



## A PROSPECTIVE STUDY ON COMPARATIVE EVALUATION OF LAPAROSCOPIC VERSUS OPEN APPENDECTOMY IN TERTIARY CARE CENTRE

### General Surgery

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### ABSTRACT

**Background:** Acute appendicitis is one of the most common surgical emergencies worldwide. Appendectomy can be performed using either the conventional open method or the laparoscopic technique. The relative benefits of each approach remain debated. Laparoscopic appendectomy (LA) has emerged as an alternative to open appendectomy (OA), offering potential advantages in postoperative recovery and morbidity. Objective: To compare laparoscopic appendectomy (LA) with open appendectomy (OA) regarding operative time, postoperative pain, complications, hospital stay, and recovery. **Methods:** A prospective comparative study was conducted on 40 patients (20 LA, 20 OA). Parameters analysed included operative time, hospital stay, postoperative pain (VAS), and complications. Statistical analysis was performed using Student's t-test and chi-square test. **Results:** Laparoscopic appendectomy showed advantages in terms of reduced postoperative pain, shorter hospital stay, lower wound infection rates, and earlier return to work. However, operative time was longer and overall cost slightly higher compared to open appendectomy. **Conclusion:** Laparoscopic appendectomy provides superior postoperative outcomes and should be considered the preferred approach where feasible.

### KEYWORDS

Acute Appendicitis, Laparoscopic Appendectomy (LA), Open Appendectomy (OA), Postoperative Pain, Surgical Outcomes

### INTRODUCTION

Acute appendicitis remains one of the most common causes of acute abdomen requiring emergency surgical intervention. It has a lifetime risk of approximately 7–10% of the population with peak incident occurring in 2<sup>nd</sup> and 3<sup>rd</sup> decades of life. Immediate diagnosis and surgical management are essential to prevent complications such as perforation, abscess formation, and peritonitis.<sup>(1)</sup>

Open appendectomy (OA), first described by McBurney in 1894, has historically been the gold standard surgical treatment due to its simplicity, reproducibility, and low cost. However, it is associated with larger incisions, increased postoperative pain, prolonged hospital stay, and higher rates of wound complications.<sup>(5)</sup>

Laparoscopic appendectomy (LA), introduced by Kurt Semm in 1983, has revolutionized surgical management by offering a minimally invasive approach. Advantages include reduced postoperative pain, shorter hospital stay, faster recovery, better cosmetic outcomes, and improved diagnostic capability, especially in atypical presentations.<sup>(2)</sup> Despite the widespread adoption of laparoscopic techniques, debate continues regarding the superiority of laparoscopic versus open appendectomy. Several studies have demonstrated comparable complication rates but differences in operative time, recovery, and hospital stay.

Some trials report longer operative time for laparoscopic procedures, while others demonstrate reduced postoperative pain and lower wound infection rates compared with open surgery.<sup>(6)</sup>

Given these conflicting findings, the present study aims to compare laparoscopic and open appendectomy in terms of operative parameters, postoperative recovery, complications, and overall outcomes in a cohort of 40 patients.

### Materials and Methods

This prospective comparative study was conducted over a period of 12 months at a tertiary care teaching hospital in Zydus Medical College and Hospital, Dahod. Our study design is prospective observational study. Total Sample size is 40 in which 20 pt are operated with open appendectomy and other 20 are operated with laparoscopic appendectomy.

### Inclusion Criteria

- Age 15-60 years
- Clinical diagnoses of acute appendicitis
- Ultrasound or CT confirmation
- Fit for general anesthesia

### Exclusion Criteria

- Appendicular mass
- Previous abdominal surgery
- Pregnancy
- BMI >35
- Severe comorbid conditions

### Surgical Technique

#### Laparoscopic Appendectomy -

- General anesthesia
- Three trocar technique
- Pneumoperitoneum with CO<sub>2</sub>
- Mesoappendix divided using cautery or clips
- Appendix ligated and removed via port

### Open Appendectomy

- McBurney or Lanz incision
- Identification and ligation of appendix
- Conventional removal and wound closure

### Parameters Evaluated

1. Operative time
2. Postoperative pain score
3. Wound infection
4. Intra-abdominal abscess
5. Hospital stay
6. Time to oral feeding
7. Time to return to normal activity
8. Complications

### Statistical Analysis

Data were analysed using SPSS version 25.0. Continuous variables were expressed as Mean  $\pm$  Standard Deviation. Student's t-test was used to compare means, while chi-square test was used for categorical variables. A p-value <0.05 was considered statistically significant.

