Management of Mirizzi Syndrome In Gastroenterology & HepatologyTeaching Hospital

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ABSTRACT

Mirizzi syndrome is defined as biliary obstruction secondary to cholecystitis, an impacted stone in the gallbladder infundibulum or cystic duct can compress the bile duct, usually at the level of the common hepatic duct (type I), or a stone can erode from the gallbladder or cystic duct into the common hepatic duct, resulting in a cholecystocholedochal fistula (type II).**The aims of the study:** To identify the incidence of Mirizzi syndrome in Iraq per year, To evaluate the diagnostic procedures and types of surgical treatment.**Patients and methods:**This is evaluation of 40 patients with M irizzi syndrome treated in theperiod from January 2009 to January 2013 in the surgical department ofGastroenterology & Hepatology Teaching Hospital/Baghdad-Iraq.**Results:**There were 40 patients with Mirizzi syndrom in this study, the incidenceof Mirizzi syndrome was 3% & most commonly occurred in female of 30-39year age group.Cholangitis is the main picture of presentations & 45% of thecases were diagnosed preoperatively &other 7 of suspecious cases with using of modern imaging studies including ERCP.Csendes classifications was applied on & it showed that, half were type I, 11 patient were type II, 7 patient were type III, & 2 patient were type IV. **Conclusions:**Mirizzi syndrome is a rare complication of cholelithiasis and requires ahigh index of suspicion in obstructive jaundice cases, by using of imaging studies we can increase the percentage of preoperative diagnosis & so conventional open surgery is the mainstay of therapy which aiming for a safe completion of cholecystectomy without injuring the biliary system and theappropriate management of the cholecystocholedochal fistula

Keyword: Mirizi , management.

Introduction:

Mirizzi syndrome is defined as biliary obstruction secondary tocholecystitis, an impacted stone in thegallbladder infundibulum or cystic duct can compress the bile duct, usually at the level of the common hepatic duct (type I), or a stone can erode from the gallbladder or cystic duct into the common hepatic duct, resulting in a cholecystocholedochal fistula (typeII).(1)This entity should be considered in the differential diagnosis of all patients with obstructive jaundice. Failure to recognize the condition preoperatively can result in a major bile duct injury, particularly during laparoscopicsurgery. (2) Thus a constant vigilance during intraoperative dissection ofCalot's triangle is required in order to avoid injury of the bile duct.The majority of cases are not identified pre-operatively, despite advances in imaging techniques. (3)The condition may be intermittent and relapsing, orFulminant, presenting as cholangitis. Imaging is, thus, essential to preoperative diagnosis, and in a literature search, the correct diagnosis wasmade in 8% to 62% of patients until ERCP was used regularly. (1)Large gallstones that become impacted in this area produce common hepatic duct obstruction by two mechanisms: mechanical obstruction by direct compression of the common hepatic duct, or they can causeobstruction secondary to repeated bouts of local inflammation. (4) In 1948, Argentinean surgeon Pablo Luis Mirizzi first described asyndrome of common hepatic duct obstruction in the setting of long standingcholelithiasis and cholecystitis.(5) The classic description of the disease includes four components :(6)

(a) A close parallel course of the cystic duct and the common hepatic duct,

(b)An impacted stone in the cystic duct or the neck of the gallbladder,

(c) Common Hepatic duct obstruction secondary to external compressionby the cystic duct stone (and the surrounding inflammation),and

(d) Jaundice, with or without cholangitis.

Mirizzi syndrome is a rare complication of cholelithiasis, with an estimated incidence of 0.05-2.7% (2, 3).With higher incidence in Central andSouth America where the reported incidenceis 4.7% to 5.7 %(7).The Mirizzi syndrome develops as a result of the acute and/or chronic inflammatory processes that follow the impaction of either a large gallstone or multiple small gallstones in Hartmann's pouch or the cysticduct in close anatomic proximity

