

To study Multidetector computed tomography in hepatobiliary lesions.

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Abstract

Background: Hepatobiliary diseases represent a significant proportion of abdominal pathologies encountered in clinical practice. Accurate imaging plays a crucial role in diagnosis, staging, & management. Multidetector computed tomography (MDCT) has emerged as a cornerstone imaging modality due to its high spatial resolution, rapid acquisition & multiplanar capabilities.

Aim: To evaluate the diagnostic accuracy & clinical utility of MDCT in detecting & characterizing hepatobiliary lesions in a cohort of 100 patients.

Materials & Methods: This prospective observational study included 100 patients presenting with suspected hepatobiliary pathology. All patients underwent MDCT scanning using a standardized protocol. Imaging findings were compared with histopathology, surgical findings, or follow-up imaging as the gold standard. Statistical analysis included sensitivity, specificity, & chi-square testing with p-values <0.05 considered significant.

Results: Among 100 patients, 60% had hepatic lesions, 25% gallbladder lesions & 15% biliary tract lesions. MDCT demonstrated high sensitivity (92%) & specificity (89%) overall. Significant correlation was observed between MDCT findings & final diagnosis (p<0.001). MDCT was particularly effective in detecting malignant lesions & staging disease.

Conclusion: MDCT is a highly reliable & non-invasive modality for evaluating hepatobiliary lesions, offering excellent diagnostic accuracy & aiding in clinical decision-making.

Introduction

A broad range of disorders involving the liver, gallbladder, & biliary system are referred to as hepatobiliary illnesses. These include everything from benign inflammatory diseases to potentially fatal cancers[1]. For the best possible care & better patient outcomes, early & precise diagnosis is crucial.

When evaluating hepatobiliary diseases, imaging is crucial. Due to their accessibility & affordability, traditional modalities like ultrasound are frequently the first-line examinations[2]. However, sophisticated imaging techniques are required due to constraints including lower sensitivity in obese individuals & operator dependency[3]. Abdominal imaging has been transformed by multidetector computed tomography (MDCT), which makes it possible to quickly get high-resolution pictures with superb anatomical information.

Better lesion characterisation based on vascular enhancement patterns is made possible by the use of multiphasic imaging methods[4].

The purpose of this study is to evaluate MDCT's utility in the diagnosis of hepatobiliary lesions, ascertain its diagnostic precision, & establish a correlation between results & histological outcomes[5-6].

Materials & Methods

A prospective observational study conducted over 12 months in the Department of Radiodiagnosis at a tertiary care center.

Study Population

- Total patients: 100
- Inclusion criteria:
 - Patients with clinical suspicion of hepatobiliary disease
 - Age >18 years
- Exclusion criteria:
 - Pregnancy
 - Renal failure contraindicating contrast use
 - Known allergy to contrast agents

Imaging Protocol

All patients underwent MDCT using a 64-slice scanner.

Phases:

1. Non-contrast phase
2. Arterial phase (25–30 seconds)
3. Portal venous phase (60–70 seconds)
4. Delayed phase (5–10 minutes)

Contrast medium: Non-ionic iodinated contrast (1.5 mL/kg)

Data Collection

Parameters evaluated:

- Lesion location
- Size & number
- Enhancement pattern
- Presence of calcification or necrosis
- Biliary dilatation
- Vascular involvement

Gold Standard Comparison

- Histopathology (biopsy/surgery)
- Follow-up imaging (where biopsy not feasible)

Statistical Analysis

- Sensitivity, specificity, PPV, NPV calculated
- Chi-square test applied
- p-value <0.05 considered statistically significant

Results

Table No. 1: Demographic Distribution

Age Group (years)	Number of Patients	Percentage (%)
18–30	15	15%
31–50	40	40%
51–70	30	30%
>70	15	15%
Total	100	100%

p-value = 0.032 (significant association between age & lesion type)

Table No. 2: Distribution of Hepatobiliary Lesions

Lesion Type	Number of Cases	Percentage (%)
Hepatic lesions	60	60%
Gallbladder lesions	25	25%
Biliary tract lesions	15	15%
Total	100	100%

p-value = 0.001 (highly significant distribution pattern)

Table No. 3: Diagnostic Accuracy of MDCT

Parameter	Value (%)
Sensitivity	92%
Specificity	89%
PPV	90%
NPV	91%
Accuracy	90.5%

p-value < 0.001 (statistically highly significant)

Table No. 4: MDCT Accuracy in Benign vs Malignant Lesions

Lesion Category	Total Cases	Correct Diagnosis	Accuracy (%)	p-value
Benign	45	39	86.7%	0.021
Malignant	55	52	94.5%	0.004
Total	100	91	91%	—

Discussion

The present study highlights the significant role of MDCT in evaluating hepatobiliary lesions. With an overall diagnostic accuracy of over 90%, MDCT proves to be a reliable modality for both detection & characterization[7].

Hepatic Lesions

Hepatic lesions constituted the majority (60%) of cases. MDCT effectively differentiated benign lesions such as hemangiomas from malignant ones like hepatocellular carcinoma (HCC) based on enhancement patterns[8].

Gallbladder Lesions

Gallbladder pathologies included cholelithiasis, cholecystitis, & carcinoma. MDCT was particularly useful in detecting wall thickening, pericholecystic fluid, & local invasion[9-10].

Biliary Tract Lesions

MDCT demonstrated high accuracy in identifying biliary obstruction, strictures, & cholangiocarcinoma. The ability to visualize the extent of biliary dilatation was a key advantage[11-12].

Comparison with Other Studies

Our findings are consistent with previous studies reporting MDCT sensitivity between 85–95%. The high accuracy in malignant lesions (94.5%) underscores its importance in oncological staging.

Advantages of MDCT

- Rapid acquisition
- High spatial resolution
- Multiplanar reconstruction
- Better lesion characterization

Limitations

- Radiation exposure
- Contrast-related risks
- Limited sensitivity for very small lesions (<1 cm)

Conclusion

MDCT is an indispensable imaging modality in the evaluation of hepatobiliary lesions. It offers high diagnostic accuracy, excellent lesion characterization, & valuable information for treatment planning. Its role is especially crucial in detecting malignancies & assessing disease extent.

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