IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 16, Issue 4 Ver. IX (April. 2017), PP 82-86
www.iosrjournals.org

A Comparative Study of Open versus Laparoscopic Appendicectomy in Tertiary Care Hospital in South India

S Carbin Joseph [1], C Danny Darlington [2*]
[1] *S.Carbin Joseph, Associate Professor, Department of Surgery, Kannyakumari Government medical college, Kannyakumari District,Tamil Nadu*
[2*] *C.Danny Darlington,Junior Resident,Department of Surgery,JIPMER,Pondicherry.*

Abstract
Introduction:
Appendicectomy is one of the commonest procedures in general surgery. Laparoscopic appendicectomy is likely to have less postoperative pain, decreased wound infection, better cosmesis and and early return to routine work.
Objectives of the study:
Laparoscopic procedure for appendicectomy is compared with open surgical technique with respect to:
• Duration of surgery
• Post operative pain and duration of analgesic
• Post operative Complications
• Post operative length of hospital stay
• Return to routine work
Materials & methods: *This is a prospective comparative study from November 2012 to October 2014 involving 100 cases, 50 open and 50 laparoscopic appendicectomy,which were randomly selected and were operated in Department of surgery,Kannyakumari Medical College.*
Results: *In present study pain score was 2.7 +/- 0.9 for open group as compared to 1.3+/- 0.5 in lap group (P<0.05) because of longer incision,stretch of muscles and woundvinfection. Post operative complications like vomiting was lower 8% in laparoscopic group in contrast to 36% in open group (P<0.05) and ileus was lower in laparoscopic group with 17.3 +/- 7.1 and for open group 30.8 +/- 8.9 with P<0.05.There is significant reduction in incidence of post operative wound infection in lap group 4% as compared to open group 26% (P<0.05).Duration of hospital stay was significantly lower for lap group 2.8 +/- 0.9 as than open group 4 +/- 2.9. The return to normal activity was earlier for lap group 8+/-3.15 days than open group 13.7 +/-3.15 days. Duration of surgery for open appendicectomy was 48.2+/-12.4 while that for lap appendicectomy was 68.5 +/- 20.3*
Conclusions: *Laparoscopic appendicectomy is better than open appendectomy in selected patients with acute or recurrent appendicitis.*
Key words: *Appendicectomy, laparoscopic appendicectomy, open appendicectomy*

I. Introduction

Appendicitis is the most common intra-abdominal condition requiring emergency surgery,with a lifetime risk of 6% (1). Appendicectomy continues to be one of the commonest procedures in general surgery and accounts for approximately 1% of all surgeries (2).Even though modern diagnostic facilities, surgery skills, fluids and antibiotic therapy have brought down the mortality from 50% to less than 1/100000 persons,the morbidity is more than 5-8%, mainly due to wound Infection (3).Laparoscopic appendicectomy combines the advantages of diagnosis and treatment in one procedure with least morbidity (4). Patients are likely to have less postoperative pain and to be discharged from hospital and return to activities of daily living sooner than those who have undergone open appendicectomy (5). The other advantages include decreased wound infection, better cosmesis, ability to explore the entire peritoneal cavity for diagnosis of other conditions and effective peritoneal toileting without the need for extending the incision(4).

II. Objectives of The Study

Laparoscopic procedure for appendicectomy is compared with open surgical technique with respect to
• Duration of surgery
• Post operative pain and duration of analgesic
• Post operative Complications like vomiting, ileus, intraabdoninal abscess and wound infection
• Post operative length of hospital stay
• Time taken to return to resume routine work

III. Methodology

Source of data

Patients admitted in surgical wards of Kannyakumari medical college with clinical diagnosis of acute or recurrent appendicitis from November 2012 to October 2014.

Methodology of collection of data:

This prospective study from November 2012 to October 2014 involved 100 cases (50 cases open and 50 cases lap) which were randomly selected in Kannyakumari medical college.

Inclucion criteria:

Patients with clinical diagnosis of acute or recurrent appendicitis with necessary investigations.

