

## Original Research Article

# A study on laparoscopic appendectomy at emergency theatre in B. P. Koirala Institute of Health Sciences

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## ABSTRACT

**Background:** Laparoscopic appendectomy is gaining its popularity as it has better patient compliance. Despite of not being “gold standard”, laparoscopic appendectomy is widely practiced in emergency setting and has become patient’s as well as surgeon’s choice of treatment. Our aim is to acknowledge the advantage and importance of laparoscopic appendectomy at emergency in a retrospective study. Our main objective was to study the efficacy of laparoscopic appendectomy, patients’ demographic profile as well as conversion rate of laparoscopic appendectomy to open appendectomy.

**Methods:** This hospital based retrospective study was carried among 54 patients who had undergone emergency laparoscopic appendectomy at B. P. Koirala Institute of Health Sciences (BPKIHS) between March and April, 2016. The patient’s file was collected from medical record section, studied and analyzed.

**Results:** During the study, it was observed that most of the patients were female (62.97%) and the patients were mostly between 20 to 40 years of age (Mean age 27 years±10.88 SD). Most of the patients presented within 24 hours of onset of symptoms, most commonly with pain in lower abdomen associated mostly with vomiting. Out of 54 patients, 48 patients (88.89%) were diagnosed with acute appendicitis. Frankly speaking, laparoscopic appendectomy was associated with shorter hospital stay (around 3 days) and also has less conversion rate (11.11%). There were minimal post-operative complications without any case of redo and mortality.

**Conclusions:** Laparoscopic appendectomy is safe and efficient procedure with shorter hospital stay and less post-operative complication.

**Keywords:** Appendectomy, Appendicitis, Conversion, Emergency, Laparoscopic, Mortality

## INTRODUCTION

Every day medical surgery is growing up with newer methods and techniques. The recent sophisticated discovery has taken over traditional ones. Laparoscopic surgery has evolved to be the greatest boon of this era. Considering patient compliance, minimally invasive surgery is wished to be practiced in any possible surgery.

Appendix is worm shaped vestigial structure attached to caecum of large intestine. Despite of having any important role in human body, it is very notorious site for

many medical conditions most common being appendicitis which may sometimes surge for medical emergency. Appendicitis is an inflammation of the appendix, a finger-shaped pouch that projects from your colon on the lower right side of your abdomen.<sup>1</sup>

Simply, appendectomy is surgical removal of appendix. Two types of procedure are practiced, open and laparoscopic appendectomy. The laparoscopic approach to appendectomy has gained wide acceptance over the last 15 years as a means of improved diagnostic accuracy and wound complication rate over open surgery.<sup>2</sup>

Appendicitis carries the risk of rupture which may happen as soon as 48 to 72 hours after symptoms begins so it is considered an emergency and need immediate surgery.<sup>3</sup>

Depending upon type of procedure and patient’s overall condition, laparoscopic appendectomy have various advantages that are less postoperative pain, faster recovery and return to normal activity, shorter hospital stay, better cosmetic results and many more.<sup>4</sup>

Ever since being described by McBurney, open appendectomy has been a well-established and widely performed operation indicated for patients with acute appendicitis.<sup>5</sup> Whether and when to perform a laparoscopic appendectomy as opposed to an open procedure remains a pertinent question. To consider the indications for laparoscopic appendectomy, it is more fitting to describe the contraindications, with the notions that all else fall into the indications category. Absolute contraindications to the laparoscopic appendectomy are hemodynamic instability and lack of surgical expertise. Relative contraindication includes severe abdominal distension that causes operative view obstruction or complicates abdominal entry and bowel manipulation, generalized peritonitis, multiple previous surgical procedure, severe pulmonary disease, pregnancy and extreme obesity.

