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RESEARCH ARTICLE

"A COMPARATIVE STUDY OF LAPAROSCOPIC APPENDICECTOMY VERSUS OPEN APPENDICECTOMY IN TERMS OF DURATION OF SURGERY,LENGTH OF HOSPITAL STAY,RESUMPTION OF DIET, POST OPERATIVE COMPLICATIONS IN THANJAVUR MEDICAL COLLEGE A PROSPECTIVE STUDY"

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Abstract

Introduction: Appendicitis is most common intra abdominal condition requiring emergency surgery. The life time rate of appendicectomy is 12% for men and 25% in women, with approximately 7% of all people undergoing appendicectomy for acute appendicitis during their lifetime. Laparoscopic appendicectomy combines the advantages of treatment and diagnosis in one procedure with the least morbidity3. Patients are likely to have less post operative pain and to be discharged from hospital and return to regular activities quicker than those who underwent an open appendicectomy

Methodology: Patients admitted in surgical wards, with clinical diagnosis of acute or recurrent appendicitis for a period of one year. The following parameters were observed between the two procedures. Duration of procedure ,Postoperative pain,Duration of surgery in minutes, Postoperative complications and wound infection, Post operative length of hospital stay in number of days, Resumption of diet.

Results: The gold standard treatment for acute appendicitis is appendicectomy. Though open appendicectomy remains gold standard, nowadays laparoscopic appendicectomy has gained a lot of importance now. Laparoscopic appendicectomy9 is equally safe and less postoperative pain and morbidity as compared to open appendicectomy. Laparoscopic appendicectomy is a useful procedure for reducing the hospital stay, return to work early, less complications encountered. With better training now in minimal access surgery now, laparoscopy has been popular now.

Conclusion: On analysing the data, we found a definite difference in outcome between open and laparoscopic appendicectomy in consecutively selected patients. The laparoscopic appendicectomy was better than the open appendicectomy with respect to pain, postoperative complications like vomiting, and wound infection rate. Postoperative recovery was good in respect with duration of hospital stay, resumption of diet. The only drawback of laparoscopic appendicectomy was with the duration of surgery. However with the above mentioned advantages outweighs the time drawback for laparoscopic appendicectomy. Overall laparoscopic appendicectomy is better than open appendicectomy in selected patients with acute or recurrent appendicitis

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Introduction:-

Appendicitis is most common intra abdominal condition requiring emergency surgery. The life time rate of appendicectomy is 12% for men and 25% in women, with approximately 7% of all people undergoing appendicectomy for acute appendicitis during their lifetime[1]. It has been observed that males had higher rates of appendicitis than females for all age groups with an overall ratio of 1.2:1.3. Even though modern diagnostic facilities, surgical skills, antibiotic therapy have brought down the mortality from 50% (before 1925) to less than 1/1,00,000 persons, still the morbidity is around 5-8% mainly due to wound infection because of delayed diagnosis and treatment. In acute appendicitis however, a treatment delay of even a few hours may result in catastrophic complication[2]. With the exploration of the laparoscopic technique it provided an opportunity to explore new method of therapy in the management of suspected acute appendicitis. Laparoscopic appendicectomy combines the advantages of treatment and diagnosis in one procedure with the least morbidity[3]. Patients are likely to have less post operative pain and to be discharged from hospital and return to regular activities quicker than those who underwent an open appendicectomy[4]. Other are decreased wound infection, ability to explore the entire peritoneal cavity for diagnosis of other conditions and effective peritoneal toileting without the need for extending the incision. Laparoscopic appendicectomy[5] is increasingly being used particularly in young females of child bearing age where the differential diagnosis of right lower quadrant pain is extensive including gynecologic pathology. Major disadvantage of laproscopic procedure is increased cost of the surgical equipments[6]. Despite these concerns however the cost effectiveness for the laparoscopic appendicectomy is easily realized once the decreased hospital stay and entire patient covalence period are accounted. The modern era of laparoscopic surgery has evoked remarkable changes in the Approach to surgical diseases[7]. The trend towards minimally invasive surgery has prompted general surgeons to scrutinize nearly all surgical procedures for possibility of conversion to the laparoscopic technique[8].

