

APPENDECTOMY: LAPROSCOPY VS OPEN COMPARATIVE OUTLOOK AT A RURAL SET UP IN INDIA.

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ABSTRACT: Background: Laparoscopic appendectomy has struggled to outperform open appendectomy. In contrast, despite minimal scientific challenge, laparoscopic cholecystectomy has quickly established the gold standard for gallstone disease. Since its inception, open appendectomy has been the gold standard for the treatment of acute appendicitis. The emergence of laparoscopic surgery transformed the surgical field. Several studies found that the laparoscopic method was better to the open approach for treating acute appendicitis. The current study is being done to assess any potential advantages of the laparoscopic method over open surgery in a rural setting.

Methods: The study was conducted in Dr Balasaheb Vikhe Patil Rural Medical College and hospital located in Loni (Maharashtra) from September 2020 to September 2021. It is a prospective comparative study. Patients were randomly divided into 2 groups alternately were operated by conventional and laparoscopic techniques respectively and their outcomes were compared.

Results: Duration of surgery learning curve is much more in laparoscopic appendectomy and Postoperative pain, wound infection and hospital stay return to work was significantly more in open group as compared to laparoscopic group ($p < 0.05$).

Conclusions: From the results of our study we conclude that laparoscopic appendectomy has superior results as compared to open appendectomy but has its own limitation at rural setup.

Keywords: Acute appendicitis, Open appendectomy, Laparoscopic appendectomy

INTRODUCTION:

Laparoscopic appendectomy has struggled to outperform open appendectomy. In contrast, despite minimal scientific challenge, laparoscopic cholecystectomy has quickly established the gold standard for gallstone disease². Since its introduction by McBurney³ more than a century ago, open appendectomy has stood the test of time: the procedure is standardized among surgeons and, unlike cholecystectomy, Open Appendectomy is typically completed using a small right lower quadrant incision and postoperative recovery is usually uneventful. Study Less postoperative discomfort, a shorter hospital stay, and an earlier return to normal activities are regarded to be benefits of laparoscopic appendectomy versus open appendectomy. While the frequency of postoperative wound infection is considered to be decreased following the laparoscopic procedure, the incidence of postoperative intraabdominal sepsis may be greater in patients operated on for gangrenous or perforated appendicitis.^{6,7} There are however notions showing only minimal benefit from laparoscopic Appendectomy, with higher cost of this method. The life time rate of Appendectomy is 12% for men and 25% in women, with approximately 7% of all people undergoing Appendectomy for acute appendicitis during their lifetime. It has been observed that males had higher rates of appendicitis than females for all age groups with an overall ratio of 1.2 to 1.3:1.3

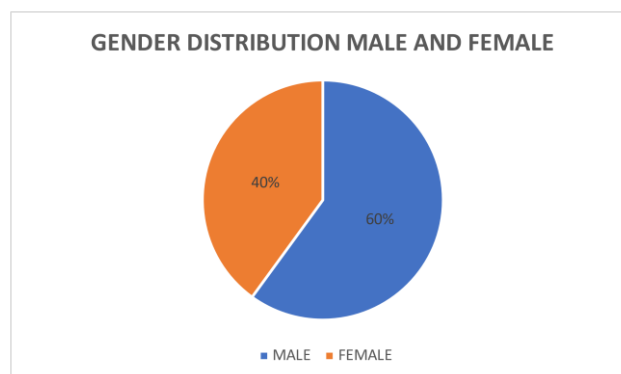


Figure 1: gender distribution in case of appendicitis

Even though modern diagnostic facilities, surgical skills, antibiotic therapy have brought down the mortality from 50% (before 1925) to less than 1/1,00,000 persons, still the morbidity is around 5-8% mainly due to delayed diagnosis & treatment, with the resultant complications. There is evidence that minimal surgical trauma through laparoscopic approach resulted in significant shorter hospital stay, less postoperative pain, faster return to daily activities in several settings related with gastrointestinal surgery. However, several retrospective studies, several randomized trials and meta-analyses comparing laparoscopic with open appendectomy have provided conflicting results. The main issue pertaining to rural set up in India is long learning Curve and the High Cost it requires.

Materials and Methods:

Prospective study from September 2020- September 2021 involved 50 patients with diagnosis of acute or recurrent appendicitis was entered into a study randomizing the choice of operation to either the open or the laparoscopic technique. Statistical comparisons were performed using the chi-square test and student's 't' test. With the introduction of the laparoscopic technique, it provided an opportunity to explore new method of therapy in the management of the suspected cases of the acute appendicitis. Laparoscopic appendectomy combines the advantages of diagnosis and treatment in one procedure with the least morbidity. Patients are likely to have less post-operative pain and to be discharged from hospital and return to activities of daily living sooner than those who have undergone an open appendectomy. Data will be analyzed for Age wise distribution, Gender wise distribution, Types of appendectomy, operative problem.

