

Comparative Study of Laparoscopic Assisted Two-Port Appendectomy versus Three-Port Appendectomy on Post-Operative Evaluation and Complications

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Abstract

Case Report

The laparoscopic appendectomy is gaining popularity because of shorter operative time, lesser post-operative pain and lesser incidence of surgical site infections. Complicated appendicitis and poor risk for general anesthesia are considered to be relative contraindications for laparoscopic appendectomy. The advantages of laparoscopic appendectomy are well proven in several prospective randomized trials and it can be performed using one to several ports. The aim of minimal access surgery is not only to minimize the number of ports but also the cost of surgery. Thus, laparoscopic assisted open appendectomy approach using two non-disposable ports saves the cost and has no added morbidity. Two-port assisted open appendectomy has the advantage of diagnostic laparoscopy and open appendectomy. It is simple and can be converted to open or intracorporeal approach when required. The aim of this article is a comparative analysis to look post-operative evaluations and complications of laparoscopic assisted two-port appendectomy versus three-port appendectomy.

Keywords: appendicitis, hospital stay, laparoscopic appendectomy, three-port, two-port.

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INTRODUCTION

The human vermiform appendix is usually referred to as “a vestigial organ with no known function”, however currently available evidence suggests that appendix is highly specialized part of alimentary tract. The appendix arises from the posteromedial aspect of cecum about 2.5 cm from iliocaecal valve where all three teniae coil coalesce. It is the only organ in the body that has no constant anatomic position. Among the causes of acute abdominal pain, acute appendicitis is the most common cause which could be handled by laparoscopy as best efficient tool [1-4]. A few randomized controlled trials have shown that laparoscopic appendectomy is safe and effective for treatment of appendicitis with improvement in outcome [1].

Over the past decade, the outcomes of laparoscopic appendectomies have compared favorably to those for open appendectomies because of decreased pain, fewer postoperative complications, shorter hospitalization, earlier mobilization and earlier return to work [5-7]. The conventional three-port technique for laparoscopic appendectomy requires three or more ports and involves high cost. Laparoscopic assisted open

appendectomy approach using two non-disposable ports saves the cost and has no added morbidity [5].

The aim of the present study is a comparative analysis to look post-operative evaluations and complications of laparoscopic assisted two-port appendectomy versus three-port appendectomy.

METHODS AND MATERIALS

This study was a hospital based randomized comparative intervention study, carried out in the upgraded department of general surgery of Sawai Man Singh Hospital Jaipur between periods from March'2017 to September'2018. A total of 60 cases were analyzed to carry out the study. All the cases who met the inclusion and exclusion criteria of the study were randomly allocated in two groups A and B (30 in each group). Allocation of the cases in group A of three-port laparoscopic appendectomy or group B of two-port laparoscopic appendectomy is done by simple random technique through chit box method. The participants in this study were belonging to abdomen pain diagnosed as acute appendicitis or recurrent appendicitis and consented for appendectomy.

A detail history with reference to onset duration of symptoms, occupational factors and systemic diseases were collected. The data were collected as per predefined performa to include various personal habits like tobacco chewing, smoking, alcohol consumption etc. The female patients were assessed for menstrual, reproductive factors and detail of parity. Thorough local and systemic examinations; blood investigations, chest x-ray and abdomen ultrasound were carried out.

Patients those having serious pre-existing cardiovascular, pulmonary or immunological diseases; appendicular lump, perforated appendix, gangrenous appendix and pelvic abscess; coagulation disorder;

pregnancy; and with multiple previous surgeries were not included in this study. In addition, patients who were not giving consent for undergoing study were also excluded from the study.

The method of analysing the significance of results were based on chi-square and unpaired t-test; considered, p-value less than 0.05 as a significant result.

OBSERVATIONS AND RESULTS

The various study parameters as shown in table 1 were considered in this comparative analysis study. The corresponding observations and results listed below in table were collected during the study period.

Table-1: Observations and Results for study population belong to group A and group B

S. No.	Study parameters	Observations		p value
		Group A: Three-port laparoscopic appendectomy	Group B: Two-port laparoscopic appendectomy	
1	Mean age (in years)	29±9.59	28.33±8.13	NS
2	Male and female ratio (M:F)	36.67:63.33	33.33:66.67	NS
3	Operation time (in minutes)	28.07±6.26	23.87±6.38	0.0022 (S)
4	Post-operative evaluation:			
	Return of bowel sound (in hours)	18.53±4.60	14.20±3.39	NS
	Parental analgesic requirements (frequency)	19	10	0.020 (S)
	8 hourly (no. of patients)	11	20	NS
	12 hourly (no. of patients)			
	Course of analgesic requirements (duration)	24	20	NS
	1 day (no. of patients)	16	4	0.044 (S)
	2 day (no. of patients)			
	Visual analogue scale	4.66±1.06	3.61±0.91	<0.001 (S)
	Post-operative hospital stay			
	1 day (no. of patients)	4	8	NS
2 day (no. of patients)	14	18	NS	
3 day (no. of patients)	12	4	0.048 (S)	
5	Post-op return to work			
	Less than 14 days (no. of patients)	20	27	0.028 (S)
	More than 14 days (no. of patients)	10	3	NS
5	Post-operative complications:			
	Nausea	4	2	NS
	Port site infection	2	0	NS
	Urinary retention	3	0	NS
	No complications	21	28	0.019 (S)

(S = significant, NS = non-significant)

In three-port laparoscopic appendectomy, the mean operative time was found to be 28.07 minutes, while in two port appendectomy it was 23.87 minutes. The mean operative time was significantly higher in three-port as compared to two-port.

