



**Research Article**

## **EFFICACY AND SAFETY OF LAPAROSCOPIC SUTURING VERSUS CLIP APPLICATION IN CHOLECYSTECTOMY: A PROSPECTIVE STUDY**

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### **ABSTRACT**

**Background:** Gallstone diseases, is a common problem nowadays, trend towards minimal invasive surgery played a pivotal role in treatment of symptomatic gallstones. Laparoscopic cholecystectomy is the gold standard procedure throughout the world for the treatment of symptomatic cholelithiasis. In laparoscopic cholecystectomy (LC), cystic duct and cystic artery are normally secured with Titanium clips. Intracorporeal ligation is usually superior to extracorporeal knotting. Aim of this study was to evaluate safety and efficacy of clipless laparoscopic cholecystectomy in closure, compared to conventional laparoscopic cholecystectomy using titanium clip. The study compared mean operative time and postoperative complications. **Material and methods:** This study was conducted at Department of General Surgery, Patna Medical College, Patna during July 2014 to June 2016. A total of 140 patients, 70 patient each group A & B i.e. ligature group and clip group. **Results:** Maximum patient undergone cholecystectomy belongs to age group 31-40 years 45 i.e. 32.14%, followed by 21-30 years 30 i.e. 21.43%. Mean operative time in both groups that found ligature group A had more operative time than clip group B i.e. 54.87 and 49.32 minutes. Only one case shows Porte site infection in clip group B. **Conclusion:** During laparoscopic cholecystectomy, silk or clips can be used to ligate the cystic duct or artery effectively and safely. Suture can be used instead of a clip applicator if one is not available. Both procedures should be well-known to the laparoscopic surgeon.

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### **INTRODUCTION**

Gallstone diseases, is a common problem nowadays, trend towards minimal invasive surgery played a pivotal role in treatment of symptomatic gallstones. Laparoscopic cholecystectomy is the gold standard procedure throughout the world for the treatment of symptomatic cholelithiasis. Many centers have special “short-stay” units or “23- hour admissions” for postoperative observation following this procedure. Whereas it is true that no operation has been more profoundly affected by the advent of laparoscopy than cholecystectomy has, it is equally true that no procedure has been more instrumental in ushering in the laparoscopic age than laparoscopic cholecystectomy has [1].

In laparoscopic cholecystectomy (LC), cystic duct and cystic artery are normally secured with Titanium clips. Intracorporeal ligation is usually superior to extracorporeal knotting. Most studies describe separate and multiple ligations of cystic duct and cystic artery, which are viewed as technically demanding and time consuming and after several modifications, the success of intracorporeal “single ligation of cystic duct and cystic artery “with silk 2/0 was observed [2].

Aim of this study was to evaluate safety and efficacy of clipless laparoscopic cholecystectomy in closure, compared to conventional laparoscopic cholecystectomy using titanium clip. The study compared mean operative time and postoperative complications.

### **MATERIAL AND METHODS**

This study was conducted at Department of General Surgery, Patna Medical College, Patna during July 2014 to June 2016. A total of 140 patients with fulfilment of inclusion criterias were taken into study and eligible patients were briefed about the nature of the study and a written informed consent was obtained from the consented patients. Thorough history was taken and clinical examination was done for all patients and findings were recorded on predesigned and pretested Proforma.

**Inclusion criterias**

- All cases of laparoscopic cholecystectomy for chronic or acute cholecystitis

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**Exclusion criterias**

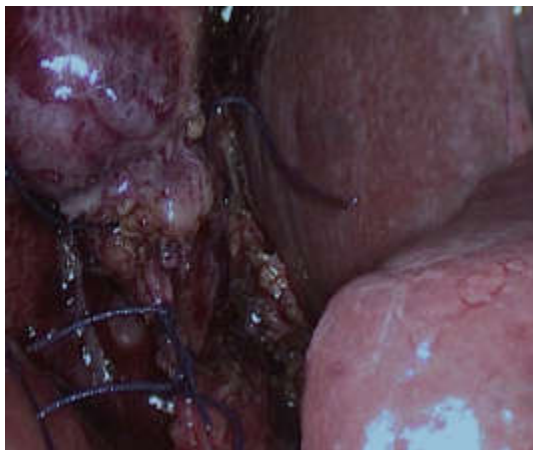
- Difficult cases of Mirrizi syndrome, dense adhesions, and frozen Calot.
- Cases converted to open.
- Any general contraindication for laparoscopy like uncorrected coagulopathy.
- Concomitant common bile duct stone.

All patients were subjected to

**Complete history taking including:** Personal history (name, age and sex) Complaint Present history including analysis of pain (onset, course, duration, site, radiation, character, what increase, what decrease and associated GIT symptoms like nausea vomiting) symptoms suggestive of complications like jaundice due to passed stone. **B) Examination** including-- General examination: (Temperature, pulse, jaundice). -- Abdominal examination: to elicit signs suggestive of acute attack of cholecystitislike Murphy sign. **C) Investigations**  
**Laboratory:** Complete blood count. Liver function studies (serum bilirubin total and direct, alkaline phosphatase, SGOT, SGPT, albumin and INR), Serum Creatinine. Random blood sugar Radiology: preoperative ultrasound MRCP if there is suspicion of passed stone to common bile duct.

**Opeative Technique:** the procedure was done under general anaesthesia with endotracheal intubation Position is initially supine the reverse Trendlenburg with tilt to the left Pneumoperitoneum was achieve with open method Four ports were inserted (two of them were 11 mm one umbilical for telescope and the other working epigastric). The other two were 5 mm for traction of Hartman and fundus of the gall bladder.

