



Three-port versus four-port laparoscopic cholecystectomy: a comparative study at a Teaching Hospital of Western Maharashtra

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Abstract

Background: Several studies have shown that 3-port laparoscopic cholecystectomy is technically feasible and has better outcome over four port LC. A comparative study was conducted with the aim to evaluate and compare the benefits of three-port over four-port laparoscopic cholecystectomy.

Methodology: The study was conducted in a Teaching hospital in a sub-urban area of Pune city, Maharashtra. This study was conducted among 80 patients who underwent laparoscopic cholecystectomy from January 2017 to February 2019. Post-operative Patients were assessed for days of hospital stay, visual analogue scale (VAS) pain score at 6 hrs and 24 hrs and time taken for return to routine activity.

Results: The VAS pain score at 6 hrs and 24 hrs was less among the three post LC cases as compared to four port LC cases which was statistically significant. ($p=0.005$). Duration of stay in hospital and return to routine activity was also significantly longer among four port LC cases.

Conclusion: Three-port LC technique is feasible and has better clinical outcomes, and the procedure has considerable advantages over four-port LC in relation.

Keywords: Three port Laparoscopic Cholecystectomy, Four port Laparoscopic Cholecystectomy, Visual analogue scale, Duration of stay in Hospital, Operative time etc.

Introduction

Gallbladder conditions contributes majority of digestive tract disorders. Cholelithiasis is the most common biliary tract pathology.⁽¹⁻³⁾ Gall stone is commonest gall bladder pathology amongst the people living in the Northern India especially the gangetic belt, so much so that cholecystectomy is the single most commonly performed surgical procedure in this part of the world.^(4,5)

The first laparoscopic cholecystectomy (LC) was done by Phillip Mouretin 1987 and afterwards in 1990 it was established by Dubois and Perissat.^(6,7)

Standard laparoscopic cholecystectomy is done by using 4 trocars. The fourth trocar is used to hold the fundus of the gallbladder to expose Calot's triangle. It has been argued that the fourth trocar may not be necessary, and laparoscopic cholecystectomy can be done safely without using it. Several studies have shown that 3-port laparoscopic cholecystectomy is technically feasible.^(8,9,10)

This comparative study was conducted with the aim to evaluate and compare the benefits of three-port over four-port laparoscopic cholecystectomy.

Parameters like operative time, days of hospital stay, and assessment of postoperative pain score using a 10-cm visual analogue score (VAS).

Methodology

The study was conducted in the Indoor patients of department of Surgery of a Teaching hospital in a sub-urban area of Pune city, Maharashtra. This study was conducted among 80 patients who underwent laparoscopic cholecystectomy from January 2017 to-February 2019. Patients with symptomatic gall stone disease, confirmed on ultrasound, were included in the study.

Patients who were unfit for General anaesthesia, having other systemic complications, portal hypertension, cirrhosis of liver, pancreatitis, peritonitis, suspected malignancy were excluded from the study.

At the beginning patients were informed and written consent was obtained from each patient for inclusion in the study. Every alternate patient was assigned to Group -1 subjected to three-port laparoscopic cholecystectomy and Group-2 subjected to four port laparoscopic cholecystectomy.

After laparoscopic cholecystectomy patients were assessed for days of hospital stay, and postoperative pain score using a 10-cm visual analogue score (VAS) at 6 hrs and 24 hrs and time taken for return to routine activity.

Statistical analysis

Data were entered and analysed by Microsoft excel software 2016. Results were presented in the

form of frequency tables. Z test was applied to see whether the observed difference between two quantitative variables is significant or not. P value <0.05 was considered as significant.

Results

A total of 40 patients were assigned to each group. The mean age of Group-1 (3 port LC) was 47.02 yrs. and Group -2 (4 port LC) was 45.10 yrs. Majority cases were females in both groups 82.5% and 87.5% in Group-1 and Group-2 respectively. (Table-1)

The operative time required was less among the four port LC cases as compared to three port LC cases which was statistically significant. ($p=0.005$). The VAS pain score at 6 hrs and 24 hrs was also significantly low among three port LC as compared to four port LC cases. Duration of stay in hospital was little longer in Four port LC cases and duration required for return to routine activity was also significantly longer among four port LC cases. (Table-2)

Table: 1 Age and gender wise distribution of study population

Characteristics	Group-1 (N=40)	Group-2 (N=40)
Age (Mean in years)	47.02 (28-61)	45.10 (29-63)
Gender		
Male	7 (17.5%)	5(12.5%)
Female	33 (82.5%)	35(87.5%)
Acute case	4(10%)	3(7.5%)
Chronic case	36(90%)	37(92.5%)

Table: 2 Comparison of variables in patients of three-port and four-port groups

Variable	Group-1 (N=40) Mean \pm SD	Group-2 (N=40) Mean \pm SD	Z-value	P-value
Operative time in Minutes	56.50 \pm 15.12	48.05 \pm 11.2	2.84	0.005
VAS score at 6 hrs	4.3 \pm 0.44	5.1 \pm 0.53	7.42	0.00001
VAS score at 24 hrs	1.92 \pm 0.58	3.28 \pm 0.76	8.99	0.00001
Duration of stay in hospital in hours	36.29 \pm 5.1	42.17 \pm 5.8	4.81	0.00001
Return to routine activity in days	4.91 \pm 0.50	5.50 \pm 0.80	3.95	0.0002

Discussion

The mean age of the patients among both the groups was almost similar and majority of the

patients were females in both the groups. The study found that operative time required was significantly less among the four port LC cases as

compared to three port LC cases. Similar findings were reported by in study conducted in Delhi^{14, 11-13}. But a studies conducted at Nepal, Manipur and Dublin reported reverse finding that three port LC requires less time than four port LC. These may be due the difference in the experience of the operating Surgeons in conducting three port LC.

The VAS pain score at 6 hrs and 24 hrs was also significantly low among three port LC as compared to four port LC cases. Similar finding was reported by the studies conducted in Delhi, Nepal, Manipur and Dublin⁽¹¹⁻¹⁴⁾. As the number of ports are more therefore, it is obvious that the pain would be more in four port LC cases.

This study confirms the findings of similar study conducted at Nepal⁽¹¹⁾ and Delhi⁽¹⁴⁾ that duration of stay in hospital is longer in Four port LC cases and duration required for return to routine activity was also significantly longer among four port LC cases.

Therefore, overall the clinical outcome was better among three port cases as compared to four port LC cases.

Conclusion

Three-port LC technique is feasible and has better clinical outcomes, and the procedure has considerable advantages over four-port LC in relation to duration of hospital stay and return to routine activity which can save the cost to the patient.

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