

Multidisciplinary Approaches for Management of Postcholecystectomy Problems (Surgery, Endoscopy, and Percutaneous Approaches)

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Purpose: A prospective study to evaluate the postcholecystectomy problem management.

Patients and Methods: From March 2005 to April 2007, 210 patients were managed using surgery, endoscopy, and percutaneous approaches.

Results: Endoscopy was therapeutic in 183 cases [stones (81), stricture (55), leakage (35)], and only diagnostic in 24 cases. Percutaneous approaches were carried out in 34 cases as diagnostic in 19 cases, stenting in 2 cases, and combined with endoscopy in 13 cases. Surgery was carried out in 40 cases either urgent in 10 cases (4.8%), or planned in 30 cases (14.3%), for peritoneal lavage in 7 cases, choledocholithotomy in 8 cases, undo ligation and T-tube drainage in 5 cases, common bile duct repair splinted by T tube in 3 cases, choledochoduodenostomy in 1 case, and Roux-en-Y choledochojejunostomy in 18 cases.

Conclusions: Endoscopy is effective and safe not only for diagnostic but also for therapeutic approaches, especially when combined with percutaneous approaches that help in failure cases, but surgery remains as the gold standard treatment not only for the cases, which failed to be treated by less invasive approaches, but also in cases that are mandatory to be explored as peritonitis.

Key Words: postcholecystectomy, ERCP, PTC, choledochoenteric anastomosis

(Surg Laparosc Endosc Percutan Tech 2009;19:459–469)

Both open and laparoscopic cholecystectomy is safe and effective treatment of patients with symptomatic cholelithiasis. Although, major biliary complications still occurs and have been more common in the initial experience with laparoscopic cholecystectomy,^{1,2} however, some authors considered it 3-folds higher than open procedure³, and usually catastrophic, with high injuries.⁴

Surgery has been the mainstay of therapy for iatrogenic biliary injury, either immediately when the injury has occurred, or very frequently at a later postoperative stage with increased morbidity and mortality.⁵ Mild occlusion or incisional injuries may be managed by T-tube or primary common bile duct (CBD) repair, unfortunately most transection injuries are associated with loss of bile duct tissue and a more complex repair is required,

hepaticojejunostomy is the procedure of choice for reconstruction with Roux-en-Y loop, tension free, mucosa to mucosa anastomosis, with adequate diameter,⁶ but anastomosis to a small no dilated duct is technically challenging particularly with surrounding fibrosis and sepsis, this approach was associated with considerable morbidity and mortality, and required a specialized center,⁷ as a result, a variety of nonsurgical approaches have evolved to deal with the problem of biliary injury.⁸

Endoscopic retrograde cholangiopancreatography (ERCP) and papillotomy has dramatically changed the treatment, and success led to the widespread use of this approach in preference to surgery,⁹ as simple, noninvasive procedure, with low morbidity and mortality, short hospital stay, and cost effective,¹⁰ with excellent results in treating stone(s),¹¹ draining obstructive cholangitis,¹² treatment of strictures,¹³ or management of other complication as bile leakage.¹⁴

Percutaneous transhepatic cholangiography (PTC) was used for delineation of the proximal biliary tree especially if ERCP failed as in CBD ligation, massive stricture, or transection,^{15,16} sometimes it is used for drainage prior surgery (percutaneous transhepatic drainage "PTD"), or percutaneous dilatation and stenting for CBD stricture.¹⁷

The aim of this work is to study and evaluate the role of these techniques (surgery, endoscopy, and percutaneous approaches), in dealing with postcholecystectomy problems and their benefits in diagnosis and treatment of such conditions in a stepwise manner.

PATIENTS AND METHODS

As Assuit university hospitals are a draining pool for most of Upper Egypt governorates. About 210 patients from the surgery department and endoscopy unit were included in the study, complaining of postcholecystectomy problems, with variable presentations either early within days or late after months or years postoperatively.

All were subjected to:

Thorough detailed history taking.
Meticulous clinical examination.

Investigation needed to diagnose the problem as:
Liver function tests and abdominal ultrasonography were performed to all cases.
Computed tomography or magnetic resonance imaging (sometimes it is needed).

Cholangiogram was carried out in all cases: as

- Trans-tube cholangiogram in cases presented with T tube in place.
- Endoscopic cholangiogram was carried out in most of cases.

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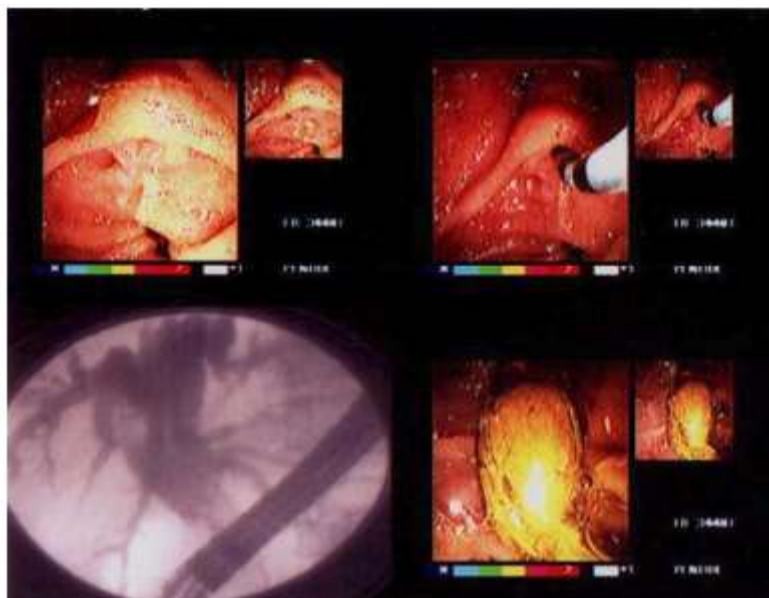


FIGURE 1. Endoscopic retrograde cholangiopancreatography of biliary stone extraction.

- PTC was carried out in some selected cases in which endoscopic approaches failed.