Objectives:-

Laparoscopic appendicectomy and Open appendicectomy is compared in terms of

1. Duration of surgery
2. Post operative complications and wound infection
3. Duration of surgery in minutes
4. Length of the hospital stay
5. Resumption of diet

Methodology:-

Source Of The Data

Patients admitted in surgical wards of Thanjavur Medical College, Thanjavur, with clinical diagnosis of acute or recurrent appendicitis for a period of one year

Method Of Collection Of Data:-

This prospective study involved 99 Cases that was consecutively selected, where the investigator was a part of the Surgical team managing the patients, by using random sampling technique.

Inclusion Criteria

Patients presenting with acute appendicitis or recurrent appendicitis

Exclusion Criteria

Patients with delayed presentation leading to appendicular mass, abscess. Patients who do not consent for the study. Pregnant women, Interval appendicectomy, Patients less than 12 years of age. In spinal or general anesthesia Open appendicectomy was performed, through the muscle splitting incision in the right iliac fossa. The base of the appendix was crushed and ligated and the stump of the appendix was not invaginated. In general anesthesia, Laparoscopic technique performed using the Standardized approach involving the closed technique for the trocar insertion and by 3- port technique. The appendix is divided after double ligation of the base. Extraction of the appendix was performed using trocar sleeve to protect the wound from Contamination during removal. All cases were followed in the postoperative period till they were discharged and then later followed for a period of 4 weeks in the outpatient department. The following parameters were observed between the two procedures.

Duration of procedure

1. Postoperative pain
2. Duration of surgery in minutes
3. Postoperative complications and wound infection.
4. Post operative length of hospital stay in number of days .
5. Resumption of diet

Results:-

Statistical analysis:

Data were entered in the excel spread sheet and variables were coded accordingly. The statistical analyses were performed using Graph pad Prism version 5 software. Data were presented as mean with Standard deviation for normal distribution/scale data. Data were presented as frequency with proportion n(%) for categorical data. Fisher's exact test was used to compare the frequencies between the groups.Unpaired 't' test was used to compare the means between the groups. $p<0.05$ were considered statistically significant.

Table 1:- Frequency distribution of type of gender observed in the study.

S.No	Gender	n	%
1	Female	47	47.5
2	Male	52	52.5

Data are expressed as n with %. The total N=99

In the study Gender distribution female gender underwent appendicectomyabout 52.5% male gender about 47.5%. in this study gender distribution is almost equivocal.

Table 2:- Frequency distribution of duration of age category observed in the study.

S.No	Age category	n	%
1	<20 years	42	42.4
2	21 – 30 years	32	32.3
3	31 – 40 years	10	10.1
4	41 – 50 years	11	11.1
5	>50 years	4	4.04

Data are expressed as n with %. The total N=99.

In this study less than 20 years of age is most commonly affected followed by 20 to 30 years of age. On increasing age the incidence of appendicitis is decreasing.

Table 3:- Frequency distribution of occurrence of fever observed in the study.

S.No	Occurrence of fever	N	%
1	Yes	51	51.5
2	No	48	48.5

Data are expressed as n with %. The total N=99

Table 4:- Frequency distribution of occurrence of vomiting observed in the study.

S.No	Occurrence of vomiting	N	%
1	Yes	62	62.6
2	No	37	37.4

Table 5:- Frequency distribution of type of surgery performed in the study.

S.No	Type of surgery	n	%
1	Open appendicectomy	49	49.5
2	Laparoscopic appendicectomy	50	50.5

Table 6:- Comparison of frequency distribution of age distribution with respect to the type of appendicectomy done in the patients.

