

**A RETRO-PROSPECTIVE EVALUATION OF OPEN VERSUS LAPAROSCOPIC  
APPENDICECTOMY: A SINGLE CENTER STUDY**

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**ABSTRACT**

The most frequent surgical procedure carried out during emergency surgery is an appendectomy. Both open (OA) and laparoscopic (LA) procedures are still used to perform appendectomy due to a lack of agreement regarding the best procedure. A retrospective observational study was undertaken on patients who were diagnosed with appendicitis and admitted to a single facility (Department of Pediatric Surgery, Dr M R Khan Shishu Hospital & Institute of Child Health, Dhaka, Bangladesh) between January 2005 and December 2013. Clinical information and hospital expenses for 65 patients who met the inclusion criteria was included for this study. The patients were split into two groups: laparoscopic appendectomy (LA) and open appendectomy (OA). Due to the observational nature of the study, informed consent from patients has been waived. Throughout the course of the trial, 65 patients had appendectomies. Depending on the operating surgeon's discretion, 24 of these surgeries were done by open surgery and 41 were done laparoscopically. In both groups, the male and female ratio and average age were comparable. Laparoscopic surgery appears to have a variety of benefits over open appendectomy. Shorter hospital stays and speedier return to normal activities were made possible by less painful laparoscopic procedures. The main disadvantage of the laparoscopic method was a little longer operating time for both surgeries.

**KEYWORDS:** Open Appendectomy, Laparoscopic Appendectomy, Retro-prospective Evaluation.

**INTRODUCTION**

In all age categories, appendicitis is the most frequent reason for abdominal surgery.<sup>[1,2]</sup> Acute appendicitis affects 7–10% of the general population, with the second and third decades of life having the highest prevalence.<sup>[3]</sup> For more than a century, open appendectomy has been the gold standard for treating patients with acute appendicitis, although the effectiveness and superiority of the laparoscopic method over the open technique are currently hotly contested.<sup>[3-5]</sup> In numerous contexts involving gastrointestinal surgery, there is evidence that little surgical trauma caused by a laparoscopic approach led to a noticeably shorter hospital stay, less postoperative pain, and a quicker return to daily activities.<sup>[6,7]</sup>

Multiple retrospective investigations<sup>[3,8-14]</sup>, numerous randomized trials<sup>[15-20]</sup>, and meta-analyses<sup>[21,22]</sup> contrasting laparoscopic with open appendectomy,

however, have produced contradictory findings. With the laparoscopic method, some of these studies have showed improved clinical results<sup>[15-17,20,23]</sup>, but other studies have only shown minimal or no clinical improvements<sup>[18-19, 24, 26]</sup> and increased surgical expenses.<sup>[4,19,24,25]</sup> In light of the fact that open surgery for acute appendicitis has not been demonstrated to be superior to laparoscopic appendectomy, unlike other laparoscopic operations<sup>[27]</sup>, we created the current study to identify any potential advantages of the laparoscopic technique.

This study compared open appendectomy to laparoscopic appendectomy in terms of clinical outcomes (hospital stay, operating time, postoperative complications, analgesic requirement, time to oral intake, and time to resume normal activity), as well as hospital expenses.

## MATERIALS AND METHODOLOGY

A retrospective observational study was undertaken on patients who were diagnosed with appendicitis and admitted to a single facility (Department of Pediatric Surgery, Dr M R Khan Shishu Hospital and Institute of Child Health, Dhaka, Bangladesh) between January 2005 and December 2013. Patients with severe medical conditions needing intensive care were eliminated, including those with hemodynamic instability, persistent medical or mental illnesses, cirrhosis, and coagulation abnormalities. The surgical team on duty decided on the sort of operation based on their preferences and experience. We examined the clinical information and hospital expenses for 65 patients who met the inclusion criteria. The patients were split into two groups: laparoscopic appendectomy (LA) and open appendectomy (OA). The demographic information, comorbidities, initial laboratory results, operation time, intraoperative findings (acute, gangrenous, or perforated appendix), time to soft diet, postoperative hospital stay, number of analgesics, and postoperative complications have all been included in the clinical data that has been gathered. Data specific to costs were examined. The right iliac fossa or periumbilical discomfort, nausea, and vomiting will be used in the clinical history and physical examination to make the diagnosis (tenderness or guarding in right iliac fossa). Imaging tests such as abdominal ultrasonography or CT will be carried out on individuals in cases when a clinical diagnosis cannot be made. As part of the procedure, third-generation cephalosporin and metronidazole will be administered prophylactically to patients in both groups at the time the general anesthesia is induced. OA will be carried out using the Lanz's incision. Following the incision, the peritoneum will be reached and opened in order to deliver the appendix, which will then be surgically removed. For the laparoscopic group, a typical 3-port method will be used. By continuously applying 12 to 14 mmHg of carbon dioxide pressure through a Verres canula positioned in the infraumbilical location, pneumoperitoneum will be generated. The patient will be positioned in a Trendelenburg posture with a small leftward rotation. In order to rule out any additional intrabdominal or pelvic pathology, the abdominal cavity will be examined. The base of the appendix will be secured with two legating loops after the mesoappendix has been divided using bipolar forceps, and the dissection will occur distal to the second loop. To reduce the chance of enteric or purulent leaking, the distal appendicular stump will then be sutured shut. A 10-mm infraumbilical port will be used to extract the specimen from an Endo bag. Every sample will be sent for histopathology. The patients won't start eating orally until after they have completely recovered from the anesthetic and their bowel noises have returned, at which point clear fluids will be introduced. When patients can handle the liquid diet and have eliminated their flatulence, a soft diet will be introduced. Patients will be released provided they are able to follow a regular diet, are stable, and have effective pain management. The surgical time (in minutes) for both procedures will start when the first skin

