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Original Article

Comparison of Laparoscopic versus Open Appendicectomy in Acute Appendicitis

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Abstract-

Introduction: Acute appendicitis is one of the most common surgical emergencies worldwide. Open appendicectomy (OA) has been the standard procedure for over a century. However, laparoscopic appendicectomy (LA) has gained popularity due to perceived advantages including reduced postoperative pain, shorter hospital stay, and improved cosmetic outcomes. This study compares laparoscopic and open appendicectomy in terms of operative time, postoperative pain, complications, hospital stay, and recovery. ***Materials and Methods:*** A prospective comparative study was conducted among 120 patients diagnosed with acute appendicitis. Patients were divided into two groups: Group A (Laparoscopic appendicectomy, n=60) and Group B (Open appendicectomy, n=60). Parameters evaluated included operative time, postoperative pain (VAS score), duration of hospital stay, wound infection, intra-abdominal abscess, and time to return to normal activity. Statistical analysis was performed using SPSS version 25. ***Results***: The mean operative time was slightly longer in LA (58.4±12.6 min) compared to OA (48.2±10.4 min). Postoperative pain scores were significantly lower in LA ($p<0.001$). The mean hospital stay was shorter in LA (2.4±0.8 days) versus OA (4.1±1.2 days). Wound infection rate was lower in LA (5%) compared to OA (15%). Time to return to normal activity was significantly earlier in LA group. ***Conclusion***: Laparoscopic appendicectomy is associated with reduced postoperative pain, shorter hospital stay, fewer wound complications, and faster recovery, despite slightly longer operative time. It may be considered the preferred approach in uncomplicated acute appendicitis.

Keywords: *Acute appendicitis; Laparoscopic appendicectomy; Open appendicectomy; Postoperative complications; Surgical outcomes.*

INTRODUCTION

Acute appendicitis is the most frequent cause of acute abdomen requiring emergency surgery worldwide[1]. The lifetime risk of developing appendicitis is approximately 7–8%, with a peak incidence in the second and third decades of life[2]. Despite advances in imaging and antibiotic therapy, appendicectomy remains the definitive treatment for most cases[3]

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Open appendicectomy (OA), first described by McBurney in 1894, has been the gold standard surgical technique for more than a century[4]. It involves a right lower quadrant incision, direct visualization of the appendix, and ligation at its base. Although effective and widely practiced, OA is associated with postoperative pain, wound complications, and longer hospital stay[5].

The advent of minimally invasive surgery revolutionized abdominal procedures. Semm performed the first laparoscopic appendicectomy (LA) in 1983[6]. Since then, LA has gained widespread acceptance due to advantages such as reduced postoperative pain, better visualization of the abdominal cavity, shorter recovery time, and improved cosmetic outcomes[7]. The magnified view provided by laparoscopy allows better identification of anatomical structures and diagnosis of alternative pathology, especially in female patients[8].

Multiple randomized controlled trials and meta-analyses have compared LA and OA. Studies suggest that LA is associated with reduced wound infection rates and shorter hospital stay, though it may involve slightly longer operative time[9][10]. However, concerns remain regarding increased intra-abdominal abscess rates in complicated appendicitis cases[11].

In developing countries, cost considerations and availability of expertise may influence the choice of surgical technique[12]. Furthermore, surgeon preference and institutional protocols also contribute to variation in practice[13].

Given evolving evidence and increasing preference for minimally invasive surgery, it is important to evaluate outcomes of LA versus OA in the context of modern surgical practice. This study aims to compare laparoscopic and open appendicectomy in terms of operative time, postoperative pain, complications, hospital stay, and recovery outcomes in patients presenting with acute appendicitis.

MATERIALS AND METHODS

A prospective comparative study conducted in the Department of General Surgery over 18 months.

Study Population

120 patients clinically and radiologically diagnosed with acute appendicitis.

Grouping

- **Group A:** Laparoscopic appendicectomy (n=60)
- **Group B:** Open appendicectomy (n=60)

Allocation was based on surgeon preference and patient consent.

