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Original Research

Comparative evaluation of efficacy of Two-port mini laparoscopic cholecystectomy and standard four-port laparoscopic cholecystectomy: A clinical study

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ABSTRACT

Background: Preliminary reports on the performance of LC suggest that the increased rate of intraoperative complications is attributed to technical difficulty. Several studies have demonstrated that less postoperative pain is associated with a reduction in either size or number of ports. Hence; under the light of above mentioned data, we planned the present study to comparatively evaluate the efficacy of Two-port mini laparoscopic cholecystectomy and standard four-port laparoscopic cholecystectomy. **Materials & methods:** The present investigation included evaluation and comparison of efficacy of two-port mini laparoscopic cholecystectomy and standard four-port laparoscopic cholecystectomy. A total of 26 patients scheduled to undergo LC were included in the present study and were broadly divided into two study groups with 13 patients in each group. One group comprised of patients that underwent Two-port mini LC, while the other group consisted of patients that underwent standard four-port LC. All the surgeries were performed under the hand of skilled and experienced surgeons. Follow-up records of all the patients were maintained and were compiled in Microsoft excel sheet and were analyzed by SPSS software. **Results:** Mean length of stay among the subjects of the two port and four port group was 25.68 and 24.12 hours respectively. Mean duration required for returning to daily activities among subjects of two port and three port group was 4.12 and 5.64 days respectively. Non- significant results were obtained while comparing the occurrence of complications in between the subjects of the two study groups. **Conclusion:** Two-port mini LC technique can be safely and effectively be carried out in gall stone patients. However; further research is recommended.

Key words: Four-port, Laparoscopic cholecystectomy, Two- port

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INTRODUCTION

Laparoscopic cholecystectomy (LC) since its inception in 1989 has become the gold standard treatment for gall stone disease. The technique of performing LC has undergone many changes and variations. Several surgeons have tried to reduce the size and number of ports to improve cosmetic and postoperative outcomes and developed their own different versions.¹⁻³

Preliminary reports on the performance of LC suggest that the increased rate of intraoperative complications is attributed to technical difficulty. The initial rate of common bile duct (CBD) injury in LC ranged from 0.2% to 3%, or up to 5 times higher than in OC. However, experience with LC and improved laparoscopic principles encouraging the accurate anatomical identification of structures, limited dissection within Calot's triangle, and the judicious use of intraoperative cholangiography have stabilized the CBD injury rate to a range of 0.25% to 0.5% nationwide.⁴⁻⁶

In the era of laparoscopic surgery, less postoperative pain and early recovery are major goals to achieve better patient care and cost effectiveness. Several studies have demonstrated that less postoperative pain is associated with a reduction in either size or number of ports.⁷⁻⁹

Hence; under the light of above mentioned data, we planned the present study to comparatively evaluate the efficacy of Two-port mini laparoscopic cholecystectomy and standard four-port laparoscopic cholecystectomy.

MATERIALS & METHODS

The present investigation was conducted in the department of general surgery of the medical institute and it included evaluation and comparison of efficacy of two-port mini laparoscopic cholecystectomy and standard four-port laparoscopic cholecystectomy. Ethical approval was obtained from the

institutional ethical committee. Written consent was obtained from all the patients after explaining in detail the entire research protocol. A total of 26 patients scheduled to undergo LC were included in the present study and were broadly divided into two study groups with 13 patients in each group. One group comprised of patients that underwent Two-port mini LC, while the other group consisted of patients that underwent standard four-port LC. Routine blood investigations were conducted in all the patients before the surgery. All the surgeries were performed under the hand of skilled and experienced surgeons. Inclusion criteria for the present study included:

- Patients with Body mass index less than 30 Kg/m²,
- Patients with negative history of any systemic illness,
- Patients with negative history of any known drug allergy,
- Patients with negative history of presence of any bleeding disorder

Complete demographic and clinical data of all the patients was obtained. Follow-up records of all the patients were maintained and were compiled in Microsoft excel sheet and were analyzed by SPSS software. Chi- square test was used for assessment of level of significance. P- value of less than 0.05 was taken as significant.