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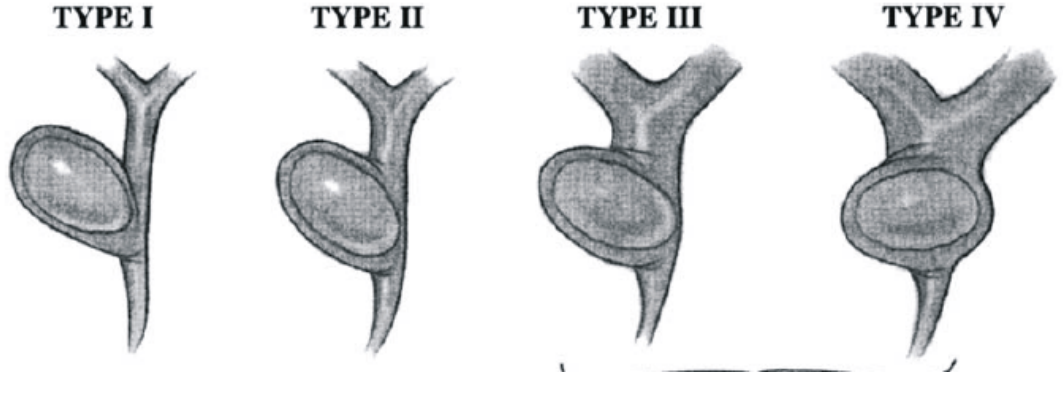
to the common hepatic duct.(7)The presence of a long parallel cystic duct or a low insertion into the common bile duct predispose to the development of this syndrome, althoughthey do not appear to be a requirement.(7)As the gallbladder becomes shrunken as a result of chronic inflammation, and tends to become partially fused to the hepatic duct, the hepatic duct is itself progressively obstructed, both by the development of an inflammatory stricture and by a direct effect of the stone itself, which finally causes pressure necrosis of the intervening walls, and results in the formation of a fistula..(7)In 1905 Kehr published the first case of benign extrinsic biliary obstructions caused by gallstones in the gallbladder (7), but it was only in1948 that Mirizzi reanalyzed and classified this clinical condition, which is characterized by mechanical compression of the common hepatic duct due to a gallstone entrapped into the gallbladder Hartmann, s pouch or into the cystic duct; therefore from that moment on, this condition was called Mirizzi syndrome. (5)

Classification:

There are three classifications which have been proposed to describe variants of Mirizzi syndrome, and to aid in selecting the appropriate therapeutic procedure.The original classification, by McSherry *etal* (8) which based on endoscopic retrograde cholangiopancreatography (ERCP), described two types.

Type I
referred to compression of the common hepatic duct by a stone impacted in the cystic duct or Hartmann's pouch.
Type II
referred to erosion of the calculus from the cystic duct into the common hepatic duct, producing a cholecystocholedochal fistula.5Csendes *et al* (9) created a second classification taking into account the extent of fistula. Type I, remained the same, external compression of the common hepaticduct due to a stone impacted at the neck of the gallbladder or at the cystic duct. Type II, the fistula involved less than one-third of the circumference of the common hepatic duct.
Type III,
involvement of between one-third and two-thirds of the circumference of the common hepatic duct.
Type IV,
destruction of the entire wall of the common hepatic duct. Types II to IV lesion referred to the presence and extent of cholecystobiliary (cholecystohepatic or cholecystocholedochal) fistula, due to erosion of the anterior or lateral wall of the common hepatic duct by impacted stones.



The third classification, proposed by Nagakawaand colleagues (10),expanded upon the definition of the Mirizzi syndrome.Type I referred to a stone impacted in the cystic duct or gallbladder neck.Type II was characterized by a fistula of the common duct.

Type III
was defined by hepatic duct stenosis due to a stone at the confluence of the hepatic and cystic ducts. Type IV was characterized by hepatic duct stenosis as a complication of cholecystitis in the absence of calculi impacted in the cystic duct or
Gallbladder neck.

