Role of Magnetic Resonance Cholangiopancreatography in Diagnosis of Different Benign and Malignant Obstructive Biliary Diseases

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Abstract

Aim: To evaluate the role of Magnetic Resonance Cholangiopancreatography (MRCP) in diagnosis of different benign and malignant obstructive biliary diseases.

Material and Methods: From December 2014 till December 2015, this study was conducted on 40 (24 males and 16 females) patients referred to Radio-Diagnosis Department, Mansoura University Hospital with suspected biliary obstructive disease on clinical and laboratory basis. First, abdominal ultrasound was done for detection of biliary obstruction. Then MRCP on 1.5 Tesla machine (Philips ingenia) was performed for all patients through conventional axial and coronal T2WMRI, 3DMRCP, MIP, and VR images. Finally, the results of MRCP was correlated with that of direct cholangiography (ERCP and PTC)/histopathological diagnosis/operative findings (taken as gold standard). The diagnostic validity test was used to calculate the sensitivity, specificity and accuracy of MRCP.

Results: Diagnostic accuracy of MRCP in detection of biliary dilatation and level of obstruction was 100%. However, it had 95% accuracy in detection the cause of obstruction. In the diagnosis of benign biliary obstruction, the sensitivity, specificity and accuracy of MRCP was 100%. While for detecting the malignant etiology of obstruction, MRCP had sensitivity and accuracy of 90.5%. The overall sensitivity, specificity and accuracy of MRCP in the diagnosis and differentiation of benign and malignant biliary obstructive diseases were 90.5%, 100% and 95% respectively.

Conclusion: MRCP is an important non invasive imaging technique in the evaluation of patients with various biliary obstructing diseases.

Key Words: MRCP – Biliary – Benign – Obstructive – Malignant.

Introduction

BILIARY obstruction is a common entity caused by benign and malignant lesions. The level of obstruction may be intra-hepatic or extra-hepatic.

Common entities are common bile duct stones, inflammatory and iatrogenic strictures, pancreatic head carcinoma, cholangiocarcinoma, peri-ampullary tumors, and metastases [1].

Non-invasive biliary imaging has been markedly advanced by the development of Computed Tomography (CT) and Ultrasound (US). Bile duct dilatation and obstruction sites can be well demonstrated with these methods, but direct cholangiography (endoscopic or percutaneous) is often then required to determine the cause and exact site of biliary obstruction prior to surgery [2].

The development of Magnetic Resonance Cholangio-Pancreatography (MRCP), which used heavy T2-weighting and rapid image acquisition (thus avoiding breathing artifact), allowed the accurate non-invasive imaging of the biliary and pancreatic trees. The weighting involved in selected MRCP sequences is unique because it allows relatively stagnant fluids, such as bile and pancreatic juice, to have high-signal intensity. Without use of a contrast agent, these fluids appear bright compared with the dark, low-signal intensity of adjacent solid hepatic and pancreatic tissue and fast-flowing fluids (such as circulating blood) [3].

MRCP shows good results in evaluating biliary anatomy before laparoscopic surgery and in evaluating living liver donors. Also MRCP is very useful in evaluation most of the intrahepatic biliary anatomical variants [4].

MRCP has the advantages of allowing detailed evaluation of the biliary tract with a large field of view, excellent patient tolerance, and Three-Dimensional (3D) data sets that can be easily displayed. MRCP is an imaging modality that less likely to cause patient discomfort or injury rather than
Endoscopic Retrograde Cholangiopancreatography (ERCP), which is an invasive procedure with a reported complication rate of 3%-9% and a reported mortality rate of 0.2%-0.5% [5].

Although ERCP is still the standard for imaging the hepato-biliary and pancreatic ductal systems, there are many advantages of MRCP over ERCP. MRCP is noninvasive, less costly, uses no radiation, requires no contrast media or anesthesia, less operator dependent, allows better visualization of ducts proximal to an obstruction, and allows detection of extra-ductal disease when combined with conventional T1- and T2-weighted sequences [6].

**Aim of the work:**
To evaluate the role of MRCP as a non-invasive imaging modality in diagnosis of different benign and malignant obstructive biliary tract diseases.

**Patients and Methods**
This study included 40 (24 males and 16 females) patients suspected of obstructive biliary disease on clinical, laboratory and ultrasound basis. Their ages ranged from 1 to 80 years with a mean age of 50 years. It was conducted at Radiodiagnosis Department-Mansoura University from December 2014 till December 2015. Patients with contraindication to MRI were excluded. The ethics committee of our institute approved this prospective study. Informed consent was taken from all patients undergoing this study.

