

To Study the 3 Port vs 4 Port Lap Cholecystectomy Comparison at Tertiary Care Hospital in Western Rajasthan

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Abstract

Background: Present study was conducted to evaluate and compare the safety outcome and advantages of three-port and four-port LC.

Methods: This prospective study included 100 patients presenting with symptomatic gall stone disease or gall bladder polyp more than 1 cm at base. Patients with jaundice and choledocholithiasis were excluded. Patients were divided into two groups: A and B, who underwent three-port and four-port LC respectively.

Results: The mean age of Group A patients was 46.4±8.53 Yrs and Group B was 45.24 ± 10.34. 63% of the operated patients were females and 37% males. Adhesion was seen in 24.00% patients in Group A and 22.00% patients in Group B. In the three-port group, 45 cases were completed successfully without any need for conversion. 4 patients were converted to four-port procedure and 1 patient was converted to open cholecystectomy. In the four-port group, 3 cases were converted to open cholecystectomy for completion. The average operative time was slightly more in the three- port LC group as compared to the four-port group. It was 46.3 +11.2 minutes for three-port cholecystectomy, ranging from 25 to 75 minutes. In the four-port cholecystectomy group, it was 42.4 ± 15.4 minutes, ranging from 20 to 100 minutes. Pain at 6 hours and 24 hours post-operatively was found

to be less in the three-port group than the four-port group. The mean Visual Analog Score was 5.71 ± 0.84 and 6.60 ± 0.83 at 6 hours; and 2.80 ± 0.81 and 3.60 ± 0.80 at 24 hours in the three-port and four-port groups respectively. The average number of hours of hospital stay was slightly less in the three-port group (37.8 ± 10.8 hours) as compared to the four-port cholecystectomy group (39.2 ± 5.6 hours).

Conclusions: Three-port procedure is safe and appears to be more cost effective than four-port LC.

Keywords: Three-port; Four port; LC.

Introduction

Diseases of the Gallbladder constitute a majority of digestive tract disorders. Among these, gall stone disease is the most common biliary pathology.¹⁻³

It has been noted that people living in the Indo-Gangetic belt are highly susceptible to the formation of gall stones, so much so that cholecystectomy is the single most commonly performed surgical procedure in this part of the world.^{4,5}

Reduction in the size and number of ports has been proposed as a method of reduced pain and duration of hospital stay post-operatively. The most practical option is by reducing the number of the ports from four to three.¹¹ The lateral fourth port is used to grasp the gall bladder funds and retract it laterally (American technique), so as to expose the Calot's triangle, facilitating dissection in this region. The use of this port was omitted in the three-port technique and results from recent studies have been encouraging.¹² This prospective

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comparative study was conducted to evaluate and compare the safety outcome and advantages three-port and four-port laparoscopic cholecystectomy, in terms of: duration of surgery, complication rates, nature of complications, post-operative pain, duration of hospital stay, return to work and cosmetic outcome.

Based above fact we are planning to conduct the study 3 port vs 4 port lap cholecystectomy comparison at tertiary care hospital in western rajasthan.

Materials and Methods

Study design: Hospital based prospective study.

Study duration: 12 months.

Study place: Dept. of Surgery, S.P. Medical College and P.B.M Hospital, Bikaner

Study population: Patients of chronic cholecystitis, symptomatic cholelithiasis, recurrent biliary pancreatitis, Gall Bladder (GB) polyp.

Sample size: 100 consecutive patients who fit into the inclusion criteria was included in the study. 50 patients will be include in the 3 port cholecystectomy arm and 50 in the 4 port cholecystectomy.

Sampling Method: Convenience sampling

Inclusion Criteria:

- Acute cholecystitis with wall thickness <3 mm.
- Age of patient between 18 and 65 years
- Diagnosis of chronic cholecystitis, symptomatic cholelithiasis, recurrent biliary pancreatitis, Gall Bladder (GB) polyp
- Controlled DM, HT, obesity, hypothyroidism.

