ORIGINAL RESEARCH ARTICLE

Comparative Analysis of Hepatobiliary and Pancreatic Pathologies on Sonography and Magnetic Resonance Cholangiopancreatography

Arvinder Singh[1], Niveditha Basappa[2], Jatinderpal Singh[3]

Abstract

Background: The pancreaticobiliary pathologies are one of the most common routinely encountered disorders. The evaluation of a suspected pancreaticobiliary pathology is a common radiological problem and is routinely diagnosed by a variety of imaging modalities including ultrasonography (USG), computed radiography, and magnetic resonance cholangiopancreatography (MRCP).

Objectives: To study and compare the radiological features in pancreatic and biliary system pathology using USG and MRCP, and to compare the findings with histopathology results wherever available.

Materials and methods: The prospective study was carried out on 50 patients with suspected pancreaticobiliary pathologies who underwent both USG and MRCP.

Results: In our study of 50 cases, there were 34 (68%) female cases and 16 (32%) male cases with hepatobiliary pathologies. The female to male ratio was 2.1:1. The maximum number of 15 (30%) cases were between the age range of 41 years and 50 years. The dilatation of the biliary system was seen in 40 (80%) cases, cholelithiasis in 22 (44%), isolated choledocholithiasis in 16 (32%), cholecystitis in 3 (6%), pancreatic divisum in 3 (6%), choledochal cyst in 3 (6%), acute pancreatitis in 2 (4%) chronic pancreatitis in 4 (8%), and common bile duct (CBD) stricture in 2 (4%) cases; these are the most common pancreaticobiliary pathologies identified on MRCP. Ultrasonography was equally good in comparison to MRCP in identifying intrahepatic biliary radical dilatation, gallbladder distension, and cholelithiasis in 100% cases. However, the sensitivity and specificity of USG in detecting choledocholithiasis was low.

Conclusion: Though USG provides a good information about the presence of biliary obstruction, it does not suggest the possible cause in many cases. Hence, USG is regarded as an initial guide to select the patients for MRI examination. Magnetic resonance cholangiopancreatography is a highly sensitive noninvasive modality in the detection of the level and cause of the biliary obstruction.

Keywords: Magnetic resonance cholangiopancreatography, Pancreaticobiliary pathologies, Sonography.

AMEI's Current Trends in Diagnosis & Treatment (2019): 10.5005/jp-journals-10055-0073

Introduction

The pancreaticobiliary pathologies are one of the most common, routinely encountered disorders in daily clinical practice. The evaluation of a suspected pancreaticobiliary pathology is a common radiological problem and is routinely diagnosed by a variety of imaging modalities including ultrasonography (USG), computed radiography, magnetic resonance cholangiography, and endoscopic retrograde cholangiopancreatography (ERCP).

The role of a radiologist is to accurately access the etiology, location, severity, and extent of the disease and to guide the clinician to choose the appropriate mode of treatment based on clinical, laboratory, and imaging findings.

Plan: Ultrasonography is the first-line imaging modality for most pancreatic and biliary pathologies due to its accuracy, safety, and noninvasiveness. It is helpful in detecting bile duct morphology, and the sensitivity and specificity of USG in pancreatic and biliary pathology is 61.63 and 83.3%, respectively.[1]

Magnetic resonance cholangiopancreatography (MRCP) is a radiologic technique that produces images of the pancreaticobiliary tree that are similar in appearance to those obtained by invasive radiographic methods, such as ERCP. Magnetic resonance cholangiopancreatography takes advantage of the inherent contrast-related properties of fluid in the biliary and pancreatic ducts. Currently, the diagnostic accuracy of MRCP is considered to be equivalent to that of ERCP for a broad spectrum of benign and malignant pancreatic and biliary ductal diseases.[2]

Magnetic resonance cholangiopancreatography makes use of heavily T2-weighted pulse sequences, thus exploiting the inherent differences in the T2-weighted contrast between stationary fluid-filled structures in the abdomen (which have a long T2 relaxation time) and the adjacent soft tissue (which has a much shorter T2 relaxation time). Static or slow-moving fluids within the biliary tree and the pancreatic duct appear of high-signal intensity on MRCP, while the surrounding tissue is of reduced signal intensity.[3,4]

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How to cite this article: Singh A, Basappa N, Singh J. Comparative Analysis of Hepatobiliary and Pancreatic Pathologies on Sonography and Magnetic Resonance Cholangiopancreatography. AMEI's Curr Trends Diagn Treat 2019;3(2):45–55.

Source of support: Nil

Conflict of interest: None

Aims and Objectives

- To study the radiological features in pancreatic and biliary system pathology using USG and MRCP.
- To compare the findings of USG with MRCP in hepatobiliary pathologies.
- To compare the findings of MRCP with histopathological results wherever available.

Materials and Methods

This prospective study was conducted in the Department of Radiodiagnosis, Guru Nanak Dev Medical College and Hospital, Amritsar, Punjab, from May 2017 to November 2019. A total of 50 patients with signs and symptoms related to biliary and pancreatic pathologies underwent USG, MRCP, and CT wherever needed for evaluation of biliary and pancreatic pathology. In all cases, a written informed consent was taken from them/guardian before conducting the study.

Sonographic imaging was done with the MINDRAY DC-8 machine using the curvilinear and superficial probe. Magnetic resonance cholangiopancreatography was done with the SIEMENS MAGNETOM AERA 1.5 TESLA MRI machine.

Technique of Examination

The investigations were done after fasting for 4 hours prior to the examination to reduce the motility to eliminate motion artifacts and to promote distension of the gallbladder (GB).

Transabdominal USG was performed on all 50 patients with suspected pancreaticobiliary pathologies with a convex probe (2–5 MHz), focusing mainly on the details of the GB, pancreas, and the biliary system. The findings were recorded in a proforma for comparisons. Magnetic resonance cholangiopancreatography is performed on a 1.5-T or superior MRI system, using a phased-array body coil. All protocols obtain heavily T2-weighted sequences. The most commonly obtained sequences were rapid acquisition and relaxation enhancement (RARE), fast-recovery fast spin-echo (FRFSE) coronal oblique 3D respiratory triggered, and half-Fourier acquisition single shot turbo spin echo HASTE axial 2D breath hold sequence which provide superior images and can be performed in single breath hold (<20 seconds) and a fat-suppressed sequence, additional sequence that can be acquired to evaluate duct wall is a fat-suppressed T1-GRE sequence. For optimum visualization of ducts, acquired images are reformatted in different planes using multiplanar reconstruction (MPR) and maximum intensity projection (MIP). The advantage of FRFSE, as a 3D technique, is the ability to perform MPRs.[4]

Observations

In our study of 50 cases, there were 34 (68%) female cases and 16 (32%) male cases with hepatobiliary pathologies. The male to female ratio was 1:2.1 (Table 1).