S. No	Age distribution	Laparoscopic appendicectomy (n=50)		Open appendicectomy (n=49)		Chi square value	df	P value
		n	%	n	%			
1	<20 years	19	38	23	46.9	3.18	4	0.527 (NS)
2	21 – 30 years	20	40	12	24.5			
3	31 – 40 years	5	10	5	10.2			
4	41 – 50 years	4	8	7	14.3			
5	>50 years	2	4	2	4.1			

Data are expressed as n with %. Fisher's exact test was done to compare the frequencies. NS = Not significant.

Table 7:- Comparison of frequency distribution of age distribution with respect to the type of appendicectomy done in the patients.

S. No	Gender	Laparoscopic appendicectomy (n=50)		Open appendicectomy (n=49)		Chi square value	df	P value
		n	%	N	%			
1	Female	24	48	23	46.9	0.011	1	0.999 (NS)
2	Male	26	52	26	53.1			

Table 8:- Comparison of frequency distribution of occurrence of symptoms with respect to the type of appendicectomy done in the patients.

S .No	Presence of symptoms before surgery	Laparoscopic appendicectomy (n=50)		Open appendicectomy (n=49)		Chi square value	f	P value
		n	%	N	%			
1	Vomiting	9	18	28	57.1	16.2		<0.0001*
2	Fever	14	28	37	75.5	22.3		<0.0001*

Data are expressed as n with %. Fisher's exact test was done to compare the frequencies.*indicates $p<0.05$ and considered statistically significant.

Table 9:- Comparison of frequency distribution of post-operative resumption of diet with respect to the type of appendicectomy done in the patients.

S. No	Resumption of diet after surgery	Laparoscopic appendicectomy (n=50)		Open appendicectomy (n=49)		Chi square value	df	P value
		n	%	N	%			
1	First POD	50	100	2	4.1	91.3	2	<0.0001*
2	Second POD	0	0	42	85.7			
3	Third POD	0	0	5	10.2			

Data are expressed as n with %. Fisher's exact test was done to compare the frequencies between the groups. * indicates $p<0.05$ and considered statistically significant.

In this study laparoscopic appendicectomy patients resumption of diet was earlier than open appendicectomy, all most all patients underwent laparoscopic appendicectomy diet was started on post operative day -1.

Table 10:- Comparison of frequency distribution of post-operative pain with respect to the type of appendicectomy done in the patients.

S. No	Post-operative pain	Open appendicectomy (n=49)	Laparoscopic appendicectomy (n=50)	Chi square value	Df	P value

		n	%	N	%			
1	Present	44	89.8	13	26	41.2	1	<0.0001 *
2	Absent	5	10.2	37	74			

Data are expressed as n with %. Fisher's exact test was done to compare the frequencies between the groups. The relative risk was 6.4 with 95% confidence interval of 2.8 to 14.5. * indicates p<0.05 and considered statistically significant.

In this study post operative pain was seen in 90% patients in open appendiectomy group where as in laparoscopic appendicectomy group post operative pain was seen in 26 % of patients.This result shows better post operative outcome amongst laparoscopic appendicectomy.

Table 11:- Comparison of frequency distribution of post-operative wound infection with respect to the type of appendicectomy done in the patients.

S. No	Post-operative wound infection	Open appendicectomy (n=49)		Laparoscopic appendicectomy (n=50)		Chi square value	f	P value
		n	%	n	%			
1	Present	14	28.6	0	0	16.4	1	<0.0001 *
2	Absent	35	71.4	50	100			

Data are expressed as n with %. Fisher's exact test was done to compare the frequencies between the groups. The relative risk was 2.42 with 95% confidence interval of 1.8 to 3.13. * indicates p<0.05 and considered statistically significant.

Table 12:- Frequency distribution of type of wound infection observed in patient with operated by open appendicectomy in the study.