That said, as laparoscopic technology advances and surgeons’ expertise increases, many surgeons have successfully performed a multitude of laparoscopic procedures in presence of these relative contraindications. In a study comparing laparoscopic and open appendectomy for complicated appendicitis in adult patients, Taguchi et al found that the minimally invasive approach was safe and feasible in this setting, though it did not significantly reduce complications.<sup>6</sup>

If intraoperative complications that cannot be handled with laparoscopy arise during laparoscopic appendectomy, conversion to open appendectomy is indicated. It is crucial to understand the circumstances in which such conversion is warranted.<sup>7,8</sup>

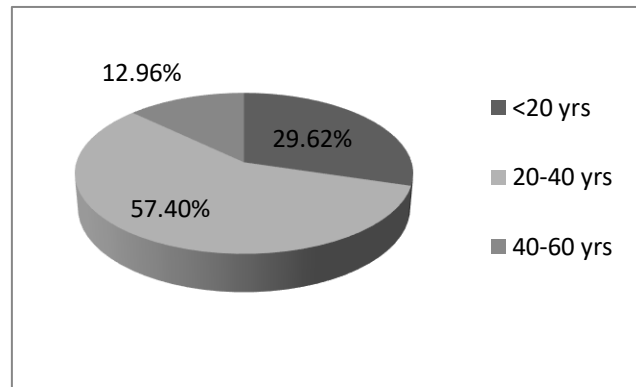
**METHODS**

A Hospital based retrospective study of patients who had undergone laparoscopic appendectomy at emergency theatre of BPKIHS from 15 March, 2016 to 24 April, 2016 were included for this study irrespective of age and sex. The files of the patients were collected from the medical record section of hospital and studied. Sample size was not based on any standard sample calculation technique as all the patients who had undergone laparoscopic appendectomy at emergency theatre of BPKIHS were recruited for this study. Categorical variables were presented as frequency. Chi-square test was performed to compare between the categorical

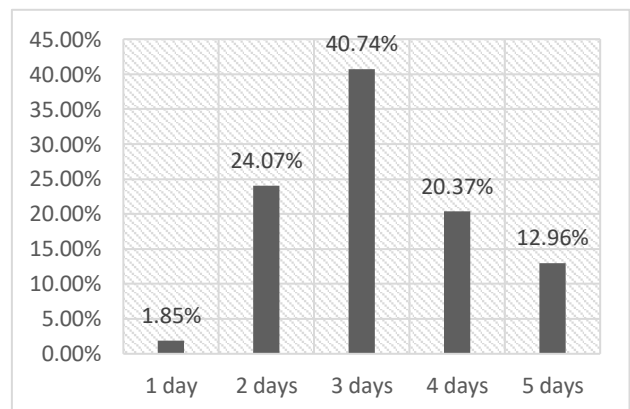
variables using SPSS. Ethical approval was approved by department research unit, department of surgery, BPKIHS.

**RESULTS**

31 patients out of 54 patients who had undergone emergency laparoscopic appendectomy were between 20 years to 40 years of age (Figure 1). Most of the patients (68.51%) were presented with complains of pain localized in lower abdomen associated commonly with vomiting. Only 27.81% patients had post-operative complications, most common being pain at surgical site, observed in 6 out of 54 patients. The duration of hospital stay was shorter as 3 days for most of the patients (40.74%) under study (Figure 2). Conversion rate from laparoscopic appendectomy to open appendectomy was only 11.11% (Table 1) with cause being uncontrolled bleeding, perforation of base of appendix and appendicular lump, without any known mortality and case of redo during period of this study.



**Figure 1: Age group of the patients.**



**Figure 2: Duration of hospital stay.**

**Table 1: Conversion rate (from laparoscopic appendectomy to open appendectomy).**

Conversion	Frequency	Percentage (%)
Yes	6	11.11
No	48	88.89

Causes of conversion are perforation of base of appendix-2 patients, uncontrolled bleeding (slippage of clip)-2 patients and appendicular lump-2 patients

## DISCUSSION

Our main aim was to know the demographic profile of patients undergoing laparoscopic appendectomy, most common presentation and presenting complaints, the conversion rate of laparoscopic appendectomy to open, operative time, postoperative complications and mortality.

