

A Comparison of Open and Laparoscopic Appendicemnesis among Patients Visiting a Tertiary Care FacilityDeepak Kumar Sah¹, Sudhanshu Shekhar²¹Senior Resident, Department of Surgery, SKMCH, Muzaffarpur, Bihar²Senior Resident, GMCH Purnia, Bihar

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Abstract:

Approximately 1% of all surgical procedures are appendectomies, making them one of the most common procedures in general surgery. Less postoperative pain, early discharge, fewer wound infections, improved cosmesis, and an early return to regular employment are all predicted with laparoscopic appendectomy. Regarding length of operation, pain following surgery, length of analgesia, complications following surgery, length of hospital stay following surgery, and return to regular employment, laparoscopic and open surgical techniques are compared. This study, which was conducted from September 2020 to August 2021, is prospective and comparative in nature. It involved 100 patients—50 open and 50 lap appendectomy—that were operated on in the surgical department of the (Medical college) in (city). The cases were chosen at random. Pain score in the open group was 2.6 ± 0.5 in the current study, while it was 1.4 ± 0.5 in the lap group ($P < 0.05$) due to wound infection and longer incision strain of muscles. Vomiting was one of the fewer post-operative problems in the laparoscopic group (6%) than in the open group (83%). Compared to open group 7, which had a 14% rate of post-operative wound infection, lap group 2 has a gradually lower incidence (4%) of such infections. In comparison to open group 3 ± 2.1 , the duration of post-operative hospital stay was significantly shorter for lap group 2.2 ± 0.4 . In the lap group, the return to regular activity was lower, taking 22 (44%) instances 6 to 9 days, compared to 28 (56%) cases in the open group 14 to 17 days. The duration of surgery was 46.2 ± 10.4 for an open appendectomy and 66.5 ± 18.5 for a lap appendectomy. For certain patients with acute or recurring appendicitis, laparoscopic appendicitis is preferable to open appendectomy.

Keywords: Appendectomy, Laparoscopic, Surgery Complications, Open Appendectomy.

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Introduction

Appendicitis is the most common intra-abdominal illness requiring emergency surgery (Ilhan et al., 2013), with a 6% lifetime risk. Appendices are among the most frequently performed procedures in general surgery; they make up about 1% of all surgical procedures (Telfor and Wallace, 2000). Although improvements in surgical methods, fluids, treatments with antibiotics, and medical diagnostics have decreased fatalities from 50% (prior to 1925) to less than 1/1,000,000, morbidity is still greater than 5-8%, mostly due to wound infection brought on by postponed diagnosis and treatment (Naraintran et al., 2018). With the least amount of morbidity, laparoscopic appendectomy is a method that combines the advantages of diagnosis and therapy.

Compared to patients who have had an open appendectomy, patients are likely to experience less discomfort following surgery, be released from the hospital sooner, and resume their regular activities of daily living (Russell et al., 2004).

According to Chawngthu and Sailo (2020), additional benefits include reduced wound infection, improved cosmesis, the capacity to examine the intact peritoneal cavity for the detection of additional disorders, and efficient peritoneal toileting without expanding the incision. Laparoscopic appendicitis is being used more frequently, especially in young women who are fertile and have a wide range of possible diagnoses for lower quadrant pain at right side, as well as gynecological pathology (Apelgren et al., 1996). Approaches to surgical disorders have undergone significant alterations as a result of the advent of laparoscopic surgery (Jaschinski et al., 2015).

General surgeons are examining almost all procedures to see if they may be converted to laparoscopic methods due to the push towards minimally invasive surgery (Naraintran et al., 2018). In the present study, the length of the appendectomy procedure using laparoscopy is compared to the open surgical technique in terms of

time spent in the recovery room, pain following surgery, length of time taken to take analgesics, postoperative complications such as ileus, vomiting, intraabdominal abscess, and wound infection, postoperative hospital reside, and time required to return to regular work.

Methods: between September 2013 and August 2014, patients having a clinical diagnosis of acute or recurrent appendicitis were admitted to the surgical wards of (Medical College, city). In this prospective study, which took place at (Medical College in city) from September 2020 to August 2021, 100 cases—50 cases opened and 50 cases lap—were sequentially chosen.

Inclusion Criteria: Individuals having the required testing and a clinical diagnosis of acute or recurring appendicitis.

Exclusion Criteria: Children under 10 year's old, pregnant women, and those with problems are excluded from the study. An appendix that has burst or become gangrenous, together with or without peritonitis, periappendicular pus, or an appendicular tumour, is referred to as complicated appendicitis. After undergoing the appropriate testing and receiving a diagnosis of acute or recurrent appendicitis, patients who complained of vomiting, fever, and tenderness in the right ileac fossa along with guarding or rigidity were scheduled for surgery.

