Section: Pathology

Original Research Article

HISTOLOGICAL SPECTRUM OF LIVER BIOPSIES IN A TERTIARY CARE CENTRE

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ABSTRACT

Background: Histopathological examination of liver tissue remains the cornerstone for diagnosis, classification, and prognostication of a wide spectrum of hepatic disorders. This is particularly relevant in government tertiary care hospitals in resource-limited settings, where access to advanced diagnostic modalities may be constrained. The objective is to evaluate the histological spectrum of liver biopsy specimens received in a tertiary care centre over a two-year period. **Materials and Methods:** This descriptive observational study was conducted in the Department of Pathology of a government tertiary care hospital over a period of two years. A total of 100 liver specimens were analysed, including core biopsies, wedge biopsies, resection specimens, and explant livers. Liver core biopsies obtained during splenectomy for portal venous disorders were also included. All specimens were fixed in formalin, routinely processed, and examined on hematoxylin and eosin-stained sections. Special stains were employed wherever indicated. Histopathological findings were documented and analysed using descriptive statistical methods. **Result:** Cirrhosis was the most common histopathological diagnosis, accounting for 21% of cases, followed by portal venous disorder–related changes (15%). Hydatid cysts constituted the most frequent cystic lesion (9%). Malignant lesions accounted for 17% of cases, with hepatocellular carcinoma being the predominant primary hepatic malignancy. Other findings included benign vascular tumors, inflammatory and metabolic liver diseases, paediatric hepatobiliary disorders, and metastatic tumors. Inadequate biopsies constituted 3% of cases. **Conclusion:** The present study demonstrates a wide histological spectrum of liver diseases encountered in a tertiary care setting. Liver biopsy continues to play a pivotal role in the diagnosis and management of hepatic disorders, particularly in resource-limited settings.

INTRODUCTION

Liver diseases represent a major global health burden and contribute significantly to morbidity and mortality worldwide. Despite advances in radiological imaging and non-invasive diagnostic techniques, histopathological examination of liver tissue continues to be the gold standard for definitive diagnosis, staging, and prognostication of a wide range of hepatic disorders.[1-3] Liver biopsy provides essential information regarding disease etiology, severity, and progression, thereby guiding clinical management.

In developing countries, particularly in government-run tertiary care hospitals, liver biopsy remains an indispensable diagnostic modality. Limited access to advanced imaging, molecular diagnostics, and comprehensive serological testing further reinforces the importance of conventional histopathology in routine practice.[4] Liver biopsy is especially valuable in the evaluation of chronic liver disease, portal hypertension, paediatric hepatobiliary disorders, and hepatic neoplasms.[5]

The histological spectrum of liver diseases varies with geographic region and prevailing etiological factors. Extrahepatic portal venous obstruction and non-cirrhotic portal hypertension are encountered more frequently in developing countries than in Western populations.[6,7] In addition, parasitic infections such as hydatid disease remain endemic in certain regions and contribute significantly to hepatic pathology.[8]

Published literature describing the histopathological spectrum of liver biopsies from Indian tertiary care

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centres remains limited, particularly studies encompassing a broad range of specimen types, including resection specimens and liver biopsies obtained during splenectomy for portal venous disorders. The present study was undertaken to analyse the histological spectrum of liver biopsies received over a two-year period in a government tertiary care hospital.

MATERIALS AND METHODS

This descriptive observational study was conducted in the Department of Pathology at a government tertiary care hospital in Hyderabad, Telangana, India, over a period of two years. The study included retrospective analysis of liver biopsy specimens received during the study period.

A total of 100 liver specimens were included, comprising trucut core biopsies, wedge biopsies, partial hepatectomy specimens, and explant livers. Liver core biopsies obtained during splenectomy for portal venous disorders were also analyzed. Specimens that were grossly autolyzed or inadequately preserved were excluded.

All specimens were fixed in 10% neutral buffered formalin, routinely processed in an automated tissue processor, and embedded in paraffin. Sections of 2–5 µm thickness were cut and stained with hematoxylin and eosin. Special stains such as Reticulin and Periodic Acid–Schiff (PAS) were employed wherever indicated. Histopathological evaluation was performed using light microscopy, with clinicoradiological and biochemical correlation whenever available.

Parameters analysed included patient age, sex, type of specimen, clinical diagnosis, and histopathological diagnosis. Data were compiled and analysed using descriptive statistical methods.

Ethical approval for the study was obtained from the Institutional Ethics Committee. Patient confidentiality was maintained, and the study was conducted in accordance with the Declaration of Helsinki.

RESULTS

A total of 100 liver specimens were evaluated. The study population comprised 51 females and 49 males, with an age range of 5 months to 72 years.

Explant liver specimens constituted the largest proportion of cases, followed by partial hepatectomy specimens and trucut liver biopsies.