The results of respective parameters on post-operative evaluation for group A and B are presented in table 1. The bowel sound, in most of the cases was found within 12 hours in the patients of group B, but result was not significant. The figure 1 (a) shown below

represents 8 hourly frequency of analgesic requirement that was highly significant for group B patients as only 33.33% patients were required analgesic, while this requirement was very high as 63.33% by patients of group A. Further, the proportion of the patients those required 2 days course of analgesic were significantly higher in group A equal to 53.33% that of for group B was 13.3%, as shown in figure 1 (b). The visual analogue scale (0 to 10) was significantly higher in group A patients. The proportion of the patients who had a post-operative hospital stay of one day were

lower in group A, while the same proportion for three-days stay were significantly higher in patients of group A equal to 40% which was 13.33% in group B, and the same is presented in figure 1 (c). The figure 1 (d)

concluded that the patients who returned to their work in 14 days after operation were having significant proportion of 90% in group B which was 66.67% in group A.

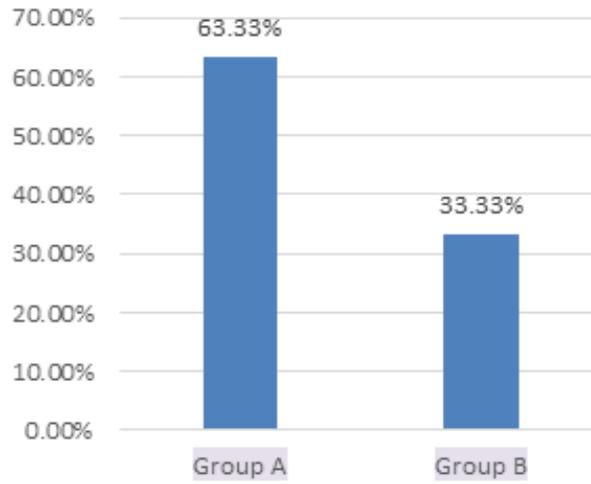


Fig-1(a): Frequency of analgesic requirement

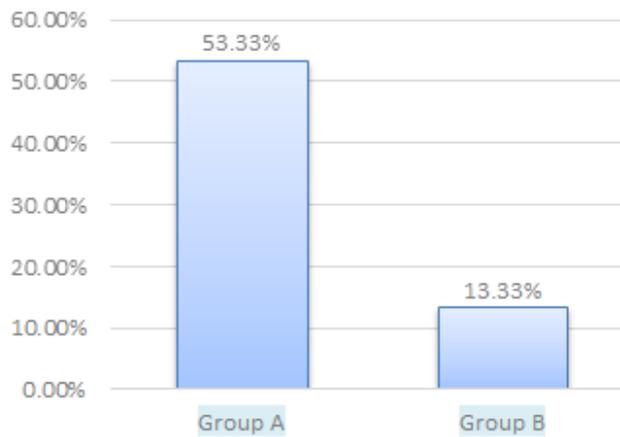


Fig-1(b): 2 days course of analgesic

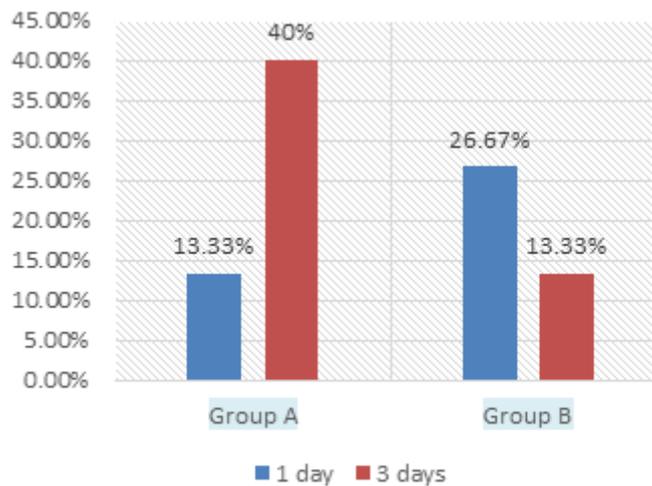


Fig-1(c): Comparison of 1 and 2 days post-operative Hospital stay

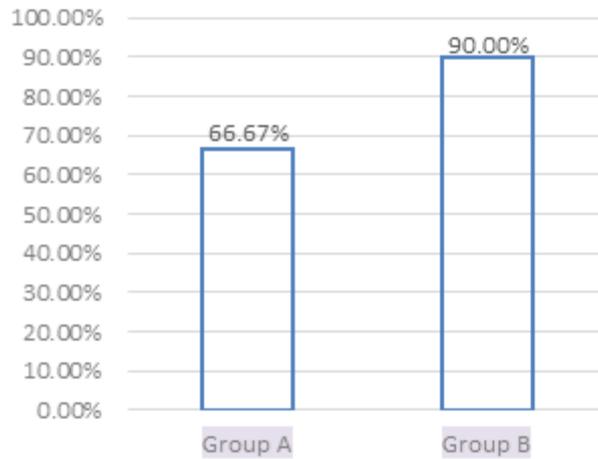


Fig-1(d): Return to work after 14 days of operation

The post-operative complications as tabulated in table 1 are represented in figure 2 shown below. From the figure, it may be inferred that only two cases of group B had complained of nausea, when compared to four cases of group A. Urinary retention was also noticed more in group A patients (3 cases), however the

difference were not significant statistically. Although, individual post-operative complications were statistically comparable in both the groups (not significant) but proportion of patients with no complications were significantly higher in group B as compared to group a (92.86% versus 88.57%).

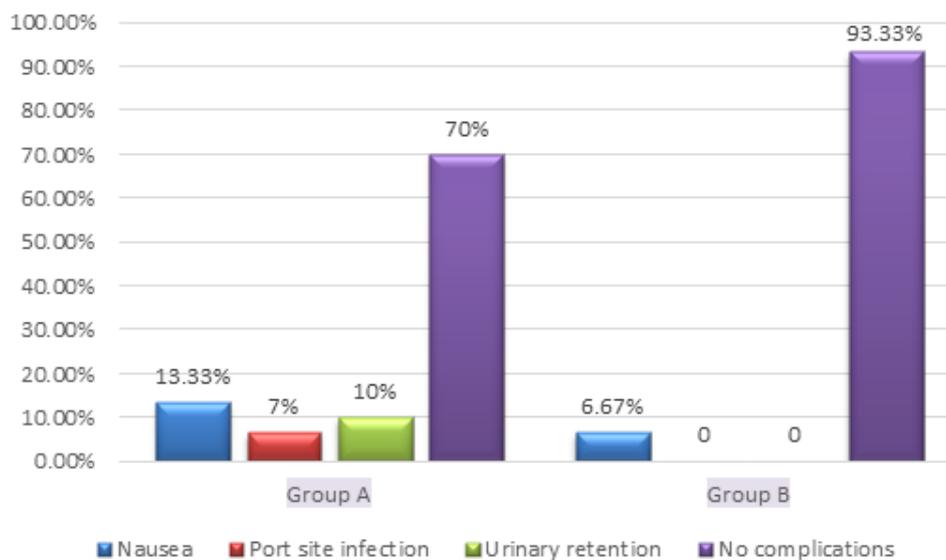


Fig-2: Comparative analysis of post-operative complications in group A and group B patients

Results shown in figures 1 (a to d) and figure 2 is concluded that the two-port laparoscopic appendectomy is better than three-port laparoscopic appendectomy.

DISCUSSION