Through an incision that splits the muscles in the right iliac fossa, an open appendectomy was carried out. The appendix stump was not invaginated, and its base was crushed and ligated. A standardised procedure that included a closed trocar insertion technique and a three-port technique was used to perform laparoscopic appendectomy procedures. The base was ligatured, and the appendix was split. Trocar sleeves were used during the appendix extraction procedure to prevent infection of the incision during removal.

The surgical procedure for a lap involves incisions at the port site followed by sutures to close the port, while an open procedure involves incisions on the skin followed by skin closure. Every case was monitored daily throughout the postoperative phase until it was discharged, and then it was followed for four weeks in the outpatient department. A visual

analogue pain scale is used to measure and the number of days the painkiller was used were the two criteria that were monitored during follow-up to compare the two treatments. Issues following surgery, such as wound infection, ileus, vomiting, and abdominal abscess. Patients in both study groups were released from the hospital as soon as possible, and the number of days that they spent in the recovery room following surgery and the amount of analgesics they took were recorded. The definition of wound infection was pus discharge that needed to be surgically drained. An abdominal abscess was described as a collection of fluid identified by computed tomography or ultrasonography that contained pus upon ultrasonographically guided aspiration.

Results

The following are the findings from the examination of data from 50 patients who had open appendectomy and another 50 individuals who had laparoscopic surgery. The study found that among the patients, 26 (52%) had open appendectomies and 22 (44%) had laparoscopic appendectomies; the remaining 24 (48%) had open appendectomies and 28 (56%) had laparoscopic appendicemies (Table 1). The study found that, in open and laparoscopic appendectomy, the largest percentages of patients 23 (46%) and 22 (44%) were in their second decade of life (Table 1). Abdominal pain was reported by 46 (92%) of the open group and 50 (100%) of the laparoscopic group in the current study.

In the open group, 38 (76%) had a history of vomiting, while in the laparoscopic group, 36 (72%) did. Fever was reported as one of the additional problems in 16 (32%) of the open group and 14 (28%) of the laparoscopic group (Table 1). Every patient in the current study experienced right iliac fossa soreness in both appendectomy groups: 50 (100%) and 43 (86%) in the open group, while 38 (76%) in the laparoscopic group experienced guarding or rigidity (Table 1).

In the current investigation, aberrant pathology was found in 45 open appendectomy cases (90%) and 42 laparoscopic cases (84%). Eight (16%) of the laparoscopic group and five (10%) of the open group had normal ultrasound results (Table 1).

Table 1: Demographics of the patients, presenting complain, past history of patients, local examinations, and ultrasound findings

Characteristic	Open Appendectomy		Laparoscopy Appendectomy	
	No. of Patients	Percentage	No. of Patients	Percentage
Age group (years)				
10-20	23	46%	22	44%
21-30	18	36%	17	34%
31-40	4	8%	6	12%
41-50	4	8%	3	6%

51-60	1	2%	2	4%
Gender				
Male	26	52%	22	44%
Female	24	48%	28	56%
Symptoms				
Abdominal pain	46	92%	50	100%
Nausea/Vomiting	38	76%	36	72%
Fever	16	32%	14	28%
Local Examination				
Tenderness (Present)	50	100%	50	100%
Tenderness (Absent)	0	%	0	%
Guarding/Rigidity (Present)	43	86%	38	76%
Guarding/Rigidity (Absent)	7	14%	12	24%
Ultrasound Findings				
Normal	5	10%	8	16%
Abnormal pathology	45	90%	42	84%

In this study, 4 (8%) instances of open appendicoplasties under 30 minutes, 39 (78%) cases from 30 to 60 minutes, 5 (10%) cases under 90 minutes, and 2 (4%) cases under 120 minutes had surgery. The average time was 46.2 ± 10.4 minutes. Less than 30 minutes (3%) were operated on for lap appendicitis, followed by 31 to 60 minutes (29

cases), 61 to 90 minutes (13 cases), 91 to 120 minutes (3 instances), and 121 to 180 minutes (2 cases). The surgery took an average of 66.5 ± 18.5 minutes. Table 2 shows that laparoscopic appendectomy takes longer than open appendectomy in terms of time.

Table 2: Duration of Surgeries

Surgery Time	Open		Laposcopic	
	No. of Patients	Percentage	No. of Patients	Percentage
<30	4	8%	3	6%
31-60	39	78%	29	58%
61-90	5	10%	13	26%
91-120	2	4%	3	6%
121-180	0		2	

Table 3: Illustration of data based on pain score and duration of Analgesic used in two groups

Details	Appendectomy		Significance	
	Open	Laposcopic	T-value	P-value
Pain Score (0-4)	2.6 ± 0.5	1.4 ± 0.5	6.94	<0.05 Sig*
Duration of analgesics	6.89 days	2.4 days	9.04	<0.05 Sig*
Parental and Oral (days)	(\pm) 2.6	(\pm) 1.2		

Following open surgery, wound infection was more likely (7%) than following laparoscopy (4%). Two cases (4%) of laparoscopic appendectomy and four cases (8%) of open appendectomy resulted in intra-abdominal abscesses. Regarding the patient's complaints, fever is present in 9 (18%) of the open and 7 (14%) of the laparoscopic appendices cases, and nausea/vomiting is reported by 8 (16%) and 6 (12%) of the patients, respectively (Table 4).

