Original Research Article

Comparative study of laparoscopic appendicectomy versus open appendicectomy in appenidicitis patients

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Abstract

Background
Laparoscopy in patients with a clinical suspicion of acute appendicitis has not gained wide acceptance and its use remails controversial. Laparoscopic appendicectomy has been shown to be both feasible and safe in randomized comparisons with open appendicectomy. In addition to improved diagnostic accuracy, laparoscopic appendicectomy confers advantages in terms of fewer wound infection,less pain faster recovery and earlier return to work. However laparoscopic appendicectomy is more time consuming is associated with increased hospital costs. It has been argued that the advantages of laparoscopic appendicectomy achieved by experienced laparoscopic surgeons are marginal compared with open appendicectomy, which can also be performed by surgeons in training through a short, cosmetically acceptable incision with minimal complications and a short hospital stay. Although the most people have concluded that the laparoscopic technique is as least good as open technique, there has been considerable controversy as whether laparoscopy is superior. **Aims and Objectives:** In this study the different aspects, e.g. intra operative diagnosis, operating time and other advantages and complications of laparoscopic appendicectomy were observed and compared to that of open appendicectomy in our setup.**Materials and Methods**:The present prospective study has been carried out in the Department of General Surgery, Rajendra Institute Of Medical Sciences, Ranchi from September 2020 to August 2021. 50 patients presented in the hospital with the clinical features of acute appendicitis were selected for the study. These patients were divided into two groups in a random way, 25 patients underwent open surgery and 25 patients underwent laparoscopic surgery.**Conclusion :**Laparoscopic appendicectomy has the advantage to directly visualize the entire peritoneal cavity and can deal with other associated pathologies. Besides good cosmesis it has the disadvantage of being expensive and having increasing operating time. Complicated cases may have to converted to open procedure. Open appendicectomy is not only cheap and faster but also has good cosmesis in uncomplicated cases. Even the complicated cases can be managed better and has lower incidence of residual intra abdominal abscess. So to conclude open appendicectomy is safe, cost effective and remains the procedure of choice in our set up.

Key Word: Laparoscopy , appendicitis , abscess .

Introduction

Though the diseases of the appendix first recognized as the "Perityphlitis" in the late 1500s only. Although the first successful appendicectomy was reported in 1736. It was Reginald Fitz, Professor of Medicine at Howard, who in 1886 gave a lucid and logical description of the clinical features and described pathologic changes of the diseases in detail[1]. He was also the first person to use the term appendicitis, and helped to establish the role of surgical removal of inflamed appendix as curative therapy[2].McBurney pioneered early diagnosis and early operative intervention, and also devised the muscle splitting incision named after him. Since then various modifications have been made in the incision for better access to the inflamed appendix and for better cosmetic results (Lanz crease incision)[3].In 1982, Semm, a German pelviscopist, first described laparoscopic appendicectomy. Schreiber (1987), Gotz and colleagues (1990) and Pier et al in 1991, were reported laparoscopic appendicectomy[4].With the recent advancement of minima access surgery the group of surgeons practicing laparoscopic performed through a single hole(Minilap appendicectomy), why should one make three holes[5].

appendicectomy advocated that panoramic view of the entire abdominal cavity is more valuable that the advantages of open appendicectomy. The group of surgeons not practicing laparoscopic appendicectomy are of the view that if the open procedure can be

Laparoscopy in patients with a clinical suspicion of acute appendicitis has not gained wide acceptance and its use remails controversial. Laparoscopic appendicectomy has been shown to be both feasible and safe in randomized comparisons with open appendicectomy[6]. In addition to improved diagnostic accuracy, laparoscopic appendicectomy confers advantages in terms of fewer wound infection, less pain faster recovery and earlier return to work. However laparoscopic appendicectomy is more time consuming is associated with increased hospital costs. It has been argued that the advantages of laparoscopic appendicectomy achieved by experienced laparoscopic surgeons are marginal compared with open appendicectomy, which can also be performed by surgeons in training through a short, cosmetically acceptable incision with minimal complications and a short hospital stay[7].

