Journal of Neonatal Surgery
ISSN(Online): 2226-0439
Vol. 14, Issue 5s (2025)
https://www.jneonatalsurg.com

OPEN ACCESS

Routine Laparoscopic is Better Than Open Appendectomy: A Reason

Dr. Nitesh Soni[*1], Dr. Bhim Chand Meena[2], Dr. Drishti Soni[3]

[*1]Assistant professor, department of General surgery, JNU medical College, Jaipur.

[2]Assistant professor, department of General surgery, JNU medical College, Jaipur.

Email ID: bhim1986@hotmail.com

[3]Resident doctor ,SMS medical college, Jaipur.

Email ID: drishti8598@gmail.com

***Corresponding Author:**

Email ID: niteshrsoni@gmail.com

Cite this paper as: Dr. Nitesh Soni, Dr. Bhim Chand Meena, Dr. Drishti Soni, (2025) Routine Laparoscopic is Better Than Open Appendectomy: A Reason. *Journal of Neonatal Surgery*, 14 (5s), 335-339.

ABSTRACT

Aim: In this study we compare the outcomes of routine laparoscopy and laparoscopic appendectomy in patients with suspected appendicitis.

Method: Patients managed with routine laparoscopy and LA for suspected acute appendicitis. All preoperative and intraoperative findings records were Maintained. The clinical outcomes were compared with those of patients undergoing OA in the preceding in one year.

Result: During the LA study period, 100 patients (47 men) with the median age of 32 years (range, 17 to 78) presented with clinical features of acute appendicitis. During the OA period, 120 patients (55 men) with the median age of 42 (range, 19 to 79) years were operated on. The median durations of surgery in Group A and Group B were 80 minutes (range, 40 to 195) and 60 minutes (range, 25 to 260), respectively (P<0.005). Postoperative complication rates were comparable between the 2 groups (13.4% in Group A versus 15.8% in Group B). The median hospital stay for patients in Group A and Group B were 2.0 days (range, 1 to 47) and 4.0 days (range, 1 to 47), respectively (P=0.037).

Conclusions: We conclude that routine laparoscopy and LA for suspected acute appendicitis is safe with shorter hospital stay. Other intra-abdominal pathologies can also be diagnosed more accurately with the laparoscopic approach.

Keywords: Laparoscopic appendectomy (LA), Open Appendecetomy (OA)

1. INTRODUCTION

The introduction of laparoscopic surgery has dramatically changed the field of surgery. With improvements in the equipment and increasing clinical experience it is now possible to perform almost any kind of procedure under laparoscopic visualization.[1]

Acute appendicitis is a common indication for abdominal surgery with a life-time incidence between 7 and 9% , and appendectomy is one of the most common surgical procedures. Open appendectomy (OA) performed through the right lower quadrant incision was first described in 1894 It has become the standard treatment of choice for acute appendicitis, remaining mainly unchanged for 100 years due to its favourable efficacy and safety.[2,3] Laparoscopic appendectomy (LA), first performed by Semm in 1983, has gradually gained acceptance. However, there remains a continuing controversy in the literature regarding the most appropriate method of removing the inflamed appendix.[4,5]

Some studies concluded that LA was superior to OA in terms of a faster recovery, improved wound healing, and earlier resumption of diet, other studies found no such benefits, or even favoured conventional appendectomy. However, most of these studies had small sample sizes, and therefore the risk of a type II error (failing to observe a difference when in truth

there is one) may be high.[6] The statistical power of analysis can be increased through a meta-analysis, which combines and compares the data from different studies. The most recent meta-analysis of the two techniques was published 3 years ago , and many high-quality trials have been published since then. Therefore, we performed a new meta-analysis to determine which technique, LA or OA, gives better patient outcome.[7]

However, several retrospective studies, several randomized trials and meta-analyses comparing laparoscopic with open appendectomy have provided conflicting results. Some of these studies have demonstrated better clinical outcomes with the laparoscopic approach, while other studies have shown marginal or no clinical benefit and higher surgical cost.[8]At present, although there is no consensus regarding the superiority of the laparoscopic approach over the conventional technique, there is trend towards greater utilization of laparoscopic appendectomy.[9]

Some studies failed to demonstrate clear advantages of LA over OA. No consensus exists as to whether laparoscopy should be performed in select patients or routinely for all patients with suspected acute appendicitis. A comparison was made with a historical group of patients who were treated with open appendectomy before the adoption of this policy.[10]

In the present study, we aim to compare the laparoscopic approach and the conventional technique in the treatment of acute appendicitis.