Exclusion criteria:

1. Children <10Yrs
2. Pregnant women
3. Clinical appendicular mass
4. Appendicitis with visceral pathology which needs open surgery.
5. Interval appendicectomy.

Patients who presented with abdominal pain, vomiting, fever, and on examination with tenderness in right ileac fossa with guarding or rigidity were investigated with necessary investigation.Patients who were diagnosed of acute/recurrent appendicitis were posted for surgery. Open appendicectomy was performed through a muscle splitting incision in the right iliac fossa. The base of the appendix was crushed ligated and stump of the appendix was not invaginated. Laparoscopic appendicectomy was done using a standard approach involving a closed technique for trocar insertion and by 3 port technique. The appendix was divided after ligature of the base. Appendix extraction was performed using trocar sleeve to protect the wound from contamination during removal. Duration of surgery taken for lap is from the time of port site incision to closure of the port by suturing and for open it is from skin incision to skin closure.All the cases were followed every day in the postoperative period till they were discharged and then later followed for a period of 4 weeks in the out patient department.

The following parameters were observed during follow up in comparison between the two procedures, post operative pain using a visual analogue pain scale and duration of analgesic used in number of days. Post operative complications like vomiting, ileus, abdominal abscess and wound infection. Patients in both study groups were discharged as soon as possible and duration of stay after surgery and duration of analgesics used after surgery in number of days is noted. Wound infection was defined as discharge of pus that required surgical drainage.Intrabdominal abscess was defined as a fluid collection diagnosed on Ultrasonography or computed tomography which contained pus on ultrasound guided aspiration.Chi-square test and student t- test, is used for analysis.

IV. Results

Patients Demographics:

The results of the analysis of data on 50 patients who underwent open appendicectomy and another group of 50 patients, who were operated laparoscopically are as follows.(TABLE 1)

Table No.1: Age and Sex Distribution:

	Appendicectomy			
	Open		Laparoscopy	
	no	%	no	%
Patients analysed	50	100	50	100
Sex				
Male	30	60	20	40
Female	20	40	30	60
Age (years)				
10-20	22	44	24	48
21-30	20	40	22	44
31-40	4	8	0	0
41-50	4	8	4	8
Mean age +/-SD	24.0 +/-8.9		21.2 +/- 7.5	

Table 2: Duration of surgery

Duration of surgery	open	lap
< 30 min	3	3
31- 60 min	42	27
61- 90min	4	12
91- 120 min	1	6
121- 180 min	0	2
MEAN	48.2+/- 12.4	68.5+/-20.3

Table 3: Post operative complications

Complications	Open n(%)	Laparoscopic n(%)	Significance t-value	p-value
Vomiting	9(18)	4(8)	____	<.05,Sig*.
Abdominal abscess	2(4)	0(0)	____	0.23,NS*.
Wound Infection	8(16)	1(2)	____	<.05,Sig*.
Ileus (hrs)	30.8 +/-8.9	17.3 +/- 7.1	6.05	<.05,Sig*.

Figure 1: Post operative hospital stay- duration:

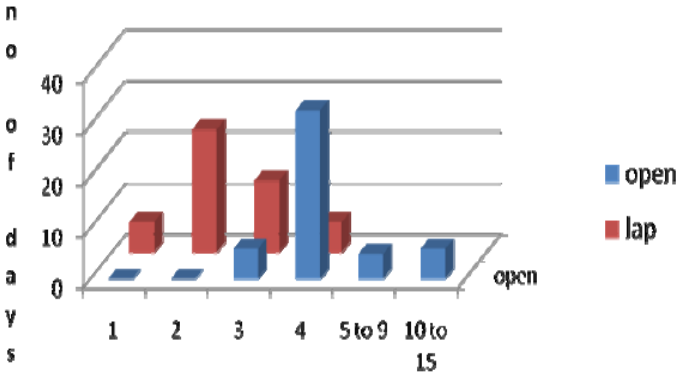
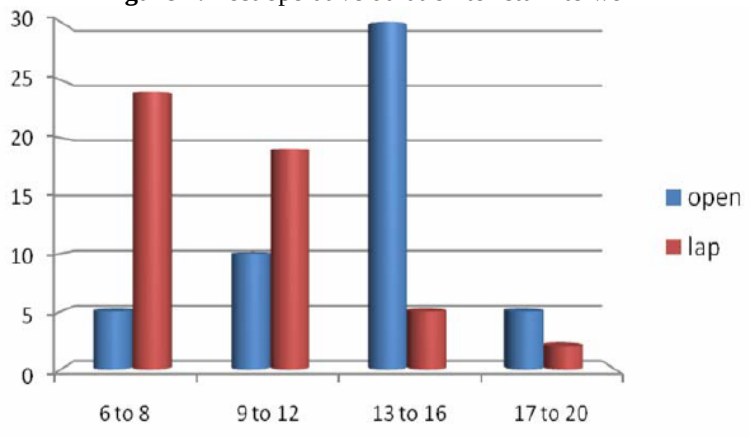


