


Literature Review: Outcomes Profile In Appendicitis Patients With Laparoscopic Appendectomy And Open Appendectomy

Nurul Hikma¹, Sulfikar Rusdam², Mesak Sule³, Reeny Purnamasari⁴, Erwin Syarifuddin⁵

¹Program Studi Pendidikan Profesi Dokter Umum Fakultas Kedokteran Universitas Muslim Indonesia,

^{2,3,4,5}Departemen Ilmu Bedah Fakultas Kedokteran Universitas Muslim Indonesia

Article Info	ABSTRACT
Keywords: Laparoscopy Appendectomy, Open Appendectomy Appendicitis, Appendectomy	Acute appendicitis is an abdominal emergency condition that commonly occurs in individuals of all ages. Traditionally, open appendectomy has been the standard method for treating appendicitis. However, with the advent of laparoscopy, laparoscopic appendectomy is now a promising alternative with potentially significant benefits. This study aims to evaluate and compare the results of laparoscopic appendectomy and open appendectomy in the treatment of acute appendicitis. From an analysis of 16 articles published between 2020-2024, laparoscopic appendectomy showed significant advantages, including less severe postoperative pain, shorter length of stay, faster recovery, and lower risk of complications such as wound infection. Overall, laparoscopic appendectomy is a better option in the treatment of acute appendicitis compared with open appendectomy.
This is an open access article under the CC BY-NC license 	Corresponding Author: Sulfikar Rusdam Department of Surgery, Faculty of Medicine, Indonesian Muslim University Indonesia Sulfikarrusdam@yahoo.co.id

INTRODUCTION

One of the main reasons for performing abdominal surgery is acute appendicitis, an abdominal emergency that is very common worldwide and can affect individuals of all ages. Traditionally, open appendectomy (Open appendectomy) has been the gold standard in the treatment of appendicitis since its introduction by Charles Mc Burney. However, since laparoscopic appendectomy (Laparoscopic Appendectomy) was first performed in 1983 by German doctor Semm, this technique has gained popularity among surgeons due to its advantages, such as smaller incisions, optimal visualization of the peritoneal cavity, safer exploration, experience less pain, and faster post-operative recovery. However, there is still some doubt regarding the safety and superiority of laparoscopic appendectomy compared with open appendectomy (Sultan, Ali and Habash, 2022).

Approximately 7% of the population experiences appendicitis throughout their lives, with peak incidence occurring between the ages of 10 and 30 years. MC Burney introduced appendectomy as the preferred method of treatment for appendicitis with an open approach. Currently, the laparoscopic appendectomy method has become a new procedure in the treatment of appendicitis. This approach offers minimal surgical trauma, less postoperative pain, and shorter hospital stays. However, higher medical costs and longer operation duration are still obstacles in laparoscopic surgery (Basukala et al., 2023). Some

studies support the benefits of laparoscopy by showing better results, while others state that laparoscopy provides little or no benefit compared to open surgery.

METHODS

This article was written using a research method in the form of a literature review by conducting a study of articles regarding the profile of outcomes in appendicitis patients with laparoscopic appendectomy and open appendectomy. The inclusion criteria in this study include the year of publication between 2020-2024, the languages used are English and Indonesian, and the research subjects are appendicitis patients. Based on searches carried out on Google Scholar using the keywords applied in writing this article, the researcher found 68 articles that were in harmony with the keywords given in the articles obtained. There were 16 articles that had completed the review. The 16 articles that have been selected have been observed and scrutinized starting from the abstract, objectives, methods, results and conclusions to collect information regarding profile outcomes in appendicitis patients with laparoscopic appendectomy and open appendectomy.

