

# Comparison Of Diagnostic Accuracy Between USG And MRCP In Biliary And Pancreatic Pathology

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## Abstract

**OBJECTIVE :-** To evaluate the diagnostic accuracy between USG & MRCP in the patients suspected of biliary and pancreatic pathology.

**MATERIAL & METHODS :** Fifty patients attending the hospital of all age groups and both sexes, suspected of biliary and pancreatic pathology, were examined first by USG and followed by MRCP, and findings were correlated with ERCP and biopsy report.

**RESULTS :-** Out of 50 patients 38 patients had biliary pathology and 12 patients had pancreatic pathology. Out of this, MRCP was 98 % accurate in diagnosis when results were compared in all cases. USG didn't help in case of CBD stricture, in evaluating Pancreatic duct into Chronic pancreatitis and in lower end of CBD pathology.

**CONCLUSION :-** USG is the cheap and easily available modality so, it is the primary investigative modality for suspected patients of biliary and pancreatic pathology, but MRCP has high diagnostic value.

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**Keywords:** Biliary pathologies, pancreatic lesions, MRCP, USG

## INTRODUCTION:-

MRCP(magnetic resonance cholangiopancreatography) is emerging as an exciting tool for the non- invasive evaluation of the pancreatic and biliary ductal system [1, 2, 3].

Non invasive imaging modality such as Ultrasonography and CT Scan are often the primary imaging modality in the evaluation of the biliary tree and pancreatic ducts [4, 5].

So, Two noninvasive, nonradiating modalities for the evaluations of pancreatic and biliary duct system are USG & MRCP.

## AIM :-

Comparison of diagnostic accuracy between USG and MRCP in the patients of suspected biliary and pancreatic pathology in V.S.Hospital.Ahmedabad Gujarat from July 2003 to July 2004.

## MATERIALS AND METHODS:-

Fifty patients of all age groups including both sexes of suspected biliary and pancreatic pathology were subjected to real time Ultrasonographic examination of biliary tree (IHBR, CHD, CBD, CYSTIC DUCT), GB and pancreas including Main Pancreatic Duct (Esaote, 3.5 to 10 MHz probes used for study), subsequently followed by MRCP (PHILIPS, 0.5 tesla machine used for study).Results were compared with either ERCP or biopsy with histopathological reports and post-operative findings.

## RESULTS:-

Comparison of diagnostic accuracy between USG & MRCP in the patients of suspected biliary pathology (Table no.1)

In our study, patients of biliary pathology especially stricture and mass lesions in lower part of CBD were better evaluated by MRCP.

In patients with Klatskin tumor, in which hepatic ducts

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TABLE NUMBER - 1

Diagnosis	No of cases	USG Dx accuracy	MRCP Dx accuracy
(A) Congenital Choledochal cyst	5	100 %	100%
(B) Duct calculi	16		
In lower end of CBD	12	25%	100%
In CHD	1	100%	100%
In mid part of CBD	3	66.6%	100%
(C) Stricture	8		
Benign	2	0%	100%
Malignant	4	25%	100%
Post operative patients	2	0%	100%
(D) Mass lesion	9		
Klatskin tumor	6	83%	100%
Periampullary mass	2	50%	50%
GB mass	1	100%	100%
Total	38		



FIGURE 1a :- USG - CBD is dilated upto lower end, calculi could not be not seen.

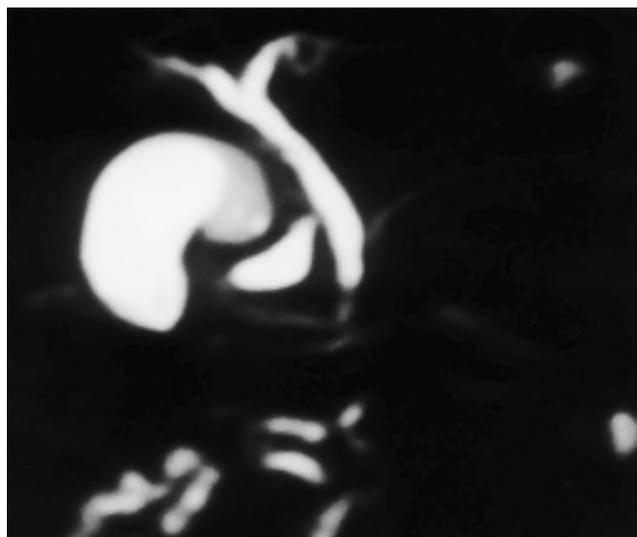


FIGURE 1b :- MRCP - CBD is dilated upto lower end, calculi seen at distal end.