Various Classification Systems of Mirizzi syndrome

McSherry		Csendes		Nagakawa	
Type I	Extrinsic compression of the common hepatic duct by stones generally impacted in the cystic duct or in the infundibulum of the gallbladder	Type I	Extrinsic compression of the common hepatic duct by stones generally impacted in the cystic duct or in the infundibulum of the gallbladder	Type I	Extrinsic compression (stenosis) of the common hepatic duct by stones generally impacted in the cystic duct or in the infundibulum of the gallbladder
Type II	Presence of cholecystobiliary fistula	Type II	Presence of cholecystobiliary fistula with diameter one third of circumference of the common hepatic duct wall	Type II	Fistulization of common hepatic duct from a stone impacted in the cystic duct or in the infundibulum of the gall bladder
		Type III	Presence of cholecystobiliary fistula with diameter two third of circumference of the common hepatic duct wall	Type III	Common hepatic duct stone at the cystic duct-hepatic duct confluence
		Type IV	Presence of cholecystobiliary fistula which involves the entire circumference of the common hepatic duct wall	Type IV	Common hepatic duct stenosis caused by cholecystitis without stones in the cystic duct or infundibulum of the gallbladder

Mirizzi syndrome is part of the differential diagnosis of all patients with obstructive jaundice, and requires a high index of suspicion. Most patients present with jaundice, and right upper quadrant pain. (2)
Elevations in the serum concentrations of alkaline phosphatase and bilirubin are present in over 90 per cent of patients. (11, 12) The clinical and laboratory findings are similar to patients who present with obstructive jaundice secondary to choledocholithiasis.
Once a diagnosis of obstructive jaundice has been made an abdominal ultrasound is often the first imaging test preformed. (5) With the use of a CTscan & MRI / MRCP the diagnosis of Mirizzi syndrome will be more accurate in addition to that both can be helpful in diagnosing other causes of obstructive jaundice such as gallbladder cancer, cholangiocarcinoma, or metastatic tumor. (13) Some authors maintain that CT scan should be used primarily to exclude malignancies—namely, liver metastases invading the biliary system and carcinoma of the porta hepatis—from the differential diagnosis. (14)
The sensitivity of ultrasound in detecting Mirizzi syndromeis 23-46 % (3, 4).Yun et al measured the preoperative diagnostic accuracy of magnetic resonance cholangiopancreatography (MRCP) and CT for Mirizzi syndrome and found that for combined modality (MRCP and CT), the overall sensitivity was 96% (versus 42% for CT); specificity was 93.5% (CT, 98.5%); positive predictive value was 83.5% (CT, 93%); negative predictivevalue, 98.5% (CT, 83.5%); and accuracy was 94% (CT, 85%). (15)

The findings on imaging studies includes ;(16, 17, 18, 19, 20)
*An impacted calculus in the Hartmann pouch or the cystic duct
* Dilatation of the CHD above the level of the impacted stone
* Narrowing of the CHD at the level of impaction
*Normal caliber of the CBD below the impaction
*A contracted gallbladder with wall-thickening.
The presence of a stone impacted in the gallbladder neck and an abrupt change to a normal width of the common duct below the level of the stoneare also very suggestive of Mirrizi syndrome. (16, 17)
Signs of cholecystitis or pericholecystitis may also be present, but they are nonspecific. (18)ERCP is considered an effective pre-operative method for diagnosing the condition in these patients and can provide a relatively accurate localization9and characterization of the cause of the billiary obstruction. Typical findings of Mirizzi syndrome at ERCP include ;(21)
(1) Mid-bile duct obstruction with dilated proximal common hepatic duct and intra-hepatic ducts combined with normal duct caliber distal to the obstruction,
(2) Insertion of the cystic duct at the point of obstruction and/or complete obliteration of the cystic duct, and (3)A stone visualized at the point of obstruction either within the cystic ductor the common duct.If a stone is not seen or suspected, however, the findings may be misleading towards a stricture or malignancy. In addition, an interesting finding that suggests Mirizzi syndrome indirectly during ERCP is the fact

that biliary tree dilatation may subside when a patient is placed in an anti-Trendelenburg position (22).