Surgical approaches (Figs. 14- 15)

Surgical approaches were carried out in the following indications:

- Urgent surgery in cases presented with biliary peritonitis, the definitive surgery cannot be carried out in most of cases because of widespread sepsis and fibrosis, and only peritoneal lavage and drainage was carried out, fortunately, definitive surgery was carried out in some cases as CBD repair over a T-tube splint, or choledocholithotomy procedure.
- Planned surgery usually carried out after failure of other nonsurgical tools for treatment or its absence but sometimes anticipated if the problem diagnosed is not solved accurately by nonsurgical treatment as CBD transection and CBD ligation.

It is usually preceded by road mapping cholangiogram, then the surgical techniques were carried out as choledocholithotomy for CBD stone(s), undo ligation with T-tube splint if CBD ligation was discovered very shortly after operation, repair of the CBD over T-tube drainage in minimal CBD injury, shunt operation (with the use of Roux-en-Y loop technique and choledochojejunostomy) for CBD injury, massive stricture fibrosis, or bad patient compliance with repeated endoscopic session and stenting.

Endoscopic Approaches (Figs. 1- 11)

Endoscopic approaches was performed for most of our cases using side viewing Pentax videoscope, using regular instruments, and blended current was used in sphincterotomy; however, balloon sphincteroplasty was also used.

Biliary leakage was treated by sphincterotomy in mild cases and/or stenting in major leakage, CBD stricture was treated by dilatation and stenting in consecutive sessions with increasing number and gauge of the stents to reach cure. CBD stone(s) were treated by sphincterotomy and

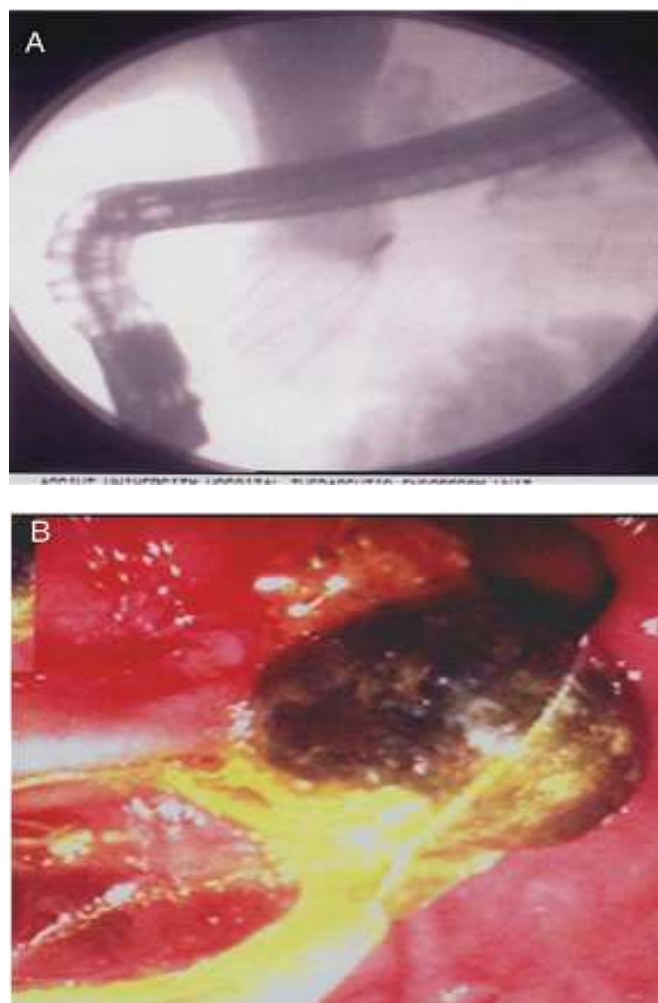


FIGURE 2. Endoscopic retrograde cholangiopancreatography of large recurrent common bile duct stone extraction.

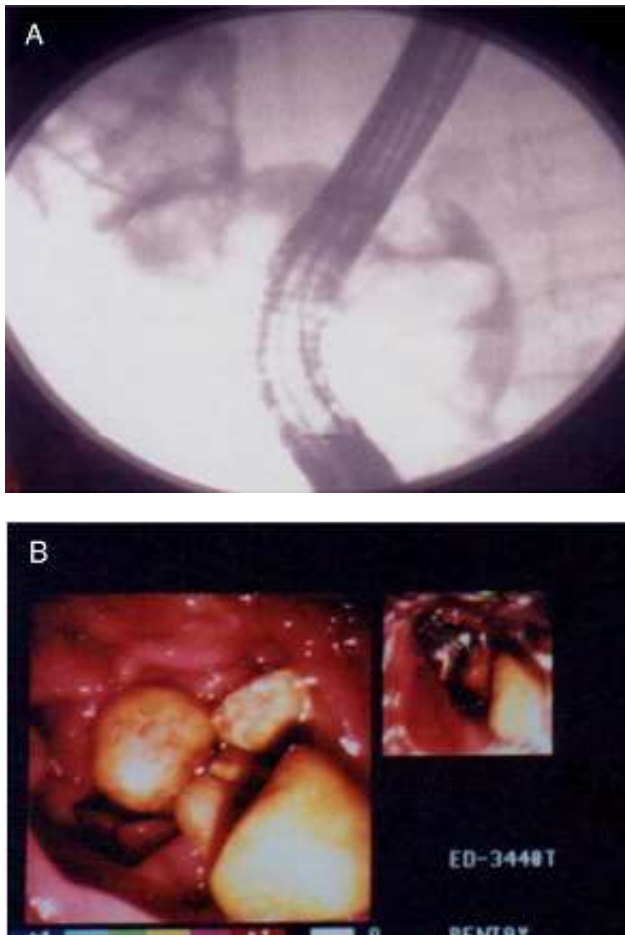


FIGURE 3. Endoscopic retrograde cholangiopancreatography of multiple common bile duct stones extraction.

retrieval using basket, balloon extractor, or manual mechanical lithotripsy. However, drainage was carried out in some cases with suspected cholangitis, or after failure of endoscopic techniques prior surgery by stents or nasal biliary catheter.



FIGURE 4. Endoscopic retrograde cholangiopancreatography of large inspissated common bile duct sludge extraction.

