EARLY LAPAROSCOPIC APPENDICECTOMY IN MANAGEMENT OF APPENDICEAL MASS

S. Shyamchand Singh¹, NG. Javan², Khumallambam Ibomcha Singh³, Tozo Luwang⁴

¹Assistant Professor, Department of Surgery, Jawaharlal Nehru Institute of Medical Sciences, Porompat, Imphal, Manipur.

²Associate Professor, Department of Surgery, Jawaharlal Nehru Institute of Medical Sciences, Porompat, Imphal, Manipur.

³Assistant Professor, Department of Surgery, Jawaharlal Nehru Institute of Medical Sciences, Porompat, Imphal, Manipur.

⁴Senior Resident, Department of Surgery, Jawaharlal Nehru Institute of Medical Sciences, Porompat, Imphal, Manipur.

ABSTRACT

BACKGROUND

Acute appendicitis is a most common surgical emergency. Approximately, 10% of acute appendicitis patients present with appendiceal mass. Surgical management of appendiceal mass remains controversial. Majority of surgeons preferred conservative treatment. This study was carried out to evaluate our experience in early laparoscopic appendicectomy (LA) in the management of appendiceal mass.

MATERIALS AND METHODS

For the study, a total of 48 patients who were admitted with a diagnosis of appendiceal mass in the Department of Surgery during the period from July 2015 to December 2016 were included. The selection of the patients was done on the basis of the clinical history, clinical examination, laboratory tests and radiological findings. All 48 patients who were diagnosed with appendiceal mass underwent laparoscopic appendicectomy.

RESULTS

Laparoscopic appendicectomy was attempted in all 48 patients. There were 32 males and 16 females within age range of 10 to 80 years, maximum in 30 - 50 years age group. One case was converted to open and segmental colectomy was performed due to dense adhesion with unhealthy base and gangrenous caecal wall. The base of the appendix was sutured in 7 cases and drain was left in for 3 - 4 days. Endoloop was used in remaining 40 cases. There was difficulty in localisation of appendix and bleeding was noted in 4 cases during intraoperative period. The average operative time was 80 minutes (range from 30 to 120 minutes) and average postoperative hospital stay was 4 - 5 days (Range from 2 to 7 days). Except for mild fever which occurred in four patients, no major postoperative complications were seen.

CONCLUSION

Early laparoscopic appendicectomy during the index admission of patient with an appendiceal mass is feasible and safe. It also avoids the need for a second admission and misdiagnosis.

KEYWORDS

Laparoscopic Appendicectomy, Perforation, Appendicitis.

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BACKGROUND

Acute appendicitis remains the most common intra-abdominal surgical pathology requiring surgical intervention. The patients presenting late in the course of acute appendicitis are complicated by the development of an inflammatory mass in the right iliac fossa.¹ An appendiceal mass is the end result of a walled-off appendiceal perforation and represents a pathological spectrum ranging from phlegmon to abscess.^{2,3} It is encountered in 2%-6% of patients presenting with acute appendicitis.^{2,3,4} The treatment of appendiceal mass is controversial; however, there are several management options for appendiceal mass.^{1,3,5,6} Traditionally, appendiceal mass was treated by

conservative method followed by interval appendicectomy 4 to 6 weeks later believing that any attempt to remove appendix is hazardous, time consuming and may lead to life threatening complications such as faecal fistula.⁷ It is now changing from the traditional approach of initial conservative treatment followed by interval appendicectomy to immediate appendicectomy.^{8,9} However, this change is not widely accepted and a large number of surgeons still continue to adopt the same traditional conservative approach.¹⁰

In 10-20% of the cases, conservative management fails and the patients need an emergency operation due to peritonitis, which is comparatively more difficult and carries more morbidity and mortality.^{11,12} In addition, the patient may suffer a recurrence of appendicitis after being discharged from the hospital.^{13,14}

Early surgical intervention has been known to be an effective alternative to conservative therapy for a long time, as it considerably reduces the total hospital stay and obviates the need for a second admission.¹⁵ The early operation on the other hand has an edge of being curative in the index admission and ensures early return to work and higher compliance. Controversy is not only confined to management, but is also about the technique, laparoscopy versus open. For

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Corresponding Author:

Dr. NG. Javan,

Associate Professor, Department of Surgery,
Jawaharlal Nehru Institute of Medical Sciences,
Porompat, Imphal East, Manipur-795005.

E-mail: ngjavan@yahoo.co.uk

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decades, open appendectomy has been the standard treatment for all forms of appendicitis.^{16,17}

Since its description in the early 1980s, laparoscopic appendectomy has become an acceptable approach for simple appendicitis.^{18,19,20}

However, the role of laparoscopy in the treatment of complicated appendicitis is controversial. With the advances in laparoscopic instrumentation and technical skill it is possible to remove an inflamed appendix in presence of mass successfully. The aim of this study is to evaluate the feasibility and safety of early laparoscopic appendectomy in the management of appendiceal mass.

