



COMPARATIVE STUDY ON LAPAROSCOPIC AND OPEN APPENDECTOMY

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ABSTRACT

**Introduction:** Appendicitis requires immediate surgical surgery, with laparoscopic appendectomy (LA) gaining popularity for shorter recovery times and less discomfort, while open appendectomy (OA) is historically preferred, with medical experts still divided. **Goal and Objective:** This research compares appendicitis management with laparoscopic and open appendectomy operations, assessing patient demographics, surgical results, pain management techniques, recuperation durations, and post-surgery issues. **Methods:** The study, conducted from November 2023 to March 2024, involved 12+ year-olds with mild to moderate discomfort planning an appendectomy, excluding pregnant women, long-term medical conditions, and ICU patients. **Results:** The study compared 60 patients, with males more likely to undergo laparoscopic appendectomy (LA) than open appendectomy (OA). Differences in age, body weight, and procedure selection were observed. LA patients had shorter operating times, less analgesia, and quicker recovery times. OA patients reported more SSI, intrabdominal abscess, and ECF cases. **Conclusion:** Laparoscopic appendectomy offers shorter operative time, faster recovery, and reduced hospital stays, with fewer postoperative issues, promoting preference in appendicitis management for optimal patient outcomes and surgical efficiency.

**KEYWORDS :** Open appendicectomy (OA), Laparoscopic appendicectomy (LA), Alvarado scores.

INTRODUCTION

The term appendicitis, which means inflammation of the appendix, is derived from Latin and combines the words appendix and -itis. In the 1540s, the term "appendix" was first used to refer to an extended protrusion of an internal organ. Acute appendicitis in adults is frequently caused by several conditions, including tumors, fecaliths, or infections. Adult cases of acute appendicitis are linked to tumors such as carcinoid tumors, mucocele, and appendiceal adenocarcinoma (Narula et al., 2023)

Our work attempts to add to this conversation by methodically contrasting the clinical results of OA and LA treatments. Several criteria will be assessed, such as postoperative complications, pain management techniques, patient demographics, surgical results, and recovery timeframes. We hope that our research will shed light on the relative benefits and drawbacks of each surgical strategy.

It is essential to comprehend the distinctions between LA and OA to maximize patient care and guide surgical decision-making. Our study intends to improve patient outcomes and appendicitis care by illuminating the relative effectiveness of various techniques.

MATERIALS AND METHOD

The study was conducted at the GOVT Cuddalore Medical College and Hospital in Chidambaram from November 2023 to March 2024. The research included all participants who were aged 12 years and above, had mild to moderate tenderness, and were planning to have an appendicectomy procedure. Only patients who gave their consent were included. Pregnant women, patients with chronic illness, and patients in ICU were excluded from the study. Out of the total participants (N=200), a total of (n=60) patients were included, with 30 each in LA and OP groups. All patients had a history of pain in the abdomen with tenderness, specifically in the right lower quadrant. The study analyzed preoperative, intra-

operative, and postoperative parameters and compared the results.

Statistical Analysis

SPSS software was used to gather and analyze the data. For categorical parameters, the data were computed as frequencies and percentages. To determine the significance between continuous variables, the Man Whitney U test, Pearson's Chi-square test, and student-independent t-test were used.

RESULTS

Out of the 60 patients, female patients are more severely affected than male patients. There is no statistically significant difference in the number of male and female patients undergoing laparoscopic operations compared to those undergoing open appendicectomies. The mean for laparoscopy is (60.1 + -4.2) while for open appendectomy, it is (64+ -4.3). Age and body weight following LA and OA operations vary significantly. Patients who have had a laparoscopy have a history of prior surgery, which is significantly different from those who have had an open appendectomy. To investigate the significant difference between LA and OA, the Man-Whitney U test was used. Patients scoring 8, 9, and 10 on the Alvarado score underwent an open appendectomy, whereas those scoring 5, 6, and 7 underwent a laparoscopy.

Table 1: Comparison Of Demographic Profile

VARIABLES	LAPAROSCOPIC (n=30)	OPEN APPENDECTOMY (n=30)	P-value
SEX (MALE/ FEMALE)	(17/13)	(10/20)	0.159
AGE	60.1 ±4.2	64±4.3	0.001
BODY WEIGHT	60.2 ±5.3	63.2±4.5	0.003
PREVIOUS SURGERY	15	6	0.061

ALVARADO SCORE			0.006
5	17	0	
6	9	0	
7	3	2	
8	2	8	
9	1	10	
10	0	10	

More severe gangrenous and perforated appendices underwent OA, while severely inflamed and normal appendices underwent LA throughout the surgical process. It displays a notable distinction. p-value of (0.000 < 0.005)

**Table 2: Surgical Procedure Findings**

VARIABLES	LAPAROSCOPIC	OPEN APPENDECTOMY	P- Value
Normal appendix	19	-	0.000
Acutely inflamed tip	20	2	
Gangrenous appendix	1	5	
Perforated appendix	-	23	

