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BILE DUCT INJURIES;

DETERMINE THE FREQUENCY DURING OPEN AND LAPAROSCOPIC CHOLECYSTECTOMY AT TERTIARY CARE HOSPITALS

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ABSTRACT… Objectives: Determine the frequency of bile duct injuries during open and laparoscopic cholecystectomy procedures. **Study Design:** Prospective Observational Study. **Place and Duration of Study:** This study was conducted at surgical department of multiple hospitals and compares the results Civil Hospital Naushahro Feroze, Liaquat University Hospital Jamshoro and Civil Hospital Karachi and NaushahroFeroze, August 2014 to December 2015. **Methods:** All 320 patients were equally divided for open cholecystectomy and Laparoscopic cholecystectomy. Demographic profile and detailed Clinical examination were recorded. All patients were evaluated for Cholelithiasis underwent preoperative investigations. All patients were resuscitated and optimized before intervention. Inclusion criteria were diagnosed case of gallstones, age $\geq$ 20 years and both gender selected for open cholecystectomy and Laparoscopic cholecystectomy and assessed the frequency of bile duct injury during both procedures. Exclusion criteria were of carcinoma of gall bladder, stone in CBD and obstructive jaundice. Chi square test was applied for p-value. **Results:** 320 cases of gallstone were undertaken for operative laparoscopic cholecystectomy and open cholecystectomy procedure. Most of the patients were 208(65%) female, male to female ratio were 1:7.2. Gall stone commonly reported in 3rd and 4th decade 186(58.13%) cases in between 36-50 years. The mean age was 39.8+5.90years. Abdominal ultrasound revealed that multiple stone 253(79.1%) cases as compared to single stone. Other common findings of thick wall gallbladder139 (43.44%) cases while ultrasonologist reported impacted gallbladder stone in 23(7.19%) cases. Common bile duct injury more occur in open procedure 24(7.5%) cases as compared to laparoscopic cholecystectomy 15 (4.7%) cases and Chi square test was applied for p-value <0.001. **Conclusion:** The Laparoscopic procedure has decreased rate of complications and bile duct injury day by day due to improved learning curve.

Key words: Common Bile duct injury, Cholecystectomy, Laparoscopic cholecystectomy.

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INTRODUCTION

Bile duct injuries are defined as second surgical procedure required to repair common bile duct injury within one year of cholecystectomy. Most of these injuries are identified at the time of cholecystectomy while others present as diffuse persistent abdominal pain after removal of gall bladder. Other symptoms included malaise, low grade fever, dearranged liver function tests, jaundice, sepsis and paralytic ileus.[1] There are several explanations defining increased risk of bile duct injuries with laparoscopic cholecystectomy common ones being limitation of laproscopic approach and learning curve of the surgeon.[2] Old age patients present with adhesions and scarring at Calot's triangle and area at increased risk for BDIs. Similarly male patients are two times more prone to BDIs because of having variations in bile duct anatomy.[3]

Other patient risk factors associated with increased incidence of bile duct injury are acute or chronic cholecystitis, obesity, previous abdominal surgery and decompensated cirrhosis.[4]

Laparoscopic techniques have led surgery to a golden era where minimally invasive procedures have taken place of complicated techniques

thus reducing hospitalization, complications and post operative patient factors.[5] Not only this but also LC provides less anesthesia requirements with decreased mean surgical evaluation time and less peri-operative complications.[6] Factors predictive of conversion to OC include significant inflammation, obesity, thickened gall bladder wall, age > 60, previous upper abdominal surgery, diabetes and other multiple co-morbids.[7]

Bismuth in 1982 presented a classification demonstrating types of BDIs. Steward at el presented with more advanced classification. Classic bile duct injury associated with LC is misidentification of common duct for cystic duct. Other BDIs include resection of common hepatic ducts and associated right hepatic arterial injury, biliary obstruction and leakage resulting from clip ligation of distal common duct with proximal ligation and division of cystic duct, biliary strictures resulting from excessive use of cautery or laser in region of common duct.[8] Majority of these injuries when associated with LC occur in proximal location. LC is also associated with greater risk of bile leakage and more extensive stricture formation.[9] Apart from benefits associated with LC, studies have shown with the advent of laproscopic surgery, the risk of bile duct injuries have increased approximately two to three times that of open cholecystectomy. Studies reports risk of BDIs with OC to be 0.06% - 0.21% and with LC the risk is 0.3% to 0.6%.[10]

