

## Biliary Leak Frequency After Open / Laparoscopic Cholecystectomy

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### ABSTRACT

**Background:** Cholecystectomy is an operative management of symptomatic biliary stones and other conditions of gallbladder. The present study was conducted with the aim to determine the incidence of biliary leak after cholecystectomy.

**Materials and Methods:** This was a Prospective study was conducted for a period of 2 years. The study enrolled subjects with biliary leakage after cholecystectomy at the Department of General surgery. The amount and duration of biliary leak was also established amongst some patients. The different treatment modalities with their ultimate outcome for management of biliary leak were taken into consideration. All the data thus obtained was recorded in a tabulated form and analyzed using SPSS software.

**Results:** Out of the total of 1200 cholecystectomies, 20 biliary leak cases were observed, out of which 6 were due to injury to major bile duct. Out of these patients, 9 patients were evaluated for site of injury, 33.3% were due to GB Bed, Duct of

Luschka, minor accessory duct. 11.1% was due to damage to cystic duct.

**Conclusion:** In the study, the overall incidence of biliary leak was 1.67%.

**Keywords:** Bile, Cholecystectomy, Gallbladder.


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### INTRODUCTION

Cholecystectomy is an operative management of symptomatic biliary stones and other conditions of gallbladder. It is broadly classified into two types - laparoscopic cholecystectomy, and the open cholecystectomy. In the year 1882, Karl Langenbunch, a German surgeon did the first successful cholecystectomy.<sup>1</sup> First presented in the 1980s, laparoscopic cholecystectomy has continued to be the gold standard for management of subjects with biliary disorder since the past few decades. In fact, about 90% of cholecystectomies nowadays are done with a laparoscopic approach. Amongst these, around 5% require conversion to open procedure, normally due to significant inflammation, or difficulty in the biliary anatomy or adhesions.<sup>2</sup> The first iatrogenic injury to bile duct injury was designated by Sprengel In the year 1891. Cholecystectomy whether laparoscopic or open is the commonly done hepatobiliary surgery. Consequently post-operative biliary escape is also frequent after cholecystectomy.<sup>3</sup> And also due to a long learning curve in laparoscopic treatment, ductal injury is on higher side amongst laparoscopic cholecystectomy than in open cases.<sup>3</sup> Unrecognized or late judgement of bile duct injury could lead to serious penalties like hepatic failure or death.<sup>4,5</sup> The present study was conducted with the aim to determine the incidence of biliary leak after cholecystectomy.

### MATERIALS AND METHODS

This was a Prospective study was conducted for a period of 2 years. The study enrolled subjects with biliary leakage after cholecystectomy at the Department of General surgery. All the subjects were examined and proper investigation and surgical management of subjects was carried out. Only subjects elder than 15 years of age were enrolled in the study. Subjects who had undergone cholecystectomy as a section of some other primary surgery like Whipple's, biliary-enteric anastomosis were not enrolled in the study.

The study was approved by the institutional ethical board and all the subjects were informed about the study and a written consent was obtained from all in their vernacular language. Complete operative and postoperative data was fetched from the hospital records.

The presentation of biliary leak, the timing of surgery and biliary leak were recorded. The amount and duration of biliary leak was also established amongst some patients. The different treatment modalities with their ultimate outcome for management of biliary leak were taken into consideration.

All the data thus obtained was recorded in a tabulated form and analyzed using SPSS software.

