

Original Article

Superiority of Laparoscopic Appendectomy over Open Appendectomy: The Hyderabad Experience

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ABSTRACT

Objective: To compare the out come of laparoscopic and open appendicectomies in terms of operative time, analgesic requirement, postoperative complications, hospital stay, return to normal activity and condition of scar.

Methods: This prospective study was carried out in Department of Surgery, Liaquat University Hospital Hyderabad/ Jamshoro from September 1997 to August 2000.

One hundred consecutive patients of age ranging from 15-45 years with features suggestive of acute appendicitis were equally divided into laparoscopic appendectomy (LA) and open appendectomy (OA) groups, after taking informed consent. LA was done with the help of three trocar/cannulae creating pneumoperitoneum with CO₂ whereas OA was performed by Lanz incision. The data were analyzed by Student t-test and Chi square tests using SPSS version 10.

Results: The operating times in OA and LA were 20-70 minutes (mean 30) and 25-95 minutes (mean 55) respectively. Increased doses of analgesics, antibiotics and antiemetics were required in OA, as compared to LA. The mean postoperative hospital stay in LA group was 1.4 days (range 1-3 days) whereas it was in OA group, it was 3.5 days (range 2-6 days).

Conclusion: LA is safe and has major benefits like less postoperative pain, decreased wound infection, early hospital discharged, early return to work and a better cosmetic scar than OA. (Rawal Med J;33:165-168).

Key words: Appendicitis, appendectomy, laparoscopic appendectomy.

INTRODUCTION

Approximately 7% of the population develop appendicitis in their life time¹ with peak incidence between the ages of 10 and 30 years² making appendectomy the most frequently performed abdominal operation.³ The unnecessary opening of the abdominal cavity and removal of normal appendix can be prevented by laparoscopy.⁴ The major benefits to patients undergoing laparoscopic appendectomy (LA) are early hospital discharge, reduced postoperative pain, decreased wound infection, early return to full activity and a better cosmetic scar.^{5,6} The limitations of LA are technical difficulty, non availability of equipment every where, longer duration of operation, higher expense and increased incidence of intra abdominal abscesses⁷ and has not as yet gained wide spread acceptance.⁸ LA is relatively a new technique and requires comparison to open appendectomy (OA) to determine its advantages. The objective of this study was to compare the out come of LA and OA in terms of operative time, analgesic requirement, postoperative complications, hospital stay, return to normal activity and condition of scar.

PATIENTS AND METHODS

This prospective study was conducted at Department of Surgery, Liaquat University Hospital Hyderabad/ Jamshoro from September 1997 to August 2000. One hundred consecutive patients of age ranging from 15-45 years with features suggestive of acute appendicitis were included in this study by convenient sampling method. All patients

with history of lump at right iliac fossa, abdominal trauma, previous lower abdominal operation and females with amenorrhea were excluded from the study. Patients were equally divided into LA and OA groups after taking informed consent. A history, physical examination, complete blood picture, urinalysis and ultrasound of abdomen were performed in all patients.

LA was done with the help of three trocar/cannulae creating pneumoperitoneum with CO₂. After identification of appendix, mesoappendiceal vessels were divided between endovascular clips. Three endovascular clips or chromic endoloops were placed around the appendix. Appendix was divided between two proximal and one distal endoloops. Appendix was delivered after placing in gloved finger. OA was done by Lanz incision.

Table 1. Total number of doses of drugs used in post-operative period (n=100).

NO	DRUGS	LAPAROSCOPIC APPENDICECTOMY		OPEN APPENDICECTOMY	
		Range	Mean	Range	Mean
1	Analgesics	1– 4 doses	1.6 doses	3–8 doses	4.8 doses
2	Antibiotics	3 – 8 doses	5.6 doses	6–10 doses	8.9 doses
3	Antiemetics	0 – 3 doses	0.5 doses	0– 4 doses	1.2 doses

Operative findings and the time taken for each operation were recorded. The operative time was noted from making skin incision to skin closure. The use of postoperative analgesics and antibiotics, dates of discharge as well as the complications during hospital stay were recorded. At postoperative visit, 15 days after discharge, the history regarding the general health and time taken for return to normal activities was recorded. Operated area was examined for evidence of wound infection, condition of scar and incisional hernia.

Table 2. Postoperative complications (n=100).