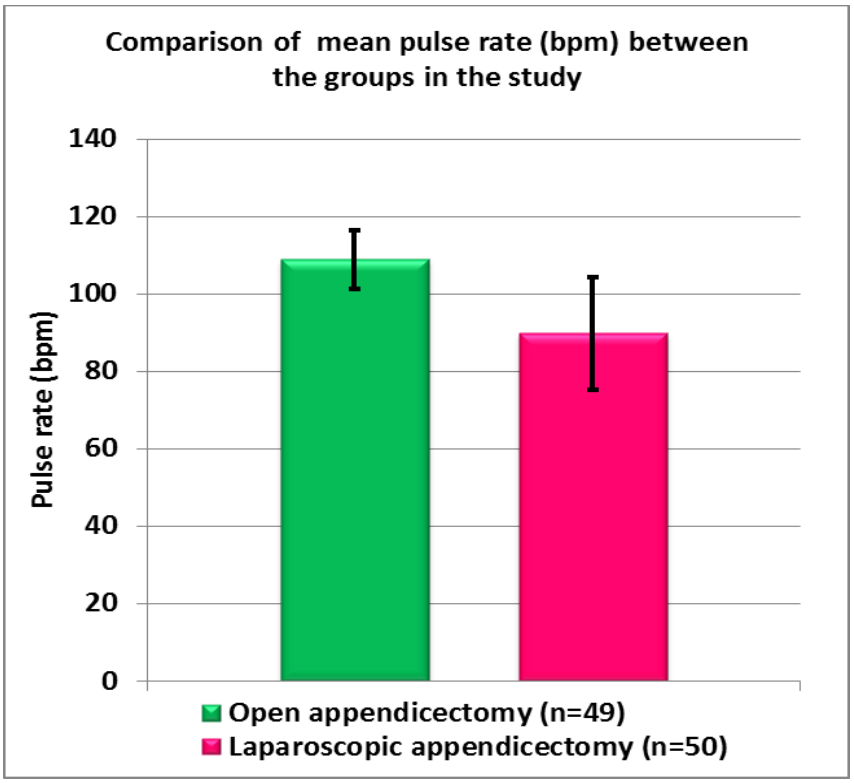
S.No	Type of wound infection in open appendicectomy patients	n	%
1	Purulent wound infection	12	85.7
2	EC fistula	1	7.2
3	Wound infection with induration	1	7.2

Data are expressed as n with %. The total N=14

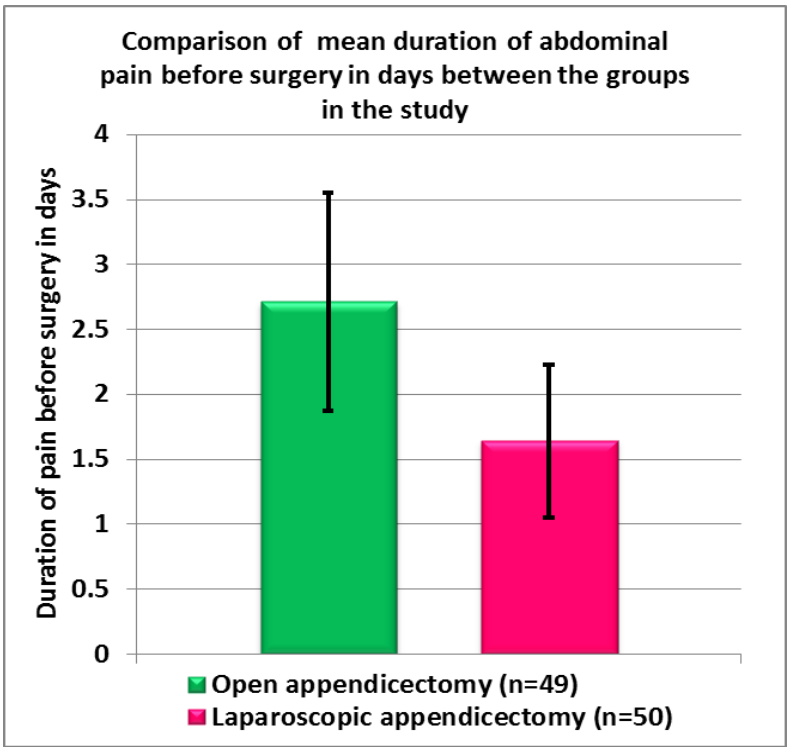
This study shows that laparoscopic appendicectomy group had nil post operative wound infection as compared to open appendicectomy group.