All patients underwent non enhanced MRCP on 1.5 Tesla machine (Philips ingenia). The final diagnosis of MRCP was correlated with the results of PTC, ERCP in addition to biopsy and histological diagnosis to those patients who had neoplasms also, the remaining patients were underwent operations and correlated their intra-operative findings.

**Imaging assessment:**
First, abdominal ultrasound was done for confirmation of biliary obstruction, then MRCP was performed for all patients. Finally PTC, ERCP and histo-pathological diagnosis were done for the patients.

**MRCP technique:**
MRCP examinations were performed on a 1.5-T MRI unit with using 8 channels circular, polarized, phased array body coil. MRCP study consists of image acquisition followed by image processing and analysis.

1- **Image acquisition:**
   A- Multi planner Fast Field Echo (FFE) localizer starting from the diaphragm to the lower border of both kidneys with slice thickness 9mm.
   
   B- Conventional axial and coronal T2 weighted FSE images of the upper abdomen: First step in performing MRCP is to localize the pancreatico-biliary duct. The axial T2 Fat Spin-Echo (FSE) MRI of the upper abdomen served as a guide to optimally localize the biliary system and to determine the correct obliquity of the coronal oblique sections of MRCP images. The axial sequence was added to minimize the risk of missing small peri-papillary lesions. From the previous axial T2 images the angle of MRCP examination was chosen from the cut at which the CBD or the region of suspected lesion tend to appear. Usually the obliquity of the angle ranges from 20° to 40° from the standard coronal plane, to give the maximum coverage for the right and left liver lobes. The scanning parameters are as follow: 2D T2 single shot fast-spine echo-SSFSE- (TR, TE, FOV and slice thickness are 1050ms, 120ms, 40mm and 6mm), 3D heavy T2 FAT SAT (TR, TE, FOV and slice thickness are 1860ms, 840ms, 32mm and 3mm), thick slab heavy T2 (TR, TE, FOV and slice thickness are 3120ms, 1200ms, 34mm and 4mm) with no inter-slice gap in all sequences.

2- **Image processing:**
The imaging data obtained after the scanning were reviewed on workstation with 2D and 3D capability with multiple editing options.
   
   A- Thin slab breath hold Two dimensional (2D) single shot heavily T2 weighted multisection sequences: Breath-hold imaging minimizes motion artifact. The angle of the coronal image could be changed several times and coronal slabs were obtained at different angles from horizontal plane pass through the head of pancreas to ensure including the distal part of the pancreatico-biliary tract in all images. The first slab was acquired at the direct coronal plane and about 4-5 slabs with different degree of obliquity were acquired on either side of the mid horizontal plane.
   
   B- Thick slab Respiratory triggered three dimensional (3D), MR cholangiopancreatography with MIP reconstruction: Images were obtained in the right anterior oblique plane parallel to the longitudinal axis of the biliary tree. Image reconstruction and post-processing of the MRCP source images was performed using a Maximum Intensity Projection (MIP) image produced in the coronal plane. Unnecessary anatomical details were edited.
and removed from the image by using a manual cutting device at the workstation to form one or few coronal MIP images showing the entire biliary system anatomy. After the 3D VR and MIP images were obtained, the native axial and coronal thin sections source images were reviewed, allowing optimal evaluation of small bile duct branches or any small accessory bile ducts.

3- Image analysis and interpretation:

In all examined cases; MRCP images were evaluated for: (1) The degree of dilatation of the intra-hepatic and extra-hepatic bile ducts as well as pancreatic duct. (2) The level of obstruction and the morphological aspect at the obstruction site. (3) Any additional information provided by the axial T1 WI and T2 WI (choledocholithiasis, tumor depiction with demonstration of its extension and the presence of lymphadenopathy or metastases). (4) Calculi were diagnosed as rounded, ovoid, or irregularly shaped signal voids were identified within a dilated or non-dilated bile duct. (5) Stenosis was defined as a transition of ductal dilation to signal void or a tapered appearance of CBD. (6) Abrupt narrowing of the CBD. (7) The presence of a mass and a stricture with an irregular margin, asymmetric dilatation or long length stricture.

As the gold standard, we used direct cholangiographies (ERCP and PTC), hysto-pathological findings after surgical intervention, in accordance with the appropriate diagnostic and therapeutic approach to each case.

