

An Assessment of the Outcome of Early and Delayed Repair of Bile Duct Injuries at a Tertiary Centre

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Abstract:

Background: Bile duct injuries refer to damage or trauma that occurs to the bile ducts, which are tubes that carry bile from the liver to the gallbladder and intestines. The present study compared the outcomes of early and delayed repair of bile duct injuries.

Materials and Methods: 70 patients with bile duct injuries in the age range of 18–60 years of both genders were divided into 2 groups of 35 each. Group I was an early repair group, and Group II was a delayed repair group. Parameters such as the amount of time since the index procedure, operative parameters, the classification of the injury and procedural factors, and the postoperative course, including 30-day readmission and 90-day mortality, were noted.

Results: Group I had 18 males and 17 females, and Group II had 20 males and 15 females. The aetiology was abdominal trauma in 27 and 19, cholecystectomy in 3 and 10, and non-biliary abdominal procedures in 5 and 6 in groups I and II, respectively. Strasburg-Bismuth classification showed A in 1 and 2, B in 2 and 3, C in 7 and 2, D in 6 and 3, E1 in 5 and 6, E2 in 4 and 4, E3 in 5 and 5, E4 in 3 and 3, E5 in 2 and 4, and X in 0 and 3 in groups I and II, respectively. Hospital length of stay was 7.2 days in group I and 8.2 days in group II; 30 days of re-admission were seen in 4 and 5, and 90 days of mortality were seen in 2 in group I and 1 in group II. Preoperative PTC catheter placement was seen in 0 and 14, and preoperative percutaneous transabdominal drain placement was seen in 0 and 11 in groups I and II, respectively. A significant difference was observed ($P < 0.05$).

Conclusion: Early repair was found to be better as compared to delayed repair of bile duct injuries. Hospital length of stay, 30 days of re-admission, preoperative PTC catheter placement, and preoperative percutaneous transabdominal drain placement

Keywords: Bile duct injury, delayed repair, PTC catheter

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Introduction

Bile duct injuries refer to damage or trauma that occurs to the bile ducts, which are tubes that carry bile from the liver to the gallbladder and intestines [1]. Bile is a digestive fluid produced by the liver that helps break down fats in the digestive process. Bile duct injuries can result from various causes, including medical procedures, trauma, and underlying medical conditions. These injuries can have serious implications and may require medical intervention [2]. A cholecystectomy consequence that has been extensively recorded is injury to the extra hepatic biliary network. Despite a recent study

showing a declining prevalence of Common bile duct injury (CBDI) linked to laparoscopic cholecystectomy, patients and surgeons continue to be extremely concerned about CBDI. Despite studies linking inflammation and conversion to open cholecystectomy with CBDI, as well as patient- and surgeon-related factors, over 30% of CBDI are missed during the index procedure and may not be detected until several days after the first injury [3]. Both immediate and delayed CBDI repairs are detailed. Since there is no rule to govern when repairs should be made, whether a patient is

qualified for an early or delayed repair should be decided based on the likelihood that the treatment will be successful and the patient's safety of the patient [4]. Patient quality of life and effective use of healthcare resources should be taken into account if equal technical and morbidity outcomes can be obtained. Even a low rate of CBDI presents a significant potential healthcare burden given the widespread use of cholecystectomy [5].

Aims and Objectives

The present study compared the outcomes of early and delayed repair of bile duct injuries.

Materials & Methods

The present study consisted of 70 patients with bile duct injuries in the age range of 18–60 years of both genders attending out-patient departments (OPD), Department of Surgery, Katihar Medical College and Hospital, Katihar, Bihar, India and Anugrah Narayan Magadh Medical College and Hospital, Gaya, Bihar, India. All patients were informed regarding the study, and their written consent was obtained. The institutional ethical committee granted ethical approval. The study period was from

January 2018 to June 2020. Data such as name, age, gender, etc. was recorded. A thorough clinical examination was done on all patients. Patients were divided into two groups of 35 each. Group I was an early repair group, and Group II was a delayed repair group. Parameters such as the amount of time since the index procedure, operative parameters, the classification of the injury and procedural factors, and the postoperative course, including 30-day readmission and 90-day mortality, were noted. Prior to and after definitive repair, the frequency of radiography and endoscopic biliary instrumentation was noted. According to the Strasberg Bismuth classification scheme, the CBDI type was reported. The results of the study were assessed statistically by using Microsoft Excel and SPSS software version 22.0. A P value less than 0.05 were considered significant.