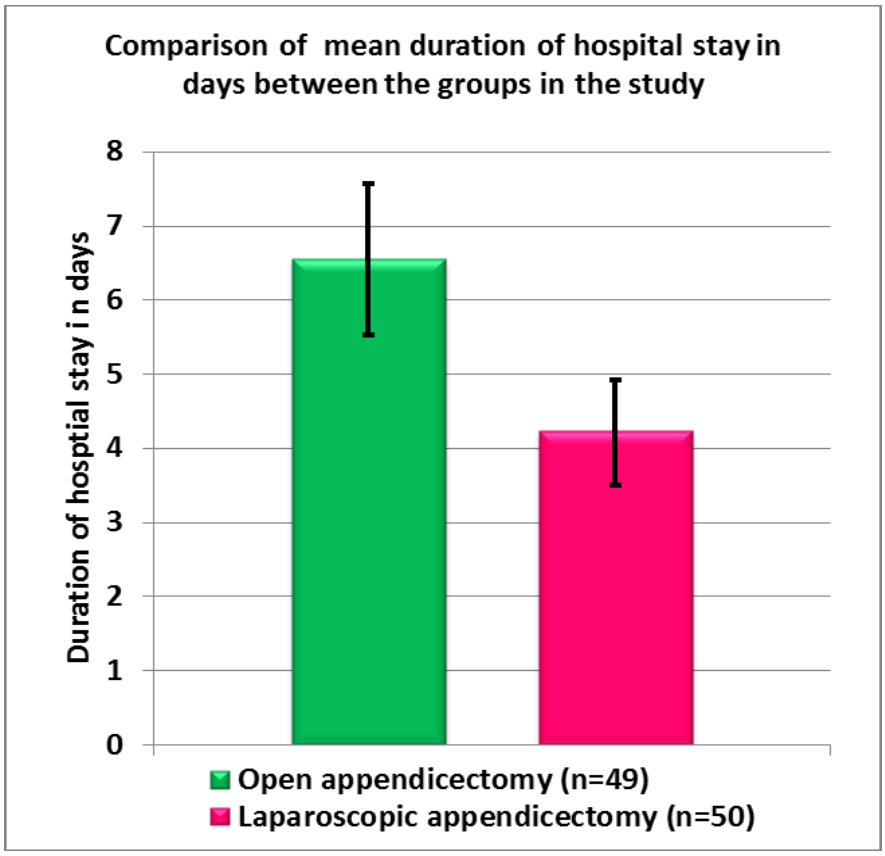
Table 13:- Comparison of mean values of various parameters with respect to the type of appendicectomy done in the patients.

