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Evaluation of biliary leakage in patient's undergone cholecystectomy

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Abstract
Cystic duct and accessory bile duct leaks are generally treated easily without a problem. Stricture development after endoscopic treatment of main bile duct leaks, even in patients without stricture at the beginning, is a remarkable point. Hence from the above findings the present study was planned to share endoscopic experience of tertiary care centre for diagnosis and treatment of biliary leakages after cholecystectomy.
The present study was planned in. Career Institute of Medical Sciences and Hospital, Lucknow.
The total 30 patients referred in-patient department (IPD) were enrolled into the present study. The aim and the objective of the study were conveyed to patients. The ages of the patients are from 20-60 years. Approval of the Institutional ethical committee was taken before the conduct of the study. Patients diagnosed as symptomatic bile leak based on history, physical examination, ultrasonography of abdomen were included in the study.
Hence from the above generated data it can be concluded that the tendency of early cholecystectomy in acute cholecystitis, and an increase in the number of laparoscopic procedures in the future, it is possible to expect a lot of patients with biliary leakage. These results could be also applied to all patients with biliary leakage. Minor bile duct injuries can be managed successfully with endoscopic and stenting.

Keywords: cholecystectomy, bile duct injury, laparoscopy, endoscopic

Introduction
Cholecystectomy is the surgical removal of the gallbladder. It is a common treatment of symptomatic gallstones and other gallbladder conditions. Surgical options include the standard procedure, called laparoscopic cholecystectomy, and an older, more invasive procedure, called open cholecystectomy. The surgery can lead to post cholecystectomy syndrome, as well as more serious complications such as bile duct injury.
Laparoscopic cholecystectomy has now replaced open cholecystectomy as the first-choice of treatment for gallstones and inflammation of the gallbladder unless there are contraindications to the laparoscopic approach. This is because open surgery leaves the patient more prone to infection. Sometimes, a laparoscopic cholecystectomy will be converted to an open cholecystectomy for technical reasons or safety.
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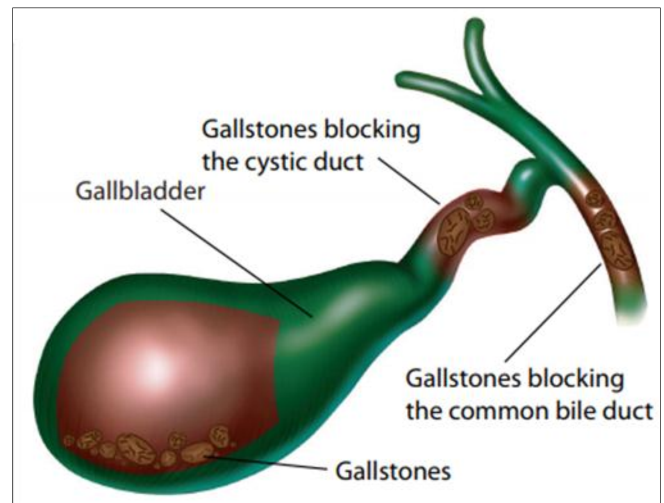

Fig 1

Laparoscopic cholecystectomy has now replaced open cholecystectomy as the first-choice of treatment for gallstones and inflammation of the gallbladder unless there are contraindications to the laparoscopic approach. This is because open surgery leaves the patient more prone to infection [1]. Sometimes, a laparoscopic cholecystectomy

will be converted to an open cholecystectomy for technical reasons or safety.

Laparoscopic cholecystectomy requires several (usually 4) small incisions in the abdomen to allow the insertion of operating ports, small cylindrical tubes approximately 5 to 10 mm in diameter, through which surgical instruments and a video camera are placed into the abdominal cavity. The camera illuminates the surgical field and sends a magnified image from inside the body to a video monitor, giving the surgeon a close-up view of the organs and tissues. The surgeon watches the monitor and performs the operation by manipulating the surgical instruments through the operating ports.

Laparoscopic bile duct exploration (LBDE) is recommended in current treatment guidelines for the management of choledocholithiasis with gallbladder in situ. Failure of this technique is common as a consequence of large or impacted common bile duct (CBD) stones. A new technique, LABEL (Laser-Assisted Bile duct Exploration by Laparoendoscopy) has been developed to enhance LBDE in cases of impacted or large stones using holmium-laser increasing the feasibility of the transcystic stone retrieval and reducing overall operative time in the treatment of choledocholithiasis [2].

A serious complication of cholecystectomy is biliary injury, or damage to the bile ducts. Laparoscopic cholecystectomy has a higher risk of bile duct injury than the open approach, with injury to bile ducts occurring in 0.3% to 0.5% of laparoscopic cases and 0.1% to 0.2% of open cases. In laparoscopic cholecystectomy, approximately 25-30% of biliary injuries are identified during the operation; the rest become apparent in the early post-operative period [3].

