

Determine the Frequency of Common Bile Duct Injuries Encounter during Laparoscopic Cholecystectomy at Tertiary Care Hospitals

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ABSTRACT

Objective:- Determine the frequency of common bile duct injuries encounter during laparoscopic cholecystectomy..

Study Design: Observational / descriptive Study.

Place and Duration of Study: This Study was conducted at the Surgical Ward 18A and Army Liver Transplant Unit, Military Hospital Rawalpindi from January 2016 to Jan 2017.

Materials and Methods: All 588 cases of gallstones had been diagnosed by abdominal ultrasound. All preoperative workup done before going laparoscopic cholecystectomy procedure. Patients age > 20 years and both gender were included in this study, while carcinoma of gall bladder, stone in CBD and obstructive jaundice were excluded from this study.

Results: 588 cases diagnosed of Cholelithiasis for laparoscopic cholecystectomy. Female patients were mostly presented with gallstone in 533(90.64%) female, female to male ratio were 10.69. The mean age was 36±6.17years. Mostly patients reported in 3rd and 4th decade age groups 366(62.24%) cases in between 36-50 years. Multiple stone was 477(81.12%) are more reported as compare to single stone. Common findings on ultrasound were thick wall gallbladder 359(61.05%) cases followed by contracted gallbladder in 69(11.73%) cases. Common bile duct injury during laparoscopic cholecystectomy observed in 19(3.23%) cases.

Conclusion: The key point in preventing CBD injury is correctly identifying the Calot's triangle. Use of IOC can help in identification and further prevention of CBD injury and complications associated with it.

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

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INTRODUCTION

Gallstones are present in 15% of adult population and in majority of cases are asymptomatic, the treatment of choice for symptomatic as well as asymptomatic gall stones is laparoscopic cholecystectomy. Laparoscopic cholecystectomy have now taken place of open cholecystectomy due to lesser hospitalization time i.e around 1.2 to 1.3 days whereas open techniques require around 3-4 days of hospitalization, longer recovery time and a higher incidence of peri-operative complications^{1,2}.

laparoscopic techniques have significantly improved patient outcomes but have been associated with a higher incidence of bile duct injuries as compared to open techniques. Studies have reported risk of BDIs to be

0.21% with laproscopic techniques whereas 0.06% with open technique^{3,4}

Second surgical procedure required to correct bile duct anatomy within one year following laproscopic cholecystectomy is defined as bile duct injury. Davidoff et al have described misinterpretation of CBD for cystic duct as the most common cause of injury. Second most common cause was identified to be hilar bleeding. While bleeding is controlled, adjacent structures can be injured by laser, electro-cautery or hemostat⁵. One important explanation for bile duct injuries is learning curve of the surgeon. The rate of BDIs was 2.2% during first 13 laproscopic surgeries which reduced to 0.1% in further surgeries⁶. It has been seen that the steepest part of learning curve relies within the first 12 operated cases.

There are certain risk factors associated with higher incidence of BDI during laproscopic procedure. These include age, sex, anatomical variations of Calot's triangle, adhesions due to previous laprotomy, impacted stone in the Hartmann's pouch. Old age patients are more likely to have strictures and adhesions involving the Calot's triangle hence are prone to have BDIs. It has been shown that males have relatively more chances than females to have aberrant anatomical abnormalities

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involving Calot's triangle thus increases their chances for BDIs⁷⁻¹⁰.

Prognosis following bile duct injury depends on early identification and repair. If BDIs are identified at the time of operation then it should be repaired at the time of operation however If the surgeon is inexperienced, the safest option is to apply simple drainage and refer to specialized department for further care as there are higher chances of failure to correct associated with the surgeon especially If he is in his learning curve¹¹⁻¹⁴. Injuries identified after cholecystectomy follow different course. Ultrasound and ERCP can be used for diagnosis. If diagnosis is uncertain despite using these modalities then retrograde cholangiography offers promising results. Patient presents with non-specific symptoms such as pain, abdominal distension, nausea followed by vomiting. Few days later the patient may develop complications such as jaundice, sepsis, biloma, biliary fistula and peritonitis. In rare instances, the patient may present with recurrent cholangitis, secondary sclerosing cholangitis and chronic liver disease¹⁵⁻¹⁸. Before the commencement of treatment, it is made sure that the patient is stabilized. For minor injuries which includes bile duct leaks and stenosis, sphincterotomy and stents can be used. For severe injuries such as laceration and obstruction of bile duct Roux en Y hepaticojejunostomy is preferred¹⁹⁻²¹.