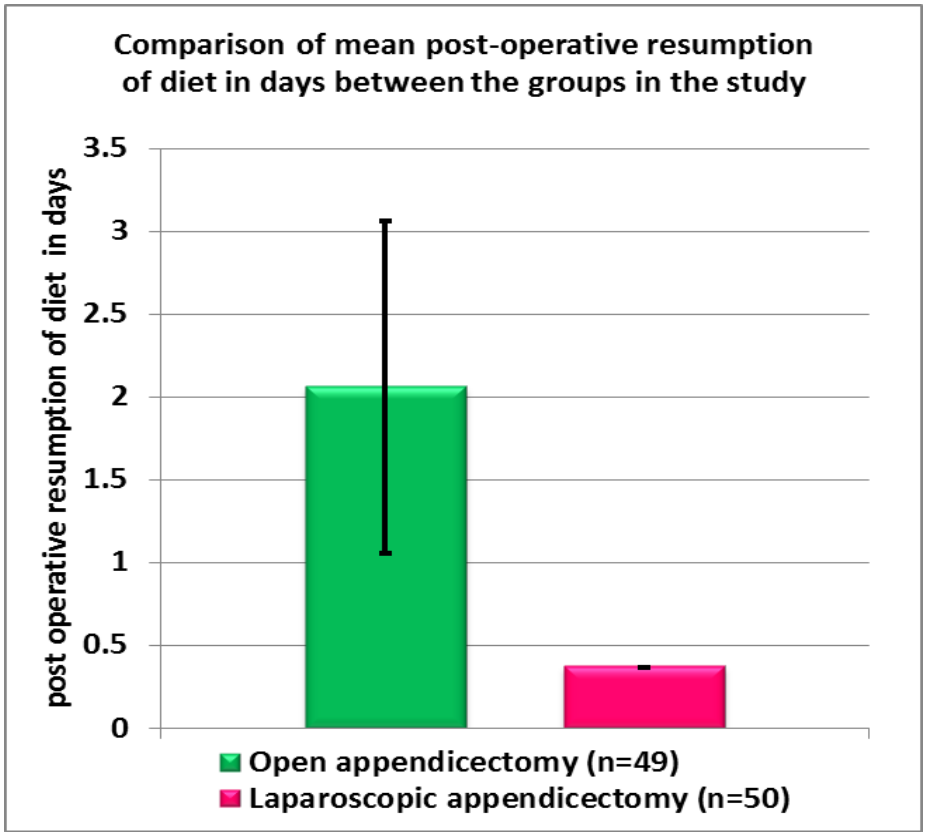
S. No	Parameters	Open appendicectomy (n=49)		Laparoscopic appendicectomy (n=50)		't' value	f	P value
		Mean	SD	Mean	SD			
1	Age in years	26.7	12.9	25.5	11.1	0.525	97	0.601 (NS)
2	Pulse rate	108.9	7.6	89.7	5.2	14.5	97	<0.0001*
3	Duration of abdominal pain before surgery (days)	2.71	0.84	1.64	0.59	7.33	97	<0.0001*
4	Duration of surgery (mins)	41.7	4.5	53.2	4.49	12.6	97	<0.0001*
5	Post-operative resumption of diet (days)	2.06	0.37	1	0	19.99	97	<0.0001*
6	Hospital stay (days)	6.55	1.02	4.22	0.71	13.2	97	<0.0001*

