

ROLE OF 128 SLICE MULTIDETECTOR COMPUTED TOMOGRAPHY IN EVALUATION OF CHOLESTATIC JAUNDICE

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Abstract

Background: Objectives: To assess the role of MDCT in Cholestatic jaundice for

1. Ascertaining the anatomical level of obstruction, 2. Determining the cause of obstruction, 3. To characterize the lesions of benign and malignant etiology, 4. To correlate MDCT findings with histopathology/operative findings/Endoscopic Retrograde Cholangiopancreatography (ERCP) findings as applicable. **Materials And Methods: Study Design and Place Of Study:** A retrospective cohort study was carried out in the Department of Radio diagnosis and imaging at Gandhi hospital, Secunderabad. **Study Subjects:** The study comprises of 65 patients including 39 males and 26 females, age ranging from 17 to 80 years. **Methodology:** Patients with clinically suspected cholestatic jaundice were evaluated on imaging by MDCT. CT scan was performed on 128 slice HITACHI SCENERIA scanner. Imaging findings are correlated with standard reference procedures which include ERCP, histopathology and operative findings. **Results:** 65 patients of cholestatic jaundice who underwent both MDCT and ERCP were evaluated. Among this 39 were male and 26 were female with 42 patients had benign etiology while 23 patients had malignant etiology. Among 42 lesions of benign etiology 18 patients had choledocholithiasis, 5 patients had chronic pancreatitis, 5 patients had cholangitis, 5 had benign stricture, 1 had Mirizzi's syndrome, 1 had secondary sclerosing cholangitis, 1 had walled off necrosis of pancreas, 1 had pseudocyst, 1 had portal cavernoma causing obstructive jaundice, 1 sludge, 1 acalculous cholecystitis, 1 ruptured aberrant cystic artery aneurysm with haemobilia and 1 acute interstitial pancreatitis. Among malignant etiology 16 patients had periampullary tumors(8 ampullary carcinoma, 5 ca head of pancreas and 3 distal cholangiocarcinoma), 5

cholangiocarcinoma (4 hilar and 1 intrahepatic), 1 hepatocellular carcinoma and 1 gall bladder carcinoma causing obstructive jaundice. The level of obstruction among 65 patients is as follows: 41 patients distal CBD, 9 mid CBD, 9 hilar and 3 intrahepatic biliary radicles. **Conclusion:** MDCT with good reformatting techniques has excellent accuracy in the evaluation of cholestatic jaundice with regards to the level and cause of obstruction. MDCT using reconstructive techniques such as MinIP and MPR constitutes a fast and non-invasive imaging technique with high diagnostic accuracy in detection of biliary pathologies and to characterize the lesions of benign and malignant etiology. It is also considered a promising diagnostic tool and used as an alternative to ERCP or PTC in the assessment of patients with bile duct obstruction.

Keywords: MDCT, jaundice, biliary obstruction

Introduction

Obstructive jaundice is a common surgical problem that happens when there is a blockage to the passages of conjugated bilirubin from liver cells to the intestine. Causes of biliary obstruction can be divided into intrahepatic or extrahepatic causes and can be divided also according to its pathology into benign or malignant causes. Ultrasound is the initial imaging technique as a non-invasive cost-effective modality for evaluating the biliary obstruction but of lower sensitivity and specificity with limited value in the evaluation of the peripheral intrahepatic ductal lesions. Magnetic resonance cholangiopancreatography (MRCP) is considered the most reliable non-invasive technique that produces high-contrast and high-resolution images of the biliary tree and allows the evaluation of the solid organs. However, contraindications including patients with cardiac pacemakers, cerebral aneurysm clips, or claustrophobia added to that high cost and not readily available. Direct cholangiography percutaneous cholangiography (PTC) or endoscopic retrograde cholangiopancreatography (ERCP) is considered the gold standard technique. They enable direct visualization of the biliary tree and at the same time propose the therapeutic intervention. The drawbacks include invasiveness and even life-threatening complications. Recently, in the last decade, multidetector computed tomography (MDCT) has led to the acquisition of true isotropic voxels that can be post-processed to yield images in any plane. The combined use of multiplanar reformatting (MPR) and minimum intensity projection (MinIP) techniques significantly improves the visualization of the biliary ducts and their site of confluence compared with those obtained by axial CT. Moreover, MinIP technique enables us to depict the small biliary duct and the pancreatic duct more clearly.