Damage to the bile ducts is very serious because it causes leakage of bile into the abdomen. Signs and symptoms of a bile leak include abdominal pain, tenderness, fever and signs of sepsis several days following surgery, or through laboratory studies as rising total bilirubin and alkaline phosphatase. Complications from a bile leak can follow a person for years and can lead to death. Bile leak should always be considered in any patient who is not recovering as expected after cholecystectomy. Most bile injuries require repair by a surgeon with special training in biliary reconstruction. If biliary injuries are properly treated and repaired, more than 90% of patients can have a long-term successful recovery [4].

Cystic duct and accessory bile duct leaks are generally treated easily without a problem. Stricture development after endoscopic treatment of main bile duct leaks, even in patients without stricture at the beginning, is a remarkable point [5].

Hence from the above findings the present study was planned to share endoscopic experience of tertiary care centre for diagnosis and treatment of biliary leakages after cholecystectomy.

Methodology

The present study was planned in Career Institute Of Medical Sciences And Hospital, Lucknow. The total 30 patients referred in-patient department (IPD) were enrolled into the present study. The aim and the objective of the study were conveyed to patients. The ages of the patients are from 20-60 years. Approval of the Institutional ethical committee was taken before the conduct of the study.

Following was the inclusion and Exclusion criteria of the study:

Inclusion Criteria

1. Age 20- 60 years
2. Patients undergone cholecystectomy
3. Patients diagnosed as symptomatic bile leak based on history, physical examination, ultrasonography of abdomen.

Exclusion Criteria

1. Patients at particular risk of heart conditions, such as congenital disease
2. Pregnant/lactating females.

Results & Discussion

The data from the 30 patients undergone the cholecystectomy were collected and presented below.

Table 1: Type of cholecystectomy and Cases of Major bile duct injury

Type of cholecystectomy	No of cases	Major bile duct injury
Open cholecystectomy	16	6
Laparoscopic cholecystectomy	14	5
Total	30	11

Table 2: Table showing site of bile duct injury

Site	No of cases
GB Bed, Duct of Luschka, minor accessory duct	18
Cystic Duct	3
CHD	3
CBD	4
Abberantrt hepatic duct	2
Total	30

Table 3: Table showing mode of treatment of biliary leak

Management	No of cases
Conservative with controlled external fistula	23
Operative	
Suturing of cystic duct	2
Primary suturing	2
Hepaticojejunostomy	3
Total	30

Table 4: Table showing results of surgical management

Results of surgical management	No. of cases
Uneventful recovery	27
Mortality	3
Total	30

Laparoscopic cholecystectomy is currently the standard of care for symptomatic gallstones. It has evolved to a daycare procedure over the last 30 years. Similarly, the management of bile leak has changed from conservative to minimally invasive approach. Cystic duct stump and small peripheral right hepatic ducts within the liver bed account for most of the injuries [6]. Those originating in liver bed often are asymptomatic [7]. when they become symptomatic, they present with abdominal pain, distension, vomiting, and

jaundice or bile leakage in a surgical drain. Retained CBD stones or CBD stricture can increase pressure in the CBD and promote bile leak as seen in two of our patients [8].

Cholecystectomy (open or laparoscopic) is one of the commonest surgeries performed worldwide. Iatrogenic bile duct injury during cholecystectomy is a dreaded complication. Though the incidence of bile duct injury is more in laparoscopic cholecystectomy in comparison to open cholecystectomy, in our study open cholecystectomy was the primary surgery in majority patients in comparison to in laparoscopic cholecystectomy. This reflects that open cholecystectomy is still being performed in large number of peripheral hospitals. Our results are consistent with other studies done in various centres of India. There are various conditions associated with increased risk of bile duct injuries such as acute cholecystitis, cute pancreatitis, cholangitis, scarring of Calot's triangle, intraoperative bleeding and anatomical variations. Lack of surgical skills, improper clip placement and excessive use of diathermy are other associated factors [9].

Majority of bile duct injuries are not recognized during cholecystectomy. Patients sustaining injury during cholecystectomy usually present in the early postoperative period. Usual clinical features are abdominal pain, distension, bile leak in drain, fever and features of septicaemia.

Laparoscopic cholecystectomy has replaced the open procedure in all but complicated cases. The procedure is associated with less discomfort, shorter postoperative recovery and hospital stay, and better cosmetic result. However, the laparoscopic approach has been associated with a higher incidence of biliary injury than open cholecystectomy, ranges from 0.5% to 2.0% [10]. According to another study of Adamsen *et al*, 1997 [11] bile duct injuries are more common following laparoscopic cholecystectomy, including fistulae,

Conclusions

Hence from the above generated data it can be concluded that the tendency of early cholecystectomy in acute cholecystitis, and an increase in the number of laparoscopic procedures in the future, it is possible to expect a lot of patients with biliary leakage. These results could be also applied to all patients with biliary leakage. Minor bile duct injuries can be managed successfully with endoscopic and stenting.

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