Inclusion Criteria

- Age 18–60 years
- Clinical diagnosis of acute appendicitis
- Ultrasound/CT confirmation
- ASA Grade I–II
- Informed consent obtained

Exclusion Criteria

- Complicated appendicitis (perforation with generalized peritonitis)
- Appendicular mass/abscess
- Previous lower abdominal surgery
- Pregnancy
- Severe cardiopulmonary comorbidities
- ASA Grade III or above

Procedure

Laparoscopic Appendicectomy:

Three-port technique under general anesthesia. Appendix identified, mesoappendix divided using bipolar cautery, base secured with endoloop, specimen retrieved in endobag.

Open Appendicectomy:

McBurney's incision. Appendix ligated and removed. Wound closed in layers.

Outcome Measures

- Operative time
- Postoperative pain (VAS at 24 hrs)
- Length of hospital stay
- Wound infection
- Intra-abdominal abscess
- Time to return to normal activity

Statistical Analysis

Data analyzed using SPSS v25. Student's t-test and Chi-square test applied. $p<0.05$ considered significant.

RESULTS

Table 1: Demographic Distribution

Variable	LA (n=60)	OA (n=60)
Mean Age (years)	29.4±8.2	31.1±7.9
Male (%)	60%	63%

Groups were comparable in age and gender distribution ($p>0.05$).

Table 2: Operative Time

Group	Mean Time (min)
LA	58.4±12.6
OA	48.2±10.4

Operative time significantly longer in LA ($p<0.01$).

Table 3: Postoperative Pain (VAS)

Group	Mean VAS Score
LA	3.2±1.1
OA	5.6±1.4

Significantly lower pain in LA ($p<0.001$).

Table 4: Hospital Stay

Group	Mean Stay (days)
LA	2.4±0.8
OA	4.1±1.2

Shorter hospital stay in LA ($p<0.001$).

Table 5: Wound Infection

Group	Cases (%)
LA	3 (5%)
OA	9 (15%)

Higher wound infection in OA ($p<0.05$).

Table 6: Return to Normal Activity

Group	Mean Days
LA	7.3±2.1
OA	12.6±3.4

Faster recovery in LA group ($p<0.001$).

DISCUSSION

The present study demonstrates that laparoscopic appendicectomy offers significant advantages over open appendicectomy in terms of postoperative pain, hospital stay, wound infection, and return to normal activity. These findings align with recent systematic reviews and randomized trials[14,15].

Although operative time was longer in LA, similar findings have been reported by Jaschinski et al.[16], who attributed increased time to port placement and learning curve. However, operative duration decreases with surgical experience[17]. Postoperative pain was significantly lower in LA group. Minimally invasive access results in reduced tissue trauma and inflammatory response[18]. Meta-analyses confirm lower analgesic requirement in LA patients[19].

Wound infection rate was lower in LA (5%) compared to OA (15%). This is consistent with findings by Ukai et al.[20] and Athanasiou et al.[21]. Reduced wound handling and specimen retrieval in endobag contribute to lower infection rates.

Hospital stay was significantly shorter in LA. Faster mobilization and early oral intake contribute to earlier discharge[22]. Enhanced recovery protocols further improve outcomes in laparoscopic surgery[23].

Return to normal activity was earlier in LA group, reflecting quicker convalescence. Cosmetic satisfaction is also higher in LA, though not measured in this study[24].

Some literature suggests increased intra-abdominal abscess in complicated appendicitis cases with LA[25], but this study excluded complicated cases.

Overall, findings support current guidelines favoring laparoscopic appendicectomy as first-line treatment in uncomplicated appendicitis.

CONCLUSION

Laparoscopic appendicectomy is superior to open appendicectomy in terms of reduced postoperative pain, shorter hospital stay, fewer wound infections, and faster return to normal activities. Despite slightly longer operative time, LA should be considered the preferred approach in uncomplicated acute appendicitis where expertise and resources are available.

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