

Research Article

DOI: <http://dx.doi.org/10.22192/ijamr.2019.06.04.002>

Appendectomy: Open versus Laparoscopic Approach

Dr. Ashok Meghwal and Dr. Satish Jain*

Meenakshi Medical College Hospital and Research Institute, Enathur, Kanchipuram – 631552

*Corresponding Author

Abstract

Keywords

laparoscopy,
appendectomy,
post operative,
intra abdominal,
invasive.

Acute appendicitis is a very common intra-abdominal condition which mostly requires emergency surgery. There are different methods used, like Open Appendectomy (OA) and Laparoscopic Appendectomy (LA), that can be used for the intervention. This is a retrospective study aiming to compare the two techniques. There is significantly greater length of operation in the laparoscopic versus the open group. Most authors agree that the length of hospital stay is shorter for patients operated with laparoscopy. LA is more expensive but becomes cheaper through time. The overall complication rate seems to be less in laparoscopic groups. LA is less painful; it has less wound infections and postoperative ileus. Hospital stay is shorter, return to a normal diet and activity is faster and the cost is decreasing. We recommend LA as a routine surgical approach for acute appendicitis.

Introduction

Open appendectomy has been a safe and effective operation for acute appendicitis for more than a century. According to the literature, approximately 7% of the population develops appendicitis in their life time, with peak incidence between the ages of 10 and 30 years, thus making appendectomy the most frequently performed abdominal operation [1].

Open Appendectomy (OA) was first described in 1894 and was performed through the right lower quadrant incision [2]. It remained the golden standard until the introduction of Laparoscopic Appendectomy (LA) by Semm in 1983 [3]. As advantages of LA have been

proposed a better wound healing, reduced postoperative pain, faster recovery, and earlier resumption of diet, earlier discharge from hospital, and finally, a better cosmetic result [4-5]. Disadvantages of LA compared to OA are considered the increased operative time, the cost of the operation and a higher incidence of intra-abdominal abscesses, especially in case of a perforated appendicitis [6-7].

The aim of this study was to compare the clinical outcomes (hospital stay, operating time, postoperative complications, analgesia requirement, and time to oral intake and to resume normal activity) and the hospital costs between open appendectomy and laparoscopic appendectomy.

Materials and Methods

Pre operative diagnosis was made using history, clinical examination coupled with laboratory findings and imaging studies. In open group, only appendix removed via McBurney's incision was included in the study. Patients in whom midline incisions were given were excluded from the study.

Pregnant women and patients with severe medical disease (hemodynamic instability, chronic medical or psychiatric illness, cirrhosis, coagulation disorders) requiring intensive care were excluded. The patients were divided into two groups: open appendectomy (OA) group and laparoscopic appendectomy (LA) group. The collected clinical data included demographic data, co-morbidities, initial laboratory findings, operation time, Intraoperative findings (acute, gangrenous or perforated appendix), time to soft diet, postoperative hospital stay, amount of analgesics and postoperative complications. The diagnosis was made clinically with history (right iliac fossa or periumbilical pain, nausea/vomiting), physical examination (tenderness or guarding in right iliac fossa). In patients where a clinical diagnosis could not be established, imaging studies such as abdominal ultrasound or CT were performed. OA was performed through standard McBurney's incision. After the incision, peritoneum was accessed and opened to

deliver the appendix, which was removed in the usual manner. A standard 3-port technique was used for laparoscopic group. Pneumoperitoneum was produced by a continuous pressure of 12–14 mmHg of carbon dioxide.

After the mesoappendix was divided with bipolar forceps, the base of the appendix was secured with two legating loops, followed by dissection distal to the second loop. Then, the distal appendicular stump was closed to avoid the risk of enteric or purulent spillage. The specimen was placed in an endobag. The patients were not given oral feed until they were fully recovered from anesthesia and had their bowel sounds returned when clear fluids were started. Soft diet was introduced when the patients tolerated the liquid diet and had passed flatus. Patients were discharged once they were able to take regular diet, afebrile, and had good pain control. The operative time (minutes) for both the procedures was counted from the skin incision to the last skin stitch applied. The length of hospital stay was determined as the number of nights spent at the hospital postoperatively. Wound infection was defined as redness or purulent or seropurulent discharge from the incision site. Seroma was defined as localized swelling without redness with ooze of clear fluid. Paralytic ileus was defined as failure of bowel sounds to return within 12 h postoperatively.