2. STUDY MATERIAL

Patients with clinical features of acute appendicitis came in November 2022 at the Department of Surgery, in Private Hospital, Jaipur

From November 2022 to 2023, Exclusion Criteria such as pregnancy, coagulopathy, severe sepsis, or a history of multiple abdominal operations . 97 patients with clinical features of acute appendicitis were operated on. 5 underwent open surgery because of a high medical risk (n=2) or previous lower abdominal surgery (n=3). Ten patients were subsequently diagnosed with pathologies other than acute appendicitis (gynecological causes: n=7; carcinoma of hepatic flexure: n=1; small bowel perforation due to fish bone: n=1; and inflamed omentum: n=1), and other procedures were performed. With the exclusion of these patients, laparoscopy was performed in 82 patients with acute appendicitis during that period (Group A).

The peritoneal cavity was accessed using the open Hassan technique, and an 11-mm trocar was inserted at the sub umbilical region for the telescope. Pneumoperitoneum was created by insufflation of carbon dioxide at a pressure of 12-mm Hg. Two additional trocars (usually 5 mm) were inserted at the lower quadrants of the abdomen. Dissection and mobilization of the appendix was performed with coagulation or ultrasonic dissector. The appendix was divided at the base between 2 Endoloops. Retrieval of the resected appendix was performed through the umbilical port, and the appendix was sent for histological examination.

During this period, 120 patients (mean age, 42; range, 19 to 93) who presented with suspected acute appendicitis underwent surgery. After excluding 6 patients with other pathologies (cecal diverticulitis: n=3; gynecological cause: n=1; cancer of the ascending colon: n=1; and small bowel perforation: n=1), 119 patients (Group B) with acute appendicitis underwent open appendectomy.

In this group of patients, a right lower quadrant muscle splitting incision was used in the majority of the situations. The mesoappendix was ligated and divided. The appendiceal stump was transfixed and invaginated using a purse-string suture. The incision was then closed in layers. This group of patients acted as a historical control to compare with the patients in Group A, who were operated on with the laparoscopic approach. Data on the patients' demographics, operative findings, and postoperative complications were collected and entered into a database.

3. RESULT

Comparisons of the patients' demographics and clinical features in the 2 periods are summarized in **Table 1**. No differences were noted in sex, duration of pain, white cell count, and the use of imaging in the 2 periods.

Table 1 : Comparison of Patients Treated for Suspected Acute Appendicitis in the 2 Periods

	Period 1 (N=120)*	**Period 2 (N=100)***	***P* Value**
Male (%)	57 (46)	47 (48)	0.673
Median age (years)	42 (19–93)	34 (18–79)	0.001
Median WBC ($\times 10^9$/L)*	13.8 (2.85–28.1)	14.0 (5.10–30.5)	0.199
Median duration of pain (hr)	24.0 (3.0–168)	24.0 (4.0–330)	0.119
ASA≥2 (%)*	36 (30.3)	28 (34.1)	0.815

US or CT scan (%)*	18 (%)	17 (%)	0.526

*Period 1=open surgery for patients with suspected appendicitis; Period 2=laparoscopic surgery for patients with suspected appendicitis; WBC=white blood cell count; ASA=American Society of Anesthesiologist Class; US=ultrasound; CT=computed tomographic.

Comparisons of patients in Group A and Group B are shown in **Table 2**. Thirty-one patients (37.8%) had complicated appendicitis with perforation or gangrenous changes in Group A, while 51 patients in Group B (42.9%) had perforated or gangrenous appendicitis. The median durations of operations for Group A and Group B were 80 minutes (range, 40 to 195) and 60 minutes (range, 25 to 260), respectively (P<0.005). The median preoperative length of hospital stay for Group A and Group B patients was 0 day (range, 0 to 2) versus 1 day (range, 0 to 2), respectively (P=0.007). Six patients in Group A versus 27 patients in Group B required convalescent care (P=0.004). Patients in Group A had significantly shorter median postoperative hospital stays (2 days; range, 0 –24) as compared with that of Group B (3 days; range, 1 to 39). The median total length of hospital stay was 3.0 days (range, 1 to 47) and 4.0 (range, 1 to 47) in Group A and Group B, respectively (P=0.037) **(Table 2)**.