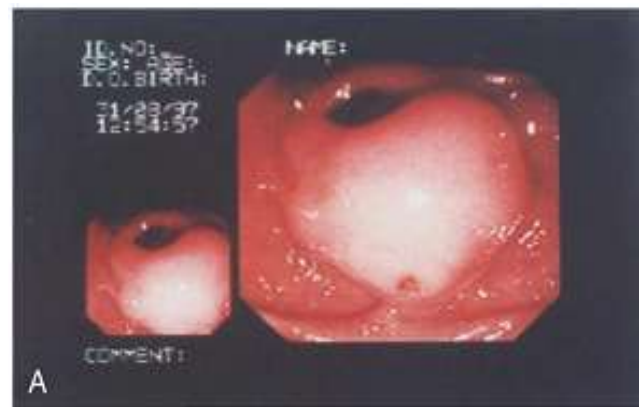


FIGURE 5. Endoscopic retrograde cholangiopancreatography of gravid papilla with stone erosion and large diverticulum.

Percutaneous Manipulation (Figs. 12- 13)

Percutaneous manipulation was carried out in cases of endoscopic failure to opacify the proximal biliary tree as in major CBD injuries, or ligation through:

- PTC prior surgery.
- Percutaneous manipulations and guide wire deployment through the CBD prior combined procedures (Rendezvous technique).
- Percutaneous dilatation and stenting for stricture, or injury.

Follow-up

Parenteral antibiotics were prescribed for all cases (Cephoperazone). Surgically treated cases were followed up for a variable period prior discharge (3- 10 days) with the appropriate treatment and follow-up. Endoscopically and percutaneously treated cases were discharged at the next day or after, with assurance of the stable condition of the patient. Data of all patients were collected and categorized for the follow-up.

Ethical Considerations and Informed Consent

The study protocol was approved by the local ethical committee, and it was explained to each patient and his/her informed consent obtained before entry into the study.

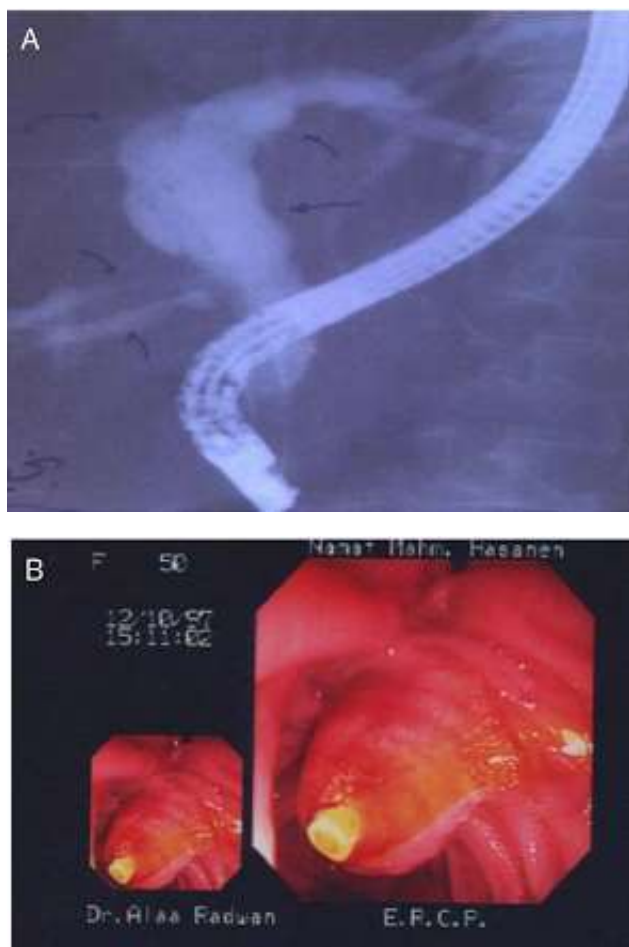


FIGURE 6. Endoscopic retrograde cholangiopancreatography of bile leakage with malplaced T-tube.

RESULTS

Ages of our patients ranged from about 20 to 60 years with a mean age of 40 years, and most of our patients were females (122), with male to female ratio about 1:1.4.

Presentations

Presentations were early within 1 month postoperatively in 45.7% (96/210), or late after 1 month postoperatively in 54.7% (114/210).

Most of our patients (168 cases about 80%) presented after open cholecystectomy, (116 cases underwent cholecystectomy and 52 cases underwent CBD exploration in addition), versus 42 cases (20%) were presented after laparoscopy. Early and late presentations are shown in Tables 1 and 2.

Investigations

Cholangiogram was the main step of diagnosis in these cases, and was carried out for all patients, through endoscopy in 207 patients (98.6%), or through the percutaneous transhepatic route in 34 patients (16.2%) after failure of ERCP. Data of cholangiograms were shown in Table 3.

Endoscopic Techniques

Manipulation of the sphincter mechanism: was shown in Table 4.