incision is made and end when the final skin stitch is applied. The number of nights spent in the hospital following surgery will be used to calculate the length of the hospital stay. Redness or purulent or seropurulent discharge from the incision site will be considered signs of a wound infection. Localized swelling without redness and an oozing of clear fluid is what is meant by seroma. Failure of bowel sounds to return within 12 hours postoperatively will be deemed paralytic ileus. Compliance with STROBE criteria, a checklist created to improve reporting standards in epidemiological research, will be used in this study.<sup>[26]</sup> Due to the observational nature of the study, informed consent from patients has been waived.

## RESULTS

Throughout the course of the trial, 65 patients had appendectomies. Depending on the operating surgeon's discretion, 24 of these surgeries were done by open surgery and 41 were done laparoscopically. In both groups, the male:female ratio and average age were comparable (Table 1).

**Table 01: Demographic profile of the patients.**

	Laparoscopic (n=41)	Open (n=24)
Average age	12 years	5 years
Male:Female	32:9	14:10

About 46.4% of the patients in the open group required extra analgesics, compared to 23.48% of those who received LA. The patients that were still present didn't need any further analgesics. Four individuals experienced problems in the laparoscopic group. The development of an intrabdominal abscess occurred in one patient, while pelvic collections occurred in the other three. Two individuals in the open group experienced problems following surgery. One person had a liver abscess, while the other case got an infection at the surgery site. The average length of the procedure was 44.51 minutes for the OA group and 59.15 minutes for the laparoscopic group [Table 2].

**Table 02: Comparison of variables between the two groups.**

	LA (n=41)	OA (n=24)
Mean operating time	59.15 min	44.51 min
Hospitalization	1.3 days	1.7 days
Time to oral intake	13.3 h	14.1 h
Postoperative analgesia use	23.48%	46.4%
Postoperative complications	9.76%	8.33%

## DISCUSSION

The general consensus is that compared to open procedures, minimally invasive surgeries cause less postoperative discomfort, have lower complication rates, and require less time to recuperate.<sup>[1]</sup> Reports on the use of laparoscopy for appendicitis initially concentrated solely on its effectiveness as a diagnostic tool once laparoscopy was introduced in surgery. The base of the

appendix can be strangulated using intracorporeal or extracorporeal suturing, end loop placement, clip application, or stapling devices in the usual surgical procedure for LA, which uses three or four trocar techniques.<sup>[3],[4]</sup> In this study, the appendicular stump was ligated during all laparoscopic surgeries using three trocars, chromic end loops, or Endoscopic Gastrointestinal Anastomosis (GIA).

Numerous research backed up the benefit of LA over an open surgery. For instance, a meta-analysis had revealed that LA causes a longer operative duration, a quicker return to normal activities, and fewer postoperative problems.<sup>[7],[8]</sup> Laparoscopic appendectomies, according to Nowzaradan et al.<sup>[9]</sup>, led to less postoperative pain, a shorter hospital stays, and an earlier return to regular activities. A retrospective analysis of 43 individuals who underwent LA and were diagnosed with acute appendicitis led to the establishment of this finding. Contrarily, a number of other studies have demonstrated that LA has slight advantages that are not statistically significant.<sup>[3],[10]</sup> This study was created to compare the postoperative results of both operations in patients with clinically confirmed acute appendicitis due to the lack of agreement in the field.

A quantitative way for evaluating a patient's pain after surgery is the total analgesic need. In our study, we calculated the postoperative analgesic doses that each patient needed to compare the two groups. When compared to patients who received LA, those who underwent OA experienced somewhat less discomfort. Our results are at odds with those of numerous previous research, which found that laparoscopic groups experienced less discomfort and used less analgesics.<sup>[11],[12],[13]</sup> One study compared the commencement of the fluid diet between the two groups and found that the laparoscopic group required much less time to achieve oral intake tolerance.<sup>[14],[15]</sup> No statistically significant differences exist between the two groups of our findings in this investigation (14.4 h in LA and 15 h in OA). Since LA is a minimally invasive treatment that is followed by a brief hospital stay and a quicker recovery, there is often a higher expectation for individuals to return to work earlier. There was no statistically significant difference between the two groups in this investigation.

Numerous studies have shown that compared to OA, LA has a relatively low rate of comorbidities.<sup>[16],[17]</sup> Most studies have found that after LA, wound infection rates are decreased.<sup>[14],[18]</sup> Contrarily, the development of an intraabdominal abscess is a significant complication that, if not adequately treated, could be fatal. One patient from each group in this study experienced an intraabdominal abscess and received the appropriate care. Due to the fact that this study was carried out in a military hospital where patients undergoing both procedures are exempt from procedure expenses, the cost was not taken into consideration.

## CONCLUSION

Over open appendectomy, laparoscopic surgery seems to offer a number of advantages. Less painful laparoscopic operations allowed for a quicker return to normal activities, and LAS necessitated shorter hospital stays. The laparoscopic approach's primary drawbacks were a slightly longer operating time for both procedures.

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