MULTIDISCIPLINARY APPROACHES FOR MANAGEMENT OF POST - CHOLECYSTECTOMY PROBLEMS, (SURGERY, ENDOSCOPY, AND PERCUTANEOUS APPROACHES)

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SUMMARY

Purpose: *This prospective study was undertaken to study and evaluate different techniques used in management of post cholecystectomy problems namely surgery, endoscopy, and percutaneous manipulation.*

Patients & Methods: *In the period March 2005 to April 2006, a randomly selected sample of 210 patients with post cholecystectomy problems (122 females and 88 males) were collected from surgery department, and managed accordingly using surgery (40 attempts), endoscopy (207 attempts), or percutaneous approaches (34 attempts).*

Results: *Endoscopic (ERCP) management was done as a therapeutic approach with 183 cases, or diagnostic cholangiogram only with 24 cases. Those cases treated included stone extraction in 81 cases, stricture or injuries (55 cases) treated by dilatation and stenting, and bile leakage (35 case) treated by sphincterotomy and/or stenting.*

Percutaneous approaches were done with 34 cases by diagnostic PTC prior surgery in 19 cases, percutaneous internal biliary stenting in 2 cases of stricture, and combined with endoscopy in 13 cases.

Surgery was done in 40 cases either urgent in 10 cases with biliary peritonitis (4.8% of cases), or planned in 30 cases (14.3% 0f cases). The techniques were peritoneal lavage in 7 cases prior proper approach, choledocho-lithotomy in 8 cases, undo ligation and T shaped tube drainage in 5 cases, repair of CBD laceration splinted by T tube in 3 cases, choledocho-duodenostomy in 1 case, and choledocho - jejunostomy as Roux-en Y loop in 18 cases.

Conclusion: *Endoscopic approaches proved efficacy, safety, and cost effectiveness not only in diagnosis and evaluation, but was also considered the main stay of treatment, especially when combined with percutaneous approaches that help in avoiding failure in some problematic cases. However surgery remains the gold standard, effective in treatment not only that failed to be treated by the less invasive approaches, but in some cases that is mandatory to be explored as biliary peritonitis.*

Keywords: *post-cholecystectomy, endoscopic retrograde cholangio-pancreatography (ERCP), Percutaneous trans-hepatic cholangiogram (PTC), choledocho-enteric anastomosis.*

INTRODUCTION AND AIM OF THE WORK

Both open and laparoscopic cholecystectomy is safe and effective treatment for patients with symptomic cholelithiasis. Although, major biliary complications still occure and have been more common in the initial experience with laparoscopic cholecystectomy (Daniel and Deziel, 1994), however some authors considered it three folds higher than open procedure (Neuhaus et al., 2000), and usually catastrophic, with high injuries (Walash & Hermann, 1997).

Surgery has been the mainstay of therapy for iatrogenic biliary injury, either immediately when the injury has occurred, or very frequently at a later post operative stage with increased morbidity and mortality (Raute et al, 1993). Mild occlusion or incisional injuries may be managed by T-tube or primary CBD repair, unfortunately most transection injuries are associated with loss of bile duct tissue and a more complex repair is required, hepatico-jejunostomy is the procedure of choice for reconstruction with Roux-en-Y loop, tention free, mucosa to mucosa anastomosis, with adequate diameter (Myburgh , 1993), However anastomosis to a small non-dilated duct is technically challenging particularly with surrounding fibrosis and sepsis, this approach was associcated with considerable morbidity and mortality, and requred a specialized center (Pleass & Garden, 1998), as a result, a variety of non surgical approaches have evolved to deal with the problem of biliary injury (Richard & Kozarek, 1994).

Endoscopic retrograde cholangio-pancreatography (ERCP) and papillotomy has dramatically changed the treatment, and success led to the widespread use of this approach in preference to surgery (Neuhaus, 1998).

Percutaneous transe-hepatic cholangiography (PTC) was used for delineation of the proximal biliary tree especially if ERCP failed as in CBD ligation, massive stricture, or transection (Soper et al, 1993). Sometimes it is used for drainage prior to surgery (PTD), or percutaneous dilatation and stenting for CBD stricture (Martin, 1991).

