

## Original Research

### Treatment outcomes in cases with bile leakage following cholecystectomy

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#### ABSTRACT:

**Background:** Last several decades laparoscopic cholecystectomy has become a gold standard in treatment of symptomatic cholelithiasis, even in patients with acute cholecystitis. Patients who undergo laparoscopic treatment recover faster, have easier postoperative course and earlier discharge from hospital. However, laparoscopic cholecystectomy is associated with higher risk of intraoperative lesions, primarily lesions of biliary ducts, intestines and vascular structures. **Aim of the study:** To study the treatment outcomes in cases with bile leakage following cholecystectomy. **Materials and methods:** The study was conducted in the department of General Surgery of the Medical institute. We included 120 patients admitting to the Department of General Surgery with the diagnosis of biliary leakage after undergoing cholecystectomy. Patients between the ages of 14 years to 60 years were included in the study. The patients having other systemic diseases such as leukemia, diabetes mellitus were excluded from the study. **Results:** In the present study a total of 120 cases were included in the study. The age of the patients ranged between 14 to 60 years with mean age at 42.21 years. No. of cases who underwent open cholecystectomy was 41 and no. of cases who underwent laparoscopic cholecystectomy was 79. The major bile duct injury was seen in 12 patients who underwent open cholecystectomy and in 18 patients who underwent laparoscopic cholecystectomy. **Conclusion:** In conclusion, bile duct injury during cholecystectomy procedure can be highly deliberating to the patient and proper management should be done for these cases.

**Keywords:** Bile duct, cholecystectomy, cholecystitis.

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#### INTRODUCTION:

Last several decades laparoscopic cholecystectomy has become a gold standard in treatment of symptomatic cholelithiasis, even in patients with acute cholecystitis.<sup>1</sup> Patients who undergo laparoscopic treatment recover faster, have easier postoperative course and earlier discharge from hospital.<sup>2</sup> However, laparoscopic cholecystectomy is associated with higher risk of intraoperative lesions, primarily lesions of biliary ducts, intestines and vascular structures.<sup>3</sup> Biliary leakage can be a serious complication of urgent cholecystectomy even in the hands of an experienced surgeon and can lead to considerable morbidity and prolonged hospitalization.<sup>4</sup>

Despite the fact that there are no properly controlled trials which could identify risk factors for bile duct injury, the risk of possible perioperative complications can be estimated based on patient characteristics (comorbidity, age, gender, body weight), intraoperative findings, and the amount of training and experience of the surgeon.<sup>5</sup> Large prospective and retrospective studies have defined the risk of biliary leakage arising from either open or laparoscopic cholecystectomy.<sup>6</sup> Hence, the present study was conducted to study the treatment outcomes in cases with bile leakage following cholecystectomy.

**MATERIALS AND METHODS:**

The study was conducted in the department of General Surgery of Hind Institute of Medical Sciences, Ataria , Sitapur, U.P., India. The ethical clearance for the study was obtained from the ethical board of the institute prior to commencement of the study. We included 120 patients admitting to the Department of General Surgery with the diagnosis of biliary leakage after undergoing cholecystectomy. Patients between the ages of 14 years to 60 years were included in the study. The patients having other systemic diseases such as leukemia, diabetes mellitus were excluded from the study. We collected data such as clinical presentations following biliary leak, timing of detection of bile leak post operatively (< 24 hour or > 24 hour), acute or chronic cholecystitis at the time of operation, amount of bile leak, duration of bile leak, postoperative investigation (MRCP, CT abdomen, USG) for bile leak, various modalities of management and its outcome, site of bile leak. The data was tabulated and evaluated statistically.

The statistical analysis of the data was done using SPSS version 20.0 for windows. The Student’s t-test and Chi-square test were used to check the significance of the data.

The p-value less than 0.05 was predetermined as statistically significant.

**RESULTS:**

In the present study a total of 120 cases were included in the study. The age of the patients ranged between 14 to 60 years with mean age at 42.21 years. **Table 1** shows the incidence of major bile duct injury after cholecystectomy. No. of cases who underwent open cholecystectomy was 41 and no. of cases who underwent laparoscopic cholecystectomy was 79. The major bile duct injury was seen in 12 patients who underwent open cholecystectomy and in 18 patients who underwent laparoscopic cholecystectomy [**Fig 1**]. **Table 2** shows the no. of cases with mode of treatment followed for management of biliary leak. We observed that conservative treatment with controlled external fistula was performed on 71 patients. Operative treatment was performed on 49 patients. Suturing of cystic duct was performed on 22 patients, primary suturing was performed on 14 patients and hepaticojejunostomy was performed on 13 patients. The results on comparing were found to be statistically significant with p-value less than 0.05.