**Table 1: Incidence of biliary leak during cholecystectomy**

Type of surgery	Incidence of biliary leak	Incidence of bile duct injury
Open cholecystectomy	15 (75%)	4 (26.6%)
Laparoscopic cholecystectomy	5 (25%)	2 (40%)

**Table 2: Site of bile duct injury**

Site	n	%
GB Bed, Duct of Luschka, minor accessory duct	3	33.3
Cystic Duct	1	11.1
Common hepatic duct	2	22.2
Common bile duct	2	22.2
Aberrant hepatic duct	1	11.1

**Table 3: Outcome of surgical management**

Outcome	n	%
Recovery	18	90
Mortality	2	10

## RESULTS

Out of the total of 300 cholecystectomies, 20 biliary leak cases were observed, out of which 6 were due to injury to major bile duct. Amongst them, 75% were due to Open cholecystectomy and 25% were due to Laparoscopic cholecystectomy. (Table 1)

Out of these patients, 9 patients were evaluated for site of injury, 33.3% were due to GB Bed, Duct of Luschka, minor accessory duct. 11.1% was due to damage to cystic duct. 22.2% were due to damage to common hepatic duct and common bile duct respectively. There was 1 case of damage to aberrant hepatic duct. (Table 2)

Table 3 illustrates the outcome of surgical management. Uneventful recovery was observed in 90% (n=18) cases and mortality in 10% (n=2) cases.

## DISCUSSION

First labeled by Mirizzi in the year 1932, intraoperative cholangiography is frequently used to evaluate the common bile duct for the occurrence of choledocholithiasis and to establish the anatomy of the biliary tract.<sup>6</sup> The exact usage of intraoperative cholangiogram has been a topic of debated for centuries, with some promoting its routine use while others deserting the technique. Advocates of routine usage of intraoperative cholangiogram signify its safety and ability to recognize and prevent any injuries to bile duct.<sup>7</sup> Conversely, few researchers contend that cholangiography is time consuming procedure, with low yield, and may in fact lead to injury to bile duct injury.<sup>8,9</sup> The adverse effects of injury to bile duct ranges from minor damages that are clinically insignificant like bile leaks, bilomas, and biliary ascites to peritonitis, sepsis and even mortality in the few acute cases and strictures of bile duct, secondary biliary cirrhosis, hypertension and end stage liver disorder requiring liver transplantation. Satisfactory and timely treatment can usually

detect the situation and save the patient from any primary morbidity and mortality. Different studies have found that the frequency of bile duct injury has reduced over decade.<sup>10</sup> and as per some author, the referral scenarios of iatrogenic bile duct injury has also declined.<sup>11,12</sup> However various contemporary reports have found no change in the frequency of bile duct injuries over past years<sup>6</sup> and the frequency and complexity of patients referred for repair have remained same at few specialist hospital units.<sup>12</sup> Whereas, bile duct injuries by immaturity surgeons continue to be seen.<sup>13</sup> In the present study, Out of the total of 1200 cholecystectomies, 20 biliary leak cases were observed, out of which 6 were due to injury to major bile duct. Amongst them, 75% were due to Open cholecystectomy and 25% were due to Laparoscopic cholecystectomy. Out of these patients, 9 patients were evaluated for site of injury, 33.3% were due to GB Bed, Duct of Luschka, minor accessory duct. 11.1% was due to damage to cystic duct. 22.2% were due to damage to common hepatic duct and common bile duct respectively. There was 1 case of damage to aberrant hepatic duct. Laparoscopic cholecystectomy has substituted the open surgery in all except for few complicated patients. The procedure is related with lesser discomfort, early postoperative recovery and less hospital stay, and better cosmetic outcome. On the contrary, the laparoscopic surgery has been related with a higher frequency of biliary injury compared to open cholecystectomy, with the range between 0.5% to 2.0%.<sup>14</sup> As per the study by, Adamsen et al, and Kum et al; injuries to bile duct are more frequent after laparoscopic cholecystectomy<sup>14</sup>, that include fistulae, with the range between 1.3% to 5.5% of cases.<sup>15</sup> According to Ali et al and Karvonen et al, the bile duct injuries are seen more commonly in the laparoscopic approach (0.2% to 0.7%) compared to the open technique (0.1% to 0.4%).<sup>16,17</sup>

## CONCLUSION

In the study, the overall incidence of biliary leak was 1.67%. Most of the injuries to bile duct required surgical repair and majority of them showed uneventful recovery. Injury to major bile duct needs prompt diagnosis and intervention as it can be life threatening.

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