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Research Article

**MANAGEMENT OF BILE DUCT INJURIES OCCURRING  
DURING LAPAROSCOPIC AND OPEN CHOLECYSTECTOMY  
AND ITS TREATMENT OUTCOMES****<sup>1</sup>Dr. Durr e Shehwar, <sup>2</sup>Dr. Muhammad Zubair, <sup>3</sup>Dr. Faheem Sarwar, <sup>4</sup>Dr. Sabika Rehman Alavi**<sup>1</sup>Sheikh Zayed Medical College & Hospital, Rahim Yar Khan<sup>2</sup>Liaquat National Hospital, Karachi<sup>3</sup>THQ Hospital Sharaqpur Sharif, Sheikhpura<sup>4</sup>Fatima Jinnah Medical College, Lahore**Abstract:**

**Purpose:** To evaluate the treatment approaches of twenty patients with bile duct injuries in open and laproscopic cholecystectomy who were referred to a tertiary center.

**Study Design:** A prospective cohort study.

**Place and Duration:** In Surgery Unit-II of Nishtar Hospital, Multan for one year duration from April 2016 to April 2017.

**Methodology:** The study is conducted in the Department of Surgery. Injuries after open cholecystectomy and laproscopic cholecystectomy patients who have experienced bile duct. cholecystectomy and injury recognition, post-operative outcome time and repair method were recorded. To describe bile duct injury type, Strassburg classification was used.

**Findings:** Biliary injuries in twenty patients were evaluated after laparoscopic cholecystectomy and open cholecystectomy. 46 years was the average age of the patients (34- to 56 average). The complication occurs in fifteen patients in seven patients during open cholecystectomy and laparoscopic cholecystectomy. 14 patients of all had Strassburg E2 and E1, E3 and E4 complications occurs in eight patients. One patient in septicemia died and in three patients Roux-en-Yhepaticojejunostomy was performed. In nineteen patients undergoing side cholecystectomy with drainage tube T. was re-scanned from the hepatojejunostomy for stenosis, bioenteric anastomosis performed. Other minor issues were conservatively handled.

**Conclusion:** After laparoscopic and open cholecystectomy, Hepatobiliary surgeon can handle biliary injury successfully. Management principles include the definition of sepsis control, anatomic injury, appealing to stages involving refined surgical technique and interventional radiolog.

**Keywords:** Hepaticojejunostomy, biliary injury, cholangiography, cholecystectomy.

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**INTRODUCTION:**

The first open cholecystectomy was performed by Carl Langenbuch (OC) in 1882. After cholecystectomy first two cases of bile duct stenosis were reported in 1905 by Mayo. For cholelithiasis treatment Open cholecystectomy remained the gold standard until the 1980s when laparoscopic cholecystectomy was initiated. During the learning of this surgical technique, initially there was outbreak of bile-duct injuries, mainly as a result of the less experience of surgeon and anatomy misinterpretation. The pattern and mechanism of the injuries are somewhat different from the traditional ones. Common abnormalities responsible for injuries of bile duct include the injury of common hepatic duct (CHD) and cystic duct (CD). Spiral cystic duct that opens long parallel to the common hepatic duct or medial to the common hepatic duct. Right hepatic duct anomalies (RHD), p. Low incidence in the anterior and posterior right sectoral hepatic ducts, common hepatic duct, abnormal vessels and right hepatic artery anomalies passing through the bile duct (CBD) are other important examples. The biliary duct injury incidence ranges from 0.1% to 0.3% in open cholecystectomy. Initially in Laparoscopic cholecystectomy has high risk of bile duct and CBD injury (> 2%) and low experience is the main reason. Since then, the risk has decreased to 0.6% .The purpose of this study is to report our experience with the management, outcomes of open cholecystectomy

surgery after bile duct injury, diagnosis and laparoscopic cholecystectomy.

**METHODOLOGY:**

This prospective study was performed in the surgical unit II of Nishtar Hospital, Multan for one year duration from April 2016 to April 2017. Patients with biliary injury after open and laparoscopic cholecystectomy and those operated from other places were selected for this study. We excluded patients having mass of the liver bed or cystic duct with small bile leakage. The time between the recognition of a complication after cholecystectomy , definite repair method , type of injury and postoperative outcome were recorded. To describe bile duct injury types Strassburg classification was used.

