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## RESEARCH ARTICLE

### A COMPARATIVE STUDY BETWEEN LAPAROSCOPIC APPENDICECTOMY VERSUS OPEN APPENDICECTOMY- A RANDOMIZED CONTROLLED PROSPECTIVE STUDY

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#### ABSTRACT

**Background:** Acute appendicitis is the most recurrent cause of persisting progressive abdominal pain in all ages. However, there is no way to prevent the development of appendicitis, the only way to reduce the morbidity and to prevent the development of appendicitis, is to perform appendicectomy before perforation or gangrene has occurred. **Objective-**To evaluate and compare the advantages and disadvantages between laparoscopic appendicectomy and open appendicectomy in general surgical practice. **Methods-**A prospective randomized controlled comparative study was conducted in the Department of Surgery in Multi- speciality hospitals in Gwalior, Madhya Pradesh from August 2017 to July 2018 a period of One years. The total population group included 100 patients with a mean age of 39 years (Age group between 18-60 years). Epi-info 7 was used for analysis. **Results:** Patients between 18 years and 60 years of age were candidates for randomization. The study was carried out as an open randomized single centre study. In the present study patients were not blinded to the surgical technique employed but were equally informed to resume normal activity and work as soon as possible at their discretion. The results show that time to return to heavy work was significantly reduced by the laparoscopic approach. Less pain in the post-operative period was the major contributing factor. In the present study, laparoscopic appendicectomy was associated with improved cosmesis when compared with open appendicectomy (P <0.01). **Conclusions:** Laparoscopic appendicectomy is a safe procedure with lower morbidity it is also an excellent training tool in laparoscopic technique and with enough experience takes no longer than open appendicectomy.

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## INTRODUCTION

Acute appendicitis is the most frequent cause of persisting progressive abdominal pain in all ages. However, there is no way to prevent the development of appendicitis, the only way to reduce the morbidity and to prevent the development of appendicitis, is to perform appendicectomy before perforation or gangrene has occurred. Open appendicectomy has been safe and effective for acute appendicitis for more than a century. Recently, several authors proposed that the new technique of laparoscopic appendicectomy should be the treatment for acute appendicitis.<sup>1</sup> Laparoscopic appendicectomy has been shown to be both feasible and safe in randomized comparisons with open appendicectomy, in addition to improve diagnostic accuracy. <sup>2</sup>Laparoscopic appendicectomy confers advantages to the patient in terms of fewer wound infections, less pain, faster recovery and earlier return to work.<sup>3-7</sup> However, laparoscopic appendicectomy is more time consuming and is associated with increased hospital costs.

It has been argued that the advantages of laparoscopic appendicectomy achieved by experienced laparoscopic surgeons are marginal compared with open appendicectomy which can also be performed by surgeons in training through a short, cosmetically acceptable incision with minimal complications and a short hospital stay.<sup>8</sup> This was based on the hypothesis that laparoscopic appendicectomy would prove superior to open appendicectomy in terms of hospital stay, post-operative morbidity like pain, complication like wound infections, intraabdominal abscess, ileus, cosmesis, operating time, earlier return to normal activity and work.

## MATERIALS AND METHODS

**Study Design-** Randomized controlled prospective study.

**Study Settings-** Department of Surgery, Multi- speciality Hospitals, Gwalior, Madhya Pradesh.

**Study Duration** – 1-year August 2017 to July 2018.

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**Study Population-** The total population group included 100 patients with mean age of 39 years (Age group between 18-60 years). Patients between 18 years and 60 years of age were candidates for randomization.

**Sampling Technique-** Stratified sampling technique.

**Sample Size-** 100 patients and after randomization 70.

**Methodology-** Every patient coming to the OPD who was diagnosed as acute appendicitis and planned for operation was numbered 1, 2, 3, 4 and soon. Every 2<sup>nd</sup> number and 4<sup>th</sup> number were selected irrespective of sex, co-morbid factors. Every 2<sup>nd</sup> patient was planned for open appendectomy and every 4<sup>th</sup> patient was planned for lap appendectomy. The patients were explained in detail about the operative modalities both laparoscopic and open appendectomies. Thus, the patient was not given the opportunity to voluntarily opt for the operative procedure they would like to undergo, and this was probably the main cause in the exclusion criteria. So, out of 100 patients the total number of patients after randomization were 70. Of these, 30 patients underwent laparoscopic appendectomy and 40 patients underwent open appendectomy finally. The two treatment groups were well matched about age, sex but not for severity of appendiceal pathology. All the patients underwent thorough pre-anesthetic checkup for general anesthesia. All the patients were thoroughly explained preoperatively likely post-operative pain and methods of analgesia available.

