Original Research Article

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A Prospective study of Role of Magnetic Resonance Cholangiopancreatography for Prediction of Difficult Cholecystectomy

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Abstract

Background and Objectives: To identify difficult cholecystectomy is often subjective, because itcan be established by the operator in an arbitrary manner.The followingparameters allow defining cholecystectomy as "difficult": difficult identification and isolation of the cystic artery and duct, scarring of Calot'striangle, inflammation, Adhesions,a short cysticduct, difficult dissection of the gallbladder wall from the hepatic bed etc.

MRCP being an excellent, easily available, safe, non-invasive modality in delineating anatomy of extra hepatic as well as intra hepatic biliary system can be used prior to everycholecystectomy to detect the exact pathology and presence of any anatomical variations. This will preclude the surgeon from coming across any unexpected variations which can lead to serious complications.

Methods: In this study, 50 cases of gallbladder disease are examined preoperatively for difficult cholecystectomy based on MRCP findings in Sir T. Hospital, Bhavnagar From December-2015 to September-2017.

Results: In this study, difficult cholecystectomy is more found in age group of 41-60 years 64.28%, more in male patients 69.23% and more common with jaundice and other associated factors like Hypertension, Diabetes and IHD. Out of 50 patients MRCP of total 41patients were done and can identify the possibility of difficult cholecystectomyin 20 patients.

Conclusion: MRCP preoperatively helps in identifying the difficultcholecystectomy. So we can preoperatively explain the patient regarding complications and methods of operations. We can minimize the intraoperativecomplications, reduce operative time and also we can prevent intraoperativemorbidity of the patients.

Keywords: MRCP; Magnetic Resonance Chaolangiopancreatography; Difficult Cholecystectomy.

Introduction

The definition of "difficult cholecystectomy" [4] is often subjective, because itcan be established by the operator in an arbitrary manner. Instead, it is necessary toestablish and make use of objective intraoperative parameters. The followingparameters allow defining cholecystectomy as "difficult": The presence of circumscribed peritonitis in the right hypochondrium, difficult identification and isolation of the cystic artery and duct, scarring of Calot's triangle, inflammation, Adhesions, an abundance of adipose tissue, a short cysticduct, difficult dissection of the gallbladder wall from the hepatic bed, and thepresence of portal hypertension.

Magnetic Resonance CholangioPancreatography being an excellent easily available, and safe non-invasive modality in delineating extra hepatic Biliary system anatomy and intra abdominal anatomy can be used prior to every laparoscopic as well as open cholecystectomy to detect the exact pathology and presence of any anatomical variations. This will preclude the surgeon from coming across any unexpected variations which can lead to serious complications. Even the presence of choledocho-lithiasis which can lead to serious biliary tree injuries

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and associated liver and pancreatic pathology can be known by Magnetic Resonance Cholangio Pancreatography and make the surgeon more cautious in his approach. This will lead to reduced intraoperative complications, reduced operative time and patients morbidity.

Aims and Objective

- To compare Magnetic Resonance Cholangio Pancreatography and Cholecystectomy findings in cases of difficult Cholecystectomy.
- To study the anatomy of the intra and extra hepatic biliary radicals and their anatomical variations.
- To assess whether routine Magnetic Resonance Cholangio Pancreatography before Cholecy stectomy and CBD stone extraction can reduce the risk of per-operative biliary tree injury.
- To know the difficulty in Cholecystectomy in which MRCP is not done.

Material and Methodology

Fifty cases of Gallbladder diseases were admitted examined and investigated particularly MRCP during the period of 1 year and 9 months from 1 Dec 2015 to Sep 2017 and detailed history of all the 50cases were taken according to proforma. Information regarding the age, sex, nature of symptoms, Associated factors like Jaundice, Hypertension, IHD, and diabetes were obtained. All patientsundergone investigations like complete haemogram, LFT, Coagulation Profile, chest and Abdomen X-Ray,ultrasound scanof abdomen and MRCP. Risk and complications of the Surgery has been explained tothe patients, consent was taken. Prior to cholecystectomy, Difficulty of Surgery were presumed based on MRCP reports and patients were explained regarding plan of Operation and Complication regarding Surgery. Inclusion criteria includes all patients who undergoing cholecystectomy.

