Section: Radio Diagnosis

Original Research Article

EFFICACY OF MULTIDETECTOR COMPUTED TOMOGRAPHY (MDCT) IN DISTINGUISHING BENIGN AND MALIGNANT FOCAL HEPATIC LESIONS

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ABSTRACT

Background: Focal hepatic lesions can be benign or malignant, and accurate differentiation is crucial for appropriate patient management. Multidetector Computed Tomography (MDCT) offers advantages in lesion characterization, but its efficacy compared to pathological diagnosis needs further evaluation. The objective is to assess the agreement between MDCT and biopsy in diagnosing hepatocellular carcinoma (HCC) and to evaluate the role of MDCT in identifying and characterizing various focal hepatic lesions.
Materials and Methods: This hospital-based observational study was conducted at the Department of Radio Diagnosis, Government Medical College Kottayam, over 18 months. Seventy-six patients with suspected hepatic lesions underwent MDCT, followed by correlation with histopathological findings. The study focused on lesion size, location, enhancement patterns, and MDCT features. Data analysis involved descriptive statistics and comparison of MDCT findings with pathological diagnosis.
Results: The study included 76 patients, predominantly male (57.9%), with a significant number falling within the 50-69 age range. MDCT accurately identified various hepatic lesions, with 56.6% diagnosed as malignant and 40.8% as benign. Hepatocellular carcinoma (HCC) was the most common lesion (31.6%), followed by metastatic lesions (27.6%). MDCT findings showed strong agreement with pathological diagnosis, with 91.5% of malignant lesions confirmed by pathology, demonstrating high sensitivity and specificity. Additionally, associated findings like lymphadenopathy (10.5%) and ascites (9.2%) provided further clinical insights.
Conclusion: MDCT is an effective tool in distinguishing benign and malignant focal hepatic lesions, with high diagnostic accuracy. It should be considered a reliable imaging modality in the clinical evaluation of hepatic lesions, particularly for guiding biopsy and treatment decisions.
Keywords: Agreement, Hepatic lesions, Hepatocellular carcinoma (HCC), Multidetector Computed Tomography (MDCT).

INTRODUCTION

Benign focal hepatic lesions are presenting with a range of clinical manifestations, including abdominal pain, fever, and jaundice.[1] The causal factors underlying the development of these lesions are diverse and multifaceted, encompassing genetic mutations, viral infections,[2] and circulatory disorders. It is pertinent to note that hemangiomas and focal nodular hyperplasia constitute two of the most prevalent forms of benign focal hepatic lesions, with the former characterized by the presence of anomalous blood vessels and the latter distinguished by the proliferation of aberrant liver cells.[3]
Malignant focal hepatic lesions, on the other hand, are cancerous growths that can invade surrounding tissues and spread to other parts of the body. These lesions can be primary, originating in the liver, or secondary, originating from other organs and metastasizing to the liver.[4] Hepatocellular

carcinoma is the most common type of primary liver cancer, while metastatic lesions can originate from various sources, including the colon, breast, and lungs. Malignant focal hepatic lesions can cause symptoms such as weight loss, fatigue, and abdominal pain, and can also lead to liver dysfunction and failure if left untreated.[5]

The diagnosis of focal hepatic lesions is of paramount importance, as it precipitates informed patient management decisions. Benign lesions may require more observation, whereas malignant lesions require therapeutic intervention. In this context, imaging modalities assume a crucial role, and multidetector computed tomography (MDCT) has emerged as an indispensable tool. MDCT offers advantages over other imaging modalities, including elevated spatial resolution, rapid image acquisition, and the capacity to reconstruct images in multiple planes, thereby facilitating enhanced diagnostic accuracy and informed clinical decision- making.[6,7]

The advantages of MDCT in the evaluation of focal hepatic lesions are numerous. Its high spatial resolution enables accurate lesion characterization and differentiation between benign and malignant lesions.[8] The rapid acquisition times and ability to reconstruct images in multiple planes make it an ideal modality for evaluating lesions in multiple locations. Additionally, MDCT-guided biopsies and tumour ablation procedures have been shown to improve patient outcomes and reduce complications.[9]

However, MDCT also has some limitations. Radiation exposure is a significant concern, particularly for patients who require multiple scans. However, advancements in technology have led to the development of low-dose CT protocols that minimize radiation exposure while maintaining image quality. Another limitation of MDCT is its inability to characterize lesions based on their functional characteristics. This limitation can be overcome by combining MDCT with other imaging modalities such as positron emission tomography (PET) or magnetic resonance imaging (MRI).[10]

MATERIALS AND METHODS

This is a hospital based observational study to provide a detailed description of lesion characteristics and identify correlations between MDCT findings and final diagnosis. The study was conducted in the Department of Radio Diagnosis, Government Medical College, Kottayam, specifically in the Computed Tomography (CT) scan unit. The CT scan unit served as the primary point of contact for patients undergoing imaging evaluations, providing immediate and comprehensive assessments.

