relatively safe procedure has made it a method of choice for diagnosis and subsequent management of hepatic lesions. Thus, histopathological study of liver biopsy is very common and is frequently done for diagnosis of

different hepatic lesions. The diagnosis of hepatic lesions is challenging as liver lesions are either primary or secondary to various metabolic, circulatory, microbial, neoplastic and toxic causes. Some of the lesions are either misdiagnosed or discovered by accident during routine medical examinations, investigations for other illnesses, surgery, or autopsies. Imaging modalities, serum markers and pathological investigations will definitely help in arriving at a specific diagnosis for appropriate patient management and prognosis.

Aim

To study histopathologic spectrum of hepatic lesions on core needle biopsy and correlation with clinicoradiological findings.

Materials And Methods

The study was conducted on 38 liver biopsies prospectively in the department of pathology at a tertiary care centre over a period of two years (July 2020 to May 2022). The clinical and radiological findings with LFT results were noted in all the cases. Formalin fixed liver biopsy tissues were processed routinely. These tissues were dehydrated with ascending grades of alcohol, cleared with xylene, and embedded in paraffin to prepare blocks. The blocks were then cut into sections of 2-5

micrometre thickness using a microtome. These sections were stained with Haematoxylin and Eosin (H&E) and were examined under the microscope. The study protocol was approved by the Protocol Committee and Institutional Ethics. The clinical history, laboratory and radiological findings (CT scan and USG) were collected as per data proforma. Clinico radiological findings were correlated with histopathological diagnosis on core needle biopsies.

We evaluated the predictive values of the routinely done liver function tests with diagnosis on the core needle biopsies (n=38). Gross and microscopic examination of the core needle liver biopsies were done. The needle biopsies were received in 10 % buffered formalin and were processed by the routine paraffin processing technique. The routine H and E stained slides of all cases were studied thoroughly and the histopathological findings were recorded.

Results

This prospective and descriptive study included 38 cases from July 2020 to may 2022. The core needle biopsies were studied of the above mentioned cases and correlation between for their clinical diagnosis, radiological diagnosis and histopathological diagnosis. While observing the Age distribution of hepatic lesions in this study, maximum number of the cases 14(36.84%) were found to be in the age group of >65 years of age. The mean age of patients in the present study was 60 years (Table 1 and Figure 1). It was observed that there was slight male preponderance with male to female ratio 1:(0.81) (Table 2 and Figure 2). Further, Clinical diagnosis wise distribution of hepatic lesions was studied; It was found that the most common diagnosis was of known case of carcinoma breast with hepatic metastasis and Hepatocellular Carcinoma which was seen in 10 (26.32%) patients and 8 (21.05%) respectively

(Table 3 and Figure 3). In this study, it was observed that all 38 cases (100%) showed deranged LFT findings. Also, it was observed that α -feto protein levels of 12 patients in the cases studied were elevated and all the cases were of HCC and Liver cirrhosis. There were only 5 (13.16%) cases out of 38 who were positive for HBsAg. All the cases showing HBsAg positive were of HCC. Among patients, maximum 33(86.84%) cases were observed with elevated aspartate amino transferase (AST) followed by 20(52.63%) cases with elevated alanine transaminase (ALT) and 22(57.89%) cases with hypoproteinemia and 17(44.74%) cases showed elevated serum bilirubin levels. Radiological diagnosis (CT findings) of the cases studied showed that maximum number of patients 24(63.16%) exhibited hepatic metastasis, followed by 12(31.58%) Hepatocellular carcinoma and 2(5.26%) liver cirrhosis. While assessing histopathological diagnosis of the cases studied, it was observed that maximum number of the patients were diagnosed with metastasis adenocarcinoma i.e 19(52.78%) followed by 12(33.33%) Hepatocellular carcinoma, 4(11.11%) of them had metastasis with unknown primary and 1(2.78%) metastatic Gastrointestinal stromal tumor respectively. Comparison between histopathology and radiology findings of hepatic lesions in patients with liver disease shows that significant correlation with Chi-square=89.53, p-value=<0.0001. Comparison between histopathology and clinical diagnosis of hepatic lesions in patients with liver disease shows that significant correlation with Chi-square=36.412, p-value=<0.0001.