Although the most people have concluded that the laparoscopic technique is as least good as open technique, there has been considerable controversy as whether laparoscopy is superior[8].

Aims and Objectives

In this study the different aspects, e.g. intra operative diagnosis, operating time and other advantages and complications of laparoscopic appendicectomy were

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observed and compared to that of open appendicectomy in our setup.

Materials and Methods

The present prospective study has been carried out in the Department of General Surgery, Rajendra Institute Of Medical Sciences, Ranchi from September 2020 to August 2021.50 patients presented in the hospital with the clinical features of acute appendicitis were selected for the study. These patients were divided into two groups in a random way.

Group I: Patients were selected for open appendicectomy.

25 patients were included in this group.

Group II: Patients were selected for laparascopicappendicectomy. 25 patients were included in this group.

After Admission,all these patients were examined clinically and findings recorded.

Methods in the Group I

In uncomplicated cases after anaesthesia,the operation was performed through grid iron incision ,the appendix was identified and removed. Abdomen was closed in layers.

In cases where the appendix was high up or difficult to approach due to adhesions, incision was coveted into muscle cutting (Rutherford Morrison Incision) and appendicectomy was done in similar fashion.

When there was perforation or gangrene the abdomen was opened through right lower paramedian incision. Appendicectomy was performed and peritoneal cavity was washed with normal saline, drain placed in peritoneal cavity. Abdomen closed in layers.

If appendicular lump detected,adhesions were separated carefully and appendicectomy done.

Postoperative management

Patients were kept on intravenous fluid on the operative day, broad spectrum antibiotics and analgesics started. On the day of surgery, Oral liquids were allowed in the evening. On the second postoperative day liquid diet was allowed and patients were discharged in the evening with advice. Where incision extension was done dissection due to adhesions was done or the cases with perforation or gangrene were discharged after 2 to 6 days after recovery.

Methods for group II

The patients were prepared in similar manner as open one. Foley's catheter inserted in all the patients. After general anaethesia patient was positioned in 100 Trendelenberg and 10º right up position. Pneumoperitoneum created with the help of veres needle and co_2 insufflator and 10 mm trocar cannula was inserted through subumblical incision. Another two 5mm ports inserted in suprapubic region and left lower quadrant. Appendix was identified and examined and also looked for other pathologies. The appendix was gently retracted and mesoappendix was divided by using bipolar electrocautery as close to the appendix. Base of the appendix was adequately exposed,two ligating loops were placed one proximal and one distal at the base. Appendix was divided and removed via umblical port. Wounds were closed in single layer.

During the procedure, the difficulties and intraoperative complications were noted.

Postoperative management

Patients were kept on intravenous fluids on the operative day in the evening patients were allowed to take liquid diet and were discharged on the next day morning with advice in uncomplicated cases. Patients having Persistent pain, vomiting,paralyticileus were made to remain in the hospital.

Follow up

The patients were followed up at the interval of 1 month for 3 months. The results of the comparative study are tabulated in the observation.

Results and Observation

The result andobservation of the present study has been presented inthefollowingtables.

The maximum numbers of patients were in adolescent and of early adult age group (16-25 years). None of them was admitted below the age of 5 years and above 45 years (Table 1)

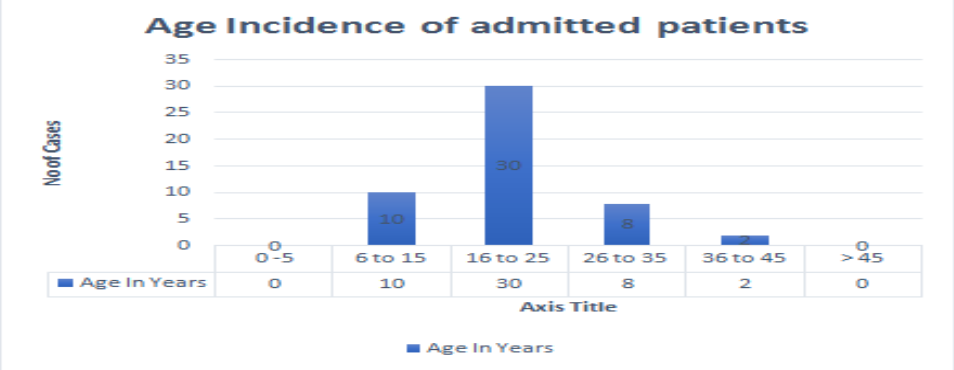


Table 1

Table 2 shows that out of 30 female patients underwent laparoscopic appendicectomy and 10 patients underwent open appendicectomy. Out of 20 male patients, 5 patients underwent laparoscopic appendicectomy and 10 patients were treated by open appendicectomy.

