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Assessment of outcome of early and delayed repair of bile duct injuries

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Abstract: Aim: To compare outcome of early and delayed repair of bile duct injuries.

Methodology: Sixty- four patients with bile duct injuries of either gender were divided into group I (Early repair) and group II (Delayed repair). Operative findings such as injury classification and procedural variables and postoperative course, including 30-day re-admission and 90-day mortality, were recorded.

Results: Aetiology was cholecystectomy in 25 and 21, abdominal trauma in 7 and 8, and non-biliary abdominal procedures in 2 and 5 groups I and II, respectively. There were 18 males and 14 females and 16 males and 16 females in groups I and II, respectively. Hospital length of stay was 7.1 days in group I and 8.4 days, 30 days of re-admission was seen in 3 and 4, and 90 days of mortality was seen in 2 in group I and 1 in group II. Strasburg-Bismuth classification showed A in 1 and 2, B in 3 and 4, C in 8 and 1, D in 6 and 4, E1 in 4 and 4, E2 in 3 and 5, E3 in 4 and 6, E4 in 3 and 4, E5 in 2 and 3 and X in 0 and 1 in group I and II respectively. Preoperative PTC catheter placement was seen in 0 and 18, and preoperative percutaneous transabdominal drain placement was seen in 0 and 12 in groups I and II, respectively.

Conclusion: Early repair found to be better as compared to delayed repair of bile duct injury.

Keywords: Bile duct injury; Delayed repair; Early repair.

1. Introduction

Cholecystitis is a common inflammatory condition affecting gallbladders usually encountered among all age groups. Cholecystectomy is one of the common surgical procedures performed by surgeons where the gall bladder is surgically excised out of the body. Open cholecystectomy and laparoscopic cholecystectomy are two surgical procedures. Both carry advantages and disadvantages of the treatment. While performing cholecystectomy, injury to the extrahepatic biliary is a commonly encountered complication.

As compared to open surgery, common bile duct injury (CBDI) is less common with laparoscopic cholecystectomy. CBDI is a serious matter among patients and surgeons [1,2]. In spite of researchers recognizing patient and surgeon-related factors linked with CBDI, such as inflammation and conversion to open cholecystectomy, it is observed that 30% of CBDI is not determined during the index operation and may not be documented until several days after the initial injury [3].

There can have various types of BDI. It may range from minor accessory duct injuries to complicated hilar injuries. There has been high morbidity with CBDI in post-operative duration, and anastomotic bile duct strictures or secondary biliary cirrhosis are late complications [4]. Cases of CBDI are identified with the endoscopic, surgical, and radiologic examination. A multi-disciplinary approach is required for prompt management of cases. The best treatment option for these patients is only possible if the case is determined early intraoperatively; management is best done with hepatobiliary surgeon [5]. In the management of bile duct injury, both early and delayed repair of CBDI is a common one. Hence in the present study, we compared the outcome of early and delayed repair of bile duct injuries.

2. Methodology

A total of sixty- four patients reporting to the general surgery department with the chief complaint of bile duct injury of either gender in age ranged 18-58 years were recruited for the study. All patients were

made aware of the study, and their written consent was obtained. Ethical approval was obtained from the institutional review board.

A thorough clinical examination was carried out. Patients were assigned to early repair (group I) and delayed repair (group II). Demographic data of each enrolled patient was recorded. Aetiology, duration of hospital stay, cases requiring re-admission, mortality in 90 days, Strasburg-Bismuth classification, preoperative PTC catheter placement, preoperative percutaneous transabdominal drain placement, etc. were recorded. Study findings were clubbed together and assessed statistically. A P-value less than 0.05 was considered significant.

3. Results

Aetiology was cholecystectomy in 25 and 21, abdominal trauma in 7 and 8, and non-biliary abdominal procedures in 2 and 5 in groups I and II, respectively. There were 18 males and 14 females and 16 males and 16 females in groups I and II, respectively. Hospital length of stay was 7.1 days in group I and 8.4 days, 30 days of re-admission were seen in 3 and 4, and 90 days of mortality was seen in 2 in group I and 1 in group II. A significant difference was observed (P< 0.05) (Table 1, Figure 1).