Table 1: Age-wise Distribution of Patients with Hepatic Lesions.

Age in years	No. of Patients	Percent
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26-45	4	10.53
46-55	8	21.05
56-65	12	31.58
>65	14	36.84
Total	38	100

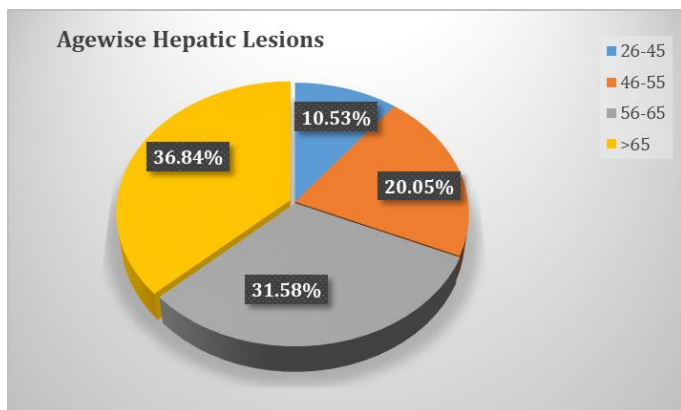


Figure 1: Age-wise Distribution of Patients with Hepatic Lesions.

Age-wise Distribution of Patients with Hepatic Lesions shows maximum number of patients were from ≥ 65 years of age group. The youngest patient was 28 years of age and the eldest patient was 85 years old. The mean age of patients in the present study was 60 years. (Table 1 and figure 1)

Table 2: Gender-wise Distribution of cases of Hepatic Lesions.

Gender	Frequency	Percent
Males	21	55.26
Females	17	44.74
Total	38	100

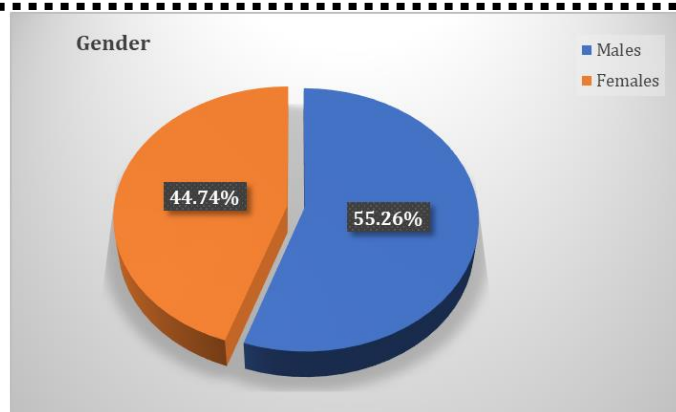


Figure 2: Gender-wise Distribution of cases with Hepatic Lesions.

Age wise distribution of cases with hepatic lesions shows that, Out of 38(100%) patients, 21(55.26%) were male and 17(44.74%) were female. The male to female ratio was 1:(0.81). The study showed slight male preponderance. (Table 2 and figure 2)

Table 3: Clinical Diagnosis wise Distribution of cases with Hepatic Lesions.

Clinical Diagnosis	Frequency	Percent (%)
Known case of carcinoma of breast	10	26.32
Hepatocellular carcinoma	8	21.05
liver cirrhosis	7	18.42
Known case of carcinoma gall bladder	4	10.53
Known case of carcinoma stomach	2	5.26
Pyrexia of unknown origin (PUO)	2	5.26
Known case of carcinoma lung	1	2.63
Known case of carcinoma pancreas	1	2.63
Known case of carcinoma recto sigmoid junction	1	2.63

Known case of carcinoma gastroesophageal junction	1	2.63
Case of spine metastasis with unknown primary and liver lesion	1	2.63
Total	38	100