Statistical analysis:

The statistical tools used for data analysis was the program SPSS (Statistical package for social science) version 17.0. Data were expressed as mean ± Standard Deviation (SD) for quantitative parametric measures, in addition to median percentiles for quantitative non-parametric measures and both number and percentage for categorized data. For comparison between two independent mean groups for parametric data, \( t \)-test was used. While, Chi-squared test was applied to study the association between each two variables or comparison between two independent groups as regards the categorized data.

The diagnostic validity test was used to calculate the sensitivity, specificity, positive predictive value, negative predictive value and diagnostic accuracy or efficacy.

Results

This study was carried out on 40 patients suspected with biliary tract obstruction, 24 males and 16 females. Their ages ranged from 1-80 years with a mean age of 50 years.

The lesions in the 40 patients were classified into 19 benign and 21 malignant obstructive biliary lesions. The 19 benign obstructive lesions Figs. (1,2) were (9 calcular obstruction Fig. (1), 5 congenital biliary disease Fig. (2), 3 post-cholecystectomy biliary complication and 2 benign biliary stricture. The site of obstruction in the 9 patients with calcular obstruction was in the CBD in all patients (7 in its distal portion and 2 in its midportion). The 21 malignant biliary obstruction Figs. (3,4) were due to (10 pancreatic head carcinoma Fig. (3); 5 cholangiocarcinoma: 2 intra-hepatic and 3 hilar (Klatskin) cholangiocarcinoma; 4 ampullary and Peri-ampullary carcinoma Fig. (4); 1 patient with common bile duct rhabdomyosarcoma, and 1 patient with liver metastases from colonic carcinoma (Table 1).

Table (1): Different benign and malignant biliary obstructive lesions in 40 patients.

<table>
<thead>
<tr>
<th>Pathology</th>
<th>No. of cases</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Benign lesions:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Congenital biliary causes</td>
<td>5</td>
<td>26.3</td>
</tr>
<tr>
<td>• Calcular CBD obstruction</td>
<td>9</td>
<td>47.4</td>
</tr>
<tr>
<td>• Benign biliary stricture</td>
<td>2</td>
<td>10.5</td>
</tr>
<tr>
<td>• Post-cholecystectomybiliary complications.</td>
<td>3</td>
<td>15.8</td>
</tr>
<tr>
<td>• Total (benign)</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td><strong>Malignant lesions:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Pancreatic head carcinoma.</td>
<td>10</td>
<td>47.6</td>
</tr>
<tr>
<td>• Cholangiocarcinoma.</td>
<td>5</td>
<td>23.8</td>
</tr>
<tr>
<td>• Ampullary &amp; Peri-ampullay carcinoma.</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>• Liver metastases.</td>
<td>1</td>
<td>4.8</td>
</tr>
<tr>
<td>• CBD Rhabdomyosarcoma</td>
<td>1</td>
<td>4.8</td>
</tr>
<tr>
<td>• Total (malignant)</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>40</td>
<td>100</td>
</tr>
</tbody>
</table>

The most common level (site) of obstruction was at the distal end of the common bile duct (in 30 patients), 5 patients at portahepatis level, 2 at proximal portion of CBD and 3 at mid portion CBD (Table 2).

The CBD had normal caliber in 8 patients and dilated in 32 patients, however 9 patients had dilated pancreatic duct.
MRCP could detect the level of obstruction in all patients and overall accuracy of MRCP in detection of biliary dilatation and level of obstruction was 100%. However, the cause of obstruction was correctly diagnosed in 38 out of 40 patients with 95% overall accuracy (Table 3).

MRCP could correctly diagnose all the 19 benign biliary lesions, however, 19 out of 21 malignant lesions were correctly diagnosed and 2 cases misclassified as benign lesion (a case of periampullary tumor and a case of rhabdomyosarcoma).

The overall sensitivity, specificity, positive predictive value, negative predictive value and accuracy of MRCP were 90.5%, 100%, 100%, 90.5%, and 95% respectively (Table 4).

Table (2): Site of obstruction by MRCP in 40 patients.