Figure 2: Post operative duration to return to work



V. Discussion

In the present study,comparison with respect to duration of surgery, laparoscopic appendicectomy has taken a mean of 68.5+/-20.3 min and open appendicectomy has taken a mean of 48.2+/-12.4 min ($p<0.001$). Similar observations have also been reported by other studies(6),(7). In almost all the literature the operating time of laparoscopic appendicectomy was found to be more than that of open appendicectomy.In general the time should be calculated from the insertion of first trocar to the end of skin suturing.Generally all laparoscopic procedures are more time consuming for the following reasons:

- Inherent nature of slow manoeuvre of laparoscopic techniques
- Time taken by careful slow insufflations.
- Routine diagnostic laparoscopy before starting any laparoscopic procedure.

A prospective randomized trial comparing laparoscopic appendicectomy with open appendicectomy was conducted in 158 patients by Hansen et al. They reported that despite of longer operating time, (63 versus 40 minutes) the advantages of laparoscopy (such as fewer wound infection and earlier return to normal activity) make it a worthwhile alternative for patients with a clinical diagnosis of acute appendicitis.

In present study pain score was 2.7 +/- 0.9 for open group as compared to 1.3 +/- 0.5 in laparoscopic group ($P<0.05$) because of longer incision stretch of muscles and wound infection. Similar observations have also been reported by other authors(8),(9).Thus the post operative analgesic required was more in open group as compared to laparoscopic group. Similar results have also been found in the following study.(6)

It is proved that laparoscopic procedures cause less postoperative pain than open. In this study none of the literature reviewed found more pain after laparoscopic procedure. The postoperative narcotic use is less after laparoscopic appendicectomy.

Post operative complications like vomiting was lower in laparoscopic group with 8% as compared with 36% in open group ($P<0.05$) and ileus was lower in laparoscopic group with 17.3 +/- 7.1 and for open group 30.8 +/- 8.9 with $P<0.05$ which were significant. Similar studies done showed the incidence of emesis was lesser and post operative ileus lesser in laparoscopic group (10). In present study there is significant reduction in incidence of post operative wound infection in laparoscopic group 4% as compared to open group 26% ($P<0.05$).A similar study done by others has also shown a significant reduction in wound infection rate (8),(10),(11),(12).Moreover, the small size of trocar incisions renders wound infections easier to manage, with prompter resolution than those following conventional appendicectomy. Duration of post operative hospital stay was significantly low for laparoscopic group 2.8 +/- 0.9 as compared to open group 4+/-2.94. The longer hospital stay in open group compared to laparoscopic group also has been reported by others (10),(13),(14).

In Nguyen N, Zainabadi K, Mavadadi S, Paya M, Stevens CM, Root J, et al, study stay was shorter for laparoscopic group ($P<0.04$) (15). Similar finding with 2.5 days versus 3.4 days were found for open and laparoscopic groups (16).

It has been shown that those patients who underwent successful laparoscopic appendicectomy have a better postoperative recovery. The reduced trauma to abdominal wall is a very significant factor in postsurgical discomfort. The better mobility of the abdominal musculature and the earlier ambulation, reduce the risk of the early postoperative complications of pneumonia and embolism.

