

Compare the Frequency of Biliary Leakage in Patients Undergoing Clipped and Clipless Laparoscopic Cholecystectomy

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ABSTRACT

Aim: To compare the frequency of biliary leakage after clipped and clip-less laparoscopic cholecystectomy in patients with cholecystitis.

Study Design: Randomized control trial

Place and Duration of Study: Department of Surgeries, Central Park Teaching Hospital Lahore and Jinnah Postgraduate Medical Centre Karachi from 1st October 2018 to 31st March 2019.

Methods: One hundred and fifty patients of both genders with ages 20 to 65 years were included. All the patients were equally divided in to two groups. Group I contains 75 patients and received conventional clipped laparoscopic cholecystectomy and in Group II clip-less harmonic scalpel was used with ultrasonic shear. Frequency of biliary leakage was examined between both groups at post-operative 7th day.

Results: In Group I 42(56%) patients were females and 33 (44%) were males with mean age 40.11±11.95 years. In Group II 45(60%) patients were females while 30 (40%) were males with mean age 41.05±10.55 years. Biliary leakage was found in 39(26%) patients (29 in Group I, 10 in Group II). There was significant difference observed between two groups in term of biliary leakage (p=0.005).

Conclusion: Clip-less harmonic scalpel method had low frequency of biliary leakage as compared to clipped laparoscopic cholecystectomy.

Keywords: Cholecystitis, Cholecystectomy, Laparoscopic, Clipped, Clip-less Harmonic Scalpel, Biliary Leakage

INTRODUCTION

Laparoscopic cholecystectomy is the gold standard for the treatment of gallstone disease. Conventionally, during laparoscopic cholecystectomy, titanium clips are used for sealing the cystic duct and the cystic artery before dividing them. There have been reports of clip dislodgement, which poses an increased risk of bile leakage¹⁻³. While using electrocautery, there is excess smoke production and an increased risk of lateral tissue damage. Due to the transmission of energy through the titanium clips, there is also an increased risk of gallbladder perforation. Slipped titanium clips also act as a nidus for stone formation.^{1,4} The harmonic scalpel can seal vessels of up to 5 mm thickness without an increased risk of leakage^{5,6}.

The use of the harmonic scalpel in laparoscopic cholecystectomy has been accepted by many surgeons. It is mainly used for the dissection of Calot's triangle and the lifting of the gallbladder from the liver bed. However, the cystic duct and cystic artery are divided after the application of conventional clips due to a fear of cystic artery and cystic duct leakage. The harmonic scalpel, which seals up to 5 mm thickness of luminal structures (vessels), can be used to divide both cystic duct and artery and has been shown as a safe method in a few studies.⁷⁻¹⁰ The cystic duct diameter and thickness may vary between patients due to existing pathology, such as acute/chronic cholecystitis, fibrotic gallbladder, etc. Hence, the 'clipless' laparoscopic cholecystectomy has not been accepted widely due to the routine use of clips for the fear of cystic duct leak. Using the harmonic scalpel for the entire operative procedure of laparoscopic cholecystectomy except cystic duct division may provide the advantage of a shorter operating time with a reduced risk of cystic duct

leakage¹¹. The present study was conducted to compare the outcomes of clipped versus clipless laparoscopic cholecystectomy in term of biliary leakage.

MATERIALS AND METHODS

This study was conducted at Department of Surgeries, Central Park Teaching Hospital Lahore and Jinnah Postgraduate Medical Centre Karachi from 1st October 2018 to 31st March 2019. A total 150 patients of both genders both ages 20 to 65 years were presented with cholecystitis and underwent cholecystectomy were enrolled in this study. Patients detailed demographic including age, sex and duration of cholelithiasis were recorded. Patients with diabetes mellitus, patients with clotting and patients with jaundice were excluded. Patients were equally divided in to two groups Group I and group II. Each Group contains 75 patients. In Group I conventional instruments were used along with clips and in Group II clip-less Harmonic scalpel along with ultrasonic shear was applied. All the patients were undergoing laparoscopic cholecystectomy. Frequency of biliary leakage was examined by MRCP at post-operative 7th day and compares the findings between both groups. Data was analyzed by SPSS 24. Chi-square test was applied to compare the frequency of biliary leakage between both groups with p-value <0.05 was taken as significant.

RESULTS

There were 87(58%) patients were females (42/75 Group I, 45/75 Group II) while 63(42%) patients were males (33/75 in Group I, 30/75 in Group II). In Group A mean age of patients was 40.11±11.95 years and in Group II it was

41.05±10.55 years. In Group I mean duration of cholelithiasis was 11.42±3.28 days and in Group II it was 12.65±4.48 days (Table 1).