RESULTS AND DISCUSSION

Table 1. Summary of the articles reviewed

No	Author's Name, Year of Publication	Article Title	Method	Sample	Conclusion
1.	(Basukala et al., 2023)	Comparison of outcomes of open and laparoscopic appendectomy: A retrospective cohort study	Retrospective cohort study	N = 450 people	Overall, the laparoscopic approach is a better option for uncomplicated appendicitis as it causes less postoperative pain and a shorter hospital stay.
2.	(Sultan, Ali and Habash, 2022)	Comparison of Open versus Laparoscopic Appendectomy in Patients with Acute Appendicitis in Terms of Postoperative Complications	Retrospective cohort study	N = 260 people	The results of this study showed that laparoscopic appendectomy is a common and safe surgical procedure.
3.	(Nureddin and Shames, 2023)	Efficacy of Laparoscopy versus Open Surgical Appendectomy in Complicated Appendicitis	Retrospective cohort study	N = 36 people	Laparoscopic appendectomy is a safe and feasible procedure for the treatment of complicated appendicitis and can be the first choice without increasing postoperative complications.

4.	(Seqsaqa et al., 2020)	Laparoscopic versus open appendectomy in complicated appendicitis in children: a single center study	Prospective Randomized Controlled Clinical Trial	N = 60 people	Laparoscopic appendectomy is a safe, feasible, and effective procedure in the management of complicated appendicitis in children, with no evidence of increased postoperative complications.
5.	(Moawed, Zabady and Hamdy, 2022)	Comparative Study Between Laparoscopic Versus Open Appendectomy in Obese Patients	Comparative studies	N = 40 people	Laparoscopic appendectomy is a feasible and safe technique in the treatment of acute appendicitis in obese patients.
6.	(Habash et al., 2022)	Comparative Study between Open and Laparoscopic Appendectomy in Acute Appendicitis	Retrospective cohort study	N = 40 people	Laparoscopic surgery is a safer approach to appendectomy, especially if performed by a skilled specialist surgeon.
7.	(Emam, 2022)	Comparative Study Between Open Surgical Technique Versus Laparoscopic Appendectomy In Complicated Appendicitis	Prospective study	N = 40 people	Laparoscopic appendectomy is a safe and feasible operation for treating complicated appendicitis, and can be the first choice without increased postoperative complications. Despite increasing surgeon experience, longer operative times remain a problem in laparoscopic surgery.
8.	(Haripriya and Baghel, 2020)	A comparative study of laparoscopic versus open appendectomy for the treatment of acute appendicitis	Comparative studies	N = 68 people	Laparoscopic appendectomy is an effective method for acute appendicitis compared to open appendectomy.
9.	(Resutra, 2020)	Comparative Study of Laparoscopic Appendectomy versus Open Appendectomy for the Treatment of Acute Appendicitis	Retrospective cohort study	N = 400 people	Laparoscopic appendectomy is a safe and feasible technique in expert hands for the treatment of acute appendicitis with comparable results to open appendectomy without a marked increase in

10.	(Singh, Sharma and Abbas, 2021)	Laparoscopic versus open appendectomy: A comparative studies	Comparative studies	N = 40 people	complications and is the definitive procedure of choice for the management of acute appendicitis. Laparoscopic appendectomy is safer and more effective than open appendectomy regardless of the indication for conversion to open surgery.
11.	(Güler, 2020)	Comparison of laparoscopic and open appendectomy on Wound infection and healing in complicated appendicitis	Prospective study	N = 363 people	In terms of wound infection and wound healing, laparoscopic surgery should be the method of choice for patients with complicated appendicitis. To reduce the frequency of wound infections, drainage channels should not be maintained for too long in patients undergoing appendectomy.
12.	(Sakran et al., 2020)	Is Laparoscopic Appendectomy Superior to Open Appendectomy?	Prospective study	N = 150 people	The advantages of laparoscopic appendectomy are decreased pain after surgery, short hospital stay, and quick return to work. Laparoscopic appendectomy should be recommended for acute appendicitis as an effective and safe procedure.
13.	(Shaikh et al., 2022)	Laparoscopic versus Open Appendectomy: A Prospective Comparative Study and 4-Year Experience in a Tertiary Care Hospital	Prospective comparative study	N = 60 people	Laparoscopic appendectomy is more promising than open appendectomy in the management of acute and recurrent appendicitis. Laparoscopic appendectomy offers less operative pain in the postoperative period, shorter postoperative hospital stay, quicker recovery, and return to normal activities as well as a cosmetically better scar at reexamination on day 30. No conversion or significant difference in wound-related complications was seen in either group.