There is a noticeable difference between the mean operating times for LA and OA, which are 100.8 and 126.9 minutes, respectively. > 500 ml of blood loss is observed in OA. In OA, there is increased drain and a significant use of NG tubes. There isn't a discernible difference between OA and LA in terms of (NG tube, drain, and blood loss). There is no discernible difference in the average number of days taken in LA (1.13 +0.34) and OA (1.08 +0.24) to initiate bowel movements. Compared to OA, patients who did not receive LA require a shorter period of parenteral analgesia (1.2+ -0.4 Vs 1.7 + -0.6) and oral analgesia (2.4 + -0.7 vs 2.4 + -0.7). With a p-value of 0.001 < 0.005, the amount of time required to resume an oral diet is much less than that of OA. There is a significant difference in the mean hospital stays between OA (8.7 days) and LA (5.1 days), with a p-value of 0.001 < 0.005.

**Table 3: Operative Procedure Characteristics**

	LAPAROSCOPIC	OPEN APPENDECTOMY	P- value
OPERATIVE TIME	100.8	126.9	< 0.001
BLOOD LOSS > 500ml	10	16	0.365
DRAIN	7	12	0.269
NG TUBE	5	9	0.473
TIME TO FIRST BOWEL MOVEMENTS	1.13 +0.34	1.08 +0.24	0.451
PARENTERAL DRUGS	1.2+ -0.4	1.7 + -0.6	0.125
ORAL DRUGS	2.4 + -0.7	4.1+ _2.1	0.063
TIME TO RESUME ORAL DIET	2.1	3.4	0.001
MEAN HOSPITAL STAY	5.1	8.7	0.001

There is no statistically significant difference observed between the LA and OA groups in terms of problems.

**Table 4**

INTRAOPERATIVE COMPLICATIONS
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	OPEN APPENDECTOMY	LAPAROSCOPIC	P- value
NONE	27	29	0.783
ILEAL INJURY	2	1	
LIMITED COLECTOMY	1	0	
POSTOPERATIVE COMPLICATIONS			
NONE	22	25	0.746
INTRA-BDOMINAL ABSCESS	3	3	0.782
ECF	1	0	1.000
SSI	4	1	0.447
STUMP APPENDIX	0	1	0.189

The post-operative complications do not differ significantly in contrast to LA patients who had OA and had been reported to have ECF, SSI, and intrabdominal abscess

## DISCUSSION

In this study, we aimed to compare laparoscopic appendectomy (LA) and open appendectomy (OA) procedures in terms of various clinical and surgical outcomes. Our findings reveal several important differences between the two surgical approaches, providing valuable insights for clinical decision-making.

### Demographic and Clinical Characteristics

We observed that female patients were more affected by appendicitis compared to male patients, which is consistent with previous studies (Blackmore et al., 2015). Interestingly, laparoscopic procedures were more commonly performed in male patients, while open appendectomies were more common in female patients. Despite this difference, there was no significant association between gender and the choice of surgical approach.

### Surgical Outcomes

Between the LA and OA groups, there were notable differences in age and body weight; younger and lighter patients were more likely to have laparoscopic operations (Baid et al., 2015). The higher prevalence of prior surgical procedures among laparoscopic patients underscores the possible advantages of less invasive methods for patients having prior abdominal surgery.

### Alvarado Score and Appendicitis Severity

Patients with higher Alvarado scores (8, 9, 10) were more likely to undergo OA, indicating that surgeons may prefer open surgery for cases of more severe appendicitis. Additionally, we found significant differences in the distribution of appendix conditions between the LA and OA groups, with OA more commonly performed for gangrenous and perforated appendices.

### Operative and Postoperative Outcomes

Operative time was significantly shorter in laparoscopic procedures, reflecting the efficiency of minimally invasive techniques. Conversely, OA was associated with greater blood loss and longer hospital stays, consistent with previous studies showing the advantages of laparoscopy in reducing surgical trauma and promoting faster recovery (Ward et al., 2014). (Blackmore et al., 2015) (Hussein et al., 2022)

### Pain Management and Recovery

Patients undergoing LA required less parenteral and oral analgesia, indicating reduced postoperative pain compared to OA. Furthermore, LA patients resumed oral diet significantly earlier than OA patients, highlighting the enhanced recovery and quicker return to normal activities associated with laparoscopic surgery (Cipe et al., 2014; Pogorelic et al., 2019; Rasuli et al., 2022).

## Complications

While LA was associated with lower complication rates overall, no significant differences were observed in specific postoperative complications between the LA and OA groups (Basukala et al., 2023; Güler et al., 2020; Hussein et al., 2022). However, OA patients were more likely to experience surgical site infections (SSI), intrabdominal abscesses, and neurocutaneous fistulas (ECF), underscoring the importance of careful postoperative monitoring and management in these patients.

## CONCLUSION

In conclusion, our study demonstrates that laparoscopic appendectomy offers several advantages over open surgery, including shorter operative time, reduced postoperative pain, faster recovery, and lower overall complication rates. These findings support the widespread adoption of laparoscopic techniques as the preferred approach for appendectomy. However, further research is warranted to validate these results in larger, multicenter studies.

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