At post-operative 7th day, 39/150 (26%) patients found to have biliary leakage (Fig. 1). In Group I biliary leakage was found in 29/75 (38.67%) patients and in Group II biliary leakage was observed in 10 (13.33%) patients. We found significant difference in term of biliary leakage between both groups with p-value 0.005 (Table 2).

Table 1: Baseline characteristics of all the patients

Variable	Group I (n=75)	Group II (n=75)	Total (n=150)
Gender			
Male	33 (44%)	30 (40%)	63 (42%)
Female	42 (56%)	45 (60%)	87 (58%)
Age (years)	40.11±11.95	41.05±10.55	-
Duration of cholelithiasis (days)	11.42±3.28	12.65±4.48	-

Fig. 1: Frequency of biliary leakage among all the patients

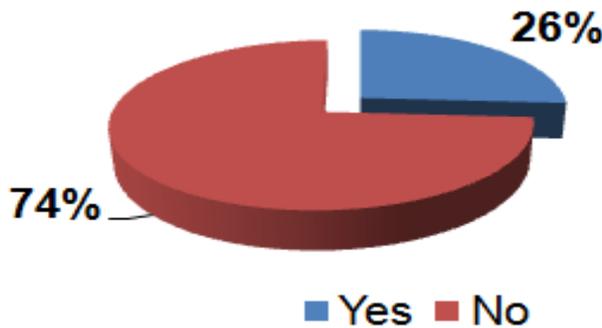


Table 2: Comparison between both groups in term of biliary leakage

Biliary Leakage	Group I	Group II	P-value
Yes	29 (38.67%)	10 (13.33%)	0.005
No	46 (61.33%)	60 (86.67%)	

DISCUSSION

Laparoscopic cholecystectomy is one of the most performing surgical procedures. Laparoscopic procedures are considered a method of choice due to its safety and fewer rates of complications.^{12,13} The present study was conducted to compare the outcomes of clipped laparoscopic cholecystectomy versus clip-less laparoscopic cholecystectomy in term of biliary leakage. In our study 58% females and 42% were male patients. In Group I, 42 (56%) patients were females and 33 (44%) were males with mean age 40.11±11.95 years. In Group II, 45 (60%) patients were females while 30 (40%) were males with mean age 41.05±10.55 years. These results were similar to many of previous studies in which female patients were high in numbers 60 to 85% as compared to males and majority of patients were ages between 30 to 50 years.^{14,15} While, a study conducted by Jamil et al¹⁶ regarding clipped and clip-less laparoscopic cholecystectomy in which they reported that 64.3% (n=54) males and 35.7% (n=30) females. While, the mean age and duration of cholelithiasis of the clipped patients was 45.54±2.56 years and

12.08±1.92 respectively. There were 55(65.5%) males and 29(34.5%) females.

In present study we found that 39/150 (26%) patients found to have biliary leakage. We found that in Group I biliary leakage was found in 29/75 (38.67%) patients and in Group II biliary leakage was observed in 10(13.33%) patients. We found significant difference in term of biliary leakage between both groups with p-value 0.005. A study by Jamil et al¹⁶ reported that the overall frequency of biliary leakage between both groups was 33.93% patients. They also reported that the biliary leakage was noted in 20(23.8%) and 37(44%) patients for clipless and clipped groups respectively. Significant difference was found between biliary leakage in groups with p-value 0.006. Another study conducted by Akhtar et al¹⁷ demonstrated the overall frequency of biliary leakage was 29(22.31%) in which 9 were from clipless group and 20 were from clipped group a significant difference was observed between clipped laparoscopic cholecystectomy and clip-less laparoscopic cholecystectomy with p-value 0.020. A study by Riaz et al¹⁸ reported that clipped laparoscopic cholecystectomy had high incidence rate of biliary leakage as compared to clip-less laparoscopic cholecystectomy a significant difference between clipped laparoscopic cholecystectomy and clip-less laparoscopic cholecystectomy with p-value 0.04. Multiple previous studies demonstrated that clipped laparoscopic cholecystectomy had higher biliary leakage rate than clip-less harmonic scalpel.¹⁸⁻²¹

CONCLUSION

Clip-less harmonic scalpel technique is better and effective with lower rate of biliary leakage as compared to conventional clipped laparoscopic cholecystectomy. So we suggested clip-less laparoscopic cholecystectomy should be performed for the management of cholecystitis.

