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Original Research Article

A retrospective comparative study of laparoscopic appendectomy and open appendectomy

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ABSTRACT

Background: Appendectomy is the most common surgical procedure performed in emergency surgery. Appendectomy is the treatment of choice, which can be done either by open or laparoscopic approach. Controversies till exist as to which is the better choice among the two surgical procedures for treating appendicitis. In this retrospective analysis, we aimed to compare outcomes of laparoscopic appendectomy with open appendectomy.
Methods: Total 120 appendectomy cases were analyzed retrospectively in a period of 2 years. The study was conducted in the department of surgery and Institutional ethical committee approval was obtained. Patient demographic data, intraoperative findings and postoperative clinical outcomes were collected standard data sheet. Biopsy specimens were sent to pathology department for histopathological evaluation to confirm the appendicitis.
Results: There was no statistical difference found in demographic data of patient's undergone appendectomy in both (OA and LA) procedures. The overall incidences of postoperative complications were significantly lower (P=.005) in laparoscopic appendectomy. The length of hospital stay was much shorter in laparoscopic appendectomy (3.5 days) when compared with open appendectomy (6.2 days).
Conclusions: The laparoscopic appendectomy was better than open or conventional appendectomy with respect to less pain, shorter hospitalization period, minimal postoperative complications and early return to normal activity.

Keywords: Appendicitis, Conventional appendectomy, Complications, Hospital stay, Laparoscopic appendectomy

INTRODUCTION

Acute appendicitis is one of the most common surgical emergencies, requires a basic investigations and clinical examination in diagnosis. Appendicitis is one of the commonest causes of abdominal pain.[1]

Approximately 7% of the global population develops appendicitis in their life span. According to the literature, open appendectomy has been an effective operation for acute appendicitis for more than a century, thus making appendectomy the most frequently performed abdominal operation.[1,2] The history, clinical examination and laboratory investigations play a crucial role in the diagnosis of appendicitis. The diagnosis of acute appendicitis purely based on the clinical judgment, which may lead to a negative appendectomy rate of 17-36%. The accuracy of clinical assessment in diagnosis of acute appendicitis varies from 50-80%.[3,4]

The operative approach to acute appendicitis consists of appendectomy (surgical removal of the vermiform appendix); is considered as an effective and safe treatment option.[4] The recent advancement in surgical procedures leads to laparoscopic appendectomy in many hospitals. However, the choice between an open and a

laparoscopic operation continues to be debated in the medical literature.[5] Appendectomy is the treatment of choice, which can be done either by open or laparoscopic approach.

The open appendectomy with abdominal incision has persisted essentially since it was pioneered by McBurney in the 19th century.[6] The use of laparoscopy in the surgical management of acute appendicitis was first described in 1983, and there is ongoing trend toward increased use of this approach. Even though, there is limited information found in the literature for comparison between open and laparoscopic surgery with acute appendicitis.[7]

The conventional appendectomy is a highly effective procedure, but despite of its success it requires longer hospital stay, more time for mobilization, delayed bowel function, pain. Literature describes that laparoscopic appendectomy procedure result of decreased pain, earlier resumption of diet, and decreased length of hospital stay for laparoscopic appendectomy versus the equivalent open procedure.[7,8]

The study was conducted with the aim to compare the duration of postoperative hospital stay, pain, recovery, other complications between open and laparoscopic appendectomy.

METHODS

The present retrospective review of consecutive patients with appendectomy in the Department of General Surgery, Mahaveer Institute of Medical Science, Vikarabad, MNR Medical College & Hospital, Sangareddy Telangana, from February 2016 to February, 2018. Total 120 patients, who underwent appendectomy in surgery department, were included in the study.

Out of 120 cases of appendectomy, 60 patients were undergone open or conventional appendectomy (OA) and remaining 60 patients were undergone Laparoscopic appendectomy (LA). The study was reviewed and approved by institutional Ethical Committee. Pre-operative diagnosis of acute appendicitis was done using history, clinical examination, laboratory findings and imaging studies in all the subjects. Data was collected from each patient on the basis of clinical, preoperative findings, postoperative recovery and follow up. The demographic data of patients, type of appendectomy (OA or LA) performed, operated time, post-operative hospital stay, oral food resumption were recorded in a standardized data collection sheet.

The choice of procedure (OA or LA) for removal of vermiform appendix was decided based on patient preferences and clinical factors. Informed consent was taken from all the patients before commencing of the procedure. Open appendectomy was performed via McBurney's incision or Ianz incision or occasionally by right paramedian incision. Operating time was calculated from the time of skin incision up to the placement of last stitch on the closing wound. In laparoscopic appendectomies, three laparoscopic ports were used. The appendix was dissected free, the appendicular artery and base of the appendix ligated using end loop. Specimens were sent to histopathological lab for evaluation of appendicitis. Postoperative hospital stay in days, time of resumption of oral food in hours was calculated from the time of surgery. Descriptive statistics including means, medians, standard deviation, and percentages were used to describe study population on all variables.

