CHAPTER 5

DISCUSSION

Study results were obtained from the 54 patients with CHCA who were examined by MRCP and underwent surgery. Two patients with an unconfirmed diagnosis of CHCA were excluded from the study because of the final diagnosis of these two patients showed tuberculous lymphadenopathy and a large common duct stone respectively.

From these results , we obtained a sensitivity of 100.0% (95% lower CI; 90.7%), specificity of 87.5% (95% CI; 61.6%, 98.4%), accuracy of 96.3 % (95% CI; 87.3%, 99.5%) and a likelihood ratio of 8 for the diagnosis of hilar CHCA. In addition, a sensitivity of 88.5%(95%CI; 69.8%, 97.6%), specificity of 100.0% (95%lower CI; 87.7%), and accuracy of 94.4%(95% CI; 84.6%, 98.8%) was reported in the diagnosis of common duct CHCA. Agreement between MRCP and operative findings were measured as Kappa values of 0.91 and 0.88 for hilar CHCA and CHCA of the common duct respectively.

Several studies have focused on evaluating different techniques used to perform an MRCP (53,76). Initial studies of MRCP were performed by gradient-echo sequences using a 2D or 3D steady state free precession sequence. A heavily T_2 weighted sequence become commonly used to perform MRCP. Our technique involves the use of a 2D cholangiogram which is performed by using coronal heavily T2- weighted images and a respiratory trigger, and then followed by on MIP to perform the cholangiogram. Several authors have decribed imaging

findings related to various abnormalities of the pancreatobiliary system, and determined its diagnostic performance (48,72,77). The use of MRCP in evaluating patients with malignant biliary ductal obstruction was reported (39, 49-51,54, 56) however the number of patients with CHCA in each study was small (39, 49-51, 54, 56). In contrary, our study was performed in a relatively large, selected group of CHCA patients. Previous studies showed high sensitivities approaching 90%-95% for biliary and pancreatic duct dilatation and strictures (48, 54, 77) and 72%-95% for choledocholithiasis (54). Inadequate data is available on the results of the diagnostic performance of MRCP for CHCA. Furthermore, the available information was usually given as a part of a study with objectives unrelated to the specific diagnostic performance of MRCP for CHCA. Some studies of MRCP (including CHCA patients) such as the study of bile duct obstruction and stone (54), or the use of MRCP after unsuccessful or incomplete ERCP(48). In these studies, the number of CHCA patients as a part of a group of study subjects was relatively low. Guibaud et al (54) obtained a sensitivity of 86% (CI: 67%, 100%), a specificity of 98% (CI : 96%, 100%) and an overall diagnostic accuracy of 97% in the diagnosis of malignanct obstruction. However, this study involved only a small number of CHCA patients. Although, overall diagnostic performance of MRCP from previous studies showed a high level of performance. Although these studies show high values for the diagnostic performance of MRCP as described above, none focussed specifically on CHCA patients. We are certain that our findings of good diagnostic performance of MRCP focusing on CHCA patients will benefit CHCA patients.

This study is a diagnostic test, a suitable choice of study design for achieving the study objective. We considered the reliability of the MRCP interpretation. Inter-observer and intra-observer reliability was carried out before the main research was started. High reliability values for the Kappa statistic were recorded, Kappa values more than 0.9 being recorded for both the inter-observer

and intra-observer reliability test. We were concerned about the possibility of an operative assessment bias. Blinding the information about the MRCP to the surgeon was conducted to control this potential bias. In considering the gold standard, we selected a clear area that was easy to visualize in the operative field. We were concerned with the interval between the MRCP and the operation date. We were sure that MRCP and operative findings assessed the pathology with the same status. Because of the suitable study design, considerations described above and the use of an adequate sample size, we strongly believe that our finding of the diagnostic performance of MRCP that measured sensitivity, specificity and accuracy, are reflect the true figures.

However, there were some limitations which may affect the diagnostic performance of MRCP. Few MRI machines are available in Thailand, and MRCP requires skilled interpretation. Therefore, the diagnostic performance of the MRCP may depend on the interpretation and experience of radiologists. This may have implications regarding the ability of genralizability from these findings.

