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ORIGINAL ARTICLE

Surgical Management of Complex Bile Duct Injuries in Specialized Hepatopancreatobiliary (HPB) Unit

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ABSTRACT

Objective: To describe the surgical management of complex bile duct injuries in a specialized hepatopancreatobiliary unit.

Design of the Study: It was a retrospective study.

Study Settings: This study was carried out at Department of Anaesthesia and Hepatobiliary Unit, Sheikh Zayed Hospital Lahore from August 2017 to August 2019.

Material and Methods: This retrospective study includes 80 patients of bile duct injury who underwent surgical correction of bile duct injury at specialized Hepatopancreatobiliary [HPB] and liver transplant department of Shaikh Zayed Hospital Lahore. All the subjects were evaluated by retrospectively. The information regarding primary operative procedure, drain placement, T-tube placement, presentation, hospital stay, Liver Function Tests [LFTs], level of biliary tract injury and type of surgical procedure obtained from patients records.

Results of the Study: During the study period 80 patients – 65 females and 15 male were operated for bile duct injury. Mean age was 39.89 years range 21 to 65 years. Hospital stay ranges from 9 to 36 days with mean of 16.18 days. Patients underwent open cholecystectomy, 43.8% laparoscopic cholecystectomy and in 3 patients procedure was converted from laparoscopic to open. 52.5% patients underwent open cholecystectomy, 43.8 laparoscopic cholecystectomy and in 3 patient's procedure was converted from laparoscopic to open.

Conclusion: It is concluded that the correct long lasting and physiological method to treat injuries of bile duct is only surgical repair. Although, surgical repair of bile duct must be operated by skilled hepatopancreaticobiliary surgeons. A practical method which is selected appropriately and implemented successfully has surely improved surgical outcome without any problem faced during the operation.

Keywords: Hepatopancreatobiliary, Bile Duct Injury, Surgical Management

INTRODUCTION

For abdominal surgery cholecystectomy is very commonly performed operation while LC "laparoscopic cholecystectomy" is considered as gold standard method for cholecystitis or symptomatic gall stones.[1] Laparoscopic cholecystectomy introduced 25 years ago and its outcomes stay unchanged with complication of injury of bile duct in the period open surgery in the modern era.[2]

Efforts are being done to enhance safety in method of laparoscopic cholecystectomy which it's include timing of the procedure done and selection of the patient along with assessment and training of surgeons performing laparoscopic cholecystectomy.[2] Owing to the lack of knowledge regarding safety bile duct injuries occurred while performing laparoscopic cholecystectomy with not any serious view of safety attained before division or cutting of every stricter if biliary duct. By using critical view safety patient can prevent from bile duct injuries and linked injury of right hepatic at LC.[2] This contain spring cleaning of callot's triangle from chubby as well as connective tissue presenting only 2 and 2 structure (cystic artery and duct) going into the gallbladder. When it's not achieved safely surgeon performed intraoperative imaging or other stratigies related to bailout.[4]

Bile duct injury symptoms include pain, fever and mild hyperbilirubinemia "2.5 mg/dl" from bile or biloma peritonitis. Biliary leakage was recognized if bile come from abdominal drain attached during cholecystectomy or come from percutaneous drainage from collection of abdominal site.[4]

The major symptoms will be jaundice with pain of abdominal or without abdominal pain, if injuries are due to occlusion of CHD "common hepatic duct" or CBD "common bile duct" At later time in some cases patients might be present with cirrhosis or cholangitis from distant bile duct injury almost months or in some cases years after surgery of bile.[4] To reduce further complications and injuries in an effort to repair BDI, surgical procedures should be performed by skilled and experienced hepatobiliary surgeon at a tertiary referral center where interventional radiologists, and gastroenterologists are available.[4]

Usually, a specialist hepatopancreatobiliary [HPB] surgeon is not present on just a call for the purpose of surgical repair of the injury. It is advised that such patients should not be early referred to unit of hepatopancreatobiliary. Although it has been proved better outcome in terms of shorted hospital stay, less cost and reduced morbidity[5]. To define the duration of bile duct repair no clear guidelines are available and if early repair is tried then sepsis or active intra-abdominal infection, peritonitis of bile or linked vascular injury with very worse outcome resulted.[6]

The option of timing for surgical repair and surgical reconstruction are significant for long period. Different interventional treatment and surgical options are available

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which require gastroenterologist's interdisciplinary cooperation, surgeons and radiologists.[7]

Numerous factors are identified by previous studies of bile duct injuries related to successful repair. These consist of treatments by the hand of an experienced HPB surgeon and specialized center along with multidisciplinary perioperative care.[8] HPB and liver transplant unit of Shaikh Zayed hospital is routinely managing such biliary injuries since 2010.

Objectives: Objective of the study is to "Describe the surgical management of complex bile duct injuries in a specialized hepatopancreatobiliary unit".

MATERIAL AND METHODS

This retrospective study includes 80 patients of bile duct injury who underwent surgical correction of bile duct injury at specialized Hepatopancreatobiliary [HPB] and liver transplant department of shaikh zayed hospital Lahore from January 2011 to December 2020. All the subjects were evaluated retrospectively. The information regarding primary operative procedure, drain placement, T-tube placement, presentation, hospital stay, Liver Function Tests [LFTs], bile duct injury level and type of surgical procedure obtained from patients records.

All data entered in SPSS 25. Descriptive statics were analyzed for different variables. Frequency tables, graphs and pie charts were generated for qualitative data and histogram for quantitate data. As this descriptive study so no test of statistical significance was applied.