<table>
<thead>
<tr>
<th>Level of obstruction</th>
<th>MRCP No. of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Porta-hepatis</td>
<td>5</td>
</tr>
<tr>
<td>Proximal portion CBD</td>
<td>2</td>
</tr>
<tr>
<td>Mid-portion CBD</td>
<td>3</td>
</tr>
<tr>
<td>Distal CBD</td>
<td>30</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40</strong></td>
</tr>
</tbody>
</table>

Table (3): Accuracy of MRCP in detection of ductal dilatation, level and cause of the obstruction in the overall 40 patients.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Total number</th>
<th>MRCP (No of patients)</th>
<th>Overall accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dilatation of the biliary tree</td>
<td>40</td>
<td>40</td>
<td>100%</td>
</tr>
<tr>
<td>Level of obstruction</td>
<td>40</td>
<td>40</td>
<td>100%</td>
</tr>
<tr>
<td>Cause of the obstruction</td>
<td>40</td>
<td>38</td>
<td>95%</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Statistics</th>
<th>MRCP</th>
</tr>
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<tbody>
<tr>
<td>Sensitivity (%)</td>
<td>90.476%</td>
</tr>
<tr>
<td>Specificity (%)</td>
<td>100%</td>
</tr>
<tr>
<td>Positive Predictive Value (PPV) (%)</td>
<td>100%</td>
</tr>
<tr>
<td>Negative Predictive Value (NPV) (%)</td>
<td>90.476%</td>
</tr>
<tr>
<td>Accuracy (%)</td>
<td>95%</td>
</tr>
</tbody>
</table>

Fig. (1): Female patient presented with jaundice after cholecystectomy. (A&B): 2D MIP reconstructed coronal oblique MRCP images. (C&D): Axial & coronal T2WL Showing: Mild dilated intrahepatic bile ducts in both liver lobes, removed GB, Dilated CBD=25mm with a large single stone impacted at its distal end measuring about 16 X 21mm. (E): ERCP image showing: A large filling defect (red arrow) at the lower end of CBD (meniscus sign).

**Diagnosis:**
- Extra-hepatic calcular obstruction at the distal end of CBD.
Fig. (2): Female patient aged 12 years presented with pain and yellowish discoloration of sclera. (A&B): 2D MIP reconstructed coronal oblique MRCP images. (C&D): Axial & coronal T2WI. Showing: Dilated main right and left hepatic ducts with fusiform cystic dilatation of CBD (red arrow). No dilatation intrahepatic biliary ducts. Distended GB. (E): Intra-operative cholangiography image showing: Fusiform cystic dilatation of CBD with dilated main right and left hepatic ducts.

**Diagnosis:**
- Congenital biliary malformation according to Todani classification ... Choledochal cyst type IVa.

Fig. (3): Male patient aged 55 years complaining with rapid weight loss and rapidly progressive jaundice. (A&B): 2D MIP reconstructed coronal oblique MRCP images. (C&D): Axial & coronal T2WI. Showing: Markedly dilated intrahepatic bile ducts in both liver lobes. Abnormal soft tissue mass of heterogenous SI is seen at the head of the pancreas (red arrow) with partial encasement of superior mesenteric vessels. Dilated CBD>18mm with irregular stenosis and abrupt cut off termination at its distal end.

**Diagnosis:**
- Malignant extrahepatic biliary obstruction by pancreatic head carcinoma (confirmed by histopathological diagnosis).
Fig. (4): Female patient aged 60 years presented with yellowish discoloration of sclera. (A&B): 2D MIP reconstructed coronal oblique MRCP images. (C&D): Axial & coronal T2WI. Showing: Mild dilated intrahepatic bile ducts in both liver lobes. Soft tissue mass is seen involving peri-ampullary region (red arrow) with proximal dilatation of CBD=12mm showing distal end irregular stricture. Mildly dilated main pancreatic duct=6mm (Double duct sign). (E) ERCP image showing dilated CBD with irregular abrupt stricture.

Diagnosis:
- Malignant extrahepatic biliary obstruction by peri-ampullary carcinoma (confirmed by ERCP and histopathological diagnosis).

Discussion

Biliary disorders are one of the common problems routinely seen in clinical practice, hence the advance in ultrasound, CT and MRI technology over the past decade have a fundamental role for evaluation the biliary system. Often the initial important task is to delineate the presence or absence of biliary obstruction. If obstruction is present, the aim of imaging is directed to define the level and if possible the cause of obstruction [2].

The gold standard investigation used in detection of obstructive jaundice is ERCP. However, ERCP is associated with many complications such as pancreatitis, cholangitis, hemorrhage, duodenal perforation and a morbidity rate of 1-7% and mortality rate of 0.2-1% [6].

In this study, malignant obstructive jaundice was common than benign causes of obstruction 21 (52.5%) malignant lesions versus 19 (47.5%) benign lesions. This is matching the results of [7] who mentioned that the malignant obstructive jaundice was common in 69 patients (62.73%) than 41 patients (37.27%) had benign etiology. However, this is not similar with [8] who stated that the benign biliary diseases were more common cause of obstruction seen in 18 (85.6%) patients out of the 29 biliary obstructive cases.