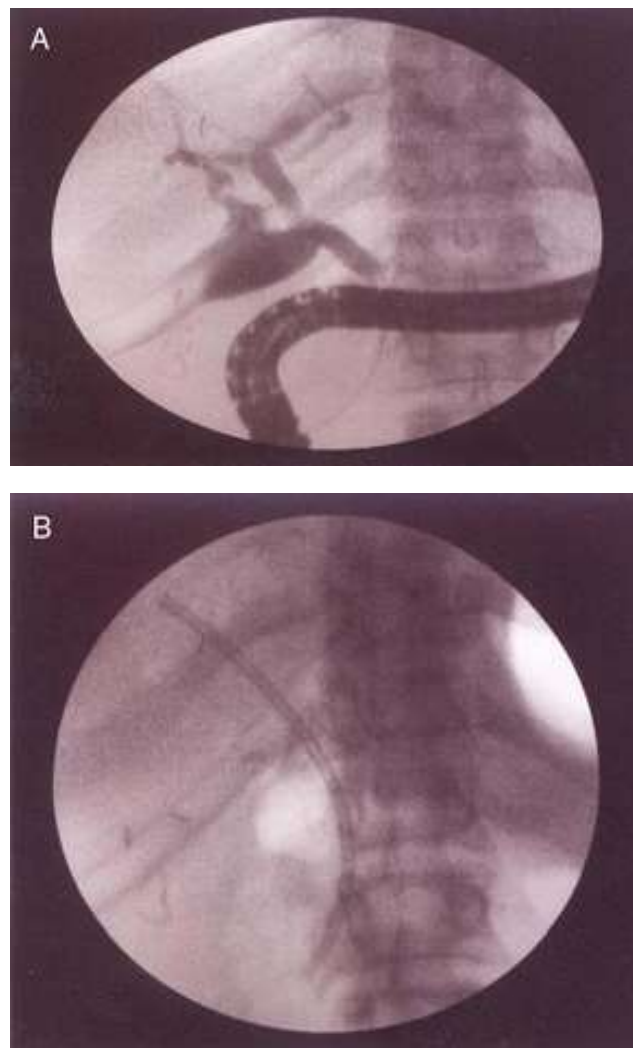


FIGURE 7. Endoscopic retrograde cholangiopancreatography of postlaparoscopic injury treated by stenting.

Choledocholithiasis

Choledocholithiasis was diagnosed in 92 cases and was treated accordingly as shown in Table 5.

Biliary Stricture

Biliary stricture was diagnosed in 78 patients (37.1%), and treated by dilatation and stenting in consecutive manner with increasing number and gauge of the stents till reaching cure, sometimes redo-ERCP was needed to substitute small sized stent by a larger one (7 cases with 8 French stent) within a very short period. As shown in Table 6. Other endoscopic maneuvers associated were discussed in Table 7. Unfortunately, endoscopy alone or combined with percutaneous approaches failed in some cases that were shifted to surgical interference, and it was shown in Table 8.

Percutaneous Transhepatic Techniques

Manipulations were carried out in 34 cases (Table 9) by:

- Diagnostic cholangiogram (PTC) that opacify the proximal biliary tree in 19 cases of failed endoscopy prior surgery.

- Therapeutic manipulation for dilatation and stenting in 1 case of CBD stricture.
- Therapeutic manipulation for dilatation and stenting in 1 case of postoperative anastomotic stricture after hepaticojejunostomy.
- Manipulation for deployment of a guide wire in biliary tree through the papilla (Rendezvous technique) in 13 cases after endoscopic failure.

Surgical Techniques

Surgical techniques were carried out in 40 cases, 10 patients were urgently operated upon because of biliary peritonitis with just peritoneal lavage and drain only in 7 cases, and definitive surgical treatment in the other 3 cases in the form of CBD repair over T-tube, and choledocholithotomy. (2/7 cases treated by drain only underwent reoperation for surgical shunt at a later time and the other 5 cases were submitted to endoscopic treatment), 30 cases were managed electively after prior cholangiography and assessment by endoscopic and/or percutaneous rout. Different techniques were carried out as shown in Table 10, however, the technique of choice was choledochojejunostomy using Roux-en-Y loop that was carried out in 18 patients (8.6%).

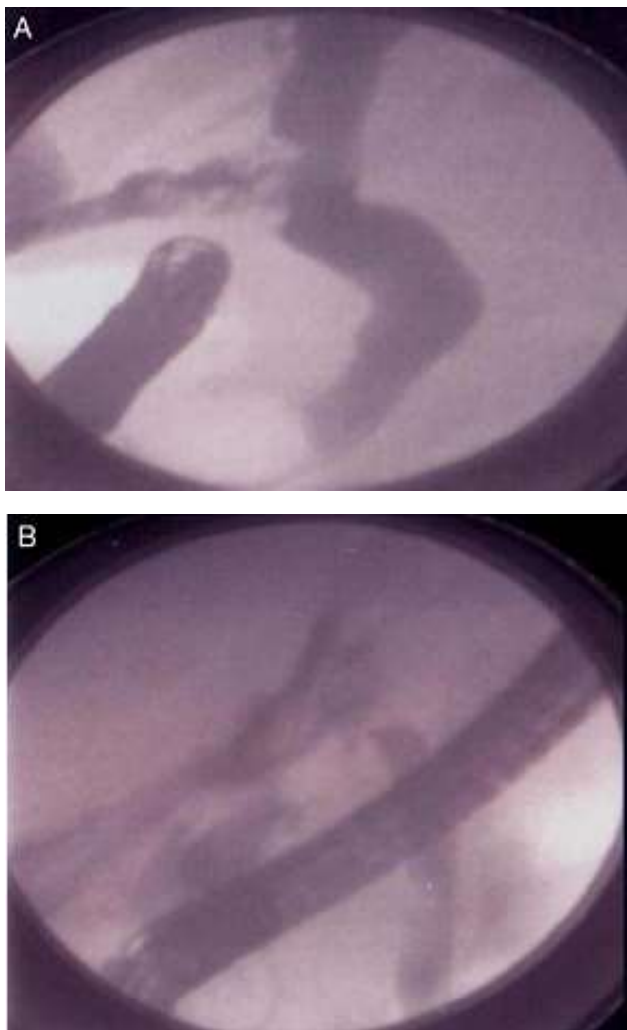


FIGURE 8. Endoscopic retrograde cholangiopancreatography of major leakage and common bile duct transection.

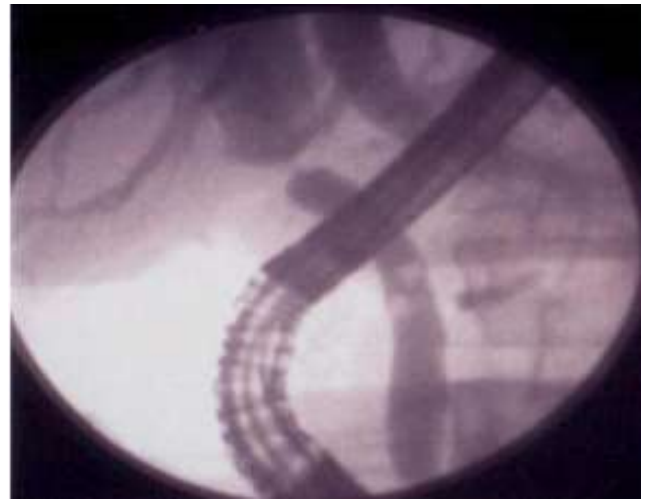


FIGURE 9. Endoscopic retrograde cholangiopancreatography of benign postcholecystectomy common bile duct stricture.

