

# Accuracy of Magnetic Resonance Cholangiopancreatography versus Endoscopic Retrograde Cholangiopancreatography in Pancreaticobiliary Disorders

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## Abstract

**Introduction:** Magnetic resonance cholangiopancreatography (MRCP) is an alternative to diagnostic endoscopic retrograde cholangiopancreatography (ERCP) for investigating biliary obstruction.

**Aim:** The aim of the study was to compare the findings of MRCP with those of ERCP in pancreaticobiliary disorders.

**Materials and Methods:** Patients who were having a history of obstructive jaundice, pain abdomen, and cholangitis were included. 25 patients with these symptoms underwent MRCP using 1.5 Tesla Siemens symphony magnetic resonance imaging scanner. The results were compared with ERCP.

**Results:** Both MRCP and ERCP were fails to detect some type of causes. They are 4% cases of stricture and 20% cases of normal in MRCP. ERCP has failed in detecting cases in all most all the type expect calculus.

**Conclusion:** MRCP is able to determine accurately more cases than ERCP in both cause and extent of obstruction.

**Key words:** Biliary obstruction, Endoscopic retrograde cholangiopancreatography, Magnetic resonance cholangiopancreatography

## INTRODUCTION

Biliary obstruction may be due to a variety of causes including choledocholithiasis, tumors, and trauma, including injury after gallbladder surgery, with choledocholithiasis being the most common cause. The prevalence of gallstones in England and Wales was 182/10,000 person years at risk. The incidence rate was 8/10,000 person years at risk for 1991-1992.<sup>1</sup> Patients with suspected biliary obstruction present with abnormal liver function

and symptoms such as jaundice, pale-colored stools, dark urine, itching, abdominal pain in the upper right quadrant, fever, nausea, and vomiting. Endoscopic ultrasonography (EUS) is the first-line imaging investigation in patients with jaundice or right upper quadrant pain.<sup>2</sup> Although EUS is non-invasive, quick and inexpensive it is very operator and patient dependent. Magnetic resonance cholangiopancreatography (MRCP) is an abdominal magnetic resonance (MR) imaging method that allows non-invasive visualization of the pancreato biliary tree and requires no contrast administration. This technique is a useful alternative to more invasive procedures like endoscopic retrograde cholangiopancreatography (ERCP), which should be used only in cases where intervention is needed. Single-shot fast spin-echo is a newer and more rapid MRCP sequence that can be performed in a single breath hold, thereby significantly reducing motion artifacts and increasing image quality.<sup>3-6</sup>

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**Aim**

The aim of the study was to compare the findings of MRCP with those of ERCP in pancreaticobiliary disorders.

**MATERIALS AND METHODS**

This prospective observational study was conducted in patients who were having a history of obstructive jaundice, pain abdomen, and cholangitis at tertiary care center. 25 patients were included in the study. The study group consisted of male and female patients, between the age of 26 and 58 years (with a mean age of 39 years). For all 25 patients per operative findings were obtained. The study was approved by the Institutional Ethical Committee. 25 patients with these symptoms underwent MRCP using 1.5 Tesla Siemens Symphony MRI Scanner. The results were compared with ERCP.

**RESULTS**

The study subjects consisted of 16 male and 9 female patients, between the age of 26 and 58 years (with mean age of 39.42 ± 6.19 years). 16 (53%) had the complaints of the obstructive jaundice, 12 (40%) had pain abdomen, and a small 5 (16%) had cholangitis.

Both MRCP and ERCP failed to detect some cases. They are malignant stricture - Klatskin tumor and normal cases (Table 1).

Both MRCP and ERCP were fails to detect some type of causes. They are 4% cases of stricture and 20% cases of normal in MRCP. ERCP has failed in detecting cases in all most all the type expect calculus (Table 2).

**DISCUSSION**

ERCP is mainly used for diagnosing as well as treating abnormalities of the bile ducts and the pancreatic ducts such as gallstones, inflammatory strictures, and leaks. ERCP is considered a boon for the dilatation of the sphincter due to the advent of endoscopy allowing insertion of small metal stents in collapsed ducts.<sup>7</sup> Fluoroscopy is used to check for blockages, lesions and stones. ERCP is also used for the treatment of obstructive jaundice, stricture of various bile ducts and pancreatic or gallbladder tumor. MRCP is more often used with a diagnostic point of view whereas ERCP is more often used for therapeutic purposes. MRCP is preferred as it is non-invasive and can help in diagnosing a particular condition. MRCP helps to visualize the bile and the pancreatic ducts as well as the surrounding soft tissues which are not possible in a person undergoing ERCP.<sup>8-10</sup> Gone is the days when people used to opt for basic operative procedures with simple operations, as now better operative

**Table 1: Comparison between MRCP and ERCP in cause of obstruction versus extent of obstruction**

Per operative findings	-	Determined		Not determined	
		N	MRCP	ERCP	MRCP
BS-PC	3	3	3	0	0
C-CA	1	1	1	0	0
CC	2	2	2	0	0
Ch-P	2	2	2	0	0
Ch-Cy	3	3	0	0	3
G-CA	2	2	2	0	0
GC+CC	1	1	1	0	0
MI-SY	1	1	0	0	1
MS-KT	4	3	3	1	1
PA-CA	1	1	1	0	0
PC	3	3	2	0	1
Primary sclerosing cholangitis	1	1	1	0	1
Normal	3	1	2	1	2
Total	25	22	18	3	7

BS-PC: Benign stricture-post cholecystectomy, C-CA: Cholangiocarcinoma, CC: CBD Calculus, Ch-P: Chronic pancreatitis, Ch-Cy: Choledochal cyst, G-CA: Gallbladder carcinoma, MI-SY: Mirizzi syndrome, MS: Malignant stricture, KT: Klatskin tumor, PA-CA: Pancreatic carcinoma, PC: Periampullary carcinoma, MRCP: Magnetic resonance cholangiopancreatography, ERCP: Endoscopic retrograde cholangiopancreatography, CBD: Common bile duct, GB: Gallbladder, GC: Gallbladder calculus

**Table 2: Comparison between MRCP and ERCP in determining the extent of obstruction by type of causes**

Per operative findings	n	Determined		Not determined	
		MRCP	ERCP	MRCP	ERCP
Calculus	3	3	3	0	0
Stricture	8	7	7	1	1
Tumors	7	7	6	0	1
Cyst	3	3	0	0	3
Extrinsic causes	3	3	2	0	1
Non disease	3	1	1	2	2
Total	25	22	18	3	7

MRCP: Magnetic resonance cholangiopancreatography, ERCP: Endoscopic retrograde cholangiopancreatography

procedures such as ERCP and MRCP have come up. ERCP is more expensive than MRCP but both the procedures are tremendously helpful to physicians to make an accurate diagnosis.<sup>11</sup> ERCP cannot be done in persons who have undergone previous allergic reaction (anaphylaxis) due to the dye used or in persons who have a history of myocardial infarction. Clotting disorders are another set of conditions which do not allow employment of ERCP. MRCP cannot be opted for in persons who have undergone previous stent surgery or have a pacemaker implanted as the MR will interfere in the working of the pace maker.<sup>12,13</sup>

**CONCLUSION**

MRCP is a comparable diagnostic investigation in comparison to ERCP for diagnosing biliary abnormalities.

MRCP is able to determine accurately more cases than ERCP in both cause and extent of obstruction. Bile ducts proximal as well as distal to the level of obstruction are made out better by MRCP.

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