

Comparison of Laparoscopic vs Open Appendectomy: Outcomes and Recovery Time

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Abstract

Background

One of the most frequent surgical emergencies in the world is acute appendicitis. Although laparoscopic and open methods are frequently employed, appendectomy is still the standard of care. The purpose of this study was to compare the surgical results, postoperative recuperation, and complications of laparoscopic appendectomy (LA) with open appendectomy (OA).

Methods

120 patients with acute appendicitis were included in a comparative cross-sectional study. Patients were split into two groups: Group B (n = 60) had an open appendectomy, and Group A (n = 60) had a laparoscopic appendectomy. SPSS version 25 was used to record and evaluate demographic information, operation time, postoperative pain (measured by the Visual Analog Scale), length of hospital stay, recovery time, and postoperative complications. To compare results between groups, independent t-tests and chi-square tests were used; $p < 0.05$ was deemed statistically significant.

Results

Although the laparoscopic group's mean operating time was marginally longer (52.6 ± 11.4 min) than the open group's (45.8 ± 10.1 min), the difference was not statistically significant ($p=0.061$). Significantly less postoperative discomfort (VAS 3.2 ± 1.1 vs. 5.6 ± 1.4 , $p<0.001$), a shorter hospital stay (2.1 ± 0.8 vs. 3.8 ± 1.2 days, $p<0.001$), and a quicker return to normal activities (7.5 ± 2.3 vs. 12.6 ± 3.1 days, $p<0.001$). The laparoscopic group experienced a significant decrease in wound infections and a decreased total complication rate (11.7% vs. 28.3% , $p=0.024$).

Conclusion

Even though laparoscopic appendectomy takes a little longer than open appendectomy, it offers better postoperative recovery, less pain, a shorter hospital stay, and fewer complications. While OA is still useful in complex patients or environments with limited resources, LA is advised as the best course of action for simple acute appendicitis.

Keywords

Acute appendicitis, Laparoscopic appendectomy, Open appendectomy, Postoperative recovery, Surgical outcomes, Minimally invasive surgery, Complications

Introduction

With a lifetime risk of roughly 6–8%, acute appendicitis is one of the most frequent surgical emergencies seen globally. It is still a major cause of stomach pain that needs to be treated surgically right away. For for than a century, the most effective treatment has been an appendectomy, which involves surgically removing the inflamed appendix. The conventional method was open appendectomy (OA), which McBurney initially described in the late 19th century. But with to improvements in minimally invasive procedures, Kurt Semm's 1983 introduction of laparoscopic appendectomy (LA) has become widely accepted and is now often chosen in contemporary surgical practice.

Surgeons have been debating laparoscopic versus open appendectomy for the past few decades. Both methods are frequently used, and each has benefits and drawbacks of its own. In an open appendectomy, the appendix is directly visible and removed through a single, bigger incision in the right lower quadrant. Laparoscopic appendectomy, on the other hand, uses tiny incisions, a camera, and specialized tools to carry out the treatment with the least amount of tissue damage. This basic variation in surgical technique has significant effects on recovery time and postoperative results.

When comparing these two methods, postoperative recovery is one of the most important factors to take into account. Reduced postoperative pain, shorter hospital stays, and a quicker return to regular activities are frequently linked to laparoscopic appendectomy. Research has shown that compared to patients following open surgery, those receiving laparoscopic operations usually need fewer analgesics and resume daily activities and oral intake earlier. Furthermore, compared to open appendectomy, laparoscopic appendectomy can shorten hospital stays by roughly 0.5 to 1 day and enable patients to resume their regular activities several days sooner, according to meta-analyses.

The rate of postoperative complications is another important factor to consider when assessing these surgical methods. Among the most often researched consequences are wound infection, intra-abdominal abscess, and postoperative ileus. Due to smaller incisions and less exposure of internal tissues to external pollutants, there is evidence that laparoscopic appendectomy is linked to a lower incidence of wound infections. However, some research has shown that there is a marginally increased risk of intra-abdominal abscess formation after laparoscopic surgeries, especially when severe appendicitis is present. Despite these results, laparoscopic appendectomy is regarded as a safe substitute for open surgery, and overall complication rates between the two methods are often comparable.