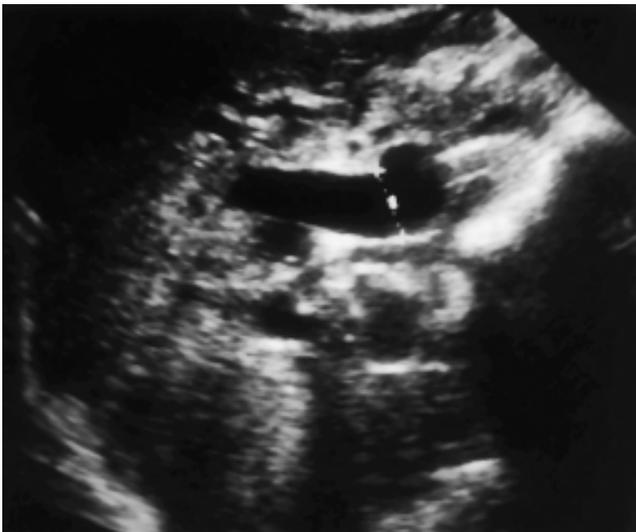


FIGURE 2a :- USG - Markedly dilated CBD upto lower end, cause could not be evaluated.

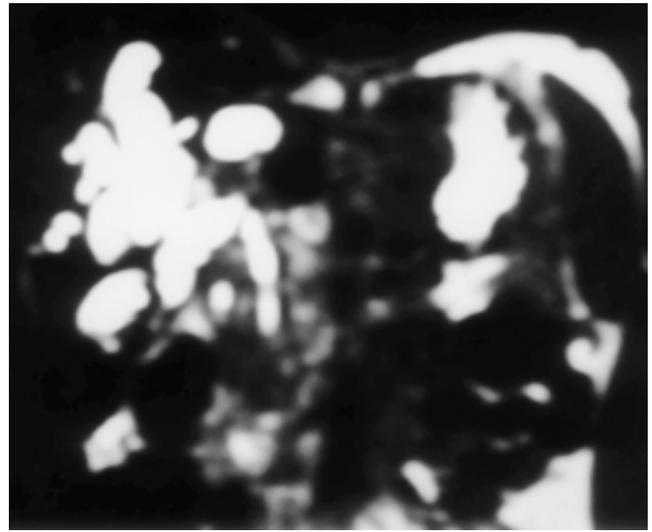


FIGURE 3b :- MRCP - Right Hepatic duct is more dilated than left hepatic duct suggestive of right hepatic duct is more involved in Klatskin tumor than left hepatic duct.

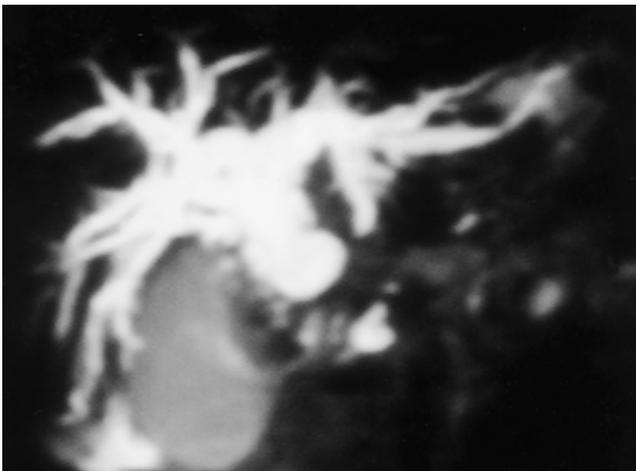


FIGURE 2b :- MRCP - Markedly dilated CBD upto lower end, malignant stricture at lower end by mass in lower end of CBD.



FIGURE 4a :- USG - Dilated Common Hepatic duct, Gall Bladder not Seen, history of cholecystectomy before 2 months, CBD not seen.



FIGURE 3a :- USG - Markedly dilated both hepatic ducts and IHBR, Common Hepatic Duct not seen-suggestive of Klatskin tumor.

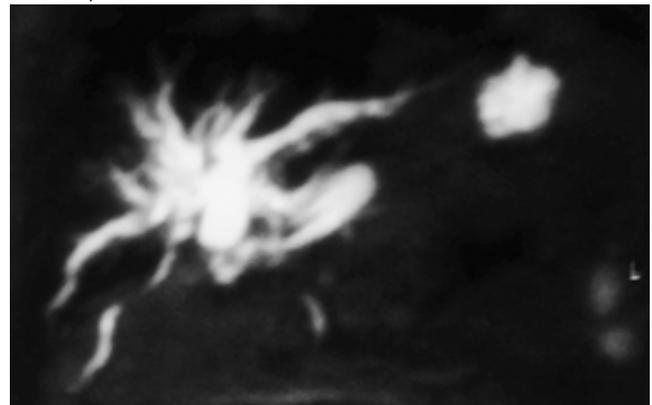


FIGURE 4b :- MRCP - Post -operative (cholecystectomy) stricture at lower end of Common Hepatic Duct.

were more involved were better evaluated by MRCP. (Fig 3a & 3b) Post-operative (cholecystectomy) strictures were better diagnosed by MRCP. (Fig 4a & 4b)

In all cases of chronic pancreatitis, calcification was better seen on Ultrasonography, but pancreatic duct dilatation, pancreatic duct irregularity, tortuosity and calculi in pancreatic duct were well demonstrated only by MRCP. (Fig 5a & 5b)



FIGURE 5a :- USG - Pancreatic calcification is better seen in chronic pancreatitis.

