

COMPARISON OF EFFECT AND SAFETY BETWEEN LAPAROSCOPIC APPENDICECTOMY AND OPEN APPENDICECTOMYS

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ABSTRACT

Introduction: Acute appendicitis is still one of the commonest surgical emergencies¹. Open procedure in appendicectomy has been a well known procedure for years. Laparoscopic appendicectomy has appeared as the alternative approach for the open appendicectomy, but some authors still state that laparoscopic appendicectomy is still not superior to open appendicectomy considering operating time which is longer in laparoscopic appendicectomy, post operative complications and cost benefits.

Objectives: To compare the safety of laparoscopic appendicectomy and open appendicectomy in the treatment of acute appendicitis in terms of post operative wound infection.

Methods: This Randomized controlled trial study conducted in the admitted patients of acute appendicitis in the Department of Surgery Hayatabad Medical Complex Peshawar, from Dec 2013 to Dec 2014. Total of 156 patients were enrolled in the study and they were randomly allocated Group A or Group B by a draw equally. Both the groups were kept under observation for 2nd, 5th and 7th days and data were collected.

Results: A total of 156 patients were observed. Out of 78 patients 46(59%) were male and 32(41%) were female in open Appendicectomy while Laparoscopic Appendicectomy contains 41(53.2%) male and 36(46.8%) female. Safety and efficacy were insignificant with $p=0.731$ each in both the group.

Conclusion: We recommend that the choice of the procedure be based on surgeon or patient preference as there is no significant difference regarding safety and efficacy in both the procedure.

Key Words: laparoscopic appendicectomy LA, open appendicectomy OA, acute appendicitis, wound infection.

INTRODUCTION

The vermiform appendix is considered by most to be a vestigial organ; its importance in surgery results only from its propensity to get inflamed, which results in clinical syndrome known as acute appendicitis.¹ Appendicitis is sufficiently common that Appendicectomy is the most frequently (16%) performed urgent abdominal operation and it is often the first major procedure performed by a surgeon in training.¹

Surgical site infection (SSI) is the most common post operative complication occurring in 5-10% of all the patients.¹ The organisms responsible are usually a mixture of gram negative bacilli and anaerobic bacte-

ria, predominately bacteroides species and anaerobic streptococci.²

Open procedure in appendicectomy has been a well known procedure for years. Laparoscopic appendicectomy has appeared as the alternative approach for the open appendicectomy, but some authors still state that laparoscopic appendicectomy is still not superior to open appendicectomy considering operating time which is longer in laparoscopic appendicectomy, post operative complications and cost benefits. The frequency of wound infection was 4% in case of laparoscopic appendicectomy in 2 cases and 16% in 8 cases in open appendicectomy.^{3,5}

Laparoscopic Appendicectomy involves some advantages such as less pain, short hospital stay, rapid post operative recovery, decreased wound infection, satisfactory exploration of abdominal space and better cosmetic scar.⁶

Laparoscopic appendicectomy is becoming increasingly common and clinical evidence suggests that it has become advantage over open surgery. Wound infection can be decreased with the use of preoperative antibiotics.⁷

Despite lots of series and trials comparing advantages and disadvantages of both the procedures consensus concerning the relative advantage of each

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procedure has not been yet reached as it is individual experience and exposure, however it has been observed from previous records that appendicectomy is frequently performed in our ward around 10-15 cases per week and the expertise regarding Laparoscopic Appendicectomy is still in the phase of development. The rationale behind doing this study is that if laparoscopic Appendicectomy is found to be effective and safe in terms of wound infection, than we will suggest other surgeons who have adequate skill in doing laparoscopic procedures to do laparoscopic Appendicectomy as a regular procedure since it is associated with short hospital stay, quick recovery time, less wound pain and better cosmetic scar.

OBJECTIVE

To compare the safety of laparoscopic appendicectomy and open appendicectomy in the treatment of acute appendicitis in terms of post operative wound infection.

HYPOTHESIS

Effect and safety of laparoscopic appendicectomy is better for the management of acute appendicitis as compared to open appendicectomy.

MATERIAL AND METHODS

After getting permission from Ethical committee for carrying out the study, the study was carried out at surgical ward of Hayatabad Medical Complex Peshawar. From Dec 2013 to Dec 2014 patients were included in the study through OPD and emergency were admitted in the ward. The diagnosis of Acute Appendicitis were made on the basis of history of pain RIF with vomiting and on clinical examination showing RIF rebound tenderness and were supported by Leucocytosis of more than 10000.

After taking informed written consent and baseline investigation, patients were randomly allocated in two groups by lottery method. Patients in group 'A' were put on the list for open appendicectomy and patients in group 'B' were go through laparoscopic appendicectomy.

Both the procedures were performed by a senior consultant surgeon expert in both the procedures and having five years of experience. Patients were assessed on 2nd, 5th and 7th postoperative day in ward as well as in out-patient department for wound infection to measure the safety and early return to routine work to measure efficacy in both the procedure.

Patients with ischemic heart diseases and jaundice, previous abdominal surgery due to adhesions, perforated gangrenous appendix and HIV/AIDS were excluded as they lead our study results biased. SPSS(version 16) were used for data analysis.