Study will be evaluated for:-Anatomy of hepatobiliary system, Presence and details of gall stones, Presence of calculus in the biliary tree, and Associated Liver and Pancreatic Pathology

Observations & Results

Age Distribution

In this study Out of 50 patients, the incidence of Cholecystectomy is most common in age group of 21-40 years (48%) followed by age group of 41-60 (14%), >60 (10%), and <20 years 4%. While Cholecystectomy is more difficult in Age group of 41-60 years (64.28%) followed by >60 years 50% and 21-40 years 37.5%.

Sex Distribution

In this study, Out of 50 patients, the incidence of Cholecystectomy is common in females (74%) as compared to males (26%). While it is more difficult in male patient 69.23% compared to female patient 37.84%. p value is 0.02559 which is significant at $p<0.05$.

Associated Factors

In my study, Out of 50 patients, most common an associated factor hypertension 28%. Followed by Diabetes 20%, Jaundice 16% and Ischaemic heart disease 8%. p value is 0.015, significant at $p<0.05$. Cholecystectomy is more difficult in associated factors.

Table 1: Age Distribution

Age (in years)	No. of Patients in My study	Cholecystectomy		Other Study (Chandrashekhar Naik G et al[26])	
		Difficult	Non Difficult	Difficult	Non Difficult
<20	2(4%)	0 (0%)	2(100%)	0%	100%
21-40	24(48%)	9 (37.5%)	15 (62.5%)	35%	65%
41-60	14(28%)	9 (64.28%)	5 (35.72%)	61%	39%
>60	10(20%)	5 (50%)	5 (50%)	42.86%	57.14%

Table 2: Sex Distribution

Sex	Number of patients My Study	Cholecystectomy		Other Study (Ayanat Huain and et al[25])	
		Difficult	Non Difficult	Difficult	Non Difficult
Male	13(26%)	9 (69.23%)	4 (30.77%)	63.64%	36.36%
Female	37(74%)	14 (37.84%)	23 (62.16%)	36.9%	63.07%

Table 3: Associated Factors

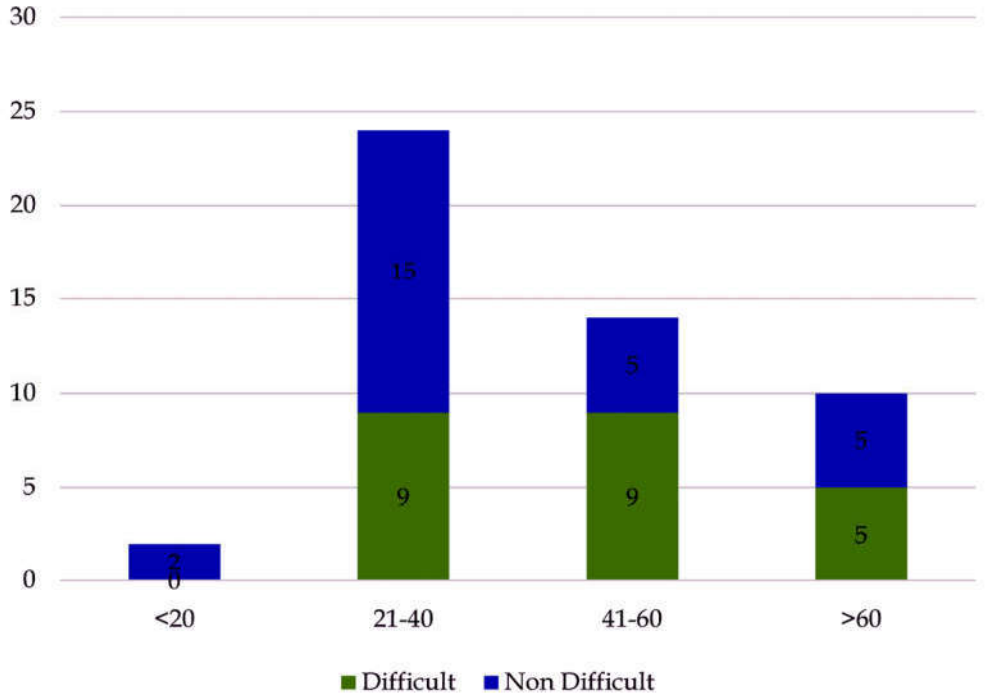
Associated Factors	Number of patients	Cholecystectomy	
		Difficult	Non Difficult
Diabetes	9(18%)	5 (55.55%)	4 (45.55%)
Hypertension	14(28%)	8 (57.14%)	6 (42.86%)
Ischemic Heart Disease	4(8%)	3 (75%)	1 (25%)
Jaundice	8(16%)	8 (100%)	0

