



## TO REVIEW THE OUTCOME OF LAPAROSCOPIC APPENDICECTOMY VERSUS OPEN APPENDICECTOMY

**Prof. Rajeev Sinha**

Professor & head, Department of Surgery, M.L.B. Medical College, Jhansi PR4/16, Medical College Campus, Jhansi

**Dr. Sudhanshu Sharma\***

Junior Resident, Department of Surgery, M.L.B. Medical College, Jhansi , Type 3/13 Medical College Campus, Jhansi \*Corresponding Author

### ABSTRACT

Proponents of laparoscopic appendectomy emphasize the advantages of laparoscopic operation decreased hospitalization, less operating time and minimal complication. this study includes comparison between laparoscopic vs open appendectomy. 50 patients in each group were included in the study during the period of November 2015 to June 2017. There were 60 male patients while female patients were 40. Of the 60 male patients, 34 patients underwent LA while 26 patients underwent OA. 16 female patients underwent LA, while 24 female patients underwent OA. All patients presented with complaint pain. Nausea was present in 54% of the patients and vomiting in 81%. Fever was present in 58%. Per-operative diagnosis were slightly different than USG findings. 19% patients had enlarged appendix with dilated bowel loop, 4% patients had adhesions of bowel, 61% patients had acute appendicitis with omental adhesion, 8% patients had RIF collection, 2% patients had only inflamed appendix, 3% patients had gangrenous perforated appendix with flakes, 3% patients had enlarged dilated appendix with dilated bowel loop. In our study most common anatomical position was retrocaecal 72%, 24% had pelvic position, 1% had preileal and 3% had subcaecal position. Operating time was longer in the OA group compared to LA group and was statistically significant. The median operation time for the LA was 20-30 minutes while that of OA was 40-50 minutes. Patients who underwent LA had a shorter hospital stay compared to OA group. The average duration of hospital stay for LA group in the study was 3-4 days while for the OA group was 5-6 days. In the LA group, only 1 patient (2%) developed caecal perforation, while 3 (6%) patients developed port site infections. For those undergoing OA, 16% had complications. The most common being wound sepsis, which occurred, in 14% of the patients. One patient had developed small bowel obstruction which was diagnosed 7 days after the surgery.

**KEYWORDS** : Open appendectomy, Laparoscopic appendectomy, Appendicitis

### INTRODUCTION

With the introduction of minimally invasive surgery, this classic approach evolved into a procedure with multiple, smaller incisions; a technique termed Laparoscopic Appendectomy. There is much literature describing the advantages of this newer approach. To name a few, patients have significantly less wound infections, reduced pain, and a reduction in ileus compared with the Open appendectomy. In the past few years, Single Incision Laparoscopic Appendectomy has gained popularity as the next major evolutionary advancement in the removal of the appendix. Described as a pioneer in the era of "scarless surgery," it involves only one transumbilical incision. Patients are postulated to have reduced post-operative complications such as infection, hernias, and hematomas, as well as a quicker recovery time and less post-operative pain scores, in comparison to its predecessors. In this review, we explore the advancement of the appendectomy from open to laparoscopic to single incision. There is evidence that minimal surgical trauma through laparoscopic approach resulted in significant shorter hospital stay, less postoperative pain, faster return to daily activities in several settings related with gastrointestinal surgery. Bearing in mind that laparoscopic appendectomy has not been found superior to open surgery for acute appendicitis, we designed the present study to determine any possible benefits of the laparoscopic approach. The aim of this study was to compare the clinical outcomes (hospital stay, operating time, postoperative complications,) and the hospital costs between open appendectomy and laparoscopic appendectomy.

### AIMS AND OBJECTIVES

#### Major

To review the outcome of Laparoscopic appendectomy versus open appendectomy at M.L.B MEDICAL COLLEGE JHANSI.

#### Minor

1. Determine the number of patients who underwent Laparoscopic appendectomy.
2. Describe patient profile for those undergoing surgery
3. Compare and contrast laparoscopic versus open appendectomy

in acute and recurrent appendicitis.

- a. length of operation
- b. intra operative and post operative complication
- c. hospital stay
- d. Time duration between symptom and operation.

### MATERIAL AND METHODS

Open appendectomy was performed by standard right iliac fossa approach. The incision would be either McBurney or Lanz. Ligation of mesoappendix including the appendicular artery was carried out by 2-0 vicryl and appendicular stump was ligated with 2-0 vicryl. Stump was buried. Where indicated 18 FG drain was introduced in the pelvis and left in situ. Indication were- 1 Peritoneal soiling 2 Peritoneal contamination. Lap appendectomy was done by three port techniques. One 10mm infraumbilical port, two 5/10 mm ports in left iliac fossa and hypogastrium. Ligation of mesoappendix was carried out by intracorporeal ligation using 2-0 vicryl or bipolar cautery or clipping. Appendicular stump was managed by ligation with 2-0 vicryl. Drain was left in certain conditions in the pelvis.

