

Endoscopic Versus Surgical Management and Outcome of CBD Stones 2020

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Abstract:

Background: Common bile duct stones are present in approximately 5% of the patients undergoing elective cholecystectomy and 10% of patients with acute cholecystitis with different modality of treatment. This study investigated endoscopic and surgical management and outcome of CBD stones among Sudanese patients at Ibn Sina Hospital October 2018 to October 2019.

The study included 68 patients. Data was collected using a constructed structured pretest questionnaire.

Objectives:To assess the outcome of endoscopic versus surgical management of common Bile duct stones.

Methods and patients:This is a hospital based descriptive cross-sectional study, which was conducted in Ibn Sena Specialized Hospital over a period of one year October 2018 to October 2019 .

Results:68 patients involved in the study , male to female ratio 0.6:1,the mean age was 61.2 years , patients underwent surgical management were 51.5%, patients underwent endoscopic management were 48.5%,multiple stones found in 73.5%,single stone found in 26.5%,stone found to be more than 1 cm in 41.2% less than 1cm in 58.8%,the success rate in achieving bile duct clearance in surgical group was 100% and in endoscopic group was 75.7%,complications developed in surgical group was wound infection in 2.85%,complications developed in endoscopic group was cholangitis 9%,in adequate clearance with stenting 9%and failure of Ercp in 15.1%,prolonged hospital stay in surgical group in comparison to endoscopic group .

Conclusion:Surgical interventions were superior in achieving bile duct clearance there was significant correlation between size and number of stones and endoscopic failure and management.

Keywords :CBD stone ,ERCP,Surgical interventions

Introduction :

Cholelithiasis is a common surgical problem which makes cholecystectomy one of the most frequently performed surgical procedures. CBD stones complicate the working and management of cholelithiasis necessitating additional diagnostic and therapeutic procedures and adds to morbidity and mortality of gall stone disease.

Common bile duct stones are present in approximately 5% of the patients undergoing elective cholecystectomy and 10% of patients with acute cholecystitis.

No single blood test or combination of blood tests can predict whether or not a CBD stone is present. Intraoperative cholangiography is a gold standard for diagnosis , but CBD stones can be diagnosed preoperatively with ultrasound, ERCP or MRCP. If CBD stones are diagnosed preoperatively, several different treatment modalities can be utilized. The factors that determine the optimal approach include the patient's age and general condition. It is also important to consider the local expertise of the Surgeon and the gastroenterologist in managing CBD stones.

Hence the algorithm for managing these patients will vary from one location to another. There are specific indications that mandate CBD open exploration and therefore, the practicing surgeon must be well versed in these techniques. Although the stones in the CBD may be silent, the development of symptoms is potentially serious; obstructive jaundice, ascending cholangitis, acute pancreatitis are all associated with serious morbidity and at times, mortality which need immediate attention⁽¹⁾.

Patients and Methods:

This was a across sectional retrospective study, hospital based ,and was conducted at Ibn Sna Hospital from October 2018 to October 2019. All patients who presented with CBD stone and accepted to participate in the study were included , data collected using a constructed structured questionnaire and hospital records. 68 patients participated in the study with clinical and radiological features of CBD stones and they received various treatment modalities surgical and endoscopic.The age and sex distribution, clinical presentation, diagnostic modalities, different therapeutic modalities and associated complications were all evaluated and compared with standard published literature.

Results:

The total number of patients included in the study was 68; the mean age was 61.7 ± 2.6 years (Figure 1). Male to female ratio was 0.6: 1 (Figure 2).

All patients presented with obstructive jaundice as shown in (Table 1).

