

## **Comparison of Common BileDuct injury, Biliary peritonitis,Jaundice and wound infection as complication in cases of Open and Laparoscopic Cholecystectomies**

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### **ABSTRACT**

**BACKGROUND:** The purpose of this study was to observe, identify and discuss the comparison of complications of open and laparoscopic cholecystectomies which includes Common Bile Duct injury, Biliary peritonitis ,jaundice and wound infection in patients who had undergone cholecystectomies during June2008 to November 2010 at B.J.Medical College Ahmedabad. **METHODS & MATERIAL:** This study has included the patients who has undergone cholecystectomy at other hospital and presented to us with complication. Complications were recorded in the form of intra operative, post operative also we have studied the possible cause of complication and its management and outcome of the management. This has helped us to compare the advantages and disadvantages of one procedure over the other. All demographic profiles were recorded prospectively and possible complications of both the operative procedures were recorded. Patients who presented with complication were investigated in the form of Routine blood investigations, CTscan, ultrasound and liver profiles and ERCP. **RESULTS:** In our study total number of patient's undergone cholecystectomy were 624. Out of which 302 patients's undergone open cholecystectomy and 322 were initiated for laparoscopic cholecystectomy out of which 16 were converted into open cholecystectomy due to abnormal anatomy or unclear Calot's triangle due to adhesions.there is no significant difference in case of intraoperative common bile duct injury ( $p=>0.05$ ) and also there is no significant difference in cases of peritonitis ( $p=>0.05$ ) and jaundice ( $p=>0.05$ ) but there is significant difference in cases of wound infection ( $p=<0.05,p=0.008$ ). **CONCLUSION:** It can be said that laparoscopic cholecystectomy has definite advantage of less chances of wound infection and its morbidity resulting from it. In cases of other complications it is comparable because of increased expertise in the field of laparoscopy. But however well designed studies with large sample size is required to address the issue.

**Key words:** common bile duct,biliary peritonitis, wound infection,endoscopic retrograde cholangiopancreatography, cholecystectomy

### **INTRODUCTION**

Laparoscopic cholecystectomy first performed in 1985, has gained acceptance as the standard of care for patients requiring cholecystectomy. Laparoscopic surgery is popular with patients. The absence of an incision is cosmetically appealing. The immediate post-operative course is smoother, allowing for early discharge from the hospital and early return to work. The procedure however is surgically demanding and introduces

Specific risks unique to the laparoscopic surgery that are not present during the performance of open cholecystectomy. Laparoscopic cholecystectomy is considered to be a gold standard in management of symptomatic cholecystolithiasis<sup>1-3</sup>

The wide-spread use of laparoscopic cholecystectomy is associated with an increased risk of intra-operative injury involving the bile ducts, bowel, and vascular structures as compared to open cholecystectomy<sup>4-7</sup>. Prevalence of bile duct injury is ranging from 0% to 7%<sup>8-14</sup>. Since surgeons are reluctant to publish their own complications rate, and since the complications of laparoscopic cholecystectomy are treated in tertiary centers, the precise magnitude of the problem remains obscure. Large population-based studies have however, allowed an accurate estimate the

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magnitude of the increased risks following laparoscopic cholecystectomy.

Misidentification of anatomy appears to be the most common cause of laparoscopic bile duct injury. The "classic" injury occurs due to mistaking the common bile duct for the cystic duct. The Common Bile Duct then is clipped and divided. Further retraction of the gallbladder that leads to a second higher injury with division of the common hepatic duct as it approaches the bifurcation. This second ductal injury is often described in the operative note as being a "second cystic duct" or "an accessory duct". This injury is particularly devastating as complete transection of the biliary tree virtually removes any possibility of non-operative management by either endoscopic or transhepatic technique and mandates the need for surgical reconstruction of the biliary tree to establish biliary-enteric drainage.

Other less common mechanisms of injury include a "tenting injury" in which the common bile duct is pulled laterally at the time of occlusion of the cystic duct and caught in the clip, thermal injuries due to injudicious use of cautery or laser, excessive application of clips to control bleeding in the area of the triangle of Calot. And finally injuries to an aberrant or low inserting right hepatic duct. Delay in recognition of biliary injuries invariably results in infection and significantly reduces the chance for optimal outcome after reconstruction.