Aims And Objectives

To assess the role of MDCT in Cholestatic jaundice for

1. Ascertain the anatomical level of obstruction.
2. Determining the cause of obstruction.
3. To characterize the lesions of benign and malignant etiology.
4. To correlate MDCT findings with histopathology/operative findings/Endoscopic Retrograde Cholangiopancreatography (ERCP) findings as applicable.

Materials And Methods

- **STUDY DESIGN AND PLACE OF STUDY:** A retrospective cohort study was carried out in the Department of Radio diagnosis and imaging at Gandhi hospital, Secunderabad.
- **STUDY SUBJECTS:** The study comprises of 65 patients including 39 males and 26 females, age ranging from 17 to 80 years.

Methodology

Patients with clinically suspected cholestatic jaundice were evaluated on imaging by MDCT. CT scan was performed on 128 slice HITACHI SCENERIA scanner. Imaging findings are correlated with standard reference procedures which include ERCP, histopathology and operative findings.

Results

Table 1

SEX	NUMBER OF PATIENTS	PERCENTAGE
MALE	39	60%
FEMALE	26	40%

Table 2

FINAL DIAGNOSIS OF CAUSE OF OBSTRUCTION	NUMBER OF PATIENTS	PERCENTAGE
CHOLEDOCHOLITHIASIS	18	27%
CHRONIC PANCREATITIS	5	7.6%
CHOLANGITIS	5	7.6%
BENIGN STRICTURE	5	7.6%
GB NECK CALCULUS WITH CBD OBSTRUCTION	1	1.5%
SECONDARY SCLORISING CHOLANGITIS	1	1.5%
WALLED OFF NECROSIS WITH CBD OBSTRUCTION	1	1.5%
PSEUDOCYST OF PANCREAS	1	1.5%
PORTAL CAVERNOMA	1	1.5%
SLUDGE	1	1.5%
ACUTE CHOLECYSTITIS	1	1.5%
CYSTIC ARTERY ANEURYSM	1	1.5%
ACUTE PANCREATITIS	1	1.5%
PERIAMPULLARY CARCINOMA	8	12.3%
CHOLANGIOCARCINOMA	8	12.3%

CARCINOMA HEAD OF PANCREAS	5	7.6%
HEPATOCELLULAR CARCINOMA	1	1.5%
CARCINOMA GALL BLADDER	1	1.5%

Table 3: LEVEL OF OBSTRUCTION

LEVEL OF OBSTRUCTION	NUMBER OF PATIENTS	PERCENTAGE
DISTAL	41	63%
MID	9	13.8%
HILAR	9	13.8%
INTRAHEPATIC	3	4.6%

Table 4: MDCT AND GOLD STANDARD METHOD DIAGNOSIS OF THE STUDIED CROSS SECTION

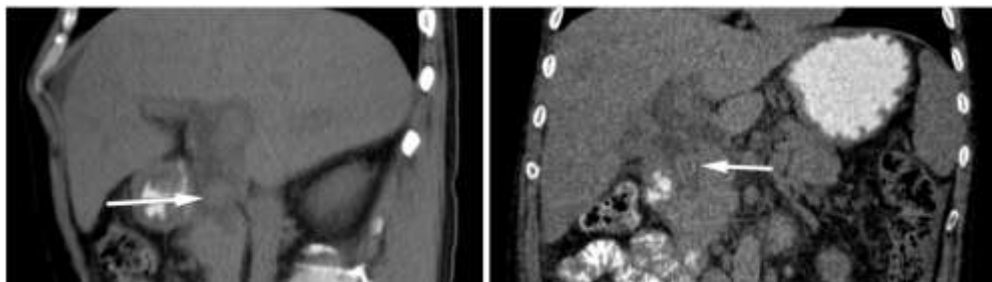
DIAGNOSIS	MDCT		GOLD STANDARD METHOD	
	Number	Percentage	Number	Percentage
BENIGN ETIOLOGY	40	61.5%	42	64.6%
MALIGNANT ETIOLOGY	22	33.8%	23	35.4%
NEGATIVE	3	3%	--	--
TOTAL	65	100%	65	100%