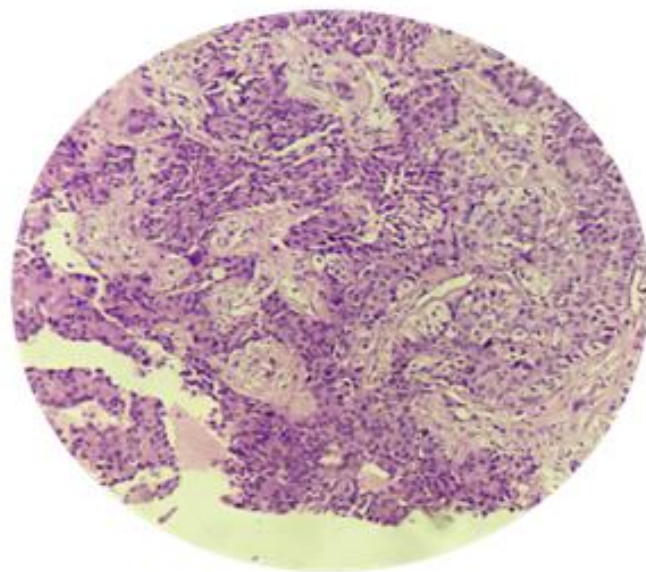


Figure 5: Photomicrograph of Hepatocellular Carcinoma (H & E sections) (10 x)

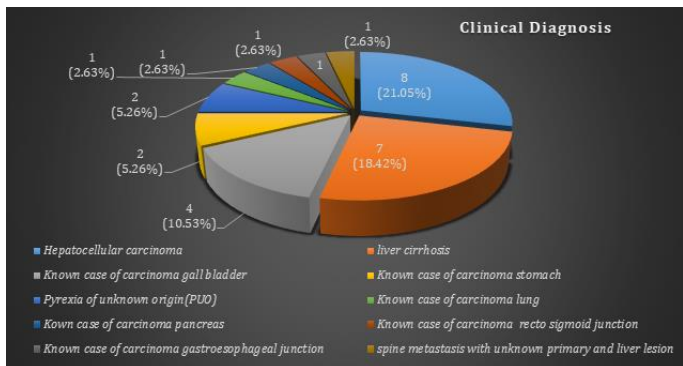


Figure 3: Distribution of Clinical diagnosis (suspected-wise) Hepatic Lesions

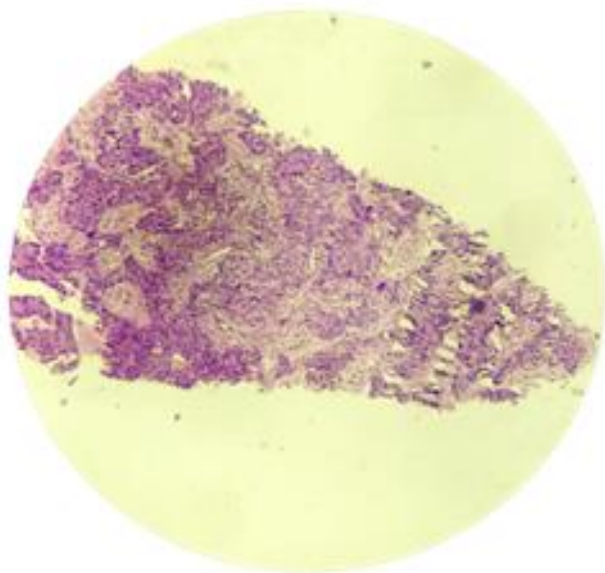


Figure 4: Photomicrograph of Hepatocellular Carcinoma (H & E sections) (scanner view)

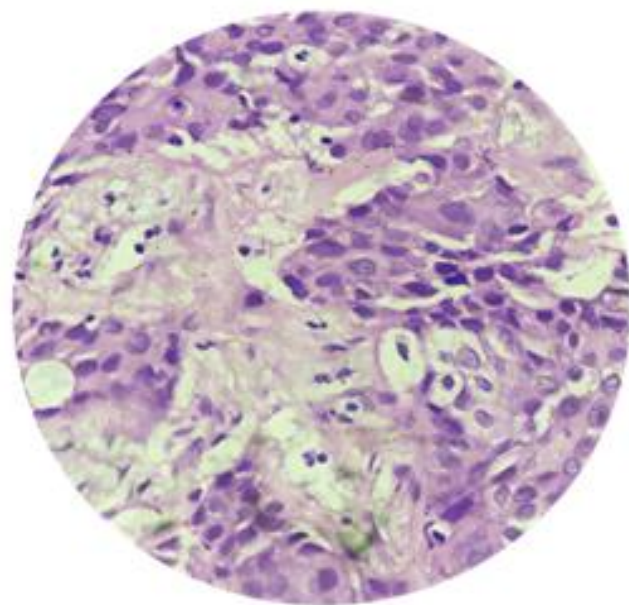


Figure 6: Photomicrograph of Hepatocellular Carcinoma (H & E sections) (40 x)

