

Open Versus Laparoscopic Appendectomy in a Tertiary Care Center – A Randomized Controlled Study

Preshak Dwivedy¹, Sharad Seth², Jagadamba Sharan³, Om Kumar Sharma⁴

ABSTRACT

Introduction: Appendicitis is the most common cause of surgical abdomen in all age groups with a lifetime risk of 6%. The role of laparoscopic appendectomy remains controversial as many researchers have suggested that overall morbidity is primarily a function of the degree of the appendicitis rather than the operative approach. The present study was designed to compare the outcome of laparoscopic appendectomy versus open appendectomy in a tertiary care hospital.

Material and methods: This was a randomized controlled study on 100 cases of acute appendicitis operated in Rohilkhand Medical College, Bareilly in a period of one year. The patients were randomly assigned to two groups of 50 each operated by open and three port laparoscopic surgery.

Results: Abdominal pain (100%) was the commonest presenting complaint. Retrocaecal anatomical position (76% in open, 70% in lap. appendectomy) of the appendix was the commonest operative finding. Wound infection rate (8%) was insignificantly higher in open appendectomy. There was significantly less operative time, postoperative pain better cosmesis and early return to normal daily activity in laparoscopic as compared to open appendectomy.

Conclusion: Laparoscopic appendectomy is better as compared to open appendectomy in terms of post-operative complications, post-operative pain, hospital stay, early return to normal activity, and subjective cosmesis.

Keywords: Acute appendicitis, Laparoscopic Appendectomy, Open Appendectomy.

INTRODUCTION

Appendicitis is the most common cause of surgical abdomen in all age groups with a lifetime risk of 6% with the peak incidence being in the second and third decades of life.¹

Open appendectomy, first described in 1894 by McBurney, performed through the right lower quadrant muscle splitting incision has for long been applied as the gold standard procedure. This procedure has mainly remained unchanged for about 100 years due to its favorable efficacy and safety.²

In 1983, Kurt Semm, a German gynaecologist, was the first to use the laparoscopic technique for appendectomy. Laparoscopy has the advantages of minimal incision, a better view of the peritoneal cavity, and safe exploration.³

The feasibility and validity of the laparoscopic approach in complicated appendicitis cases remain controversial, as it is associated with an increased incidence of intra-abdominal collection, but several other trials have statistically found that the laparoscopic approach is associated with fewer postoperative complications.⁴

The role of laparoscopic appendectomy remains controversial as many researchers have suggested that overall morbidity is primarily a function of the degree of the appendicitis rather than the operative approach. Though several independent studies and meta-analysis comparing the procedures have been done, but the final word has not been said as yet.⁵

The present study was designed to compare the outcome of laparoscopic appendectomy versus open appendectomy in a tertiary care hospital.

MATERIAL AND METHODS

The present study was carried out in department of general surgery at Rohilkhand Medical College and Hospital, Bareilly, Uttar Pradesh to compare the advantages and disadvantages of open and laparoscopic appendectomy in general practice.

It was a randomized control study over a period of one year. 100 patients who consented and fulfilled the inclusion criteria of the study were included in the study and subdivided into two groups of 50 each.

Group A: 50 patient's undergoing open appendectomy.

Group B: 50 patient's undergoing laparoscopic appendectomy.

Computer generated random numbers from 'random.org' were used for randomization.

Exclusion criteria: Patient's not giving consent, patient's with severe comorbid conditions, appendicular mass, appendicular perforation, appendicular abscess, and pregnancy.

Informed consent was obtained from all the participants. Ethical approval for the study was obtained from the Institutional Ethical Committee.

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All participants were explained about the objectives of the study and an informed written consent was obtained. Face-to-face interviews, history and physical examination were conducted. The purpose, benefits, risks, anonymity and confidentiality of the study was clearly explained to the patients. Data was entered in specially prepared proformas for this purpose.

STATISTICAL ANALYSIS

The results were presented in frequencies, percentages and mean±SD. The Chi-square test was used to compare the categorical variables. The unpaired t-test was used to compare continuous variables between the groups. A p-value<0.05 was considered significant. All data analysis was carried out on the SPSS version 16.0 (Chicago, Inc., USA).

RESULTS

Abdominal pain was the presenting complaint amongst all the patients in both the groups. Vomiting was seen in 78% patients of Open and in 68% of Laparoscopic appendicectomy. There was no significant (p>0.05) difference in the presenting symptoms between the groups.(Fig. 1)

Retrocaecal anatomical position of the appendix was the commonest amongst majority of patients in both Open (76%) and laparoscopic appendicectomy (70%).

