A Comparative Study of Open Versus Laparoscopic Appendicectomya

Andrea Pérez[1], Laura Villaverde[2], Ana Isabel[3]

Abstract Introduction: *Acute appendicitis remains one of the most common surgical emergencies worldwide. Appendicectomy is the standard treatment, performed either by open appendicectomy (OA) or laparoscopic appendicectomy (LA). Over the last three decades, laparoscopic surgery has gained popularity due to presumed benefits such as reduced postoperative pain, shorter hospital stay, and improved cosmetic outcomes. However, controversies remain regarding operative time, cost, and complication rates.* ***Materials and Methods****: This prospective comparative study was conducted on 120 patients diagnosed with acute appendicitis. Patients were divided into two groups: Group A (Open Appendicectomy, n=60) and Group B (Laparoscopic Appendicectomy, n=60). Parameters compared included operative time, postoperative pain, hospital stay, wound infection, return to normal activity, and complications. Statistical analysis was performed using chi-square test and independent t-test. A p-value <0.05 was considered significant.* ***Results****: The mean operative time was slightly longer in LA group (65.4 ± 12.3 minutes) compared to OA group (54.6 ± 10.2 minutes) (p<0.05). Postoperative pain scores were significantly lower in LA group. Mean hospital stay was 2.3 days in LA versus 4.1 days in OA (p<0.001). Wound infection rate was 3.3% in LA compared to 13.3% in OA. Patients in LA group resumed normal activities earlier.* ***Conclusion****: Laparoscopic appendicectomy offers advantages of reduced postoperative pain, shorter hospital stay, fewer wound infections, and faster recovery, despite slightly longer operative time. LA should be considered the preferred approach in uncomplicated appendicitis where facilities and expertise are available.*

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

[1] Médica, Residente de Medicina de Urgencias, Facultad de Medicina, Universidad de Antioquia. Medellín, Colombia. E
2 Médica, Especialista en Toxicología, Universidad de Antioquia. Medellín
[3] Licenciada en Farmacia, Especialista en Farmacia Hospitalaria, Servicio de Farmacia, Hospital Público da Mariña. Lugo, Medellín
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INTRODUCTION

Acute appendicitis is one of the most common causes of acute abdomen requiring emergency surgical intervention worldwide[1]. It has a lifetime risk of approximately 7–8% and affects all age groups, with peak incidence in the second and third decades of life[2]. Despite advances in diagnostic imaging and antibiotic therapy, surgical removal of the inflamed appendix remains the definitive treatment[3].

Open appendicectomy (OA), first described by McBurney in 1894, remained the gold standard procedure for nearly a century[4]. It involves a right lower quadrant incision and direct removal of the appendix. Although effective and safe, it is associated with postoperative pain, wound infection, and longer recovery time[5].

The introduction of laparoscopic appendicectomy (LA) by Semm in 1983 revolutionized the surgical management of appendicitis[6]. Laparoscopy provides magnified visualization of the abdominal cavity, allowing accurate diagnosis and minimal tissue trauma. Since its inception, LA has increasingly been adopted worldwide due to its minimally invasive nature[7].

Several studies have demonstrated that LA is associated with decreased postoperative pain, shorter hospital stay, earlier return to work, and improved cosmetic results[8–10]. However, concerns remain regarding longer operative time, higher cost, and potential for intra-abdominal abscess formation[11].

Recent meta-analyses have shown that LA significantly reduces wound infection rates compared to OA, though the difference in intra-abdominal abscess rates remains controversial[12–14]. Additionally, with improved surgical expertise and advanced equipment, operative time differences have become negligible in many centers[15].

In developing countries, open appendicectomy remains widely practiced due to cost constraints and limited laparoscopic facilities[16]. Therefore, comparative evaluation of both techniques in different healthcare settings remains clinically relevant.

This study aims to compare open and laparoscopic appendicectomy in terms of operative time, postoperative pain, complications, hospital stay, and recovery, thereby assessing the overall effectiveness and safety of both procedures.

MATERIALS AND METHODS

This prospective comparative study was conducted in the Department of General Surgery at a tertiary care hospital over a period of 18 months.

