



Radiodiagnosis

A STUDY ON THE ROLE OF MAGNETIC RESONANCE CHOLANGIOPANCREATICOGRAPHY IN EVALUATING PANCREATICO-BILIARY DISEASES

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ABSTRACT In this cross sectional study, 30 patients with suspected pancreatico-biliary pathologies who under went Magnetic resonance cholangio pancreaticography (MRCP) over a period of 2 years were included. Mrcp findings are correlated with ultrasonography, computed tomography, ERCP and postoperative findings. Frequency of incidence of various pancreatico-biliary pathologies, their age wise and sex wise distribution were studied. In the present study there is male preponderance and male to female ratio being 1.5:1. Pancreatitis predominated in both males (33.4 %) and females (33.4%) followed by cholangiocarcinoma. Presence of biliary stricture and their location in biliary tree were also studied. This study revealed, both benign and malignant strictures are equally common in occurrence. The present study also revealed, proximal and distal CBD malignant strictures are equally common whereas proximal CBD benign strictures (83.3%) are more common than distal CBD benign strictures (16.7%). There is now enough evidence to suggest that the efficacy of MRCP is at par with that of ERCP and can be considered as the gold standard for evaluation of the pancreatico – biliary system.

KEYWORDS : Magnetic resonance cholangio pancreaticography, MRCP, pancreatico-biliary pathologies.

INTRODUCTION

Biliary obstruction may be due to a variety of causes including choledocholithiasis, tumours, and trauma etc. Neoplasms of the bile and pancreatic ducts present major challenge both for diagnosis and treatment. Ultrasonography is the first-line imaging investigation in patients with jaundice or right upper-quadrant pain. Ultrasonography is very operator and patient dependent and has limitations especially in the evaluation of the distal CBD where bowel gas, debris, fluid in the duodenum and obesity can degrade the image quality. CT scan also has its share of limitations, especially in demonstrating important pathology, biliary stones.

Endoscopic retrograde cholangiopancreatography (ERCP) is currently the 'gold standard' for the diagnosis of biliary obstruction. ERCP is a very operator dependent and invasive procedure and it is associated with 1-7% related morbidity and 0.2%-1% mortality.

Magnetic resonance cholangiopancreatography (MRCP) is a noninvasive diagnostic technique that was developed for the visualization of the biliary and pancreatic ducts. MRCP has potentially two major advantages in neoplastic pancreatico-biliary obstruction. Firstly, MRCP can directly reveal extraductal tumor whereas ERCP depicts only the duct lumen. Second, MRCP lacks the major complication rate of approximately 3% associated with ERCP such as sepsis, bleeding, bile leak and death. MRCP with its inherent high contrast resolution, rapidity, multiplanar capability and virtually artifact free display of anatomy and pathology in this region is proving to be examination of choice in patients with pancreatico-biliary diseases.

AIMS AND OBJECTIVES

To describe the Magnetic Resonance Cholangio-Pancreatography (MRCP) appearance in pancreatico-biliary disease and to prove that Magnetic Resonance Cholangio-Pancreatography (MRCP) is one of the best imaging modality for evaluation of pancreatico-biliary disease and it can also be used as a screening modality for the same.

MATERIALS AND METHODS

STUDY PLACE

The present study is conducted in Department of Radiology, Alluri Sitarama Raju Academy of Medical sciences, Eluru.

STUDY DURATION

The present study is conducted over a period of two years commencing from November 2015 to October 2017.

STUDY POPULATION

SAMPLE SIZE

The study comprised a total of 30 patients referred to radiology department with suspected pancreatico-biliary disease who met the following inclusion criteria.

INCLUSION CRITERIA

All in-patient and out-patient cases including both sex of any age preferred for MRCP in clinically suspected cases of pancreatico-biliary disease attending Alluri Sitarama Raju Academy of Medical sciences, Eluru over a period of two years.

EXCLUSION CRITERIA

Patients having Cardiac pacemakers, prosthetic heart valves, cochlear implants or any metallic orthopedic implants.

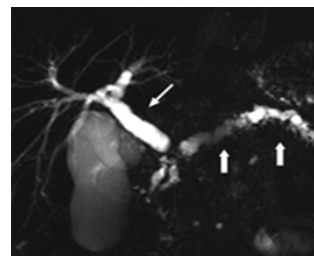
EQUIPMENT

The patients were scanned using 1.5 Tesla Siemens make Magnetom Avanto (superconducting Magnet) 16 channeled Tim Dot system MRI machine.

OBSERVATIONS & RESULTS

A total of Thirty patients who were clinically diagnosed as having pancreatico-biliary diseases were sent for MRCP and were included in the present study.

Fig: 1. PERIAMPULLARY CARCINOMA



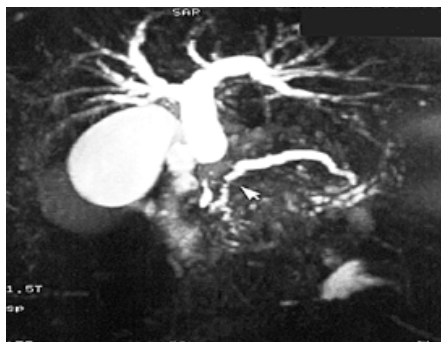
MRCP image showing dilatation of CBD and PD with GB distention suggestive of mass lesion in pancreatic head

Fig: 2. CAROLI'S DISEASE



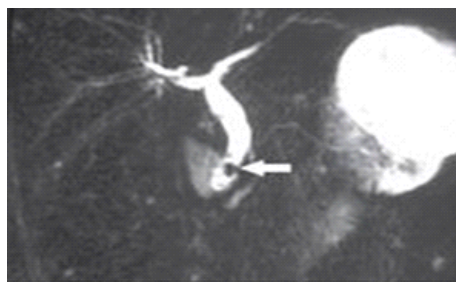
Multiple dilated intrahepatic bile radicles suggestive of Caroli's disease

Fig: 3. CHRONIC PANCREATITIS



MRCP image showing irregular dilated MPD and atrophic pancreas. Signal void areas (arrows) are related to calcifications.