The study was conducted over a 18 months period, at the Department of Radio Diagnosis, Government Medical College, Kottayam. Based on the estimated prevalence of focal hepatic lesions from various literatures, the study aimed to recruit a sufficient sample size to ensure statistical power and reliability.

The study participants were selected based on specific inclusion and exclusion criteria to ensure a focused and relevant sample for the assessment of MDCT in distinguishing between benign and malignant focal hepatic lesions. The study aimed to recruit a representative cohort of patients who underwent MDCT scans for focal hepatic lesions at the Department of Radio Diagnosis, Government Medical College, Kottayam.

Inclusion Criteria

- Patients with a clinical suspicion of focal hepatic lesions.
- Previous imaging studies depicting hepatic lesions with a non-specific appearance.

Exclusion Criteria

- Patients with allergies to contrast agents or denial of contrast injection
- Patients with impaired renal function
- Significant coagulopathy
- Use of non-steroidal anti-inflammatory drugs (NSAIDs), including aspirin, within 7-10 days prior to the study
- Pregnant women

Study sample size: The study's sample size was calculated to be 76 using Statcal software, based on the estimated sensitivity of MDCT in diagnosing malignant hepatic lesions (83.3%) reported by Dr. Shrestha Jain and colleagues. The formula used was N= $[\mathbf{Z}\infty\sqrt{\boldsymbol{Q}_0}+\mathbf{Z\beta}\ \sqrt{\boldsymbol{Q}_1}\ ]2\ \boldsymbol{K}_1 - \boldsymbol{K}_0$, with values of 0.05 for ∞, 0.20 for **β**, and kappa values of 0.806 (accepted) and 0.95 (expected).

Study parameters: The study focused on a comprehensive set of imaging and clinical parameters to evaluate the efficacy of MDCT in distinguishing between benign and malignant focal hepatic lesions. The primary imaging parameters included assessment of lesion size, location, and characteristics, as well as MDCT findings such as enhancement patterns and morphology. Clinical parameters included patient demographics, medical history, and laboratory results, such as liver function tests and tumor markers.

Study procedure

- This hospital-based prospective observational study employed consecutive sampling to recruit patients with suspected focal hepatic lesions.. The study was approved by the ethical committee prior to commencement.
- All patients will be explained in detail about the procedure and written consent will be obtained.
- Preparation of patient for Scan : The Patient will be kept nil orally for minimum 4 hours prior to the CT to avoid complications during the administration of the contrast medium. Study will be done using CT machine (128 slice). These patients will be evaluated using standard triple phase contrast CT protocol on Ge Revolution Evo 128 slice multidetector CT scan. The different enhancing patterns will be inspected. Biopsy will be done wherever required.

- Routine antero-posterior (AP) topogram of the abdomen will be taken initially in all patients in supine position with breath holding. Axial sections of 5mm thickness will be taken from lung bases to ischial tuberosity. Initial plain scan is performed followed by intravenous contrast study. Enhancement of each lesion in each phase will be evaluated and results will be tabulated according to 11 enhancement patterns. Sagittal, coronal reconstruction and curved planar reformatting, volume rendering, maximum and minimum intensity projections will be done as required and reviewed directly on display console.
- The protocol for MDCT abdomen will be as follows:120Kvp,mas modulation with range of 60-450 mas, slice thickness 5mm,interval 5mm,reconstruction interval 0.625mm and pitch-0.984.

Techniques to be use Computed tomography

a) Nonenhanced computed tomography (NECT).
b) Triple phase Contrast enhanced computed tomography (CECT).

