

# Diagnostic Correlation of Histopathological and Radiological Findings in Hepatic Lesions Keeping Histopathology as Gold Standard

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## ABSTRACT

**Background:** Hepatocellular carcinoma (HCC) is the most common type of primary hepatic neoplasm that mostly occur in a background of chronic liver disease (CLD) and cirrhosis. Hepatic lesion consists of a wide range of neoplasms, both benign and malignant, with distinct histopathological and radiological findings.

**Aim:** To determine the concordance in histopathological and radiological findings while diagnosing various liver lesions by keeping histopathology as a gold standard.

**Study design:** Cross-sectional

**Place and duration of study:** Aznostics Diagnostics Centre, Ittefaq Diagnostic Centre and FMH Lahore, Pakistan from 1<sup>st</sup> January 2015 to 1<sup>st</sup> June 2017.

**Methods:** A total of 50 patients of liver lesions diagnosed on CT scan and histopathological findings were included. All the diagnosed patients of liver lesions were included and the pregnant females were excluded.

**Results:** By comparing CT scan findings with the histopathological findings the sensitivity was 93.75%, specificity was 85.33%, positive predictive value was 90.90% and negative predictive value was 88.23% in differentiating metastatic liver lesions from other types of liver lesions.

**Conclusion:** CT scan is a useful tool in diagnosing liver lesions. The results indicate that CT scan shows good sensitivity, specificity, positive predictive value, negative predictive value to differentiating the metastatic tumors of liver from other liver lesions.

**Keywords:** Hepatic lesion, histopathology, CT scan, radiology

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## INTRODUCTION

Hepatic lesions consist of a wide range of neoplasms, both benign and malignant; with distinct histopathological and radiological findings<sup>1</sup>. These can be native liver lesions or might be secondary as result of metastasis. Throughout the world, it is estimated that the liver malignancy is fifth most common cancer amongst males and eighth amongst females. In high risk countries the onset of liver cancer occur in less than 20 years of age, while in low risk areas, it usually occur after 50 years of age<sup>2</sup>. The incidence of liver cancer in Pakistan is 8/100,000 per annum<sup>3</sup> and a prevalence of 3.7%<sup>4</sup>, but it varies upto 39% in the international data<sup>5,6,7</sup>.

The benign lesions are exceedingly frequent, diverged and in most cases are asymptomatic. The liver function tests are usually undiagnosed or normal. In this advanced era of modern techniques the accurate diagnosis of hepatic lesions is critical for devising a proper management plan<sup>8</sup>. However; it is always hard to differentially diagnose hepatic lesions even with biochemical, clinical data and radiological techniques. In developing countries like Pakistan, some non-invasive techniques like CT scan and MRI are used besides histopathology for diagnosis of this lesions<sup>9</sup>.

Among the primary hepatic neoplasm, the hepatocellular carcinoma (HCC) is the most common neoplasm that occurs in patients of chronic liver disease (CLD) and cirrhosis. The biochemical studies have stood out in describing the enzymes levels and composition of cancerous tissue as compared with normal hepatic tissue<sup>10</sup>. In some lesions of liver, due to the overlapping of radiological findings, diagnosis is made on the basis of patient's medical history and histopathological findings<sup>11</sup>.

The radiological scan usually reveals a filling defect or displacement or compression of viscera's depending upon the size, shape and site of lesion. However, an unequivocal diagnosis may not be made with such sophisticated techniques. Even transcutaneous biopsy may not be useful in cases of small size and highly vascularized hepatic tumours<sup>12</sup>.

Now a days radiology is a central tool for many liver lesions and playing important role in treating diseases and predicting outcomes. The advanced imaging has improved the diagnostic accuracy throughout the spectrum of diseases with reduced reviewers variability and provision of consistent expression of features like tumor volume, perfusion, yielding reliability and consistency which were impossible with only visual inspection. This data is invaluable as complement to histopathology when contextualized as a unified report. However, there is no direct association between the case reporting systems of pathology and radiology departments, even in the host

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institutions. This isolation can have detrimental effects on diagnosis and management of cases.

Integrated workflow of pathology and radiology is mandatory because pathology describes the specific molecular and histological features of involved tissue while radiology focalize the pathological lesions and tells clinical stage and possible comorbidity. When incorporated both histopathology and radiology have potential for better diagnosis, tracking of treatment response and assessment of disease evolution.<sup>13</sup>Therefore, the purpose of this study was to compare the similarity in histopathological and radiological findings while diagnosing various hepatic lesions by keeping histopathology as a gold standard.