The aim of this work is to study thoroughly and evaluate the role of each technique (surgery, endoscopy, and percutaneous approaches), separetly or in combination in dealing with post cholecystectomy problems and their benefits in diagnosis and treatment of such conditions.

PATIENTS AND METHODS

Random sample of 210 patients from the surgery department, and endoscopy unit, Assiut University Hospital was taken. They were complaining of post cholecystectomy problems, and were subjected to:

Thorough detailed history taking.

Meticulous clinical examination.

Investigation needed to diagnose the problem were done as follows:

Liver function tests, and abdominal ultrasonography were done to all cases.

CT or MRI (if needed).

Cholangiogram was done in all cases: as

*-Trans-tube in cases presenting with T.tube in place.
*-Endoscopic cholangiogram (ERC) done in most of cases.
*-Percutaneous transhepatic cholangiogram (PTC) done in some selected cases in which endoscopic approaches failed.

Surgical approaches was done as follow:
*-Urgent surgery in cases presenting with biliary peritonitis, the definitive surgery can not be done because of widespread sepsis and fibrosis and cases underwent *peritoneal lavage& drainage*, fortunately, definitive surgery was done in some cases as *CBD repair over a T-tube splint, or shunt operation* in correctable iatrogenic CBD injury.
*-Planned surgery usually preceded by cholangiogram was done as *Choledocho-lithotomy* 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 choledocho-jejunostomy) for CBD injury, massive stricture fibrosis, or bad patient compliance with repeated endoscopic session and stenting.

Endoscopic approaches: was done 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.

CBD stricture was treated by dilatation and stenting. *CBD stones* were treated by sphincterotomy and retrieval using basket, balloon extractor, or manual mechanical lithotrepsy. However, *Drainage* was done in some cases with suspected cholangitis, or after failure of endoscopic techniques prior surgery by stents or nasal biliary catheter.

Percutaneous Manipulation: was done in cases of endoscopic failure to opacify the proximal biliary tree as in CBD injuries, or ligation through:
*-Percutaneous transhepatic cholangiogram (PTC) prior surgery.
*-Precutaneous manipulations and guide wire deployment through the CBD prior combined procedures (Rendez vous technique).
*-Percutaneous dilatation, and stenting for stricture, or injury.

Follow up:

Parenteral antibiotics were prescribed for all cases (ciprofloxacine).

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 in the same day after assurence of the stable condition of the patient.

Data of all patients were collected, and categorized for follow up.

RESULTS

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

Presentations: were early within one month post operatively (96/210) about 45.7 %, or late after one month post operatively (114/210) about 54.3 %.

Most of our patients (168 cases 80%) presented after open cholecystectomy, (116 cases underwent cholecystectomy and 52 cases underwent cholecystectomy plus CBD exploration), versus 42 cases (20%) presented after laparoscopy.

Early and late presentations are shown in next tables.

Investigations: cholangiogram was the main method of diagnosis in these cases, and was done for all patients, via endoscopy in 207 patients (98.6 %), or via percutaneous trans-hepatic rout in 34 patients (16.2 %).

Biliary stricture: was seen in 78 patients (37.1%), and treated by dilatation and stenting, sometimes redo-ERCP was needed to substitute small sized stent by a larger one (7 cases with 8 french stent deployment).

Unfortunately, endoscopy alone or combined with percutaneous approaches failed in some cases that were shifted to surgical interference.

Percutaneous trans-hepatic techniques were done in 34 cases by:

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

*-Therapeutic manipulation for dilatation and stenting in one case of CBD stricture.

*-Therapeutic manipulation for dilatation and stenting in one case of post-operative anastomotic stricture after hepatico-jejunostomy.

*-Manipulation for deployment of a guide wire in biliary tree through the papilla (Rendez vous technique) in 13 cases after endoscopic failure.

Surgical techniques: were done in 40 cases, 10 patients were urgently operated upon due to biliary peritonitis with peritoneal lavage and drain only in 7 cases (2/7 underwent re-operation for surgical shunt at a later time and the other 5 cases were submitted to endoscopic treatment), and definitive surgical treatment in 3 cases.

30 cases were managed electively after prior cholangiography and assessment by endoscopic or percutaneous rout. Different techniques were done as shown in table (10), however the technique of choice was choledocho-jejunostomy using Roux-en Y loop that was done in 18 patients (8.6%).