14.	(Istanb, 2023)	Comparison of open and laparoscopic techniques in the surgical treatment of acute appendicitis	Prospective comparative study	N = 169 people	Longer intraoperative duration is the only disadvantage of laparoscopic appendectomy. Laparoscopic appendectomy offers lower morbidity, shorter length of stay, and rapid recovery to return to normal activities compared with open appendectomy. In the surgical treatment of acute appendicitis, laparoscopic appendectomy can be applied as a routine treatment and primary choice.
15.	(Izhar et al., 2022)	Efficacy of Open vs. Laparoscopic Appendectomies	Randomized controlled trial	N = 110 people	Laparoscopic appendectomy is safer than open appendectomy.
16.	(Khazaal, 2022)	Laparoscopic vs Open Appendectomy: Comparison on Clinical Outcomes	Comparative studies	N = 128 people	These findings suggest that laparoscopic appendectomy has many advantages compared with open appendectomy, including shorter hospital stays, earlier return to work, and lower risk of wound infection.

In the research carried out Basukala et al., (2023) The results showed that the operating time with the laparoscopic technique was statistically longer than with the open approach. However, higher levels of postoperative pain, longer need for parenteral anesthesia, and longer hospital stays were all significantly associated with open approach appendectomy. Therefore, a laparoscopic approach may be a better option for the treatment of uncomplicated appendicitis.

In the research carried out Sultan, Ali and Habash (2022) The results showed that laparoscopic appendectomy can be used as the preferred approach in the treatment of acute appendicitis. It is characterized by minimal surgical intervention, as well as a low complication rate depending on surgical experience. Therefore, patients with acute appendicitis can be advised to use it as a safe treatment.

In the research carried out Nureddin and Shames (2023) found that laparoscopic appendectomy is a simple and practical method for treating difficult appendicitis and can be the first choice without an increase in postoperative complications. However, longer procedures also pose a challenge to laparoscopic techniques given the growing expertise of surgeons. According to our findings, this topic should be addressed in future research. Further sample size tests are needed to validate our findings.

In the research carried outSeqsaqa et al., (2020)demonstrated that laparoscopic appendectomy is safe, feasible, and effective in the management of complicated appendicitis in children. In addition, it provides many advantages, including faster recovery, fewer drain requirements, shorter hospital stays, and fewer wound infections, with no evidence of increased postoperative intraperitoneal infections, ileus, or hospitalization. stay again.

In the research carried outMoawed, Zabady and Hamdy (2022)demonstrated that laparoscopic appendectomy is a feasible and safe technique in the management of acute appendicitis in obese individuals. Laparoscopy improves diagnostic capabilities and rules out other causes of abdominal pain. Laparoscopic appendectomy is superior to open appendectomy in reducing the rate of wound infection, postoperative pain and analgesic requirements, as well as the duration of postoperative hospitalization. Patients undergoing laparoscopic appendectomy begin oral feeding earlier than with the open technique. In addition, laparoscopic appendectomy reduces the likelihood of postoperative ileus. The duration of laparoscopic appendectomy is shorter than open appendectomy. Laparoscopic appendectomy also provides better cosmetic results than open appendectomy.

In the research carried outHabash et al (2022)showed that laparoscopic appendectomy has advantages over traditional open surgery, especially in terms of hospital stay, resumption of daily activities, and the absence of wound infections. Therefore, we recommend laparoscopic appendectomy in acute appendectomy patients because it has better results.

In the research carried outEmam (2022)demonstrated superior laparoscopic appendectomy in terms of pain, intra-operative and post-operative complications, as well as speeding up post-operative recovery such as length of hospital stay, oral recovery time, interval before analgesics are required, and return to normal activities. The sole drawback is the longer operating time. In patients with acute or recurrent appendicitis, laparoscopic appendectomy is a superior option with significant safety and effectiveness compared to open appendectomy. In the research carried outHaripriya and Baghel (2020)shows that laparoscopic appendectomy is a safer and more effective method for patients with acute appendicitis compared with open appendectomy.

