

Original Research Article

# Study of post cholecystectomy biliary leakage and its management


P. Krishna Kishore<sup>1\*</sup>, B. Manju Sruthi<sup>2</sup>, G. Obulesu<sup>3</sup>

<sup>1</sup>Assistant Professor, Department of General Surgery, Fathima Institute of Medical Sciences, Kadapa, India

<sup>2</sup>Assistant Professor, Department of Anesthesiology, Rajiv Gandhi Institute of Medical Sciences, Kadapa, India

<sup>3</sup>Assistant Professor, Department of Microbiology, Fathima Institute of Medical Sciences, Kadapa, India

\*Corresponding author email: [manjusruthi99@gmail.com](mailto:manjusruthi99@gmail.com)

	International Archives of Integrated Medicine, Vol. 3, Issue 9, September, 2016. Copy right © 2016, IAIM, All Rights Reserved. Available online at <a href="http://iaimjournal.com/">http://iaimjournal.com/</a>	
	ISSN: 2394-0026 (P)	ISSN: 2394-0034 (O)
	Received on: 07-08-2016	Accepted on: 30-08-2016
	Source of support: Nil	Conflict of interest: None declared.
<b>How to cite this article:</b> P. Krishna Kishore, B. Manju Sruthi, G. Obulesu. Study of post cholecystectomy biliary leakage and its management. IAIM, 2016; 3(9): 222-227.		

## Abstract

**Background:** Cholecystectomy is one of the most frequently performed surgeries. The surgery is associated with many avoidable complications and hence requires a serious and cautious approach.

**Aim:** The aim of this study was to know the outcome of post cholecystectomy biliary leaks and its management methods.

**Materials and methods:** 10 cases of biliary leaks were studied from 100 open cholecystectomies and 100 laparoscopic cholecystectomies from 2013 January to 2014 January. Pre-operative workup with ultrasound abdomen, LFT and other biochemical investigations were done and diagnosis was established. The outcome of surgery and its most common post-operative complication - biliary leak was studied with following parameters: Post-operative diagnosis, Surgery - Lap or Open, Incision, Method of approach – Fundus or Classical method, CBD exploration, Intra-operative findings, Drains used, Post-operative symptoms, Amount of collections, Removal of drains, USG – Sub hepatic collections, ERCP etc.

**Results:** In the present study of 10 cases, fundus first method was done in 3 cases of open cholecystectomies and none in laparoscopic cholecystectomies. Classical procedure was done in 7 cases out of which 3 cases were done in laparoscopy method and 16 cases in open method. Intra-operative detection of bile duct injury is noted in 3 cases of open cholecystectomies and non in laparoscopic method. In the present study, 56 % of the patients were treated conservatively who required no therapy and surgical placement of the drain itself was sufficient.

**Conclusion:** Pain abdomen, Jaundice, Nausea and Vomiting are the major complaints in case of bile leaks and fistulas. Pathologically, chronic cholecystitis is commonest cause of leaks after surgery mainly because of fibrosis at calots triangle. Incidence of Post-operative bile leaks is almost the same in open and laparoscopic cholecystectomy. Routine placement of drains is must because it permits post operative evacuation of serosanguineous exudates and monitoring of bleeding or leakage of bile. Abdominal collections, bilomas or sub-hepatic abscess are reported less with the placement of drains.

## Key words

Post cholecystectomy, Biliary leakage, Management.

## Introduction

Cholecystectomy is one of the most frequently performed surgeries. The surgery is associated with many avoidable complications and hence requires a serious and cautious approach. The frequency of bile duct injury remains fairly constant. The seriousness of this complication relates in part of problems of biliary fistula and uncontrolled sepsis and in part to the technical difficulties of successful repair of bile duct injuries [1, 2].

Laparoscopic cholecystectomy has now replaced open cholecystectomy as the first-choice of treatment for gallstones unless there are contraindications to the laparoscopic approach. Sometimes a laparoscopic cholecystectomy may be converted to an open cholecystectomy for technical reasons or safety [3].

Complications associated with cholecystectomy are bile duct injuries, bile leak from accessory bile ducts or due to clip displacement from the cystic duct, retained stones in the common bile duct, perforation of gallbladder, bleeding from liver, cystic or hepatic artery, subphrenic abscess and peritonitis. Bile duct injuries are important because they are preventable, but once they occur, they may be associated with considerable morbidity and mortality [4, 5].

Inadequate management of bile duct injuries may lead to severe complications, such as biliary peritonitis leading to sepsis and multiple organ failure in the early phase, and biliary cirrhosis during long-term follow-up. The initial management consists of team work, including an

experienced interventional radiologist, an endoscopist and surgeon, which to a great extent reduce the incidence of re-operations.

## Materials and methods

The present study includes detailed retrospective analysis of post cholecystectomy biliary leaks and fistulas its etiological factors and its management methods.