Operation time was significantly (p=0.001) higher amongst patients of Open appendicectomy (48.98±8.91 minutes) than Lap appendicectomy (39.88±7.69 minutes). (Table-1)

Post-operative pain was significantly (p=0.001) higher amongst patients of Open appendicectomy than Lap appendicectomy at <12 and >24 hours.(Table-2)

Wound infection was the most common post-operative

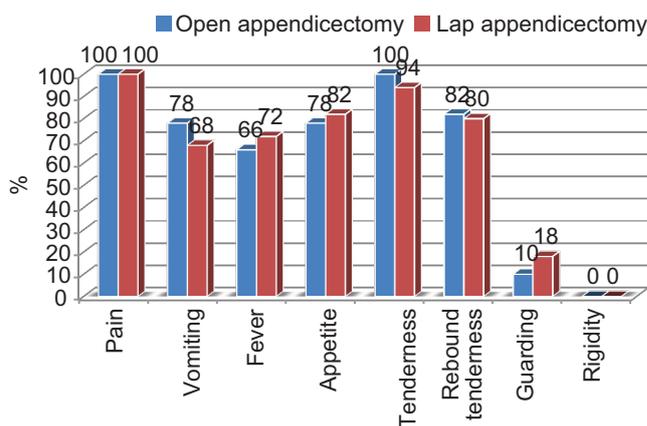


Figure-1: Comparison of presenting symptoms between the groups

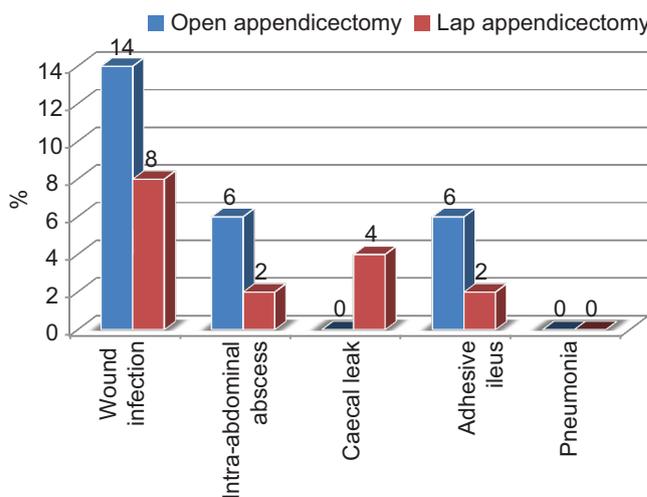


Figure-2: Comparison of post-operative complications between the groups

Groups (n=100)	Operation time in minutes (Mean±SD)
Open appendicectomy (n=50)	48.98±8.91
Lap appendicectomy (n=50)	39.88±7.69
p-value ¹	0.001*
¹ Unpaired t-test, *Significant	

Table-1: Comparison of operative time between the groups

Groups (n=100)	Pain score (VAS)	
	<12 hours	>24 hours
Open appendicectomy (n=50)	7.22±1.37	6.28±1.24
Lap appendicectomy (n=50)	5.70±1.64	4.48±1.29
p-value ¹	0.001*	0.001*
¹ Unpaired t-test, *Significant		

Table-2: Assessment of post-operative pain according to Visual analogue scale between the groups

Groups (n=100)	Cosmesis (Mean±SD)
Open appendicectomy (n=50)	1.66±0.84
Lap appendicectomy (n=50)	1.30±0.50
p-value ¹	0.01*
¹ Unpaired t-test, *Significant	

Table-3: Comparison of cosmesis according to modified Hollander scale between the groups

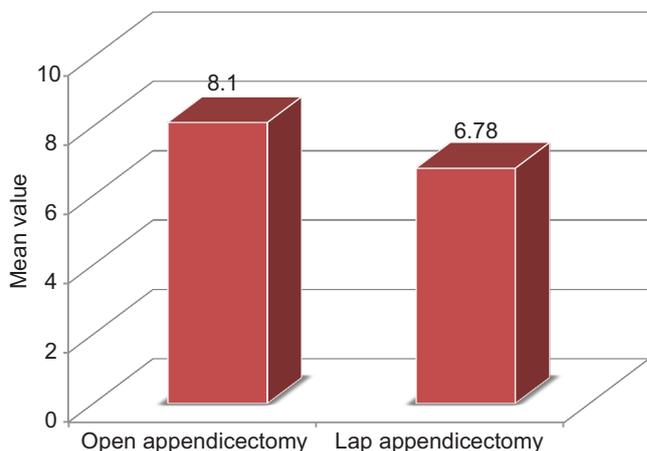


Figure-3: Comparison of return to daily normal activities between the groups

complication in both Open (14%) and Lap appendicectomy (8%). There was no significant (p>0.05) difference in post-operative complications between the groups.(Fig. 2)