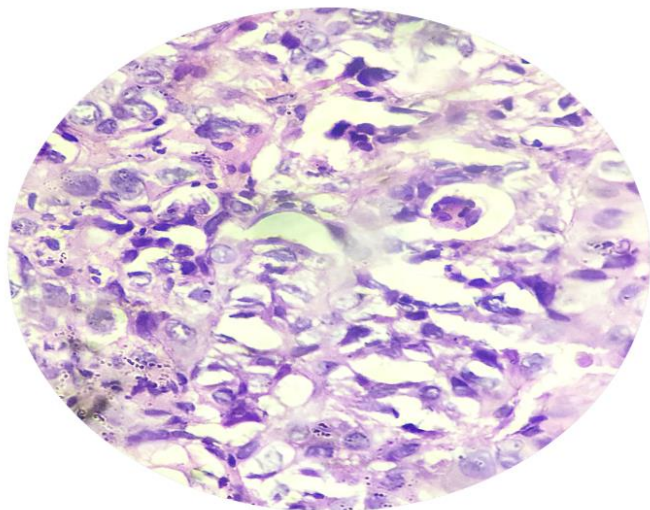


Figure 7: Photomicrograph of Hepatocellular Carcinoma (H & E sections) (40 x)

Discussion

The current study was conducted to emphasize importance of histopathology for diagnosing the hepatic lesions and also to assess the correlation of imaging findings with that of histopathological diagnosis. Liver pathology falls into two major categories, neoplastic and non-neoplastic diseases. Histological assessment of various hepatic lesions play a fascinating challenge to all modern day pathologists⁴. Biopsy with radiological findings and clinical impression are important for definitive diagnosis of hepatic lesions and it is not possible regardless of considering all of them. So we aimed to evaluate the clinic-radiological and histopathological characteristics of patients with hepatic lesions who underwent core needle biopsy in the present study.

The study was conducted in the Pathology and Radiology departments of a tertiary care hospital. The histopathology section obtained 38 core needle biopsies for standard histopathological analysis. The medical records along with histopathological evaluation of 38 patients were reviewed. The impact of various factors including the patients' age, sex, clinical symptoms, chief

complaints, clinical diagnosis, radiological and pathological findings were investigated in order to identify determinant variables. We found a significant relationship between histopathology results and radiology (CT) findings.

Table 4: Comparison of mean age and male to female ratio distribution in hepatic lesions with other studies

Study	Mean Age	Male: Female Ratio
Qaisarani MK et al (2017)	60	1:(0.81)
Agarwal NS et al (2018)	42.5	1:(0.7)
present study	60	1:(0.81)

While observing the age distribution of hepatic lesions in this study, maximum number of patients 14(36.84%) were found to be in the age group of >65 years of age, while 12(31.58%) patients and 8(21.05%) from age group of 56-65 years and 46-55 years respectively and very few 4(10.53%) patients lies in the age group of 26-45 years. The male to female ratio was 1:0.81 which signifies slight male preponderance. A similar study by Agarwal NS et al.³⁰⁷ showed that out of 65 instances, 56.92% of the people were male and 43.07% were female. The ratio of men to women was 1:0.7. Our results were also consistent with this study.

In our study, the mean age of the patients was 60 years which was comparable with Qaisarani M K et al⁵, Parveen S et al⁶ and Sudakar G et al⁷ that was published in 2018. In United Kingdom study, the mean age of patients with hepatic lesions was raised in 55–59 years. In present study hepatic lesions were more prevalent in men than women which was in accordance with study by Siegel RL et al, Konfortion J. et al^{8,9,10}.