REFERENCES

- Jain SK, Tanwar R, Kaza RCM, Agarwal PN: A prospective randomized study of comparison of clipless cholecystectomy with conventional laparoscopic cholecystectomy. *J Laparoendosc Adv Surg Tech* 2011, 21:203–208.
- Mahabaleswar V, Kaman L, Iqbal J, Singh R: Monopolar electrocautery versus ultrasonic dissection of the gallbladder from the gallbladder bed in laparoscopic cholecystectomy: a randomized controlled trial. *Can J Surg* 2012;55:307–11.
- Hong T, Xu X-Q, He X-D, Qu Q, Li B-L, Zheng C-J: Choledochoduodenal fistula caused by migration of endoclip after laparoscopic cholecystectomy. *World J Gastroenterol* 2014; 28: 4827–9.
- Sasi W: Dissection by ultrasonic energy versus monopolar electrosurgical energy in laparoscopic cholecystectomy. *JLS* 2010; 1:23–34.
- Redwan AA: Single-working-instrument, double-trocar, clipless cholecystectomy using harmonic scalpel: a feasible, safe, and less invasive technique. *J Laparoendosc Adv Surg Tech A* 2010; 20:597-603.
- Lee SJ, Park KH: Ultrasonic energy in endoscopic surgery. *Yonsei Med J* 1999; 40:545–9.
- Kandil T, Nakeeb AE, Hefnawy EE: Comparative study between clipless laparoscopic cholecystectomy by harmonic scalpel versus conventional method: a prospective randomized study. *J Gastrointest Surg* 2010; 14:323–8.

8. Bessa SS, Al-Fayoumi TA, Katri KM, Awad AT: Clipless laparoscopic cholecystectomy by ultrasonic dissection. *J Laparoendosc Adv Surg Tech A* 2008; 18:593-8.
9. Vettoretto N, Saronni C, Harbi A, Balestra L, Taglietti L, Giovanetti M: Critical view of safety during laparoscopic cholecystectomy. *JLS* 2011; 15:322-5.
10. Gelmini R, Franzoni C, Zona S, Andreotti A, Saviano M: Laparoscopic cholecystectomy with harmonic scalpel. *JLS* 2010; 14:14-9.
11. Mukesh KS, Vijayata S, Mohinder KG, Deepak S: Triple ligation technique of clipless laparoscopic cholecystectomy: a spanner especially for complicated cholecystitis. *Int J Adv Med* 2017; 4:1358-63.
12. Saha PK, Roy RR, Rahman M, Khan EH, Reza SM, Rabbani MG, Alom KS. Clipless laparoscopic cholecystectomy: an initial experience of 50 cases in Bangladesh. *J Sci Foundation* 2016;13(1):11-4.
13. Singh K, Gupta S, Kumar V, Garg V. Comparison of laparoscopic cholecystectomy performed using harmonic scalpel as the sole instrument or by using standard clip and electrocautery Technique. *Int J Contemp Med Res* 2016;3:3043-6.
14. Husain A, Pathak S, Firdaus H. Assessment of operative predictors for difficulty in laproscopic cholecystectomy. *Int J Contemp Med Res* 2016;3:1232-4.
15. Elshoura AA, Saber SA, Elshora OA. Efficacy of harmonic scalpel in total clipless laproscopic cholecystectomy. *Int J Med Res Health Sci* 2016;5(2):29-35.
16. Jamil B, saeed A, parveen H. Comparison of the frequency of billiary leakage with clipless versus clipped laparoscopic cholecystectomy for management of cholecystitis. *JMPB* 2019; 54(05); 2019.
17. Akhtar HS, Farooq Z, Rathore H, Farooq MU, Ahmad A. Clipped or clipless cholecystectomy; which option to choose to prevent postoperative biliary leakage in patients of cholecystitis. *Professional Med J* 2018; 25(6):805-9.
18. Riaz O, Riaz MF, Rehan A. Metal clips versus intracorporeal ligation for cystic duct occlusion in laparoscopic cholecystectomy. *APMC* 2017;11(2):165-8.
19. Sharma D, Sharma B, Solanki M. Laproscopic cholecystectomy: cystic duct occlusion with titanium clip or ligature. *Int J Sci Res* 2016; 5(11):1909-12.
20. Zaidi AH, Halim A, Azami R, Rana SH, Naqvi S, Shan A. Complications in laparoscopic cholecystectomy. *APMC* 2015;9(2):57-65.
21. Rajra A, Gupta M, Agnihotri L. Comparing outcome of patients in laparoscopic cholecystectomy by using clips vs ligation for cystic duct occlusion. *Sch J App Med Sci* 2016; 4(4D):1418-23.