Table 4: Open vs Laproscopic Cholecystectomy

Cholecystectomy	No. of Patients	Cholecystectomy		Other study (Sharma NK etal[27])	
		Difficult	Non Difficult	Difficult	Non Difficult
Open	14 (28%)	9 (64.28%)	5 (35.72%)	63.53%	42.30%
Laproscopic	36 (72%)	14 (38.88%)	22 (61.12%)	36.36%	57.68%

Table 5: Predictors and value of findings for patients undergoing Cholecystectomy

Level of Difficulty	Number of Patients	Cholecystectomy			
		Laproscopic		Open	
		MRCP Done	MRCP Not Done	MRCP Done	MRCP Not done
Non Difficult	27	17	5	4	1
Difficult	23	13	1	7	2



Graph 1: Age Distribution in my study

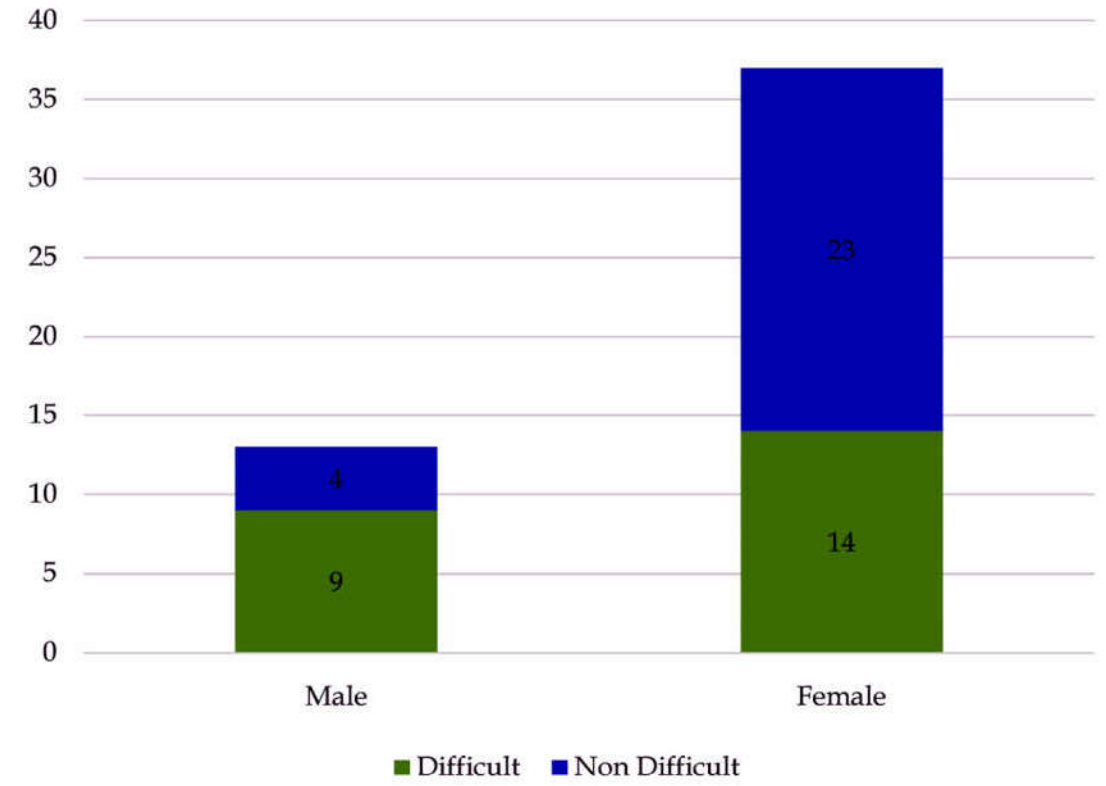
Open vs Laproscopic Cholecystectomy

Out of 50 Patients, 13 (26%) have undergone Open Cholecystectomy while 37 (74%) have undergone Laproscopic Cholecystectomy.