ERCP is also essential for preoperatively determining the presence of afistula & allows partial relief of the obstructed hepatic duct, thus serving both diagnostic and therapeutic purposes. (23)Although diagnostic imaging techniques have been perfected, preoperative diagnosis of Mirizzi syndrome is not an easy task and continues tobe a challenge for the surgeon. Therefore, even intra-operative cautious recognition of the condition and application of the appropriate surgical judgment according to the characteristics of each case will lead to successful treatment. (24)

Patients And Methods:

This is evaluation of 40 patients with Mirizzi syndrome treated in the period from January 2009 to January 2013 in the surgical department of Gastroenterology & Hepatology Teaching Hospital/Baghdad-Iraq.

A total of 1333 cholecystectomies were performed in this period, the data of 40 patients with Mirizzi syndrome were reviewed (case sheets, operative notes,discharge summary cards, theater operative records) retrospectively& by history & examination, routine laboratory tests, liver function test including; total serum bilirubin,Alkaline phosphatase, &both Alanintransaminase (ALT) &Aspartate transaminase (AST), preoperative imagingstudies, starting with abdominal ultrasonography, followed by CT scan&MRI/MRCP accordingly. In some patients ERCP was done for diagnostic& therapeutic purposes especially in those who presented as cholangitis &obstructive jaundice.

The Csendes classification was followed to categorize the patients, for types II, III or IV when cholecystobiliary fistula existed, the classification was made intraoperatively. All patients were seen in the surgical department within 10 days, 3 months from their discharge from the hospital and every 6months thereafter.

None of the patients with Mirizzi syndrome had previous hepatobiliary surgical intervention prior to diagnosis. The diagnosis of Mirizzi syndrome was achieved preoperatively in 18 patients (45 %), in addition to other 7 suspecious patients, the other 22 patients (55%) were diagnosed intraoperatively.

In our study& during cholecystectomy fundus first approach performed inall 35 cases (except 5 laparoscopy).

The treatment of Type I in our study , including 5 cases accomplished laparoscopically, cholecystectomy is adequate, others underwent partialcholecystectomy leaving 1-2 cm cuff of the infundibulum &suturing with absorbable suture material after extraction of the stone& this is due to obscure of the cystic duct by inflammatory changes in the Calot's triangle or occlusion of the cystic duct or the gallbladder neck by a large stone, one case was empyema of the gallbladder & treated by cholecystostomy with extraction of a large stone.

Type II,

treated by partial cholecystectomy &stone removal, others & due to CBD stone necessitating CBD exploration, stone extraction& choledochoduodenostomy, the duodenum was freely mobile &easily reached the site of the fistula.

Type III,

patients treated by partial cholecystectomy, CBD exploration& T-Tube insertion , other patients treated by cholecystectomy & Roux en-Y Hepatico-Jejunostomy due to dilated CHD & nareawing of CBD as a complication of recurrent cholangitis, one patient treated by Cholecystectomy, Fistula Closure & Transduodenal Sphenictroplasty.

Type IV,

were treated by cholecystectomy & Roux en- Y hepatico-Jejunostomy. Open laparotomy intervention with fundus first dissection applied to all cases of preoperatively diagnosed MS(18p.s =45%)& in suspicious cases(7=17.5%), other 10 cases required conversion from laparoscopic to open procedures & 5 cases laparoscopically performed successfully & all 5were type 1 MS.

Results:

Age and sex distribution of the patients

A total of (1333) patients underwent cholecy stectomy in 4 year, 40patients of them had Mirizzi syndrome included in this study 23 females and17 males.Age ranged between 25-80 years, with a peak age group being (30-39) y. for female patients, and (40-49) y. for male patients.Table 1:

The incidence of Mirizzi syndrome according to the year & the procedures of cholecystectomy.

The study was done during a period of 4 years (2009-2012), it included 1333 cholecystectomies of which 1020 completed laproscopically including 5 with a Mirizzi syndrome, and 84 underwent conversion from laparoscopy to laparotomy because of unclear anatomy & difficulties in safe dissection,among which 10 had Mirizzi syndrome.