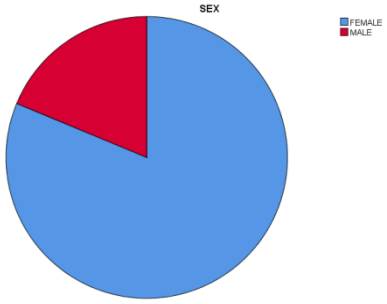
RESULTS

During the study period 80 patients – 65 females and 15 male [as shown in fig 1] were operated for bile duct injury. Mean age was 39.89 years [range 21 to 65 years]. Hospital stay ranges from 9 to 36 days with mean of 16.18 days as shown in table 1.

Table 1

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Age	80	21	65	39.89	9.948
Hospital Stay in Days	80	9.00	36.00	16.1875	7.25851
T.BILI	80	.40	25.31	6.0485	5.79245
Valid N (listwise)	80				

Fig -1



42 [52.5%] patients underwent open cholecystectomy, 35 [43.8] laparoscopic cholecystectomy and in 3 patients procedure was converted from laparoscopic to open.

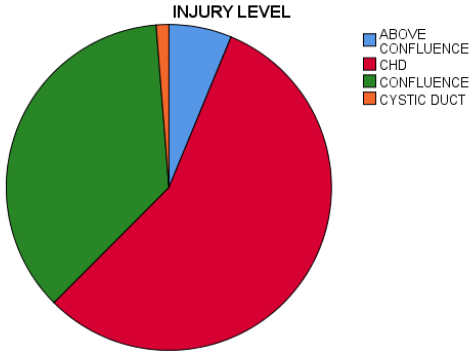
In 17 patients redo surgery was attempted by either the primary surgeon or other tertiary care hospitals. Jaundice was most common presentation along with bile leak as shown in table 2.

Table 2: Presentation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bile leak	31	38.8	38.8	38.8
	Itching	3	3.8	3.8	42.5
	Jaundice	46	57.5	57.5	100.0
	Total	80	100.0	100.0	

Most of injuries were at the level of common hepatic duct [CHD] and confluence of hepatic duct as shown in fig 2.

Fig 2:



Hepaticojejunostomy [hepjej] was commonly done procedure as shown in table 3. 7 patients needed right hepatectomy and hepjej due to complex biliary and vascular injury. 8 patients had hepjej at other centers and presented with narrowing of hepjej. Liver resection [seg IV b] was done in such cases and hepjej revised.

Table 3: Procedure

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Cystic duct ligation	1	1.3	1.3	1.3
	Hepjej	61	76.3	76.3	77.5
	Liver resection + hepjej	3	3.8	3.8	81.3
	Liver resection + revision of hepjej	8	10.0	10.0	91.3
	Right hepatectomy + hepjej	7	8.8	8.8	100.0
	Total	80	100.0	100.0	

DISCUSSION

In past twenty five years owing to advances in technology, enhanced experience of laparoscopic, enhancements in surgical training, BDI remain to occur double because it is frequently operated during the laparoscopic cholecystectomy as contrasted to open surgery [9-11].

Owing to experience of laparoscopic experience, advancement in technology and advance surgical training sine 25 years, the injuries of bile duct frequently occurring during process of laparoscopic cholecystectomy as compare toopen surgery. [9-11]

Importantly with advancement in laparoscopy the configuration of the bile duct injuries also changed. Among bile duct injuries only 1/3 part are complicated injuries like thermal injuries, central injuries in the direction of the hepatic hilum, whole transection of bile duct, while ¼ part of bile duct injuries are mixed vasculobiliary injury.[12]

Along with long duration of hospital stay, with increase in cost of hospitalization, post-operative mortality and morbidity also increase due to bile duct injuries. They harm quality of life of the patient for long time and cause of occasionally claims against surgeons.[12]

Many meetings of international consensus have published guidelines of safe clinical practice suggesting that CVS (critical view of safety) must be tried in every patient in both types of cases difficult and straightforward.[13,14]

Its not possible that all type of specialized treatments and diagnostic workup available in all medical settings there must be a low barrier for medical appointment. Unluckily, injuries occurred but suboptimal treatment of injuries of biliary duct is not known these days.

To achieve best outcome multidisciplinary different approaches need to be implemented like hepatopancreatobillary surgeons, interventional radiologists and gastroenterologists are essential. And the most important thing patient must be referred to a hospital with proficiency in BDI.[15]

Surgical reconstruction time has been asked effect the long term outcome, though thus issue is still controversial. Many research have determined that late in the surgical repair has very minimum hazard of complications postoperatively as contrasted to early repair.[15, 16, 17]

In contrast, publications by Barauskas et al. (2012)[18], Booij et al. (2016) [19], Kirks et al. (2018)[20], and Felekouras et al. (2019)[21] all showed similar short- and long-term results for early and delayed repair.

On the other hand finding of the studies conducted by Barauskas et al. (2012)[18], Booij et al. (2016) [19], Kirks et al. (2018)[20], and Felekouras et al. (2019)[21] represent same results for primary and deferred repair with our study results. Our hospital is reliable center for referred hepatobiliary surgeries in cases of post cholecystectomy biliary surgeries. To handed all cases of cholecystectomy biliary injuries we used multidisciplinary management approach.

CONCLUSION

It is concluded that the correct long lasting and physiological method to treat injuries of bile duct is only surgical repair. Although, surgical repair of bile duct must be operated by skilled hepatopancreaticobiliary surgeons. A practical method which is selected appropriately and implemented successfully has surely improved surgical outcome without any problem faced during the operation.

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