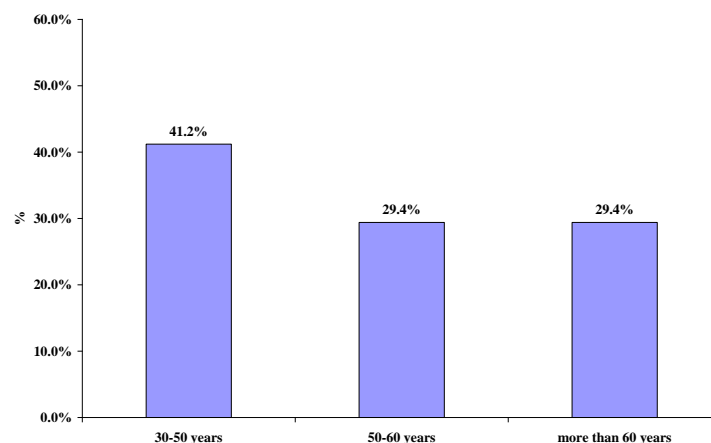


Table (1) presentation

Presentation	N	%
obstructive jaundice	68	100.0
Pain without jaundice	0	0.0
Jaundice with cholengitis	5	7.4
Silent	0	0.0

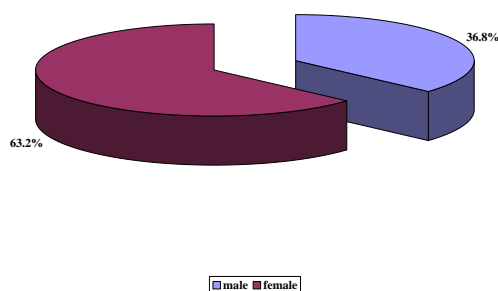


Figure (2) gender

Some Patients developed pancreatitis and other some had a history of cholecystectomy(Table 2).

Table (2) development of pancerititis and history of cholecystectomy

		N	%
patient developed pancreatitis	yes	1	1.5
	no	67	98.5
Total		68	100.0
history of cholecystectomy	yes	1	1.5
	no	67	98.5
Total		68	100.0

U/S and MRCP were the predominant investigation tool as shown in (Table3).

Table (3) Investigations done

		N	%
kind investigation done	U/S and MRCP	68	100
	ERCP	46	67.6
history of ERCP	yes	13	19.1
	no	55	80.9

Endoscopic Versus Surgical Management and Outcome of CBD Stones 2020

Multiple stones found in the majority of patients and the Size is less than 1 cm in fourty patients (Table 4).

Table (4) characteristics of the stone

		N	%
multiple stone or single	multiple	50	73.5
	single	18	26.5
Total		68	100.0
size of stone	less than 1cm	40	58.8
	more than 1cm	28	41.2
Total		68	100.0

The primary duct clearance was done by CBD exploration in 35 patients and the rest by ERCP (Table5).

The type of endoscopic management received was sphincterotomy with basket stone extraction with balloon dilatation in 25 patients and some had stent in (Table5).

The type of surgical intervention was choleduco enteric bypass in the majority of patients (Table5).

Table (5) interventions

		N	%
primary duct clearance	ERCP	33	48.5
	CBD exploration	35	51.5
Total		68	100.0
CBD exploration after failure or difficulty of ERCP	yes	13	19.1
	no	55	80.9
Total		68	100.0
Endoscopic management they receive	Stent	3	9
	balloon dilation and sphincterotomy + basket stone extraction	25	75.7
	failed ERCP	5	15.1
	Total	33	100.0
Surgical intervention	CBD exploration+Ttube	4	11.4
	Choleducoenteric bypass	31	88.6
Total		35	100.0

In endoscopic group the majority of cases ended with succesful bile duct clearance and part of them ended by failure of ERCP and aminority complicated by cholangitis as shown in (Table 6).

In surgical group all patients ended by succesful bile duct clearance , the only complication is wound infection as shown in (Table 6).

Table (6) Outcome of interventions

		N	%
endoscopic group	cholangitis	3	9
	no complications(sucsess bile duct clearance)	25	75.7
	Failed ERCP	5	15.1
Total		33	100
surgical group			
	wound infection	1	2.85
	no complications	34	97.1
Total		35	100.0

The hospital stay in surgical group was 5 to 7 days in 97,1%(n34) and in 1 patiens was 2 weeks but in endoscopic group it was 24 hours in 91%(n30) and for 3 patients was 3 days 9%. Size and numbers of stone significantly correlated with CBD exploration after failure of ERCP, and type of endoscope and surgical management and outcome of endoscope (P value < 0.05) (Tables 7 and 8).