The incidence of Mirizzi syndrome in our study was approximately 3%,least in 2012 (1.6 %), and highest in 2011 (4.4%). Table 2:

Clinical presentation

Two patients (5%) presented with subclinical jaundice. Symptoms of Mirizzi syndrome are essentially those of cholecystitis, choledocholithiasis or cholangitis. Twenty three patients (57.5%) presented with epigastric or right upper quadrant pain, jaundice, fever (signs of cholangitis), and elevated liver function tests. They may have episodic pain like biliary colic, or manifest

As systemic symptoms of fever, chills, tachycardia, and anorexia. The condition may be intermittent and relapsing, or fulminant, presenting ascholangitis. Table 3**:**

Severity of jaundice

All patients were evaluated by liver function test including serum bilirubin, alkaline phosphatase, & transaminases (ALT) & (AST).

Two of the patients presented with subclinical jaundice, & serum bilirubin was below 2mg/dl, most of serum bilirubin level was below 2.5 mg/dl, & amaximum level was 18.6 mg/dl with pictures of cholangitis.Alkaline phosphatase was elevated in all 40 patients. Table 4:

Findings on imaging studies

All 40 patients underwent abdominal US, it was the first imaging technique showing the presence of a large gallstone or a large gallstones load .Twenty four patients had thick wall (>4mm) contracted gallbladder with a large single stone or filled with multiple stones, 16 patients had distended gallbladder with multiple stones &either normal wall thickness or thickened wall.Twenty eight patients (70%) had a stone in the neck of the gallbladder or in the cystic duct (impacted stone). Extra-hepatic bile duct dilatation was noted in 31(77.5%) patients.In 13(32.5%) patients there was CBD stone(s) in association with MS.

The ultrasound was followed by CT scan orMRI/MRCP or both depending on availability and clinical situation, to exclude malignancy in the porta hepatis and pancreas, however, periductal inflammation may present as a mass lesion on imaging studies and be misinterpreted as carcinoma of the gallbladder, cholangiocarcinoma or metastases. CT scan was done in 17 patients confirming the ultrasound findings & excluding any mass lesion. MRI/MRCP did in25 patients with 100% demonstrations of an impactedstone in Hartmann, s pouch or cystic duct & CHD dilatation above impactedstone.

Seven patients underwent an ERCP with successful canulation, all the patients had extra-hepatic bile duct dilatation, 3 of them had CBD stones and the other 4 patients had CHD stones. Sphincterotomy was done for all the patients with extraction of the stones in 2 patients& biliary sludge in one, 14 the other 4 patients underwent a temporary biliary drainage in the form ofplastic stent in 2 and nasobiliary tube in the other 2. Table 5:

The preoperative diagnosis of MS was considered after doing the above investigations in 18(45%) patients, while it was suspicious in 7 (17.5%) patients.

Operative treatment & types of Mirizzi syndrome according toCsendes classifications.

Type I found in 20 patients (50 %).Thirteen out of 20 underwent cholecystectomy, 5 of them laparoscopically.Six patients treated by partial cholecystectomy & one end with cholecystostomy.

Type II found in 11 patients (27.5 %).Nine treated by partialcholecystectomy, 2 by partial cholecystectomy and choledochoduodenostomy after CBD exploration.

Type III found in 7 patients (17.5 %). Four treated by partialcholecystectomy and T-tube drianage after CBD exploration, 2 by cholecystectomy & Roux en-Y hepatico-jujenostomy, &one by cholecystectomy, fistula closure (choledochoplasty) & transduodenal Sphinectroplasty.

Type IV found in 2 patients. Both of them were treated by cholecystectomy& Roux en- Y hepatico-jujenostomy. Table 6:

Types of surgical intervention

Twenty five patients underwent an open cholecystectomy from the start, the remaining 15 dealt with by laparoscopy in which 10 were converted toopen because of failure to progress.Table 7:

Postoperative complications:

There was no mortality rate in our 40 patients, 6 pt. develop minor chest infection which responds to medical therapy, 3 pt. suffered from minor not complicated wound infection responding well to conservative treatment without necissating surgical intervention, and 2 pt. develop urinary tract infection & one superfecial thrombophlibitis. The maximum hospital stay was 7 days. Table 8:

Table 1: Age and sex distribution

Age(years)	No. & %	Male	Female
20 – 29	3(7.5)	0	3
30 - 39	15(37.5)	5	10
40 – 49	11 (27.5)	6	5
50 – 59	8 (20)	5	3
>= 60	3 (7.5)	1	2
Total	40	17 42.5%	23 57.5%

Table 2: the incidence of Mirizzi syndrome according to the year & the type of intervention.