Exclusion Criteria:

- Severe co-morbid conditions (uncontrolled diabetes, hypertension or presence of IHD)
- Diagnosis of acute cholecystitis with wall thickness more than 3 mm, Mirizzi syndrome, suspicion of GB cancer
- ASA Grade-4
- DM, HT, COPD, bleeding disorders patients.

Data Collection:

The details of preoperative assessment, intraoperative observation, postoperative course and postoperative Follow-up with reference to following points were recorded in a proforma

Data Analyzis:

To collect required information from eligible patients a pre-structured pre-tested Proforma was used. For data Analyzis Microsoft excel and statistical software SPSS was used and data was analyzed with the help of frequencies, figures, proportions, measures of central tendency, appropriate statistical test.

Results

The mean age of Group A patients was 46.4 ± 8.53 yrs and Group B was 45.24 ± 10.34 . The both group were comparable. 63% of the operated patients were females and 37% males and there was no significant difference among the two groups (Table 1).

Table 1: Comparison of age in study groups

Parameter	Group A	Group B	p-Value
	Mean \pm SD (n = 50)	Mean \pm SD (n = 50)	
Age (yrs)	46.4 ± 8.53	45.24 ± 10.34	>0.05 (NS)

Adhesion was seen in 24.00% patients in Group A and 22.00% patients in Group B (Table 2).

Table 2: Intraoperative findings of anatomical variations, adhesions

Intraoperative observations	Group A (n = 50)	Group B (n = 50)	Total (n = 100)	p-value
Anatomical variation	1 (2)	0 (0)	1 (1)	0.23
Adhesions	12 (24)	11 (22)	23 (24)	0.16

In the three-port group, 45 cases were completed successfully without any need for conversion. 4 patients were converted to four-port procedure and 1 patient was converted to open cholecystectomy. In the four-port group, 3 cases were converted to open cholecystectomy for completion. This result was not statistically significant (Table 3).

Table 3: Conversion rates in both groups

Conversion	Group A (n = 50)	Group B (n = 50)	Total (n = 100)	p-value
Open	1 (2.00)	3 (6.00)	4 (8.00)	0.236
4 port	4 (8.00)		4 (8.00)	

The average operative time was slightly more in the three-port LC group as compared to the four-port group. It was 46.3 + 11.2 minutes for three-port cholecystectomy, ranging from 25 to 75 minutes. In the four-port cholecystectomy group, it was 42.4 ± 15.4 minutes, ranging from 20 to 100 minutes. The difference however was found to be statistically insignificant. Pain at 6 hours and 24 hours post-operatively was found to be less in the three-port group than the four-port group and the results were statistically significant. The mean Visual Analog Score was 5.71 ± 0.84 and 6.60 ± 0.83 at 6 hours; and 2.80 ± 0.81 and 3.60 ± 0.80 at 24 hours in the three-port and four-port groups respectively. The average number of hours of hospital stay was slightly less in the three-port group (37.8 ± 10.8 hours) as compared to the four-port cholecystectomy group (39.2 ± 5.6 hours). However, the difference was not statistically significant (Table 4).

Table 4: Comparison of post-operative variable in study groups

Parameters	Group A		Group B		p-value
	Mean	SD	Mean	SD	
Duration (min)	46.3	11.2	42.4	15.4	0.452
VAS at 6 hours	5.71	0.84	6.60	0.83	0.01
VAS 24 hours	2.80	0.81	3.60	0.80	0.01
Hospital stay (Days)	37.8	10.8	39.2	5.6	0.136

Discussion

100 patients were considered for inclusion in the study. A fully informed written consent was taken from all patients. All the patients were sequentially divided into two separate Groups A and B. Group A patients were subjected to three-port laparoscopic cholecystectomy and Group B patients were subjected to conventional fourport laparoscopic cholecystectomy. All the surgeries were performed by the same operating team.

