



A Study on Post Cholecystectomy bile duct injuries and their management

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Abstract

Introduction: Bile duct injuries remain a nightmare for surgeons who perform cholecystectomy surgeries.

Aim: To evaluate the outcome of post cholecystectomy bile duct injuries and their management.

Method: This prospective observational study was conducted in 100 patients above 18 years who got admitted in Government Villupuram Medical College and Hospital planned for elective laparoscopic or open cholecystectomy over a period of two years.

Results: In this study 100 patients who were planned for elective laparoscopic or open cholecystectomy were followed up. The mean age of presentation was 31 to 40 years with a female predominance (66%). Vomiting remained the primary symptom among the study group

(70%). Cholelithiasis(61%) was the predominant indicator of surgery followed by cholecystitis. Laparoscopic approach was preferred and post operatively 40% patients developed jaundice. Biliary leakage was seen in 25% population and bile duct injury was noticed in 5% patients. Conservative approach was followed in 89% of the study groups.

Conclusion: The anatomy of biliary system remains highly variable among normal individuals. Post operative bile leakage should be managed conservatively if the collection is less than 250 ml/day. A structured step wise approach is needed for the management of post operative biliary leakage.

Keywords: Bile duct injuries, Biliary leakage, Cholelithiasis, Laparoscopic cholecystectomy.

Introduction

The prevalence of gallstone disease in India remains to be 6.12%. The preferred treatment for any symptomatic gallstone disease is doing Cholecystectomy. In United States more than 750 Cholecystectomies are done every year. Open Cholecystectomy remained the preferred surgical option for patients before the advent of Laparoscopic Cholecystectomy in late 1980s which showed promising results in decreasing post operative pain, hospital stay and cost. But there was raising concern that Laparoscopic Cholecystectomy was associated with increased risk for Common Bile Duct injuries. This problem was seen more predominantly in developing countries like India especially in tertiary care centers. In the era of Open Cholecystectomy incidence of bile duct injury was 0.1% to 0.2%. This raised upto 0.4% in Laparoscopic era. In early 1990s, the high rate of complication was thought to be due to learning curve associated with laparoscopic procedures. However instead of declining this rate has reached a plateau and subsequent publications revealed that bile duct injuries are inherent problem of laparoscopic procedures. As per many studies, a late repair is preferred for bile duct injuries because early repair is associated with increased risk for biliary strictures whereas early repair is preferred by Schmidt et al because it decreases hospital stay, pain and inconvenience

Materials and Methods

A prospective observational study was conducted at Government Villupuram Medical college and hospital, Tamil Nadu, India for a period of 2 years.

Study Design: Observational study

Study Centre: Government Villupuram medical college and hospital

Study Population: All patients who fulfill the inclusion and exclusion criteria were included in the study after obtaining informed written consent.

Sample Size: 100. It is calculated using openepi software.

Study Period: 2 years

Inclusion Criteria: All patients above 18 years who were planned for elective laparoscopic or open cholecystectomy for primary gallbladder pathology.

Exclusion Criteria: Patients undergoing cholecystectomy secondary to surgical procedures like Whipple's procedure, biliary enteric anastomosis, etc

Methodology

All patients who fulfilled the inclusion criteria were enrolled. Written informed consents were obtained. The present study was carried out in Government Villupuram medical college and hospital where 100 patients planned for elective laparoscopic or open cholecystectomy participated in the present study. All patients have undergone detailed examination according to the proforma approved by the Institutional Ethical Committee.

Statistical Analysis

Data collected was entered in Microsoft excel and analysed using SPSS version 24. Qualitative variables were expressed in percentage. Quantitative variables were expressed in mean and standard deviation. Chi square test was used to test significance of difference in proportion. Independent "t" test was used to test significance of difference in means.