Table (7) stone type correlation

	multiple stone or sigle				P value
	multiple		Single		
pt underwent CBDexploration after failure or difficulty of ERCP	N	%	N	%	
Yes	9	18.0	4	22.2	0.017*
No	41	82.0	14	77.8	
what kind of edoscopic management they receive					
Stent	2	4.0	1	5.6	0.022*
balloon dilation and sphincterotomy + basket stoneextraction	14	28.0	11	61.1	
failed ERCP	5	10.0	0	0.0	
what kind of surgical intervention they had?					
CBD exploration+Ttube	1	2.0	3	16.7	0.036*
Choleducenteric bypass	28	56.0	3	16.7	
complications developed in endoscopic group					
Cholangitis	3	6.0	0	0.0	0.001*
no complications	47	94.0	18	100.0	

Endoscopic Versus Surgical Management and Outcome of CBD Stones 2020

Table (8) Stone size correlation

	size of stone				P value
	less than 1cm		more than 1cm		
pt underwent CBD exploration after failure or difficulty of ERCP	N	%	N	%	
Yes	7	17.5	6	21.4	0.019*
No	33	82.5	22	78.6	
what kind of endoscopic management they receive					
Stent	0	0.0	3	10.7	0.027*
balloon dilation and sphincterotomy + basket stone extraction	14	35.0	11	39.3	
failed ERCP	0	0.0	5	17.9	
what kind of surgical intervention they had?					
CBD exploration+Ttube	1	2.5	3	10.7	0.018*
Choleduocenteric bypass	25	62.5	6	21.4	
complications developed in endoscopic group					
Cholangitis	1	2.5	2	7.1	0.025*
no complications	39	97.5	26	92.9	

Significant (P value < 0.05)

Statistically were negative correlation between the character of stone and outcome of surgical management in one hand age and gender on the other hand (P value < 0.05) (table 9 and 10).

Table (9) Age correlations

	Age						P value
	30-50 years		50-60 years		more than 60 years		
multiple stone or single	N	%	N	%	N	%	
Multiple	24	85.7	14	70.0	12	60.0	0.065*
Single	4	14.3	6	30.0	8	40.0	
size of stone							
less than 1cm	20	71.4	11	55.0	9	45.0	0.176*
more than 1cm	8	28.6	9	45.0	11	55.0	
complications developed in endoscopic group							
Cholangitis	1	3.6	1	5.0	1	5.0	0.087*
no complications	27	96.4	19	95.0	19	95.0	

Not significant (P value > 0.05)

Table (10) Sex of the patients correlations

	sex				P value
	male		female		
multiple stone or sigle	N	%	N	%	
Multiple	15	60.0	35	81.4	0.073*
Single	10	40.0	8	18.6	
size of stone					
less than 1cm	12	48.0	28	65.1	0.069*
more than 1cm	13	52.0	15	34.9	
complications developed in endoscopic group					
Cholangitis	1	4.0	2	4.7	0.077*
no complications	24	96.0	41	95.3	
	25	100.0	43	100.0	

Not significant (P value > 0.05)

Discussion:

This is a cross sectional descriptive prospective study of endoscopic versus surgical management of CBD stones from march 2018 to march 2019 at Ibn sina hospital .The total number of patients included in the study was 68 patients with female predominance (male : female ratio 0.6:1) which is found relevant to Redwan and Omer study with female predominance 1.6 : 1⁽²⁾, and Abdalrawof who concluded that female were 58.5% (3) unlike Durga who found that there was increased incidence in male (M :F 1: 0.94)⁽⁴⁾ .In our study the mean age was 61.7 as in Redwan and Omer the mean age was 40 years⁽²⁾.

All patients presented with obstructive jaundice 100% and some of them complicated by cholangitis 7.4 % and pancreatitis 1.5 % and history of cholecystectomy in one patient 1.5 % . Durga found that the main presenting symptoms was abdominal pain , jaundice and sometimes fever⁽⁴⁾, Abolfazl Shojaiefard, Majid Esmaeilzadeh study show biliary colic and jaundice were the main presenting feature 12 .