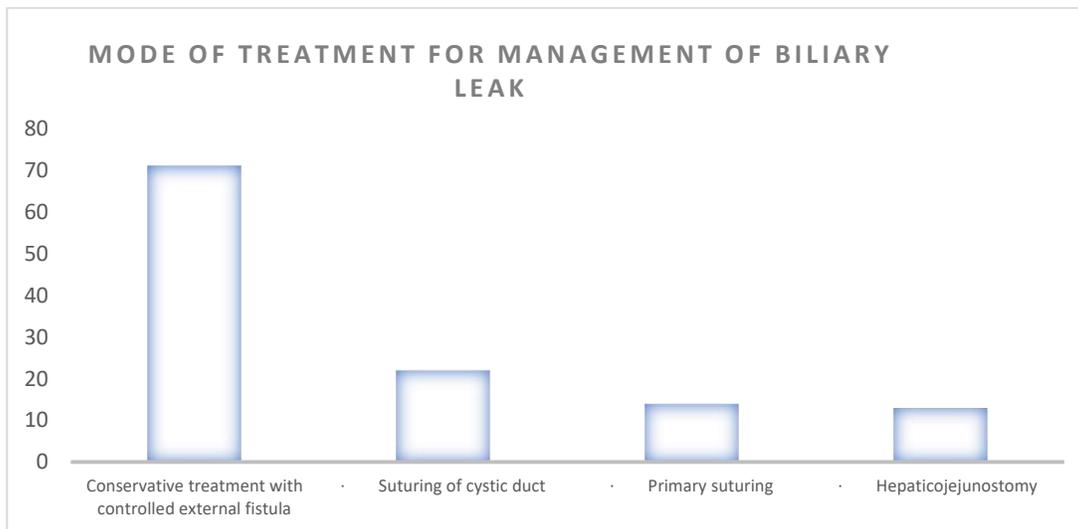
**Table 1: Incidence of major bile duct injury after cholecystectomy**

Type of cholecystectomy	No. of cases	Major bile duct injury
Open cholecystectomy	41	12
Laparoscopic cholecystectomy	79	18

**Table 2: No. of cases with mode of treatment followed for management of biliary leak**

Management of biliary leak	No. of cases	p-value
Conservative treatment with controlled external fistula	71	0.005
Operative treatment		
• Suturing of cystic duct	22	
• Primary suturing	14	
• Hepaticojejunostomy	13	

**Figure 1:**



## DISCUSSION:

In the present study we observed that majority of patients underwent conservative treatment for bile leakage following cholecystectomy with 100% success rate. Tzovaras G et al evaluated the efficacy of minimal access endoscopic and percutaneous techniques in treating symptomatic bile leak. Twenty-one patients with symptomatic bile leak following laparoscopic cholecystectomy underwent assessment of the extent of the bile leak via ultrasound/CT and ERCP. Following diagnosis, the patients were treated by sphincterotomy and biliary drainage and, if necessary, percutaneous drainage of the bile collection. Only one patient required primary surgical treatment following diagnosis of a major duct injury. The other 20 were treated by a combination of sphincterotomy (including a stent in most) plus percutaneous drainage in six. In 19 of 20, this minimal access approach stopped the leak. They concluded that most patients who present with bile leakage after cholecystectomy can be managed successfully by means of ERCP with percutaneous drainage of any large bile collection. Zerem E et al evaluated the efficacy of percutaneous catheter drainage as a minimally invasive treatment in the management of symptomatic bile leak following biliary injuries associated with laparoscopic cholecystectomy. Twenty two patients with symptomatic bile leak following laparoscopic cholecystectomy underwent percutaneous drainage of the bile collection under ultrasound control. In patients with jaundice and in those with persistent drainage, endoscopic retrograde cholecysto-pancreatography (ERCP) was performed immediately for diagnostic and for therapeutic intervention when appropriate. In other patients, ERCP was performed 4-6 weeks after the discharge from the hospital to document the healing of the leaking site. Five patients with jaundice were initially treated by a combination of endoscopic plus percutaneous drainage. One of them required surgical treatment following diagnosis of a major duct injury. The other 17 were treated by percutaneous drainage initially and for 14 of them it was definitive treatment. Three patients required sphincterotomy as additional treatment for stopping the leak. There were no complications related to the percutaneous drainage procedure. They concluded that most patients with bile leakage can be managed successfully by percutaneous drainage. If biliary output does not decrease, endoscopy is needed. In patients with jaundice endoscopic diagnostic and therapeutic procedures should be performed immediately.<sup>7,8</sup> Christoforidis E et al evaluated the efficacy of minimal access endoscopic and percutaneous modalities in treating symptomatic bile leak and biloma formation. Sixteen patients with biloma after open or laparoscopic cholecystectomy underwent assessment of the site and extent of the bile leak via endoscopic retrograde cholangiography (ERC). Endoscopic sphincterotomy was performed in all patients who were managed non-