Unfortunately, these techniques carries some risks, one patient developed anastomotic stricture after hepatico-jejunostomy by 3 months post operatively (1/18 cases), and it was managed successfully by percutaneous dilatation and stenting, but no mortality was detected.

Tabel (1) showed early presentations and their incidence.

Duration► & item▼	1-5 d.		6-10		11-15		16-20		21-25		21-25		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
Ab. Chola.	-	-	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.& ja.	-	-	1	0.5	2	1	2	1	2	1	-	-	7	3.3
Colic, inf.	-	-	-	-	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) shows late presentations and their incidence.

Duration► Item▼	6 m.		1yr.		2yr.		5yr.		10yr.		↑10yr.		Total	
	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) Shows 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 ducts	31	14.8
* Arrest of the dye (ligated CBD)	19	9.1
* Transection of CBD	4	2
* Free cholangiogram.	7	3.3

Endoscopic techniques

Table (4) Shows endoscopic intervention with papillary sphincter *Choledocholithiasis:*

Items	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) shows 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 lithotrepsy	13	6.2
Mechanical external lithotrepsy	7	3.3
Failed retrieval and stenting	6	2.9
Bad general condition & stenting	5	2.4
Total	92	43.9

Table (6) Number and % of stricture manipulation techniques

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

Table (7) shows other endoscopic maneuvers done.

Other endoscopic maneuvers	No	%
Stenting after stone extraction due to cholangitis	6	2.9
Naso biliary cath. after stone extr. due to 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 tech. and stenting for CBD transaction	1	0.5
Rendez-vous tech. and stenting for CBD Ligation	7	3.3
Rendez vous tech. For duodenal diverticulae	3	1.4
Brush & bile cytology in suspicious lesions	4	2
Biopsy of suspicious lesions	5	2.4

Table (8) shows the number and % of failed cases

Cause of failure	No	%
Transection of CBD	3	1.4
Ligated or clipped CBD	12	5.7
Failed stone retrival 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

Table (9) shows percutaneous techniques.

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

Table (10) shows surgical techniques and its percentage.

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

Illustrated cases

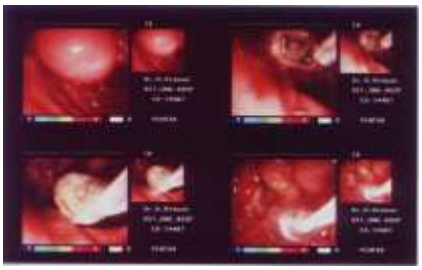

Fig. (1) Endo. Stone extraction

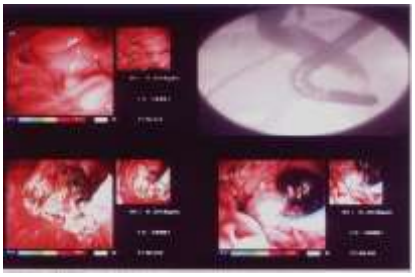

Fig. (2) Endo. Stone extraction

Fig. (3) ERC, bile leakage

Fig. (4) Endo. Para-ampullary diverticulae

Fig. (5) ERC, bile leakage

Fig. (6) PTC, biliary injury and stricture

Fig. (7) PT, wire into duodenum

Fig. (8) PT stenting for str. Injury

Fig. (9) ERC, post lap. Leakage

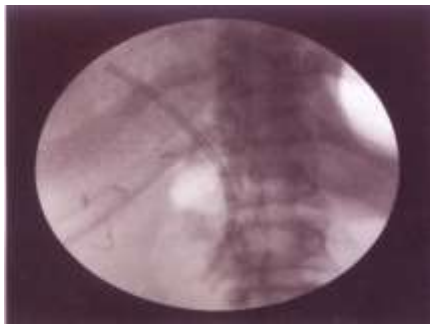

Fig. (10) ERC, stenting for leakage

Fig. (11) ERC, CBD ligation

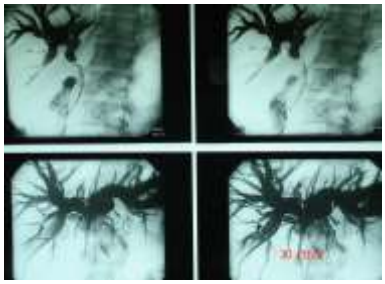

Fig. (12) PTC, hilar stricture injury

Fig. (13) PT stenting for post op. strict.