RESULTS

A total of 156 patients were observed, which were divided in two equal groups, i.e. open Appendicectomy and Laparoscopic Appendicectomy. Sex wise distribution shows that out of 78 patients 46(59%) were male and 32(41%) were female in open Appendicectomy while Laparoscopic Appendicectomy contains 41(52.6%) male and 37(47.4%) female. Male to female ratio was 1.26:1. Sex distribution among the groups was insignificant with p-value=0.516.

Average age was 35.18 years + 9.90 SD with rang 16-50 years. Open appendicectomy contain 20(25.6%) patients in less than 25 years, 22(28.2%) patients 26-35

patients lies in the age of more than 45 years. While group B contains 10(12.8%) patients in less than 25 years, 18(23.1%) in 26-35 years, 26(37.2%) patients lying in 36-45 years and 21(26.9%) patients have age more than 45 years. The age distribution among the group was also insignificant with p-value 0.107.

After 2nd day of surgery, 10(61.5%) have a wound infection in open appendicectomy while 5(6.5%) have wound infection in laparoscopic appendicectomy. Which was insignificant with p-value=0.174. When wound infection was observed on 5th day, open appendicectomy have still 9(11.7%) patients with wound infection and 4(5.2%) patients have wound infection in laparoscopic appendicectomy which is insignificant (p-value=0.147). Finally at 7th day when wound infec-

Table 1: Comparison of efficacy in two groups

			Group		Total	P-value
			Open appendicectomy	Laparoscopic appendicectomy		
Efficacy of procedure	Yes	Count	5	4	9	0.731
		% within Group	6.4%	5.1%	5.8%	
	No	Count	73	74	147	
		% within Group	93.6%	94.9%	94.2%	
Total	Count	78	78	156		
	% within Group	100.0%	100.0%	100.0%		

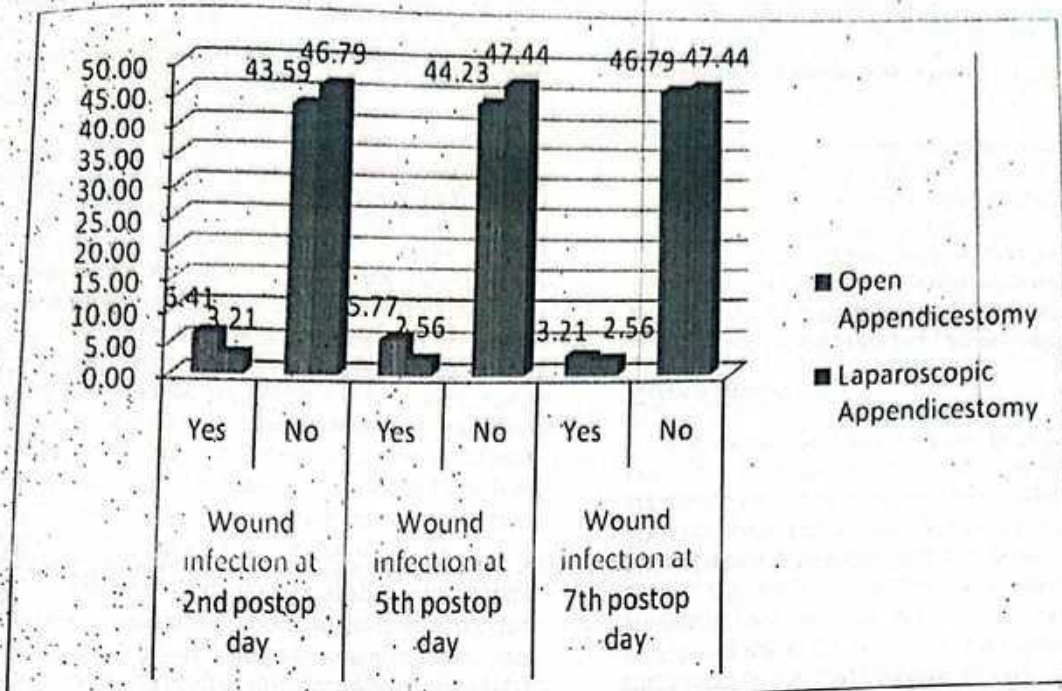


Fig 1: Comparison of safety in two groups

tion was observed. Open appendicectomy reduced the wound infection to 5(6.5%) patients; while in laparoscopic appendicectomy the same results were seen as recorded at 5th post operative day. But still the wound infection was insignificant in both the group with p -value=0.731. (Fig 1)

Efficacy of Open appendicectomy is 93.6%, while in laparoscopic appendicectomy the efficacy was 94.9%. But still the efficacy was insignificant in both the group (p -value=0.731). (Table 1)

DISCUSSION

Initially, laparoscopy was used as a diagnostic tool to decrease the rate of negative appendectomy while minimizing complications,⁸ but Laparoscopic techniques have revolutionized gallbladder surgery without any randomized clinical trial supporting the change from open appendectomy to laparoscopic appendectomy.⁹ The surgical technique for laparoscopic appendectomy is now well described, and several methods have been developed.^{10,11}