#### **MATERIALS AND METHODS**

- Study period of this dissertation is from June 2008 to November 2010. Patients admitted in our institution for different indications of cholecystectomy were considered for study. Detailed history was elicited in each case. Various symptoms were noted and a detailed general, systemic and local examination was done in all cases. Laboratory investigations were carried out in all cases including blood and other specific investigations in the form of USG Abdomen, CECT Abdomen and ERCP. Two types of surgeries were performed which includes Open cholecystectomy and laparoscopic cholecystectomy

during and after which different types of intra operative and post-operative complications and any specific management done for the same was studied. Minimum follow up is of 4 months and maximum follow up is of 8 months.

- Patients having clear and unclear Calot's triangle were those in which proper visualization or identification of Calot's triangle may be clear anatomically and unclear due to adhesions respectively. Those patients having abnormal course of cystic artery or duct or any aberrant duct were considered as having abnormal anatomy.
- Patients having bleeding from liver bed or any vessels that require drain were considered having intraoperative hemorrhage.
- Patients who had pain on 3rd post-operative day onwards were considered having pain as post-operative complications.

#### **RESULTS**

In our study total number of patient's undergone cholecystectomy were 624. Out of which 302 patients's undergone open cholecystectomy and 322 were initiated for laparoscopic cholecystectomy out of which 16 were converted into open cholecystectomy due to abnormal anatomy or unclear Calot's triangle. So patients who were converted to open cholecystectomy were included in the open group. Common bile duct injury is major concern while dealing with cholecystectomy. Both the group of surgery has chances of CBD injury but intraoperative recognition of the same and its management in the form of hepaticojejunostomy was done. There was no significant difference in both group ( $p > 0.05$ ,  $p = 0.6225$ , chi square test 0.242) as per table no 1. In cases of post operative peritonitis, patients were presented with the complains of distension of abdomen, pain and fever. There was no significant difference ( $p > 0.05$ ,  $p = 0.6225$ , chi square test 0.242) in this complication too as per table no 2. Laparoscopic patients had more peritonitis in which two patients had unclear calot's triangle with adhesions and one patients had only adhesions and all 3

had CBD injury (one lateral and two total transection) which were missed intra operatively and all presented lately. All of them operated for CBD injury out of which one patient expired.

In open group, two patients had total transection of CBDout of which one was operated outside our hospital and transferred on 14<sup>th</sup> postoperative day. Complication in both patients was diagnosed on ERCP.

**Table 1: Injury to CBD**

Injury to CBD	Open (n=318)	Laparoscopy (n=306)	Total
Yes	002 (00.63%)	003 (00.99%)	005 (00.80%)
No	316 (93.37%)	303 (99.01%)	619 (00.99.2%)
Total	318 (100.0%)	306 (100.0%)	624 (100.0%)

**Table 2: Peritonitis**

Peritonitis	Open (n=318)	Laparoscopy (n=306)	Total
Yes	002 (00.63%)	003 (00.98%)	005 (00.80%)
No	316 (99.37%)	303 (99.02%)	619 (99.2%)
Total	318 (100.0%)	306 (100.0%)	624 (100.0%)

**Table 3: Wound infection**

Wound infection	Open (n=318)	Laparoscopy (n=306)	Total
Yes	012 (03.77%)	002 (00.65%)	014 (02.24%)
No	306 (97.23%)	304 (99.35%)	610 (97.76%)
Total	318 (100.0%)	306 (100.0%)	624 (100.0%)

**Table 4: Jaundice**

Jaundice	Open (n=318)	Laparoscopy (n=306)	Total
Yes	003 (00.94%)	008 (02.61%)	011 (01.76%)
No	315 (99.06%)	298 (97.39%)	613 (98.24%)
Total	318 (100.0%)	306 (100.0%)	624 (100.0%)

In open cholecystectomy group 12 patients out of 318 developed wound infection which may be attributed to wide tissue damage due to large incision in comparison to laparoscopic group. It has (p<0.05, p = 0.008, chi square test=6.921) which is statistically significant.

All laparoscopic group with cholangitis had CBD injury (4 patient had total transection, one had lateral, one cystic duct leak, two had CHD stricture). In open group one patient had total transection of CBD, one had lower CHD stricture and one patient had CBD stricture detected on CECT abdomen. As one patient had cystic duct leak patient did not develop jaundice. As far as statistics is concern there is no significant in group (p=>0.05, p=0.1128, chi square test=2.5143).