Cosmesis as per the modified Hollander scale was significantly (p=0.01) better in Lap appendicectomy (1.30±0.50) than Open appendicectomy (1.66±0.84).(Table-3)

The mean duration of hospital stay of patients of Open appendicectomy and Lap appendicectomy was 3.60±0.85

and 3.80 ± 0.78 days respectively. There was no significant ($p > 0.05$) difference in duration of stay between the groups. Return to normal activity was significantly ($p = 0.002$) delayed amongst patients of Open appendectomy (8.10 ± 2.55) than Lap appendectomy (6.78 ± 1.31). (Fig. 3)

DISCUSSION

Laparoscopic appendectomy is a new procedure as compared to laparoscopic cholecystectomy. Unlike laparoscopic cholecystectomy, laparoscopic appendectomy has not been universally accepted as the "Gold standard" because of controversy regarding exact benefits.⁶

The most common symptom of appendicitis was abdominal pain in both the groups. Vomiting was seen in 78% patients of open and in 68% of Lap appendectomy. Mehta et al (2017)⁷ reported that abdominal pain was the presenting feature in all the patients in both the groups and vomiting was present in 64% of Open and 80% of Lap appendectomy.

In the present study, retrocaecal anatomical position was the most common amongst majority of patients in both open appendectomy (76%) and Lap appendectomy (70%). This finding is almost in agreement with the study by Shrivastava et al (2019)⁸ in which the most commonly diagnosed position of appendix in both groups was retrocaecal (open appendectomy=67.5%, LA=60%).

Operation time was significantly ($p = 0.001$) higher among patients of Open appendectomy (48.98 ± 8.91 minutes) than Lap appendectomy (39.88 ± 7.69 minutes) in the present study. The operation time in this study was also in agreement with the study by Nazir et al (2019)⁹ in which the mean operating time for laparoscopic appendectomy and open appendectomy was 46.98 ± 2.99 minutes and 53.02 ± 2.88 minutes respectively ($p < 0.001$).

In this study, post-operative pain according to visual analogue scale was significantly ($p = 0.001$) higher amongst patients of Open appendectomy than Lap appendectomy at < 12 and > 24 hours. Pradhan et al (2015)¹⁰ found that the mean comparison of postoperative pain by visual analogue scale, was significantly low in laparoscopic appendectomy, compared with Open appendectomy, 24 hours after surgery which is similar to our study.

In the present study, wound infection as a post-operative complication was the most common in both open appendectomy (08%) and Lap appendectomy (4%) which is similar to the study conducted by Simkhada et al (2018)¹¹ who reported that there were 12 (10.9%) wound infection cases in Open appendectomy group and 3 (3.3%) cases in laparoscopic appendectomy group.

In this study, cosmesis was significantly ($p = 0.01$) higher among patients of Lap appendectomy (1.30 ± 0.50) than Open appendectomy (1.66 ± 0.84) representing better cosmetic results in laparoscopic appendectomy than open appendectomy which is similar to the study conducted by Patel et al (2018)¹² who reported that laparoscopic appendectomy had better subjective cosmesis as compared to open appendectomy.

In this study, the mean duration of stay of patients of Open

appendectomy and Lap appendectomy was 3.60 ± 0.85 and 3.80 ± 0.78 days respectively. This finding was in agreement with the study by Shrivastava et al (2019)⁸ in which mean post-operative stay in laparoscopic appendectomy group was 3.2 ± 0.34 days and in Open appendectomy group was 2.3 ± 0.24 days.

In the present study, return to normal activity required a significantly ($p = 0.002$) higher time in patients of Open appendectomy (8.10 ± 2.55 days) as compared to Lap appendectomy (6.78 ± 1.31 days). This finding is also supported by various other studies (Nana et al, 2007; Richard et al, 1994; Namir et al, 2005).¹³⁻¹⁵

CONCLUSION

Overall, we observed that Laparoscopic appendectomy is better as compared to open appendectomy in relation to post-operative pain, post-operative hospital stay, early return to normal activity, diagnosis of additional pathologies and subjective cosmesis.

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