The maximum number of 15 (30%) cases were between the age range of 41 years and 50 years, followed by 13 (26%) cases between the age range of 51 years and 60 years, 8 (16%) cases between 31 years and 40 years, 7 (14%) cases between 61 years and 70 years, 3 (6%) cases each between 21 years and 30 years and >70 years, respectively, and only one (2%) case between 11 years and 20 years (Table 2).

The cholelithiasis was the most common finding in 25 (50%) patients with 19 (38%) females and 6 (12%) males. The second most common finding was choledocholithiasis seen in 16 (32%) patients with 10 (20%) females and 6 (12%) males. There were 10 (20%) cases of GB mass with 8 (16%) females and 2 (4%) males. The other pathologies include acute pancreatitis 4 (8%), atrophic pancreatitis 4 (8%), choledochal cyst 2 (4%), pancreatic lipomatosis 1 (2%), pancreatic mass 1 (2%), common bile duct (CBD) stricture 1 (2%), abnormal cystic duct 2 (4%), and cholangiocarcinoma 5 (10%) cases. The intrahepatic biliary dilatation was seen in 40 (80%) cases in both USG and MRCP (Table 3).

On sonography, the GB distension was seen in 43 (86%) cases while on MRCP it was seen in 44 (88%) cases. On sonography, GB was contracted in 6 (12%) cases while on MRCP it was seen in 5 (10%) cases. Both USG and MRCP showed GB wall mass in 10 (20%) cases. The contracted GB was seen in 6 (12%) cases on USG, and on MRCP it was seen in 5 (10%) cases. Ultrasonography showed intraluminal GB contents in 31 (62%) cases, while MRCP showed it in 30 (60%) cases. The GB calculi were seen in 22 (44%) cases on both USG and MRCP. The GB sludge was also seen 2 (4%) cases on both USG and MRCP.

On USG, the CBD was dilated in 31 (62%) cases with obscuration of lumen in 1 (2%) case. The MRCP showed dilatation in 32 (64%) cases indicating that it is a better modality for CBD dilatation. The CBD calculi were seen in 16 (32%) cases on sonography while MRCP showed it in 17 (34%) cases. One case showed a calculus in the cystic duct stump on MRCP, which was missed on sonography. The CBD mass was seen in 5 (10%) cases on sonography and in 7 (14%) cases on MRCP. One case was that of multifocal CBD masses. The CBD sludge was equally seen in 6 (12%) cases on both the modalities.

In our study of 50 cases, the pancreas was normal in 42 (84%) cases, with the pancreatic abnormalities seen in 8 (16%) cases. The pancreas appeared atrophic in three (6%) cases on sonography and in four (8%) cases on MRCP. The pancreatic enlargement was seen in two (4%) cases with one case of pancreatic lipomatosis and one case of pancreatic tail cyst. On sonography, one (2%) case was poorly visualized due to the overlying bowel gas due to inherent disadvantage of ringing down artefacts.

The main pancreatic duct (MPD) was normal in 43 (86%) cases on sonography and dilated in 7 (14%) cases. The MRCP showed normal MPD in 40 (80%) cases with dilated in 10 (20%) cases, indicating that MRCP is a better modality for assessment of MPD.

Table 1: Gender distribution in 50 study cases

Gender	*No. of patients*	*Percentage*
Female	34	68
Male	16	32
Total	50	100

Table 2: Age distribution in 50 study cases

	Gender		
Age in years	*Female (%)*	*Male (%)*	*Total (%)*
11–20	1 (2)	–	1 (2)
21–30	2 (4)	1 (2)	3 (6)
31–40	8 (16)	–	8 (16)
41–50	9 (18)	6 (12)	15 (30)
51–60	9 (18)	4 (8)	13 (26)
61–70	3 (6)	4 (8)	7 (14)
>70	2 (4)	1 (2)	3 (6)
Total	34 (68)	16 (32)	50 (100)

Table 3: Number of patients showing various pancreaticobiliary pathologies as observed on ultrasonography and magnetic resonance cholangiopancreatography

	Female (n = 34)		*Male (n = 16)*		*Total (n = 50)*	
Diagnosis	*No*	*(%)*	*No*	*(%)*	*No*	*(%)*
USG						
Cholelithiasis	19	38	06	12	25	50
Pancreatic atrophy	01	02	02	04	03	06
Choledocholithiasis	10	20	06	12	16	32
Cholecystitis	03	06	01	02	04	08
Pancreatic lipomatosis	00	00	00	00	00	00
Cholangiocarcinoma	03	06	02	04	05	10
Bulky pancreas	01	02	01	02	02	04
GB mass	08	16	02	04	10	20
CBD stricture	00	00	00	00	00	00
Pancreatic mass	01	02	00	00	01	02
Liver mets	02	04	00	00	02	04
MRCP						
Cholelithiasis	19	38	03	06	22	44
Pancreatic atrophy	02	04	02	04	04	08
Choledocholithiasis	08	16	09	18	17	34
Cholecystitis	03	06	01	02	04	08
GB mass	08	16	02	04	10	20
Pancreatic lipomatosis	01	02	00	00	01	02
Acute pancreatitis	01	02	01	02	02	04
Choledochal cyst	01	02	01	02	02	04
Cholangiocarcinoma	04	08	03	06	07	14
CBD stricture	00	00	01	02	01	02
GB stump calculus	0	0	1	2	1	2
Hydatid cyst	1	2	0	0	1	2
Abnormal cystic duct	1	2	1	2	2	4
Pancreatic mass	1	2	0	0	1	2
Hepatocholecystic fistula	1	2	0	0	1	2
Histopathology						
Cholelithiasis	19	38	03	06	22	44
Adenomyomatous hyperplasia	01	02	00	00	01	02
Cholangiocarcinoma	03	06	02	04	05	10

The sensitivity, specificity, positive predictive value, negative predictive value, and accuracy of USG compared to MRCP were calculated in assessment of intrahepatic biliary radicles (IHBR), GB, CBD, and pancreatic pathologies Table 4).