RESULTS

In the present study, a total of 26 patients scheduled to undergo LC were included and were broadly divided into two study groups with 13 patients in each group. One group comprised of patients that underwent Two-port mini LC, while the other group consisted of patients that underwent standard four-port LC. Mean age of the patients of the two port mini LC group and standard four port LC group was 48.2 and 45.2 years respectively. There were 8 males and 7 females in the two port group while there were 7 males and 8 females in the four port group respectively. Mean Body mass index of the subjects of the two port and three port group was 24.5 and 23.1Kg/m² respectively. Mean duration of surgery among the subjects of the two port and four port group was 53.2 minutes and 51.6 minutes respectively. Mean length of stay among the subjects of the two port and four port group was 25.68 and 24.12 hours respectively. Mean duration required for returning to daily activities among subjects of two port and three port group was 4.12 and 5.64 days respectively. Significant results were obtained while comparing the mean duration required for returning to daily activities. Hemorrhage was seen in 2 patients of the two port group while it was seen in 1 patient of the four port group. Stone spillage

Graph 1: Demographic data

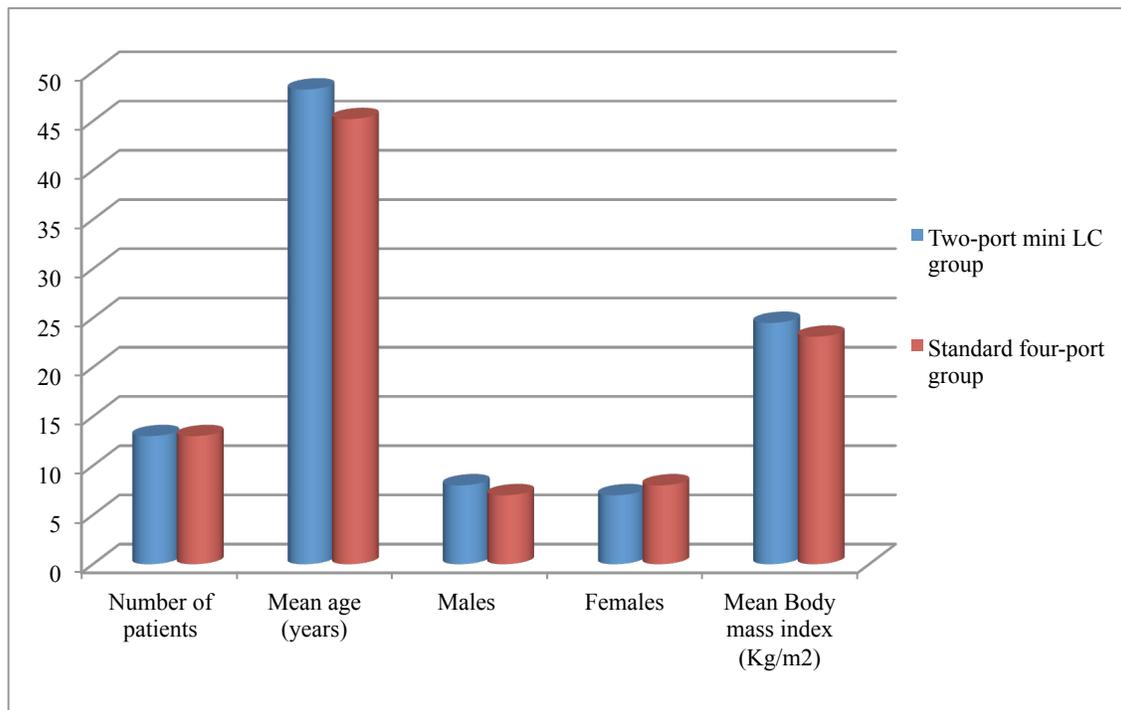


Table 1: Comparison of efficacy between two port and four port LC techniques

Parameter	Two-port mini LC group	Standard four-port group	P-value
Duration of surgery (minutes)	53.2	51.6	0.58
Length of stay (hours)	25.68	24.12	0.88
Return to daily activities (days)	4.12	5.64	0.02*

*: Significant

Table 2: Comparison of complications between two port and four port LC techniques

Complications	Two-port mini LC group (number of patients)	Standard four-port group (number of patients)	P-value
Hemorrhage	2	1	0.58
Stone spillage	4	5	
Others	0	1	

was seen in 4 patients of the two port group, while it was seen in 5 patients of the four port group. However; non- significant results were obtained while comparing the occurrence of complications in between the subjects of the two study groups.