MATERIAL AND METHODS

This Prospective Observational Study was conducted at surgical department of multiple hospitals and compares the results Civil Hospital Naushahro Feroze, Liaquat University Hospital Jamshoro and Civil Hospital Karachi and NaushahroFeroze, August 2014 to December 2015. 320 patients were came this period and equally divided into open cholecystectomy and Laparoscopic cholecystectomy. Demographic profile and detailed Clinical examination were recorded. All patients were evaluated for Cholelithiasis underwent preoperative investigations. All patients were resuscitated and optimized before intervention. Inclusion criteria were diagnosed case of gallstones, age ≥ 20 years and both gender selected for open cholecystectomy and Laparoscopic cholecystectomy and assessed the bile duct injury according to new Strasberg classification in both procedures. Exclusion criteria were of carcinoma of gall bladder, stone in CBD and obstructive jaundice. Chi square test was applied for p-value.

RESULTS

Diagnosed 320 cases of gallstone were undertaken for operative laparoscopic cholecystectomy and open cholecystectomy procedure. Most of the patients were 208(65%) female, male to female ratio were 1:7.2. Gall stone commonly reported in 3rd and 4th decade 186(58.13%) cases in between 36-50 years. The mean age was 39.8+5.90years. Abdominal ultrasound revealed that multiple stone 253(79.1%) cases as compared to single stone. Other common findings of thick wall gallbladder 139(43.44%) cases while ultrasonologist reported impacted gallbladder stone in 23(7.19%) cases (Table-I). Common bile duct injury more occure in open procedure 24(7.5%) cases as compared to laparoscopic cholecystectomy 15 (4.7%) cases and Chi square test was applied for p-value <0.001 (Table-II, Figure-1).

Variable	No. Patients	Percentage
Gender		
Male	39	12.19%
Female	281	87.81%
Age		
20-35 years	89	27.81%
36-50 years	186	58.13%
51-60 years	45	14.06%
Ultrasound Finding		
Single Stone	67	20.9%
Multiple Stone	253	79.1%
Impacted Stone at Neck of Gallbladder	23	7.18%
Thick Wall Gallbladder	139	43.44%
Empyema	48	15%
Mucocele	29	9.06%
Contracted Gallbladder	66	20.6%

Table-I. Demographic Variable of patients N=320

Injury Classification	Open Cholecystectomy	Laparoscopic Cholecystectomy
A. Leak from subvesical duct	0	1(0.31%)
B. Clipped and divided right segmental duct	0	0
C. Divided right segmental duct	0	0
D. Lateral injury common hepatic duct	1(0.31%)	2(0.625%)
E1. Common hepatic duct division ≥ 2 cm from bifurcation	10(3.13%)	6(1.88%)
E2. Common hepatic duct division < 2 cm from bifurcation	9(2.81%)	5(1.56%)
E3. Common duct division at bifurcation	4(1.25%)	1(0.31%)
E4. Separate left and right hepatic duct strictures.	0	0
E5. Combined injury to main duct at bifurcation and right segmental bile duct	0	0
Total	24(7.5%)	15(4.7%)