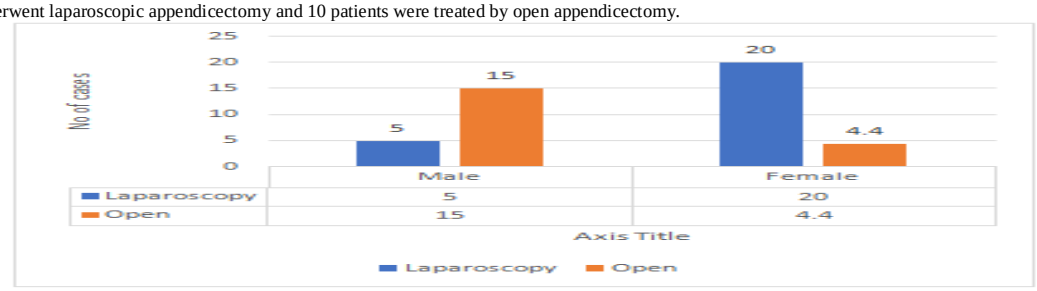


Table 2

This piechart(table 3) shows that 98% patients were suffering from acute appendicitis (complicated or uncomplicated). Only one patient out of 50 had non pathological appendix on histopathological examination.

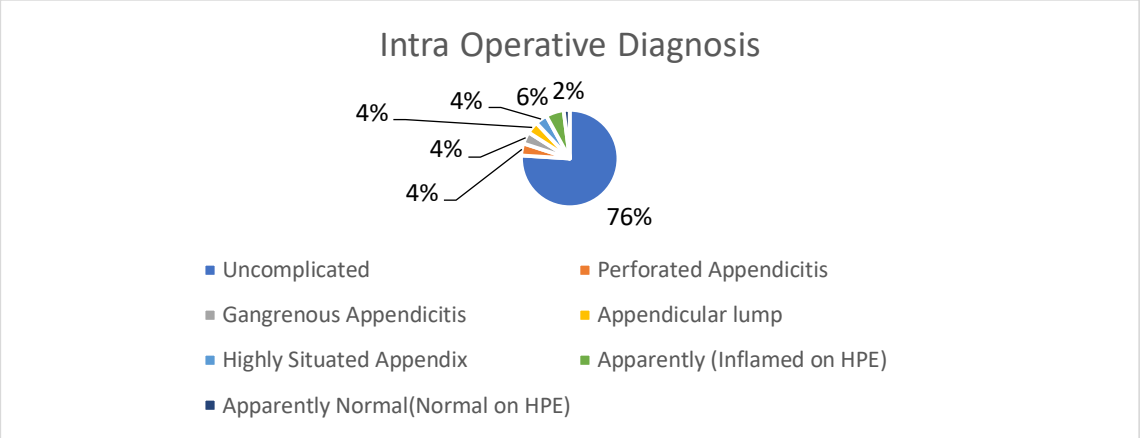
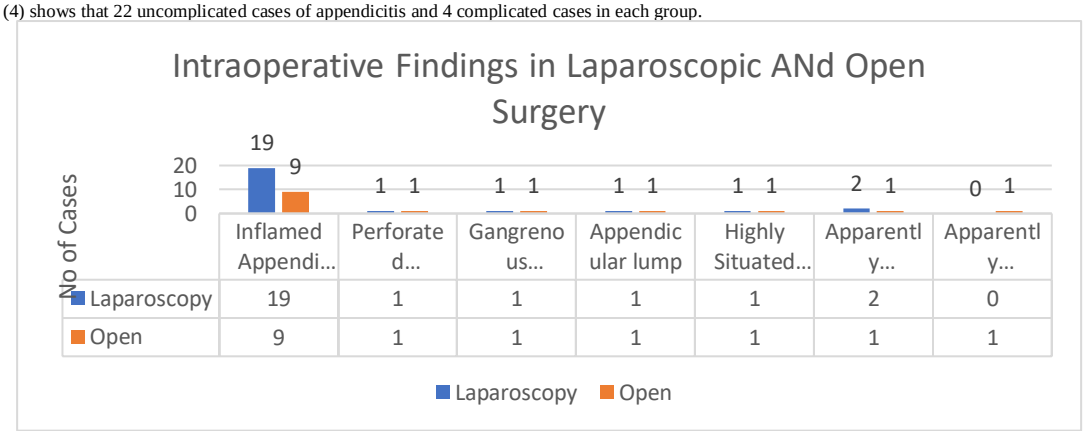