**DISCUSSION**

Most common complication following laparoscopic cholecystectomy is bile duct injury. In our study the prevalence of bile duct injury was 0.99% in case of laparoscopic cholecystectomy where as same was reported to be 3.98% in Rooh-ul-Muqlrn, Qutab-e-Aslam et al<sup>15</sup>, and it is 0.1% in the study of S Duca,O Bala et al<sup>16</sup>. However in case of open cholecystectomy it is 0.63%. No study was found to compare this complication of open procedure. Commonest reason for the injury was inadvertent and miss identification of anatomy at the calots triangle, that may be due to severe adhesion,abnormal anatomy ,improper technique of surgery and fibrosed gall bladder and acute cholecystitis. In our set up facility for intraoperative cholengiogram was not available so all injuries were not detected intraoperatively. So in order to avoid morbidity we need to have facility for the same and proper understanding of anatomy and use of critical view of safety before dividing any structures at calots. Best results were achieved if injuries were diagnosed intraoperatively and management done in same seating in the form of 3 Rou-en y hepatico-jejunostomy and 2 t-tube drainage.

Post operative peritonitis is major concern while dealing with cholecystectomy. In our study there were 5 cases of peritonitis 2 in open group and 3 in laparoscopic group. In our study adhesion was the main reason for CBD injury resulting in to the peritinitis, one patient lateral injury and two had complete transaction with leak. Injury was detected on ERCP in both groups. Out of all patient reexplored one expired in laparoscopic group due to septicemic shock. Another cause for the biliary peritonitis is bile leakage from second accessory ducts.

Post operative wound infection in case of open cholecystectomy is 3.77% and in case of laparoscopic group it is 0.65% where as it is 4.84% in Rooh-ul-Muqlrn, Qutab-e-Aslam et al<sup>15</sup>. All patients were managed conservatively with dressing and anti biotics. There is definite advantage of

laparoscopic surgery as it has small incision and less tissue damage compare to open surgery. But laparoscopic surgery is also not free from wound infection so proper care and aseptic precautions should be taken while dealing with laparoscopic surgery.

Jaundice was the presenting symptom in cases of biliary tree strictures.in our study it is 0.94% in open group and 2.61% in laparoscopic group where as in case of Dr.Ambreen mannan,Dr.Suhail Ahmed Soomro et al<sup>17</sup> it is 6.3% ,and 1.42% in Rooh-ul-Muqlrn, Qutab-e-Aslam et al<sup>15</sup> . Those patients who have complete transection of CBD were presented early with features of jaundice and fever, there were such 4 cases and all were investigated in the form of CECT AND ERCP. In all above cases Rou en y hepatico jejunostomy done. All patients' discharged. Miss identification of anatomy and adhesions was the major cause. One patient has lateral CBD injury, probable cause was the lateral thermal injury. In this case the t-tube drainage with primary repair was done. One patient has cystic duct leak with jaundice. It was diagnosed on ERCP and management was done in the form of ERCP and stent. Two patients has CHD stricture and presented on 3<sup>rd</sup> and 4<sup>th</sup> post operative month,and cause is partial clip application, management was hepaticojejunostomy.in open group one patient has CBD transection and in this case abnormal anatomy is thecause,and one patient had CBD stricture and one has CHD stricture ,both the cases cause is lateral thermal injury. Patient managed with Rou en y hepatico jejunostomy.

#### **CONCLUSION**

It can be conluded from the above study that laparoscopic cholecystectomy has definite advantage as far as wound infection is concerned. Whereas biliary tract injuries and complications resulting from it are more in cases of laparoscopic group than open group. Main cause was the adhesions and unclear anatomy at calots.So it is best to not to proceed with laparoscopy in such cases and better to convert to open so as to minimise the complication rates. Also there is need of

hour is to follow the principles of surgery such as critical view of safety in order to prevent possible complications. Apart from that proper understanding of anatomy and judicious use of electrocautry is recommended. Most important thing is that take second opinion in case of doubt of anatomy at calots. Technical expertise is needed to reduce the rate of complication. Patients in which injuries recognised on table and managed in same seating have the best results but it is a technically demanding task. A patient presented late with complications has more morbidity. So early diagnosis and management of the same gives good results.

Laparoscopic cholecystectomy is best if done with proper training, expertise and care. How ever larger studies needed for the same to be concluded..

**Compliance with Ethical Standards** this study received no financial support. Formal consent to undergo type of surgery was taken. There was no ethics committee at the time when study was carried out.

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