In the research carried outResutra (2020)The results showed that most cases of acute appendicitis can be treated laparoscopically. Laparoscopic appendectomy is as safe as open appendectomy and can reduce postoperative morbidity in experienced hands. Laparoscopic appendectomy is a useful method for reducing hospital stays, complications, and early return to normal activities. As better training in minimal access surgery becomes available, this technique may be recommended as the technique of choice for the management of acute appendicitis.

In the research carried outSingh, Sharma and Abbas (2021)The results showed definite differences in outcomes between open and laparoscopic appendectomy in certain patients. We conclude that the laparoscopic appendectomy method is superior to the open method for acute appendicitis because LA is associated with less, not less, postoperative pain. analgesics used, earlier resumption of oral feeding and decreased length of hospital

stay, fewer intraoperative and postoperative complications despite comparable operative times and higher conversion rates in laparoscopic appendectomy. Laparoscopic appendectomy is safer and more effective than open appendectomy, regardless of the indication for conversion to open appendectomy. Overall, Laparoscopic Appendectomy is better than Open Appendectomy in patients with acute appendicitis.

In the research carried out Güler (2020) It was found that postoperative wound infections were less frequently seen in patients with complicated appendicitis who underwent laparoscopic appendectomy. However, there was no statistically significant difference compared with open surgery, and wound dehiscence complications were significantly less frequent in the laparoscopic patient group. It was found that the use of surgical drainage can increase the rate of wound infection and this complication significantly increases the rate of hospitalization. Therefore, in terms of wound infection and wound healing, laparoscopic surgery should be the method of choice for patients with appendicitis complications who are at high risk of infectious complications and the drain should not be kept for a long time in patients undergoing appendectomy. To reduce the frequency of wound infections, we believe that maximum care should be given to all patients undergoing open and laparoscopic surgery, especially in terms of reducing morbidity, length of hospital stay, medical costs, and labor loss.

In the research carried out Sakran et al (2020) demonstrated laparoscopic appendectomy is a safe, simple, and efficient technique for the treatment of appendicitis in experienced hands, this procedure provides better patient cosmetic results and fewer postoperative complications, decreased pain after surgery, short hospital stay, and return to work early. Laparoscopic appendectomy should be recommended for acute appendicitis as an effective and safe procedure.

In the research carried out Shaikh et al (2022) It was found that laparoscopic appendectomy is a more versatile approach than open appendectomy in the management of acute and recurrent appendicitis. Prolonged intraoperative duration was the only disadvantage of laparoscopic appendectomy in the study. However, operative time was found to decrease with experience in the literature. Laparoscopic appendectomy offers less pain at the surgical site in the postoperative period, shorter postoperative hospitalization, so that patients can recover more quickly and return to normal activities. Cosmetically, laparoscopic appendectomy was found to provide patients with a better scar at day 30 of follow-up. Although wound-related complications were found to be higher in open appendectomy in the literature, no significant difference was seen in our study.

In the research carried out Istanbul (2023) demonstrated laparoscopic appendectomy has become the primary treatment strategy in the surgical treatment of acute appendectomy due to the potential advantages of the minimally invasive nature of the procedure such as showing higher recovery rates, requiring shorter hospital stays, lower complication rates, and providing benefits. in patients with high comorbidities such as obesity. Laparoscopic appendectomy can be planned in advance of appendectomy in all patients who do not present contraindications to laparoscopic appendectomy.

In the research carried out Izhar et al (2022)It was found that laparoscopic appendectomy is a safer and more clinically beneficial technique. In most cases of suspected appendicitis, if possible, laparoscopy should be considered as the procedure of choice.

In the research carried out Khazaal (2022)demonstrated laparoscopic appendectomy has many advantages over open appendectomy, including shorter hospital stay, earlier return to work, and lower risk of wound infection. In addition, we found that patients in the laparoscopy group had a strong preference (during consent collection) and high satisfaction after surgery.