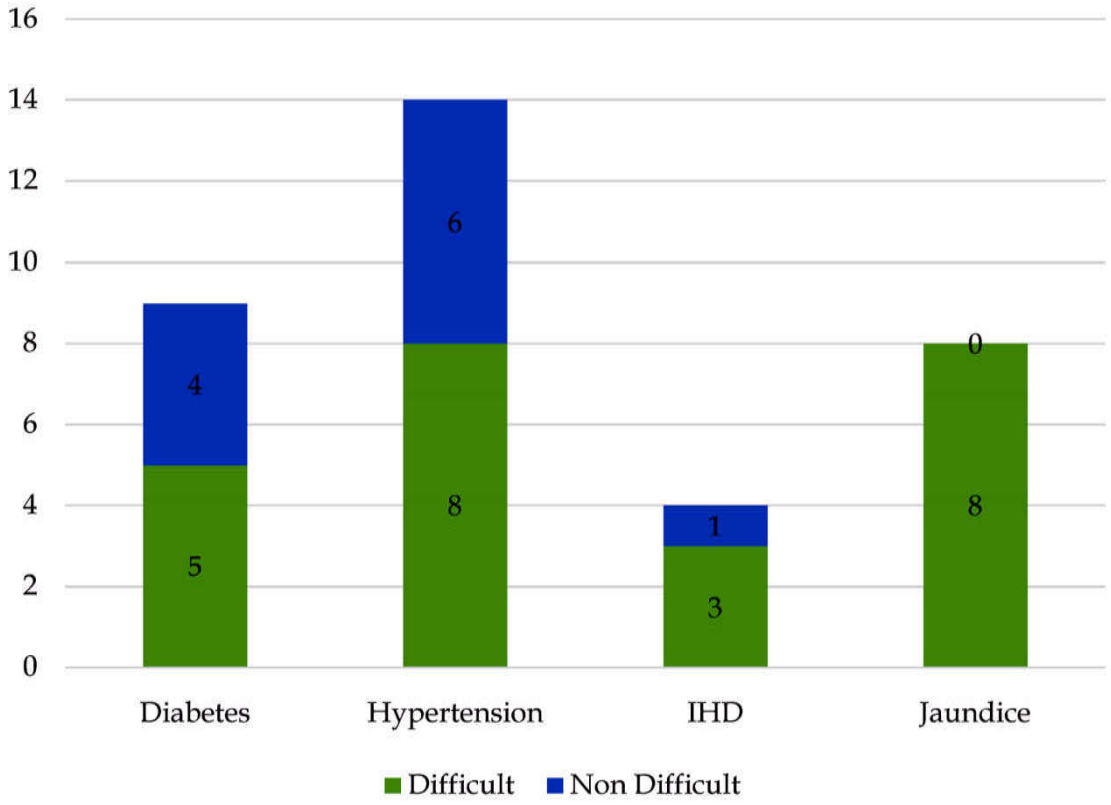
Difficult Cholecystectomy is more done via open method (64.28%) then laproscopic (38.88%). p value is 0.045, significant at $p<0.05$.

Predictors and value of findings for patients undergoing Cholecystectomy

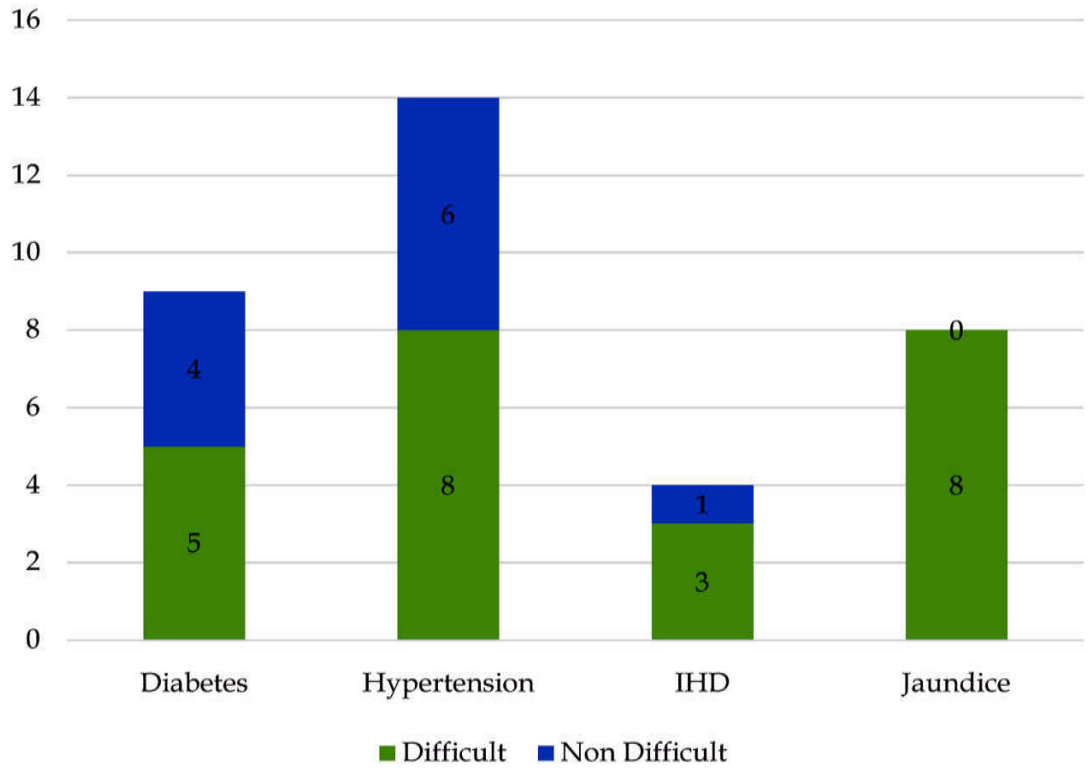
Out of 50 patient difficult cholecystectomy have identified in 23 patient and Non difficult cholecystectomy identified in 27 patient. Out of 41 patient who have done MRCP, we could know the difficult in cholecystectomy preoperatively so we could better manage in those patient intraoperatively.