Table 1: Gender distribution of patients

Gender	Percent
Male	49.0
Female	51.0

Table 2: Distribution of liver specimens by type

Specimen	Percent
Hepatectomy/ Lobectomy	33 %
Trucut Biopsy	22 %
Core and wedge biopsies	19 %
Explant Liver	14 %
Cystectomy	7 %
Excision Biopsy	5 %

Cirrhosis was the most common histopathological diagnosis, followed by portal venous obstruction–related changes and hydatid cysts. Malignant lesions included hepatocellular carcinoma, cholangiocarcinoma, and metastatic adenocarcinoma. Rare diagnoses included hepatic adenoma, polycystic liver disease, and portal inflammation associated with hyperoxaluria. Inadequate biopsies accounted for 3% of cases.

Table 3: Histopathological spectrum of liver lesions

Diagnosis	Percent
Biliary Cystadenoma	2%
Haemangioma	5%
Hilar Cholangiocarcinoma	3%
Hydatid Cyst	7%
Metastasis	6%
Hepatocellular carcinoma	15%
Biliary Atresia	5%
Budd-Chiari Syndrome	1%
Choledochal Cyst	3%
Cirrhosis	20%
Donor liver for transplant	2%
EHPVO	21%
Fatty Liver	1%
Hyperoxaluria	1%
Multiple Ruptured abscess	1%
Hepatitis	4%
Wilson Disease	3%

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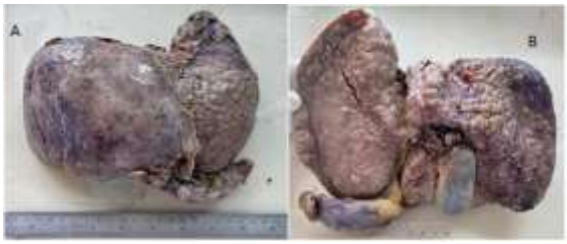

Figure 1a&b: Gross morphology of cirrhotic liver showing nodular surface

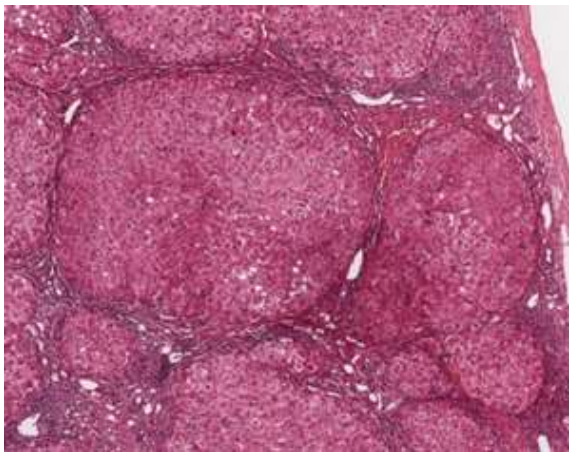

Figure 2: Photomicrograph of liver cirrhosis showing nodules of variable sizes with thin fibrous septa (H & E, 10X).

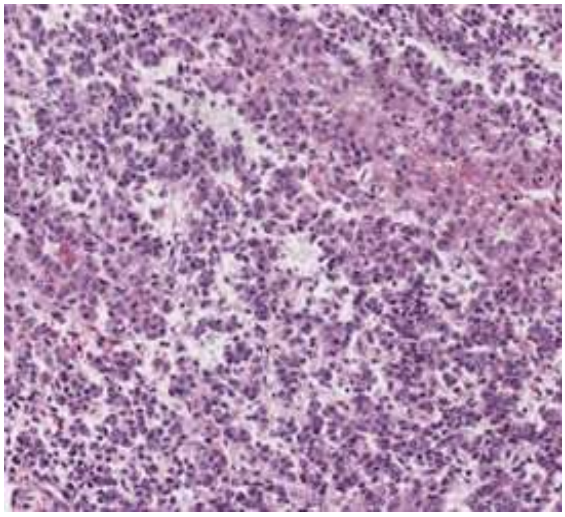

Figure 3: Photomicrograph of hepatoblastoma with primitive tumor cells (H & E, 20X).

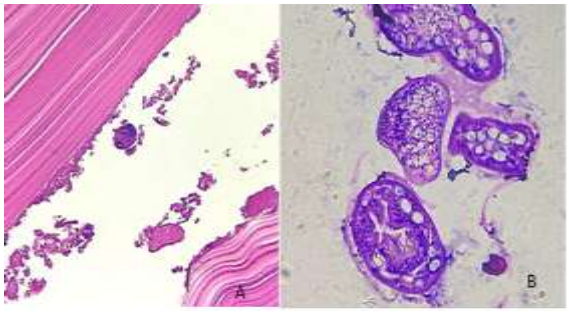

Figure 4a&b: Photomicrograph showing acellular lamellate layer and protoscolices of hydatid cyst in liver (H & E, 10X and 40X).