Two noninvasive modalities, USG and MRCP, are compared in the detection of various pancreaticobiliary pathologies. Sensitivity, specificity, positive predictive value, negative predictive value, and accuracy of USG are calculated (Table 5).

Discussion

The pancreaticobiliary pathologies are evaluated using several imaging techniques; USG, computed tomography (CT), and MRCP are the most commonly used noninvasive modalities. The percutaneous transhepatic cholangiography (PTC) and the ERCP are the most commonly used invasive techniques (Figs 1 to 9).

In the present study, 50 patients with pancreaticobiliary pathologies were evaluated primarily by using the two noninvasive imaging modalities, i.e., USG and MRCP. The results of USG were compared with that of MRCP in pancreaticobiliary pathologies and histopathology wherever the results were available.

In our study of 50 patients, 34 (68%) were females and 16 (32%) were males. There was a female preponderance with male:female ratio of 1:2.1. The mean age of the study population was 45.6 years. Håkansson et al.[5] studied 85 patients, out of which 43 (51%) were males and 42 (49%) were females. Ferrari et al.[6] studied 131 patients, and the distribution of male patients was 47% while that of females was 53%. Upadhyaya et al.[7] studied 100 patients, out of which 46% were males and 54% were females.

Kushwah et al. studied 50 patients, out of which 20 (40%) were males and 30 (50 %) were females. In our study of 50 patients, 32% were males and 68% were female patients, which closely matches with Kushwah et al.[8]

In our study, the maximum number of 15 (30%) cases were between the age range of 41 years and 50 years, followed by 13 (26%) cases between the age range of 51 years and 60 years, 8 (16%) cases between 31years and 40 years, 7 (14%) cases between 61 years and 70 years, 3 (6%) cases each between 21 years and 30 years and

Table 4: Correlation of the findings of ultrasonography with magnetic resonance cholangiopancreatography findings

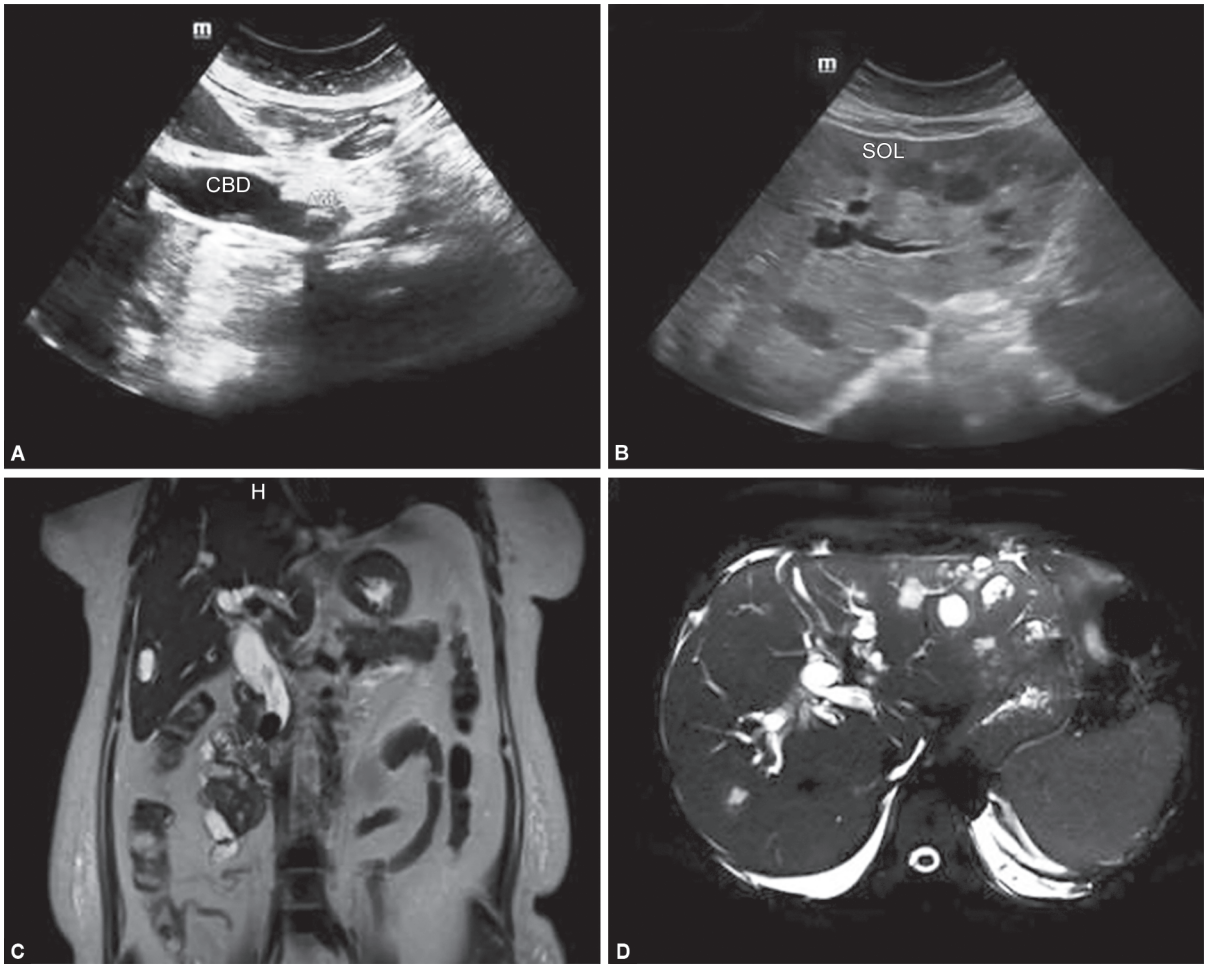
	Observation					*Correlation*					
USG vs MRCP	*TP*	*FP*	*FN*	*TN*	*Total*	*Sn*	*Sp*	*PPV*	*NPV*	*Accuracy*	*p value*
IHBRS	40	0	0	10	50	100	100	100	100	100	<0.001*
Other findings	4	0	3	43	50	57.14	100	100	93.48	94	<0.001*
GB distension	6	1	0	43	50	100	97.73	85.71	100	98	<0.001*
GB wall	16	1	0	33	50	100	97.06	94.12	100	98	<0.001*
Luminal contents	30	1	0	19	50	100	95	96.77	100	98	<0.001*
CBD diameter	31	0	1	18	50	96.88	100	100	94.74	98	<0.001*
CBD lumen	22	2	7	19	50	75.86	90.48	91.67	73.08	82	<0.001*
Pan size	5	0	3	42	50	62.5	100	100	93.33	94	<0.001*
Pan duct	7	0	3	40	50	70	100	100	93.02	94	<0.001*