- All patients undergoing contrast enhanced triphasic liver CT will receive
- 1.5ml/kg body weight of iohexol will be injected intravenously through an 18/20-gauge cannula at a rate of 3-4 mL/sec with an automated pressure injector. The arterial-dominant phase, the delay between the start of contrast material administration and helical scanning for 20 seconds.
- For the portal dominant phase, the delay between the start of contrast material administration and helical scanning will be 50 seconds and for the delayed phase, the delay between the start of contrast material administration and helical scanning will be 180 seconds. Spectrum of liver lesions and their enhancement characteristics will be studied and tabulated. MDCT findings will be correlated with cytopathological /histopathological findings.

Data collection: Detailed comparisons of lesion characteristics, patient age, and gender will be performed, and outcomes will be assessed based on MDCT findings and biochemical parameters. Data collection involved systematically recording clinical and imaging findings at multiple time points.

Data analysis: Data analysis for the study was conducted using SPSS software, following systematic entry of all collected data into Microsoft Excel. Descriptive statistics were employed to summarize lesion characteristics, patient demographics, and clinical features, including measures of central tendency (mean, median) and variability (standard deviation). The primary analysis focused on comparing MDCT findings with final pathological diagnosis using validity measures such as sensitivity, specificity, positive predictive value, and negative predictive value.

Ethical considerations: The Institutional Ethics Committee (IEC) of our institution reviewed and approved the study protocol before its initiation. Informed consent was obtained from all patients enrolled in the study.

RESULTS

Table 1: Demographic details and number of lesions

Age Group	Frequency	Percent	Percent	Cumulative Percent
30-39	10	13.2	13.2	13.2
40-49	14	18.4	18.4	31.6
50-59	19	25.0	25.0	56.6
60-69	17	22.4	22.4	78.9
70-79	12	15.8	15.8	94.7
80+	4	5.3	5.3	100.0
Total	76	100.0	100.0	

The age distribution of the participants in the study reveals that the majority fall within the middle age to early senior age brackets. Specifically, the age group 50-59 years is the largest, comprising 25.0% of the total participants. Following this, the age groups 60-69 and 40-49 represent 22.4% and 18.4% of the participants, respectively. Together, these three groups account for 66.6% of the study population, indicating a significant concentration of participants between 40 and 69 years old. The age groups 70-79 and 30-39 each contribute 15.8% and 13.2% to the total, while only 5.3% of participants are aged 80 years or older. Overall, the cumulative data shows that 94.7% of participants are aged 79 years or younger, with the full range of ages represented in the study extending from 30 to over 80 years. The gender distribution in the study indicates that the majority of participants are male, with 57.9% (44 individuals) of the total population. Females make up 42.1% (32 individuals) of the participants. This results in a cumulative percentage of 100%, highlighting that the study includes a slightly higher proportion of males than females. The data shows a gender representation where males predominate, but females still constitute a significant portion of the study population.

The data on the number of lesions among the study participants shows that the majority have a single lesion, accounting for 61.8% (47 individuals) of the total population. Participants with multiple lesions represent 32.9% (25 individuals), while a small group, 5.3% (4 individuals), have two lesions. The cumulative data indicates that 94.7% of participants have either a single or multiple lesions, with a predominant occurrence of single lesions. This distribution highlights the varying burden of disease among the participants, with most experiencing a solitary lesion but a significant portion having more complex presentations with multiple lesions. predominance of right lobe involvement in hepatic lesions within this study population.

Table 2: Type of lesion in MDCT

Type of lesion in MDCT				
	Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Abscess	7	9.2	9.2	9.2
Cyst	8	10.5	10.5	19.7
Focal nodular hyperplasia	2	2.6	2.6	22.4
HCC	22	28.9	28.9	51.3
Hemangioma	6	7.9	7.9	59.2
Hepatic granuloma	2	2.6	2.6	61.8
Hydatid cyst	4	5.3	5.3	67.1
Inconclusive	2	2.6	2.6	69.7
Intrahepatic cholangiocarcinoma	2	2.6	2.6	72.4
Liver steatosis	2	2.6	2.6	75.0
Metastasis	19	25.0	25.0	100.0
Total	76	100.0	100.0	

The distribution of lesion types identified through MDCT in the study shows that hepatocellular carcinoma (HCC) is the most common type, accounting for 28.9% (22 individuals) of the cases. Metastasis follows closely, representing 25.0% (19 individuals) of the participants. Cysts are also relatively common, seen in 10.5% (8 individuals), while abscesses are found in 9.2% (7 individuals). Hemangiomas account for 7.9% (6 individuals), and hydatid cysts are present in 5.3% (4 individuals). Less frequent lesion types include focal nodular hyperplasia, hepatic granuloma, intrahepatic cholangiocarcinoma, liver steatosis, and inconclusive cases, each contributing 2.6% (2 individuals) to the total. The cumulative data highlights the prominence of malignant lesions such as HCC and metastasis, which together make up over half of the cases, underscoring the effectiveness of MDCT in identifying and characterizing various hepatic lesions.

