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LAPAROSCOPIC APPENDECTOMY – AN EFFECTIVE SURGICAL APPROACH FOR ACUTE APPENDICITIS

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Abstract

Acute appendicitis is one of the most frequent surgical emergencies globally, and appendectomy remains the definitive treatment. While open appendectomy has historically been considered the standard procedure, laparoscopic appendectomy has increasingly gained prominence as a minimally invasive alternative. This study aimed to compare the outcomes of laparoscopic and open appendectomy in patients with uncomplicated acute appendicitis. A prospective comparative analysis was conducted on 80 patients between 2023 and 2024, with 40 undergoing open appendectomy and 40 undergoing laparoscopic appendectomy. Key parameters analyzed included operative time, postoperative pain, hospital stay, and complication rates. The results demonstrated that although laparoscopic appendectomy was associated with a longer operative time (55.3 ± 9.5 minutes vs. 46.5 ± 8.2 minutes, $p=0.02$), it provided significant clinical benefits such as reduced pain duration (1.9 ± 0.7 vs. 3.8 ± 1.1 days, $p<0.01$), shorter hospital stay (3.1 ± 1.0 vs. 6.2 ± 1.4 days, $p<0.001$), and fewer complications (5% vs. 15%, $p=0.04$). These findings confirm that laparoscopic appendectomy is a safe and effective surgical approach for acute appendicitis, particularly in uncomplicated cases, offering superior recovery and reduced morbidity compared to open surgery.

Keywords: *Acute appendicitis; laparoscopic appendectomy; open appendectomy; minimally invasive surgery; postoperative outcomes; surgical complications; hospital stay; recovery.*

Introduction

Acute appendicitis remains one of the most common surgical emergencies worldwide, with a lifetime incidence of 7-10% (WHO, 2023). Laparoscopic appendectomy has emerged as a preferred minimally invasive technique, offering advantages such as reduced postoperative pain, faster recovery, and lower complication rates compared to open surgery (Nguyen et al., 2022).

Objective

To compare the efficacy and outcomes of laparoscopic versus open appendectomy in patients with acute appendicitis.

Literature Review

Acute appendicitis has been recognized as one of the most frequent surgical emergencies since the late nineteenth century, with global lifetime incidence rates reported at seven to ten percent [Anderson, 2018, p. 112]. Traditionally, open appendectomy has long been considered the standard surgical approach, yet the introduction of laparoscopic techniques in the late 1980s revolutionized the management of this condition [Semm, 1983, p. 245]. Several studies have demonstrated that laparoscopic appendectomy offers significant clinical advantages. A meta-analysis revealed that patients undergoing laparoscopic appendectomy experienced reduced postoperative pain and required less analgesia compared to those who underwent open surgery [Nguyen et al., 2022, p. 51]. Additionally, shorter hospital stays and faster return to daily activities have been consistently documented, further reinforcing the minimally invasive approach [Sajid et al., 2019, p. 327]. In terms of complications, wound infection remains one of the most important postoperative risks. Evidence suggests that laparoscopic appendectomy significantly lowers the incidence of superficial surgical site infections compared to open procedures [Ghosh, 2023, p. 174]. Furthermore, laparoscopic access allows for better visualization of the abdominal cavity, reducing the likelihood of missed diagnoses such as gynecological pathology or Meckel's diverticulum [Liang et al., 2020, p. 89]. However, the laparoscopic approach is not without limitations. Several authors have noted that operative time is generally longer in laparoscopic appendectomy, although this difference diminishes

with surgical experience [Singh et al., 2021, p. 210]. Moreover, the requirement for advanced equipment and trained personnel poses challenges in low-resource settings [Kumari & Patel, 2022, p. 134]. Large-scale systematic reviews, including the Cochrane analysis, have concluded that laparoscopic appendectomy is associated with lower complication rates, particularly in terms of wound infection, and is now considered the preferred method in uncomplicated cases [Cochrane, 2022, p. 47]. Nevertheless, open appendectomy remains a valuable alternative, especially in complicated or perforated appendicitis where laparoscopic surgery may increase the risk of intra-abdominal abscess formation [Anderson & Clarke, 2019, p. 256].

Methods

Study Design: Prospective comparative study (2023-2024). **Participants:** 80 patients (40 open, 40 laparoscopic) with uncomplicated acute appendicitis (Alvarado score ≥7).

Outcome Measures:

a) Operative time

b) Postoperative pain (VAS scale)

c) Hospital stay duration

d) Complication rates (wound infection, abscess, bowel injury)

Statistical Analysis: Independent t-tests, χ^2 tests (significance: $p<0.05$).

Results

Parameter	Open Appendectomy (n=40)	Laparoscopic Appendectomy (n=40)	p-value
Operative time (min)	46.5 ± 8.2	55.3 ± 9.5	0.02

Parameter	Open Appendectomy (n=40)	Laparoscopic Appendectomy (n=40)	p-value
Pain duration (days)	3.8 ± 1.1	1.9 ± 0.7	<0.01
Hospital stay (days)	6.2 ± 1.4	3.1 ± 1.0	<0.001
Complications (%)	15	5	0.04

Discussion

Although laparoscopic appendectomy required longer operative time (p=0.02), it demonstrated superior outcomes, including a 3-fold reduction in complications (5% vs. 15%, p=0.04) and shorter hospitalization (3.1 vs. 6.2 days, p<0.001). These findings align with global meta-analyses (Cochrane, 2022) and support laparoscopy as the gold standard for uncomplicated appendicitis. Limitations include small sample size and exclusion of perforated cases.

Conclusion

Laparoscopic appendectomy is a safe and effective treatment for acute appendicitis, offering faster recovery and fewer complications than open surgery. Its adoption should be prioritized where resources and expertise permit.

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