A COMPARATIVE STUDY OF MAGNETIC RESONANCE CHOLANGIOPANCREATOGRAPHY AND ENDOSCOPIC RETROGRADE CHOLANGIOPANCREATOGRAPHY

Flora Juanita Edwin[1], Arun Chelladurai[2]

[1]Associate Professor, Department of Radiodiagnosis, Government Thoothukudi Medical College.
[2]Associate Professor, Department of Radiodiagnosis, Government Thoothukudi Medical College.

ABSTRACT

BACKGROUND

Magnetic Resonance Cholangiopancreatography (MRCP) is a non-invasive technique for direct visualization of biliary tree and pancreatic duct. It provides images similar to those obtained with invasive cholangiography (ERCP and PTC). Aim of the study is to compare Magnetic Resonance Cholangiopancreatography (MRCP) and Endoscopic Retrograde Cholangiopancreatography (ERCP) in the evaluation of biliary obstruction.

MATERIALS AND METHODS

The study is a prospective study of 27 cases in the age group of 22 to 65 years who were having a history of obstructive jaundice. The patients underwent MRCP and the results were compared with ERCP.

RESULTS

Of the 27 cases, MRCP picked up calculus in 12 cases. ERCP also noted calculus in 12 cases. A small CBD calculus was missed in both MRCP and ERCP. GB calculus in one case was masked in the MRCP images by the bright signal from bile in GB. But the conventional SE images and source images of MRCP were reviewed in that case and GB calculus was diagnosed in that case based on source images. Stricture was correctly noticed in 8 of the patients in MRCP as well as ERCP. Malignant tumour was diagnosed by MRCP in 6 cases, which was also noted correctly by ERCP.

CONCLUSION

The study concluded that MRCP is a superior imaging modality when compared with ERCP, mainly because it is non-invasive and can give a detailed map of biliary tree allowing visualisation of ducts proximal as well as distal to the level of obstruction. MRCP can also show the extent of lesion more accurately than ERCP.

KEYWORDS

Magnetic Resonance Cholangiopancreatography, Endoscopic Retrograde Cholangiopancreatography, Percutaneous Transhepatic Cholangiography, Biliary Diseases.

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BACKGROUND

Magnetic Resonance Cholangiopancreatography (MRCP) is a non-invasive technique for direct visualisation of biliary tree and pancreatic duct.[1,2] It provides images similar to those obtained with invasive cholangiography (ERCP and PTC).

In the evaluation of biliary tree and pancreatic duct, sonography has limitations as the bowel gas and obesity can limit the image resolution. CT scan also has limitations because cholesterol stones may be missed as their attenuation resembles fluid. Biliary strictures are also not visualised directly on CT. ERCP and PTC are invasive imaging modalities.[3,4]

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Corresponding Author:
Dr. Flora Juanita Edwin,
Associate Professor,
Department of Radiodiagnosis,
Govt. Thoothukudi Medical College Hospital,
Thoothukudi-628001,
Tamilnadu.
E-mail: eflorajuanita@yahoo.in
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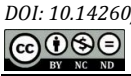


MRCP since its introduction by Wallner et al in 1991 has experienced remarkable growth in the diagnosis of biliary diseases. It has now assumed the position of modality of choice in the evaluation of biliary tree and pancreatic duct.[5,6,7,8,9]

AIM OF THE STUDY

Aim of the study is to compare Magnetic Resonance Cholangiopancreatography (MRCP) and Endoscopic Retrograde Cholangiopancreatography (ERCP) in the evaluation of biliary obstruction. Reference standards for comparison were surgery or biopsy taken laparoscopically.

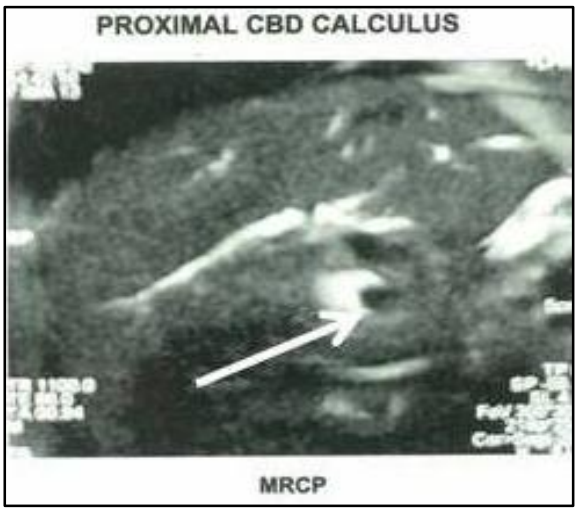
MATERIALS AND METHODS

The study is a prospective study done in Government Thoothukudi Medical College from February 2016 to July 2016. Patients in the age group of 22 to 65 years who were having a history of obstructive jaundice were included in the study; 27 patients with obstructive jaundice underwent MRCP using 1.5 Tesla GE MRI Scanner; 17 were males and 10 were females. The results were compared with ERCP.