Results

Table 1 showing gender and surgical findings

	Open appendectomy (n= 150)	Laprosopic appendectomy (n=135)
Gender		
Male	83	61
female	67	74
Surgical findings		
Uncomplicated acute appendicitis	110(73.33%)	105(77.77%)
gangrenous appendicitis	13(8.66%)	8(5.92%)
Appendiceal abscess	16(10.66%)	15(11.11%)
peritonitis	11(7.33 %)	7(5.18%)

Table 2 showing operative and postoperative clinical data

	Open appendectomy (n= 150)	Laposcopic appendectomy (n=135)
Mean operative time	26 minutes	46 minutes
Days of hospitalization	2-3days	One day
Post operative pain	36 hours	12 hours
Return to normal activity	20 days	12 days
Complications		
Vomiting	13	7
Wound dehiscence	7	0
Wound infection	53	1
Haemoperitoneum	1	0

Discussion

Acute appendicitis is the most common intra-abdominal condition requiring emergency surgery [8]. The possibility of appendicitis must be considered in any patient presenting with an acute abdomen, and a certain preoperative diagnosis is still a challenge [9]. Although more than 20 years have elapsed since the introduction of laparoscopic appendectomy (performed in 1983 by Semm, a gynaecologist), open appendectomy is still the conventional technique. Some authors consider emergency laparoscopy as a promising tool for the treatment of abdominal emergencies able to decrease costs and invasiveness and maximize outcomes and patients' comfort [10]. Several studies [11-13] have shown that laparoscopic appendectomy is safe and results in a faster return to normal activities with fewer wound complications. These findings have been challenged by other authors who observed no significant difference in the outcome between the two procedures, and moreover noted higher costs with laparoscopic appendectomy [14-15]. Anyway, a recent systematic review of meta-analyses of randomized controlled trials comparing laparoscopic versus open appendectomy concluded that both procedures are safe and effective for the treatment of acute appendicitis [16].

A number of surgeons suppose that laparoscopy has the advantage as if a patient who has laparoscopic cholecystectomy and his appendix was found to be inflamed so he can have appendectomy at the same time with no any extension of incision or instruments [17]. Wide field visions of appendix with more space to movement through a small hole like incision are enormous advantages of laparoscopic surgery.

Laparoscopy participates in evaluating acute abdomen. And had a major role in young females when it is

difficult to distinguish between acute appendicitis and gynecological clinical conditions like "Pelvic Inflammatory disease", "Twisted ovary" and ectopic pregnancy etc [18].

Laparoscopic procedures had rarer postoperative respiratory complications compared to open surgery [19]. Advantages of laparoscopic appendectomy are its better visualisation of organs, shorter hospital stay, fewer wound infection, less post-operative pain and rapid coming back to work. The results of the study show that laparoscopic appendectomy gives rise to significantly less post-operative pain, shorter hospital stay and quick recovery. Mean operation time was longer in laparoscopic appendectomy (46 minutes) compared to open (26 minutes). We observed that the delay was not during operation rather than before starting the real operation in positioning the patient, application of different tubes, cables and video apparatus around the patient.

Wound infection concerning skin was almost zero, as the appendix was pulled into the trocar before removing. This action minimizes the risks of wound infection to the skin.

It was difficult to calculate post-operative pain. So, we indirectly measure it by calculating how many days took to mobilize freely and how long the patient used analgesics. On average after 12 hours the patients were fully mobilized and did not need any analgesics where as in open appendectomy group this average time was 36 hours. This finding is common in almost all the studies done up to date [20].

The patients were discharged home after 24 hours in laparoscopic appendectomy while in open group the patient discharged on the second day.

Conclusion

There is still a debate among surgeons concerning the choice of the proper technique for appendectomy. Supporters of the OA find it easy and fast to perform. They use a small incision and consider that they have less IAA. As more retrospective studies and meta-analyses occur it seems that an increasing number of surgeons adopt LA. It becomes more minimal with the one-port technique. Operative time has been reduced after training. It is less painful; it has less wound infections and postoperative ileus. Other complications have the same rate as OA. Hospital stay is shorter, return to a normal diet and activity is faster and the cost is decreasing. Laparoscopic appendectomy is an effective and safe option and the procedure of choice for most patients regardless of age, sex and BMI. We recommend LA as a routine surgical approach for acute appendicitis.