Our data supports prior studies in the literature with respect to patient compliance, post-operative complications, conversion rate, mortality and hospital stay.

A study for outcomes and cost analysis of laparoscopic versus open appendectomy conducted at division of general surgery of civil hospital of Ragusa, Italy revealed that the overall incidence of minor and major complications was significantly lower after laparoscopic appendectomy (2.9%) than after open appendectomy (13.2%), rate of intra-abdominal abscess being similar. Also, length of hospital stay was significantly shorter in laparoscopic group than open group.<sup>9</sup>

Another study on laparoscopic versus open appendectomy, a prospective randomized double-blind study has shown that there was no any mortality and some early complications in the laparoscopic group required a reoperation. Physical health and general scores on the short-form 36 (SF36) quality of life assessment forms were significantly better in the laparoscopic group.<sup>10</sup>

During this study, 54 cases who had undergone laparoscopic appendectomy at emergency theatre were studied. During this, it was found that most of cases (48 out of 54, i.e., 88.88%) were diagnosed as acute appendicitis, 1 (1.86%) case as appendicular lump, 2 (3.70%) cases as appendicular abscess, 3 (5.56%) cases as appendicular perforation peritonitis. Among them 20 (37.03%) were male and 34 (62.97%) were female most of them (57.40%) being between 20-40 years of age with mean age of 27 years±10.88 years standard deviation (range=13-58 years). Also, 20 (37.03%) were single and 34 (62.97%) were married. Most of participants (40.74%) had hospital stay of 3 days with mean duration of hospital stay 3.19 days±1-day standard deviation (range=1-5 days). The present findings of rate of conversion from laparoscopic appendectomy to open appendectomy was 11.1%. Likewise, the previous study by Gupta et al also showed the decrease trend from laparoscopic appendectomy to open appendectomy.<sup>11</sup> The 37 participants (68.51%) presented with complaint of pain in right lower abdomen which had no radiation or shifting character and also 13 participants (24.07%) had complaint of pain in right lower abdomen which initially

started at periumbilical region and then shifted to right lower abdomen i.e., right iliac fossa, others have atypical presentation. Beside this chief complaint, most of participants presented with one or more associated complaints such as vomiting in 33 participants (61.11%), fever in 15 participants (27.77%), nausea in 14 participants (25.92%), anorexia in 10 participants (18.52%), abdominal distension in 2 participants (3.70%) and loose stool in 1 participant (1.86%). Most of participants (25 participants, 46.30%) were presented to hospital within 24 hours after onset of symptoms. On general physical examination, 46 participants (85.19%) had fair look, 6 participants (11.11%) were febrile and only 2 participants (3.70%) had toxic look. On abdominal examination, most of them presented with more than one finding. Tenderness in right iliac fossa was very common and found in all participants followed by rebound tenderness in 36 participants (66.67%).

There was no mortality and any case of redo. Pain at surgical site was most common postoperative complication presented in 6 participants (11.11%) followed by mild abdominal pain in 3 participants (5.56%). Other's complications were loose stool (3.70%), vomiting (1.86%), abdominal distension (1.86%), termination of pregnancy (1.86%) and fever (1.86%). The operative time for laparoscopic appendectomy was mostly between 31-60 minutes with mean operative time of 63.8±29 minutes standard deviation (range=20-120 minutes). Out of 54 participants, 46 participants (85.19%) had heart rate between 60-100 beats/minutes with mean heart rate of 84.72 beats/minutes±14.43 beats/min standard deviation (range=60-120 beats/minutes).

This study is probably first in Nepal to study the conversion rate regarding laparoscopic appendectomy. Major limitation of this study is limited sample size. Also, study being retrospective in nature, causation cannot be determined. Confounding variables are not adjusted to find out the true association.

## CONCLUSION

Laparoscopic appendectomy is associated with fewer post-operative complications, shorter hospital stays, less operative time. Laparoscopic appendectomy is safe and feasible without risk of mortality.

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