Table 2: Comparing the Operating Time and Length of Hospital Stay Between the Laparoscopic and Open Appendectomy

	Group A (N=82)	**Group B (N=119)**	***P* Value**
Median operating time in minutes	80 (40–196)	60 (25–260)	<0.005
Median preoperative hospital stay in days	0 (0–2)	1 (0–2)	0.007
No. of patients required convalescence	6	27	0.004
Median postoperative stay	2.0 (0–24)	3.0 (1–39)	0.001
Median total hospital stay in days	2.0 (1–47)	4.0 (1–47)	0.037

Conversion was required in 6 patients (7.3%) with complicated appendicitis in Group A. The reasons for conversion included extensive peritonitis in perforated appendices including an appendiceal mass in 4 cases, difficult dissection in 1 patient, appendix not identified in 1 patient. The median total length of hospital stay for the conversion group was 5.5 days (range, 5 to 24) versus 3 days (range, 1 to 23) for the nonconversion group, P=0.001. The conversion group, however, did not have increased morbidity, 1 (16.7%) versus 10 (10.9%), P=0.671. No operative mortalities or intraoperative complications were attributed to laparoscopy. The overall complication rate was 14.8% (27/196). Four (4.9%) patients in the laparoscopic group suffered from intraabdominal abscess, which required readmission. One was treated with open drainage, and the others were successfully treated by CT-guided percutaneous drainage. They subsequently made an uneventful recovery and were discharged from the hospital. The wound infection rates were 3.66% (3/82) and 5.04% (6/119) in the laparoscopic and open groups, respectively. Two patients (1.68%) from the open group suffered from pneumonia but none was reported in the laparoscopic group. The overall complication rate in Group A (13.4%) was comparable to that of Group B (15.8%) **(Table 3)**. Two patients in Group B required readmission for epigastric pain and intestinal obstruction, respectively. Both were treated conservatively. Compared with Group A, the readmission rate was not significantly different (P=0.679).

Table 3 Comparison of Complications Between Laparoscopic and Open Appendectomy for Acute Appendicitis

	Group A (N=82)	**Group B (N=119)**	***P* Value**
Postop ileus	3	5	0.764
Wound infection	4	6	0.861
Intraabdominal abscess	4	0	0.021
Intestinal obstruction	0	1	0.387
Cardiopulmonary complication	0	2	0.220
Total (%)	11 (13.4)	18 (15.1)	0.734

4. DISCUSSION

Acute appendicitis is one of the most commonly encountered surgical conditions that requires emergency surgery. Early diagnosis with prompt surgery is the preferred treatment option to prevent complications, such as perforation that can lead to an increase in morbidity. However, this would lead to a great deal of unnecessary appendectomies and has been the centre of debate. Moreover, thorough examination of the peritoneal cavity is not possible with the conventional right iliac fossa incision. Laparoscopic surgery is a major surgical advance in the last 2 decades, and it enables shorter hospital stay and faster recovery. Laparoscopy has become the preferred surgical approach for gallbladder disease and gastroesophageal reflux disease. Laparoscopic appendectomy has gained popularity and is believed to have the same advantages, both in diagnostic and therapeutic value.[11]

In this study, the change in the operative approach in patients with suspected appendicitis is shown to be safe and effective. The laparoscopic skills of experienced laparoscopic surgeons can be transferred to a different operation without increasing the patients' morbidity. Laparoscopy can be performed in 94.8% of patients with suspected appendicitis. Despite the fact that the incidence of complicated appendicitis was 37%, the conversion rate was only 7.8%, which is comparable to the results of other studies. The operating time is longer with the laparoscopic approach, and this reflects the learning curve of the procedure.[12] No intraoperative complication led to morbidity or conversion. The use of preoperative imaging for diagnosis of equivocal cases was similar in the 2 periods. Thus, although the preoperative stay was shorter in the laparoscopy period, laparoscopy did not reduce the need for imaging in patients with equivocal presentations.[13]

In this study, the presentations of the patients with suspected appendicitis were similar in the 2 periods, and no differences existed in the duration of pain or the white cell counts of patients in the 2 periods. With the exclusion of patients with pathologies other than appendicitis, the incidence of morbidity was similar in the open or laparoscopic approach. The overall complication rates were similar in the 2 groups of patients. However, the median hospital stay was significantly shorter in the laparoscopy group. There was no difference in terms of wound complications, and conversion did not lead to a higher wound complication rate. The occurrence of intraabdominal abscess is higher in those patients undergoing laparoscopy. This finding is consistent with findings in other studies. The increase in the incidence of intraabdominal abscess shown in the present study confirmed the findings in a metaanalysis that demonstrated increased, though not statistically significant (OR=1.94, 95% CI 0.68 to 5.58, P>0.05) intraabdominal abscess in patients who underwent laparoscopic appendectomy. The incidence of intraabdominal abscesses was increased (OR=2.48, CI 1.45 to 4.21). [14]

Patients who underwent laparoscopic appendectomy had significantly longer operating times than did those having open surgery. This could be attributed to the inclusion of the patients in the study who were undergoing operations within the early phase of the learning curve. According to other studies, this difference tends to drop as the laparoscopic operative experience improves, which in turn may reduce the complication rate. Length of hospital stay was significantly shorter in the laparoscopic group. Some authors argue that the appendiceal pathology was a major determinant of length of hospital stay. Patients with gangrenous or perforated appendicitis were most likely to require an extended hospital stay. These patients are sicker and required an extended hospital stay regardless of the surgical technique used. Admittedly, our study was not a randomized trial, and a bias towards early discharge of patients undergoing LA might contribute to the shorter hospital stay in the laparoscopic group. However, the study was carried out within a short period of time, and there were no significant changes in the postoperative management. The incidence of complicated appendicitis was similar in the 2 groups, and the short hospital stay is likely to be due to the use of a different surgical approach.