MATERIALS AND METHODS

The present case series study of early laparoscopic appendectomy in management of appendiceal mass has been carried out in the Department of Surgery, Jawaharlal Nehru Institute of Medical Sciences (JNIMS), Imphal, Manipur. The approval of medical ethics was taken from Medical Ethics committee of JNIMS. Informed consent was taken from patients for this study.

A total of 48 patients who presented with acute appendicitis with appendiceal mass were studied during 1-1/2- year period from July 2015 to December 2016 in our hospital. Preoperatively appendiceal mass was diagnosed by clinical examination and ultrasound of the whole abdomen and confirmed by intraoperative finding. All clinical, investigation and operative findings were recorded into a database. Collected data included gender, age, clinical features, investigations, intra-operative findings, operative time, postoperative complications and hospital stay. Laparoscopic appendectomy was performed in all patients within 24 hours of admission. Laparoscopic appendectomy was attempted in all patients by using three-port technique. Endoscopic pre-tied loops were used for ligation of the base of appendix. All area of the intra-abdominal collection was aspirated and peritoneal cavity was washed thoroughly with normal saline. All patients were given aerobic and anaerobic antibiotics coverage. An abdominal drain was kept in patients in whom we feel it is required. Conversion of laparoscopic surgery to open laparotomy was done in difficult situations. The feasibility of laparoscopic appendectomy in appendiceal mass was assessed on the basis of ability to complete the surgery by laparoscopic method.

RESULTS

The age at presentation in the present study is as shown below-

Age Group	No. of Cases	Percentage
10 to < 30 Years	14	29.16 %
30 to < 50 Years	20	41.66%
50 to < 70 Years	11	22.91%
70 to < 90 Years	3	6.25%

Table 1. Age Distribution of Patients

During 1-1/2 years study period, 48 patients (32 males and 16 females) underwent laparoscopic appendectomy for appendiceal mass. Male to female ratio was 2:1. The maximum number of patients was seen in age group 30-50 years.

Clinical Presentation	Number of Patients	Percentage
Right Iliac fossa pain	41	85.41%
Generalised abdominal pain	7	14.58%
Fever	30	62.5%
Nausea	35	72.91%
Vomiting	15	31.25%
Diarrhoea	5	10.41%
Loss of appetite	25	52.08%
Right iliac fossa mass	45	93.75%
Abdominal guarding	5	10.41%

Table 2. Clinical Features

The duration of treatment elsewhere before admission ranges from three to ten days. In our study, 45 patients (85.41%) presented with right iliac fossa pain and 7 patients (14.58%) presented with generalised abdominal pain. Thirty patients (62.5%) had fever and 35 patients (72.91%) had nausea. Most of the patients were found to have tenderness with palpable mass in right iliac fossa (93.75%). On Investigation, 39 patients (81.25%) had leucocytosis of more than 12,000/mm³. Ultrasound can demonstrate the presence of appendiceal lump in 35 patients and the remaining 13 patients were identified during laparoscopy.

Laparoscopic appendectomy was performed in all patients within 24 hours of admission. In one patient, there was difficulty in localisation of appendix due to dense adhesion with unhealthy appendiceal base with gangrenous caecal wall and so was converted to open segmental colectomy which was excluded from the study. In 7 patients, bases were sutured with Vicryl 2-0 and abdominal drain was left in for 3-4 days. In remaining 40 patients, endoscopic pre-tied loops were used for ligation of the base of appendix and no drain was kept. Since we were able to operate in all cases and finish the surgery laparoscopically, it is feasible to do a laparoscopic appendectomy in patients with appendiceal mass.

Operative finding, operative time, complication and hospital stay are shown in tables below.

Operative Findings	Number of Patients
Simple Mass (Phlegmon)	34
Loculated pus collection	8
Appendiceal Abscess	5
Dense Adhesion	1

Table 3. Intraoperative Finding

The commonest intra-operative findings in our study was simple appendiceal mass (phlegmon) which was seen in 34 cases.

Operative Finding of Appendix	Number of Cases
Inflamed appendix without gangrene and perforation	33
Gangrene with perforation	8
Gangrene without perforation	7

Table 4. Intraoperative Finding of Appendix

The most common intra-operative finding of appendix was inflamed appendix without gangrene and perforation seen in 33 cases.

Operation Time (Minutes)	Number of Patients
30 – 60	15
60 – 90	25
90 – 120	7
Table 5. Operation Times	

The operative time ranges from 30 to 120 minutes with an average of 80 minutes.

Type of Complication	Number of Patients
Intra-operative Bleeding	4
Post-operative Fever	4
Table 6. Complications	

There was intraoperative bleeding in 4 cases which was controlled by harmonic scalpel, mild oozing by pressure. Except for mild fever in four patients, there were no major post-operative complications seen in our study.