Unfortunately, these techniques carry some risks, 1 patient developed anastomotic stricture after hepaticojejunostomy by 3 months postoperatively (1/18 cases), and it was managed successfully by percutaneous dilatation and stenting, but no mortality detected.

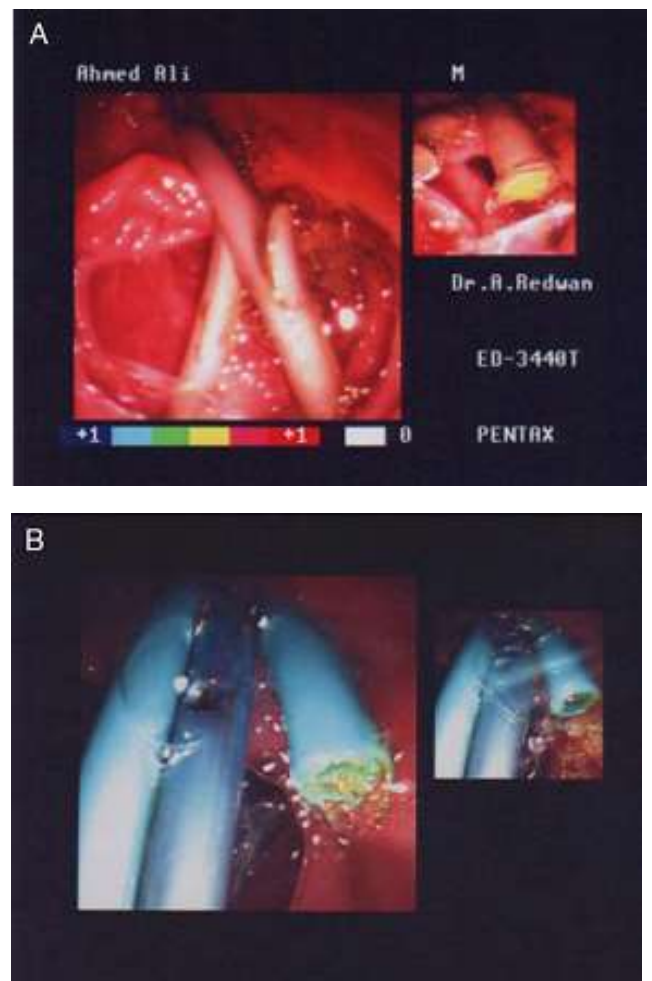


FIGURE 10. Endoscopic retrograde cholangiopancreatography of biliary plastic stenting, double and triple.



FIGURE 11. Endoscopic retrograde cholangiopancreatography of common bile duct ligation.

DISCUSSION

The incidence of postcholecystectomy problems in this work was higher after conventional open cholecystectomy (116 cases) more than laparoscopic cholecystectomy (42 cases). In contrary to the generally accepted higher incidence after laparoscopic cholecystectomy (0.2%) more than open cholecystectomy (0.1%), and usually laparoscopic bile duct injury tends to be more severe and high proximally¹⁸ and this may be attributed to the low incidence and affinity for laparoscopic procedures in Upper Egypt locality.

Bile leakage was very common among our patients (20%) seen as leakage in 38 patients (18.1%), or bile fistula in 2 patients (1%), usually originated from the liver bed or biliary injury as described before,^{18,19} as the sphincter of Oddi creates a pressure gradient that result in bile spillage to outside rather than into the duodenum.²⁰

Leakage was demonstrated by cholangiogram in most of cases (35 cases out of 40), however, the spillage was very mild and not evident by contrast injection in the rest, such mild cases of biliary leak may resolve spontaneously as stated before,²¹ other presentations was detected as jaundice which was encountered in 7 cases (3.3%). In agreement with Bergman et al²², who stated that presenta-



FIGURE 12. Percutaneous transhepatic stenting for postoperative stricture (after hepatico jejunostomy operation).

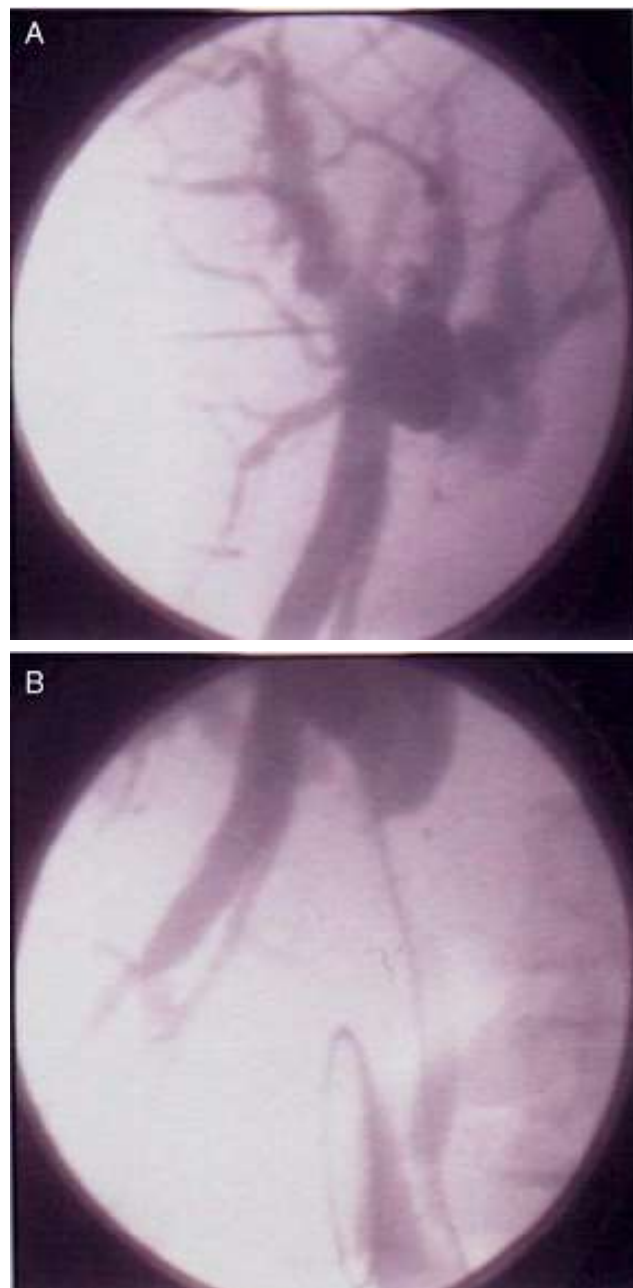


FIGURE 13. Percutaneous transhepatic cholangiography of hilar stricture injury and manipulation of the wire to duodenum.

tion according to the nature of bile duct injury may be encountered.

