

COMPARATIVE STUDY OF OPEN VERSUS LAPAROSCOPIC APPENDECTOMY IN A TERTIARY CARE TEACHING HOSPITAL

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Received : 02/11/2022
 Received in revised form : 25/11/2022
 Accepted : 07/12/2022

Keywords:

Acute appendicitis, laparoscopic or open appendectomy, postoperative discomfort, and wound infection.

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DOI: 10.47009/jamp.2023.5.2.116

Source of Support: Nil,
 Conflict of Interest: None declared

Int J Acad Med Pharm
 2023; 5(2); 557-560



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Abstract

Background: The most frequent emergency requiring general surgery is acute appendicitis. The most common emergency abdominal surgery is an appendectomy, which is the preferred treatment for acute appendicitis. Although open appendectomy is a safe and efficient procedure with minimal morbidity, it has been linked to intestinal obstruction, wound infection, and post-operative pain, which may cause recovery to be delayed. An effective choice for treating appendicitis is laparoscopic appendectomy. This research compared the laparoscopic and open approaches for treating appendicitis in patients at a tertiary care teaching hospital. **Materials and Methods:** 120 patients with appendicitis who had been admitted to the department of general surgery at the World College of Medical Sciences Research and Hospital participated in this prospective research. They were split into two groups of 60 patients each: the open appendectomy (OA) group and the laparoscopic appendectomy (LA) group. **Result:** Abdominal pain is the most common symptom of appendicitis, which is also frequently prevalent in children between the ages of 11 and 20. Laparoscopic appendectomy has been proven to be just as secure and successful as open appendectomy. LA has less postoperative pain, a shorter hospital stay, and more acceptable cosmetic results. In the LA group (3.4+1.6) and in the OA group (4.2+1.3), the pain score was considerably lower. **Conclusion:** LA was determined to be equally secure and reliable as OA. LA has less postoperative pain, a shorter hospital stay, and more satisfactory cosmetic results.

INTRODUCTION

Vermiform appendix irritation is referred to as appendicitis. The most frequent abdominal emergency in the globe and the most frequent reason for abdominal surgery across all age groups is acute appendicitis. Men have a lifetime chance of appendicitis of 8.6%, while women have a risk of 6.7%.^[1,2] One of the most frequent causes of acute abdominal pain that necessitates surgery is acute appendicitis, with a lifetime prevalence of about 7%.^[3] This condition is very challenging to diagnose, particularly given the clinical conditions and subtle early symptoms.^[4] When a surgical choice is made based on the clinical symptoms and findings, negative appendectomy is seen in 15–30% of cases.^[5] Early surgery results in a poor assessment of acute abdominal discomfort and a negative appendectomy, whereas prolonged surgery results in complications from appendicitis perforation.^[6] Delays in identification can result in a number of complications, such as perforation,

periappendicular abscess, wound infection, and intraabdominal adhesion.^[7] The ease of the patient is given more thought in the twenty-first century; this decision is due to the development of new technology and surgical techniques.^[8] The most frequent procedure carried out by general doctors is an appendectomy. Acute appendicitis is a tough and challenging diagnosis to make. Anrecognised appendectomy rejection rate for suspected appendicitis is 15%–20%, and in pregnant women, the rate is even higher at 20–30%.^[9] German gynaecologist Semm K first conducted the laparoscopic appendectomy. With the advancements in technology over the last two to three decades, it has become more widely accepted as a diagnosis and therapeutic approach for acute appendicitis. Since then, many people have used this method. Despite its widespread acceptance, there is still ongoing discussion in the literature about the best method to remove an inflamed appendix.^[10] However, due to the emergency nature of the disease, which is frequently treated by junior staff

during off-hours when laparoscopic equipment, trained staff, and supervision may not be available in the hospital, laparoscopic appendectomy is still not regarded as the gold standard for acute appendicitis as laparoscopic cholecystectomy has become for cholelithiasis.^[11] Numerous studies have demonstrated improved clinical results when using a laparoscopic approach.^[12] Some authors have disputed these clinical results, which showed no discernible difference between the two operations' outcomes and also mentioned the higher cost of laparoscopic appendectomy. Laparoscopic surgery in the modern era has shown notable improvements in surgical disease. General surgeons have reversed the trend towards minimally invasive surgery by reviewing every procedure to determine whether laparoscopic techniques are appropriate.^[13] In order to evaluate open and laparoscopic appendectomy in patients with acute appendicitis, that was the study's main objective.