We excluded two unconfirmed CHCA patients whose final diagnosis was negative for CHCA. The ability of other imaging modalities performed before the MRCP affect the diagnostic performance of MRCP. The MRCP is unable to be used as the first line or as the single procedure used to diagnose patient with CHCA. The diagnostic performance of MRCP will be appropriate and effective if used in conjunction with clinical information either US or CT information.

Our study was conducted in an area with the highest prevalence of CHCA. We have more than ten years experience in the used of diagnostic imaging modalities of CHCA patients. This was a possible reason fore the resulting exclusion of only a small number of unconfirmed CHCA patients. The number of unconfirmed CHCA patients may have been greater if the study was performed in other areas. A different status involving factors of different rates of prevalence, as

well as the experience of clinicians and radiologists, would affect the diagnostic performance of MRCP.

Two false positive cases of hilar CHCA were recorded. Both were actually cases of common duct CHCA. The false lesion on the MRCP may occur with actually cases of debris proximal to the common duct lesion. The debris appears as low signal intensity when compared with that of the bile duct, and this would cause an over-estimation of the proximal extension to the true lesion. In the diagnosis of CHCA at the common duct, three false negative cases were reported. The cases were later diagnosed as hilar CHCA by MRCP. The operative findings were CHCA at the common duct. Debris proximal to the common duct may cause a false lesion at the hilar region and cause misdiagnosis of common duct CHCA. This is one disadvantage of MRCP because it cannot distend the binary duct when used in isolation. Injection of a contrast agent in the ERCP can distend the bile duct. Occasionally, diagnosis of the common duct lesion can only be performed only when the common duct was distended.

Based on previous knowledge and the information gained from this study, the biliary system, and especially biliary obstruction, can be diagnosed by noninvasive and invasive techniques. Although the diagnostic performance of US and the conventional CT is limited, they are not primary cholangiographic techniques. US remains the first line imaging modality for diagnostic biliary obstruction. The benefit of both techniques is that they can not only assess biliary tracts, but also underlying pathology. Result of the cholangiogram, (not only conventional cholangiography but also MRCP) will provide additional useful information.

From the results of this study, MRCP is established as an effective technique in the diagnosis of hilar CHCA and CHCA at the common duct, despite a degree of misdiagnosis being reported. Some advantages of the MRCP are; 1) it is a non-invasive technique; 2) it requires neither contrast agents nor biliary

intervention; 3) the success rate is higher than ERCP (~ 95%); 4) with MR imaging, MRA(MR angiography), MRP (MR portography) information, which can be performed concurrently. The "all in one approach" gives the clinician all the information necessary for the planning of adequate treatment (45); 5) and it is less dependent on the operator than the sonogram.

However, there are some disadvantages of the MRCP when compared with conventional studies; 1) the MRCP predominantly demonstrated a duct proximal to the stricture, but was unable to distend the stricture itself (as occurs in conventional cholangiography), which may create difficulties in assessing the length of the stricture and ampulla; 2) debris proximal to the obstructive lesion may cause over estimation of the proximal extent of the true lesion. 3) no therapeutic option can be offered simultaneously to diagnostic information being obtained (compared with ERCP); 4) the surgical clip can cause substantial signal dropout in the image, which may obscure pathologic condition at the signal dropout area (39); 5) contraindications of MRCP is the same as for MRI, with a place maker and intracranial metalic aneurysmal clip used.

ERCP is regarded as the diagnostic procedure of choice in cases of abnormality of the biliary and pancreatic duct. However, MRCP may be a suitable alternative choice for the same purpose, particularly; 1) when the patient does not require further endoscopic treatment, or when endoscopic treatment cannot be performed, as with CHCA patients or patients with other forms of malignacy who require a purely diagnostic examination; 2) when the patient poses a technically difficult or impossible situation in whom previous biliary surgery or drainage proceduress deny endoscopic access (three of five may fail); 3) the patient for whom ERCP is unsuccessful, or to increase safety and the success rate; 4) an MRCP could be performed before an ERCP, PTBD, internal drainage or biliary endoprosthesis, or even laparoscopic cholecystectomy, in order to increase the

safety and success rate; 5) it may replace the purely diagnostic purpose of ERCP in relation to hilar CHCA and CHCA at the common duct.