Table-II. Strasberg-Bismuth Injury Classification N=320

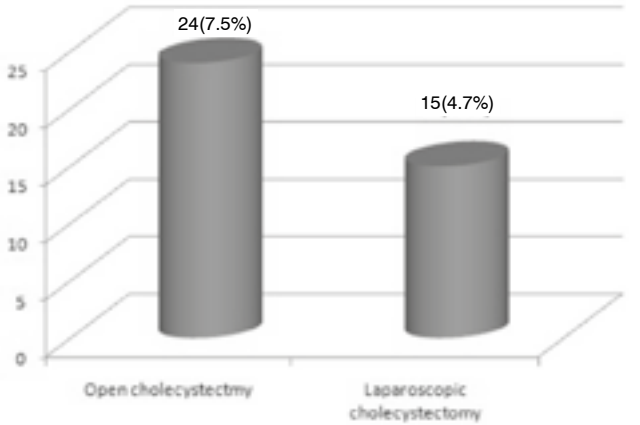

Figure-1. Bile Duct injury (n=320)
P value <0.001

DISCUSSION

Though majority of studies report increased rate of BDIs with laproscopic cholecystectomy, some studies also report equal incidence with both of these procedures.[12] Our study shows decreased incidence of bile duct injuries with LC and this may be due to small sample size and review over a short period of time. LC has increased the rate of cholecystectomies for asymptomatic gall bladder disease because of being an easy procedure both for the surgeon as well as patient. LC was found to be a cost-effective procedure.[13]

Routine use Intraoperative cholangiograph (IOC) has shown to decrease rate of BDIs as it provides an overview of anatomy before the surgeon opens up. It can prevent misidentification of CBD as cystic duct. As most of BDIs occur during the learning curve of surgeon, hence its use can help in identification of structures. However it has not shown to completely abolish incidence of BDIs as misidentification is not the only reason for injury. IOC is also associated with small risk of adverse effects such as allergic reaction to contrast agents and is also a contraindication with Mirizzi syndrome.[11] In our study showed that common bile duct injury more occure in open procedure 24(7.5%) cases as compared to laparoscopic cholecystectomy 15 (4.6%) cases. While in the study of Sadia Sana was reported bile duct injury 2(4%) patients in laparoscopic cholecystectomy group while 3(6%) patients observed in open cholecystectomy group.[12]

Multiple factors affect outcome of BDIs including timing of repair, associated vascular injuries, level of injury and operative techniques applied for repair. Treatment of bile duct injuries requires multidisciplinary approach. The goal of treatment is to repair biliary tract and prevent development of long and short term complications such as biliary fistula, biliary strictures, abscess, recurrent cholangitis and biliary cirrhosis.[13] Bergman[14] et al presented a study demonstrating repair of bile duct injuries. He showed that ultrasonography, ERCP can help in diagnosis and if these modalities cannot confirm diagnosis then retrograde cholangiography has shown promising effects. Minor bile duct leaks can be treated with endoscopic sphincterotomy or

insertion of biliary endoprosthesis with elective stent removal after six weeks. Some minor bile duct leaks require percutaneous or surgical drainage of bile collection. Early complications of these procedures include cystic duct leak and distal obstruction which presented with bleeding after precut spincterotomy. Severe complications may include multiple organ failure with respiratory insufficiency leading to death. Late complications of endoscopic treatment includes strictures involving common hepatic duct. Major bile leaks require surgical repair over T-tube at site of leakage or ERCP and insertion of biliary endoprosthesis. Complications of these procedure includes bile leakage which can be treated by removal of T-tube with biliary endoprosthesis.[15]

CONCLUSION

Key hole surgery is safe as compared with open cholecystectomy for cholelithasis now a days. The Laparoscopic procedure has decreased rate of complications and bile duct injury day by day due to improved learning curve.

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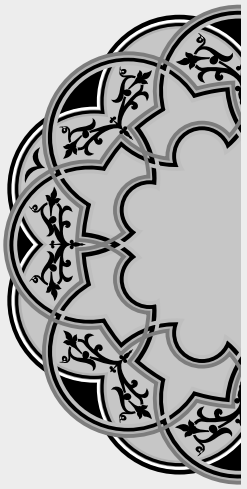
PREVIOUS RELATED STUDY

Jahangir Sarwar Khan, Hamid Hasan, Mohammad Iqbal. LAPAROSCOPIC CHOLECYCTECTOMY; COMMON BILE DUCT INJURY AFTER LEARNING CURVE (Original) Prof Med Jour 17(3) 373-378 Jul, Aug, Sep 2010.



"A woman is like a tea bag; you never know how strong it is until it's in hot water."

Eleanor Roosevelt

AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Dr. M. Paryal Tagar	Conception and design, Critical revision of the article for important intellectual content	
2	Dr. Khawar Saeed Jamali	Statistical expertise, Critical revision of the article for important intellectual content	
3	Dr. Mujeeb Rehman Abbasi	Drafting of the article	
4	Dr. Sarang Tagar	Data collection	