All cases that have under gone cholecystectomy (both open and lap) between 2013 January to 2014 January in the upgraded department of general surgery at Fatima Institute of Medical Sciences, Kadapa, with a post operative bile leak of at least 100 ml per day are included in the study.

Cases with no leak or leak less than 100 ml per day were excluded from the study. 10 cases of biliary leaks were studied from 195 open cholecystectomies and 146 laparoscopic cholecystectomies from 2013 January to 2014 January.

Pre-operative workup with ultrasound abdomen, LFT and other biochemical investigations were done and diagnosis was established. The outcome of surgery and its most common post-operative complication - biliary leak was studied with following parameters:

- Post-operative diagnosis
- Surgery - Lap or Open
- Incision
- Method of approach – fundus or classical method
- CBD exploration

- Intra-operative findings
- Drains used
- Post-operative symptoms
- Amount of collections
- Removal of drains
- USG – Sub hepatic collections
- ERCP.
- Management

A master chart prepared with variables and data analyzed. The results were tabulated and compared with other studies and results interpreted.

## Results

Of the 7 post-operative bile leaks in laparoscopic cholecystectomies 4 cases found to have bile duct injury on ERCP and of 18 cases in open cholecystectomies, four cases were reported to have duct injury.

In the present study of 10 cases, fundus first method was done in 3 cases of open cholecystectomies and none in laparoscopic

cholecystectomies. Classical procedure was done in 7 cases out of which 3 cases were done in laparoscopic method and 16 cases in open method.

Intra-operative detection of bile duct injury was noted in 3 cases of open cholecystectomies and non in laparoscopic method.

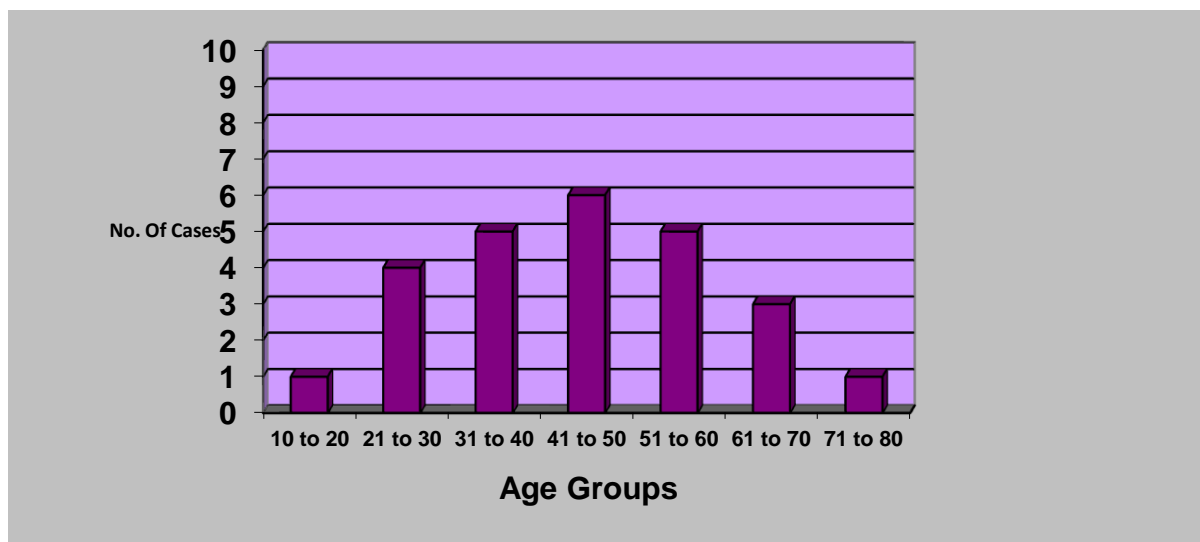
## ERCP Vs Cholangiogram

Out of 10 cases, post-operative ERCP was done in 7 cases out of which 4 cases were found to have ductal injuries and 1 were having normal anatomy. Post-operative cholangiogram was done in 1 case.

## Drains

Death reported in one case was due to septicemia. In 7 cases drains were removed by 6<sup>th</sup> POD in which injury was detected in one case. In 5 cases drains were removed after 14<sup>th</sup> POD in which injury was found in 3 cases (**Chart – 1, 2** and **Table – 1 to 4**).