Table 3

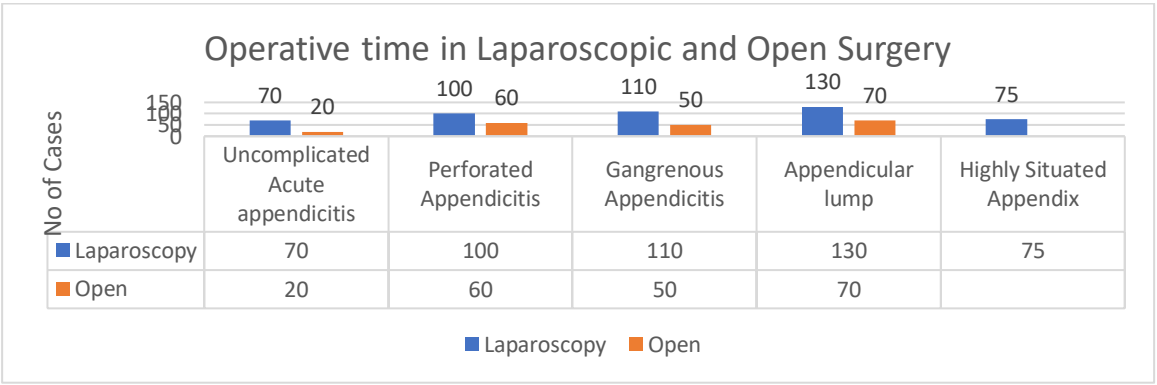
This table (4) shows that 22 uncomplicated cases of appendicitis and 4 complicated cases in each group.



	Inflamed Appendi...	Perforated...	Gangrenous...	Appendicular lump	Highly Situated...	Apparently...	Apparently...
Laparoscopy	19	1	1	1	1	2	0
Open	9	1	1	1	1	1	1

Table 4

This table(5) shows that the mean operating time in laparoscopic appendicectomy group was 75.40 minutes whereas in open appendicectomy group it was 26.56 minutes.



	Uncomplicated Acute appendicitis	Perforated Appendicitis	Gangrenous Appendicitis	Appendicular lump	Highly Situated Appendix
Laparoscopy	70	100	110	130	75
Open	20	60	50	70	

Table 5

This table(6) shows that out of 25 patients underwent laparoscopic appendicctomy, 2 patients were converted to open appendicectomy.

Table 6

Types	No of Patients underwent Laparoscopy	No of Patients Converted to Open Surgery
Uncomplicated	21	2
Perforated Appendicitis	1	--
Gangrenous Appendicitis	1	--
Appendicular Lump	1	--
Highly Situated Appendix	1	--
Total	25	2