Results

The present study consists of 70 patients. The patients were randomly divided into 2 groups of equal number: Group I (n = 35), early repair, and Group II (n = 35), delayed repair. The mean age of patients in Group I was 40.83±6.25 years and in Group II was 44.70±6.73 years, respectively.

Table 1: Demographic parameters of patients

Parameters	Group I(n=35)	Group II (n=35)
Method	early repair	delayed repair
Age of patients (Years)	40.83±6.25	44.70±6.73
Gender		
Male	18 (51.43%)	20 (57.14%)
Female	17 (48.57%)	15 (42.86%)

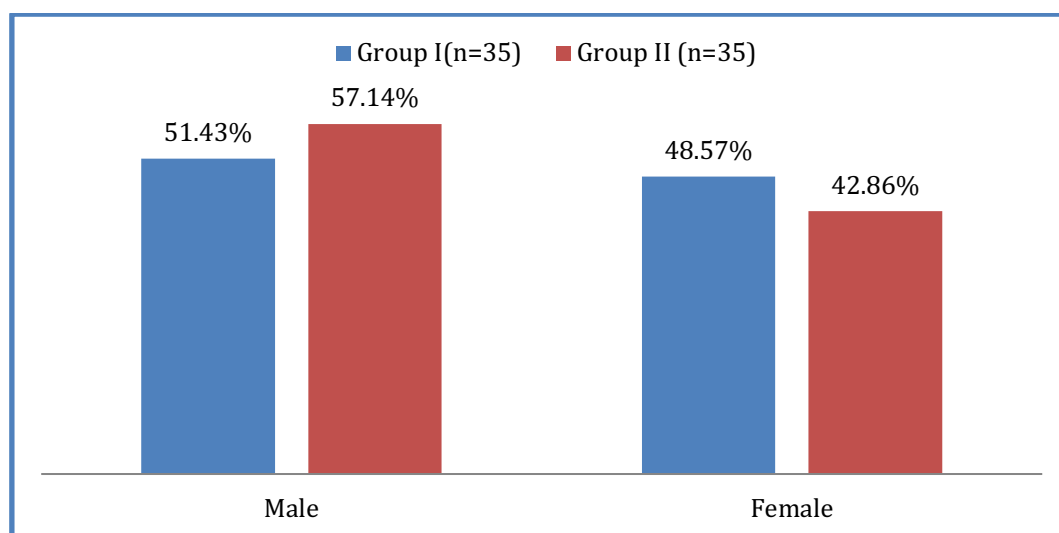


Figure 1: Percentage wise gender in study group

Table 1; Figure 1 show that group I had 18 males and 17 females, and group II had 20 males and 15 females.

Table 2: Comparison of parameters and variables of patients

Parameters	Variables	Group I	Group II	P value
Aetiology	Abdominal trauma	27	19	0.05
	Cholecystectomy	3	10	
	Non-biliary abdominal procedures	5	6	
Strasburg-Bismuth classification	A	1	2	0.65
	B	2	3	
	C	7	2	
	D	6	3	
	E1	5	6	
	E2	4	4	
	E3	5	5	
	E4	3	3	
	E5	2	4	
	X	0	3	
Hospital length of stay (Days)		7.2	8.5	0.05
30 days of re- admission		4	5	0.73
90 days of mortality		2	1	0.84
Preoperative PTC catheter placement		0	14	0.01
Preoperative percutaneous trans abdominal drain placement		0	11	0.04

Table II, shows that the aetiology was abdominal trauma in 27 and 19, cholecystectomy in 3 and 10, and non-biliary abdominal procedures in 5 and 6 in groups I and II, respectively. Strasburg-Bismuth classification showed A in 1 and 2, B in 2 and 3, C in 7 and 2, D in 6 and 3, E1 in 5 and 6, E2 in 4 and 4, E3 in 5 and 5, E4 in 3 and 3, E5 in 2 and 4, and X in 0 and 3 in groups I and II, respectively. Hospital length of stay was 7.2 days in group I and 8.2 days in group II; 30 days of re-admission were seen in 4 and 5, and 90 days of mortality were seen in 2 in group I and 1 in group II. Preoperative PTC catheter placement was seen in 0 and 14, and preoperative percutaneous trans abdominal drain placement was seen in 0 and 11 in groups I and II, respectively. A significant difference was observed ($P < 0.05$).

