

**Original article:**

## Comparative study between open and laparoscopic appendectomy

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### Abstract:

**Introduction:** Appendectomy, being the most common surgical procedure performed in general surgery, is still being performed by both open and laparoscopic methods due to a lack of consensus as to which is the most appropriate method.

**Aims & Objectives:** To compare the laparoscopic appendectomy with open appendectomy in respect to total operating time, morbidity, post-operative pain, post-operative complication, hospital stay, return to work.

**Results & Observation:** The mean duration of the time required in open appendectomy was  $31.96 \pm 7.11$  min. Whereas the mean duration of the time required in laparoscopic appendectomy was  $54.7 \pm 18.33$  min. This difference in the mean duration of both the procedures was statistically significant ( $P=0.001$ ). Mean duration for the resumption of the oral feed (post operative) patients of open appendectomy was  $41.4 \pm 10.96$  hrs. Whereas in patients of laparoscopic procedure it was  $30.78 \pm 11.76$  hrs. This difference is statistically significant ( $P=0.001$ ). In laparoscopic procedure mean time duration of post operative hospital stay is  $2.06 \pm 0.81$  days. Whereas in open procedure, the mean time duration of post operative hospital stay is  $2.84 \pm 1.01$  days, which is quite high then laparoscopic procedure. This difference in the two groups is statistically significant ( $P=0.001$ ). In open procedure, 37 no. of patients were without any complications whereas in laparoscopic procedure, 47 no. of patients were without any complication. This difference in the two groups is statistically significant ( $P=0.04$ ).

**Conclusion:** Our study concluded that laparoscopic technique is a safe and clinically beneficial operative procedure. It provides certain advantages over open appendectomy, including short hospital stay, decreased requirement of postoperative analgesia, early food tolerance, and earlier return to normal activities and less post operative complications.

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### INTRODUCTION

Appendicitis is the most common reason for acute abdominal pain with a lifetime risk of 8.6% for males and 6.7% for females.<sup>1</sup> The human vermiform appendix is usually referred to as “a vestigial organ with no known function”. Currently available evidence suggests that appendix is highly specialized part of alimentary tract. Acute appendicitis is one of the most common causes of an abdominal emergency. There is evidence in

literature that alchemists and physicians recognized the existence of clinical entity associated with severe inflammation of tissue surrounding the cecum, it was Goldbeck,<sup>2</sup> who invented the term ‘perityphilitis’. It was Fitz,<sup>3</sup> professor of Medicine in Harvard who in 1886 gave a lucid and logical description of the clinical features and described in detail the pathological changes of the disease. He was also the first to use the term appendicitis.

He wrote “in most fatal cases of typhilitis, the cecum is intact whlst the appendix is ulcerated and perforated. The question should be entertained of immediate opening. If any good result is to arise from such treatment it must be applied early”.

The first appendectomy was performed in 1736 by Claudius<sup>2</sup> amyand, surgeon to west-minster and St. George’s Hospitals. The evolution of operative treatment of appendicitis proceeded significantly when Hancock<sup>2</sup>, in London successfully drained an appendix abscess.

Credit of first published account of appendectomy must go to kronlein<sup>1</sup> in 1886. The treatment of choice is the surgical removal of the inflamed appendix by using open appendectomy (OA) first described by McBurney<sup>4</sup> in 1894 or by using laparoscopic appendectomy (LA) specified by Semm<sup>5</sup> in 1983. mcBurney,<sup>6</sup> in New York pioneered early diagnosis and early operative intervention and also devised the muscle splitting incision named after him. In 20<sup>th</sup> century development and laparoscopic surgery changed the face of general surgery forever. In 1901, kelling<sup>7</sup> performed the first laparoscopic examination of abdominal cavity. In 1987 lap. cholecystectomy revolutionized laparoscopic surgery.

Semm<sup>8</sup>, in 1983 performed first laparoscopic appendectomy. The benefits of lap

appendectomy are not as dramatic as lap. cholecystectomy but lap appendectomy is getting acceptance all over world. In this study we are going to compare open appendectomy with lap appendectomy.

#### **AIMS AND OBJECTIVES:**

To compare the laparoscopic appendectomy with open appendectomy in respect to total operating time, morbidity, post-operative pain, post-operative complication, hospital stay, return to work.

#### **MATERIALS & METHODS:**

The present study was conducted on patients admitted in department of General Surgery, NIMS Medical College and Hospital, Jaipur. This was a prospective, randomized parallel group comparative clinical study from 15 feb. 2015 to 16 july 2016. The study included a total of 100 patients with presumptive diagnosis of Acute appendicitis, recurrent appendicitis.

#### **Selection of patients**

This was a comparative study and included a total of 100 patients with presumptive diagnosis of Acute appendicitis, recurrent appendicitis divided randomly into two groups of 50 patients each undergoing open appendectomy or laparoscopic appendectomy.