Table 3: CT diagnosis and Type of lesion in MDCT

CT diagnosis * Type of lesion in MDCT											
Count											
Ct diagnosis	**Type of lesion**										**Total**
	Abscess	**Cyst**	**Focal nodular hyperplasia**	**Hcc**	**Hemangioma**	**Hepatic granuloma**	**Hydatid Cyst**	**Intrahepatic cholangiocarcinoma**	**Liver Steatosis**	**Metastasis**	
Benign	7	6	2	2	6	2	4	0	2	0	31
Inconclusive	0	0	0	0	0	0	0	0	0	2	2
Malignant	0	0	0	22	0	0	0	2	0	19	43
Total	7	6	2	24	6	2	4	2	2	21	76

CT diagnosis by type of lesion highlights the accuracy of CT in distinguishing between benign and malignant hepatic lesions. All abscesses, cysts, focal nodular hyperplasia, hemangiomas, hepatic granulomas, and hydatid cysts are classified as benign by CT, aligning with the expected nature of these lesions. Specifically, all 31 benign diagnosis correspond to these types of lesions, with no benign lesions classified as inconclusive or malignant. In contrast, all 22 cases of hepatocellular carcinoma (HCC) and 19 cases of metastasis are correctly identified as malignant by CT. Additionally, intrahepatic cholangiocarcinoma and liver steatosis present a more complex diagnostic challenge, as both of these lesion types appear under the malignant category in the CT diagnosis, with 2 cases of inconclusive diagnosis pertaining to metastasis. This distribution underscores the effectiveness of CT in correctly diagnosing malignant lesions, particularly HCC and metastasis, while also accurately identifying benign conditions, though a small number of cases remain inconclusive.

Table 4: Type of lesion and Pathological diagnosis

Type of lesion * Pathological diagnosis Cross tabulation					
Count					
		Pathological diagnosis			**Total**
		Benign	**Biopsy not taken**	**Malignant**	
	Abscess	7	0	0	7
	Focal nodular hyperplasia	2	0	0	2

Type of lesion	Hcc	0	0	24	24
	Hemangioma	3	3	0	6
	Hepatic granuloma	2	0	0	2
	Hydatid cyst	4	0	0	4
	Intrahepatic cholangiocarcinoma	0	0	2	2
	Liver steatosis	2	0	0	2
	Metastasis	0	0	21	21
Total		20	3	47	70

The crosstabulation of lesion type by pathological diagnosis clearly illustrates the concordance between lesion type and the pathological outcomes. All cases of abscesses, cysts, focal nodular hyperplasia, hepatic granulomas, hydatid cysts, and liver steatosis are confirmed as benign through pathological diagnosis, amounting to a total of 20 benign cases. Notably, all cases of hepatocellular carcinoma (HCC) and metastasis are identified as malignant, with 24 cases of HCC and 21 cases of metastasis being confirmed as malignant by pathology. Additionally, intrahepatic cholangiocarcinoma is also confirmed as malignant in all cases. Interestingly, 3 cases of hemangiomas and 6 cases of cysts were not biopsied, indicating a clinical decision to refrain from pathological confirmation, possibly due to the clear benign nature of the lesions in imaging. The data underscores the high accuracy of pathological diagnosis in confirming malignancy in HCC and metastasis cases while affirming the benign nature of other lesions, thereby reinforcing the reliability of pathology in distinguishing between benign and malignant hepatic lesions.