MATERIALS AND METHODS

The study was carried out at the World College of Medical Sciences Research and Hospital in Jhajjar, India, in the department of general surgery. The Institute Ethical Committee's approval for conducting the research was sought before beginning the study. Privacy and confidentiality were protected. This research involved 120 patients with acute appendicitis who underwent both open and laparoscopic appendectomies. Those who were ready to participate were included among patients older than 14 years old who were hospitalised with a clinical diagnosis of acute appendicitis and underwent appendectomy. Females who are pregnant, people taking steroids, people with compromised immune systems, people receiving chemotherapy for cancer, people with chronic medical conditions, people with psychiatric or haemodynamically unstable illnesses, people with cirrhosis, people with coagulation disorders, and people who are unwilling to contribute were all excluded from the study. Using the questionnaire/proforma, informed consent was gathered. The patient's routine blood tests, such as total blood counts, platelet counts, random blood sugar levels, urea, creatinine, etc., and urine examinations, served as the study's main source of data. (routine & microscopy). Age, sex, operation time, intraoperative findings (acute, gangrenous,

perforated), time to liquids/soft diet, hospital stay following surgery, postoperative pain score, need for analgesics, and complications were among the data gathered. Histopathology verified the clinical diagnosis. The sort of operation was chosen based on the preferences and qualifications of the on-call surgeon. Clinical evaluation revealed tenderness or guarding in the right iliac fossa, and the history of right lower abdominal pain, nausea, and vomiting helped to confirm the diagnosis. The patients were split into two groups of 60 each: open appendectomy and laparoscopic appendectomy. The standard Mc Burney incision was used to perform OA, and the peritoneum was accessed and opened to deliver the appendix. The mesoappendix and base of the appendix were both ligated and cut, and the appendix was then removed as normal. LA was completed using the traditional 3 ports method. The table was inclined to the left in trendelenburg position after producing pneumoperitoneum of pressure 10–12 mmHg of CO₂ via a verres needle supraumbilical site. The distal portion of the mesoappendix was sliced and removed via a 10mm port after the mesoappendix was cut with a Harmonic scalpel and its base ligated with a pre-tied endoloop. Data from clinical and research studies was gathered, examined, and analysed. The SPSS software 20 version was used for data analysis after all the data had been input into a proforma. (IBM Corp., Armonk, NY, United States). Data was given as mean and standard deviation, and statistical analyses were conducted using Student's t-test and the chi square test. Any p-value that was 0.05 or lower was regarded as significant.

RESULTS

Age distribution: According to [Table 1], the majority of cases in this research (38.3% of open appendectomy cases and 48.3% of laparoscopic appendectomy cases) were from the age group of 11 to 20 years. [Table 3] reveals that all patients (100%) reported experiencing abdominal discomfort, the majority of patients (81.7% vs. 90.0%) reported experiencing nausea or vomiting, and less than half (43.3% vs. 31.7%) reported having fever. A third of the patients (60.0% vs. 63.3%) had guarding/rigidity and all patients had RIF pain. In 8.0% and 11.7% of the OA and LA groups, respectively, the biopsy result (HPE report) was normal (negative appendectomy).

Table 1: Shows the distribution of ages in each of the groups.

| Age group in years | Open appendectomy (OA) | Laparoscopic appendectomy (LA) |
|--------------------|------------------------|--------------------------------|
| 11-20 | 23(38.3%) | 29(48.3%) |
| 20-30 | 13(21.7%) | 14(23.3%) |
| 30-40 | 12(20.0%) | 11(18.3%) |
| 40-50 | 07(11.7%) | 04(6.7%) |
| 50-60 | 05(8.3%) | 02(3.3%) |

Table 2: Shows the open group contains 35.8% men and 64.2% women, while the Lap group contains 35.0% men and 65.0% women.

| Age group (Yrs) | Open appendectomy (OA) | | Laparoscopic appendectomy (LA) | |
|-----------------|------------------------|--------|--------------------------------|--------|
| | Male | Female | Male | Female |
| 11-20 | 08 | 15 | 10 | 19 |
| 20-30 | 05 | 08 | 05 | 09 |
| 30-40 | 04 | 08 | 04 | 07 |
| 40-50 | 03 | 04 | 01 | 03 |
| 50-60 | 02 | 03 | 01 | 01 |
| Total | 22 | 38 | 21 | 39 |

