

A Retrospective Observational Study to Compare the Outcome of Two Port versus Three Port Laparoscopic Cholecystectomies Performed at BMC Sagar

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Abstract:

Introduction: Laparoscopic cholecystectomy is conventionally done by using three or four ports of various size. Cosmesis is very important aspect of laparoscopic surgery. So, trend is towards us of fewer ports for better cosmesis.

Objective: Aim of the study is to compare outcome between two port & three port laparoscopic cholecystectomy and see whether there is any advantage in using one technique over the other.

Method: Total number of 42 patients who underwent laparoscopic cholecystectomy were studied and divided into two groups. In Group A, patients who were operated by three port and in Group B, those operated by two port laparoscopic cholecystectomy were studied. The outcome was measured as primary and secondary. Primary included better cosmetic appearance of scar & secondary included post-operative pain, amount of analgesic required, time to ambulation & duration of hospital stay.

Results: Out of 42 subjects enrolled, 16 were males and 26 females. Laparoscopic cholecystectomy using two ports yielded no mortality and no significant difference in surgical complications or conversion to open surgery. On the other hand, it resulted in better outcome in terms of cosmetic appearance, patient satisfaction, need for analgesia, early ambulation & cost effectiveness.

Conclusion: Two port laparoscopic cholecystectomy has an edge over three port laparoscopic cholecystectomy due to excellent appearance of scar and less post-operative pain. Thus, it may emerge as a better alternative to improve patient outcome.

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Introduction

Laparoscopic cholecystectomy is considered the 'gold standard' for treatment of cholelithiasis [1]. The first laparoscopic cholecystectomy was performed in 1987 by Phillip Mouret and was later established by Dubois and Perissat in 1990 [2]. It was then quickly adopted around the world, and in 1992 soon after it became the new gold standard [2]. Short length of hospital stay, immediate regaining of physical activity, low prevalence of postoperative pain, and good cosmetic outcomes contribute to the benefits of laparoscopic cholecystectomy [3]. Laparoscopic cholecystectomy is generally performed using four ports into abdominal cavity: one for camera port, one for retraction of gallbladder & two for manipulation ports [4]. With increasing experience,

it has been shown that laparoscopic cholecystectomy can be safely performed using three ports also, and recently, two-port technique and single incision Laparoscopic cholecystectomy [5,6,7] has been shown to be feasible. The two-port laparoscopic cholecystectomy has been reported to be safe and feasible with significantly reduced post-operative pain & cosmetically more acceptable than the conventional four-port technique [5]. Furthermore, as patients have growing awareness of the quality of life, there has been an increase in demand for cosmesis. The aim of this study was to compare two-port with three-port laparoscopic cholecystectomy and to demonstrate whether there are extra benefits with two-port laparoscopic cholecystectomy.

Material & Method

In this retrospective, observational, single-center study undertaken at General Surgery Department of Bundelkhand Medical College, Sagar, a total of 42 patients who underwent laparoscopic cholecystectomy were included, out of which 26 were females and 16 males. This study was performed in Bundelkhand Medical College, Sagar, from July 2022 to June 2023. Ethical approval was obtained from the hospital review committee before conducting the study.

Inclusion criteria was patients who underwent planned laparoscopic procedure, and age of 18 years or older. Following counselling with a member of the research team and provision of written patient information relating to the study prospective, signed informed consent was obtained from each patient before inclusion.

Exclusion criteria included: non-laparoscopic procedure, any patient incapable of providing informed consent, and those unable to commit to the medical follow-up of the study for geographical, social, or psychological reasons.

As per the number of ports used in laparoscopic cholecystectomy, patients were divided into operated case via two ports & three ports, each group consisting of 21 patients. Group A: Laparoscopic cholecystectomy by using 2 ports Group B: Laparoscopic cholecystectomy by using three ports.

Two port laparoscopic cholecystectomy: Pneumoperitoneum was established by blind puncture using Veress needle. After insufflation of the abdomen with CO₂, two ports were inserted into the peritoneal cavity: one 10mm optical port above or below the umbilicus and another 10 mm operating port in the epigastric area (3cm below xiphisternum). The operating surgeon performs the procedure from the left side of the patient. The gall bladder is manipulated through two or three strategically placed traction sutures, passed through fundus, the body, and the neck area of the gall bladder, respectively, using laparoscopic straight needle holder.