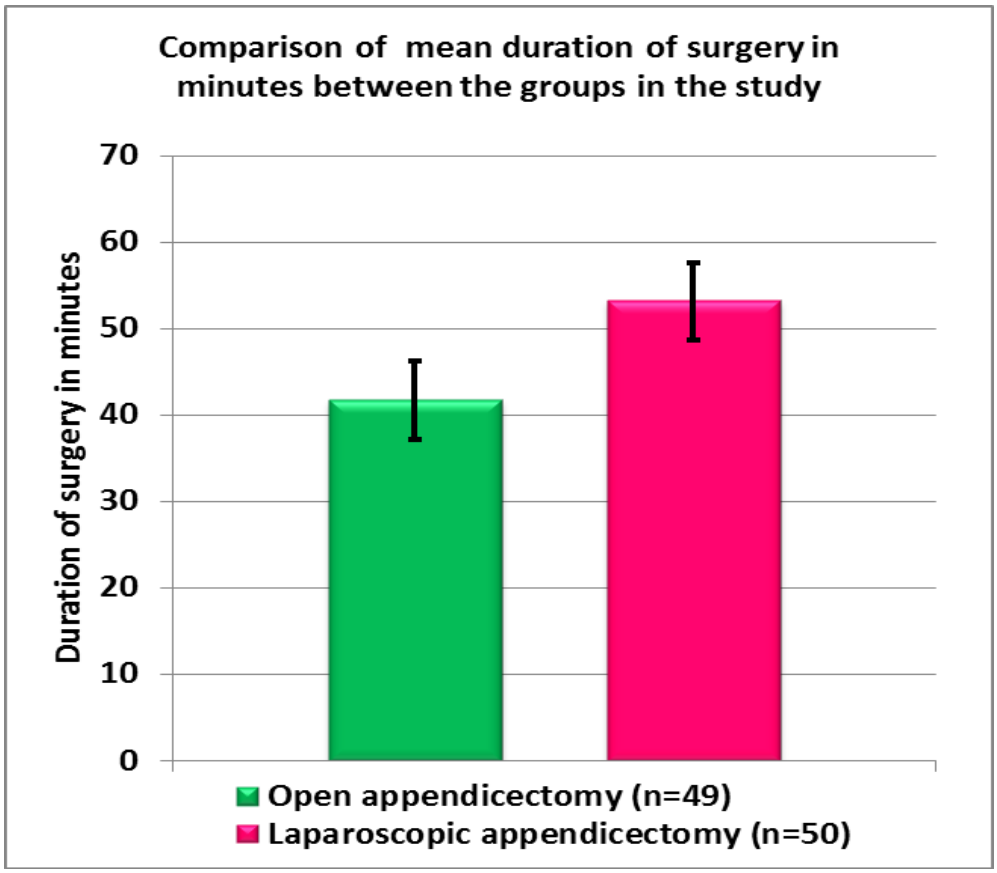


Data are expressed as n with %. Unpaired‘t’ test was done to compare the frequencies between the groups. *indicates $p<0.05$ and considered statistically significant.




Comparison of mean duration of hospital stay in days between the groups in the study
Duration of hosptial stay i n days
8
7
6
5
4
3
2
1
0
Open appendicectomy (n=49)
Laparoscopic appendicectomy (n=50)


Comparison of mean post-operative resumption of diet in days between the groups in the study
post operative resumption of diet in days
3.5
3
2.5
2
1.5
1
0.5
0
Open appendicectomy (n=49)
Laparoscopic appendicectomy (n=50)



Discussion:-

The gold standard treatment for acute appendicitis is appendicectomy. Though open appendicectomy remains gold standard, nowadays laparoscopic appendicectomy has gained a lot of importance now. However the role of laparoscopy in appendicectomy, commonest indications remains controversial. Several studies have been conducted around the world, some have supported and favored laparoscopy and some others are not. Most cases of acute appendicitis can be treated by laparoscopy. Laparoscopic appendicectomy[9] is equally safe and less postoperative pain and morbidity as compared to open appendicectomy. Laparoscopic appendicectomy is a useful procedure for reducing the hospital stay, return to work early, less complications encountered. With better training now in minimal access surgery now, laparoscopy has been popular now. Laparoscopic procedures decrease the loss of earning days by an early return to work and shorter hospital stay[10]. Hence it's useful in India where most of them are daily wages workers. Hence laparoscopic appendicectomy may replace open appendicectomy.

Conclusion:-

On analysing the data, we found a definite difference in outcome between open and laparoscopic appendicectomy in consecutively selected patients. The laparoscopic appendicectomy was better than the open appendicectomy with respect to pain , postoperative complications like vomiting, and wound infection rate. Postoperative recovery was good in respect with duration of hospital stay, resumption of diet. The only drawback of laparoscopic appendicectomy was with the duration of surgery. However with the above mentioned advantages outweighs the time drawback for laparoscopic appendicectomy. Overall laparoscopic appendicectomy is better than open appendicectomy in selected patients with acute or recurrent appendicitis

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