**RESULTS:**

From April 2016 to April 2017, 22 patients with open-cholecystectomy and biliary injury after laparoscopic cholecystectomy were treated in our unit. From our unit 5 patients, while the rest were from other places (seventeen) were treated. Patients age ranged from 34 to 56 years (mean age 47 years). In 15 patients of Laparoscopic cholecystectomy and in 7 patients of open cholecystectomy having complications were recorded. Complications were accepted in four of fifteen patients with laparoscopic cholecystectomy and in 3 of 7 patients with open cholecystectomy (Table-I).

**Table-I: Clinical Details of Twenty Two Patients**

|  | <i>Open cholecystectomy</i> | <i>Laprosopic cholecystectomy</i> | P     |
|--|-----------------------------|-----------------------------------|-------|
| Mean age M/F                             | 46<br>3/4                   | 40.5<br>3/12                      | —     |
| Intraoperative recognition of injury (%) | 3 (43%)                     | 4 (27%)                           | >0.05 |
| Median time of presentation(Range)(Days) | 26 (3-180)                  | 37 (1-20)                         | <0.01 |
| Presentation bile leak/fistula           | 3                           | 7                                 | <0.01 |
| Jaundice                                 | 1                           | 4                                 | <0.01 |

The bile duct injury types during laparoscopic cholecystectomy and open cholecystectomy is given in Table II.

**Table-II: Types of bile duct injuries**

| <i>Types Of Injury</i>               | <i>Open Cholecystectomy (N=7)</i> | <i>Laprosopic cholecystectomy (N=5)</i> |
|--------------------------------------|-----------------------------------|---|
| Bismuth I and II (Strassburg E1& 2)  | 2+4                               | 3+5                                     |
| Bismuth III and IV (Strassburg E3&4) | 1+0                               | 4+3                                     |

In the open cholecystectomy group Six patients have bismuth type I and II injuries. In contrast, there were eight types (Strassburg type E3 and 4) III and IV. 19 patients underwent hepaticojejunostomy with Roux-en-Y (two patients had to undergo with left and right hepatic channels anastomosis). Transanastomotic stents were used in seven patients while T-tube drainage done in 3 patients and lateral choledocorrection. Postoperatively one patient died of septicemia. Postoperative complications included jaundice (n = 2), biliary fistula (n = 3), wound infection (n = 5) and cholangitis (n = 2). All patients were treated conservatively (except who needed hepaticojejunostomy revision for bilioenteric anastomosis stenosis). The length of hospitalization ranged from 6 to 19 (mean 11.03) days. By radionuclide scanning (HIDA), permeability of hepaticojejunostomy was determined in 3 patients. Patients were Follow-up after 4 to 36 weeks (mean 16) months. After the first three visits four patients died.

### DISCUSSION:

Cholecystectomy is one of the general elective general surgery operations. Open cholecystectomy in 1990 was almost replaced by laparoscopic cholecystectomy. The open approach has many advantages, but with an estimated incidence of 0.7-0.8%, it is associated with a two- or three-fold increase in the risk of biliary injury. The ideal time to repair a biliary lesion occurs and it is known that experienced repairers produce the best results in primary repair. Intraoperative cholangiography is expected to provide protection against bile duct injuries by avoiding the wrong anatomy. In none of this series, this research was done. Protective effect of intraoperative cholangiography in the prevention of biliary injury, open cholecystectomy and laparoscopic cholecystectomy have been proposed. Roux-en-Y hepaticojejunostomy. Now the standard procedure for repair of these injuries and a good result have been documented in various series. In our study, biliary injuries, consistent with other studies, were accepted at the time of open cholecystectomy and laparoscopic cholecystectomy at approximately 1/3 of the patients. We agree with others that the best results for this illness can be obtained in tertiary units. For this reason, the best treatment for the lesions that are recognized during surgery is to provide adequate drainage and to remove the source of possible sepsis. Patients can be transferred to a specific unit where complete cholangiography can be achieved. Eradication of sepsis should be attempted in all cases before repair. The original injury is always greater because revision anastomosis in patients with hepaticojejunostomy is necessary to achieve a healthy mucosa for anastomosis of the proximal resection of the bile. The level of bismuth injury has an important effect on the outcome of these patients. This emphasizes the need to encourage repair initiatives outside the third degree unit at all times. Study limitations: Biliary injuries are not a rare complication after closed and open cholecystectomy, but in our study we were actually limited to twenty in the third stage because of the number of patients dealing with the peripheral location. The majority of patients preferred to go to tertiary hospitals located in the center.

### CONCLUSION:

Bile duct injury after open or laparoscopic cholecystectomy should be performed by a trained surgeon in a tertiary hospital. Management principles include the anatomical definition of injury, infection control, the use of interventional radiology, and refined surgical techniques.

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