VI. Conclusion

Laparoscopic appendicectomy is better than the open appendicectomy with respect to pain score, lesser use of analgesics, post operative complications like vomiting, ileus and wound infection rate. Post operative recovery is good in respect to duration of hospital stay, return to normal work. The only drawback of laparoscopic appendicectomy is longer duration of surgery. However the above mentioned advantages outweigh the time drawback for laparoscopic appendicectomy. Overall laparoscopic appendicectomy is better than open appendicectomy in selected patients with acute or recurrent appendicitis.

References

[1]. Guller U, Hervey S, Purver H, Muhlbair L, Peterson E, Eubanks S, al."Laparoscopic database" Ann Surg 2004;239: 43-52.
[2]. Telfor G, Wallace J, "Appendix" chapter 13 in Oxford text book of surgery,Morris PJ., Wood WC., Eds. Vol.2, 2nd Edn, Oxford Medical Publications, 2000; 180-189.
[3]. Palanivelu C, "Laparoscopic appendiectomy" chapter 53 in Text book of surgical laparoscopy, Shrinivas Fine Art Limited, 2002; 411-424.
[4]. Britton J, Barr H, "Endoscopic Surgery". Chapter 13 in Oxford text book of Surgery, Morris PS, Malt RA Eds. Vol.1, 2nd Edn, Oxford Medical Publications, 1994;847-862.
[5]. Russell RCG, Williams NS, Bulstrode CJK. "The vermiform appendix". Chapter 67 in short practice of surgery, Bailey and Love's 25th Edn, Arnold Publication 2004; 1204-1218.
[6]. RK Mishra, GB Hanna, A Cuschieri "Laparoscopic versus Open Appendicectomy for the Treatment of Acute Appendicitis" World Journal of Laparoscopic Surgery, January-April 2008;1(1):19-28.
[7]. M. Marzouk, M. Khater, M. Elsadek, A. Abdelmoghny "Laparoscopic vs open appendicectomy A prospective comparative study of 227 patients" Surg Endosc (2003) 17: 721–724.

[8]. Chung RS, Rowland Dy, Paul Li, Diaz J, Clevelan, Ohio, "A meta analysis of Randomized controlled trials of laparoscopic versus conventional appendicectomy," Am J Surg,1999;177:250-256.
[9]. Minne L, Varner D, Burnell A, Ratzer E, Clark J, Haun W, "Laparoscopic vs Open Appendicectomy Prospective Randomized Study of outcome", Arch Surg, 1997;132:708-712.
[10]. Ortega AE, Hunter JG, Peters JH, Swantrom LL, Schirmer B, "A prospective randomized comparison of laparoscopic appendicectomy with open appendicectomy." Am J Surg. 1995;169:208-273.
[11]. Tate JJT, Chung SCS, Dawson J, Leong HT, Chan A, Lau WY, et al,"Conventional versus laparoscopic surgery for acute appendicitis" Br J Surg. June 1993;80:761-762.
[12]. Pedersen AG, Petersen OB, Wara P, Ronnjng H, Qvist N and Laurberg S,"Randomized clinical trial of laparoscopic versus open appendicectomy" Br J Surg.2001;88:200-205.
[13]. McAnena OJ, Austin O, O'Connell PR, Hederman WP, Gorey TF, Fitzpatrick J, "Laparoscopic versus open appendicectomy: a prospective evaluation" Br J Surg, August 1992;79:818-820.
[14]. Martin LC., Puente I, Sosa JL, Bassn A, Breslaw R, McKenney MC,et al, "Open versus Laparoscopic Appendicectomy A Prospective Randomized Comparison", 1995;22(3):256-262
[15]. Hinzelmann M, Simmen HP, Cummins AS, Largiader F, "Is Laparoscopic Appendicectomy the New 'Gold Standard'? Arch Surg, 1995; 130:782-785.
[16]. Nguyen N, Zainabadi K, Mavadadi S, Paya M, Stevens CM, Root J, et al., "Trends in utilization and outcomes of laparoscopic versus open appendicectomy", Am J Surg, Dec 2004; 188(6):813-820.