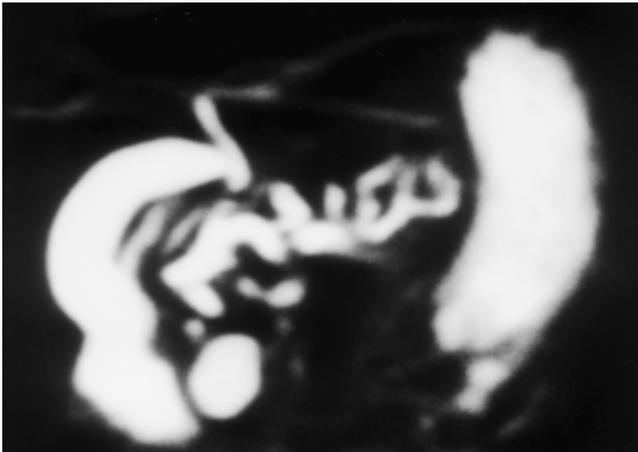


FIGURE 5b :- MRCP - Main pancreatic duct and its branches are irregular, tortuous and dilated.

ERCP, histopathological reports and per and post-operative findings were compared. MRCP was 98% accurate in diagnosis of diseases.

False negative result in one patient was due to technical problem. In this patient MRCP diagnosis was mass lesion in 2nd part of duodenum, but per operation mass was in

the head of pancreas.

#### DISCUSSION:-

Two noninvasive, nonradiating modalities for evaluation of biliary & pancreatic pathology are USG & MRCP.

Magnetic resonance cholangiopancreatography (MRCP) is a radiologic technique that produces images of the pancreaticobiliary tree that are similar in appearance to those obtained by invasive radiographic methods, such as endoscopic retrograde cholangiopancreatography (ERCP)

The basic principle underlying MRCP is that body fluids, such as bile and pancreatic secretions, have high signal intensity on heavily T2-weighted magnetic resonance sequences (i.e., they appear white), whereas background tissues generate little signal (i.e., they appear dark) [6].

Since its introduction by wallner et al in 1991[7], MRCP has undergone tremendous technical changes essentially in the search for an optional imaging sequence. In 1991 - wallner BK et al introduced MRCP used a breath hold two dimensional, T-2 gradient echo sequence using steady state Free Precession (SSFP) [7]. Marimoto improved image quality by introducing - 3D SSFP sequences [3]. Modified FSE sequences were introduced recently. These are the RARE (Rapid Acquisition with Rapid Enhancement sequence) and HASTE (half fourier acquisition single shot turbo spin echo sequences). So, now HASTE & RARE sequence used and ideal choalangiographic sequence for MRCP are a combination of HASTE & RARE takes only 10 minutes imaging time [8].

Currently, diagnostic accuracy of MRCP is considered to be equivalent to ERCP for a broad spectrum of benign and malignant pancreatic & biliary diseases [9].

Ultrasonography has limitation especially in the evaluation of distal CBD where bowel gas, debris/ fluid in the duodenum and obesity can degrade the image quality [4, 5]. Other imaging modalities are invasive, hence MRCP is an excellent modality for evaluation of biliary and pancreatic diseases.

Meta-analysis including 67 patients study shows that MRCP is 97% sensitive & 98% specific for defining the biliary tract obstruction [10]. The overall sensitivity, specificity and accuracy of MRCP in the detection of bile duct lesions were 97%, 98% and 97%, respectively [11].

Specificities for detecting chronic pancreatitis-99% [12]. Results of studies show clearly that USG is not able to diagnose cases of stricture, mass lesion, calculi in lower

end of CBD.

#### CONCLUSION:-

In the patients of suspected biliary and pancreatic pathology, USG is the primary imaging modality of choice, but it has very less diagnostic accuracy in evaluation of benign, malignant stricture of lower end of CBD, calculi in lower end of CBD, congenital anatomical variants, post-operative biliary tree anatomy and pathology.

So, MRCP based on heavily T-2 weighted images (HASTE & RARE sequences) produces remarkable increased contrast between stagnant fluid (bile) and background (abdominal fat, hepatic, pancreatic parenchyma) has almost 100% diagnostic accuracy.

So, all patients having biliary and pancreatic pathology, not clearly diagnosed by USG must be evaluated by MRCP for diagnostic accuracy.

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