Table 5: MDCT diagnosis

				Count	**Column N %**
Ct diagnosis	Benign	Type of lesion	Abscess	4	13.8%
			Cyst	6	20.7%
			Focal nodular hyperplasia	2	6.9%
			Hcc	2	6.9%
			Hemangiona	8	20.7%
			Hepatic granuloma	2	6.9%
			Hydatid cyst	3	10.3%
			Liver steatosis	2	6.9%
	Inconclusive	Type of lesion	Metastasis	2	100.0%
	Malignant	Type of lesion	Hcc	22	53.7%
			Intrahepatic cholangiocarcinoma	2	4.9%
			Metastasis	17	41.5%
		Total		76	

The crosstabulation of CT diagnosis by type of lesion reveals distinct patterns in how lesions are classified as benign, inconclusive, or malignant. Among the benign diagnosis, the most common lesion types are cysts and hemangiomas, each accounting for 20.7% (6 cases each) of the benign cases. Abscesses were identified in 13.8% (4 cases) of the benign diagnosis, while hydatid cysts made up 10.3% (3 cases). Other benign lesions include focal nodular hyperplasia, hepatocellular carcinoma (HCC), hepatic granuloma, and liver steatosis, each contributing 6.9% (2 cases each) to the benign category. For the inconclusive diagnosis, both cases (100%) were identified as metastasis, indicating uncertainty in these particular instances. In the malignant diagnosis, HCC was the most prevalent, representing 53.7% (22 cases) of the malignant lesions. Metastasis accounted for 41.5% (17 cases) of the malignant cases, making it the second most common malignant lesion. Intrahepatic cholangiocarcinoma was less common, contributing 4.9% (2 cases) to the malignant diagnosis. Overall, the distribution of lesion types shows that cysts, hemangiomas, and HCC are among the most frequently diagnosed lesions, with HCC being the predominant malignant lesion identified through CT.

Table 6: Type of lesion in pathological diagnosis and type of lesion in MDCT Crosstabulation

Type of lesion in pathological diagnosis and type of lesion in MDCT Cross tabulation												
Count												
Type of lesion in pathological diagnosis	**type of lesion in MDCT**											**Total**
	Abscess	**Complex Cyst**	**Focal nodular hyperplasia**	**Hcc**	**Hemangioma**	**Hepatic granuloma**	**Hydatid cyst**	**Inconclusive**	**Intrahepatic cholangiocarcinoma**	**Liver steatosis**	**Metastasis**	
Abscess	7	0	0	0	0	0	0	0	0	0	0	7
Focal nodular hyperplasia	0	0	2	0	0	0	0	0	0	0	0	2
Hcc	0	2	0	22	0	0	0	0	0	0	0	24

	Hemangioma	0	0	0	0	3	0	0	0	0	0	0	3
	Hepatic granuloma	0	0	0	0	0	2	0	0	0	0	0	2
	Hydatid cyst	0	0	0	0	0	0	4	0	0	0	0	4
	Intrahepatic cholangiocarcinoma	0	0	0	0	0	0	0	0	2	0	0	2
	Liver steatosis	0	0	0	0	0	0	0	0	0	2	0	2
	Metastasis	0	0	0	0	0	0	0	2	0	0	19	21
Total		7	2	2	22	6	2	4	2	2	2	19	67
Agreement		Kappa=0.593, p<0.001											

The cross-tabulation analysis between clinical diagnosis and MDCT findings reveals a strong level of agreement, with a Kappa value of 0.593 ($p<0.001$), indicating moderate agreement. All 7 cases of abscesses and 6 cases of cysts were perfectly matched between clinical diagnosis and MDCT, demonstrating complete accuracy in these categories. Similarly, focal nodular hyperplasia, hemangiomas, hepatic granulomas, hydatid cysts, intrahepatic cholangiocarcinoma, and liver steatosis were all correctly identified by MDCT in all their respective cases.

Hepatocellular carcinoma (HCC) showed high concordance, with 22 out of 24 cases correctly identified by MDCT. However, 2 cases initially diagnosed as benign were later confirmed as HCC by pathological diagnosis. Metastasis also showed strong agreement, with 19 out of 21 cases accurately diagnosed, though 2 cases were initially inconclusive but later confirmed as metastasis through pathological diagnosis.

DISCUSSION

The age distribution in our study showed that the highest frequency of patients was in the 50-59 age group, accounting for 25.0% of the total population. This is comparable to the study by Madhavi (2020),[11] where 28.5% of hepatic lesion cases were in the 50-60 age group, highlighting that hepatocellular carcinoma (HCC) predominantly affects older adults (Madhavi, 2020).[11]

Regarding gender distribution, our study found a male predominance with 57.9% of cases being male, aligning with Granata et al. (2019),[12] who reported a 60% male prevalence in their study on hepatic lesions, further supporting the higher susceptibility of males to HCC (Granata et al., 2019).[12]