Year	Lap.	Open	Conversion	Mirizzi syndrome
2009	198	47	14	7(2.6%)
2010	231	64	22	10(3.2%)
2011	312	53	24	17(4.3%)
2012	279	65	24	6(1.6%)
Total	1020	229	84	40(3%)
	1333			

Table 3: Clinical presentation

Presentation	No. of patients	Percent %
Subclinical Jaundice	2	5
Obstructive jaundice	15	37.5
Cholangitis	23	57.5
Total	40	100%

Table 4: Severity of jaundice

Bilirubin mg /dl	No.	Alkaline phosphatase i.u/L		
		<100	100-200	>200
Subclinical & mild< 2.5	19	9	6	2
Moderate 2.5-7.5	13	6	6	3
Severe >7.5	8	1	2	5
Total	40	16	14	10

Table 5: Findings onimaging studies

Findings / Imaging	No.	Contracted G.B with thick wall	Impacted stone in Hartmann pouch or cystic duct.	CHD dilatation above impacted stone.	CBD stone(s) in association with MS.
Ultrasound	40	24	28	31	13
CT Scan	17	8	12	6	4
MRI/MRCP	25	7	25	25	8
ERCP	7	2	4	7	3

Table 6: Operative treatment & type's ofMirizzi syndrom according to Csendes classifications

Type	No.& %	Operation	No. & %
Type I	20 (50%)	Cholecystectomy	13(32.5%)
		Partial cholecystectomy	6 (15%)
		Cholecystostomy	1 (2.5%)
Type II	11(7.5%)	Partial cholecystectomy	9 (22.5%)
		Partial cholecystectomy andcholedochoduodenostomy after CBD exploration.	2 (5%)
Type III	7(17.5%)	partial cholecystectomy and T-tube drianage after CBD exploration	4 (10%)
		Cholecystectomy & Roux en- Y hepatico-jejunostomy	2 (5%)
		Cholecystectomy ,fistula closure (choledochoplasty)&transduodenal sphinectroplasty	1 (2.5%)
Type IV	2 (5%)	Cholecystectomy& Roux en- Y hepatico-jejunostomy.	2 (5%)
Total	40		100%

Table 7: Types of surgical intervention

Intervention		No.
Open		25
Laparoscopy	Conversion	10
	Progression	5
Total		40

Table 8: postoperative complications

complication	No.
Chest infection	6
Wound infection	3
Urinary tract infection	2
Superficial thrombophlebitis	1
Mortality	Nill

Discussion:

This study is evaluation of 40 patients with Mirizzi syndrome treated in the period from January 2009 to January 2013 in the surgical department of Gastroenterology & Hepatology Teaching Hospital /Baghdad-Iraq. In this study the incidence of MS among our cholecystectomy patients was 40/1333 (3%) which is less than that occurring in Central and South America where the reported incidence is 4.7% to 5.7%(7), but higher than the 0.1% - 0.7% incidence seen in Jill Zaliekas& J. Lawrence Munson study in patients who have symptomatic gallstones done in Lahey Clinic Medical Center, Burlington, MA, USA,(25) in addition to that the incidence varies yearly as seen in our study (table 2),from this we can conclude that the incidence might vary depending on geographic location & the time of the study.

Female patient constitutes57.5% of the cases, while it was 80% in SabirA.Rakhem done in same centre. (26)

Mirizzi syndrome commonly occurs in 30-39 year age group in our study,&in 40-49 y. age group in Sabir A. Rakhem. (26)

Mirizzi syndrome is part of the differential diagnosis of all patients with obstructive jaundice, and requires a high index of suspicion, in our study clinical presentations is that of cholangitis in 23 patients 57.5%.