DISCUSSION

The main advantages of laparoscopic surgery include better cosmetic results, decreased post-operative pain and faster functional recovery.⁷ In the present study, Mean age of the patients of the two port mini LC group and standard four port LC group was 48.2 and 45.2 years respectively. There were 8 males and 7 females in the two port group while there were 7 males and 8 females in the four port group respectively. Mean Body mass index of the subjects of the two port and three port group was 24.5 and 23.1Kg/m² respectively. Sreenivas S et al compared the standard four-port LC with two-port mini LC. A total of 116 consecutive patients undergoing LC were randomised to four-port/two-port mini LC. In two-port mini LC, a 10-mm umbilical and a 5-mm epigastric port were used. Outcomes measured were duration and difficulty of operation, post-operative pain, analgesia requirements, post-operative stay, complications and cosmetic score at 30 days. Out of 116 patients, the ratio of M:F was 11:92, with mean age 40.79 ± 12.6 years. Twelve patients (nine in four-port group and three in two-port group) were lost to follow-up. The mean operative time were similar (P = 0.727). Post-operative pain was significantly low in the two-port group at up to 24 hrs (P = 0.023). The overall analgesia requirements (P = 0.003) and return to daily activity (P = 0.00) were significantly lower in two-port group. The cosmesis score of the two-port group was better than four-port group (P = 0.00). However, the length of hospital stay (P = 0.760) and complications (P = 0.247) were similar between the two groups. Two-port mini LC resulted in reduced pain, need for analgesia, and improved cosmesis without increasing the operative time and complication rates compared to that in four-port LC. Thus, it can be recommended in selected patients.¹⁰

In the present study, mean duration of surgery among the subjects of the two port and four port group was 53.2 minutes and 51.6 minutes respectively. Mean length of stay among the subjects of the two port and four port group was 25.68 and 24.12 hours respectively. Mean duration required for returning to daily activities among subjects of two port and three port group was 4.12 and 5.64 days respectively. Significant results were obtained while comparing the mean duration required for returning to daily activities. Novitsky YW et al hypothesized that LC using miniports (M-LC) is safe and produces less incisional pain and better cosmetic results than LC performed conventionally (C-LC). Seventy-nine patients scheduled for an elective LC who agreed to participate in this trial were randomized to undergo surgery using 1 of the 2 instrument sets. Thirty-three C-LCs and 34 M-LCs were performed and analyzed. There were 8 conversions (24%) to the standard technique in the M-LC group. No intraoperative or major postoperative complications occurred in either group. The average incisional pain score on the first postoperative day was significantly less in the M-LC group (3.9 vs 4.9; P = .04). No significant differences occurred in the mean scores for pain on postoperative days 3, 7, and 28. However, 90% of patients in the M-LC group and only 74% of patients in the C-LC group had no pain (visual analog scale score of 0) at 28 days postoperatively (P = .05). Cosmetic results were superior in the M-LC group according to both the study nurse's and the patients' assessments. Laparoscopic cholecystectomy can be safely performed using 10-mm umbilical, 5-mm epigastric, 2-mm subcostal, and 2-mm lateral ports.¹¹

In the present study, Hemorrhage was seen in 2 patients of the two port group while it was seen in 1 patient of the four port group. Stone spillage was seen in 4 patients of the two port group, while it was seen in 5 patients of the four port group. However; non-significant results were obtained while comparing the occurrence of complications in between the subjects of the two study groups. Lee KW et al tested the feasibility of needlescopic

cholecystectomy using a two-port technique with 3-mm miniaturised instruments. They determined the technical difficulty of this new technique by comparing the data from the first 50 patients with those of the latter 50. One conversion to open cholecystectomy was reported. Three patients required the enlargement of epigastric port to a size of 5 mm and six patients required an additional port to complete the operation. The median operating time was 62 minutes (range, 33-168 minutes). The median pain score was 3.5 (range, 0-9) and the median postoperative stay was 2 days (range, 1-14 days). Six patients had postoperative complications. When the first 50 patients were compared with the latter 50, there were no differences in the conversion rate, operating time, complication rate, and duration of hospital stay. However, the latter 50 patients had significantly lower pain scores and faster resumption of diet. The median operating time of needlescopic cholecystectomy was notably longer compared with that of the two-port laparoscopic cholecystectomy. Patients undergoing needlescopic cholecystectomy had a better resumption of diet and less postoperative pain than the two-port laparoscopic cholecystectomy group. Two-port needlescopic cholecystectomy is technically feasible and may further improve the surgical outcomes in terms of postoperative pain and cosmesis.¹²

CONCLUSION

Under the light of above obtained data, the authors conclude that Two-port mini LC technique can be safely and effectively be carried out in gall stone patients. However; further research is recommended.

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