*$p < 0.001$, significant

Table 5: Correlation of ultrasonography diagnosis with magnetic resonance cholangiopancreatography diagnosis

	Observation					*Correlation*					
USG vs MRCP	*TP*	*FP*	*FN*	*TN*	*Total*	*Sn*	*Sp*	*PPV*	*NPV*	*Accuracy*	*p value*
Cholelithiasis	12	0	0	38	50	100	100	100	100	100	<0.001*
Choledocholithiasis	13	3	3	31	50	81.25	91.18	81.25	91.18	88	<0.001*
Cholangiocarcinoma	7	0	3	40	50	70	100	100	93.02	94	<0.001*
Chronic pancreatitis	3	0	1	46	50	75	100	100	97.87	98	<0.001*
GB mass	10	0	0	40	50	100	100	100	100	100	<0.001*

*$p < 0.001$, significant



Figs 1A to D: (A and B) Ultrasound showing a well-defined calculus at the distal end of common bile duct with distal acoustic shadowing. The proximal common bile duct shows dilatation with a minimal sludge layering along its dependent part. Ill-defined cystic areas seen in the liver metastasis; (C and D) Magnetic resonance cholangiopancreatography T2-weighted sequence in Coronal plane of same patient showing better depiction of the calculus in distal common bile duct (arrow) with well delineation of whole of common bile duct and intrahepatic biliary radicles. The multiple cystic lesions scattered in both the lobes of liver was metastasis

>70 years, respectively, and only 1 (2%) case between 11 years and 20 years. The youngest patient in our study was 18 years old and the oldest was 75 years old. These findings are comparable to study conducted by Kaur et al.[9]

The cholelithiasis was the most common pathology identified in 22 (44%) patients both on USG and MRCP, and similarly cholecystitis was seen in 4 (8%) cases on both USG and MRCP.

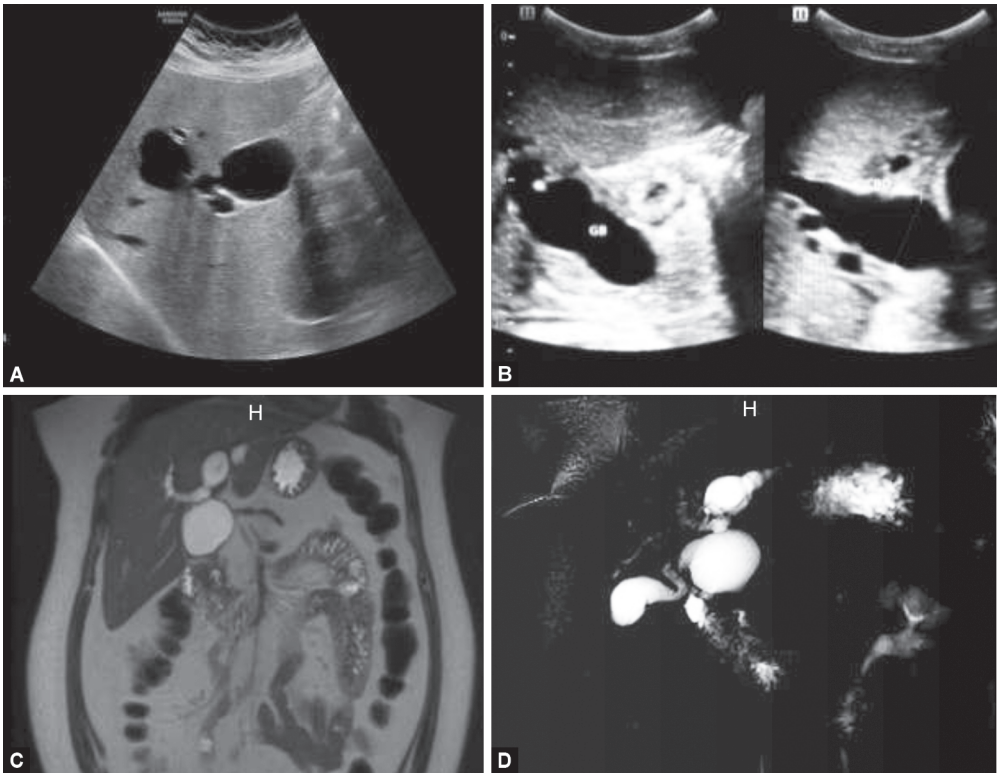
The choledocholithiasis was identified in 16 (32%) patients on USG and 17 (14%) patients on MRCP. In one patient, the echogenic sludge was noted on USG; however, on MRCP a small calculus was noted. The sensitivity of USG and MRCP in the detection of choledocholithiasis was 81.2 and 100%, respectively. Similarly, a study done by Kaur et al.[9] showed sensitivity in detection of choledocholithiasis on USG and MRCP as 63 and 100%, respectively. In a study conducted by Attri et al.,[10] the sensitivity and specificity of MRCP in the detection of choledocholithiasis was 85–100%, which is comparable to our study.

In our study, the CBD stricture was detected in 1 (2%) patient on MRCP, which was missed in USG. Shadan et al.[11] reported benign strictures in 4% cases. In a study conducted by Kaur et al., the benign stricture was noted in 5 (10%) cases[9] and in the study conducted by Bhatt et al.[12] the benign stricture was seen in 2% patients, which is same as in our study.