All patients in our study were evaluated by liver function tests,& all show elevated total serum bilirubin including 2 of the cases with subclinical jaundice, also most of the patients presented with elevated serum alkaline phosphatase ,& if this isthe case it will be necessary to evaluate the situation by imaging studies for correct diagnosis.

Ultrasonography demonstrated the presrence of an impacted stone in Hartmann's pouch or cystic duct in favor of Mirizzi syndrome in28/40(70%)of our patients compared to that found in Csendes' series which was 28%.(9)

Extrahepatic bile duct dilatation was noted in 31/40 (77.5%)patients while it was 81% in Csendes' series,(9) even with the increasing sensitivity of ultrasound in our hospital still we need an additional imaging to obtain more details of the biliary pathology & most of the articles agree about that.(6,7,9,25,27,28)

CT scan provides no much information over US in diagnosis of MS but can detect other causes of obstructive jaundice. (6, 7, 9, 25, 27, 28)20 MRI & MRCP performed in 25 p. with 100% detecting impacted stone & dilated extrahepatic bile duct above the impacted stone, &this percent is same as Sabir A. Rakhem.(26), so in MS can be as good as ERCP in diagnosis& its ability to delineate details of biliary strictures & to detect acholecystocholedochal fistula, in addition , T2 weighted sections can differentiate a neoplastic mass from an inflammatory one,(27,28) but ERCPhad added advantage of possibility of stone retrieval &the ability of stenting which improve surgical outcome &also facilitates identification of the common bile duct during operative dissection, but we should not forget the complications of ERCP. Others consider ERCP as a more effective way of defining anatomy of the biliary tree when the diagnosis is suspected andprobably represents the gold standard investigation (29).In our study 7 patients underwent ERCP, 4 with impacted stone at the insertion of cystic duct to CHD, & 3 patients had CBD stone & extractiondone for them.

Surgery is the mainstay of therapy of Mirizzi syndrome, the dense inflammatory reaction in Calot's triangle, as well as the frequent aberrant biliary anatomy, pose a difficult challenge to the unsuspecting surgeon when dealing with a Mirizzi syndrome. The two principal aims are: (6)

(a) The safe completion of cholecystectomy without injuring the biliarysystem and

(b) The appropriate management of the cholecystocholedochal fistula.

Meticulous dissection and vigilance are essential inorder to avoid inadvertent bile duct injury. If the diagnosis of Mirizzi syndrome is made preoperatively, an operative strategy that minimizes the risk of injury to thebiliary tract can be carried out.For this reason, open procedure is preferred by most of the surgeons. (2, 6, 9,11, 25, 27, 28)

A standardized surgical approach has been recommended based on the Csendes classification of the variants of Mirizzi syndrome. (9)

Type I - Cholecystectomy plus common bile duct exploration withT-tube placement. Exploration should be performed only if the CBD is easily exposed.

Type II - Suture of the fistula with absorbable material orCholedochoplasty with the remnant gallbladder.

Type III - Choledochoplasty; suture of the fistula is not indicated.

Type IV - Bilio-enteric anastomosis is preferred since the entire wall ofthe common bile duct has been destroyed.

In our study& during cholecystectomy fundus first approach performed in all 35 cases (except 5 laparoscopy).A total of 20/40(50%) cases were Type I, 13 patients including 5 cases accomplished laparoscopically, cholecystectomy is adequate, 6 patients underwent partial cholecystectomy leaving 1-2 cm cuff of the infundibulum &suturing with absorbable suture material after extraction of the stone&thisis due to obscure of the cystic duct by inflammatory changes in the Calot, striangle or occlusion of the cystic duct or the gallbladder neck by a large stone, one case was empayema of the gallbladder & treated by cholecystostomy with extraction of a large stone. Eleven patients (27.5%) cases were Type II , 9/11treated by partial cholecystectomy &stone removal, 2 cases due to CBD stone necessitating CBD exploration, stone extraction& choledochoduodenostomy, the duodenum were freely mobile &easily reach the site of the fistula.Seven patients(17.5%) cases were Type III, 4 patients treated by partial cholecystectomy, CBD exploration & T-Tube insertion , 2 patients treated by cholecystectomy & Roux en- Y Hepatico-Jejunostomy due to dilated CHD &narrowing of CBD as a complication of recurrent cholangitis, one patient treated by Cholecystectomy, Fistula Closure & Transduodenal Sphenictroplasty.