Results

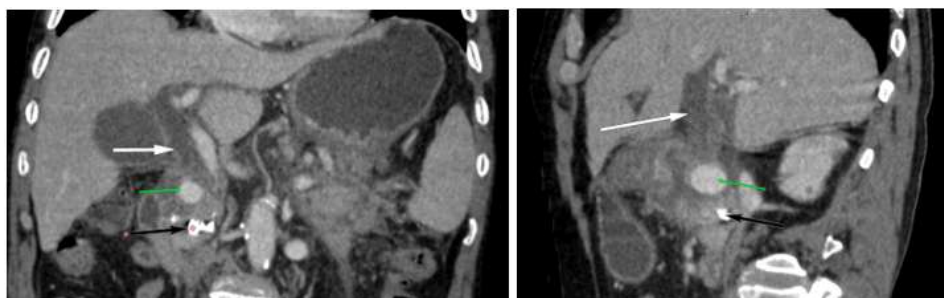
- 65 patients of cholestatic jaundice who underwent MDCT were evaluated.
- Among this 39 were male and 26 were female with 42 patients had benign etiology while 23 patients had malignant etiology.
 - Among 42 lesions of benign etiology, 18 patients had choledocholithiasis, 5 patients had chronic pancreatitis, 5 patients had cholangitis, 5 had benign stricture, 1 had Mirizzi's syndrome, 1 had secondary sclerosing cholangitis, 1 had walled off necrosis of pancreas, 1 had pseudocyst, 1 had portal cavernoma causing obstructive jaundice, 1 sludge, 1 acalculous cholecystitis, 1 ruptured aberrant cystic artery aneurysm with haemobilia and 1 acute interstitial pancreatitis.
 - Among malignant etiology 16 patients had periampullary tumors (8 ampullary carcinoma, 5 carcinoma head of pancreas and 3 distal cholangiocarcinoma), 5 cholangiocarcinoma (4 hilar and 1 intrahepatic), 1 hepatocellular carcinoma and 1 gall bladder carcinoma causing obstructive jaundice.

- The level of obstruction among 65 patients is as follows: 41 patients had distal CBD obstruction, 9 patients had mid CBD obstruction, 9 hilar obstruction and 3 intrahepatic biliary radicles obstruction.

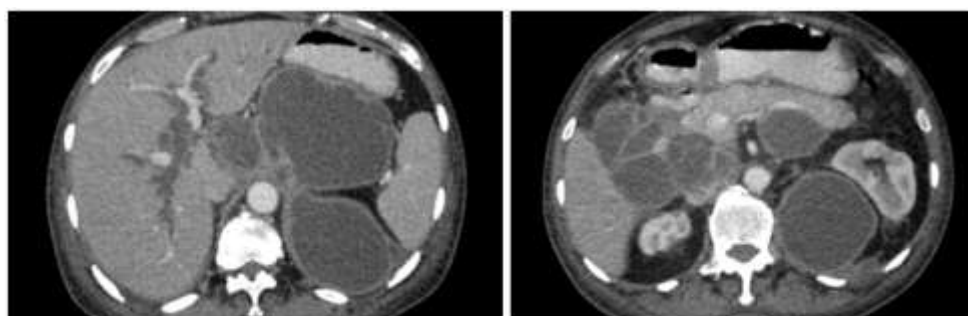
CASE 1 – 38 YEAR MALE WITH CHOLEDOCHOLITHIASIS IN DISTAL CBD WITH UPSTREAM DILATATION OF PROXIMAL CBD AND CENTRAL INTRA HEPATIC BILIARY RADICLES DILATATION



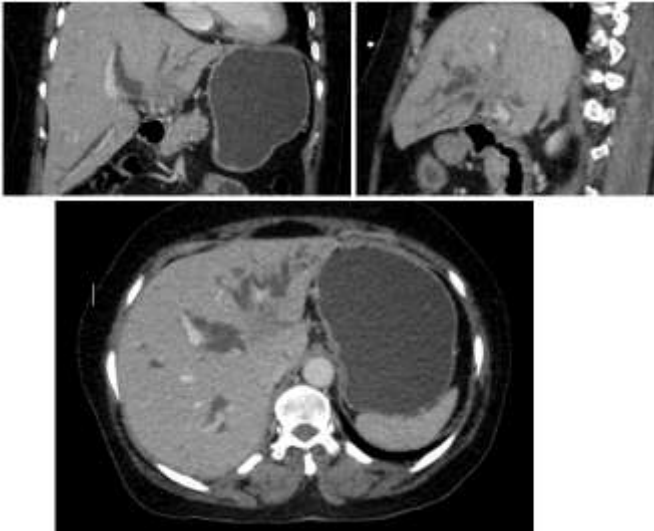
CASE 2 - ACUTE ON CHRONIC PANCREATITIS WITH DISTAL CBD STRICTURE WITH GASTRODUODENAL ARTERY ANEURYSM CAUSING OBSTRUCTIVE JAUNDICE



