



## Early Laparoscopic Appendicectomy in Complicated Appendicitis – A Retrospective Analysis of Our Experience

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### Abstract

**Background:** *Laparoscopic approach for complicated appendicitis including appendicular mass remains controversial. Outcomes of laparoscopic approach for higher grades of appendicitis are reviewed.*

**Methods:** *Over a period of four years 152 patients undergo appendectomy in our General Surgical Unit. Among them 59 patients had complicated appendicitis. As was our practise based on our experience, all these 59 patients were taken up for Laparoscopic Appendicectomy within 24 hours of admission. About 3% (2 cases) of cases had to be converted to open because of various reasons (dense caecal or ileal adhesions). The other 57 patients were successfully operated upon by the minimally invasive procedure. All patients were uniformly treated with parenteral broad spectrum antibiotic for a minimum of 48 hours starting from the time of admission. Age of patients was ranging from 11 to 54. Various parameters analysed are length of hospital stay, return to full activity, and complication rates.*

**Results:** *Results of early laparoscopic appendicectomy for complicated appendicitis in our hospital were reviewed. The mean operating time for these 57 patients was 55 minutes. The average hospital stay was 3.5 days. Most of the patient returned to complete activity by day 5. There was no immediate postoperative complication in any of these cases. One patient had stump appendicitis with abscess after 9 months, who underwent open abscess drainage, and appendicular stump excision. One patient had port site hernia after 2 years. Follow up data was available on all these patients for a minimum period of 6 months.*

**Conclusion:** *From our collective experience on such cases of complicated appendicitis we conclude that, in spite of slightly increased operating time than uncomplicated cases, all patients with complicated appendicitis should be considered for the minimally invasive procedure on the same admission, as the benefits of early laparoscopic procedure definitely outweigh the demerits of open procedure or interval appendicectomy.*

## Introduction

Appendectomy is one of the most commonly performed General Surgical procedures in any surgical unit worldwide. Since the advent of minimally invasive surgery, Laparoscopic appendectomy has been the norm for all cases of uncomplicated appendicitis, except in specific circumstances of surgeon's or patient's preference or any contraindication for laparoscopic procedure. From various metaanalyses of prospective randomized trials it has been proven that Laparoscopic approach has been better than an open approach when compared with various parameters like pain killer requirements, in-patient stay, surgical site infections, early recovery etc.<sup>[1-5]</sup>. In one critical review of randomised control trials, the various parameters are comparable between both groups<sup>[6]</sup>.

Traditionally, most cases of complicated appendectomy were treated by open procedure. In cases of Appendicular mass, most surgeons still prefer to manage initially with intravenous antibiotics and perform an interval appendectomy.

In 1996, from a retrospective analysis of 34 patients with higher grades of appendicitis, the authors have concluded that laparoscopic appendectomy is safe in patients with gangrenous appendicitis, while the risk of infectious complications in those patients and hospital stay is increased<sup>[7]</sup>.

In another retrospective analysis, Johnson and Peetz has proven that laparoscopic appendectomy, in fact has definite benefit in reducing hospital stay and hospital costs in cases of appendicular perforations.

Complicated appendicitis is generally termed so when there is a regional or generalised peritonitis, when there is an abscess, when the appendix is perforated or gangrenous. A research study has quoted the various grades of appendicitis based on the appearance as Normal looking – Grade 0, Redness and Edema – Grade 1, Fibrin – Grade 2, Segmental necrosis – Grade 3A, Base necrosis – Grade 3B, Abscess – Grade 4A, Regional peritonitis – Grade 4B, Generalised peritonitis – Grade 5<sup>[8]</sup>. There was no clear place to include appendicular mass in this grading system of appendicitis, as a mass is a clinical finding and various higher grades can present clinically as a mass. Though abscess in itself can present clinically as a mass, not all cases of appendicular mass has abscess in the mass. Also some cases of regional peritonitis can present as a mass, not all cases of appendicular mass has regional peritonitis. So it is not appropriate to treat appendicular mass conservatively as was followed in earlier days.

In our analysis, we have included the cases of appendicular mass among the complicated appendicitis and we considered the cases of appendicular mass to occupy a place somewhere between grade 3B and 4B if we include the clinical examination and slightly modify the grading of appendicitis.

It's our practise, to advocate laparoscopic approach as initial modality of treatment in all cases of appendicitis irrespective of the severity of appendicitis based on clinical and radiological findings.

With all the literatures in mind, we have analysed our performance of laparoscopic approach on

patients with higher grades of appendicitis (Grades 3-5) over the past four years

### Materials and Methods

Data of 59 patients who underwent Laparoscopic appendicectomy for complicated appendicitis including appendicular mass at our University teaching hospital between March 2010 and May 2014 were collected and reviewed.