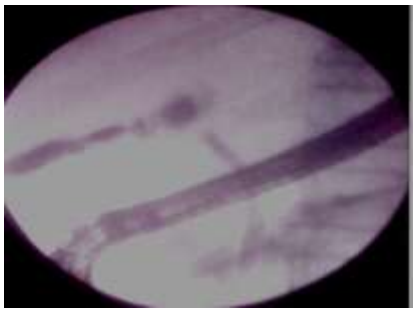

Fig. (14) ERC, CBD transaction injury

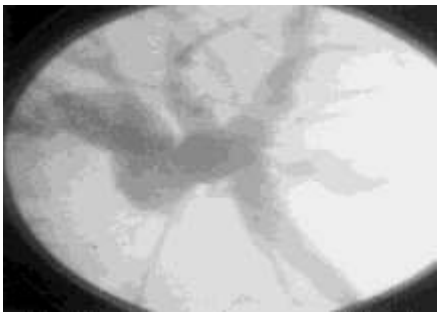

Fig. (15) PT, hilar stricture injury

Fig. (16) PT, wire to duodenum

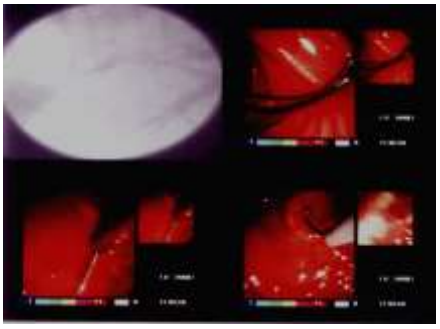

Fig. (17) ERC, rendez vous technique

Fig. (18) ERC, stenting for str. Injury

DISCUSSION

The incidence of post cholecystectomy problems in this work was higher after conventional open cholecystectomy (116 cases) than laparscopic 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 proximally (McMahon, et al., 1995), 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 (Elboim et al., 1993). However, a significant leakage may arrise from bile duct injury (McMahon et al., 1995) as the sphincter of Oddi creates a pressure gradient that may result in bile spillage to outside rather than into the duodenum (Barkun et al., 1997).

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 and such mild cases of biliary leak may resolve spontaneously (Shailesh et al., 1997). Other presentations can be expected according to the nature of bile duct injury (Bergman et al., 1996) as jaundice which was encountered in 7 cases (3.3%).

Endoscopic approach (ERCP) is simple, non invasive procedure, with low morbidity & mortality, short hospital stay, and coast effective method of management (Brandabur et al., 1988).

Sphincterotomy was done with 114 patients (55.1%), prior stone extraction (Cotton et al., 1994), for draining obstructive cholangitis (Leung et al., 1989), prior stenting or dilatation of strictures (Classen 1987), or management of other complication as bile leakage (Choudari et al., 1999). On the other hand, pre cut knife was used in 50 patients (24.1%) with difficult cannulation (Long et al., 1984) and impacted stone in the papilla (Carr-Locke & Cotton, 1985). Moreover balloon guided sphincter dilatation (sphincteroplasty) was practiced with 25 cases (12.1%) as an alternative to sphincterotomy (Choudari et al., 1999), for CBD stone removal (Tytgal et al., 1996).

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% current failure rate (Cuschieri et al., 1996), 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, and stenting was done for those cases (Maxton, et al., 1996) prior surgery.

Biliary strictures were treated by dilatation in 8 cases (3.8%), and with concomitant stenting in 65 patients (31 %) using different types of stents that proved its usefulness (Siegel & Cohen, 1994), using endoscopic approaches in almost all patients, or combined with percutaneous approaches in 2 cases only (rendez vous technique) which proved its usefulness in treatment of such cases of endoscopic failure (Smith , 1995). However endoscopic approaches alone or combined with percutaneous manipulations failed to treat 3 cases with CBD stricture that were shifted to surgery.