**Statistical Analysis:** Data will be consolidated and entered a Microsoft Excel spreadsheet and then transferred to Epi info version (7.1.3.0. centre for disease control and prevention, Atlanta, Georgia, USA, 2013) software for analysis. Chi-square test used for categorical data and Mann Whitney test used for ordinal data.

## RESULTS

**Table 1. Intraoperative factors between Laproscopic and Open appendectomy**

Factors	Lap (N=30)	Open (N=40)	p-value
Wound infection	4	10	0.001*
Abscess	3	2	0.61
Caecal leak	1	2	0.11
Adhesions	1	3	0.22
Pneumonia	1	2	0.01*
VAS>12 hours	12	11	0.34
>24 hours	8	10	0.21
Operation Time	55 (15-90) minutes	30 (30-60) minutes	0.00*

\*statistically significant p<0.05

As per table 1 factors which are affecting lap and open appendectomy were most commonly are wound infection which was statistically significant. It was low in lap. Similarly abscess, leak, adhesions were not significant and were comparable in both the surgeries. Operation time was less in Open as compared to Lap and it was significant (p<0.05).

**Table 2. Post-operative factors between Laproscopic and Open appendectomy**

Factors	Lap (days)	Open (days)	p-value
Hospital stay	4 (3-5)	6 (3-10)	0.001*
Convalescence Normal	3	4	0.01*
Heavy Activity	8	10	0.01*
Death	0	0	0

\*statistically significant p<0.05

As per table 2 post-operative factors plays a significant role. Duration of hospital stay was less in Lap as compared to Open. Which was significant (p<0.05). This may be due to reason that healing of wound may be delayed in Open as compared to Lap. Period of Convalescence was less in Lap as compared to Open which was significant (p<0.05). No mortality was seen in any appendectomy.

## DISCUSSION

Acute appendicitis is one of the most frequent causes of abdominal emergency in nearly all age groups and is notorious in its ability to stimulate other conditions.<sup>1</sup> Also, in hospital laparoscopic and open Appendectomy is performed routinely on patients with acute appendicitis so, the prospective comparative study of laparoscopic appendectomy and open appendectomy in suspected cases of acute appendicitis. The study was conducted on 70 patients of 100 patients who were randomly selected through surgical outdoor or emergency department. Most studies report a median hospital stay of 2 - 5 days of laparoscopic or open surgery.<sup>3,4,6</sup> Although, some recent retrospective cohort studies or chart reviews found laparoscopic appendectomy associated with significantly shorter hospital stay. Other retrospective investigations reported non-significant difference. Similarly, some randomized controlled trials associated laparoscopic appendectomy with decreased hospital stay.<sup>7</sup> However, others report no significant difference between laparoscopic appendectomy and open appendectomy.<sup>9,10</sup> Even meta-analysis report controversial findings.<sup>9,10,11</sup> The present study revealed a significantly shorter hospital stay for patients undergoing laparoscopic appendectomy (P <0.1). in the present study Operation time was less in Open as compared to Lap and it was significant. (p<0.05). Duration of hospital stay was less in Lap as compared to Open. Which was significant (p<0.05). This may be due to reason that healing of wound may be delayed in Open as compared to Lap. Period of Convalescence was less in Lap as compared to Open which was significant. (p<0.05). No mortality was seen in any appendectomy.

**Conclusion:** Laparoscopic appendectomy has been shown to be both feasible and safe in comparison with open appendectomy. Though both comparable Laparoscopic appendectomy is associated with increased operating time. The general perception is that it has marginal advantages and may not be worth the trouble.

**Conflict of Interest-** None declared.

**Source of Funding-** None.

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