Our study had male preponderance for hepatic lesions as compared to females which was in concordance with

Qaisarani M K et al⁵, ParveenS et al⁶, Sudakar G et al⁷ and Agarwal A et al¹¹. Malignancy was most common diagnosis seen which collaborates with various other researchers mentioned above^{5,6,7,11}. In contrast to this, an article published by Rao UM et al¹² in 2016 found to have more of benign diagnosis. In our study metastatic diagnosis (65.75%) was most prevalent than primary HCC; metastasis preferably from breast, gall bladder, stomach, adenocarcinoma of gastrointestinal tract and this finding was in accordance with Ominde ST et al and various other researchers results⁵⁻¹⁰.

In our study, the most prevalent chief complaints were patients pain in abdomen, weight loss, distention of abdomen, fever, jaundice, vomiting, itching and anorexia respectively. These symptoms were the specific complaints of patients with malignant lesions. In a study in Pakistan on 82 patients suspected of having Hepatocellular Carcinoma, the most important reported symptom was right hypochondrial pain. Consistently, pain in abdomen was the most frequent symptom in our study as well. In patients whose clinical examination was normal but had hepatic lesions, the possibility of a metastatic Adenocarcinoma was higher compared to Hepatocellular Carcinoma. With respect to the correlation between radiological and histopathology findings, among the 38 assessed cases, a significant correlation was observed.

In this study; out of 38 (100%) patients with hepatic lesions, 8 (21.05%) had hepatocellular carcinoma (HCC), 7 (18.42%) had liver cirrhosis, 10 (26.32%) had carcinoma of the breast, 2 (5.26%) had pyrexia of undetermined origin (PUO), and 2 (5.26%) had carcinoma of the stomach, respectively. Additionally, there were 1(2.63%) cases each of spine metastases, pancreatic cancer, recto-sigmoid cancer,

gastroesophageal junction cancer and 1(2.63%) lung cancer.

Our study shows the patients majority 19(50%) patients had pain in abdomen, 18(47.36%) patients had weight loss, 14(36.84%) had distention of abdomen, 11(28.95%) patients had fever, 8(21.05%) patients had jaundice, 6(15.79%) patients had vomiting, 3(7.89%) patients had itching, 3(7.89%) patients had anorexia respectively. This finding was in accordance with Salemis NS et al and Shokouh Zahir et al¹³.

All the LFT's i.e. among 38(100%) of hepatic lesions in patients with liver disease observed as deranged. Among the HBSAG findings 33(86.84%) were found negative and 5(13.16%) were positive.

These results were in concordance with the Indian study by Chawla and Sunila, 2013 and Agha et al, 2015^{14,15,16,17}

Table 5: Comparison of histopathological diagnosis in the patients with hepatic lesions with other studies

Study	Metastasis	Primary Lesion (Hepatocellular Carcinoma)
Hossain m. et al (2013)	74%	26%
Shokouh Z. et al (2015)	83%	17%
Present Study	68.41%	31.59%

In this study, histopathological diagnosis of hepatic lesions in patients with liver disease it was found that majority 19(52.78%) of patients diagnosed with Metastatic adenocarcinoma followed by 12(33.33%) Hepatocellular carcinoma, 4(11.11%) of them had Metastasis with unknown primary and 1(2.78%) Metastatic gastrointestinal stromal tumor respectively. Similar results were observed in Hossain m. et al (2013) and Shokouh Z. et al (2015).

Comparison between histopathology and radiology findings of hepatic lesions in patients with liver disease

shows that significant association with Chi-square=89.1, p-value= <0.0001. And also comparison between histopathology and radiology findings of hepatic lesions in patients with liver disease shows that significant association with Chi-square=38.000, p-value= <0.0001.

Conclusion

Histopathological examination of liver biopsy helps to diagnose and assess the severity of various hepatic diseases and often drives therapeutic management. Thus, liver biopsy is an essential tool for accurate diagnosis and management of liver diseases. The diagnostic accuracy of hepatic lesion enhances with utility of histopathological diagnosis in conjunction with radiological patterns and serum markers. Association of radiological and pathological findings found to have statically significant value in the current study. However, core needle biopsy is gold standard for specific diagnosis of hepatic lesions and for early patient management.

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