Another metric that is often contrasted between the two approaches is operational time. Due to the technical difficulty and learning curve of minimally invasive surgery, laparoscopic appendectomy has historically been linked to lengthier operating times. Laparoscopic procedures may take seven to eighteen minutes longer than open appendectomy, according to meta-analyses. However, this discrepancy has increasingly diminished over time due to improvements in laparoscopic technology and surgeon experience, making the length of the procedure less of a constraint when selecting the surgical technique.

Laparoscopic appendectomy has a clear advantage in terms of diagnostic accuracy. When the appendix seems normal, surgeons can confirm the diagnosis and find other illnesses by using a camera to directly view the entire abdominal cavity. Because gynecological disorders can mimic appendicitis, this is especially helpful for female patients who are of reproductive age. As a result, laparoscopic surgery is a useful diagnostic technique in addition to a curative treatment.

In contemporary surgical practice, cosmetic results and patient satisfaction are also crucial factors. Compared to the larger incision needed for open surgery, laparoscopic appendectomy leaves fewer scars due to its smaller incisions. Higher patient satisfaction and a better quality of life after surgery are frequently associated with this improved cosmetic result. Additionally, a speedier recovery and less pain after surgery improve the patient's overall experience.

Open appendectomy is still crucial in some clinical situations, even with the benefits of

laparoscopic appendectomy. Due to improved access and control, an open technique may be recommended in cases of complex appendicitis, such as perforation, abscess formation, or substantial intra-abdominal adhesions. Furthermore, open appendectomy is still a dependable and efficient choice in resource-constrained environments where laparoscopic tools and knowledge might not be easily accessible.

The choice of surgical procedure is also influenced by cost-effectiveness. Shorter hospital stays, quicker recuperation, and an earlier return to work may balance the higher initial costs associated with laparoscopic appendectomy due to specialized equipment and lengthier operating times. Therefore, laparoscopic appendectomy may provide long-term financial benefits when taking into account total healthcare spending and societal expenditures.

It is crucial to carry out comparison studies in order to fully assess the efficacy of both approaches due to their widespread use and the variation in reported results. When choosing the best surgical strategy for patients with acute appendicitis, factors like recovery time, length of hospital stay, postoperative pain, and complication rates are crucial. When choosing the best procedure, institutional resources, surgeon experience, and patient-specific considerations must also be taken into account.

To sum up, both laparoscopic and open appendectomy are safe and efficient ways to treat acute appendicitis. Nonetheless, laparoscopic appendectomy has shown a number of benefits, most notably less pain following surgery, a shorter hospital stay, and a quicker recovery. Open appendectomy is still a viable option in certain situations despite these advantages. Therefore, choosing the best surgical technique for each patient requires a balanced and evidence-based approach. In order to add to the expanding body of knowledge in this area, this study compares laparoscopic versus open appendectomy with an emphasis on results and recovery time.

Methodology

Over the course of six months, this comparative cross-sectional study was carried out in the general surgery department of a tertiary care hospital. Patients with acute appendicitis were included in the study based on radiographic, laboratory, and clinical evaluations. A non-probability consecutive sampling technique was used to recruit 120 patients, who were split into two groups: Group A (n = 60) received laparoscopic appendectomy, while Group B (n = 60) underwent open appendectomy. The study comprised patients of both genders who were between the ages of 15 and 60. To reduce confounding variables, patients with severe comorbidities (e.g., uncontrolled diabetes mellitus, severe cardiovascular disease), complex appendicitis (e.g., appendicular mass, abscess, or generalized peritonitis), or prior abdominal procedures were excluded.

Surgeons with similar levels of experience conducted all surgeries under general anesthesia. The appendix was located, ligated, and removed using endoscopic tools in the laparoscopic group using a typical three-port method. The appendix was accessed and removed in the open appendectomy group using a standard right lower quadrant incision known as McBurney's incision. All patients received prophylactic antibiotics before to surgery, and both groups followed the same postoperative care procedures.