Table 3: Showing the distribution of data for both groups based on histopathological (HPE) results and symptoms and signs.

| Symptoms/Signs | Open appendectomy (OA)(n)% | Laparoscopic appendectomy (LA)(n)% |
|-------------------|----------------------------|------------------------------------|
| Abdominal pain | 60 (100.0%) | 60 (100.0%) |
| Nausea/vomiting | 49(81.7%) | 54(90.0%) |
| Fever | 26(43.3%) | 19(31.7%) |
| Tender RIF | 60(100.0%) | 60 (100.0%) |
| Guarding/rigidity | 36(60.0%) | 38(63.3%) |
| HPE normal | 05(8.0%) | 07(11.7%) |
| HPE confirm | 55(91.7%) | 53(88.3%) |

The length of hospital stay following surgery. The majority of patients in the Laparoscopic Appendectomy (LA) group spent a maximum of 2.4 days in the hospital following operation, compared to 3-5 days in the Open Appendectomy (OA) group.

Table 4: Depicting the distribution of statistics based on the degree of pain and the amount of time each group used an analgesic. The LA group experienced significantly less pain and used analgesics for a shorter period of time.

| Postoperative pain | Open appendectomy (OA) | Laparoscopic appendectomy(LA) | P -value |
|-----------------------------|------------------------|-------------------------------|----------|
| Pain score (0-4) | 4.2±1.3 | 3.4±1.6 | <0.04 |
| Time spent using analgesics | 10.16±4.2 | 4.82±1.9 | <0.03 |

DISCUSSION

This study's age group was similar to age groups in a number of other studies where appendicitis is more prevalent in younger adults. According to numerous studies, laparoscopic appendectomy leads to a quicker recovery and early return to regular activities with fewer complications. The length of the hospital stay was also reduced, which led to earlier feeding and hospital discharge.^[14-16] Visual Analog Score (VAS), which has a score range of 0 to 10, with 0 representing no pain and 10 representing the most pain, was used to measure the intensity of surgical pain. VAS measurements were taken right away following surgery, then every hour for four hours, at eight hours, and at 24 hours. Compared to the open group, the laparoscopic group's pain score and analgesic usage time were found to be lower, at (3.4±1.6) and (4.82±1.9) and (4.2±1.3) and (10.16±4.2) respectively. This difference was found to be statistically significant at $p=0.04$, which is consistent with other studies.^[17] According to this study, the open group experienced slightly more post-operative hospital days than the laparoscopic group, which is consistent with research by Hellberg et al,^[18] as well as other randomised clinical studies and meta-analyses.^[19] An open group method is more common than a laparoscopic one when complicated appendicitis is present. Both groups experienced sickness and vomiting, and the open group after surgery saw a few intra-abdominal abscesses while the lap group

did not. Similar research revealed that the lap group experienced less vomiting.^[20] Due to longer muscle incision stretches and wound infection, the pain score in this study was higher in open surgery (10.16±4.2) than in laparoscopic (4.82±1.9), and this was found to be statistically significant at a p -value less than 0.03. Despite being straightforward and efficient, the traditional open appendectomy has some drawbacks, such as the chance of unnecessary appendectomies, wound sepsis, and a delayed recovery.^[21] This study found that laparoscopy greatly reduced the rate of postoperative wound infection, which is consistent with research by Marzouk M et al.^[22] The 10mm trocar cannula sheath was used to retrieve the appendix specimen; there was no direct interaction with the port site. Plastic bags were used when the appendix was too big to fit inside the cannula. If required, the periappendiceal fluid collection was laparoscopically aspirated without contaminating the port opening. To avoid port site herniation, a single port closure vicryl suture was used to seal a 10mm port. Contrast this with an open method, which calls for numerous sutures to close the incisions and may encourage the collection of hematoma and infection.^[23]

CONCLUSION

We came to the conclusion that laparoscopic appendectomy is a secure and efficient method for treating appendicitis. Compared to an open

appendectomy, it offers more acceptable cosmetic results, a shorter hospital stay, and considerably less postoperative discomfort. In addition, compared to an open appendectomy, it lowers the incidence of postoperative incision infection. But it's important to take into account the cost-effectiveness of the laparoscopic process and the timing of the operation at odd hours.

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