5. CONCLUSION

We conclude that the change in the surgical approach to manage suspected appendicitis is safe and effective. Although the operating time is longer in laparoscopic appendectomy. The overall morbidity was similar to that of open surgery. However, the incidence of intraabdominal collection is higher in those undergoing laparoscopy. The advantages of laparoscopic appendectomy seem to be mainly related to the improved diagnostic ability and shorter hospital stay.

REFERENCES

[1] Sauerland S, Lefering R, Neugebauer EAM: Laparoscopic versus open surgery for suspected appendicitis (Cochrane review); in The Cochrane Collaboration (ed): Cochrane Library, Issue 1/2002 [CD-ROM]. Oxford, Update-Software, 2002.

[2] Sauerland S, Lefering R, Holthausen U, Neugebauer E: A meta-analysis of studies comparing laparoscopic with conventional appendectomy; in Krähenbühl L, Frei E, Klaiber C, Büchler MW (eds): Acute Appendicitis: Standard Treatment or Laparoscopic Surgery? Prog Surg. Basel, Karger, 1997, vol 25, pp 109–114.

[3] Lavonius MI, Liesjärvi S, Ovaska J, Pajulo O, Ristkari S, Alanen M: Laparoscopic versus open appendectomy in children: A prospective randomised study. Eur J Pediatr Surg 2001;11:235–238.

[4] Little DC, Custer MD, May BH, Blalock SE, Cooney DR: Laparoscopic appendectomy: An unnecessary and expensive procedure in children? J Pediatr Surg 2002;37:310–317.

[5] Benson K, Hartz AJ: A comparison of observational studies and randomized, controlled trials. N Engl J Med 2000;342:1878–1886. A prospective analysis of 1518 laparoscopic cholecystectomies. The Southern Surgeons Club. N Engl J Med. 1991 Apr 18;324(16):1073–1078. doi: 10.1056/NEJM199104183241601.

[6] Attwood S. E., Hill A. D., Murphy P. G., Thornton J., Stephens R. B. A prospective randomized trial of laparoscopic versus open appendectomy. Surgery. 1992 Sep;112(3):497–501.

[7] Bonanni F., Reed J., 3rd, Hartzell G., Trostle D., Boorse R., Gittleman M., Cole A. Laparoscopic versus conventional appendectomy. J Am Coll Surg. 1994 Sep;179(3):273–278.

[8] Daniell J. F., Gurley L. D., Kurtz B. R., Chambers J. F. The use of an automatic stapling device for laparoscopic appendectomy. Obstet Gynecol. 1991 Oct;78(4):721–723.

[9] Deutsch A. A., Zelikovsky A., Reiss R. Laparoscopy in the prevention of unnecessary appendicectomies: a prospective study. Br J Surg. 1982 Jun;69(6):336–337. doi: 10.1002/bjs.1800690615.

[10] Dunn E. L., Moore E. E., Elerding S. C., Murphy J. R. The unnecessary laparotomy for appendicitis-can it be decreased? Am Surg. 1982 Jul;48(7):320–323.

[11] Frazee R. C., Roberts J. W., Symmonds R. E., Snyder S. K., Hendricks J. C., Smith R. W., Custer M. D., 3rd, Harrison J. B. A prospective randomized trial comparing open versus laparoscopic appendectomy. Ann Surg. 1994 Jun;219(6):725–731. doi: 10.1097/00000658-199406000-00017.

[12] Gangal H. T., Gangal M. H. Laparoscopic appendicectomy. Endoscopy. 1987 May;19(3):127–129. doi: 10.1055/s-2007-1018257.

[13] Leape L. L., Ramenofsky M. L. Laparoscopy for questionable appendicitis: can it reduce the negative appendectomy rate? Ann Surg. 1980 Apr;191(4):410–413. doi: 10.1097/00000658-198004000-00004.

[14] Nakhgevany K. B., Clarke L. E. Acute appendicitis in women of childbearing age. Arch Surg. 1986 Sep;121(9):1053–1055. doi: 10.1001/archsurg.1986.01400090083014.