Results

Table 1: Age Distribution of Study Groups

Age	Frequency	Percentage
Up to 30 yrs	10	10
31-40 yrs	45	45
41-50 yrs	35	35

51-60 yrs	5	5
Above 60 yrs	5	5
Total	100	100

Figure 1: Age Distribution of Study Groups

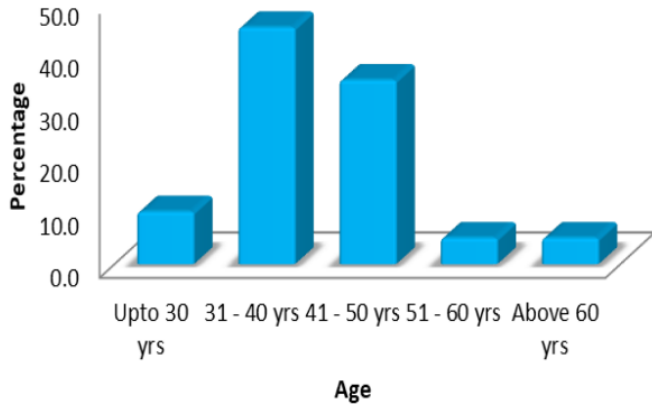


Table 2: Sexwise distribution of study groups

	Frequency	Percentage
Male	34	34
Female	66	66
Total	100	100

Figure 2: Sexwise distribution of study groups

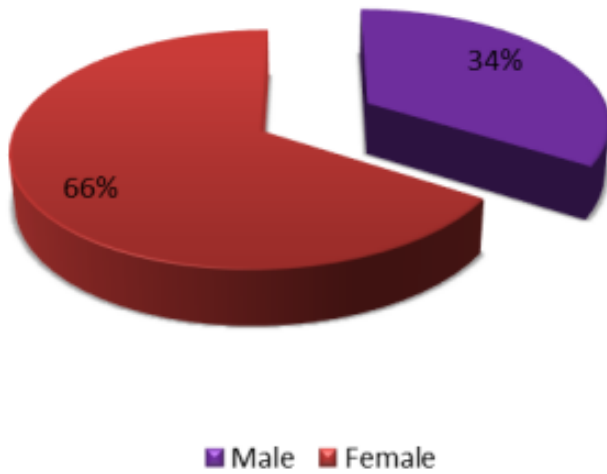


Table 3: Distribution of study participants according to symptoms

	Frequency	Percentage
Vomiting	70	70
Abdominal	20	20

pain		
Early Satiety	10	10
Total	100	100

Figure 3: Distribution of study participants according to symptoms

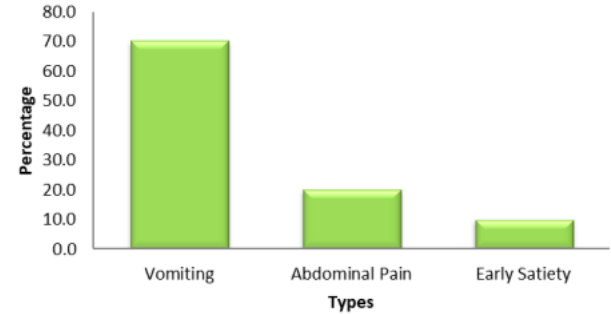


Table 4: Preoperative diagnosis among study participants

Diagnosis	Frequency	Percentage
Cholecystitis	29	29
Empyema	5	5
Gall stone	61	61
Mucocele	5	5
Total	100	100

Figure 4: Preoperative diagnosis among study participants

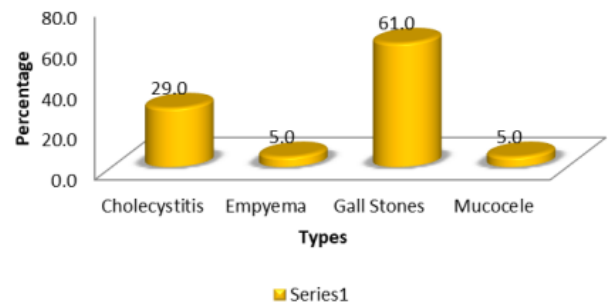


Table 5: Type of surgery among study participants

Procedure	Frequency	Percentage
Lap	85	85
Lap to Open	5	5
Open	10	10
Total	100	100

Figure 5: Type of surgery among study participants

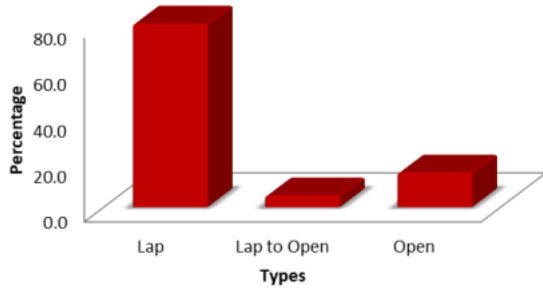


Figure 7: CBD exploration among study participants

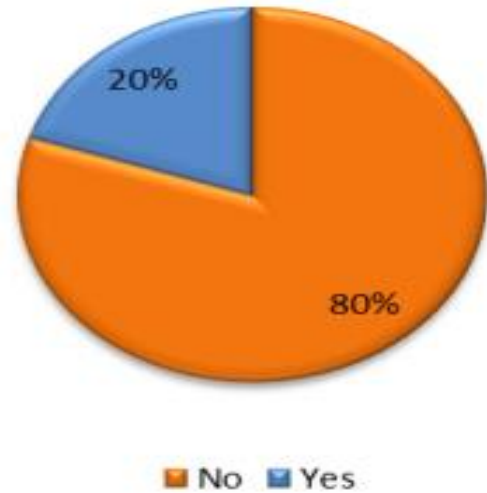


Table 6: Post operative symptoms among study participants

Symptoms	Frequency	Percentage
Jaundice	40	40
Fever	20	20
Bilious vomiting	25	25
Sepsis	15	15
Total	100	100