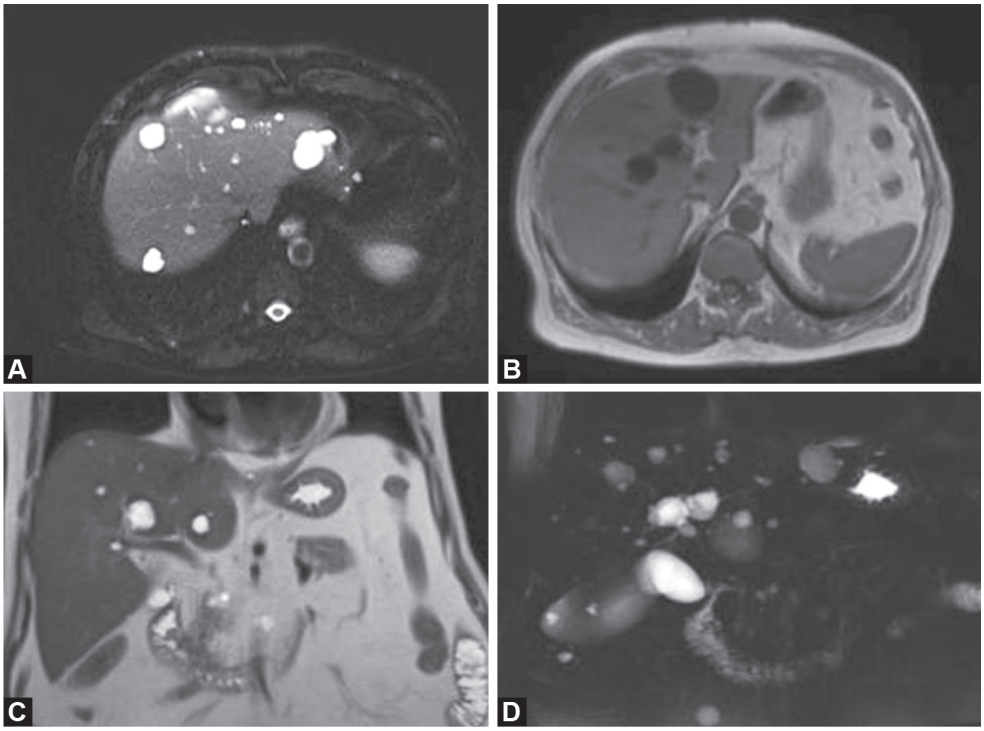
The choledochal cyst was identified in two (4%) patients on MRCP in our study, which yielded 100% diagnostic information in identifying the choledochal cyst. However, on USG, the choledochal cyst was not identified due to the distal location and misdiagnosed as other cystic lesion. In the study conducted by Bhatt et al.,[12] choledochal cysts were noted in five patients, which is similar to our study. Upadhayaya et al.[7] reported the choledochal cyst in 3% of cases in his study, which is comparable with our study.

In our study of 50 patients, the abnormal cystic duct was observed in 2 (4%) patients on MRCP, which was not initially diagnosed on USG. In a study by Sarawagi et al.,[13] it was reported that low insertion of the cystic duct was seen in 18 (9%) cases and 8 (4%) cases had a lower medial insertion. Taourel et al. showed a low cystic duct insertion in 11 (9%) cases and a medical cystic duct insertion in 22 (17%) cases.[14]

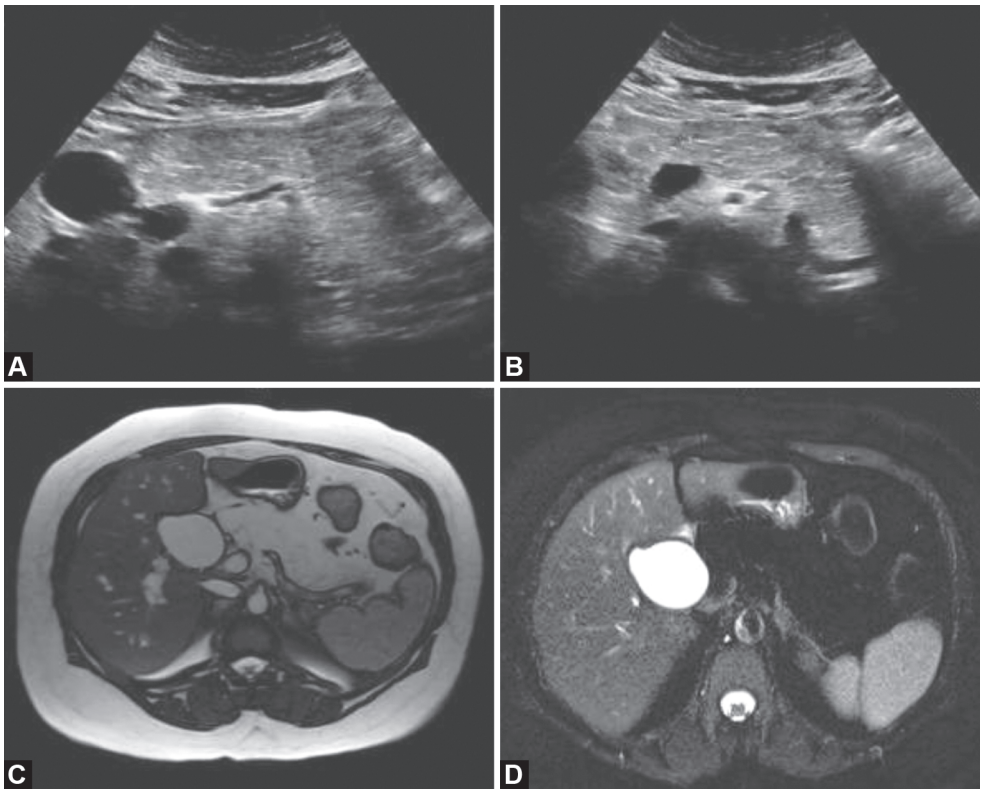
Magnetic resonance cholangiopancreatography is highly accurate in the diagnosis of anatomic variants of the biliary tree that may increase the risk of bile duct injury during laparoscopic cholecystectomy.[14]



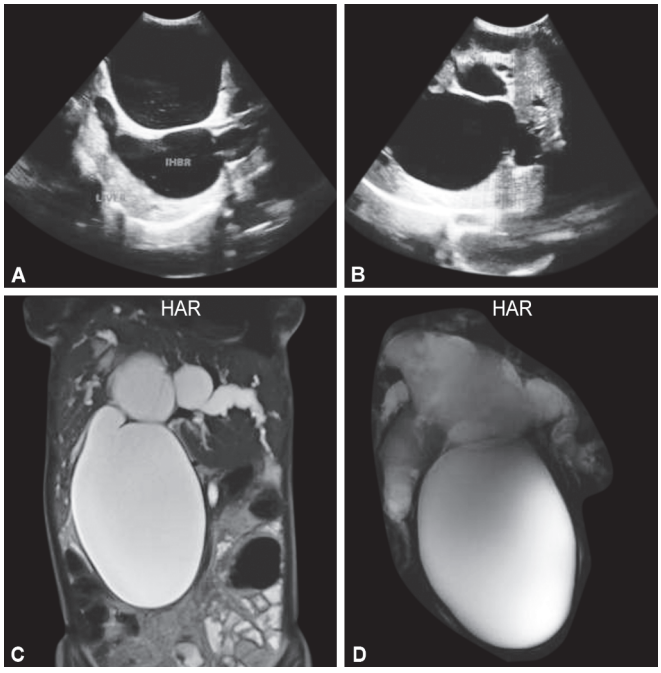
Figs 2A to D: Choledochal cyst (type IVB—Todani classification): (A and B) Ultrasound showing the saccular type of dilatation of the common bile duct with similar sacculation in relation to the left intrahepatic biliary duct; (C and D) Magnetic resonance cholangiopancreatography confirms saccular dilatations in relation to the main common bile duct and the left hepatic duct suggestive of intrahepatic and extrahepatic saccular type of choledochal cyst