Table 4: Illustration of data based on post-operative complications

Complications	Open		Laposcopic	
	No. of Patients	Percentage	No. of Patients	Percentage
Vomiting	8	16%	6	12%
Abdominal abscess	4	8%	2	4%
Wound Infection	7	14%	2	4%
Fever	9	18%	7	14%

After an open appendectomy, 7 (14%) cases stayed in the hospital for 3 days, 24 (48%) cases for 4 days, 12 (24%) cases for 5 to 9 days, and 7 (14%) cases for 10 to 15 days. Table 5 shows that after a lap appendectomy, 4 (8%) cases stayed in the hospital for 1 day, 19 (38%) cases for 2 days, 16 (32%) cases for 3 days, and 7 (14%) cases for 4 days.

Table 5: Illustration of data based on post-operative stay in hospital

Hospital stay after Surgery (days)	Open		Laposcopic	
	No. of Patients	Percentage	No. of Patients	Percentage
1	0	0	4	8%
2	0	0	19	38%
3	7	14%	16	32%
4	24	28%	7	14%
5-9	12	24%	2	4%
10-15	7	14%	0	0

Returning to regular employment after an open appendectomy took 4 (8%) patients 6 to 9 days, 12 (24%) cases 10 to 13 days, 28 (56%) cases 14 to 17 days, and 6 (12%) cases 18 to 20 days in the current study. Returning to ordinary work after a lap appendectomy took 22 (44%) cases 6 to 9 days, 18 (36%) cases 10 to 13 days, 6 (12%) cases 14 to 17 days, and 4 (8%) cases 18 to 20 days (Table 6).

Table 6: Post-operative time taken to return to normal work

Days for recovery	Open		Laparoscopy	
	No. of Patients	Percentage	No. of Patients	Percentage
6-9	4	8%	22	44%
10-13	12	24%	18	36%
14-17	28	56%	6	12%
18-20	6	12%	4	8%

Discussion

In the comparison of study durations, the mean time for laparoscopic appendectomy was 66.5±18.5 minutes, while the mean time for open appendectomy was 46.2±10.4 minutes. Naraintran S et al. (2018) have also observed similar observations.

Results from a meta-analysis of randomised controlled trials including one hundred patients have been published. The laparoscopic appendectomy had an average operating time that was twenty minutes longer. In a prospective comparative trial involving 100 patients, Chawngthu and Sailo, (2020) found that although laparoscopic appendectomy requires a longer operating duration, its benefits make it a valuable substitute for individuals suffering from acute appendicitis.

The pain score for the open group in the current study was 2.6±0.5, while the pain score for the laparoscopic group was 1.4±0.5 (P<0.05), likely due to wound infection and lengthier incisional muscle stretch. Other writers have also observed similar observations (Chung et al., 1999). In a research by Ortega et al. (1995), 135 patients were blinded to the surgical technique by a special dressing when they reported their linear analogue pain levels. The laparoscopic group's pain score was much lower than the open group's.

Vomiting was one of the less common post-operative problems in the laparoscopic group (12% vs. 16% in the open group). In the current study, group 2 that underwent laparoscopic surgery had a much lower occurrence of post-operative wound

infection (4%) than group 7 that underwent open surgery (14%). Similar results were demonstrated by Naraintran et al. (2018), who found that laparoscopic appendectomy considerably reduced the rate of postoperative wound infection. In the laparoscopic group, there was one (2%) wound infection; in the open group, there were eight (16%) wound infections.

The highest length of post-operative hospital stay was observed in 19 (38%) instances on the second day in the laparoscopic group and 24 (48%) cases on the fourth day in the open group. Others have also noted that the open group had a longer hospital stay than the laparoscopic group (Chawngthu and Sailo, 2020).

The regular length of postoperative stay for the laparoscopic group in Shaikh et al.'s study from 2022 was 3.69±0.71 days, while the OA group's was 5.28±0.63 days. For the laparoscopic group, come back to regular activity was achieved earlier than for the open group (14.7±3.15 days), at 7±3.15 days. Similar results have been found in other investigations (Naraintran et al., 2018).

Conclusion

In patients who were consecutively selected, we saw a clear difference in the result between open and laparoscopic appendectomy. In terms of pain score, analgesic usage, and post-operative complications, the laparoscopic appendectomy performed better than the open procedure. Regarding the duration of the hospital stay and return to regular employment, the post-operative recuperation went well. The length of the procedure was the only negative aspect of the laparoscopic

appendectomy. For certain patients with acute or recurring appendicitis, laparoscopic appendicitis is often preferable to open appendectomy.

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