Singh et al., [9]; Mandelia et al., [10] and Francesco et al., [11] found that choledocholithiasis are the common presentable cause of biliary obstruction and obstructive jaundice. These results are similar to our results as stones within the bile duct were the main cause of benign obstructive jaundice (9 out of 19 patients).

Mandelia et al., [10] mentioned that the sensitivity, specificity and diagnostic accuracy of MRCP in diagnosis of choledocholithiasis ranged from
81-100%, 85-100% and 90-100% respectively. This coincides with the results of this study, as MRCP could correctly diagnose all 9 cases of CBD stones so, the sensitivity, specificity and diagnostic accuracy was 100%.

MRCP could detect the site of obstruction in the CBD, as the site of obstruction in all the 9 calcicular cases in current study were correctly diagnosed (7 were in the distal portion of the CBD and 2 were in its mid-portion). These results are similar to [8] who concluded that MRCP can detect the length of the stone as well as the exact location of it. They said that both coronal images and 3D images that rotated at different angles are useful and an axial plane tends to better outline the most distal common bile duct and pancreatic duct segments.

In the current study of, type was correctly diagnosed in all 4 cases of choledochal cyst by MRCP and confirmed by post-operative findings. According to Todani’s classification, there was one case of fusiform extrahepatic choledochal cyst (Type I), 2 cases of combined intrahepatic and extrahepatic choledochal cyst (Type IVa) and one case of intramural cystic dilatation distal end CBD (choledochocele Type III). This is in agreement with [12] who stated that MR cholangio-pancreatography has been shown to be 100% accurate in the evaluation of choledochal cyst.

Katabathina et al., [13] said that typical manifestations of benign stricture were clearly identified by presence of smooth short strictures. In this study, we could correctly diagnose 2 benign CBD strictures showing smooth short regular margins and those were underwent dilated stent.

Yu et al., [14] concluded that the presence of a mass, stricture with long length (>1.2cm) and an irregular margin and asymmetric dilatation of the bile ducts help in the diagnosis of a malignant stricture. In this study, irregular and long length stricture was observed in all malignant lesions presented by stricture except one.

In this study, the most common cause of malignant obstructive jaundice was the pancreatic carcinoma [10 out of 21 (47.6%)]. This is in agreement with [7] who mentioned that the most common malignant tumors were pancreatic carcinoma, but not similar to [15] who reported that most common cause of malignant obstruction was cholangiocarcinoma.

In the present study, MRCP was able to detect the level of obstruction in all 40 lesions (100%) and the cause of obstruction in 38 cases with percentage accuracy of 95%. This is in agreement with [16] who reported that the sensitivity of MRCP in identifying the level of obstruction was found to be 100% and are not similar with [17] who conducted study on 110 patients, the overall MRCP diagnostic accuracy for detection the level of obstruction was 95.5% and the cause in 87.5% cases.

MRCP had sensitivity and accuracy of 90.5% for detecting the malignant etiology of obstruction as among 21 malignant lesions in the present study, MRCP was correctly diagnosed 19 while 2 lesions were falsely diagnosed (one case of CBD rhabdomyosarcoma and one case of peri-ampullary tumor), all of them confirmed by results of ERCP and histopathological diagnosis. This is in agreement with [7] who found that sensitivity and specificity of MRCP in detection of malignant obstruction was 86% and 92% respectively.

Verma et al., [7] concluded that the sensitivity and specificity MRCP was 92.3% and 86% respectively for detecting the benign etiology of obstruction. While our results showed that the sensitivity, specificity and accuracy of MRCP was 100% in benign biliary obstruction.

The role of MRCP in diagnosis and differentiation of different benign and malignant biliary diseases had been studied by Singh et al., [9], Al-obaidi et al., [18] who reported that the sensitivity, specificity and diagnostic accuracy range between 81-100%, 84-100% and 90-96% respectively. This is similar with the results of this study as the overall sensitivity, specificity, Positive Predictive (PPV), Negative Predictive Value (NPV) and accuracy of MRCP in differentiation of benign and malignant biliary obstruction was 90.5%, 100%, 100%, 90.5%, and 95% respectively.

Conclusion:

MRCP is a rapid, accurate and non-invasive imaging technique for evaluation and diagnosis of various biliary obstructing conditions, as it offers diagnostic value nearly equivalent to the invasive procedures like PTC and ERCP.