Figs 3A to D: Caroli's disease (type V choledochal cyst) congenital cystic dilatation of the intrahepatic biliary tree. Multiple well-defined cystic lesions seen in relation to both the lobes of liver, distributed at the periphery. On magnetic resonance cholangiopancreatography 3D recon, they appear to be communicating with the biliary radicles—Caroli's disease



Figs 4A to D: Type II choledochal cyst with pancreatic lipomatosis: (A and B) Ultrasound showing a saccular type of dilatation of common bile duct. The pancreas was bulky in nature with markedly increased echogenicity suggestive of fatty infiltration; (C and D) Magnetic resonance cholangiopancreatography shows saccular dilatation of common bile duct with the bulky pancreas and markedly reduced intensity on theT2W sequence—choledochal cyst with pancreatic lipomatosis



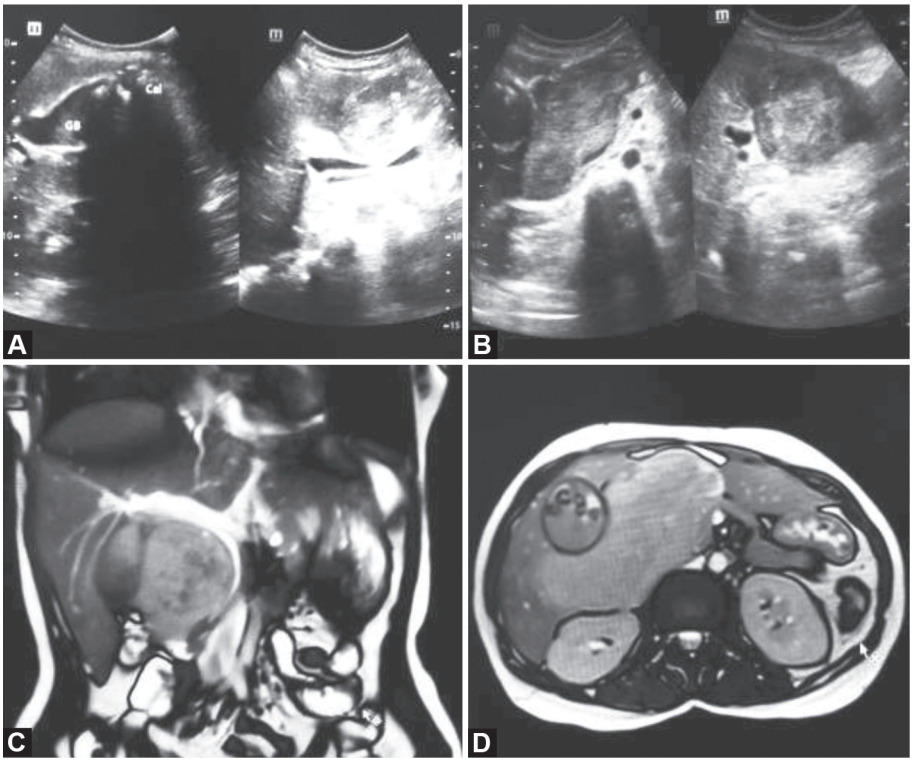
Figs 5A to D: Large choledochal cyst (type IVA-Todani classification): (A and B) Ultrasound showing a large fusiform type of common bile duct dilatation (>6 cm) with markedly dilatated intrahepatic biliary radicles; (C and D) Magnetic resonance cholangiopancreatography showing a massively dilated fusiform type of extrahepatic common bile duct dilatation (>6 cm) with narrowing in the distal end (congenital stricture). The intrahepatic biliary radicles are also severely dilated

The acute pancreatitis was identified in two (4%) patients on USG and MRCP. The chronic atrophic pancreatitis was identified in three (6%) patients on USG and in four (8%) patients on MRCP. In one case, there were no features of acute pancreatitis on USG; however, peripancreatic edema was identified on MRI and hence acute on chronic pancreatitis diagnosis was made. The ductal dilatation was identified in two patients with pancreatitis on USG and in all cases of pancreatitis on MRCP. Shadan et al.[11] reported chronic pancreatitis in 10% cases, which nearly matches our study.

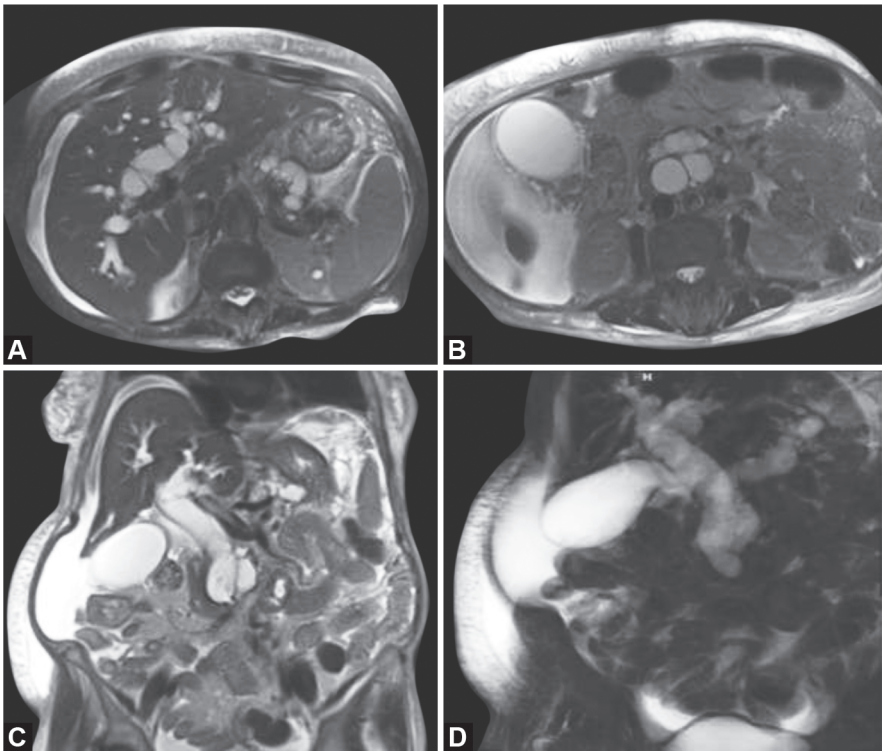
In our study of 50 patients, cholangiocarcinoma was identified in five (10%) patients on ultrasound and seven (14%) patients on MRCP and the results were confirmed in five (10%) patients on histopathology. Only one case of Kaltskin's tumor was detected. Two cases were wrongly diagnosed on USG; one was reported as calculus and other as obscured CBD due to poor echo window. Shadan et al.[11] reported cholangiocarcinoma in 4% cases, Bhatt et al.[12] reported Klatskin's tumor in 12% cases and Reinhold et al.[15] reported cholangiocarcinoma in 2.3% cases. In a study conducted by Kaur et al.,[9] cholangiocarcinoma was noted in 10% cases, which is nearly same as in our study.