The laparoscopic appendectomy has now become an indispensable tool for treatment of those with undiagnosed abdominal pain for diagnostic workup. It is considered to be a safe and excellent alternative to open appendectomy. Complicated appendicitis and poor risk for general anesthesia are considered to be relative contraindications for

laparoscopic appendectomy. Traditional laparoscopic appendectomy (three-ports) did not offer much advantage due to prolonged operative time and higher cost [5].

The study presented here found statistically significant difference between outcomes of two-point and three-point techniques of appendectomy. The mean operative time was significantly lower in two-port and significantly higher in three-port technique. Short-operative time in two-port technique was probably because of ease of operative technique and extracorporeal knotting being easier and faster. Results

shown significant difference in the length of hospital stays in laparoscopic group for two-port and for three-port. Patient's assisted two-port laparoscopic appendectomy was discharged early from the hospital, probably because of lesser postoperative pain and early return of bowel movement.

Further, the post-operative complications were significantly lower in both the groups. Though, appendix was delivered through the trocar hole and was inflamed in most cases, but surgical site infections were not higher probably because of preoperative prophylactic antibiotics were used. There was no case of intra-abdominal abscess in any group, probably because only uncomplicated acute appendicitis was included in this study.

This comparative study has confirmed that the two-port laparoscopic appendectomy is found to be more effective because of low cost, shorter operative time, significant early discharge from the hospital and lesser surgical site infections.

CONCLUSION

The advantages of laparoscopic appendectomy are well proven in several prospective randomized trials and it can be performed using one to several ports. Each technique has its own merits and demerits. The two-port technique offers a better post-operative experience with less pain, reduced use of analgesics and reduced hospital stay. The return of bowel sound is earlier in the two-port technique with early starting of oral feeding. Post-operative nausea and vomiting is also decreased in two-port laparoscopic appendectomy.

Thus, it can be concluded that the two-port laparoscopic appendectomy technique is better and safer alternative to traditional three-port technique in performing a safe laparoscopic appendectomy.

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