Study Design

Prospective comparative study.

Sample Size

A total of 120 patients diagnosed with acute appendicitis were included. Patients were randomly allocated into:

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

Inclusion Criteria

- Age 15–60 years
- Clinical diagnosis of acute appendicitis
- Ultrasonography-confirmed appendicitis
- Willing to provide informed consent

Exclusion Criteria

- Complicated appendicitis (perforation with generalized peritonitis)
- Appendicular mass/abscess
- Severe cardiopulmonary comorbidities
- Pregnancy
- Previous major abdominal surgery
- Conversion cases (excluded from analysis)

Surgical Procedure
Open appendicectomy was performed through McBurney's incision. Laparoscopic appendicectomy was performed using standard three-port technique under general anesthesia.

Parameters Studied
- Operative time (minutes)
- Postoperative pain (VAS score at 24 hours)
- Duration of hospital stay (days)
- Wound infection
- Intra-abdominal abscess
- Time to return to normal activity

Statistical Analysis
Data were analyzed using SPSS software. Quantitative variables were expressed as mean ± SD. Chi-square test and independent t-test were used. A p-value <0.05 was considered statistically significant.

RESULTS

Table 1: Demographic Distribution

Variable	Open (n=60)	Laparoscopic (n=60)	p-value
Mean Age (years)	28.4 ± 9.3	27.6 ± 8.7	0.64
Male (%)	36 (60%)	38 (63%)	0.72

Interpretation: Both groups were comparable demographically.

Table 2: Operative Time

Parameter	Open	Laparoscopic	p-value
Mean Operative Time (min)	54.6 ± 10.2	65.4 ± 12.3	<0.05

Interpretation: LA required significantly longer operative time.

Table 3: Postoperative Pain (VAS at 24 hrs)

Open	Laparoscopic	p-value
6.8 ± 1.2	4.2 ± 1.1	<0.001

Interpretation: LA significantly reduced postoperative pain.

Table 4: Hospital Stay

Open	Laparoscopic	p-value
4.1 ± 1.3 days	2.3 ± 0.8 days	<0.001

Interpretation: LA significantly reduced hospital stay.

Table 5: Postoperative Complications

Complication	Open (%)	Laparoscopic (%)
Wound Infection	13.3%	3.3%
Intra-abdominal abscess	3.3%	5%

Interpretation: Wound infection significantly lower in LA.

Table 6: Return to Normal Activity

Open	Laparoscopic	p-value
14.2 ± 3.1 days	8.6 ± 2.4 days	<0.001

Interpretation: LA patients resumed activity earlier.

DISCUSSION

The present study demonstrates that laparoscopic appendicectomy offers superior postoperative outcomes compared to open appendicectomy in uncomplicated acute appendicitis.

Operative time was significantly longer in LA group, consistent with findings by Jaschinski et al.[12] and Yu et al.[13]. However, this difference is attributed to the learning curve and setup time. With increased surgical expertise, this gap narrows significantly.

Postoperative pain was markedly lower in LA group, aligning with studies by Sauerland et al.[14] and Di Saverio et al.[15]. Reduced tissue trauma and smaller incisions explain this finding.

Hospital stay was significantly shorter in LA group, similar to findings reported in recent meta-analyses[16–18]. Early mobilization and reduced pain contribute to quicker discharge.

Wound infection was significantly higher in OA group. This observation is consistent with studies by Bhangu et al.[19] and Wei et al.[20], who reported reduced surgical site infection rates in LA.

Return to normal activity was faster in LA group, confirming findings from global surgical outcome studies[21–23].

However, intra-abdominal abscess rates were slightly higher in LA group, though not statistically significant. This remains debated in literature[24].

Overall, our findings support the growing consensus that laparoscopic appendicectomy provides better postoperative recovery and patient satisfaction.

CONCLUSION

Laparoscopic appendicectomy is a safe and effective alternative to open appendicectomy. It offers significant advantages including reduced postoperative pain, shorter hospital stay, fewer wound infections, and faster return to normal activities. Despite slightly longer operative time, laparoscopic approach should be preferred in uncomplicated cases where expertise and facilities are available.

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