The fundal suture was placed higher up in the right hypochondrium just below the tip of 9th costal cartilage. It was fixed by either tying a knot or by hemostatic clips. The second suture was placed through the body of gallbladder and was placed below the fundal suture in the same fashion. The other traction suture was placed in the right flank at a lower level to hold the neck of gallbladder. The

gallbladder was then separated from the liver bed and extracted through the epigastric operating port. When a drain was needed, it was introduced through the epigastric port.

Three port laparoscopic cholecystectomy: The three-port technique was done by using one 10-mm umbilical port for camera, one 10-mm operating port in the epigastrium, one 5-mm port in the right hypochondrium for retraction at gall bladder neck. The fundus of the gall bladder was tied with a suture passed from the anterior axillary line. Postoperative pain was measured using the Visual Analogue Scale, which consists of a line, usually 100 mm long, whose ends are labelled as the extremes ('no pain and 'pain as bad as it could be'). The patient is asked to put a mark on the line indicating his/her pain intensity.[8]

The cosmetic appearance was assessed using the Hollander Wound Evaluation Scale [5], which addresses six clinical items: (i) step-off borders, (ii) contour irregularities, (iii) scar width, (iv) edge inversion, (v) excess inflammation, and (vi) overall cosmetic appearance. Each of these items was graded from 0–1; the optimal score was 6, and any score less than this was considered suboptimal.

Data was entered in password-protected Microsoft Excel software and the outcome in terms of visual analogue scale (for post-operative pain), amount of analgesia required, time to ambulating, and duration of hospital stay was calculated and compared.

Result & discussion: Study to compare the efficacy of two port laparoscopic cholecystectomy over three port was carried out for 42 subjects. There were 16 males and 26 females. Conversion to open surgery was not done for any group.

Hollander Wound Evaluation Scale Score for post-operative scar in study subject: Moreover, port site hernia was not observed in both groups, and there were no deaths during the time of study. Cosmetic appearance and patient satisfaction for the scar were optimal (excellent) in 34 patients (88.57%) and suboptimal (good) in 8 patients (11.42%); however, as regards group A, they were excellent in 18 patients (62.85%) and suboptimal in 3 patients (37.14%). Table 1 shows patient characteristics and follow-up results. The two-port method appeared financially affordable on using disposable instruments.

Visual Analogue Scale Scoring for Post-Operative Pain in Study Subjects

Table 1:

VAS	Two port laparoscopic cholecystectomy			Three port laparoscopic cholecystectomy		
	Male(5)	Female(16)		Male (10)	Female(11)	
0 to 10						
0-3	4(9.52%)	13(30.95%)	18	7(16.66%)	8(19.04%)	15(35.71%)
4-6	1(2.38%)	2(4.76%)	2	3(7.14%)	2(4.76%)	5(11.90%)
7-9	0	1(2.38%)	1	0	1(2.38%)	1(2.38%)
10	0	0	0	0	0	0
	5(11.90%)	16(38.09%)	21(50%)	10(47.61%)	11(52.38%)	21(50%)

Table 2:

Hollander wound evaluation score	Two port laparoscopic cholecystectomy			Three port laparoscopic cholecystectomy		
	Male (5)	Female (16)		Male (10)	Female (11)	
0 to 6 score						
6	4(9.52%)	13(30.95%)	17(40.47%)	7(16.66%)	8(19.4%)	16(35.69%)
5	1(2.38%)	2(4.76%)	2(7.14%)	2(4.76%)	2(4.76%)	5(9.53%)
4	0	1(2.38%)	1(2.38%)	1(2.38%)	1(2.38%)	2(4.76%)
3	0	0	0	0	0	0
	5(11.9%)	16(38.09%)	21(50%)	10(23.80%)	11(26.19%)	21(50%)

Post-operative pain in two port laparoscopic cholecystectomy was less in comparison to three port laparoscopic cholecystectomy as assessed by Visual Analogue Scale.

Amount of analgesia required in cases of using two ports was on an average of 15 infusions of 100 mL Paracetamol as compared to average 18 infusions in three ports. Average time to ambulation in two port laparoscopic cholecystectomy was 1 day whereas it was 1.2 days by using three ports.

Average duration of hospital Stay was maximum during 4-6 days period in both cases. The mean operative time was 45.243 min for group A and 40.567 min for group B.

Thus, in terms of outcome, laparoscopic cholecystectomy by using two ports-seems to be a promising alternative in laparoscopic cholecystectomies.

Conclusion

Two-port laparoscopic cholecystectomy needed more operative time and more experience to be performed. It has advantages over three port laparoscopic cholecystectomy in that the patients having excellent cosmetic outcome, patient's satisfaction & minimal post-operative pain with needs of less analgesia and had a shorter hospital stay. The other advantages include cost effectiveness.

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