Biliary injuries was treated endoscopically as the only definitive treatment modality in the majority of patients (Barkun et al., 1997), and its efficacy and safety are well established (Sugiyama et al., 2000), however the endoscopic technique of choice is still controversial (Bergman et al., 1996), but at least the presumed benefit entail reduction or elimination of intraductal pressure gradient across the sphincter of Oddi (Shailesh et al., 1997), so the decreased resistance across the ampulla therefore diverts bile flow into the duodenum away from the site of injured duct, and the bile flow through the fistula decreases to a degree sufficient to allow healing in association with removal of any pathological obstruction as stone that may induce or maintain leakage (Prat et al., 1997), and this can be accomplished endoscopically by sphincterotomy, stent deployment, nasal biliary catheter insertion, or combination of these (Bjorkman et al., 1995).

In this work, sphincterotomy was done for treatment of minor leakage in 16 cases; on the other hand biliary stent placement was done for 16 cases with major leakage that led to resolution of the leakage and healing of the injury site as agreed by Lorenzini et al., (1995). Here the biliary stents play a dual role in that it abolish pressure gradient in the CBD at the level of the sphincter (Barkun eta l., 1997), and in addition, tamponade the leak site with proximal end of the stent above the leak site (Smith et al., 1986), moreover the stent was also successful in treatment of cystic duct leak (Barkun et al., 1997).

In one patient , nasal biliary tube drainage was done to treat biliary leak and proved usefulness in treating simple leak, and it is preferred over stent placement as it allows follow up cholangiography, and is easily removed without additional procedures (Chow et al., 1997), but it is uncomfortable to the patient (Ponchon et al., 1989).

Failure of the endoscopic approaches was encountered in 33 cases (15.8%), due to variable difficult situations as transaction injury, major laceration, ligation or clipped CBD, tough CBD stricture to be dilated or dilatation is not enough for treatment, and lastly bad patient compliance by repeated endoscopic sessions for treatment. In contrary to other reports detecting success in 78-94 % of cases (David et al., 1993, Walden et al., 1993), the European association of endoscopic surgeons (EAES) reported failure rate of endoscopic manipulation of 20% (Cuschieri et al., 1996). In this study the overall success rate of endoscopic manipulation was 80% with variable rates for each problem, and all failure cases were shifted to surgery.

Percutaneous approaches was done in 34 cases in this study including:

*- Diagnostic cholangiogram only (PTC) in 19 patients (9.1%) to delineate the biliary tree, and it is considered to be a vital investigation in planning for surgical interference (Soper et al., 1993).

*- Therapeutic manipulations in 15 patients (7.1%), either as the only treatment in 2 cases of CBD stricture by 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 (Martin & Rossi, 1994), or dilatation and stenting for stricture (Smith et al., 1995). Thus combined approaches help in decreasing the failure rate of endoscopic manipulation, and in treatment of post operative anastomotic stricture after Roux loop choledocho-jejunostomy as a

substitution to another surgical interference with its difficulties.

Surgical approaches was done in 40 patients (19%), doing variable surgical techniques as peritoneal lavage and drain in cases presenting with biliary peritonitis, choledocho-lithotomy 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. One patient/19 developed anastomotic stricture after 3 months that was treated by percutaneous manipulation and stenting).

Although surgery remains the gold standard for treatment (Myburgh , 1993), surgery is resorted to after trial of minimally invasive tools as endoscopic approaches (ERCP) which is the first preferred tool (Mussack et al., 2000 and Olsen , 2000), with percutaneous manipulation, or both techniques in combination, so that surgical management should be performed only after failure of non surgical methods (Vecchio et al., 1998). The goal of therapy is not necessarily to avoid surgery, but to achieve the best long term results in the most coast 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 (Cuschieri , 1995), however CBD repair over T-tube was also needed in some cases (Ress et al., 1993), and choledocho-duodenostomy was performed for one patient with close proximity of duodenum (Roslyn & Zinner, 1994).

Unfourtunatly these surgical approaches are very sophisticated especially when anastomosis is done to a small non-dilated duct that is technically challenging particularly in the face of surrounding fibrosis and sepsis (Pleass & Garden, 1998), 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, hypoalbuminic, and jaundiced and her surgery is technically very difficult. 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 (Pleass and Garden , 1998).

A coordinated multidisciplinary approach to diagnose and treat patients with biliary injuries is now the standard technique (Richardo et al., 1994), including endoscopic, percutaneous transe-hepatic and surgical techniques, however the definitive treatment remains controversial.