On the basis of our preliminary experience with laparoscopic appendectomy¹² we undertook this prospective randomized study to evaluate the incidence of wound infection. In our series, all operations were performed by surgical residents with the assistance of the attending surgeon, and much instruction was involved. LA on the other hand has been shown in several randomized, controlled trials to be superior on the aspect of postoperative pain or use of analgesia¹³ number of postoperative complications¹⁴ hospital stay¹⁵ and return

to normal activities^{14,16}. There was no difference in the staffing between the open and laparoscopic cases, so the times are probably comparable although they are generally longer than in most other series.¹⁷

Nowzaradan et al¹⁵ reviewed 43 patients with suspected appendicitis without perforation who had laparoscopic appendectomy and found that they had less postoperative pain, a shorter hospital stay, a faster return to activity, a lower morbidity rate, and a better cosmetic result than those who had an open appendectomy during the same time period. However, those patients with perforative appendicitis were excluded from the laparoscopic group, and this undoubtedly influenced the outcome. Ortega et al¹⁸ reviewed 253 patients randomized to three groups to compare laparoscopic and open appendectomy. They concluded that laparoscopic appendectomy produced less pain and more rapid return to normal activity (9 vs. 14 days, $p < 0.001$) and required a shorter hospital stay (2.16 days vs. 2.83 days when the appendix was stapled; $p < .05$).¹⁹

However, when the groups were examined based only on the patients who had acute appendicitis or a normal appendix,²³ have shown a more rapid return to normal activity and work after laparoscopic appendectomy compared with open appendectomy, our data support this.²⁰ In the study by Frazee et al²¹ the patients in the open appendectomy group required 25 days to return to full activity. Also, the patients in both groups reported returning to work after approximately the same time period. This is similar to a report by Richards et al²² who were unable to measure any advantage regarding

return to physical activity after laparoscopic appendectomy.

There was one intra-operative complication in the laparoscopic group involving trocar insertion and an abdominal wall hematoma. Gaining access to the abdominal cavity is the most common time for complications to occur during laparoscopic surgery.²³ For this reason we have used the open technique exclusively and visualize each trocar during insertion. There were no other intraoperative complications in this group. The rate of readmission to the hospital was equal in the open and laparoscopic groups, with wound infection or intra-abdominal abscess being the predominant reason. There were three intra-abdominal abscesses in each group, and although there were six wound infections in the open group and three in the laparoscopic group, this was not a significant difference.²⁴

Additionally, Ortega et al¹⁸ noted six intra-abdominal abscesses in laparoscopic and 0 in open appendectomy patients ($p = NS$), although wound infections were more common among open appendectomy patients (11 vs. 4, $p < 0.05$). The researchers believed that this may be a major advantage of the laparoscopic technique. Others have found that the rate of wound infection after laparoscopic appendectomy is low compared with that of the open procedure.²⁴ In the technical part of the laparoscopic procedure, incidence of wound infection can be reduced by placing the appendix in a bag or drawing it into the trocar for removal and not allowing the specimen to remain in contact with the wound. Further, use of the Endo-GIA instrument decreases operative time for laparoscopic appendectomy^{2,19} and decreases the amount of potential contamination by not allowing the open end of the specimen in the abdominal cavity which are comparable to our study results.

Laparoscopic appendectomy can be performed with similar morbidity to open appendectomy and may actually have a decreased wound infection rate. However, in the routine patient with the clinical diagnosis of acute appendicitis, it does not seem to offer any major advantages. The length of hospital stay is decreased over the open procedure when all patients are considered together, but when the patients are stratified according to pathologic findings, these differences do not seem to be significant. Additionally, the operative time is increased with laparoscopic appendectomy, and there is no benefit regarding hospital cost. Further, the time required for full physical recovery did not appear to be different. In the patients with vague clinical findings, especially women of child-bearing age or obese patients, diagnostic laparoscopy may be useful, but based on our findings, we cannot recommend this procedure routinely.²⁰

Despite this evidence LA has not become the gold standard in treating acute appendicitis. This may be partly because of inconsistency in the literature, because other studies show no differences at all between

OA and LA or only disadvantages for the laparoscopic technique²⁵.

In our study only one postoperative abscess was observed after OA and none after LA. We noticed that laparoscopic irrigation of the peritoneal cavity could be performed effectively. Our study has some limitations. We could not assess the effects of laparoscopic surgery in the obese patient, as body mass indices were not recorded. Cost analysis was not included, and our follow-up was limited to the first 1 week postoperatively.

CONCLUSION

In conclusion, LA is not superior to OA. It is an equivalent technique as the benefits gained through improved quality of life were offset by the effect of longer operating times and more serious early complications. Some authors praise the value of laparoscopy in the case of diagnostic uncertainty among women. This application may not be as useful in the current age of widespread use of CT scans with excellent specificity and sensitivity for the diagnosis of appendicitis. LA has been demonstrated to have advantages in certain situations such as surgery in the obese patient proved cosmesis by hiding trocar incisions in the pubis can be an advantage for certain patients. Based on what we know today, we recommend that the choice of the procedure be based on surgeon or patient preference.

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