RESULTS

A total 120 patients underwent appendectomy were included in the study. There were 60 patients with open appendectomy (OA) and 60 with laparoscopic appendectomy (LA). The demographic data with baseline characteristics are shown in Table 1.

Table 1: Patients demographic data.

	OA group (n=60)	LA group (n=60)	P value
Mean age (in years)	36 (12-84)	31 (13-62)	1.000
Gender (%)			
Male	31 (51.6%)	33 (55%)	1.000
Female	29 (48.3%)	27 (45%)	1.000
Previous abdominal surgeries (%)	3.4%	8.9%	0.512
Total count (in cells/cu mm)			
Uncomplicated cases	12.1(4.7-23.5)	12.9 (4.8-21.7)	0.810
Complicated cases	19.9 (4.7-24.3)	20.3 (4.7-21.9)	0.794

Out of 120 patients, 53.3% were male and mean age was 36 yrs in OA cases, 31 yrs in LA cases. Intraoperative findings were noted down and percentage of findings was shown in Table 2. Inflamed appendix was seen in higher

number of cases (43.3%), followed by gangrenous appendix (36.6%), perforated appendix (17.5%), Meckel's diverticulum (2.5%).

Table 2: Intraoperative findings of appendectomy.

	Method		Total (n=120)
	OA(n=60)	LA (n=60)	
Inflammed appendix	25 (41.6%)	27 (45%)	52 (43.3%)
Gangrenous appendix	23 (38.3%)	21 (35%)	44(36.6%)
Perforated appendix	11 (18.3%)	10 (16.6%)	21(17.5%)
Meckel's diverticulum	01 (1.6%)	02 (3.3%)	03(2.5%)

Pain was significantly reduced within 2 days in laparoscopic appendectomy. Postoperative complications are less in laparoscopic appendectomy patients (5%) than open appendectomy cases (13%). Postoperative hospital stays varied case to case, the mean length of hospital stay in open appendectomy was 6.5 days and it is more than laparoscopic appendectomy cases (3.5 days). Postoperative clinical outcomes were demonstrated in Table 3. Postoperative complications, length of stay, time to return back to work were all lesser among patients who underwent laparoscopic appendectomy. Laparoscopic appendectomy took average 71.36 mts and it is 9.05 mts more than open appendectomy.

Table 3: Clinical outcomes of appendectomy.

	OA group	LA group	Difference	P value
Mean operation time (in minutes)	62.31	71.36	9.05	0.724
Mean duration of postoperative pain (in days)	4.6	1.71	2.89	0.003*
Post-operative complications rate	13%	5%	8%	0.005*
Mean hospital stay (days)	6.2 (4-11)	3.5 (2-7)	2.7	0.001*

*Statistically significant

DISCUSSION

The present retrospective study comparative analysis, authors observed that LA is a safe surgical procedure with minimal access and lesser frequency of major complications and post-operative incisional pain especially in children below the age of 15 yrs. LA was not attempted on patients with heart failure due to any increased intra-abdominal pressure could compromise their cardiovascular hemodynamics.[8,9]

While performing the LA method of appendectomy, co-existing pelvic pathologies can be diagnosed and managed during laparoscopic, surgeons could manage cases of ectopic pregnancy and ovarian cysts in women of reproductive age group.

For removal of gall bladders for USG confirmed symptomic gall stones while performing LA, conventional 4 parts were used as in Lap chole while avoiding any extra part for removal of appendices.[9,10] The results of present study reveal that postoperative complications following LA are less than as compare to OA.

Previous studies in adults have also documented the advantages of laparoscopic appendectomy over open appendectomy in terms of rapid postoperative recovery and lower degree of surgical stress, short hospital stay, less postoperative complications.[3,6-9]

The benefits of laparoscopic appendectomy are controversial in children with perforated appendicitis and acute appendicitis as explained by Wullstein et al, Horwitz et al and Ikeda et al.[11-13]

Menezes et al, revealed the benefits of laparoscopic appendectomy in terms of reduction of major complications.[14] In the present study, the laparoscopic appendectomy to result in shorted duration of hospitalization. The present results are in agreement with Towfing et al, Bartin et al and Far et al.[15-17]

The current study had its limitations due to the retrospective comparison rather than a controlled assessment of difference between two procedures. Long term follow-up was not done in the present study.

CONCLUSION

On analyzing the data of the study, authors conclude that laparoscopic appendectomy seems to have significant advantages over open appendectomy.

Open appendectomy has been the mainstay of treatment and golden standard method of treatment for acute appendicitis, but the comparative results of this study throw light a laparoscopic appendectomy as an effective and safe option. In spite of several advantages, Laparoscopic appendectomy needs longer duration of operation, as it involves trocar entry, diagnostic laparoscopy and several small incisions.

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