When post cholecystectomy problems occur, some authors support the use of endoscopic approaches, while others suggest that this merely delays satisfactory surgical treatment (Doctor et al., 1998). Still endoscopic approache 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 (Frederic , 1994), and percutaneous transe - hepatic 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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الطرق المختلفة للتعامل مع مشاكل ما بعد استئصال المرارة
(الجراحة ، المناظير ، والتعامل الخارجى عن طريق الجلد)

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مشاكل ما بعد استئصال المرارة عبارة عن مجموعة من الأعراض المختلفة والمتداخلة وهى ليست بالنادرة الحدوث بل نراها بصورة شبه يومية بعيادات الجراحة العامة ، مستشفى أسيوط الجامعى. وتم أخذ عينة عشوائية من هؤلاء المرضى عبارة عن ٢١٠ مريض ممن يعانون من هذه المشاكل للتعامل معهم باستخدام احدى هذه الطرق أو جميعها وتشمل الجراحة المعتادة ، استخدام المنظار التداخلى للقنوات المرارية، وكذلك استخدام التداخل الخارجى عن طريق الجلد والكبد تحت الأشعة. وشملت العينة ١٢٢ مريضة و٨٨ رجلا، وأثبتت الدراسة أن معظم هذه المشاكل قابل للتلافى بالتقييم الجيد للمريض قبل العملية وكذلك استخدام المهارات الجراحية والاحتياطات أثناء الجراحة.

تم رصد الأعراض المختلفة لهؤلاء المرضى وشملت الالتهاب البريتونى المرارى ، الرشح المرارى ، الانسداد اليرقانى ، اعراض بالأشعة بالصبغة على القنوات المرارية ، المغص المرارى وكذلك التهاب القنوات المرارية.

تم استخدام المنظار التداخلى للقنوات المرارية فى علاج ١٨٣ حالة ، وكذلك بغرض التشخيص فقط لعدد ٢٤ حالة تمهيدا للجراحة ، وشملت الحالات ٨١ حالة بها حصوات مرارية تم علاجها منظاريا بالاستخراج بالسلة أو البالون أو كلاهما معا ، أو تكسير الحصوات المرارية ، وكذلك عدد ٥٥ ضيق أو اصابة بالقناة المرارية تم علاجها بالتوسيع ثم تركيب دعامة مرارية ، هذا بالاضافة للعديد من التداخلات المنظارية الاخرى.

كذلك تم استخدام التداخل الخارجى عن طريق الجلد والكبد فى ٣٤ حالة للتشخيص فقط تمهيدا للجراحة فى ١٩ حالة منها ، أو للعلاج بالتوسيع وتركيب الدعامة المرارية فى حالتين منها ، أو التعامل المزدوج بالمشاركة مع المنظار فى علاج ال ١٣ حالة المتبقية والتى بها ضيق مرارى ، أو اصابات بالقناة المرارية.

التداخل الجراحى تم استخدامه فى علاج ٤٠ حالة مرضية منها بصورة عاجلة فى ١٠ حالات مصابة بالتهاب مرارى بريتونى ، أو بصورة غير عاجلة بعد التحضير فى ٣٠ حالة أخرى ، هذا وتراوح التدخل الجراحى بين الغسيل البريتونى البسيط فقط فى ٧ مرضى ، استخراج حصوات القنوات المرارية فى ٨ حالات ، علاج ضيق أو اصابة القناة المرارية فى ٨ حالات ، وكذلك توصيل القنوات المرارية بالامعاء فى ١٩ حالة.

وأثبتت الدراسة أن التداخل المنظارى آمن ومفيد وغير مكلف للمريض ليس للتشخيص فقط وانما للعلاج ويعتبر الركيزة الاساسية فيه وبخاصة اذا اقترن بالتداخل الخارجى عن طريق الجلد والكبد حيث يساهم فى تخفيض نسبة الفشل للتداخل بالمنظار. ولكن تظل الجراحة المعتاده هى الملاذ لعلاج مثل هذه الحالات ليس فقط عند فشل الوسائل الأخرى البسيطة مثل المنظار أو التداخل الخارجى تحت الأشعة ، ولكن عندما تكون الجراحة حتمية مثل حالات الالتهاب البريتونى المرارى.