Endoscopic approaches (ERCP) is simple, noninvasive procedure, with low morbidity and mortality, short hospital stay, and cost effective methods of management as evident previously by Brandabur et al.¹⁰

Sphincterotomy was carried out with 114 patients (55.1%), prior stone extraction or draining obstructive cholangitis as documented previously by Cotton et al and Leung et al.^{11,12}

Sphincterotomy was also carried out prior dilatation and/or stenting for biliary strictures, or management of other complication as bile leakage in agreement with previous protocols of Classen and others.^{13,14}

In contrast, precut knife was used in 50 patients (24.1%) with difficult cannulation, or impacted stone in the papilla "gravid papilla" as stated by previous authors.^{23,24}

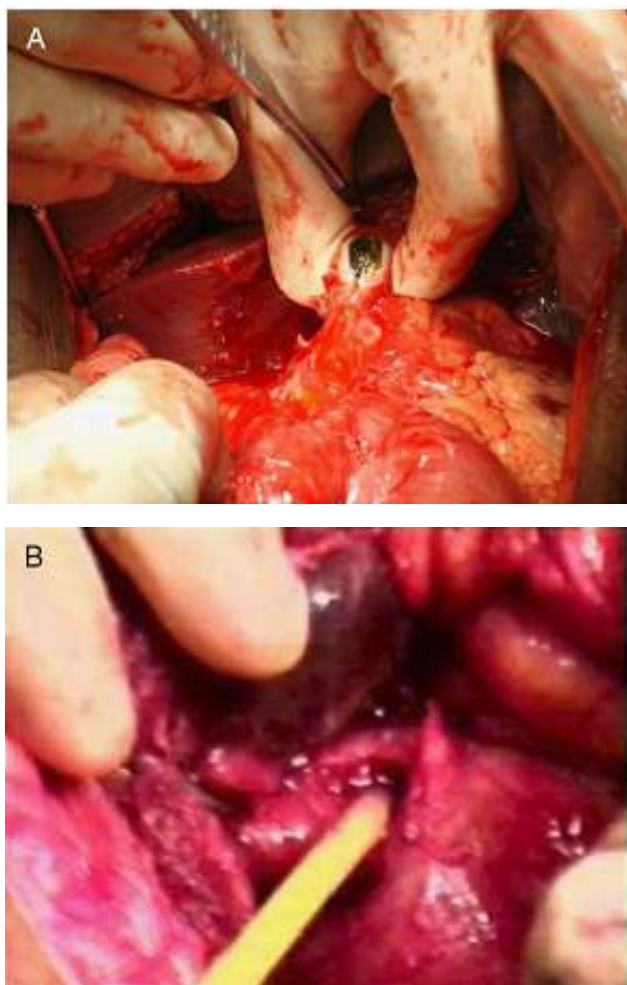


FIGURE 14. Operative photograph of choledocholithotomy and T-tube drain.

Moreover balloon guided sphincter dilatation (sphincteroplasty) was practiced in only 25 cases (12.1%) as an alternative to sphincterotomy for CBD stone removal as carried out by other authors.^{14,25}

Choledocholithiasis was treated by different endoscopic techniques in 81 cases (38.6%), with failure to extract CBD stones in 11 cases out of 92 cases (12%), in contrary to 20% failure rate encountered by Cuschieri et al,²⁶ and this may be explained by the fact that most of the stones encountered in this work was soft, or easily crushed improving the success rate. For those cases with endoscopic failure, drainage by biliary stenting was carried out as practiced by Maxton prior surgery.²⁷

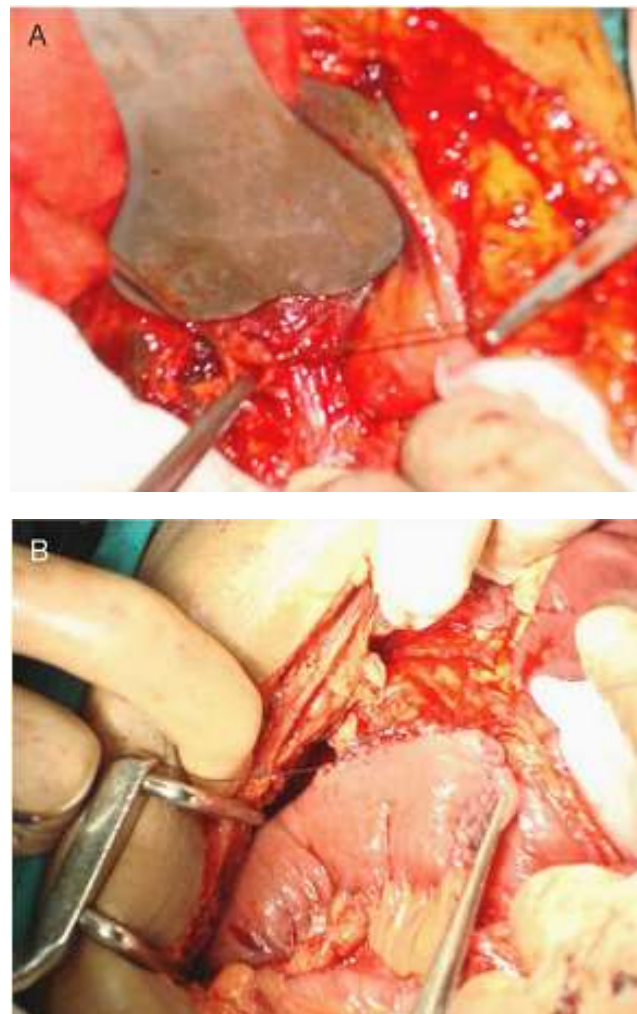


FIGURE 15. Operative photograph of Raux-en-Y loop hepatico-jejunostomy.