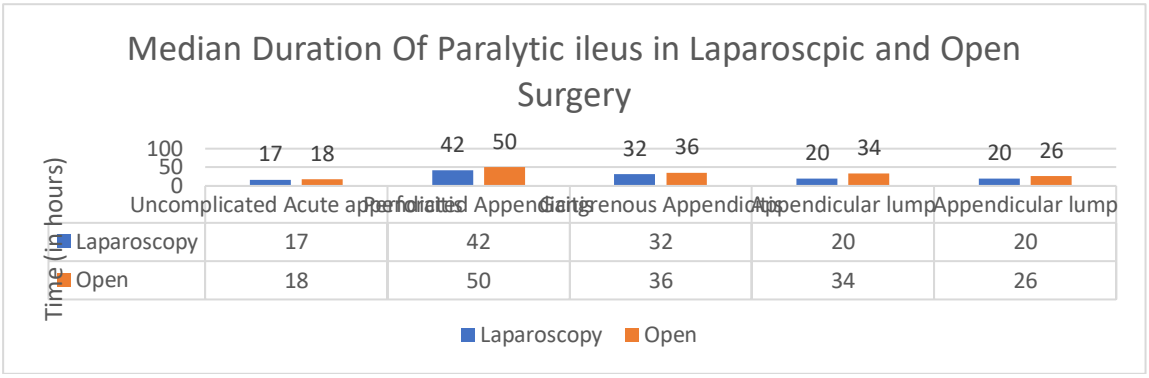


Table 7

The table (7) shows that in laparoscopic appendicectomy group the mean duration of paralytic ileus was 19.00 hours, and in open appendicectomy group the mean duration of paralytic ileus was 21.36 hours.

The table (8) shows that in laparoscopic appendicectomy group the mean duration of allowamce of liquid diet was 20.26 hours, and in open appendicectomy group the mean duration allowamce of liquid diet was 21.36 hours.

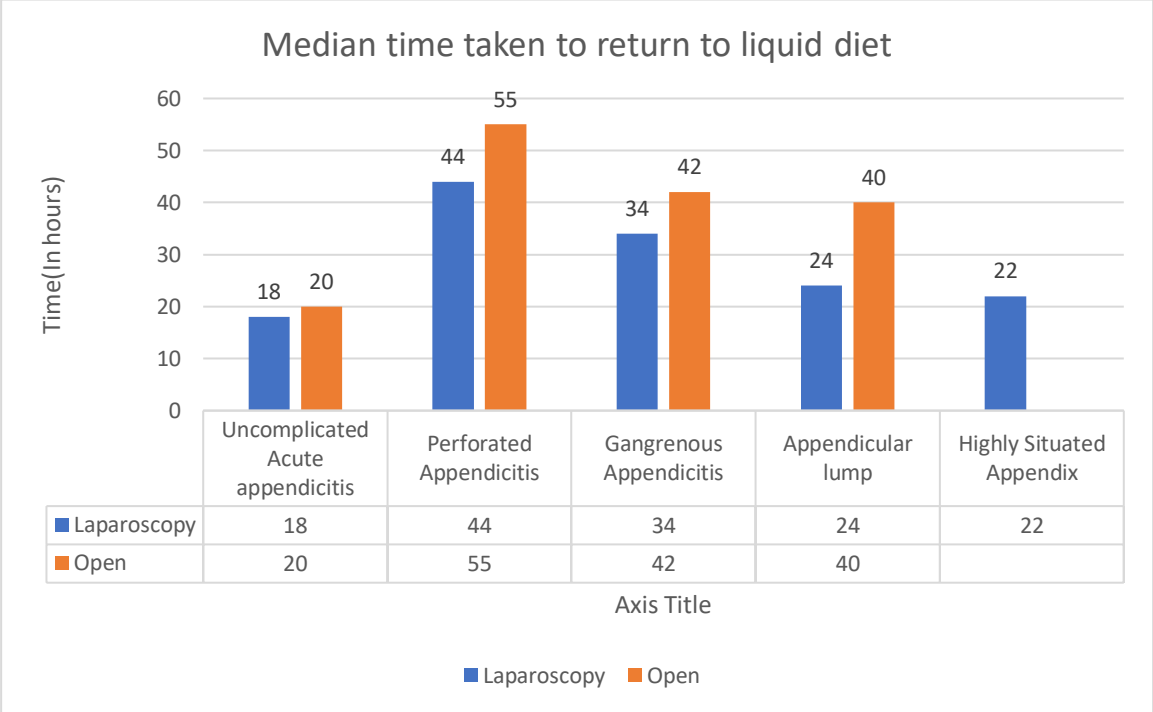
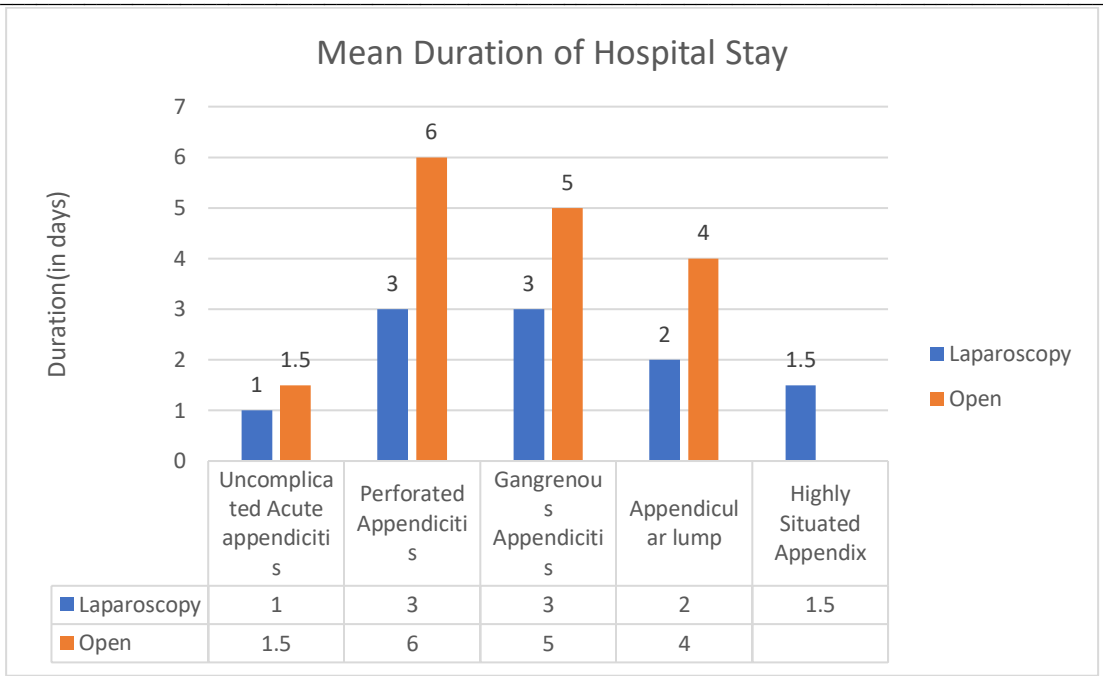