CONCLUSION

Based on the series of studies cited, the main conclusion is that laparoscopic appendectomy is a better option than the open approach in the treatment of acute appendicitis. The laparoscopic method shows many advantages such as less postoperative pain, shorter duration of hospital stay, faster recovery, and lower risk of complications such as wound infection. Despite challenges such as longer operative times and possible conversion to open methods, these benefits consistently provide a rationale for recommending laparoscopic appendectomy as a primary option, especially in the context of patients with comorbidities or high risk of complications. The importance of training and experience in laparoscopic techniques was also highlighted in the study, where increased surgical expertise can reduce the duration of surgery and optimize postoperative outcomes. This confirms that with proper support, laparoscopic appendectomy is not only effective but can also improve patient satisfaction and the efficiency of the surgical procedure. Therefore, improvements in laparoscopic surgical education and wider use of this technique could potentially yield significant benefits in the management of appendicitis globally.

REFERENCES

- Basukala, S. et al. (2023) 'Comparison of outcomes of open and laparoscopic appendectomy : A retrospective cohort study', (April), pp. 1–6. doi: 10.1002/hsr2.1483.
- Emam, MAE (2022) 'OPEN ORIGINAL Appendectomy In Complicated Appendicitis'. doi: 10.21608/aimj.2022.108248.1687.
- Güler, Y. (2020) 'Comparison of laparoscopic and open appendectomy on wound infection and healing in complicated appendicitis', (December 2019), pp. 1–9. doi: 10.1111/iwj.13347.
- Habash, MM et al. (2022) 'Comparative Study between Open and Laparoscopic Appendectomy in Acute Appendicitis', 89(October), pp. 7567–7570.
- Haripriya, DA and Baghel, DA (2020) 'A comparative study of laparoscopic appendectomy versus open appendectomy for the treatment of acute appendicitis', 8(12), pp. 42–45. doi: 10.21276/jamdsr.
- Istanb, NC (2023) 'Comparison of open and laparoscopic techniques in the surgical treatment of acute appendicitis', 10(6), pp. 704–710. doi: 10.14744/nci.2022.08941.
- Izhar, M. et al. (2022) 'Efficacy of Open vs . Laparoscopic Appendectomies', 02(05), pp.

208–212.

- Khazaal, AS (2022) 'Laparoscopic vs Open Appendectomy : Comparison on Clinical Outcome', (May 2019), pp. 2020–2023.
- Moawed, A., Zabady, M. and Hamdy, AA (2022) 'OPEN ORIGINAL Comparative Study Between Laparoscopic Versus Open Appendectomy in Obese Patients', pp. 123–128. doi: 10.21608/aimj.2022.121859.1843.
- Nureddin, H. and Shames, M. (2023) 'Efficacy of Laparoscopy versus Open Surgical Appendectomy in Complicated Appendicitis', 29(2), pp. 185–191.
- Resutra, R. (2020) 'Comparative Study of Laparoscopic Appendectomy versus Open Appendectomy for the Treatment of Acute Appendicitis', 1, pp. 22–27.
- Sakran, MMA et al. (2020) 'Is Laparoscopic Appendectomy Superior to Open Appendectomy?', 88(4), pp. 1707–1713.
- Seqsaqa, M. et al. (2020) 'Laparoscopic versus open appendectomy in complicated appendicitis in children : a single center study'.
- Shaikh, A.H. et al. (2022) 'Laparoscopic versus Open Appendectomy : A Prospective Comparative Study and 4-Year Experience in a Tertiary Care Hospital', pp. 208–214.
- Singh, A., Sharma, M. and Abbas, M. (2021) 'Laparoscopic versus open appendectomy : A comparative study', 5(2), pp. 325–330.
- Sultan, Al, Ali, SH and Habash, MM (2022) 'Comparison of Open versus Laparoscopic Appendectomy in Patients with Acute Appendicitis in Terms of Postoperative Complications Comparison of Open versus Laparoscopic Appendectomy in Patients with Acute Appendicitis in Terms of Postoperative Complications', (August).