Fig:4 CHOLEDOCHOLITHIASIS



Coronal MRCP images showing filling defect in distal CBD calculus

TABLE NO.01: SEX WISE DISTRIBUTION OF VARIOUS DISEASES AS OBSERVED ON MRCP.

Type of disease	Males	Percentage (%)	Females	Percentage (%)
Biliary atresia	01	5.6	00	00
Choledochal cyst	01	5.6	01	8.3
Choledocholithiasis	01	5.6	03	25
Post operative stricture	01	5.6	00	00
Cholangiocarcinoma	03	16.6	03	25
Carcinoma gall bladder	00	00	01	8.3
Pancreatitis	06	33.4	04	33.4
Carcinoma pancreas	02	11	00	00
Periampullary carcinoma	03	16.6	00	00
Total	18	100%	12	100 %

In the present study the pancreatitis predominated in both males (33.4 %) and females (33.4%) followed by cholangiocarcinoma.

TABLE NO.02: DISTRIBUTION OF SITE OF MALIGNANT STRICTURE IN PANCREATICO-BILIARY SYSTEM AS OBSERVED ON MRCP.

Site of Malignant Stricture	No. of Patients	Percentage (%)
Right Main Hepatic Duct	1	16.7
Left Main Hepatic Duct	0	0
Confluence of Right and Left Main Hepatic Ducts	1	16.7
Proximal CBD	2	33.3
Distal CBD	2	33.3
Total	6	100 %

The present study revealed, proximal and distal CBD malignant strictures are equally common.

TABLE NO.03: DISTRIBUTION OF SITE OF STRICTURE AMONG BENIGN PANCREATICO-BILIARY SYSTEM AS OBSERVED ON MRCP.

Site of benign stricture	No. of patients	Percentage (%)
Proximal CBD	5	83.3
Distal CBD	1	16.7
Total	6	100%

The Present study revealed proximal CBD benign strictures are more common than distal CBD benign strictures.

DISCUSSION

Evaluation of suspected biliary obstruction has traditionally involved a variety of imaging modalities including ultrasonography (US), computed tomography (CT) and invasive cholangiography. These techniques have limitations because of poor visualization of intraductal stones on US and CT and the need for invasive procedures like ERCP and PTC. MRCP is a non-invasive imaging modality that provides good visualization of the hepato biliary system.

6 Cases of cholangiocarcinoma were evaluated. In one case of cholangiocarcinoma diagnosed by MRI there was infiltration into the gallbladder and minimal local spread. Per operative findings were those of carcinoma of gallbladder. This is a known limiting factor on imaging when both, the gall bladder and bile duct are involved. MRI helped in defining the level, extent and staging of the disease in the pre surgical evaluation. Guibaud et al, Barish MA and Soto and Amandeep Singh, Harkaran Singh Mann, Chuni Lal Thukral, and NeetiRajan Singh who concluded their studies with sensitivities ranging from 80-86% and specificities of 96-100% and diagnostic accuracies of 91-100% for level of obstruction.

In 3 cases of periampullary carcinoma, MRI was able to delineate the extent, level and local infiltration and helped in staging of the lesion. The assessment of the periampullary lesions was difficult on ultrasound in obese patients and bowel gas shadows was also a limiting factor. Sugita et al in his study of 25 cases of periampullary tumors reported a sensitivity 88%, specificity 100 and diagnosis accuracy of 96%.

Morphology of the gland can be seen but the caliber of main pancreatic duct was difficult to visualize.

In 4 cases of choledocholithiasis, MRCP clearly shows the IHBR dilatation, caliber of CBD and the site of the calculus, especially in the distal CBD which is difficult to visualize on ultrasound. Varghese et al who reported 91% sensitivity, specificity of 98% and diagnostic accuracy of 97% on MRCP. AnkurMandelia, Arun Kumar Gupta, Devendra Kumar Verma, and Sanjeev Sharmareported 95% sensitivity, specificity of 90% and diagnostic accuracy of 93% on MRCP.

In 2 cases of choledochal cysts, MRCP yielded diagnostic information by providing exact anatomic map in pre surgical evaluation. Kim et al in his study of 20 patients concluded the same.

In 1 case of biliary atresia, MRCP detected with an accuracy of 100%. SeokJooan and Myung-Jun Kim in a study of 47 patients showed MRCP had a sensitivity, specificity and diagnostic accuracy of 100%, 96% and 98% respectively. Ultrasound serves as good initial modality for evaluation in neonates presenting with cholestatic jaundice.

CONCLUSION

The introduction of MRCP now readily permits the study of anatomy and pathology of the biliary tree including pancreatic duct very easily.

Based on the results of our study the following conclusions can be made:

- MRI serves as an accurate and noninvasive, non-ionizing imaging method for evaluation of pancreatico-biliary anatomy and pathology.
- Ultrasound still remains the primary investigative modality of choice.
- Combination of MRI and MRCP allows safe surgical management decisions.
- Potentially useful in patients undergoing biliary enteric anastomosis for knowing the level and extent of strictures.
- Very useful tool in case of obese patients and children.
- Drawbacks
 - a) Claustrophobia
 - b) No therapeutic and interventional procedures can be carried out
 - c) Breath holding is not possible in elderly, children and debilitated patients
 - d) Time consuming.

There is now enough evidence to suggest that the efficacy of MRI and

MRCP is at par with that of ERCP and can be considered as the gold standard for evaluation of the pancreatic – biliary system.

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