### STATISTICAL ANALYSIS

Categorical data were presented as frequencies and percentage. Parametric and nonparametric continuous data were presented as mean and standard deviation and evaluated by the Data analysis t test. Comparisons between the two groups were made on an intention-to-treat basis. Thus, patients in the laparoscopic-assisted group converted to the open procedure were not excluded from the analysis.

### RESULTS

A total of 100 (50 laparoscopic and 50 open) patients underwent surgery for appendicular pathology between October 2015 and may 2017. All patients who underwent LA and OA were included in the study. There were 60 male patients while female patients were 40. Of the 60 male patients, 34 patients underwent LA while 26 patients underwent OA. 16 female patients underwent LA, while 24 female patients underwent OA.

**Table-1a: Age Wise Distribution (Laparoscopic and Open appendectomy) (N= 100)**

Age (yrs)	Laparoscopic	Open
1-10	02 (04.00%)	00(00.00%)
11-20	14 (28.00%)	00(00.00%)
21-30	22 (44.00%)	22(44.00%)
31-40	05 (10.00%)	20(40.00%)
41-50	06 (12.00%)	07(14.00%)
>51	01 (02.00%)	01(02.00%)

**Table-1b: Sex Distribution (Laparoscopic and Open appendectomy) (N= 100)**

Sex	Laparoscopic	Open
Male	34(68.00%)	26(52.00%)
Female	16(32.00%)	24(48.00%)

**Table-2: Per- Operative diagnosis (Laparoscopic and Open appendectomy)**

Intra-operative Diagnosis	Laparoscopic	Open
Enlarged appendix with dilated bowel loop	15(30.00%)	04(08.00%)
Inflamed appendix with terminal ileum adhesion	01(02.00%)	03(06.00%)
Inflamed appendix with omental adhesion	26(52.00%)	35(70.00%)
Inflamed appendix with periappendicular collection	08(16.00%)	00(00.00%)
Enlarged appendix with dilated bowel loop and periappendicular collection	00(00.00%)	03(06.00%)
Inflamed Appendix	00(00.00%)	02(04.00%)
Perforated gangrenous Appendix with flakes over bowel	00(00.00%)	03(06.00%)

**Table 3: Complications(Laparoscopic and Open appendectomy)**

Complication	Laparoscopic	Open
Caecal perforation	01(02.00%)	00(00.00%)
Port site infection	03(06.00%)	00(00.00%)
Postop, Bleeding	00(00.00%)	01(02.00%)
Small bowel obstruction	00(00.00%)	01(02.00%)
Surgical site infection	00(00.00%)	07(14.00%)
Conversion ratio	01(02.00%)	00(00%)
Conversion to 4 port	00(00%)	00(00%)

**Tab- 4: Comparison of the duration of surgery Laparoscopic and Open appendectomy**

Laparoscopic(min) (Mean±S.D.)	Open(min) (Mean±S.D.)	p value
24.08±15.70	49.04±9.75	0.0001

**Table-5: Comparison of the hospital stay Laparoscopic and Open appendectomy**

Laparoscopic (Mean±S.D.)	Open (Mean±S.D.)	p value
03.60±01.04	05.52±0.95	0.0001

**DISCUSSION**

A total of 100(50 laparoscopic and 50 open) patients underwent surgery for appendicular pathology between October 2015 and may 2017. All patients who underwent LA and OA were included in the study. There were 60 male patients while female patients were 40. Of the 60 male patients, 34 patients underwent LA while 26

patients underwent OA. 16 female patients underwent LA, while 24 female patients underwent OA. The patient ages ranged from 9 years to 58 years. Majority of the patients who underwent LA were in the age groups 21-30 yrs and for open appendectomy most common age group was 21-40 years. There were two patients with appendicitis in the age group >51 years in the study groups. Patients in the study presented with various symptoms. All patients presented with complaint pain. Nausea was present in 54% of the patients and vomiting in 81%. Fever was present in 58%. Anorexia is the most constant symptom of appendicitis although in the study few patients were presented with the symptom. The diagnosis of acute appendicitis is more often a clinical diagnosis. Baseline investigations normally performed include full blood count, urinalysis and urea and electrolytes. Other investigations done including abdominal ultrasound, plain abdominal radiography, high resonance sonography. In the study patients undergoing laparoscopic appendectomy were thoroughly investigated as most of them had been referred to the outpatient surgical clinic and there was enough time to do investigations before surgery. During intraop diagnosis was slightly different than USG findings . 19% patients had enlarged appendix with dilated bowel loop, 4% patients had adhesions of bowel, 61% patients had acute appendicitis with omental adhesion, 8 % patients had RIF collection, 2% patients had only inflamed appendix, 3%patients had gangrenous perforated appendix with flakes, 3% patients had enlarged dilated appendix with dilated bowel loop. In our study most common anatomical position was retrocaecal 72%, 24% had pelvic position,1% had preileal and 3% had subcaecalposition. Duration of operation was longer in the OA group compared to LA group and was statistically significant. The median operation time for the LA was 20-30 minutes while that of OA was 40-50 minutes. Patients who underwent LA had a shorter hospital stay compared to OA group. The average duration of hospital stay for LA group in the study was 3-4 days while for the OA group was 5-6 days. In my study hospital stay for OA is slightly larger than LA because for patients satisfactions and the population we included were basically from rural background and they stay until unless stitches are out. There were very few complications noted in the study. In the LA group, only 1 patient (2%) developed caecal perforation, which was managed by doing open laprotomy and making stoma (caecostomy) while 3 (6%) patients developed port site infections which was managed conservatively. For those undergoing OA, 16% had complications. The most common being wound sepsis, which occurred, in 14% of the patients. One patient had developed small bowel obstruction which was diagnosed 7 days after the surgery . it was managed by doing re-laparotomy and doing adhesionolysis .one patient developed bleeding complication due to inadequate messentry ligation. It was managed by reopening the wound and doing proper ligation of messentry. One patient (3%) had no improvement after LA while the OA group also had one patient showing no improvement. . These two patients were females and were referred to the gynaecologic clinic The rest of the patients, in LA - 97%and OA - 97.6% had resolution of symptoms.