In our study, the sensitivity, specificity, and accuracy of USG in the detection of cholangiocarcinoma was 70, 100, and 94%, respectively. In a study by Attri et al.,[10] the overall sensitivity was 83.3%, specificity was 100%, and accuracy was 98.0% for cholangiocarcinoma on MRCP, which is comparable with our study.

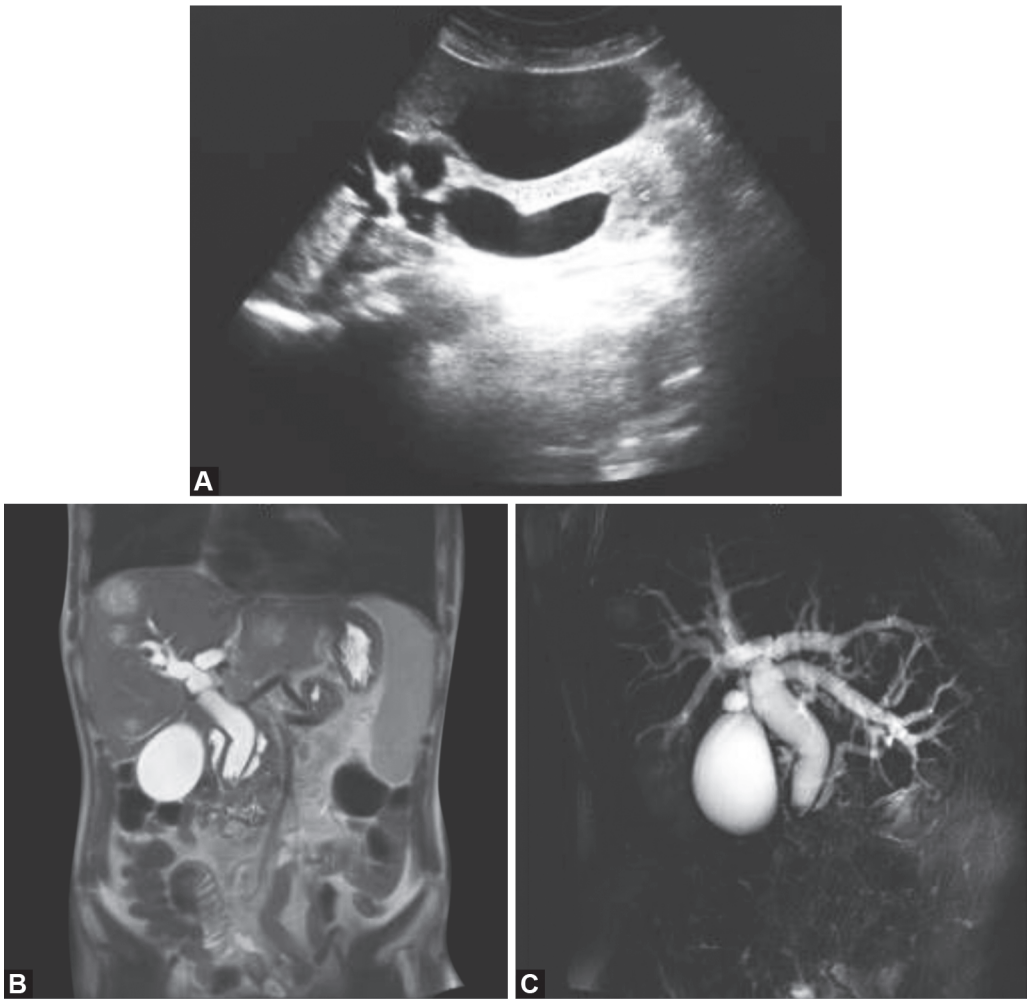
The GB carcinoma was identified in 10 (20%) patient on both USG and MRCP, which was confirmed on histopathology. Shadan et al.[11] reported carcinoma GB in 4% cases, while Bhatt et al.[12]



Figs 6A to D: Diffuse infiltrating type of gallbladder carcinoma: (A and B) Ultrasound showing a large irregular-shaped mass in relation to anterior wall of gallbladder, with multiple calculi and sludge in its lumen. The mass is diffusely infiltrating into the adjacent hepatic parenchyma merging imperceptibly with it. The common bile duct was compressed; (C and D) Magnetic resonance cholangiopancreatography shows a large irregular gallbladder mass with infiltration into the adjacent hepatic parenchyma. Note the common bile duct is better visualized and is displaced and stretched by the mass—a typical gallbladder carcinoma



Figs 7A to D: Anomalous common bile duct opening into third part of duodenum with common bile duct stricture. Magnetic resonance cholangiopancreatography showing moderate-to-severe dilatation of intrahepatic biliary radicals. Main extrahepatic common bile duct is also markedly dilated with abnormal opening into the third part (horizontal part) of the duodenum. Main pancreatic duct (MPD) is also marked dilated and tortuous in nature with abnormal drainage into the third part of duodenum. Gallbaldder appears mildly overdistended—abnormal distal common bile duct and MPD drainage in duodenum with distal common bile duct stricture



Figs 8A to C: Distal common bile duct cholangiocarcinoma with biliary tree dilatation: (A) Ultrasound showing dilatation of intrahepatic biliary radicals and main common bile duct. Narrowing is seen in the distal end with a small ill-defined isoechoic mass; (B and C) Magnetic resonance cholangiopancreatography shows dilatation of common bile duct and main pancreatic duct with a small mass in the distal end of common bile duct—cholangiocarcinoma

reported it in 2% cases. The sensitivity and specificity, of both USG and MRCP was 100%. This is comparable with the previous study conducted by Attri et al.[10] where MRCP was highly diagnostic with sensitivity, specificity and accuracy of 100% each. All the cases diagnosed as GB mass in our study were diagnosed as adenocarcinoma on histopathologic evaluation.