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**Observations:**

Group I = Open Appendectomy

Group II = Laparoscopic Appendectomy

**Table 1: Mean Operative time (min.)-wise distribution among groups**

Groups	N	Mean	Std. Deviation	Mean difference	P value
I	50	31.96	7.11	22.74	0.001 (S)
II	50	54.7	18.33		

**Test applied: Unpaired t test                      S=Significant**

**TABLE 2 : Mean time taken for resumption of oral feeds (hr)-wise distribution among groups**

Groups	N	Mean	Std. Deviation	Mean difference	P value
I	50	41.4	10.96	10.62	0.001 (S)
II	50	30.78	11.76		

**Test applied: Unpaired t test                      S=Significant**

**TABLE 3: Distribution of patients according to mean duration of post operative hospital stay**

Groups	N	Mean	Std. Deviation	Mean difference	P value
I	50	2.84	1.01	0.78	0.001 (S)
II	50	2.06	0.81		

**Test applied: Unpaired t test                      S=Significant**

**Table 4: Distribution of patients according to post operative complications**

	No	intra abdominal abscess	ilius	Pain	wound Infection	Vomiting
Group I	37	0	2	6	4	1
Group II	47	1	1	1	0	0

**Test applied: chi-square test                      p value=0.04 (S)**

### Discussion:

Over a period of 18 months 100 consecutive patients with clinical diagnosis of acute appendicitis, recurrent appendicitis, were included in the study. Out of 100 cases 50 cases were operated through laparoscopic appendectomy and 50 through open appendectomy . In group I, the mean duration of the time required in open appendectomy was  $31.96 \pm 7.11$  min. Whereas in group II , the mean duration of the time required in laparoscopic appendectomy was  $54.7 \pm 18.33$  min. This difference in the mean duration of both the procedures was statistically significant ( $P=0.001$ ).

Post operative bowel sounds came early in maximum cases in laparoscopic procedure comparatively in open appendectomy therefore resumption of oral feeding was early in laparoscopic procedure comparatively to open procedure. Mean duration for the resumption of the oral feed (post operative) In group I patients was  $41.4 \pm 10.96$  hrs. Whereas in group II patients it was  $30.78 \pm 11.76$  hrs. This difference in the two groups is statistically significant ( $P=0.001$ ). The mean time duration required for post operative hospital stay in Group II, is  $2.06 \pm 0.81$  days. Whereas in group I, the mean time duration of post operative hospital stay is  $2.84 \pm 1.01$  days, which is quite high then group II. This difference in the two groups is statistically significant ( $P=0.001$ ).

The complication in the post operative period in group I , 37 no. of patients were without any complications whereas in group II ,47 no. of patients were without any complication. This difference in the two groups is statistically significant ( $P=0.04$ ).

Laparoscopic surgery is emerging as a revolution in surgery.

Now a days so many procedures like cholecystectomy hernia repair, tubectomy, appendectomy, adrenelectomy, vaginal

hysterectomy, splenectomy, are done by laparoscopic methods. Initially laparoscopic appendectomy was not accepted as a better options but with more experience in laparoscopic surgeries, laparoscopic appendectomy has been shown to be more feasible and safe in randomized comparison with open appendectomy. In addition to improved diagnostic accuracy, lap. appendectomy confers advantage to the patient in terms of fewer wound infectious, less pain, improved cosmetic results, definitive treatment of non appendiceal lesions, faster recovery and earlier return to work. However, laparoscopic appendectomy is more time consuming.

Laparoscopy allows thorough examination of entire abdomen and pelvis and gives a better diagnosis especially in women of child bearing age and obese patient.

With advanced laparoscopic surgery mesoappendix is divided by harmonic scalpel or linear stapler. Without clipping endoloops are applied at the base of appendix or endostapler can also be used but it is not cost effective so we have not used it in our series.

### CONCLUSION

1. Rate of negative appendectomy is less by laparoscopic method because of better exposure and visualization especially in women, we can better diagnose whether pathology is of appendix or uterus and adnexa.
2. Parenteral analgesic requirement is for shorter duration after laparoscopic appendectomy (1 day Vs 2 days.)
3. Reduced morbidity after laparoscopic appendectomy.
4. Reduced post operative hospital stay after laparoscopic appendectomy (1-3 days Vs 2-4 days)
5. Early resumption of normal activities in (4-14 days Vs 7-16 days)

6. Early return to work in laparoscopic appendectomy (7-20 days v/s 10-30 days.)
  7. Less post operative complications after laparoscopic appendectomy
  8. Allows thorough exploration of abdominal cavity.
  9. Definitive treatment of non appendiceal lesions.
  10. Better cosmetic results in laparoscopic appendectomy.
- Our experience suggests that laparoscopic approach is better than open approach to treat any case of appendicitis.

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