FUNDAMENTAL CONCEPT OF MRCP

Bile and pancreatic duct fluid are static and have long T2 times. Therefore, high resolution, heavily T2 weighted images display these structures as areas of high signal intensity

against solid parenchymal organs and flowing blood with a shorter T2 or rapid dephasing. Three dimensional reconstruction algorithms can then be applied to produce image of the entire biliary tree or pancreatic duct.



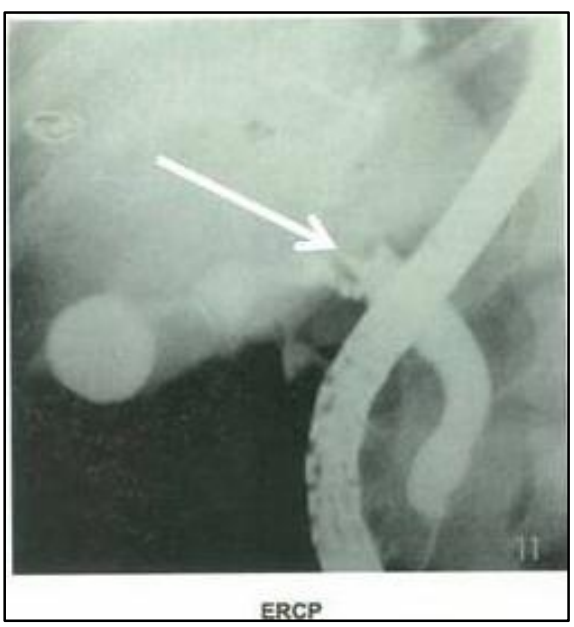


Fig. 1

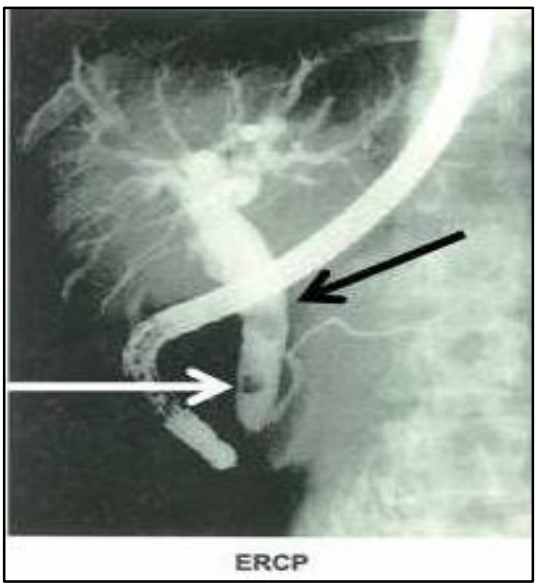


Fig. 2

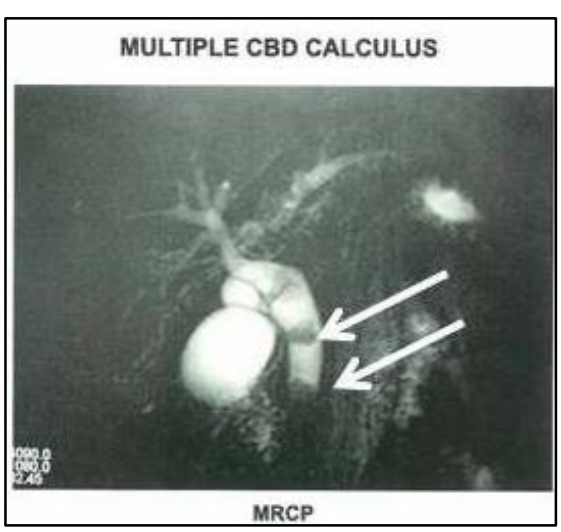


Fig. 3

RESULTS

Of the 27 cases, MRCP picked up calculus in 12 cases. ERCP also noted calculus in 12 cases. A small CBD calculus was missed in both MRCP and ERCP. GB calculus in one case was masked in the MRCP images by the bright signal from bile in GB. But the conventional SE images and source images of MRCP were reviewed in that case and GB calculus was diagnosed in that case based on source images.