Biliary strictures were treated by just dilatation only in 8 cases (3.8%), or with concomitant stenting in 65 patients (31%) in consecutive endoscopic sessions, as practiced previously by Siegl.²⁸

Biliary stenting was carried out using endoscopic approaches in almost all patients, or combined with percutaneous approaches in 2 cases only (Rendezvous technique) which proved its usefulness in treatment of such cases of endoscopic failure as stated by Smith et al,²⁹ however, endoscopic approaches alone or combined with percutaneous manipulations failed to treat 3 cases with CBD stricture that was shifted to surgery.

TABLE 1. Early presentations and their incidence

Duration item	1-5 d		6-10 d		11-15 d		16-20 d		21-25 d		25-30 d		Total	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Leakage	11	5.2	19	9	5	2.4	-	-	2	1	1	0.5	38	18.1
Abnormal Cholangiogram	-	-	5	2.4	17	8.1	-	-	-	-	1	0.5	23	11
Jaundice	10	4.8	5	2.4	2	1	1	0.5	3	1.4	2	1	23	11
Leak and jaundice	-	-	1	0.5	2	1	2	1	2	1	-	-	7	3.3
Colic, infection	-	-	-	-	2	1	1	0.5	-	-	2	1	5	2.4
Total	21	10	30	14.3	28	13.3	4	2	7	14.7	6	2.9	96	45.8

TABLE 2. Late presentations and their incidence

Duration	6 m.		1yr.		2yr.		5yr.		10yr.		↑10yr.		Total	
Item	No	%	No	%	No	%	No	%	No	%	No	%	No	%
Jaundice	20	9.5	8	3.9	14	6.7	13	6.2	8	3.9	15	7.1	78	37.1
Colic	8	3.9	4	2	8	3.9	2	1	2	1	3	1.4	27	12.9
Cholangitis	-	-	1	0.5	2	1	2	1	1	0.5	1	0.5	7	3.3
Fistula	2	1	-	-	-	-	-	-	-	-	-	-	2	1
Total	24	11.4	13	6.2	24	11.4	17	8.1	10	4.8	19	9	114	54.3

TABLE 3. Cholangiographic finding

Cholangiogram findings	No	%
Dilatation of biliary channels	128	61
Stone		
Single stone	41	19.5
Multiple stones (2-3)	51	24.3
Leakage		
Major leakage	19	9.1
Minor leakage	16	8.6
Stricture		
Low CBD	3	1.4
Mid CBD	5	2.4
High CBD	39	18.6
Hepatic duct	31	14.8
Arrest of the dye (ligated CBD)	19	9.1
Transection of CBD	4	2
Free cholangiogram.	7	3.3

CBD indicates common bile duct.

TABLE (4) Endoscopic intervention with papillary sphincter

Papillary sphincter	No	%
Sphincterotomy	114	55.1
Knief sphincterotomy	50	24.1
Balloon sphincteroplasty	25	12.1
No interference	15	7.2
Failed cannulation (diverticulae)	3	1.5
Total	207	100

TABLE 5. Stone manipulations

Stone manipulation	No	%
Stone retrieval by basket	26	12.4
Stone retrieval by balloon	22	10.5
Combined basket & balloon.	13	6.2
Mechanical internal lithotripsy	13	6.2
Mechanical external lithotripsy	7	3.3
Failed retrieval and stenting	6	2.9
Bad general condition & stenting	5	2.4
Total	92	43.9

Biliary injuries was treated effectively by endoscopy in the majority of patients as its efficacy and safety are well established by previous documentations,^{20,30} and the presumed benefit entail reduction or elimination of

TABLE 6. Number and percentage of stricture manipulation techniques

Stricture manipulation	No	%
Dilatation of stricture only	8	3.8
Dilatation, stenting	7	3.3
8 Fr. Stent.	32	15.2
10 Fr. Stent.	12	5.7
11.5 Fr. Stent.	9	4.3
12 Fr. Stent.	5	2.4
Double stents		
Rendez-vous technique & stenting	2	1
Failed cases to be dilated	3	1.4
Total	78	37.1

Table 7. Other endoscopic maneuvers done

Other endoscopic maneuvers	No	%
Stenting after stone extraction due to cholangitis	6	2.9
Nasal biliary catheter after stone extraction because of cholangitis	4	2
Nasal biliary catheter for leakage	1	0.5
Stenting for haemobilia	1	0.5
Stenting for major leakage	16	7.6
Rendez vous technique and stenting for CBD transection	1	0.5
Rendez vous tech. and stenting for CBD stricture	7	3.3
Rendez vous technique For duodenal diverticula	3	1.4
Brush & bile cytology in suspicious lesions	4	2
Biopsy of suspicious lesions	5	2.4

intraductal pressure gradient across the sphincter of Oddi as explained by authors,²¹ so the decreased resistant across the ampulla therefore diverts bile flow into the duodenum away from the site of injured duct, and the bile flow through the fistula lessens to a degree sufficient to allow healing in association with removal of any pathologic obstruction as stone that may induce or maintain leakage as explained by Prat et al,³¹ and this can be accomplished endoscopically by sphincterotomy, stent deployment, nasal biliary catheter insertion, or combination of these as practiced previously.³²

In this work, sphincterotomy was carried out for treatment of minor leakage in 16 cases; in contrast, biliary stent placement was carried out for 16 cases with major

Table (8) Number and percentage of failed cases

Cause of failure	No	%
Transection of CBD	3	1.4
Ligated or clipped CBD	12	5.7
Failed stone retrieval and stenting	8	3.8
Failed stricture manipulations	3	1.4
Failed stricture dilatation to enough size (8 Fr. Stent)	2	1
Major leakage and haemobilia	1	0.5
Major CBD injury	2	1
Bad patient compliance by repeated ERCP sessions	2	1
Total	33	15.8

CBD indicates common bile duct; ERCP, endoscopic retrograde cholangiopancreatography.