The mean age of Group A patients was 46.4 ± 8.53 yrs and Group B was 45.24 ± 10.34. The both group were comparable. 63% of the operated patients were females and 37% males and there was no significant difference among the two groups.

Age and gender distribution was almost similar in the two groups. Gall stone disease is a female preponderant disease, mostly affecting middle aged females. Few studies have linked the etiology to estrogen hormone.⁶ Most of the patients in either groups had multiple calculi with chronic symptom.

In the three-port group, 45 cases were completed successfully without any need for conversion. 4 patients were converted to four-port procedure and 1 patient was converted to open cholecystectomy. In the four-port group, 3 cases were converted to open cholecystectomy for completion. This result was not statistically significant.

Kumar P et al. was observed that there were 3 conversions to four-port and 1 conversion to open cholecystectomy in the Group A patients. A fourth port had to be introduced for various reasons like, difficult anatomy of the Calot's triangle with aberrant relations of the cystic duct and cystic artery in one case and distended Hartman's pouch obscuring the anatomy of the Calot's triangle in another. Third case had a long right hepatic artery which had to be traced high up in the gall bladder fossa, along with a long cystic duct before joining the common hepatic duct. The case which was converted to open cholecystectomy had injury to common bile duct which underwent primary repair and was managed successfully. There were 3 conversions to open cholecystectomy in the four-port group. Two cases had dense adhesions of the gall bladder with surrounding structures. Third case was an hour glass type of gall bladder with a long cystic duct in which there was a cystic artery bleed due to the slippage of the clips applied on the stump of cystic artery, which could not be controlled laparoscopically. Further evaluation of these patients was not done in the study as the variables assessed were disproportionate to those included in the study. Other authors have reported similar causes of conversion. Few other causes reported include cholecysto-digestive fistula, choledocholithiasis, intrahepatic adhesions and equipment failure.⁷⁻⁹

The average operative time was slightly more in the three-port LC group as compared to the four-port group. It was 46.3 + 11.2 minutes for three-port cholecystectomy, ranging from 25 to 75 minutes. In the four-port cholecystectomy group, it was 42.4 ± 15.4 minutes, ranging from 20 to 100 minutes. The difference however was found to be statistically insignificant.

Kumar P et al. was observed that the mean operative time in the four-port group was found to be slightly less than the three-port group. This is probably because the addition of the fourth port facilitates dissection of the Calot's triangle as it is better exposed due to laterally retracted gall bladder. Mixed results have been found in literature in this regard. While some authors have reported similar findings, some have reported three

port procedure to be shorter than fourport.¹⁰⁻¹¹ They have explained this on the basis of less time required to create an additional port. We believe that three port cholecystectomy is a relatively new technique and with increasing experience, mean procedural time is likely to reduce.

Pain at 6 hours and 24 hours post-operatively was found to be less in the three-port group than the four-port group and the results were statistically significant. The mean Visual Analog Score was 5.71 ± 0.84 and 6.60 ± 0.83 at 6 hours; and 2.80 ± 0.81 and 3.60 ± 0.80 at 24 hours in the three-port and four-port groups respectively. The average number of hours of hospital stay was slightly less in the three-port group (37.8 ± 10.8 hours) as compared to the four-port cholecystectomy group (39.2 ± 5.6 hours). However, the difference was not statistically significant.

Kumar P et al. was observed that the Three-port cholecystectomy scores over the four-port technique in terms of various post-operative outcomes. Post-operative pain at 6 and 24 hours and use of analgesics were statistically less in the three-port group and so was the duration of return to work and normal activity. Mean duration of hospital stay was also slightly less in the three-port group. The cosmetic effect of the surgery in both groups was evaluated one month after surgery and patient satisfaction was overall found to be better in the three-port group. The main reason for partial satisfaction was that the patients in four-port group were aware of the fact that the number of scars could have been reduced.¹¹

Conclusion

Three-port procedure is safe and appears to be more cost effective than four-port LC.

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