**MATERIALS AND METHODS**

This cross-sectional study was carried out at Aznostics Diagnostics Centre, Ittefaq Diagnostic Centre and FMH Lahore, Pakistan from 1<sup>st</sup> January 2015 to 1<sup>st</sup> June 2017. All the diagnosed patients of liver lesions were included and the pregnant females were excluded from the study. After meeting inclusion and exclusion criteria about 50 patients were included in the study. All the basic demographic information of patients was obtained on proforma after informed consent. By using CT 16 slice scanner, scanning was done by a radiologist. The report of biopsies was assessed by histopathologist. SPSS version 21 was used to analyzed the data and for calculation of sensitivity, specificity, positive predictive value and negative predictive value.

**RESULTS**

Most of the patients 22(44%) lie in the age group of 41-60 years while 14(28%) patients and 12(24%) patients lie in the age group of 20-40 years and 61-80 years respectively and very few patients lie in the age group of 81-100 years. Out of 50 patients 29(58%) were males and 21(42%) were females. Out of the 50 patients most the patients were found to have adenocarcinoma 14(28%), hepatocellular carcinoma 9(18%), Metastatic carcinoma 6(12%), Neuroendocrine tumor 4(8%) and others 17(34%) miscellaneous liver diseases such as Cholangiocarcinoma, Tuberculosis, Non-Hodgkin’s Lymphoma and Steatohepatitis. On the basis of CT scan findings 10(20%) patients had benign disease of liver, 7(14%) patients had Primary tumor of Liver and 33(66%) patients had metastasis in the liver having primary from other site of body.

On the basis of histopathological findings 10(20%) patients had benign disease of liver, 8(16%) patients had Primary tumor of Liver and 32(64%) patients had metastasis in the liver having primary from other site of body.

In keeping view of histopathology as gold standard, we can compare CT scan findings with the histopathological findings and calculate the sensitivity 93.75%, specificity is 85.33%, Positive Predictive value is 90.90% and Negative Predictive value is 88.23% in differentiating metastatic liver lesions from other types of liver lesions.

Table 1: Comparison of CT scan from histopathology to differentiate metastatic tumors from other liver lesions;

CT Scan Findings	Histopathology (Gold Standard)		Total
	Positive	Negative	
Positive	30	3	33
Negative	2	15	17
Total	32	18	50

Table 2: Cross Tabulation of Histopathology and CT scan Findings

CT Scan Findings	Histopathology Findings			Total
	Benign	Primary tumor of liver	Metastatic tumor	
Benign	8	0	2	10
Primary tumor of liver	0	7	0	7
Metastatic tumor	2	1	30	33
Total	10	8	32	50

**DISCUSSION**

The imaging characteristics of focal liver lesion are variable which may be interpreted as either benign or malignant. The pathophysiology of the liver lesions give characteristic imaging manifestations, which help the radiologist for diagnosis<sup>14</sup>. The diagnosis of liver lesions on biopsy is a gold standard but the progress in CT scan has increased the number of focal liver lesions detection<sup>15</sup>.

In one study, most of the patients 33(47.2%) were in arrange of 41-60 years of age and few patients 11(15.7%) were in arrange of 61 - 70 years with mean age of presentation was 60.9±4.7 years.<sup>16</sup>In another study the mean age of study group was 53.4 years (range 19–93 years)<sup>17</sup>.

In our study the peak incidence of disease is 22(44%) between 41-60 years of age and 14(28%) between 20-40 years of age and 12(24%) lie in the age group of 61-80 years of age. The age of people in our study is 51.25 years (range 20-86 years).

Histopathology results of one study on liver lesions shows 34 malignant and 7 benign or tumor like lesions.<sup>18</sup>In current study histopathology diagnose 32 liver lesions as malignant and 10 as benign.

In this study of 50 patients we found sensitivity of CT scan to diagnose metastatic tumor is 93.75% and specificity is 85.33% positive predictive value is 90.90% and negative predictive value is 88.23% from other types of liver lesions. This data is very much similar with the international data and the data shows sensitivity of 80% and specificity of 96% respectively<sup>19</sup>. The one more study shows a comparison of Doppler sonography findings with the histopathology and cytopathology and shows sensitivity (94.5%), specificity (91%), diagnostic accuracy (93%), positive predictive value (92%) and negative predictive value 93.9%<sup>16</sup>.

**CONCLUSION**

It was found that CT scan is also a useful tool in diagnosing liver lesions, as the results show that CT scan has good sensitivity, specificity, positive predictive value and negative predictive value to differentiating the metastatic tumors of liver from other liver lesions.

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