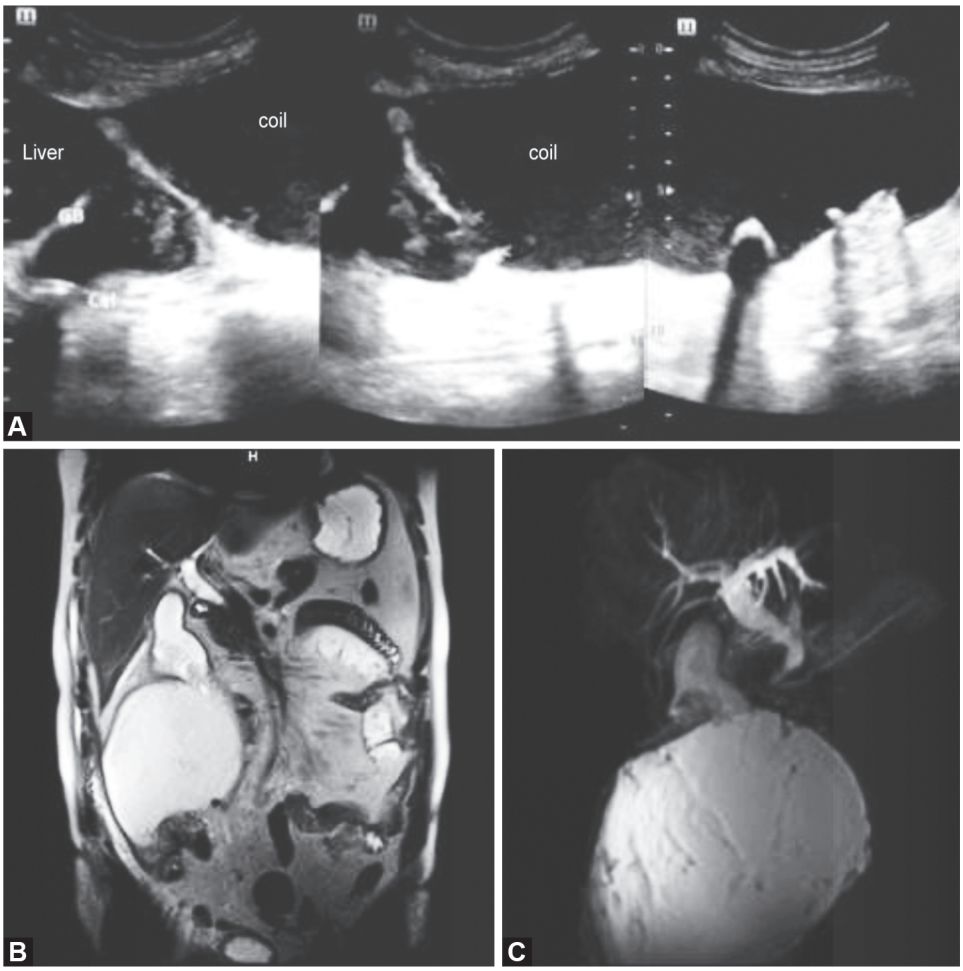
It was noted that the percentage distribution of cholangiocarcinoma in our study closely matches with a study done by Soto et al.[16] The percentage distribution of the carcinoma of the pancreas in our study is low compared to the other studies. The overall of the sensitivity and specificity of USG and MRCP in the diagnosis of pancreatic mass were 100%. In the study conducted by Kaur et al.,[9] the sensitivity of USG in diagnosing carcinoma pancreas was 75% because of obscuration of the head of the pancreas by bowel gas shadows. The sensitivity and diagnostic accuracy of MRCP is 100%, which is same as our study.

In our study, a case of hydatid cyst of the liver was noted on MRCP, i.e., one (2%) patient, which was misdiagnosed as a simple hepatic cyst on USG, which is comparable to the study conducted by Shadan et al.,[11] which showed one (2%) case of the hydatid cyst.

There was one case of hepatocholecystic fistula, which was accurately diagnosed on MRCP whereas it was missed on USG. Similarly, a case of cystic duct stump calculus was accurately diagnosed on MRCP, which was not detected on USG. Hence, MRCP plays a major role in complicated cases of hepatobiliary pathologies.[17]

Tamura et al.[18] reported that overall sensitivity and specificity values of MRCP for delineating pathologic pancreatic changes were 88 and 98%, respectively. In our study, the cases of chronic atrophic pancreatitis were detected with a sensitivity of 75% and specificities of 100% on USG compared to MRCP.

Overall, the pathologies causing obstructive biliopathy included both benign and malignant lesions. The benign lesions constituted 55% (22/40) cases, and malignant lesions constituted 45% (18/40) cases. The most common benign cause was calculus. The accuracy, sensitivity, and specificity of USG compared to MRCP in the diagnosis of being 81, 91, and 88%, respectively. The most common cause of obstruction in malignant pathology was cholangiocarcinoma. The sensitivity, specificity, and accuracy of USG in the diagnosis of malignant diseases were 70, 100, and 94%, respectively, compared to MRCP.



Figs 9A to C: Ruptured gallbladder forming cholecytocystic fistulous communication (a complication of gallbladder mucocele): (A and B) Ultrasound showing a breach in the continuity of fundus of gallbladder, communicating with a large intra-abdominal collection. This collection shows a calculus with the sludge in it indicating a ruptured gallbladder; (C) Magnetic resonance cholangiopancreatography showing a case of complication of cholecystitis in which there is a breach in continuity in the fundus of gallbladder and gallbladder is communicating with the a large intra-abdominal cystic collection. There is a calculus at the gallbladder neck with about two calculi in the extrabiliary cystic collection suggestive of cholecystocystic communication. The intrahepatic and extrahepatic biliary radicles are not dilated

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