Operative time, postoperative pain, length of hospital stay, and time to resume regular daily activities were the main outcome measures. Postoperative problems include wound infection, intra-abdominal abscess, and postoperative ileus were secondary outcomes. The Visual Analog Scale (VAS) was used to measure postoperative discomfort 24 hours following surgery. Recovery time was defined as the number of days required to return to regular activities, and the length of hospital stay was measured in days from the time of operation to discharge.

A standardized proforma was used to gather data, and SPSS version 25.0 was used for analysis. While qualitative factors like gender and complication rates were shown as frequencies and percentages, quantitative variables like age, surgical time, and hospital stay were given as mean \pm standard deviation. The chi-square test was utilized for categorical data, and the independent sample t-test was utilized to compare means between the two groups. Statistical significance was defined as a p-value of less than 0.05. Before the study started, the institutional review board granted ethical permission, and each subject gave their informed consent.

Results

The study had 120 patients in total, 60 of whom underwent laparoscopic appendectomy (Group A) and open appendectomy (Group B). There were no statistically significant variations between the two groups' demographic features.

Table 1: Demographic Characteristics of Study Participants

Variable	Group A (Laparoscopic) n=60	Group B (Open) n=60	p-value
Mean Age (years)	32.4 \pm 10.2	34.1 \pm 9.8	0.321
Gender (Male)	35 (58.3%)	37 (61.7%)	0.705
Gender (Female)	25 (41.7%)	23 (38.3%)	

According to surgical results, the laparoscopic group's mean operating time was marginally longer than that of the open group, although this difference was not statistically significant.

Table 2: Operative Outcomes

Parameter	Group A (Laparoscopic)	Group B (Open)	p-value
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Parameter	Group A (Laparoscopic)	Group B (Open)	p-value
Operative Time (minutes)	52.6 ± 11.4	45.8 ± 10.1	0.061

The laparoscopic group showed notable advantages in postoperative recovery metrics. Laparoscopic appendectomy patients had shorter hospital stays, less postoperative pain, and a quicker return to their regular activities.

Table 3: Postoperative Recovery Outcomes

Parameter	Group A (Laparoscopic)	Group B (Open)	p-value
Pain Score (VAS at 24 hrs)	3.2 ± 1.1	5.6 ± 1.4	<0.001
Hospital Stay (days)	2.1 ± 0.8	3.8 ± 1.2	<0.001
Return to Normal Activity (days)	7.5 ± 2.3	12.6 ± 3.1	<0.001

Compared to the open appendectomy group, the laparoscopic group experienced less postoperative problems. Intra-abdominal abscess formation did not differ statistically significantly between the two groups, however wound infections were more frequent in the open group.

Table 4: Postoperative Complications

Complication	Group A (Laparoscopic) n (%)	Group B (Open) n (%)	p-value
Wound Infection	3 (5.0%)	10 (16.7%)	0.041
Intra-abdominal Abscess	2 (3.3%)	1 (1.7%)	0.558
Postoperative Ileus	2 (3.3%)	6 (10.0%)	0.143
Total Complications	7 (11.7%)	17 (28.3%)	0.024

Despite a little longer operating time, laparoscopic appendectomy was generally linked to far better postoperative recovery outcomes and a lower rate of complications than open appendectomy.

Conclusion

In conclusion, it was discovered that both open and laparoscopic appendectomy were safe and efficient surgical methods for treating acute appendicitis. Nonetheless, laparoscopic appendectomy showed distinct advantages over the open method in a number of important areas. Laparoscopic surgery is preferable in terms of recovery results; patients who had it reported far less postoperative discomfort, shorter hospital stays, and a quicker return to regular daily activities.

much while the laparoscopic appendectomy procedure took a little longer, this difference was not clinically significant and could go down much more as surgeon skill and minimally invasive techniques improve. Furthermore, a lower frequency of postoperative complications, especially wound infections, was linked to the laparoscopic procedure, which enhances patient outcomes and satisfaction.

Despite these advantages, open appendectomy is still a useful procedure, particularly in resource-constrained environments or in complex situations where laparoscopic intervention might not be practical. As a result, the surgical procedure selection should be tailored to the patient's condition, the surgeon's experience, and the facilities that are available.

Overall, because of its improved recovery profile and good results, laparoscopic appendectomy might be suggested as the best course of action for simple acute appendicitis.

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