MATERIALS AND METHODS

This Prospective Observational Study was conducted at Surgical ward 18A and Army Liver Transplant Unit, Military Hospital Rawalpindi, January 2016 to Jan 2017. There were 588 cases of gallstones had been diagnosed by abdominal ultrasound. All preoperative workup done before going for laparoscopic cholecystectomy procedure. Patients age ≥ 20 years and both gender were included in this study, while carcinoma of gall bladder, stone in CBD and obstructive jaundice were excluded from this study.

RESULTS

There were 588 cases diagnosed of Cholelithiasis for laparoscopic cholecystectomy. Female patients were mostly presented with gallstone in 533(90.64%) female, female to male ratio were 10.69:1. The mean age was 36 ± 6.17 years. Mostly patients reported in 3rd and 4th decade age groups 366(62.24%) cases in between 36-50 years. Multiple stone was 477(81.12%) are more reported as compare to single stone. Common findings on ultrasound was thick wall gallbladder 359(61.05%) cases followed by contracted Gallbladder in 69(11.73%) cases. Common bile duct injury during laparoscopic cholecystectomy observed in 19(3.23%) cases.

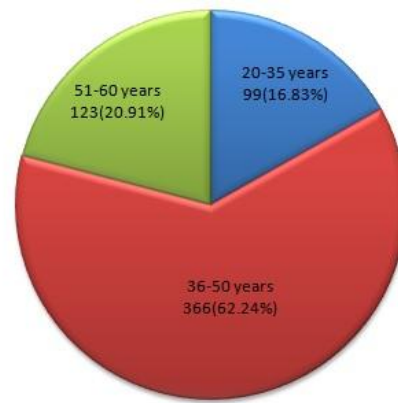


Chart No.1: Age Distribution n-588



Chart No.2: abdominal ultrasound finding n-588

DISCUSSION

There are several points proposed to avoid the incidence of bile duct injury during laparoscopic procedures. Hunter has given five points to reduce the incidence of bile duct injury. These include greater use of 30 degree angled laproscope as it is believed to provide a more perpendicular view of hilar structures. Use of firm cephalad retraction of fundus of gallbladder which helps visualize the hilar structures due to better exposure. The first assistant should retract the gall bladder infundibulum laterally instead of parallel to the common bile duct to separate common duct from cystic duct. Continuous dissection of cystic duct into gall bladder and prompt conversion to open technique whenever extensive bleeding occurs. Some more points contributed by Davidoff and his colleagues include keeping the surgical field clear by continuous use of suction and irrigation. Interpretation of cholangiogram is of significant importance and it should be done with caution. Inability of the common duct to opacify should raise suspicion for its occlusion. Avoid using laser, cautery or hemostatic clips to control bleeding because it may lead to extensive injuries involving the bile duct^{5,22}. It has been observed that the outcome following repair was better in cases when repair was performed by a different surgeon other than the one

performing cholecystectomy. However in majority of clinical trials, the surgeon performing the cholecystectomy performs the repair²³.

It was observed in the current study out of 588 cases 533 were female (90.64%) and 55 male (9.35%); with female to male ratio of 10.69:1. Mohan H reported that out of 1100 cases, 952 were females and 148 males with female to male ratio 6.4:1⁶⁹⁽²⁴⁾.

In the present study, the maximum age recorded was 60 years and a minimum of 20 years, out of 588 cases maximum distribution was observed in 3rd and 4th decade and least was seen in 6th decade. In the study conducted by Memon MR reported mean age of patients undergoing laparoscopic cholecystectomy was 45 years⁷⁰⁽²⁵⁾.