Table 8: Biliary leakage among study participants

	Frequency	Percentage
No	75	75
Yes	25	25
Total	100	100

Figure 6: Post operative symptoms among study participants

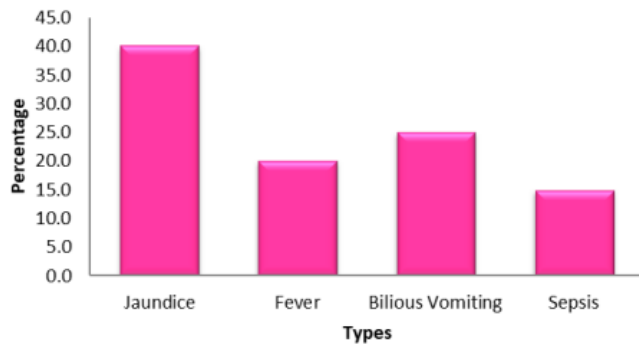


Figure 8: Biliary leakage among study participants

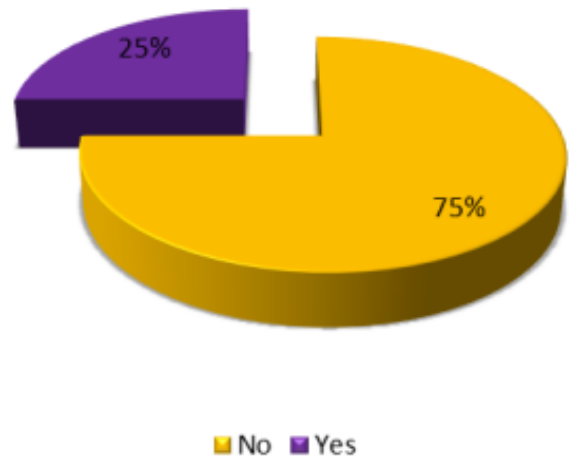


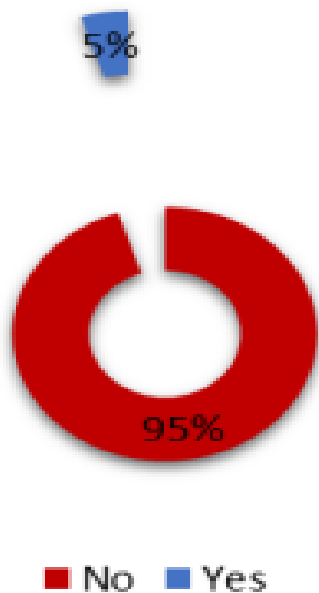
Table 7: CBD exploration among study participants

	Frequency	Percentage
No	80	80
Yes	20	20
Total	100	100

Table 9: Bile duct injuries among study participants

	Frequency	Percentage
No	95	95
Yes	5	5
Total	100	100

Figure 9: Bile duct injuries among study participants



Strasberg Classification

Class A	Injury to small ducts in continuity with the biliary system, with cystic duct leak
Class B	Injury to sectoral duct with consequent obstruction
Class C	Injury to sectoral duct with consequent bile leak
Class D	Lateral injury to extrahepatic ducts
Class E1	Stricture >2cm distal to bifurcation
Class E2	Stricture <2cm distal to bifurcation
Class E3	Stricture at bifurcation
Class E4	Stricture involving right and left bile ducts; ducts are not in continuity
Class E5	Complete occlusion of all bile ducts

Table 10: Management among study participants

	Frequency	Percentage
Reoperation	1	1
Stenting	3	3
Bile duct repair	2	2
Sphincterotomy	5	5
Conservative	89	89
Total	100	100