**CONCLUSION**

Laparoscopic appendectomy takes longer to perform in our institution than open appendectomy and has a longer learning curve. Postoperative complications are lower with laparoscopic appendectomy when compared with open appendectomy with regards to surgical site infections, scar cosmesis ,post operative pain and hospital stay. There is less inclination of patients towards undergoing laparoscopic surgery at M.L.B Medical College Jhansi. From the study, it can be concluded that laparoscopic appendectomy surgery compares well with other centres

**REFERENCES:**

- Charles Imber, Geoffrey Glazer. Management of peritonitis with special reference to appendicitis. Surgery International, Medicine Publishing Company, Vol. 47: pg. 255-257.
- P. Ronan O'Connell. The vermiform appendix. Bailey and Love, Short practice of surgery, Arnold, 23rd edition: pg. 1078-1092.
- Claus G.P; Sjoerdsma W; Jansen A; Grimbergen C.A. Quantitative standardardised analysis of advanced laparoscopic surgical procedures. Endoscopic Surgery and Allied Technologies 1995; 3:210- 213.

4. Cuschieri A. Whither minimal access surgery. Tribulations and expectations. *Am J Surg.* 1995; 169;9- 19.
5. Satava R.M; Ellis S.R. Human interface technology. An essential tool for the modern surgeon. *Surg. Endoscopy* 1994; 8: 817 - 20.
6. Sjoerdsma W; Herder J.L; Howard M.J; Jansen A; Bannenberg J.J.G; Grimbergen C.A. Force transmission of 69 laparoscopic grasping instruments. *Minimal invasive therapy and allied technologies* 1997; 6: 274 - 8. 70
7. Rau G; Radermacher K; Thull B; Von Pichler C. Aspects of ergonomic system design applied to medical work systems. In *computer intergrated surgery: Technology and clinical applications.* Taylor R.H; lavallers S; Burdea G.C; Mosges R eds. MIT Press, 1996: 203 - 21.
8. McBurney C. The incision made in the abdominal wall in cases of appendicitis. *Ann. Surgery* 1894; 20: 38-43.
9. Semm K. Endoscopic appendicectomy. *Endoscopy* 1983; 15: 59 - 64.
10. Memon M.A. Review. Laparoscopic appendicectomy: Current status. *Annals of the Royal College of Surgeons of England*; Nov. 1997; 79 (6) pg. 393 - 402.
11. Hellberg A; Rudberg C; Kullman E; Enochsson L; Fenyó G; Graffner H; Hallerback B; Johansson B; Anderberg B; Wenner J; Rugqvist I; Sorensen S. Prospective randomized multicentre study of laparoscopic versus open appendicectomy. *British Journal of Surgery (England)* Jan. 1999 86(1) pg. 48 - 53. 71
12. Charoonratana V; Chansawang S; Maipang T; Totemchokchyakarn P. Laparoscopic appendicectomy. *European J. Surgery (Sweden)* April 1993 159 (4) pg. 235 - 7.
13. Herman B.P; Otte J.B. Laparoscopic appendicectomy: Pros and cons - literature review of 4190 cases. *Acta chirurgica Belgica*; June 1997 97(3) pg 110 - 7.
14. Adams F. (Trans) *The Genuine works of Hippocrates.* London Sydenhaus Society 1849 pg 820 - 821.
15. Gunning J.E; Rosenzweig B.A. *Evolutions of endoscopic surgery.* White RA, Klein SR(eds). *Endoscopic surgery:* Boston, Mosby 1991 pg 1 - 9.
16. Berci G. *History of endoscopy.* Endoscopy: New York, Appletoncentury- crafts 1976, pg XLIX - XXIII.
17. Kelling G: *Zur Coloskopie - Archi klin chir* 1923, 126: 226-228.