Results:

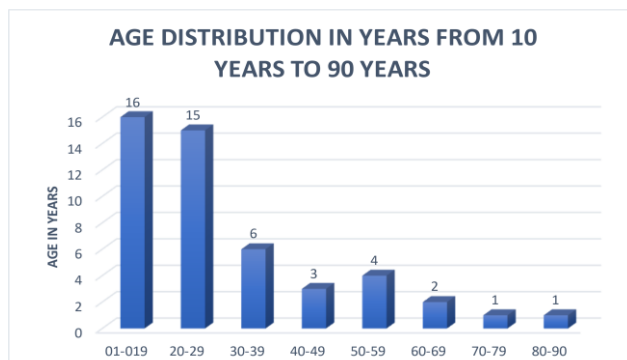
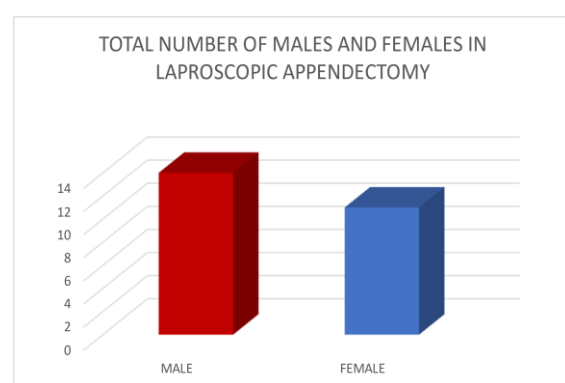
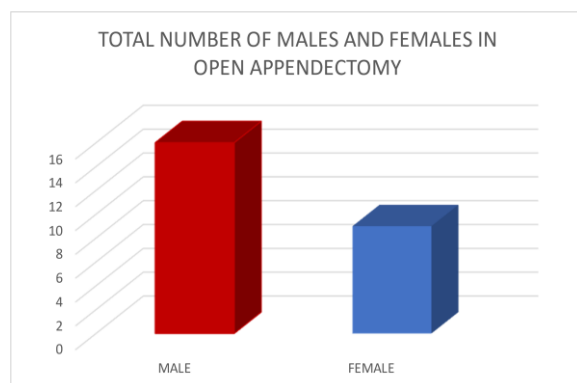


Figure 2: age distribution of patients presenting with appendicitis

The mean age of the patients in open and laparoscopic Appendectomy was and 34.64 years respectively in present study 25 in open group and 25 in laparoscopic group complained of abdominal pain.

In present study 16 patients of open appendectomy and 14 patients of laparoscopic Appendectomy were males. 9 patients of open and 11 of laparoscopic Appendectomy were females History of vomiting was present in 16 of open and 20 of laparoscopic group. The other complaint was fever in 7 (28%) of open and 5 (20%) of laparoscopic group. In present study 10 (40%) and 8 (32%) of the patient of open and laparoscopic group respectively had the history of episodes of abdominal.

Mean operative time in open and laparoscopic Appendectomy group was 71.5 and 106.5 minutes respectively which is statistically significant. Higher Operative time in laparoscopic group in our study may be Due to additional steps of operation like setup of Instruments, insufflation, and making ports under direct Vision. Also the operating team.



Discussion:

The advancement of surgical technology, namely laparoscopic surgery, has enabled the General Surgeon to expand his surgical reach to super specialty. We conducted this study to assess our expertise in this sector due to the disagreement around the possible advantages of laparoscopic appendectomy. The relative benefits of laparoscopic versus open appendectomy were determined mostly by post-operative discomfort and the length of analgesics needed. Post-operative complications such as vomiting, ileus, wound infection, and post-operative recovery in terms of length of stay and return to normal employment were all evaluated.