Table 8

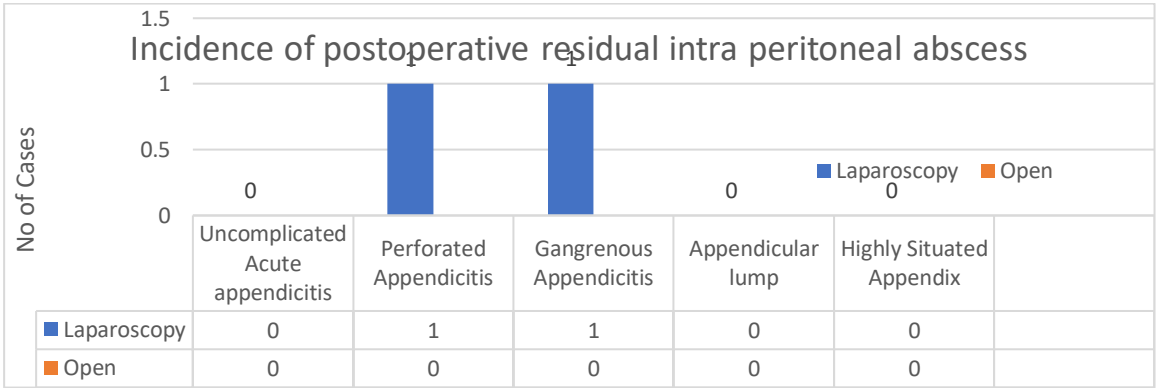
The mean hospital stay in laparoscopic appendicectomy group was 1.23 days and in the open appendicectomy it was 1.90 days.(Table 9)