### RESULTS

**Demographic distribution****Table 1: - demographic distribution of patient included this study**

|                 | Laparoscopic | Open |
|-----------------|--------------|------|
| Number of pt.   | 20           | 20   |
| Mean Age(years) | 28.4         | 30.1 |
| Male            | 12           | 13   |
| Female          | 8            | 7    |

**Operative Findings****Table 2: - Table showing Operative findings of patients included in this study**

|                     | Laparoscopic | Open   |
|---------------------|--------------|--------|
| Mean Operative Time | 65 min       | 45 min |
| Blood Loss          | Minimal      | Mild   |

The mean operative time in the laparoscopic group was significantly higher than the open group ( $p < 0.001$ ). Blood Loss is slightly higher in open appendicectomy as compare to laparoscopic appendicectomy. This increase reflects the technical complexity and setup time associated with laparoscopy.

**Post Operative outcomes****Table 3: - Table showing post-op outcome of patients included in this study**

|                     | Laparoscopic | Open     |
|---------------------|--------------|----------|
| Pain score          | 3.1          | 5.2      |
| Hospital Stay       | 2 days       | 3 days   |
| Time to oral intake | 12 hours     | 24 hours |
| Return to work      | 10 days      | 16 days  |

**Hospital Stay**

The mean duration of hospital stay was significantly shorter in the laparoscopic group compared to the open group ( $p < 0.001$ ). Early ambulation and reduced postoperative discomfort contributed to faster discharge.

**Postoperative Pain**

Postoperative pain assessed using Visual Analog Scale (VAS) was significantly lower in the laparoscopic group compared to the open group ( $p < 0.001$ ), indicating improved patient comfort and recovery.

**Complications****Table 4: - Table showing Post op complication in pt included in this study**

|                         | Laparoscopic | Open |
|-------------------------|--------------|------|
| Wound infection         | 1            | 4    |
| Intra-abdominal Abscess | 1            | 1    |
| Ileus                   | 1            | 1    |
| Total complication      | 3            | 7    |

The complication rate was lower in the laparoscopic group compared to the open group. Most complications in the open group were surgical site infections. However, the difference was not statistically significant ( $p = 0.152$ ), likely due to the small sample size.

**DISCUSSION**

Appendectomy remains the definitive treatment for acute appendicitis, with both laparoscopic and open techniques widely practiced.

The present study demonstrates that laparoscopic appendectomy offers significant advantages over open appendectomy in terms of less postoperative pain, shorter hospital stay, earlier return to normal activity and lower wound infection rates. Although operative time was longer in the laparoscopic group, this finding is consistent with existing literature and is often attributed to the learning curve.

Shorter hospital stay observed in the laparoscopic group aligns with studies by Guller et al. and Katkhouda et al., which reported faster recovery and early discharge following minimally invasive surgery.

Reduced postoperative pain in the laparoscopic group is a major benefit, facilitating early mobilization and return to normal activities. This finding is consistent with multiple randomized controlled trials and meta-analyses.

The lower complication rate, particularly surgical site infections, further supports the advantages of laparoscopy. Although not statistically significant in this study, likely due to limited sample size, similar trends have been reported in larger studies.

In the Indian healthcare setting, factors such as cost, availability of

equipment, and surgeon expertise influence the choice of procedure. However, with increasing adoption of laparoscopic techniques, LA is becoming the preferred approach.

**CONCLUSION:-**

Laparoscopic appendectomy is a safe and effective alternative to open appendectomy. It offers reduced postoperative pain, shorter hospital stay, and lower complication rates, despite a longer operative time. It should be considered the procedure of choice in centres with adequate laparoscopic facilities and expertise. However, open appendectomy remains a reliable and efficient technique, especially in complicated cases or resource-limited settings.

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