Ultrasound is a routine examination in daily practice and it is the first line imaging modality of choice in many clinical presentations (e.g. abdominal pain) as well as in asymptomatic patients as a screening tool⁷²⁽²⁶⁾. Ultrasound is widely accepted for the diagnosis of biliary system disease. It has the greatest sensitivity for the diagnosis of cholelithiasis (approximately 99%) when compared with other imaging modalities. It is also of great help in the diagnosis of the spectra of appearances in acute and chronic cholecystitis and in the diagnosis of intra- and extrabiliary duct dilation. In our study ultrasound examination revealed single stone in 111(18.87%) patients where as multiple stones in 477(81.12%) patients, thick wall gallbladder in 359(61.05%) patients, while contracted gallbladder 69(11.73%) cases. However ultrasound finding given by Ji W et al⁷³⁽²⁷⁾ in their study shows multiple stones in 69.71%, thick wall gallbladder in 41.67% and adhesions in 35% of cases.

Intraoperative Cholangiogram (IOC) can reduce the rates of BDIs because of providing an overview of the anatomy before the surgeon opens. It could prevent errors which could occur due to mis-identification of structures. It can be a useful tool for surgeons during their learning curve. However the supportive role of IOC was not supported by all studies. Also it has been found that IOC is associated with small risk of allergic reaction to contrast agents injected during the procedure. Mirizzi syndrome is also an identified contraindication to use of IOC [25]²⁸. In our study out of 588 Laparoscopic cholecystectomy cases 19(3.23%) patients had CBD injury. An international study conducted by Maria Kapoor reported reported 1.3% CBD injury²⁹.

One important point to consider while undergoing laparoscopic cholecystectomy is that the conversion of laparoscopic technique to open technique should not be considered as a complication of laparoscopic cholecystectomy but should be considered as an important step taken for the safety of patient^{30,26}.

CONCLUSION

The key point in preventing CBD injury is correctly identifying the Calot's triangle. Use of IOC can help in identification and further prevention of CBD injury and complications associated with it.

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Kelley JE, Burrus RG, Burns RP et al, Safety, efficacy, cost and morbidity of laparoscopic versus open cholecystectomy: a prospective analysis of 228 consecutive patients. *Am surg* 1993;59: 23-27.
2. Gadacz TR, Talamini MA, Lillimoe KD, et al, Laparoscopic Cholecystectomy, *Surg Clin North Am* 1990;70:1249-1262.
3. Hezug U, Messmer P, Suttar M, Tondelli P, Surgical treatment of for cholelithiasis, *Surg Gynecol Obstet* 1992; 175:238-242.
4. Roslyn JJ, Binn GS, Hughes EFX, et al, Open cholecystectomy: a contemporary analysis of 42,474 patients, *Ann surg* 1993;218:129-137.
5. Way LW. Bile duct injury during laparoscopic cholecystectomy. *Annals Surg* 1992;215(3):195.
6. The Southern Surgeons Club. A prospective analysis of 1518 laparoscopic cholecystectomies. *N Eng J Med* 1991;324:1073.
7. Schrimmer BD, Edge SB, Janet DIX, Hyser MJ, Hanks JB, Jones RS, Laparoscopic Cholecystectomy, Treatment of choice for symptomatic cholelithiasis, *Ann Surg* 1991;213(6): 665-676.
8. Waage A, Nilsson M. Iatrogenic bile duct injury: a population-based study of 152 776 cholecystectomies in the Swedish Inpatient Registry. *Archives Surg* 2006;141(12):1207-13.
9. Mahatharadol V. Bile duct injuries during laparoscopic cholecystectomy: an audit of 1522 cases. *Hepato-gastroenterol* 2003;51(55):12-4.
10. Chapman WC, Abecassis M, Jarnagin W, Mulvihill S, Strasberg SM. Bile duct injuries 12 years after the introduction of laparoscopic cholecystectomy. *J Gastrointestinal Surg* 2003;7(3):412-6.
11. Flum DR, Cheadle A, Prella C, Dellinger EP, Chan L. Bile duct injury during cholecystectomy and survival in medicare beneficiaries. *JAMA. J Am Med Assoc* 2003;290(16):2168-73.
12. Nuzzo G, Giuliani F, Giovannini I, Murazio M, D'Acapito F, Ardito F, et al. Advantages of multidisciplinary management of bile duct injuries occurring during cholecystectomy. *Am J Surg* 2008; 195(6):763-9.
13. Mercado MA. Early versus late repair of bile duct injuries. *Surgical Endoscopy* 2006;20(11):1644-7.