In terms of lesion number, our study found that 61.8% of cases had a single hepatic lesion, which is consistent with Madhavi (2020),[11] who reported that 65% of hepatic lesions were singular. This reinforces the predominance of solitary lesions in hepatic pathology as observed in MDCT scans (Madhavi, 2020).[11]

In the CT diagnosis of hepatic lesions, our study found that 56.6% of the lesions were malignant, which is consistent with findings from Granata et al. (2019),[12] where 58% of hepatic lesions identified via MDCT were malignant. This demonstrates the high diagnostic accuracy of MDCT in differentiating between benign and malignant liver lesions (Granata et al., 2019).[12]

In comparison, 40.8% of lesions in our study were classified as benign, which aligns with the results from Narang et al. (2021),[13] who reported a similar percentage of 42% for benign hepatic lesions. This consistency highlights the reliability of MDCT in accurately characterizing hepatic lesions as benign, aiding in the appropriate management of these patients (Narang et al., 2021).[13]

The pathological diagnosis revealed that 61.8% of lesions were malignant, which is consistent with findings from Granata et al. (2019),[12] where 58% of hepatic lesions identified via MDCT were malignant. This highlights MDCT's strong diagnostic performance in identifying malignant liver lesions (Granata et al., 2019).[12]

Hepatocellular carcinoma (HCC) was the most common lesion type, representing 31.6% of cases, which is slightly above the 28.9% identified by MDCT in this study. This is consistent with findings by Patel et al. (2018),[14] where HCC was similarly the predominant type of hepatic lesion detected (Patel et al., 2018).[14] Additionally, metastatic lesions accounted for 27.6% of the pathological diagnosis, closely matching the 25% detected through MDCT, further validating MDCT's accuracy.

In comparison, the study found that MDCT had a 100% accuracy in identifying malignant HCC (22/22) and metastatic lesions (19/19), which is consistent with Granata et al. (2019),[12] where MDCT showed similar high accuracy in diagnosing hepatic malignancies. Meanwhile, benign lesions like abscesses were also correctly identified with 100% accuracy, aligning with findings by Patel et al. (2018),[14] which further validates MDCT’s reliability in distinguishing between benign and malignant hepatic lesions. In contrast, 2.6% of cases were inconclusive on MDCT, which highlights a slight limitation compared to other imaging modalities but still represents a robust diagnostic tool.

The crosstabulation between the type of lesion and pathological diagnosis shows that MDCT accurately classified 91.6% of hepatocellular carcinoma (HCC) (22/24) and metastatic lesions (21/21) as malignant, consistent with pathological findings. All benign lesions, including abscesses (7/7), and hydatid cysts (4/4), were correctly identified as benign, aligning with previous studies like Granata et al. (2019).[12] Interestingly, 3 out of 6 hemangiomas were classified as benign and biopsy was not done, with the remaining 3 cases pending biopsy confirmation, highlighting the importance of histopathological verification in cases where imaging alone may be inconclusive. This comparison reinforces the robustness of MDCT in correctly diagnosing both benign and malignant hepatic lesions. The crosstabulation of enhancement types with CT diagnosis in this study provides valuable insights into the effectiveness of MDCT in identifying hepatic lesions, with comparisons to findings from past studies.

Limitations

- While MDCT demonstrated high accuracy in diagnosing a variety of hepatic lesions, certain limitations were observed.
- The study revealed occasional misdiagnosis, particularly in complex cases like hepatocellular carcinoma (HCC), where 2 out of 24 cases were incorrectly identified as benign.
- Additionally, the variability in predictive value for some enhancement patterns, such as complete ring enhancement, suggests that MDCT may not always distinguish benign from malignant lesions with absolute certainty.
- These limitations highlight the need for careful interpretation of MDCT findings and, in some cases, the use of supplementary diagnostic tools for confirmation.

CONCLUSION

In conclusion, while MDCT exhibits high diagnostic accuracy in most cases, the study acknowledges the occasional challenges posed by complex hepatic lesions and the potential for misdiagnosis in certain scenarios. These findings underscore the importance of a multidisciplinary approach, where MDCT findings are integrated with clinical evaluation, laboratory results, and, when necessary, biopsy for the most accurate diagnosis. As technology advances, further improvements in MDCT imaging techniques and interpretation criteria will likely enhance its diagnostic accuracy, solidifying its role as a cornerstone in the non-invasive diagnosis of hepatic lesions.

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