**Chart – 1:** Age wise distribution of cases.



## Discussion

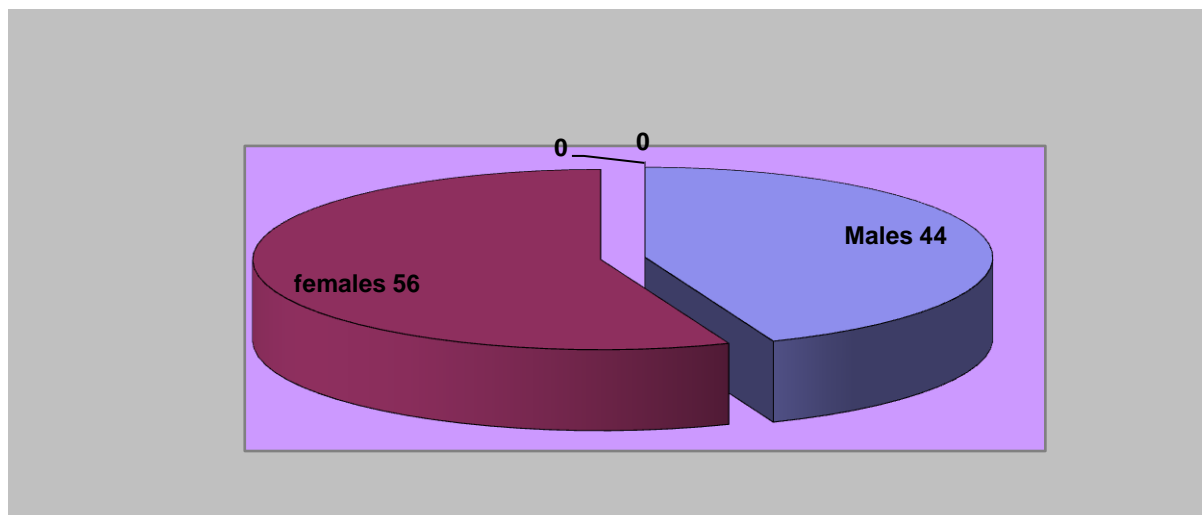
### Symptoms

Present study stated that pain abdomen, mostly in the right upper quadrant, vomiting and jaundice

were the most common post-operative symptoms of biliary leaks and fistulas. Nausea and vomiting usually precede the jaundice and more commonly appreciated in the early post-operative period. Jaundice invariably develops and is more

pronounced with ductal obstruction and sepsis .it or bile leak without any ductal obstruction [6].  
is less noticeable with intra-peritoneal bile alone

**Chart – 2:** Sex wise distribution of cases.



**Table – 1:** Analysis of symptoms.

Symptoms	No. of cases	%
Pain in abdomen	6	24
Vomiting	3	14
Jaundice	4	16
Fever	3	10
Ileus	1	4
Cholangitis	1	4
Peritonitis	2	6

### Operations

#### Lap Vs Open cholecystectomy

**Table – 2:** Operations – Lap vs Open.

Operations	Total cases	No. of leaks	%	Bile duct injuries	%
Laparoscopic cholecystectomy	146	7	4.8	4	2.06
Open cholecystectomy	195	18	9.2	4	2.05

**Table – 3:** Intra operative detection of bile duct injury.

Diagnosis	No. of cases	%
Acute cholecystitis	2	20
Chronic cholecystitis	7	56
Cholelithiasis	1	4
Empyema or Pyocele	1	12
Mucocele GB	1	4

The incidence of bile duct injury was almost same in open (2.07%) as compared to laparoscopic cholecystectomy (2.06%). This was in controversy to western findings which state that the incidence of bile duct injuries were more common with laparoscopic (0.6%) as compared to open (0.3%). This controversy may be attributable to the experienced, limited surgeons performing laparoscopic cholecystectomy with less incidence of learning curve as compared to the majority of surgeons performing open cholecystectomy with increased incidence of learning curve [7].

**Table – 4:** Management.

Treatment	Cases	%
Conservative	7	56
Endoscopic stenting	4	16
Sphinterotomy + Stenting	1	8
Primary repair	3	12
Reoperation	1	4

The increase incidence of fibrosis noted in this study was due to most of the patients delay in seeking medical treatment. Failure to recognize the anatomical anomaly was due to lack of pre-operative and intra-operative cholangiogram.

#### **Intra-operative detection of bile duct injury**

Bile duct injury detected during open cholecystectomy was only 12% and almost nil in laparoscopic cholecystectomy as compared to the 15% reported in one study [8].

#### **Clinical pathology**

Chronic cholecystitis appeared to be the most common cause in the bile duct injury than acute cholecystitis of the 25 cases. 52% (13) found to have chronic cholecystitis as compared to the acute cholecystitis with 20% (5 cases). One study showed acute cholecystitis is the most common cause of bile duct injury. This controversy is due to increased number of cases of chronic cholecystitis as they delay in approaching for treatment in G.M.C. when compared to the western patients getting the earliest possible treatment [9].

#### **Abdominal collections**

Cases in which tube drain have been kept to detect the post-operative bile leak have resulted in controlled fistula with almost no signs of localized or generalized peritonitis. In uncontrolled fistula huge volumes of bile accumulate in the peritoneal cavity or sometimes in sub-phrenic or sub-hepatic spaces.