NO	COMPLICATION	LAPAROSCOPIC APPENDICECTOMY		OPEN APPENDICECTOMY		P Value
		Number. of cases	%	Number of cases	%	
1	Pain	24	48	50	100	0.246
2	Vomiting	10	20	26	52	0.240
3	Fever	05	10	10	20	0.770
4	Wound infection	02	04	08	16	N.S
5	Paralytic ileus	02	04	12	24	N.S
6	Constipation	04	08	06	12	N.S
7	Haematuria	01	02	00	00	N.S
8	Respiratory Tract infection	02	04	04	08	N.S

Statistical analysis was performed using SPSS version 10. Continuous data variables were compared between groups using student's t-test of the mean. Discontinuous variables and proportions were compared using Chi-square test. A p- value of less than 0.05 was considered to be statistically significant.

RESULTS

There were no significant differences in age, sex, body habitus, clinical presentation or laboratory findings between the groups. The operating times in OA and LA were 20-70 minutes (mean 30) and 25-95 minutes (mean 55) respectively ($p < 0.001$). LA was successfully done in 47 (94%) patients. Among these, 7 (14%) patients encountered some difficulty in the procedure due to adhesions, non-visible appendix and equipment failure. Three (6%) cases of LA group were converted to open technique. The reasons for conversion were Meckel's diverticulitis and equipment failure. Increased doses of analgesics, antibiotics and antiemetics were required in OA as compared to LA (Table 1). Bowel sounds, after LA appeared within 12-24 hours whereas they appeared in 24-48 hours after OA. The LA patients were able to resume diet 12 hours sooner.

Table 3. Hospital stay and time taken to return to normal activity (n=100).

Post-operative hospital stay	LAPAROSCOPIC APPENDICECTOMY		OPEN APPENDICECTOMY		
	Range	Mean	Range	Mean	
	1-3 days	1.4 days	2 – 6 days	3.5 days	P= 0.000 T= - 10.17
Period of return to normal activity	8-18 days	12.5 days	15 – 25 days	19.5 days	P= 0.000 T= -10.98

Most of the postoperative complications were observed after OA as compared to LA but none were statistically significant (Table 2). The mean postoperative hospital stay in LA group was 1.4 days, whereas in OA group, it was 3.5 days (Table 3). There were no major complications or mortality. The condition of scar was better in LA group.

DISCUSSION

With the introduction of laparoscopy, the surgical approach to appendectomy took a new turn and a large number of surgical procedures were attempted with this new technique. In 1981, Kurt Semm a German gynaecologist performed the first LA.⁹ LA like other laparoscopically adapted procedures, LA did not gain wide spread acceptance because the benefits of laparoscopic approach are not immediately self evident.¹⁰ The first large series of LA came from Germany which demonstrated that it could be applied to most cases of appendicitis with a high degree of success, a low rate of complications and an operative speed as fast as OA.¹¹

In this study, the mean operative time was about 25 minutes shorter in OA group as compared to LA group. This is comparable to other studies reporting about 10.7 to 30 minutes shorter mean operative time for OA group.¹²⁻¹⁵ The incidence of conversion to open appendectomy in this study was similar to that reported by Lujan Moupean¹⁶ but less than those reported in some studies^{14,17} and higher than those reported in other

studies.¹³ Mean analgesic requirement of LA group was 1.6 doses and is comparable to reported 1-2.2 doses.¹⁸ Mean analgesic requirement of OA group was 4.8 doses and is substantially higher than that reported in other studies.¹⁹ Our postoperative complications were minor and occurred much less in patients of LA group. They were treated conservatively. The wound infection rates of LA and OA groups were 4% and 16% respectively and are comparable to other studies reporting rates of 0% to 6% and 5% to 11% in LA and OA groups respectively.^{12-16, 20}

In this study, the mean period of hospital stay was 2.1 days shorter in LA group (1.4 days) than OA group (3.5 days) and this difference is slightly higher than that reported in other studies.^{13,15} Mean period of return to normal activity was 7 days earlier in LA group (12.5 days) than OA group (19.5 days) and is comparable to the figures reported in other studies.^{4,21} The scars of LA were better than those observed after OA and this superiority of scar has also been reported in other studies.^{11,21} In conclusion, in comparison to OA, LA was found to be associated with shorter hospital stay, decreased wound infection rate, decreased analgesic requirement, earlier return to normal activity and better cosmetic results. Therefore, LA can be safely recommended for acute appendicitis unless laparoscopy itself is contraindicated.

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