References

1. Kumar B, Samad A, Khanzada TW, Laghari MH, Shaikh AR. Superiority of Laparoscopic appendectomy over open appendectomy: The Hyderabad experience. *Rawal Med J* 2008; 33:165-8.
2. McBurney C. The incision made in the abdominal wall in cases of appendicitis, with a description of a new method of operating. *Ann Surg.* 1894;20(1):38-43.
3. Semm K. Endoscopic appendectomy. *Endoscopy.* 1983;15(2):59-64.
4. Chung RS, Rowland DY, Li P, Diaz J. A meta-analysis of randomized controlled trials of laparoscopic versus conventional appendectomy. *Am J Surg.* 1999;177(3):250-6.
5. Azaro EM, Amaral PC, Ettinger JE, Souza EL, Fortes MF, Alcantarag RS, et al. Laparoscopic versus open appendectomy: A comparative study. *JLS.* 1999;3(4):279-83.
6. Bennett J, Boddy A, Rhodes M. Choice of approach for appendectomy: a meta-analysis of open versus laparoscopic appendectomy. *Surg Laparosc Endosc Percutan Tech.* 2007;17(4):245-55.
7. Jadad AR, Moore RA, Carroll D, Jenkinson C, Reynolds DJ, Gavaghan DJ, et al. Assessing the quality of reports of randomized clinical trials: is blinding necessary? *Control Clin Trials.* 1996;17(1):1-12.
8. Chung RS, Rowland DY, Li P, Diaz J. A meta-analysis of randomized controlled trials of laparoscopic versus conventional appendectomy. *Am J Surg.* 1999;177:250-256. doi: 10.1016/S0002-9610(99)00017-3.
9. Bhangu A, Søreide K, Di Saverio S, Assarsson JH, Drake FT. Acute appendicitis: modern understanding of pathogenesis, diagnosis, and management. *Lancet.* 2015;386:1278-1287. doi: 10.1016/S0140-6736(15)00275-5.
10. Di Saverio S. Emergency laparoscopy: a new emerging discipline for treating abdominal emergencies attempting to minimize costs and invasiveness and maximize outcomes and patients' comfort. *J Trauma Acute Care Surg.* 2014;77:338-350. doi: 10.1097/TA.0000000000000288.
11. Garbutt JM, Soper NJ, Shannon W, Botero A, Littenberg B. Meta-analysis of randomized controlled trials comparing laparoscopic and open appendectomy. *Surg Laparosc Endosc.* 1999;9:17-26. doi: 10.1097/00019509-199901000-00004.
12. Towfigh S, Chen F, Mason R, Katkhouda N, Chan L, Berne T. Laparoscopic appendectomy significantly reduces length of stay for perforated appendicitis. *Surg Endosc.* 2006;20:495-499. doi: 10.1007/s00464-005-0249-8.
13. Olmi S, Magnone S, Bertolini A, Croce E. Laparoscopic versus open appendectomy in acute appendicitis: a randomized prospective study. *Surg Endosc.* 2005;19:1193-1195. doi: 10.1007/s00464-004-2165-8.
14. Kurtz RJ, Heimann TM. Comparison of open and laparoscopic treatment of acute appendicitis. *Am J Surg.* 2001;182:211-214. doi: 10.1016/S0002-9610(01)00694-8.
15. Agresta F, De Simone P, Leone L, Arezzo A, Biondi A, Bottero L, et al. Italian Society Of Young Surgeons (SPIGC). Laparoscopic appendectomy in Italy: an appraisal of 26,863 cases. *J Laparoendosc Adv Surg Tech A.* 2004;14:1-8. doi: 10.1089/109264204322862270.
16. Jaschinski T, Mosch C, Eikermann M, Neugebauer EA. Laparoscopic versus open appendectomy in patients with suspected appendicitis: a systematic review of meta-analyses of randomised controlled trials. *BMC Gastroenterol.* 2015;15:48. doi: 10.1186/s12876-015-0277-3.
17. Eden CG, Haigh AC, Carter PG, Coptcoat MJ. Laparoscopic nephrectomy results in better postoperative pulmonary function. *J Endourol.* 1994;8:419-23.

18. Schauer PR, Luna J, Ghiatas AA, Glen ME, Warren JM, Sirinek KR. Pulmonary function after laparoscopic cholecystectomy. Surg. 1993;14:389-97.
19. Fritts L, Orlando R. Laparoscopic appendectomy. A safety and cost analysis. Arch Surg. 1991;1:247-57.
20. Kouhia ST, Heiskanen JT, Huttunen R. Long-term follow-up of a randomized clinical trial of open versus laparoscopic appendectomy. Br J Surg. 2010;97(9):1395-400.

Access this Article in Online	
	Website: www.ijarm.com
	Subject: Medical Sciences
Quick Response Code	
DOI: 10.22192/ijamr.2019.06.04.002	

How to cite this article:

Ashok Meghwal and Satish Jain. (2019). Appendectomy: Open versus Laparoscopic Approach. Int. J. Adv. Multidiscip. Res. 6(4): 8-12.

DOI: <http://dx.doi.org/10.22192/ijamr.2019.06.04.002>