All patients uniformly underwent ultrasound to confirm the diagnosis. Some patients needed a CT scan for diagnosis. They were started on intravenous Ceftriaxone and Metronidazole. They were taken up for Laparoscopic appendicectomy within 24 hours of admission after obtaining proper consent, including consent for conversion to open if necessary.

58 patients were chosen for General Anaesthesia, and one patient was given epidural anaesthesia, as he had severe Interstitial Lung Disease.

### Technique

CO<sub>2</sub> pneumoperitoneum created through veress needle in all patients. A 10mm umbilical camera trocar and two 5mm trocars on either iliac fossa inserted. A thorough diagnostic Laparoscopy was done. Appendix identified and dissected free from all adhesions. Abscess if present was completely drained. Mesoappendix cauterised by bipolar diathermy and appendicectomy done after ligating base of appendix with endoloops. Thorough peritoneal lavage was given. Appendix was delivered through a custom made endobag.

During the procedure, 2 patients required conversion because of dense bowel and omental adhesions and friable appendix.

Various grades of appendix based appearance are as follows:

Findings	No. of patients
Segmental necrosis	13
Base necrosis	3
Phlegmon (Mass)	14
Abscess	21
Regional peritonitis	4
Diffuse Peritonitis	2

All patients received parenteral antibiotics for a minimum of 48 hours. Oral diet was initiated based on the return of bowel motility.

### Results

Data from all 59 patients were analysed. 2 patients required conversion to an open procedure (3%), and were excluded from our outcome analysis.

In the 57 patients, Analgesics were not required in any patient for more than 48 hours. No patient had wound infection. One patient had prolonged ileus; consequently oral intake was delayed till postoperative day 3. Subsequently the patient was found to have localised abscess, which was drained under sonography guidance and promptly responded to drainage. All patients were discharged between 2 to 5 days (mean-3.5 days)

### Discussion

Though the lack of a proper prospective randomised control study assessing the outcome of open and laparoscopic appendicectomy in complicated is considered a lacuna in literature, it has been globally accepted that to design one such study is an impractical venture, as quoted in one of the recent prospective study<sup>[9]</sup>.

Hence we proposed to retrospectively analyse the outcomes of all the cases of complicated appendicitis within our surgical experience in the past 4 years.

Surgeon's all over the world traditionally preferred to perform an open exploration for cases of complicated appendicitis as higher grades of appendicitis was thought to be contraindication of laparoscopic approach<sup>[7, 10]</sup>. Some studies disagreed with this concept and compared the end result of Laparoscopic and open approaches in complicated appendicitis<sup>[11-13]</sup>. On the contrary to the conventional thoughts, Laparoscopy offers the best result for complicated appendicitis in terms of less pain, reduced postoperative complication, and early recovery to full activity.

We originally started out practise of performing laparoscopy in such patients because of patient's preference to have a less scar. The results from those patients were too impressive to be ignored. Later we adopted the same approach in all such patients which became our standard practise eventually.

In this observational study we reviewed our four year experience in performing a laparoscopic appendicectomy in complicated cases of appendicitis.

Of the 57 patients who were successfully treated laparoscopically, no patient had postoperative wound infection. A possible explanation to this is our practise to deliver the specimen in an endobag. Moreover, because of laparoscopic approach a complete evacuation of the abscess and thorough peritoneal wash was possible. In a discreet study, a very high rate of post-operative wound infection has been reported (43.6%),

possibly due to the inability to avoid contamination of wound in open approach<sup>[14]</sup>.

Two patients in our observation study period required conversion, a conversion rate of 3.4%. Rate of conversion is variable in various studies between 0 to 47%<sup>[13-15]</sup>. In one of this study the conversion rate has been shown to correlate with the surgeon's expertise<sup>[13]</sup>.

One patient in our study group had a recurrent episode of similar symptoms after 9 months, diagnosed as stump appendicitis with abscess. A laparotomy was performed as the patient was reluctant for a second laparoscopic procedure, abscess drained and the remnant stump was excised. Various studies have reported laparoscopic approach as reason for higher rate of stump appendicitis. However, in a comprehensive review of literature of 36 cases of stump appendicitis, about 66% of cases were initially performed by an open approach<sup>[16]</sup>. This disproves the theory of laparoscopic approach being responsible for stump appendicitis.

In one study, the author has quoted based on a retrospective analysis of open appendicectomy group, the length of hospital stay in this group to be 6.6 days<sup>[15]</sup>. In our study, which exclusively included patients who underwent laparoscopic appendicectomy on complicated appendicitis, the average length of hospital stay was found to be 3.5 days.

To conclude, from our observation, laparoscopic appendicectomy for higher grades of appendicitis is the safest approach especially when the surgical expertise is available. Also the patient gets the benefit of early return to work, and cosmetically lesser scar.

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