Table 1. Comparison of parameters

Parameters	Variables	Group I	Group II	P value
Aetiology	Cholecystectomy	25	21	<0.05
	Abdominal trauma	7	8	
	Non-biliary abdominal procedures	2	5	
Gender	Males	18	16	>0.05
	Females	14	16	
Hospital length of stay	Days	7.1	8.4	>0.05
30 days of re- admission		3	4	>0.05
90 days of mortality		2	1	<0.05

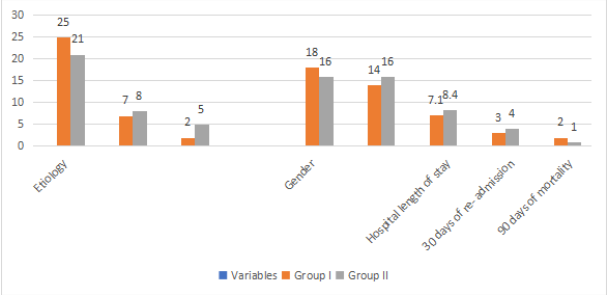

Figure 1. Graphically comparison of parameters

Strasburg-Bismuth classification showed A in 1 and 2, B in 3 and 4, C in 8 and 1, D in 6 and 4, E1 in 4 and 4, E2 in 3 and 5, E3 in 4 and 6, E4 in 3 and 4, E5 in 2 and 3 and X in 0 and 1 in group I and II respectively. Preoperative PTC catheter placement was seen in 0 and 18, and preoperative percutaneous transabdominal drain placement was seen in 0 and 12 in groups I and II, respectively. A significant difference was observed (P< 0.05) (Table 2).

4. Discussion

Bile duct injuries occurring during surgery are not uncommon. Laparoscopic cholecystectomy too encounters such complications of the procedure [9,10]. The procedure is carried out under a specialist surgeon following an aseptic procedure adhering to all sterilization protocols and appropriate treatment [11,12]. The present study was conducted to compare the outcome of early and delayed repair of bile duct injuries.

We observed that etiology was cholecystectomy in 25 and 21, abdominal trauma in 7 and 8, and non-biliary abdominal procedures in 2 and 5 in groups I and II, respectively. There were 18 males and 14

Table 2. Other parameters

Parameters	Variables	Group I	Group II	P value
Strasburg-Bismuth classification	A	1	2	>0.05
	B	3	4	
	C	8	1	
	D	6	4	
	E1	4	4	
	E2	3	5	
	E3	4	6	
	E4	3	4	
	E5	2	3	
	X	0	1	
Preoperative PTC catheter placement		0	18	<0.05
Preoperative percutaneous transabdominal drain placement		0	12	<0.05

females and 16 males and 16 females in groups I and II, respectively. Hospital length of stay was 7.1 days in group I and 8.4 days, 30 days of readmission were seen in 3 and 4, and 90 days of mortality was seen in 2 in group I and 1 in group II. Kirks *et al.,* [13] conducted a study in which patients with CBDI managed surgically were retrospectively reviewed. Patients undergoing early repair, such as those occurring less than 48 hours from injury and delayed repair that is occurring more than 48 hours, were recorded among 61 patients. Results revealed no differences in both groups regarding all parameters compared. Patients undergoing delayed repair exhibited an increased chance of readmission if VBI was present or if multiple endoscopic procedures were performed prior to repair.

We found that Strasburg-Bismuth classification showed A in 1 and 2, B in 3 and 4, C in 8 and 1, D in 6 and 4, E1 in 4 and 4, E2 in 3 and 5, E3 in 4 and 6, E4 in 3 and 4, E5 in 2 and 3 and X in 0 and 1 in group I and II respectively. Preoperative PTC catheter placement was seen in 0 and 18, and preoperative percutaneous transabdominal drain placement was seen in 0 and 12 in groups I and II, respectively. Rao *et al.,* [14] determined the outcome of early and delayed definitive repair of bile duct injury among 50 patients. Off 50, 15 underwent early, and 35 underwent delayed repair. 10.8 months was the mean follow-up. Strasberg classification had seven patients (E1), 15 (E2), 20 (E3), 5 (E4), and 3 type D injuries. Hepaticojejunostomy (HJ) was performed in 48 and primary repair in 2 patients. Post-op bile leak was seen in 4 cases and cholangitis in 3 cases. Ianneli *et al.,* [15] observed in their study that the late group had higher postoperative complications as compared to the early group. The early group and immediate group showed significantly more complications than the late group.

5. Conclusion

Early repair found to be better as compared to delayed repair of bile duct injury.

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Conflicts of Interest: "The authors declare no conflict of interest."

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