



ORIGINAL RESEARCH PAPER

General Surgery

THREE-PORT MINI-LAPAROSCOPIC CHOLECYSTECTOMY PROSPECTIVE COMPARATIVE STUDY

KEY WORDS: Laparoscopic cholecystectomy; trocars; Calots triangle; Mini Lap

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ABSTRACT

Introduction: laparoscopic cholecystectomy the 4-port operation Technique is standard worldwide. This study is a comparison of the a 3-port or a 4-port method, and the intraoperative and postoperative findings of the groups were compared. **Materials and Methods:** The files of 70 patients who underwent a laparoscopic cholecystectomy due to gallbladder disease between April 2024 to September 2024 were analyzed. It is a prospective study. The patients were divided into 2 groups 35 each, according to the use of a 3-port or a 4-port method, and the intraoperative and postoperative findings of the groups were compared. **Results:** A total of 70 patient files were reviewed and the only significant difference between the 2 groups as follow. the 3-port cases, 10.5% were male, and 90.5% were female. Of the 4-port cases, 28.5% were male and 72.5% were female ($p=0.010$). A significant difference was seen between the 2 groups with respect to the mean operation time. The average hospitalization period was longer in the 4-port group. post op analgesia was less in 3-port group, return to normal activity was significant. No significant difference was found in the number of intraoperative complications: gallbladder perforation ($p=0.215$), liver hemorrhage ($p=0.481$), entry of the gallstone into the abdomen ($p=0.760$). **Conclusion:** The three-port LC was associated with reduced cost of an additional port, less use of analgesics, and less work days lost by patients to start regular activities, so it seems cost effective than four-port LC. three port cholecystectomy can be recommended as a safe alternative procedure in elective surgery, but in difficulties during Calot's triangle consider 4th port or open cholecystectomy.

INTRODUCTION

First laparoscopic cholecystectomy (LC) is performed in 1987.¹

Diseases of the gallbladder constitute the most, of which gallstone disease is the most common.²

LC is standard method of treatment of cholelithiasis.^{3,4}

Attempts at improvement in standard method aiming to improve cosmesis and reduction of postoperative pain, hospital stay, and cost.⁵

It can be reduced by Reducing the number of the ports from four to three is the most practical option.^{6,7,8,9}

In standard technique, the gallbladder fundus is grasped and retracted laterally through the lateral fourth port to expose the Calot's triangle.

In the three-port technique, the use of this fourth port omitted.¹⁰ LC without much difficulty by using the three-port technique defines technical feasibility.¹¹

This prospective comparative study aims at evaluating the feasibility of the three-port technique over four port.

METHODS

This study included 70 patients with symptomatic gallstone disease confirmed by ultrasound in the our hospital, MGSSH Thane from April 2024 to the September 2024.

Patients who were unwilling to be a part of the study, jaundiced patients with radiological evidence of common

bile duct stones, patients unfit for general anaesthesia, patients with liver cirrhosis, patients with portal hypertension, patients with coagulopathy, patients with acute cholecystitis, patients with empyema of gall bladder, pregnant female or patients with malignancy were excluded.

All patients were operated by the same surgeon. Informed consent been taken from all patients. Patients were randomized for the three-port LC group or the four-port LC group. The patients' demographics and ultrasound findings were recorded. Preoperative workup was done, and patients were admitted the day before surgery.

Three-port technique steps

The pneumoperitoneum was achieved by either open Hasson's technique. Ten millimetres infraumbilical (camera port), 10-mm subxyphoid (working port), and single 5-mm port 3 cm right to right midclavicular line and 3 cm downward from subcostal margin were inserted.

This allows better retraction of gall bladder. We used a 10-mm 30° operating telescope (Karl Storz) in the infraumbilical port.

The gallbladder was retracted using grasping forceps through the 5-mm port holding the infundibulum by its jaws and retracting the liver by its shaft providing exposure similar to that done by fundal grasper. Dissection was done through the 10-mm subxyphoid port.

The infundibulum was retracted with the left hand, and anterior and posterior dissection is done in Calot's triangle with the right hand creating wide window. Critical view of safety was obtained. Clipping of the cystic duct and cystic artery was achieved using Liga clip 400 10-mm through the

10-mm subxyphoid port.

Retrieval of the gallbladder was done through the umbilical port. The fascia of port site is closed with PORT Vicryl. Skin incisions were closed 2-0 Ethilon. All dressings were kept in place until the first follow-up visit after 1 week.

Standard Four-port technique steps

Another 5-mm port was inserted in right flank in the anterior axillary line in addition to the three ports used to grasp and provide traction to the gallbladder fundus. Rest of the procedure was the same.

Statistical Analysis

The student's t test, chi square test, z test with standard deviation was used to evaluate the difference in each parameter. A p value <0.05 was considered statistically significant.

RESULTS

The study included 70 patients: three-port group included 35 patients and four-port group included 35 patients. The demographic data were comparable in both groups. The current study included 90.5% female in 3 Port and 72.5% were female in 4 Port Group.

The mean operating time in three-port group was 40.3 ± 29.8 min and four-port group was 55.8 ± 32.3 min. Operative time was shorter in three port group than four port group ($p=0.04$).

In three port group there was no post-operative complications where as in four port group 3 (14%) patients showed post-operative complication (port site infection) which is statistically significant ($p=0.03$).

Mean Early return to work post surgery for three port group was 2.8 ± 0.95 and for four port group was 4.36 ± 2.6 days ($p=0.13$) significant.

post-operative pain it was measured using VAS score every 12 and 24 hours. A VAS score 1-3 was called as low pain score (mild) and 4-10 as high pain score (severe).

Mean VAS score for three port group was 1.20 ± 1.08 and in four port group was 2.9 ± 0.84 , which was statistically significant ($p=0.008$).

Post-operative analgesia required in three port groups was 70.83 ± 25.33 and in four port groups was 142 ± 40.3 with p value 0.0001 which is statistically significant.

significant difference was found in the number of intraoperative complications and post operative complication: that in 4 port group, Port site infection, gallbladder perforation ($p=0.215$), liver hemorrhage ($p=0.481$), entry of the gallstone into the abdomen ($p=0.760$).

DISCUSSION

Outcome of LC depends on reduction in postoperative pain, better cosmetic results, and early return to work. It has been claimed that reduction in the number and size of ports can achieve this outcome. This was proved by previous studies.^{12,13}

Gallstone disease is predominant in middle aged females, which might be linked to estrogen and progesterone hormone especially progesterone acting on gallbladder and reducing motility, causing stasis and thereby promoting gallstone formation. In present study female preponderance was present over male.^{13,14}

Operative time depends upon the skill of operating surgeon for the different technique. In present study shorter operative time in the 3-port group.

Intraoperative complication Haemorrhage in our study was

due to dense adhesion of gall bladder with surrounding structures and also due to buried gall bladder. This result of our study was similar with the Chauhan et al study.¹⁵

In present study three port group required less analgesia than four port group due to less number of skin incision in three port group. This result is similar with Kumar et al study.

In present study post operative complication was most common in 4 port group that is port site infection. This result is similar with Aziwa study.¹⁴

Early return to work in three port group as compared to four port group was seen. Four port over three-port LC showed, less postoperative pain, early return to normal activity, less intra operative complications and post-operative complications.

CONCLUSION

The three-port LC was associated with reduced cost of an additional port, less use of analgesics, and less work days lost by patients to start regular activities, so it seems cost effective than four-port LC. three port cholecystectomy can be recommended as a safe alternative procedure in elective surgery, but in difficulties during Calot's triangle consider 4th port or open cholecystectomy.

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