leakage that led to resolution of the leakage and healing of the injury site as agreed by Lorenzini et al.³³ And documented by other authors^{20,34} that the biliary stents play a dual role in that it abolish pressure gradient in the CBD at the level of the sphincter and in addition, tamponade the leak site with proximal end of the stent above the leak site.³⁴

In 1 patient, nasal biliary tube drainage was carried out to treat biliary leak and proved usefulness in treating simple leak, and it is preferred over stent placement as it allow follow-up cholangiography, and easily removed without additional procedures, but it is uncomfortable to the patient as noticed previously by Chow et al and Ponchon et al.^{35,36}

Failure of the endoscopic approaches was encountered in 33 cases (15.8%), because of variable difficult situations as transection injury, major laceration, ligation or clipping, tough stricture for dilatation; dilatation is not enough for treatment, and lastly bad patient compliance by repeated endoscopic sessions for treatment. The overall success rate of endoscopic manipulation was 80% with variable rates for each problem, In contrary to other reports detecting variable success in ranging from 78% to 94% of cases as stated by Davids et al^{37,38}, however, the European association of endoscopic surgeons reported failure rate

Table 9. Percutaneous techniques

The item	No.	%
Percut. Cholangiogram	2	1
CBD tough stricture	3	1.4
CBD transection	12	5.7
CBD ligation	2	1
Biliary peritonitis		
Percut. stricture dilatation & stenting	1	0.5
Percut. dilatation and stenting for post operative stricture after hepatico-jejunostomy	1	0.5
Rendez vous techn.	2	1
CBD stricture	1	0.5
CBD transection	7	3.3
CBD ligation	3	1.4
Failed cannulation		
Total	34	16.2

CBD indicates common bile duct

Table 10. Surgical techniques and its percentage

The surgical techniques	No	%
Peritoneal lavage and drainage	7	3.3
Choledocholithotomy	8	3.8
Undo ligation of CBD	5	2.4
CBD repair over T-tube	3	1.4
Choledochoduodenostomy	1	0.5
Choledochojejunostomy, Roux-en Y loop	18	8.6

CBD indicates common bile duct

of endoscopic manipulation of 20%.²⁶ In this study, the overall success rate of endoscopic manipulation was 80% as documented with variable rates for each problem. All failure cases were shifted to surgery.

Percutaneous approaches was carried out in 34 cases in this study, 33 cases with failure of preliminary endoscopic approaches, and 1 case with postoperative anastomotic stricture as follow:

- Diagnostic cholangiogram only (PTC) in 19 patients (9.1%) with failure of therapeutic percutaneous manipulation, and it is helpful to delineate the biliary tree, that is crucial for road mapping prior surgical interference as evident by Soper et al.¹⁵
- Therapeutic manipulations in 15 patients (7.1%), either as the only treatment in 2 cases of CBD stricture by percutaneous dilatation and stenting, or combined with endoscopy (Rendez vous technique) in 13 patients, and this combined approach was very useful in negotiating the obstructive element, or dilatation and stenting for stricture as documented previously,^{29,39} thus combined approaches helps in decreasing the failure rate of endoscopic manipulation, moreover in treatment of postoperative anastomotic stricture after Roux loop choledochojejunostomy as a substitution to another surgical interference with its difficulties (in 1 patient).

Surgical approaches was carried out in 40 patients (19%), doing variable surgical techniques as just peritoneal lavage and drain in cases presented with biliary peritonitis, choledocholithotomy in 8 patients, undo ligation of CBD with T-tube splint in 5 patients, CBD repair over T-tube in 3 patients, or bilio-enteric anastomosis in 19 patients (1 patient out of 19 developed anastomotic stricture after 3 months that was treated by percutaneous manipulation and stenting).

Although surgery remains the gold standard for treatment as stated by Myburgh,⁶ surgery is resoled to after trial of minimally invasive tools as endoscopic approaches (ERCP) which is the first preferred tool as documented by many authors,^{40,41} in conjunction to percutaneous manipulation alone, or both techniques in combination, so that surgical management should be performed only after failure of nonsurgical methods as stated,⁴² so the goal of therapy is not necessarily to avoid surgery, but to achieve the best long term results in the most cost effective manner and with the least morbidity and mortality.

Hepatico jejunostomy is considered to be the procedure of choice in biliary reconstruction as Roux-en-Y loop type as evident by many authors previously,⁴³ however, CBD repair over T-tube was also needed in some cases of minor CBD laceration as proved by Ress et al;⁴⁴ moreover,

choledochoduodenostomy was also performed for 1 patient with close proximity of duodenum and sever adhesion of the surrounding field in agreement with data of Roslyn and Zinner.⁴⁵

Unfortunately these surgical approaches is so sophisticated especially when anastomosis is carried out to a small nondilated duct that is technically challenging particularly in the face of surrounding fibrosis and sepsis as evident previously,⁷ so it needs a specialized surgeons and well equipped center for managing such patients. In such case, early reconstruction can be undertaken after appropriate assessment and before sepsis disrupts the operation field, however, the majority of biliary injuries present late, the patient may be septic, hypoalbuminemic, and jaundiced, her surgery is technically very difficult but still may be considered, and injudicious attempts at repair by the surgeon who has perpetrated the injury may compromise the patient's surgical prospect and multiple surgical manipulations carries a poor long-term results, for this reason it is recommended to refer such patients early to a specialized center.⁷

A coordinated multidisciplinary approach to diagnose and treat patients with biliary injuries is now the standard technique including endoscopic, percutaneous transhepatic and surgical techniques; however, the definitive treatment remains controversial.⁴⁶

When postcholecystectomy problems occurs, some authors support the use of endoscopic approaches, whereas others suggesting that this merely delays satisfactory surgical treatment as stated by Doctor et al⁴⁷; but still endoscopic approaches is the first choice treatment and endoscopically treated patients are exposed to a relatively minor morbidity and mortality, but it required a considerable skill not available in many community,⁴⁸ and percutaneous transhepatic approach may be helpful in combination with endoscopic techniques to guard against failure in some cases, and in spite of all these consideration, surgery remains the gold standard treatment of such problems with its difficulties, invasiveness, and complications.

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