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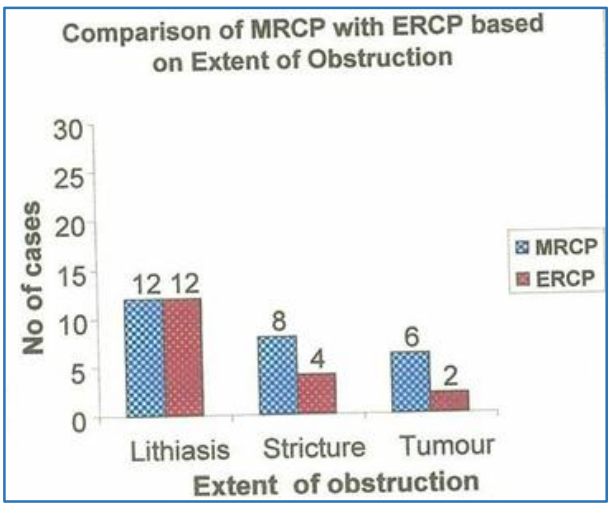
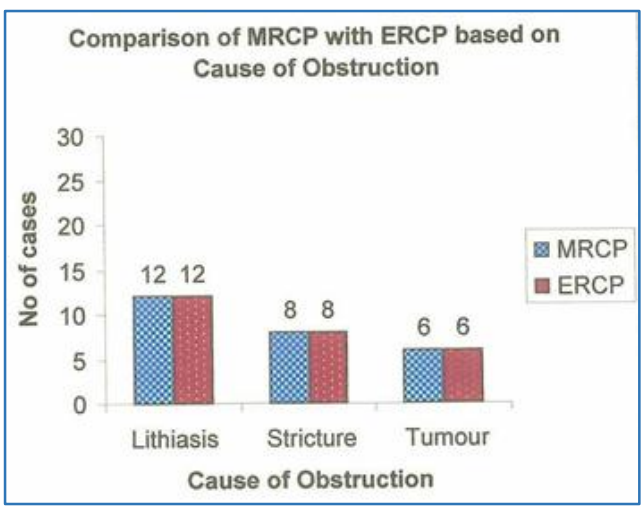


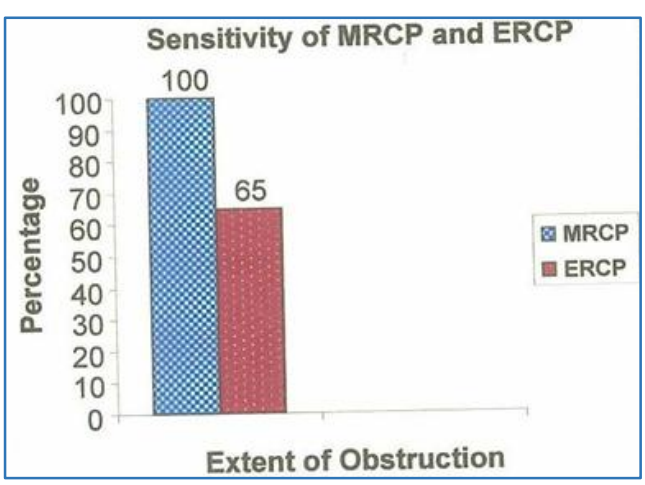


Variables	MRCP			ERCP		
	Calculus	Stricture	Tumour	Calculus	Stricture	Tumour
Sensitivity	92%	100%	100%	92%	100%	100%
Specificity	100%	100%	100%	100%	100%	100%
Positive Predictive Value	100%	100%	100%	100%	100%	100%

DISCUSSION

In our study the sensitivity, specificity and positive predictive value of MRCP and ERCP are equal in noting the cause of obstruction.

In our study, MRCP noted the level and extent of obstruction with a sensitivity of 100%. ERCP in our study has a sensitivity of 100% in noting the level of obstruction and only 65% in mapping the extent of obstruction.



As ultrasonogram is non-invasive and cheaper, it was used as the initial screening investigation in our study. In our study cases ultrasonogram was able to detect biliary obstruction and its level in all cases. In cases of lithiasis, due to excessive bowel gas and obesity it was difficult to detect calculus in CBD in 20% of cases.[10,11]

Ultrasonogram was able to detect stricture in all cases, but it was very difficult to differentiate benign from malignant stricture in 50% of cases. In cases of tumour causing biliary obstruction, ultrasonogram had a poor sensitivity to detect the extent of tumour.[12]

Even though the sensitivity, specificity and positive predictive value of MRCP in our study is comparable with ERCP in noting the cause and level of obstruction, MRCP is clearly superior to ERCP in mapping out the extent of obstruction. This is useful in planning further management of the disease. Thus magnetic Resonance Cholangiopancreatography may replace diagnostic Endoscopic Retrograde Cholangiopancreatography for diagnostic purposes following an initial clinical and ultrasonographic examination. ERCP may then be reserved for patients who require intervention in treating biliary obstruction.

CONCLUSION

MRCP is a superior imaging modality when compared with ERCP, mainly because it is non-invasive. No radiation exposure or anaesthesia is required. There are no complications of invasive procedure. MRCP can give a detailed map of biliary tree allowing visualisation of ducts proximal as well as distal to the level of obstruction. MRCP can also show the extent of lesion more accurately than ERCP. MRCP can be used as a road map before any surgical intervention.

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