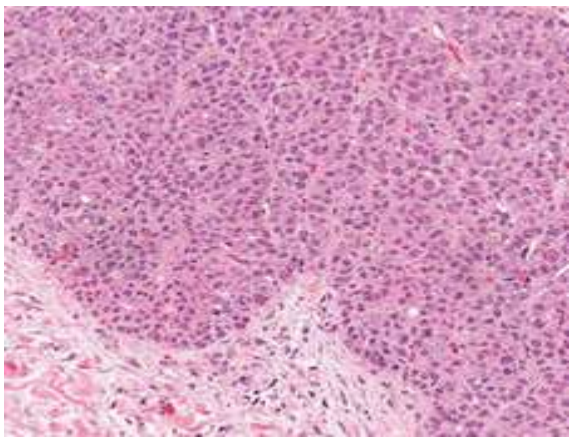

Figure 5: Photomicrograph showing Hepatocellular carcinoma (H & E, 10X)

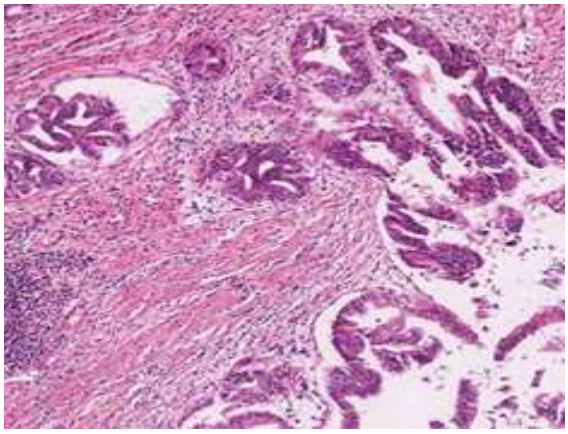

Figure 6: Photomicrograph showing cholangiocarcinoma (H & E, 10X)

DISCUSSION

Histopathological examination of liver tissue continues to play a pivotal role in the definitive diagnosis and characterization of hepatic diseases, particularly in resource-limited settings where advanced non-invasive diagnostic modalities may not be uniformly available.[1,2]

In the present study, cirrhosis constituted the most common pathological diagnosis. This finding is consistent with reports from developing regions where chronic liver disease remains a major cause of morbidity and mortality due to delayed diagnosis, limited access to healthcare, and persistent exposure to etiological factors such as chronic viral hepatitis, alcohol use, and metabolic liver disease.[9,10] The occurrence of cirrhosis across a wide age range, including paediatric patients, highlights the contribution of congenital and childhood cholestatic disorders such as biliary atresia to end-stage liver disease in low-resource settings.[11]

A notable observation was the relatively high frequency of portal venous obstruction–related histological changes. Non-cirrhotic portal hypertension and porto-sinusoidal vascular disorders are known to be more prevalent in developing countries and are frequently associated with prothrombotic states, infections, and delayed

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diagnosis.[6,12] Histopathological evaluation is crucial in differentiating these entities from cirrhosis, as treatment strategies and prognostic outcomes differ significantly.[7]

Parasitic liver diseases, particularly hydatid cysts, formed an important component of non-neoplastic lesions in this study. The frequency of hydatid disease reflects its endemic nature in rural and semi-urban populations with close human–animal contact.[8] Despite advances in imaging techniques, histopathology remains essential for confirmation in surgically excised specimens.

Neoplastic lesions accounted for a significant proportion of cases, with hepatocellular carcinoma being the most common primary hepatic malignancy, followed by cholangiocarcinoma. This pattern aligns with global cancer data identifying hepatocellular carcinoma as the most prevalent primary liver cancer, commonly arising in a cirrhotic background.[5,13] Metastatic tumors further emphasize the liver's role as a frequent site for secondary malignancies and the importance of histopathology in identifying the primary tumor.[14]

Benign hepatic tumors and paediatric liver malignancies, though infrequent, were also encountered. Paediatric tumors such as hepatoblastoma are clinically significant due to their aggressive behaviour and need for early diagnosis and multidisciplinary management.[15]

A small proportion of biopsies were inadequate, which is a recognized limitation of liver biopsy procedures, particularly in fibrotic or heterogeneous lesions. This highlights the importance of adequate sampling and close clinicopathological correlation to avoid diagnostic pitfalls.[1]

Limitations

This was a single-centre study conducted in a government tertiary care hospital, which may limit the generalizability of the findings. The sample size restricted the ability to establish strong statistical correlations between etiological factors and histopathological patterns. Incomplete clinical and radiological data in some cases have affected etiological interpretation.

CONCLUSION

The present study highlights the wide histological spectrum of liver diseases encountered in a government tertiary care centre in a resource-limited setting, with cirrhosis and portal venous disorders being the most common findings. The substantial burden of advanced and potentially preventable liver pathology highlights the continued relevance of liver biopsy in accurate diagnosis and clinical decision-making. Histopathological examination remains an essential diagnostic tool for guiding patient management and public health planning.

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