**Ligature group A (fig 1):** The Calot was dissected by the use of monopolar hook till achieving the critical view of safety then cauterization of the the cystic artery well away from the hilum after its adequate dissection then 20 cm vicry2/0 suture was passed around the cystic duct and 2 knots were taken proximally and one more distally (on the gall bladder side).



**Fig 1** final view after ligatures

**Clip group B (fig 2):** Dissection of Calot triangle was done by mono-polar hook till achieving the critical view of safety, then clipping of the cystic artery by 2 clips and cutting in between then clipping of the cystic duct by 3 clips and cutting between the proximal 2 and distal one.



**Fig 2** Clipping of the cystic duct and artery

For quantitative variables, mean and standard deviation were used, whereas for categorical variables, frequency and proportion were used. Data was also visualized using suitable diagrams such as bar graphs, pie graphs, and box plots. Through comparing mean values, the relation between categorical explanatory variables and the quantitative result was determined. The mean variations, as well as their 95% confidence intervals, were discussed. Cross-tabulation and percentage comparisons were used to determine the relationship between explanatory variables and categorical outcomes. The statistical significance was determined using the chi-square test. Statistical significance was described as a P value of less than 0.05.

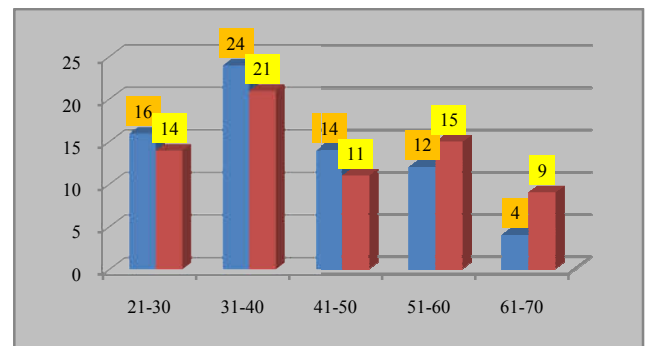
**RESULTS**

The study was conducted at Department of General Surgery, Patna Medical College, Bihar, during July 2014 to June 2016 in a single unit. Ethical clearance was taken from the institute board members. In total, 140 patients aged 18-80 years were selected and divided into two groups of 70 subjects each; all of them underwent LC.

**Table 1** Age distribution in both studied groups

Age in years	Group A (n=70)	Group B (n=70)	Total
21-30	16 (22.85%)	14 (20.00%)	30 (21.43%)
31-40	24 (34.28%)	21(30.00%)	45 (32.14%)
41-50	14 (20.00%)	11 (15.71%)	25 (17.85%)
51-60	12 (17.14%)	15 (21.42%)	27 (19.28%)
61-70	04 (05.71%)	09 (12.85%)	13 (09.28%)

Table 1 shows that maximum patient undergone cholecystectomy belongs to age group 31-40 years 45 i.e. 32.14%, followed by 21-30 years 30 i.e. 21.43%.



**Fig 3** Age distribution in both studied groups

**Table 2** gender distribution in study groups

Gender	Group A (n=70)	Group B (n=70)
Male	52 (74.28%)	59 (84.28%)
Female	18 (25.72%)	11 (15.72%)
Total	70 (100.00%)	70 (100.00%)

Table 2 shows most cases were males i.e. 74.28% in group A and 84.28% in group B.

**Table 3** Mean operative time in minutes

In minutes	Group A (n=70)	Group B (n=70)
Mean operative time ± S.D	54.87 ± 07.84	49.32 ± 08.97
	t-statistic: -03.898, P= 0.0002, significant	
Standard error of mean	01.72	02.14
Mean postoperative hospital stay	1.41 days	1.30 days
Cystic duct leak	00	00
Porte site infection	00	01

Table 3 shows mean operative time in both groups that found ligature group A had more operative time than clip group B i.e. 54.87 and 49.32 minutes. Mean hospital stay also decreased in clip group B i.e. 1.30 days in comparison to 1.41 days. Only one case shows Porte site infection in clip group B.

**DISCUSSION**

The study was conducted at Department of General Surgery, Patna Medical College, Bihar, during July 2014 to June 2016 in a single unit. In total, 140 patients aged 18-80 years were selected and divided into two groups of 70 subjects each; all of them underwent LC. Present study shows that maximum patient undergone cholecystectomy belongs to age group 31-40 years 45 i.e. 32.14%. Similarly Kandil T *et al* (3) (2010) & Singal R *et al* (4) (2018) also shows maximum age group were 31-45 years i.e. 33.65% & 41.23% respectively. Most cases were males i.e. 74.28% in group A and 84.28% in group B. This result was also comparable to Kandil T *et al* (3) (2010) & Singal R *et al* (4) (2018) study. Mean operative time in both groups that found ligature group A had more operative time than clip group B i.e. 54.87 and 49.32 minutes. Mean hospital stay also decreased in clip group B i.e. 1.30 days in comparison to 1.41 days. Only one case shows Porte site infection in clip group B. Abou-Sheishaa MS *et al* (5) (2018) study also given similar results to present study like mean hospital stay i.e. 1.4 days in ligature group and 1.3 days in clip group. Similarly Lichten JB *et al* (6) (2001), Vu T (7) (2008) & Redwan AA *et al* (8) (2010) studies shows comparable results to present study.

Only one case showed Porte site infection in clip group which was similar to Abou-Sheishaa MS *et al* (5) (2018) study i.e. 2 cases in 22 patients of LC. Also Barkun JS *et al* (9) (1999) study showed comparable results.

**CONCLUSION**

During laparoscopic cholecystectomy, silk or clips can be used to ligate the cystic duct or artery effectively and safely. Suture can be used instead of a clip applicator if one is not available. Both procedures should be well-known to the laparoscopic surgeon. Total timing and complications are also dependent on the expertise and capabilities of the surgeons or residents, and can be reduced with good training and direction.

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