Previous literature suggests that the operating time of laparoscopic Appendectomy was found to be more than that of open Appendectomy. In considering operating time, the exact identification of the timing of the start of the procedure and its conclusion varies. In general, the time should be calculated from the insertion of first trocar to the end of skin suturing. Mean

operative time in open and laparoscopic Appendectomy group was 71.5 and 106.5 minutes respectively which is statistically significant. Higher Operative time in laparoscopic group in our study In this study duration of post-operative hospital stay was significantly low for laparoscopic group 2.84 ± 0.9 as compared to open group 7.68 ± 2.38 . The longer hospital stay in open group compared to laparoscopic group also has been reported by others similar studies. In this study, the return to normal activity was early for laparoscopic group 13.52 ± 2.24 days as compared to open group 20.80 ± 6.28 days. Other studies have also shown that laparoscopic group patients returned to normal work earlier. It has been shown that those patients who underwent laparoscopic Appendectomy had a better postoperative recovery. The reduced trauma to the abdominal wall is a very significant factor in postsurgical discomfort. The better mobility of the abdominal musculature and the earlier ambulation reduced the risk of

Details	Appendectomy		Significance	
	Open Mean /SD	Laparoscopy Mean /SD	t value	P value
Duration of hospital stay after surgery (days)	7.7 1.95	2.8 1.23	4.9	0.001
Time taken for return to normal work (days)	20.8 3.21	13.5 2.86	7.3	0.001

Mean Duration of post operative hospital stay for open group (7.7 ± 1.95) and (2.8 ± 1.23) days for laparoscopic group. Which shows that laparoscopic Appendectomy significantly reduced the hospital stay ($P < 0.001$). Patients who had laparoscopic Appendectomy return to full activities was (13.5 ± 2.86) versus (20.8 ± 3.21) days for patients who underwent open Appendectomy. Again this difference was significant ($P < 0.001$)

postoperative complications of pneumonia and embolism.

Despite the success of conventional Appendectomy, there have been numerous attempts to improve the diagnostic accuracy and outcome of patients with acute appendicitis, because the negative Appendectomy rate in most series is still in the range of 20% to 30% additionally, the recovery time after an open Appendectomy can be significant. Initially, laparoscopy was used as a diagnostic tool to decrease the rate of negative Appendectomy while minimizing complications and can prove beneficial in tackling with all other abdominal pathology if found concurrently while doing diagnostic laparoscopy.

The surgical technique for laparoscopic appendectomy is now well described, and several methods have been developed. Schirmer et al.⁹ reviewed 122 nonrandomized patients who had either diagnostic laparoscopy and open Appendectomy or laparoscopic Appendectomy and found no difference in hospital stay, mortality, complications, between the two procedures. They concluded that a randomized study would be needed to avoid selection bias, because their study did not show any significant benefit to laparoscopic Appendectomy over the open procedure Nowzaradan et al.¹⁰ 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 prerogative appendicitis were excluded from the laparoscopic group, and this undoubtedly influenced the outcome.

Ortega et al.⁸ reviewed 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, $p < 0.05$). Our results showed a significant overall decrease in the number of hospital days in patients who underwent a laparoscopic Appendectomy. However, when the groups were examined based only on the patients who had acute appendicitis or a normal appendix, there was no statistical difference, whereas the patients with perforated appendices were discharged significantly earlier in the laparoscopic group. The open perforated patients received a much longer course of postoperative antibiotics than did the laparoscopic patients (7.3 days vs. 1.3 days, $p < 0.01$), which has been found by others to account for increased length of stay in open Appendectomy patients. Additionally, those patients who had a laparoscopic Appendectomy and perforation may have had less inflammation than those having an open procedure. When the lengths of stay in other studies are examined based on the pathologic findings, the

differences may not be as significant as when the total group is analyzed. Despite the success of conventional Appendectomy, there have been numerous attempts to improve the diagnostic accuracy and outcome of patients with acute appendicitis, because the negative Appendectomy rate in most series is still in the range of 20% to 30% additionally, the recovery time after an open Appendectomy can be significant. Initially, laparoscopy was used as a diagnostic tool to decrease the rate of negative Appendectomy while minimizing complications. The surgical technique for laparoscopic Appendectomy is now well described, and several methods have been developed. Rate of wound infection after laparoscopic Appendectomy is low compared with that of the open procedure. 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. Laparoscopic Appendectomy can be performed with similar morbidity to open Appendectomy and may actually have a decreased wound infection rate. While the frequency of postoperative wound infection is considered to be decreased following the laparoscopic procedure, the incidence of postoperative intraabdominal sepsis may be greater in patients operated on for gangrenous or perforated appendicitis.

CONCLUSION:

On analyzing the data, we have found a definite difference in outcome between open Appendectomy and laparoscopic Appendectomy in our study. Laparoscopic Appendectomy was better than open appendectomy with respect to wound infection rate, early resumption of oral feeds, postoperative pain, lesser use of analgesics, postoperative hospital stay and return to normal activities. Although above mentioned advantages were at the cost of slightly increased duration of surgery and cost of surgery. But going by our study we definitely find an overall advantage of laparoscopic Appendectomy.

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