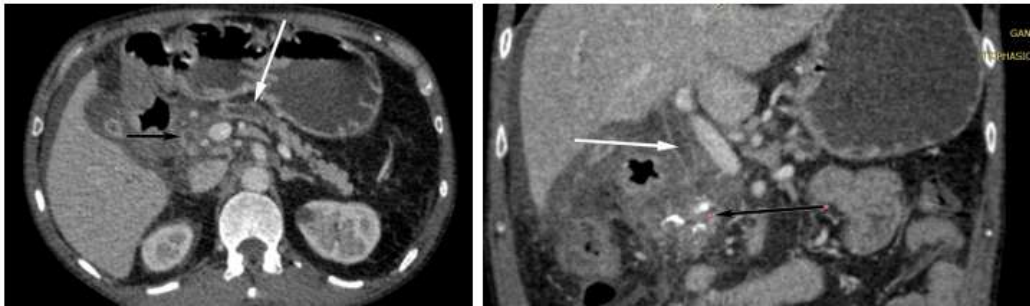
CASE – 3 PSEUDOCYST OF PANCREAS CAUSING OBSTRUCTIVE JAUNDICE



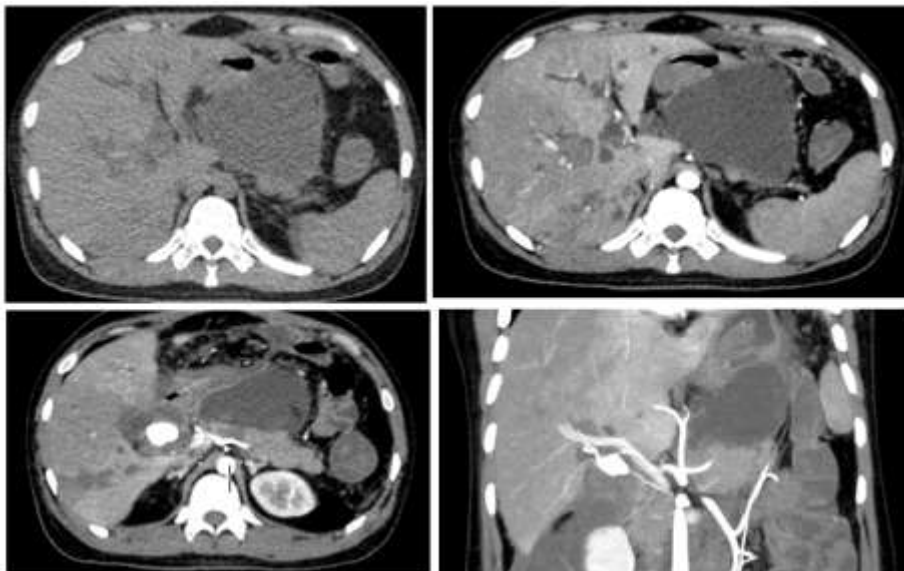
CASE 4 - KLATSKIN TUMOR WITH BILOBAR INTRA HEPATIC BILIARY RADICLES DILATATION IN 52 YEARS FEMALE



CASE 5 - CARCINOMA HEAD OF PANCREAS WITH DOUBLE DUCT SIGN



CASE 6 - RUPTURED ABERRANT CYSTIC ARTERY (ARISING FROM SUPERIOR MESENTERIC ARTERY) ANEURYSM CAUSING OBSTRUCTIVE JAUNDICE IN 28 YEARS MALE



Discussion

- Our study showed a higher prevalence for male gender to biliary obstruction than for females.
- Regarding the most affected age group, our study showed that 60–70 years is the most affected age group.
- In our study, it was found that calculous obstructive jaundice was the main cause of benign obstructive jaundice (27%).
- Regarding the nature of the cause of biliary obstruction, our study showed benign dominance by 64.6% compared to 35.4% for malignant.

Conclusion

- MDCT with good reformatting techniques has excellent accuracy in the evaluation of cholestatic jaundice with regards to the level and cause of obstruction.
- MDCT using reconstructive techniques such as MinIP and MPR constitutes a fast and non-invasive imaging technique with high diagnostic accuracy in detection of biliary pathologies and to characterize the lesions of benign and malignant etiology. It is also considered a promising diagnostic tool and used as an alternative to ERCP or PTC in the assessment of patients with bile duct obstruction.

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