U/S and MRCP were the imaging modalities used in our study in all patients 100 % . Gianpiaro et al a study about the accuracy of MRCP, EUS and U/S in detection of CBD stones⁽⁵⁾ .

In our study 35 patients were subjected to surgical intervention in form of choledochcoenterostomy (n= 31) and CBD exploration with T tube . the success rate of achieving bile duct clearance was 100% with complication developed in one patient in form of wound infection in comparison to Adam who concluded that the incidence of retained CBD stones after CBD exploration with T tube was 15 % . wound infection was 5 % in T tube group in comparison to choleducodedunostomy which is 3.4%⁽⁶⁾ .

Ali et al , a prospective study of 83 patients which compared two methods for surgical management of CBD stones. In group I, 6 patients developed residual stones in CBD, reoperation was required for 3 of them and endoscopic retrograde cholangiopancreatography with sphincterotomy for another 3 patients, while in the other group (group II) 2 patients suffered from ascending cholangitis and were managed conservatively. No missed or residual CBD stones were developed and no patients need reoperation⁽⁷⁾, Ravi et al a study of 60 patients who underwent CBD exploration with T tube , 34 patients had no complications. 3

Endoscopic Versus Surgical Management and Outcome of CBD Stones 2020

patients had wound infection. In 4 patients along with wound infection cholangitis and sepsis (1 each), pancreatitis in one patient and bile leak in one patient was observed.

In our study the success rate in achieving bile duct clearance with ERCP is 75.7% with inadequate clearance and stenting in 9% and failure of cannulation in 15.15% , complications developed in 3 patients in form of cholangitis 9%⁽⁸⁾ , Gad et al studied 94 patients of whom 76 (78.8%) and 18(21.2%) underwent single and multiple ERCP sessions respectively , and impacted stone is the most common cause of failure of ERCP in (60%)⁽⁹⁾.

Laszlo Lakatos et al concluded that The rate of successful cannulation for ERCP was (97.1%). Bile duct stones were detected in 81 patients (39.3%), and successfully removed in 79 (97.5%)⁽¹⁰⁾.

In our study size and number of stones were significantly related to surgical intervention after failure of ERCP and to endoscopic management and outcome of endoscopy (p value<0.05). Ravi MJ et al found that stone size and number had major impact in the endoscopic outcome as he studied 60 patients, 59 patients underwent ERCP and in 01 patients ERCP was not attempted. In 45 patients stones were extracted successfully with complete clearance of CBD. There was 4 of these patients had stones measuring between 11mm to 14mm. Mechanical Lithotripsy was used to reduce the size of the stones in these 4 patients. Stones were extracted using basket with or without endoscopic sphincterotomy. In 2 patients CBD could not be cannulated . there was 8 patients had failed ERCP. there was 4 of these patients had stones measuring more than 12mm and multiple and in 2 patients impacted stones and other 2 patients had oedematous papilla. were the cause for failure. In 6 patients complete CBD clearance could not be achieved. All these patients were having multiple CBD stones and stones measuring more than 12mm. Smaller stones were extracted using basket. One patient had impacted large stone⁽⁸⁾ .

Mohamed rizwan et al who studied 60 patients with retained stones and treated with ERCP which was failed in 15 patient due to large size of the stone in 6 (40%), Technical difficulty in cannulation 3 (20%), impacted stone in cystic duct remnant 1(6%) , periampullary diverticulum 2(13%) ,patient unable to tolerate procedure2(13%)⁽¹¹⁾ . . .

In our study the hospital stay is more prolonged in surgical group 5 to 7 days in 97,1%(n34) and in 1 patients was 2 weeks but in endoscopic group its 24 hours in 91%(n30) and for 3 patients was 3 days 9%, Which is relevant to Gad who concluded that hospital stay is prolonged in surgical group in comparison to endoscopic group⁽⁹⁾

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