References

Role of MRCP in Diagnosis of Different Benign & Malignant Obstructive Biliary Diseases


المختصر العربي

التقييم المبكر للإنسداد المراري ينطوي على تعريف مكان الإنسداد داخل أو خارج القنوات الرارية بالكاد ويتعتبر الهدف من أي فحوصات إشعاعية هو التأكد من وجود إنسداد بالقنوات الرارية المكانية عن طريق انسداد هذه القنوات ومجوهر هذا الإنسداد بالضبط وقد يوجد سبب معقول لذلك. وهذا عدد من طرق الفحص شملت الموجات فوق الصوتية عبر البطين، والمناظر الصيفية الانخراطي الراريء الداخلي والتصوير الصيفي الانخراطي عن طريق الجلد والتصوير الرقمي المغناطيسي للقنوات المرارية.

والهدف من هذا البحث هو توضيح نور التصوير بالرنين المغناطيسي كتقنية أمنة في التشخيص والتقيق بين الإصابة المميزة والخبيثة.

والمح体制改革 للمادة 61

وقد أصبح استخدام الرنين المغناطيسي للقنوات المرارية وقنوات البكتريكس في حالات الإنسداد المرارية وسيلة أمنة وغير متعلقة وحساسة بنسبة كبيرة وكذلك فهو فحص نادر من المضاعفات والأعراض الجانبية حيث لا يتطلب استخدام أي أنواع من الصبغات الكيميائية أو التعرض إلى كميات كبيرة من الإشعاعات الموجية الضارة وبالتالي يمكن استخدام المناظر الصيفية الانخراطي الراريء الداخلي للتشخيص وصرف الهواء فقط على الفحص وربما يمكن تجنب الكثير من المضاعفات وتقليل الكثير من الزوايا البصرية.

ثم إجراء الدراسة بواسطة جهاز رنين مغناطيسي (0.5 تسبلا) على أربعة مرضى محتاج وجود إنسداد بالقنوات المرارية اعتباراً على الكشف الطبية المبدئي ونتائج التشخيص البدنية الحيوية التي تشتهي في في وجوب إنسداد. ولم يتم استخدام أي تدابير في فحص الرنين. وبعد ذلك تم مقارنة النتائج مع المناظر الصيفية الانخراطي الراريء أو النتائج الفردي للتشخيص بأخذ عينات مسجدة وتحليلها من أجل تقييم الرنين المغناطيسي التشخيصي الدقيق في تسجيل أعراض الإنسداد المرارية بأشكالها المتعددة.

ثم استخدام مختلف التدابير الحديثة لأجهزة الرنين المغناطيسي في إعادة مراجعة وفي مراجعة ما بعد المعالجة من أجل الحصول على أفضل النتائج الممكنة وصوتيات الإجابة الإجابة التشريحي للقنوات المرارية.

ومع أجرى هذا البحث بقيم الأشعة التشخيصية، مستشفى جامع المنطقة من الفترة nguyện 2015 حتى ديسمبر 2014 وقد اشتملت على 40 مريض 24 من الذكور 16 من الإناث. تراوح أعمارهم من سن عام إلى 80 عام وقد تم تصنيفهم على أساس سبب إنسداد القنوات المرارية:

- المرضى الذين يعانون من إنسداد القنوات الصيفية نتيجة الإصابة الخبيثة (21 حالة).
- المرضى الذين يعانون من إنسداد القنوات المرارية الخبيثة (6 حالات).
- المرضى الذين يعانون من إنسداد القنوات المرارية (9 حالات).
- المرضى الذين يعانون من إنسداد إنسداد الصيفية (3 حالات).
- المرضى الذين يعانون من إنسداد معين مع إنسداد العامة (1 حالة).

وقد أظهرت النتائج أن المبكرية بالنوعية والدقيقة لفحص الرنين المغناطيسي للقنوات المرارية في التشخيص والتقيق بين أعراض الإنسداد المراري المعيسة والخبيثة هي 100% و95% على التوالي.

وبعد هذا البحث يمكن استنتاج ما يلي: قد وجدنا أن الرنين المغناطيسي للقنوات المرارية يعترف وسيلة سريعة ودقيقة في تقييم المرضى المشتبه فيه ولمجود إنسداد مراري عندن والتفصيل بين الإصابة المعيسة والخبيثة وأيضاً يمنح دقة في التشخيص ما يعادل تقريباً استخدام المناظر الصيفية الانخراطي الراريء الداخلي.