Hospital Stay (Days)	Number of Patients
2 – 3	10
4 – 5	30
6 – 7	7
Table 7. Hospital Stay	

The average hospital stay was 4 - 5 days.

DISCUSSION

There are many controversies regarding management of appendiceal mass. Traditional treatment of appendiceal mass is conservative, which is followed by interval appendicectomy.^{6,8} Most surgeons do not widely accept early surgical intervention for appendiceal mass but continue to adopt same traditional conservative approach.⁹ Recently, laparoscopic approach has been extended to all kind of complicated appendicitis.

The role of laparoscopic appendicectomy for appendiceal mass has been added to the list of controversies. The earlier belief was that surgery is difficult in a state where the inflamed appendix is buried deep in the mass and the bowel loops are friable. However, this is no more a valid argument at present, due to an improvement in anaesthesia, electrosurgical unit and antibiotics. The operative problems such as localisation of the appendix, adhesiolysis and bleeding can be tackled with a magnified view of the laparoscope. LA provides the advantages of panoramic view with increased magnification, ability to visualise the hidden corners and clearance of purulent material as compared to the open technique.

It is not always possible to distinguish between an appendiceal mass and an appendiceal abscess before the operation. And non-operative management is not always successful.^{21,22,23} In Thomas' ²¹ series, six of 37 patients thought to have a phlegmon were subsequently found to have abscesses. In our study, 34 cases were of phlegmon, 8 cases were loculated pus collection and 5 patients were abscesses out of 48 patients diagnosed as appendiceal mass.

Jordan et al¹⁵ in 1979, performed 42 open appendicectomies in palpable masses and recommended early surgery in patients with appendicitis with palpable masses. Horwitz et al²⁴ and others have suggested avoiding

the laparoscopic approach in complicated appendicitis because of the increased risk of post-operative, intra-abdominal abscesses.^{25,26} None of our patients developed such complications as good peritoneal lavage with a large amount of normal saline was routinely done in our cases, in addition to intravenous and oral antibiotic regimens.

Valla et al²⁷ recommended the open approach in cases with appendiceal masses. In contrary, our study and many other studies^{28,29} have showed that appendiceal masses can be successfully treated laparoscopically. Our findings matched favourably with others in terms of safety and feasibility.

Richards et al²⁸ reported that laparoscopic appendicectomy resulted in fewer complications, a shorter hospital stay and a lower hospital cost than open appendicectomy in patients with perforated appendicitis. Chin et al²⁹ found laparoscopic appendicectomy feasible and safe for complicated appendicitis. Tirabassi et al³⁰ reported a considerably high conversion rate (36%) after laparoscopic operation for perforated appendicitis. In our series, conversion was done in only one case due to dense adhesion with unhealthy appendiceal base and gangrenous caecal wall.

There are several advantages of the laparoscopic approach in complicated appendicitis. It enables visualisation of the whole abdominal cavity and a thorough peritoneal lavage, which is difficult with a small incision. In open surgery, atypical localisation of the appendix or inaccurate diagnosis may require an extension of the incision as well. The laparoscopic approach also allows patients to become mobile and pain-free much faster, due to less trauma to the muscles and fascia.³¹ Another advantage of laparoscopy lies in a 30% lower rate of adhesions, which is particularly a common late complication, especially in children with perforated appendicitis.³²

The benefit of a shorter hospital stay in laparoscopic appendicectomy was not observed in our series. This is mainly due to our policy of giving intravenous antibiotics for a longer period of about 4 to 5 days in our studies. The average length of stay with conservative treatment varied from 10 to 18 days^{33,34} with a further eight days required for elective appendicectomy. Our patients had an average hospital stay of 4-5 days which is much shorter as compared with conservative treatment.

LA in complicated appendicitis has been reported to offer increased safety, shorter length of hospital stay, less pain and quicker return to normal activity with fewer complications.^{35,36,37,38} In contrast, it has also been reported that LA in complicated appendicitis is associated with higher risks of postoperative intra-abdominal abscess formation, bleeding and bowel injuries.^{39,40} In our study, only 4 patients had mild fever without any major complication. We feel that LA is safe, feasible and effective in complicated appendicitis. Early operation also has an edge of being curative in the index admission and ensures early return to work and higher compliance.

Limitations

One of the drawback of our study is the lack of follow-up to know about the late complications and another limitation is small sample size.

CONCLUSION

Early laparoscopic appendectomy during the index admission of patient with an appendiceal mass is a total curative treatment with short hospital stay, less postoperative pain, minimal morbidity and better patient compliance. It is feasible, safe and avoids the need for a second admission.

Abbreviations

LA- Laparoscopic Appendectomy.

JNIMS- Jawaharlal Nehru Institute of Medical Sciences.

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