operatively, any retained duct stones were removed, and an endoprosthesis was inserted in a selected basis. Percutaneous drainage of the bile collection, under ultrasound or computed tomography guidance, followed ERC. ERC supplemented by computed tomography or ultrasound guided percutaneous biloma drainage was successful in 15 patients. One patient having major ductal injury was treated surgically. Thirteen patients had leakage from the cystic duct, one from the right hepatic duct, and one from an aberrant right hepatic duct. Bile duct stones were removed from seven patients an endoprosthesis was inserted in six and a nasobiliary catheter in one. Bilomas resolved and bile leakage was treated successfully in all 15 patients with no further complications. It was concluded that ERC accurately diagnoses the cause of post cholecystectomy bile leakage and biloma formation. Furthermore, endoscopic sphincterotomy and selective stent insertion in coordination with percutaneous drainage procedures represents in the majority of cases the corner stone of a definitive treatment. Ljubičić N et al investigated the results of endoscopic treatment of postoperative biliary leakage occurring after urgent cholecystectomy with a long-term follow-up. This is an observational database study conducted in a tertiary care center. All consecutive patients who underwent endoscopic retrograde cholangiography (ERC) for presumed postoperative biliary leakage after urgent cholecystectomy in the period between April 2008 and April 2013 were considered for this study. Patients with bile duct transection and biliary strictures were excluded. Biliary leakage was suspected in the case of bile appearance from either percutaneous drainage of abdominal collection or abdominal drain placed at the time of cholecystectomy. Procedural and main clinical characteristics of all consecutive patients with postoperative biliary leakage after urgent cholecystectomy, such as indication for cholecystectomy, etiology and type of leakage, ERC findings and post-ERC complications, were collected from our electronic database. All patients in whom the leakage was successfully treated endoscopically were followed-up after they were discharged from the hospital and the main clinical characteristics, laboratory data and common bile duct diameter were electronically recorded. During a five-year period, biliary leakage was recognized in 2.2% of patients who underwent urgent cholecystectomy. The median time from cholecystectomy to ERC was 6 d (interquartile range, 4-11 d). Endoscopic interventions to manage biliary leakage included biliary stent insertion with or without biliary sphincterotomy. In 23 (77%) patients after first endoscopic treatment bile flow through existing surgical drain ceased within 11 d following biliary therapeutic endoscopy (median, 4 d; interquartile range, 2-8 d). In those patients repeat ERC was not performed and the biliary stent was removed on gastroscopy. In seven (23%) patients repeat ERC was done within one to fourth week after their first ERC, depending on the extent of the biliary leakage. In two of those patients

common bile duct stone was recognized and removed. Three of those seven patients had more complicated clinical course and they were referred to surgery and were excluded from long-term follow-up. The median interval from endoscopic placement of biliary stent to demonstration of resolution of bile leakage for ERC treated patients was 32 d (interquartile range, 28-43 d). Among the patients included in the follow-up (median 30.5 mo, range 7-59 mo), four patients (14.8%) died of severe underlying comorbid illnesses. Their results demonstrated the great efficiency of the endoscopic therapy in the treatment of the patients with biliary leakage after urgent cholecystectomy.<sup>9,10</sup>

#### **CONCLUSION:**

In conclusion, bile duct injury during cholecystectomy procedure can be highly deliberating to the patient and proper management should be done for these cases.

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