	Uncomplicated Acute appendicitis	Perforated Appendicitis	Gangrenous Appendicitis	Appendicular lump	Highly Situated Appendix
Laparoscopy	1	3	3	2	1.5
Open	1.5	6	5	4	

Table 9

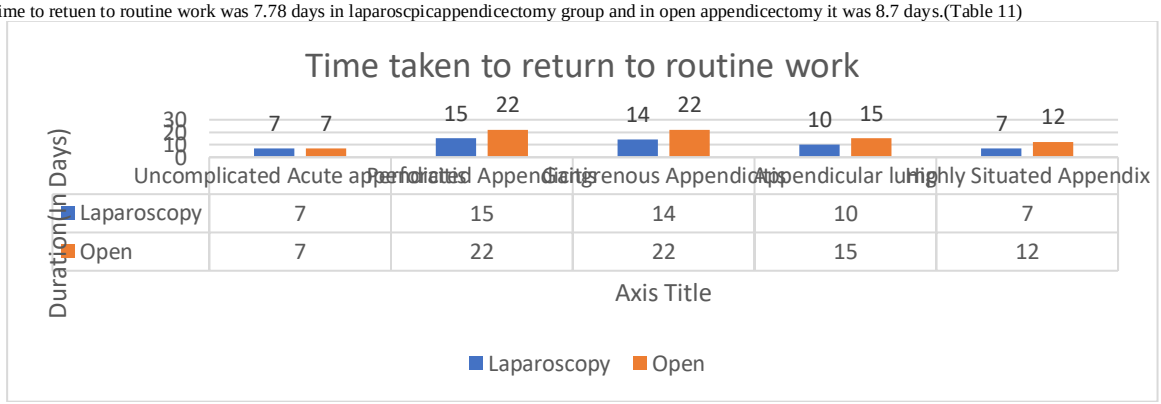
This table (10) shows that 2 cases of residual intra peritoneal abscess were found in laparoscopic appendicectomy. In open appendicectomy group no case of residual intra peritoneal abscess was found.



	Uncomplicated Acute appendicitis	Perforated Appendicitis	Gangrenous Appendicitis	Appendicular lump	Highly Situated Appendix	
Laparoscopy	0	1	1	0	0	
Open	0	0	0	0	0	

Table 10

The time to retuen to routine work was 7.78 days in laparoscpicappendicectomy group and in open appendicectomy it was 8.7 days.(Table 11)



	Uncomplicated Acute appendicitis	Perforated Appendicitis	Gangrenous Appendicitis	Appendicular lump	Highly Situated Appendix
Laparoscopy	7	15	14	10	7
Open	7	22	22	15	12

Table 11

Discussion

Out of 50 patients admitted with the clinical features of acute appendicitis 40 patients (80%) were adolescent and early adult age group (6-25 years). None of those was admitted were below 5 years and the peak incidence of acute appendicitis was in adolescent and early age group.

R.K.Raghupati (2003) done laparoscopic appendicectomy on 70 cases. Out of 70 cases, 8 cases were under 5 years and 30 cases were between 5-10 years of age and 32 cases were above the age of 10 years. In Guller Ulrich study (2004) the average patients was 30.7 years.

In our study the peak incidence age group is 6 to 25 years, which is similar to the above studies.

In present study out of 30 female patients, 20 patients underwent laparascopic appendicectomy and 10 patients under open appendicectomy. Out of 20 male patients, 5 patients underwent lap appendicectomyand 10 patients underwent open appendicectomy.

Probably because of cosmetic consciousness, female patients demand laparoscopic appendicectomy and also the surgeon was little bit biased towards laparoscopic appendicectomy.

In our study the mean time taken in laparoscopic procedure was 75.4 minutes. The time taken in complicated appendicitis (Perforated – 100 minutes, gangrenous- 110 minutues, appendicular lump- 130 minutes) was more in comparison with uncomplicated acute appendicitis (70 minutes) In open procedure the mean time taken was 26.56minutes. In complicated cases (perforated-60minutes, gangrenous – 50minutes, appendicular lump- 70minutes and in high up appendix–64minutes) of acute appendicitis time taken was much more than the uncomplicated case (20 minutes).