Discussion

The present study compared the outcomes of early and delayed repair of bile duct injuries.

Bile duct injuries can range from very minor accessory duct injuries to complicated hilar injuries, as described [6]. These injuries can have significant morbidity in the post-op period and can also have late complications such as anastomotic bile duct strictures or secondary biliary cirrhosis, resulting in lifelong disability [7]. The optimal management of these patients requires multimodality care with surgical, radiologic, and endoscopic collaboration. Among hepatobiliary surgeons, debates exist regarding the optimal timing for the repair of BDIs. It is generally accepted that if an injury is identified intraoperatively, then immediate repair by a hepatobiliary surgeon is the best approach [8]. Both the patient and the surgeon are quite concerned about iatrogenic bile duct damage. Nearly all

injuries in the modern period occur during laparoscopic cholecystectomy. Although prevention would be preferable, it's essential to reduce morbidity [9]. In order to stabilise the patient, determine the type of injury, and provide the right therapy at the same time, it necessitates multispecialty care at a tertiary care facility with a sufficient arsenal [10,11]. We observed that group I had 18 males and 17 females, and group II had 20 males and 15 females. Rao et al.[12] found that 15 patients had an early repair and 35 had a delayed repair. The post-operative complications that were seen were cholangitis in 3 patients (1 in the early group and 2 in the delayed group) and post-operative bile leak in 4 patients (3 in the early group and 1 in the delayed group). Both variables exhibited a significantly high stricture rate when compared to post-operative bile leak and cholangitis. According to McDonough's grading, the grades of repair were A in 30 patients, B in 16, C in 1, and D in 3 patients. Two patients in the early group and one patient in the delayed group both had the stricture.

We observed that the aetiology was abdominal trauma in 27 and 19, cholecystectomy in 3 and 10, and non-biliary abdominal procedures in 5 and 6 in groups I and II, respectively. Strasburg-Bismuth classification showed A in 1 and 2, B in 2 and 3, C in 7 and 2, D in 6 and 3, E1 in 5 and 6, E2 in 4 and 4, E3 in 5 and 5, E4 in 3 and 3, E5 in 2 and 4, and X in 0 and 3 in groups I and II, respectively. Hospital length of stay was 7.2 days in group I and 8.2 days in group II; 30 days of re-admission were seen in 4 and 5, and 90 days of mortality were seen in 2 in group I and 1 in group II. Preoperative PTC catheter placement was seen in 0 and 14, and preoperative percutaneous trans-abdominal drain placement was

seen in 0 and 11 in groups I and II, respectively. Strasberg et al.[13] suggested that extreme VBI may occur in 10% of VBI; this occurrence constitutes 8.3% of the CMC's experience with VBI. Early hepatico-jejunostomy after initial damage control surgery is performed only during second-look procedures following resuscitation and when primary repair is not feasible based on tissue quality, the location of injury, or for segmental biliary resections. In research by Kirks et al.[14], individuals with CBDI who underwent surgery were retrospectively evaluated. The results of individuals who had early (within 48 hours of the injury) and delayed (beyond 48 hours) repair were compared. 61 patients had surgical biliary repairs in total. There were no variations in the patient characteristics, injury classification subtype, frequency of vasculo-biliary injuries (VBI), hospital length of stay, 30-day readmission rate, or 90-day mortality rate between the early and delayed repair groups. If VBI was present or several endoscopic procedures were carried out prior to repair, patients who delayed repair showed an elevated risk of readmission. These factors were used in the construction of a prediction model.

Limitations of the study

Smaller sample size and a shorter follow-up period.

Conclusion

The authors found that early repair was better as compared to delayed repair of bile duct injuries. Hospital length of stay, 30 days of re-admission, preoperative PTC catheter placement, and preoperative percutaneous trans abdominal drain placement.

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