14. Mercado MA, Chan C, Orozco H, Tielve M, Hinojosa CA. Acute bile duct injury: The need for high repair. *Surg Endoscopy* 2003;17(9):1351-5.
15. Wu YV, Linehan DC. Bile duct injuries in the era of laproscopic cholecystectomies. *Surgical Clinics North Am* 2010;90(4):787-802.
16. Connor S, Garden OJ. Bile duct injuies in the era of laproscopic cholecystectomy. *Bri J Surg* 2006; 93(2):158-68.
17. Mercado MA, Dominiguez I. Classification and management of bile duct injuries. *World J Gastrointestinal Surg* 2011;3(4):43-8.
18. Lee CM, Stewart L, Way LW. Postcholecystectomy abdominal bile collections. *Arch Surg* 2000;135(5):538-42.
19. Saad N, Darcy M. Iatrogenic bile duct injury during laproscopic cholecystectomy. *Techniques in vascular and Int Radiol* 2008;11(2):102-10.
20. Karvonan J, Gullichsen R, Laine S, Salminen D, Gronroos JM. Bile duct injuries during laproscopic cholecystectomy: Primary and longterm results from single institution. *Surg Endoscopy* 2007;21(7):1069-73.
21. Sahajpal AK, Chow SC, Dixon E, Greig PD, Gallinger S, Wei AC. Bile duct injuries associated with laproscopic cholecystectomies: Timing of repair and longterm outcomes. *Arch Surg* 2010; 145(8):737-63.
22. Hunter JG. Avoidance of bile duct injury during laproscopic cholecystectomy. *Am J Surg* 1991; 161:71.
23. Flum DR, Cheadle A, Prela C, Dellinger EP, Chen L. Bile duct injury during cholecystectomy and survival in medicare beneficiaries. *JAMA* 2003; 290(16):2168-73.
24. Mohan H, Punia RPS, Dhawan SB, Ahal S, Sekhon MS. Morphological sepectrum of gallstone disease in 1100 cholecystectomies in North india. *North Ind J Surg* 2005;67:140-2.
25. Memon MR, Muhammad G, Arshad S, Jat MA, Bozdar AG, Shah SQA. Study of open conversion in laproscopic cholecystectomy. *Gomal J Med Sci* 2011;9(1):51-54.
26. Nuernberg D, Ignee A, Dietrich CF. Ultrasound in gastroenterology. Biliopancreatic system. *Med Klin Munich* 2007;102(2):112-126.
27. Ji W, Li LT, Wang ZM, Quan ZF, Chen XR, Li JS. A randomized controlled trial of laproscopic versus open cholecystectomy in patients with cirrhotic portal hypertension. *World J Gastroenterol* 2005;11(16):2513-17.
28. Flum DR, Koepsell T, Heagerty P, Sinanan M, Dellinger EP. Common bile duct injury during laproscopic cholecystectomy and the use of intraoperative cholangiography: adverse outcome or preventable error. *Archives Surg* 2001;136(11): 1287-92.
29. Kapoor M, Yasir M, Umar A, Suri A, Aiman A, Kumar A. Complications of laproscopic cholecystectomy, an analysis of 300 patients. *JK-Practitioner* 2013;18(1-2): 7-11.
30. Alaraibeh KI, Ammari F, Al Heiss H, Al Jaber TM, Qasaimeh GR, Hanik B, et al. Laproscopic cholecystectomy for gallstones: a comparision of outcome between acute and chronic cholecystitic. *Ann Saudi Med* 2001; 21:312-16.