Tarronff M (1998) reported, the operative time was longer in laparoscopic procedure than open procedure (72 minutes versus 58 minutes). Hellberg et al (1999 January) observed time taken for laparoscopic procedure was 60 minutes and 50 minutes for open procedure.

Pederson AG et al (2001) found that time required for laparoscopic appendicectomy was 60 minutes and for open appendicectomy it was 40 minutes.

Time required for laproscopic appendicectomy was more or less similar to the above studies but time required for open appendicectomy is significantly less. Overall in our study time required in open appendicectomy was much less than the time required for laparoscopic appendicectomy.

Bandolier (1998) has found 8% of operations, which started as laparoscopic procedure, later converted into open procedure.

In Yao's (1999) study, out of 9 patients with abcess formation around the perforated ppendix, 3 patients were converted to laparotomy. Present study also observed the need of conversion to open in difficult cases.

In our study, we found that the duration of paralytic ileus was little shorter in laparascopic group (19.00 hours) than open (21.36 hours) and resumption of liquid diet was earlier in laparoscopic appendicectomy (20.26 hours) than open appendicectomy(23.48 hours). Though difference was significant in uncomplicated cases of acute appendicitis, the difference was not significant in uncomplicated appendicitis.

Jitea N et al (1996 July- August) reported bowel movement was earlier in laparpscopic appendicectomy than open appendicectomy. Kazemier et al (1997 april) reported that return of bowel sound and resumption of diet was similar in both laparoscopic appendicectomy and open appendicectomy.

Overall the duration of hospital stay was not significantly different 1.23 days after laparoscopic appendicectomy and 1.90 days after open appendicectomy. But the stay was significantly differ due to complicated cases becauses open procedures were performed through bigger incision i.e right lower paramedian incision.

Attwood et al (1972) observed that the patients after laparoscopic appendicectomy may be discharged earlier from the hospital (2.5 versus 3.8 days)

We found the incidence of postoperative intraabdominal abscess was significantly higher in laparoscopic appendicectomy than in open appendicectomy (8.68 % vs 0%). The incidence was much higher especially in complicated cases of acute appendicitis. We got two cases of residual abscess out of three cases of complicated acute appendicitis but the size of abscess was small in one case which was responded well with antibiotics.

Kluiber RM et al (1996), tHartR, Rajagopal C (1996), were reported that the chance of inra abdominal residual abscess was more in laparoscopic group than the open group.

In our study we found that restoration to normal routine work was earlier after laparoscopic appendicectomy (mean time7.7days) than open procedure. We found 7.78days mean time required resuming work after laparoscopic appendicectomy but it was 8.70days after open appendicectomy. In open appendicectomy in complicated cases this duration was much higher i.e. 22days in perforated & gangrenous cases and 15days in appeendicular lump cases, where as in laparoscopic appendicectomy associated with complicated cases this duration was 15days for perforated appendicitis, 14days for gangrenous and 10days for appendicular lump cases.

Attwood SE et al (1992), Jitea n al (1996) ,Parko Z (IS 6), prado E (1997), Klingler A et al (1998) were reported that the time required to return to normal work was quit earlier after laparoscopic appendicectomy. Thus our study report was also similar to the above mentioned authors work that the morbidity after laproscopic appendicectomy was less than open appendicectomy due to small incision.

Conclusion

Laparoscopic appendicectomy has the advantage to directly visualize the entire peritoneal cavity and can deal with other associated pathologies. Besides good cosmesis it has the disadvantage of being expensive and having increasing operating time. Complicated cases may have to be converted to open procedure.

Open Appendicectomy is not only cheap and faster but also has good cosmesis in uncomplicated cases. Even the complicated cases can be managed better and has lower incidence of residual intrabdominal abscess.

So to conclude open appendicectomy is safe, cost effective and remains the procedure of choice in our set up.

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