Sub-diaphragmatic collections are seen only in 16% of cases on ultra sound abdomen and generalized peritoneal collections in 4% (i.e., one case) due to blockage of drain. No collection is seen in about 80 % of cases because of free flow of bile through the tubes.

The surgical clinics of N A reports sub-hepatic collections in as many as 25% of cases on ultra sound abdomen.

#### **ERCP Vs Cholangiogram**

Out of 25 cases ERCP done in 13 cases (i.e., 52%) as compared to the 73% reported by the one study.

ERCP revealed no duct injury in 5 cases (i.e., 38%). The commonest injury seen on ERCP is CBD 4 cases (30%) followed by CHD - 3 cases (23%) and RHD with 7.6% i.e., one case. Cholangiogram is done in only 3 cases in which primary repair over T- tube is performed.

#### **Management**

In the present study, 56% of the patients were treated conservatively who required no therapy and surgical placement of the drain itself was sufficient as compared to the 25% in one study. Endoscopic management of biliary leak is seen in 24% with stenting alone in 16% and sphincterotomy + stenting in 8% of cases as compared to one study.

Primary repair over T tube is attempted in 12% of cases where the duct injury is detected intra-operatively. Re-Exploration was required in only 1% of the cases.

#### **Drains**

In the present study most of the leaks subsided by sixth POD, even if the drain amount accounts to 500 ml per day initially. Only one case, out of the 14 cases where the drains are removed by 6<sup>th</sup> POD reported to have injury on ERCP.

Other cases that continue to drain approximately after sixth POD should be suspected to have duct injury and hence ERCP should be sought. Out of 10 cases that continued to drain as long as from 14 to 37 POD showed ductal injuries in six cases. In one case drains are not removed as it reported to be dead [9].

#### **Mortality and morbidity**

Mortality and morbidity associated with open cholecystectomy found to be higher as compared to laparoscopic cholecystectomy.

Mortality with open procedure found to be 0.5% and 5% morbidity, whereas laparoscopic

procedure found to have 0% mortality with 27% morbidity [10].

## **Conclusion**

- Pain abdomen, Jaundice, Nausea and Vomiting are the major complaints in case of bile leaks and fistulas.
- Pathologically Chronic cholecystitis is commonest cause of leaks after Surgery mainly because of fibrosis at calots triangle.
- Incidence of Post-operative bile leaks is almost the same in open and laparoscopic cholecystectomy.
- Routine placement of drains is must because it permits post operative evacuation of serosanguineous exudates and monitoring of bleeding or leakage of bile. Abdominal collections, bilomas or sub-hepatic abscess are reported less with the placement of drains.
- Intra operative detection bile duct injury is commonly noticed with open than laparoscopic cholecystectomy.
- Laparoscopic injury is attributed primarily because of inexperience with instrumentation and techniques or the experienced surgeon familiar with proper methods yet with inadequate exposure in the operative visual field due to acute or chronic inflammation.
- Pre operative cholangiogram is required to know the abnormal duct anomaly.
- In case of severe inflammation and adhesions, fundus first method carries least duct injury.
- Drain amount usually becomes nil by 6<sup>th</sup> POD. Cases which continued to drain after 5-7 days approximately should be

suspected as having duct injury and subjected to ERCP.

- Most of the post operative bile leaks are managed conservatively and by endoscopic procedures, rarely requiring re-operation.
- Mortality and Morbidity with laparoscopic is much less compared to open cholecystectomy provided it is done in experienced hands

## **References**

1. Russell RCG, et al. Bailey and love, Short Practice of Surgery, 23<sup>nd</sup> edition, CRC Press, 2000.
2. Courtney M. Townsend Jr., et al. Sabiston Textbook of Surgery, 19<sup>th</sup> edition, Saudners, 2012.
3. Micahel J. Zinner, Maingot's abdominal operations, 11<sup>th</sup> edition, MacGraw Hill, 2007.
4. Kasper DL, et al. Harrison's Principles of Internal Medicine, 16<sup>th</sup> edition, MacGraw Hill, 2004.
5. Farquharson's Text Book Of Operative Surgery, 8<sup>th</sup> edition, CRC Press, 2014.
6. RJ Last Text Book of regional and applied anatomy, 10<sup>th</sup> edition, Churchill Livingstone, 1999.
7. Blumgart Surgery of the liver and the biliary tract, 3<sup>rd</sup> edition, Elsevier, 2012.
8. Schwartz Text Book Surgery, 7<sup>th</sup> edition, MacGraw Hill, 2004.
9. Mc. Gregor Synopsis of surgical anatomy, CRC Press, 12<sup>th</sup> edition, 1986.
10. Skandalakis Anatomical complications in general surgery, MacGraw Hill, 1982.