Graph 2: Sex wise Distribution in my study



Graph 3: Associated Factors



Graph 4: Laproscopic vs Open Cholecystectomy

Discussion

This study is a prospective study of 50 case of Role of Magnetic Resonancecholangiopancreatography for prediction of difficult cholecystectomy in Sir T. Hospital, Bhavnagar.

- As per the Age distribution, Out of 50 patients, the incidence ofCholecystectomy is most common in age group of 21-40 years (48%) followedby age group of 41-60 (14%), >60 (10%), and <20 years 4%. WhileCholecystectomy is more difficult in Age group of 41-60 years (64.28%)followed by >60 years 50% and 21-40 years 37.5%. In other study (Chandrashekhar Naik G et al [1]) cholecystectomy is difficult in 41- 60 years61% followed by >60 years 42.86%, and 21-40 years 35%. So in every patientsof age group 41-60 years and >50 years require MRCP preoperatively.
- As per sex distribution, Out of 50 patients, the incidence of Cholecystectomyis common in females (74%) as compared to males (26%). While it is moredifficult in male patient 69.23% compared to female patient 37.84%. p value is 0.02559 which is significant at p<0.05. In other study (Ayanat Huain and et al [2]) also, it is more difficult in Male patient 63.64% as compared to female patient 36.9%. So every Male patient undergoing Cholecystectomy require MRCPpreoperatively.
- Out of 50 patients, most common associated factor is hypertension 28%. Followed by Diabetes 20%, Jaundice 16% and Ischaemic heart disease 8%. pvalue is 0.015, significant at p<0.05. Cholecystectomy is more difficult inassociated factors especially Jaundice patients. So in every Jaundice patients andassociated factors we should go for MRCP preoperatively.
- Out of 50 Patients, 13 (26%) have undergone Open Cholecystectomy while 37 (74%) have undergone Laproscopic Cholecystectomy.

  Difficult Cholecystectomy is more done via open method (64.28%) then laproscopic (38.88%). p value is 0.045, significant at p<0.05. In Other study (Sharma NK et al [3]) Difficult Cholecystectomy are found 63.53% in Open Method and 36.36%in Laproscopic method. While Non difficult cholecystectomy are found 42.30%in open mehod and 57.6% in Laproscopic method.
- Out of 50 patients Magnetic Resonance CholangioPancreatography of total 41patients were done and can identify the possibility of difficult cholecystectomyin 20 patients by any of the factors like adhesions, fibrosis, cystic duct or

CBD abnormality etc. And we could thus prevent the possibility of intraoperativecomplications in all these patients. Although Out of 50 patients 9 Patient's MRCP was not done. Form there 2 patients Cholecystectomy were founddifficult. One of these two patients have post operative histopathology reportsuggestive of Ca. Gallbladder. So if we have done MRCP preoperatively, Wemight know the Malignancy of Gall Bladder preoperatively.

Conclusion

Magnetic resonance Cholangiopancreatography as compared to ERCP and peroperative cholangiogram is safe, noninvasive, easily available every where, and helpful preoperatively in identifying difficult cholecystectomy. Peroperative cholangiogram is not feasible every time.

The data in these study suggestive that Magnetic resonance cholangiopancreatography preoperatively helps in identifying the difficult cholecystectomy. So we can preoperatively explain the patient regardingcomplications and methods of operations. We can minimize the intraoperativecomplications, reduce operative time and also we can prevent intraoperativemorbidity of the patients.

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