Two cases were Type IV; both were treated by cholecystectomy & Rouxen- Y hepatico-Jejunostomy.

Open laparotomy intervention with fundus first dissection applied to allcases of preoperatively diagnosed MS(18p.s =45%)& in suspicious cases(7=17.5%), other 10 cases required conversion from laparoscopic to open procedures & 5 cases laparoscopically performed successfully&all 5 were type 1 MS.

The role of laparoscopic approach in the treatment of Mirizzi syndrome remains controversial. Some authors consider the condition unsuitable for laparoscopic surgery since the inflammatory tissue in the area of Calot'striangle offers a high operative risk in dissection. (29, 30, 31)

Other authors propose laparoscopic surgery in the treatment of Mirizzisyndrome (32, 33), but in presence of cholecystocholedochal fistulaconventional laparotomy is mandatory. (27)

Even in type I Mirizzi syndrome, laparoscopic surgery is not always feasible (6, 27) .When the diagnosis is made, there should be a planned open procedure, if the condition is encountered during laparoscopic Cholecystectomy, the challenges inherent in the dissection of Calot's triangle in an inflamed,fibrotic field mandate open conversion in most cases. (34)Apart from the usual simple minor postoperative complications (chest infection, wound infection,superficial thrombophlebitis & urinary

Tract infection) our entire patients was symptom free with normal liver function tests through the last follow-up visit.Outcomes following operation were generally good, there was no major procedure related complications and no mortality. Following surgery, we monitor all patients with abdominal ultrasound & serial liver function tests (Total serum bilirubin, alkaline phosphatase and S.GOT, S.GPT).
The association of Mirizzi syndrome and gallbladder carcinoma is also of interest; in such cases it is obvious that complex surgical procedures should be avoided. However, despite all these modern diagnostic modalities, it ispossible for the problem to become apparent only during operation. (27)
In our study all the gallbladders were sent for histopathological examination and the results was chronic cholecystitis no malignant tumor.

Conclusion& Recommendations

1. Mirizzi syndrome is a rare complication of cholelithiasis and requires a high index of suspicion in the setting of obstructive jaundice and each case is unique in its own way.
2. Each sonographer should know about the existence of Mirizzi syndrome, and, in case of ultrasound suspect, he should refer the patient to the best diagnostic and therapeutic path in communications with the surgeons.
3. The prognosis of MS is very good for type 1 lesions, as simple cholecystectomy is all that is necessary for cure.
4. Cholangiography (intraoperative and ERCP) if available as well as MRCP aids in both the diagnosis and identification of anatomy and may prevent serious biliary injury.
5. In fit patient conventional surgery is the mainstay of therapy of Mirizzi syndrome, and requires the safe completion of cholecystectomy without injuring the biliary system and the appropriate management of the cholecystocholedochal fistula.
6. The association of Mirizzi syndrome and gallbladder carcinoma is also of interest; in such cases it is obvious that complex surgical procedures should be avoided
7. The role of laparoscopic approach in the treatment of Mirizzi syndrome remains controversial
8. In high-risk patients suffering from MS, biliary drainage by endoscopic sphincterotomy and placement of a stent in the choledochal duct has been carried out
9. Although the diagnostic imaging techniques have been perfected, preoperative diagnosis of MS is not an easy affair and continues to bea challenge for the surgeon. Therefore, even intraoperative24 precautious recognition ofthe condition and application of theappropriate surgical method according to the characteristics of eachcase will lead to successful treatment.
10. It is important to identify patients with Mirizzi syndrome preoperativelybut seems even more important to consider its diagnosis during surgical dissection.

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