Fig 10: Management among study participants

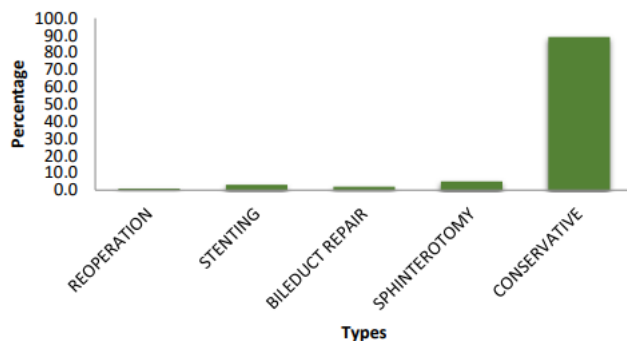


Table 11: Bile duct repair among study participants

	Frequency	Percentage
No	95	95
Yes	5	5
Total	100	100

Figure 11: Bile duct repair among study participants

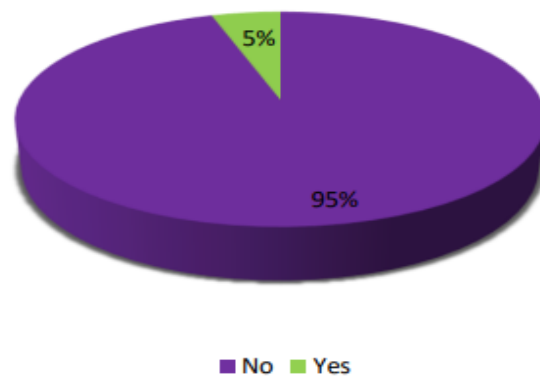


Table 12: Drain collection among study participants.

	Frequency	Percentage
<200 ml	65	65
200 – 500 ml	20	20
500 – 1000 ml	10	10
>1000 ml	5	5
Total	100	100

Figure 12: Drain collection among study participants.

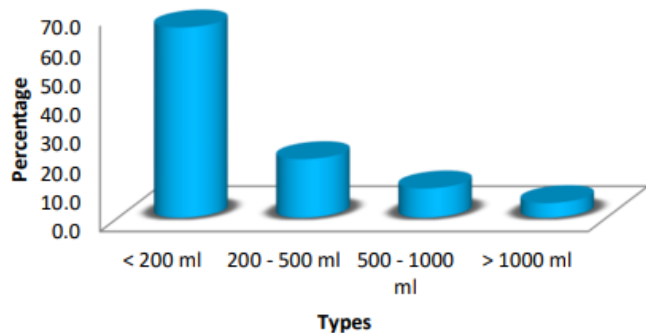
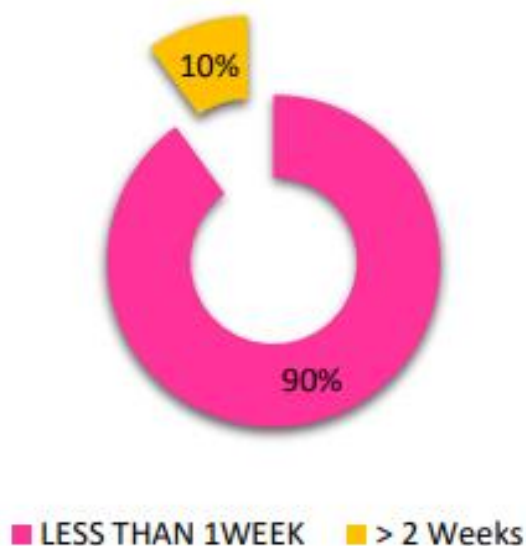


Table 13: Duration of hospital stay among study participants

	Frequency	Percentage
< 1 week	90	90
>2 weeks	10	10
Total	100	100

Figure 13: Duration of hospital stay among study participants



Discussion

Surgery remains the gold standard treatment for post laparoscopic bile duct strictures. The target is to establish an uninterrupted bile flow through gastrointestinal tract. Studies have shown successful results following bilioenteric drainage. The outcome of surgery depends on

the timing of repair, level of injury and presence of infection at the time of repair. Chronic cholecystitis remains to be the most common cause of bile duct injuries than acute cholecystitis of the 29 cases.

Timing of repair needs proper evaluation and depends on patient’s clinical condition, time from injury, type of injury(biliary fistula vs obstruction), nutritional status and presence or absence of inflammation. Patients usually present at a median of 3 days after laparoscopic cholecystectomy. Patients who present early after surgery without any sepsis or vascular injury can be proceeded with early surgical intervention within 72hrs. Strasberg A, Strasberg D injuries, cystic duct injuries and leak from duct of Luschka can be managed with endoscopic sphincterotomy and placement of biliary stents.

If partial transection of bile duct injury is identified at the time of surgery, primary repair using monofilament absorbable sutures should be used and T tube is brought out via common bile duct at a distant site away from repair site.

Walsh et al stated that early stricture repair has higher stricture rate than delayed repair. Sahajpal et al reported high stricture rates in patients between 72hrs and 6 weeks duration. The best option is to do delayed repair 6 to 8 weeks after bile duct injury after sepsis control and allowing to recover from acute injury with better understanding of level and type of injury.

Conclusion

The anatomy of biliary system remains highly variable among normal individuals. Leakage from accessory bile ducts can occur intraoperatively and postoperatively. These can be identified by intraoperative cholangiogram. Post operative bile leakage should be managed conservatively if the collection is less than 250ml/day. A structured step wise approach is needed for the management of post operative biliary leakage. Unless

and otherwise surgery is indicated conservative approach is preferred for post operative biliary leakage.

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