Case Report

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A Comparative Study of Laparoscopic Appendectomy Versus Open Appendectomy

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Abstract

Background and objectives: Laparoscopic appendectomy has rapidly become established as the popular alternative to open appendectomy, it has a safety profile better than open procedure.

Aim: Laparoscopic procedure for appendectomy is compared with open surgical Technique.

Methods: hospital based study from July 2022 to August 2023, involved 60 patients with Diagnosis of acute appendicitis was entered into a study randomizing the Choice of operation to either the open or the laparoscopic technique. Statistical Comparisons were performed using the chi-square test and students 't' test.

Results: the mean post op pain score was 1.37±0.49 for laparoscopic and for open appendectomy is 3.27±0.828 ($p<0.0001$). as per complications in laparoscopic group vomiting, wound infection was more in open group ($p<0.007$). In the laparoscopic group, 26 (86.7%) patients were satisfied whereas only 50% were satisfied in open group.

Conclusion: Laparoscopic appendectomy was better than open appendectomy in a properly prepared and selected patient in terms of Post-operative pain, Post-operative complications like vomiting, wound infection, fever, Duration of the hospital stay, Return to the work, Cosmetic benefit.

Keywords: Acute appendicitis; Appendectomy; Open procedure; Laparoscopy procedure.

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INTRODUCTION

In surgical practice Acute appendicitis is one of the common causes of acute abdomen encountered, requiring emergency surgery. The life time rate of appendectomy is 12% for men and 25% in women, with approximately 7% of all people undergoing appendectomy for acute appendicitis during their lifetime. It has been observed that males had higher rates of appendicitis than females for all age groups with an overall ratio of 1.2:1.31.

Even though modern diagnostic facilities, surgical skills, antibiotic therapy have brought

down the mortality from 50% (before 1925) to less than 0.001% persons, still the morbidity is around 5-8% mainly due to delayed diagnosis & treatment, with the resultant complications.[2]

Laparoscopic appendectomy 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. Laparoscopic appendectomy often point to the increased cost of the surgical equipments as a major disadvantage of the laparoscopic procedure. Despite these concerns however the cost effectiveness for the laparoscopic appendectomy is easily realized once the decreased hospital stay and entire patient covalence period are accounted.[3]

The modern era of laparoscopic surgery has evoked remarkable changes in the Approach to surgical diseases. The trend towards minimally invasive surgery has Prompted general surgeons to scrutinize nearly all surgical procedures for possibility of conversion to the laparoscopic technique.

AIM

To study comparison between the outcomes of Laparoscopic appendectomy and Open appendectomy.

METHODS

This prospective study from july 2022 until august 2023 involved 60 Cases of acute appendicitis that were consecutively selected, where the investigator was a part of the Surgical team managing the patients, by using random sampling technique. Patients with delayed presentation leading to appendicular mass, abscess, do not consent for the study and less than 12 years of age were excluded from study. In spinal or general anesthesia Open appendectomy 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 post-operative period till they were discharged and then later followed for a period of 4 weeks in the outpatient department. A proforma was used to collect the relevant information. Data was analyzed Using the Students t-test and Chi-square analysis and P value of <0.05 is considered Significant.

RESULTS

In the study, 11 (36.7%) males and 19 (63.3%) females underwent laparoscopic appendectomy. 19 (63.3%) males and 11 (36.7%) females underwent open appendectomy. The mean age for undergoing laparoscopic appendectomy was 28.67 years and open appendectomy was 29.73 years. (Table 1)

18 (60%) patients had nausea and vomiting in laparoscopic appendectomy. 20 (66.7%) patients had nausea and vomiting in open group. 13 (43.3%) patients had fever in laparoscopic group, 12 (40%) had fever in open group. In both groups almost all had RIF pain in both groups.

Table 1: Sociodemography

Age	Laparoscopy		Open		P value
	N	%	N	%	
<20	10	33.3	7	23.3	0.27
21-30	9	30	12	40	
31-40	7	23.3	3	10	
41-50	4	13.3	8	26.7	
Sex					
Male	11	36.7	19	63.3	0.04
Female	19	63.3	11	36.7	

All patients had tenderness in both groups. 9 (30%) patients in laparoscopic group and 19 (63.3%) patients in open group had guarding on local examination.

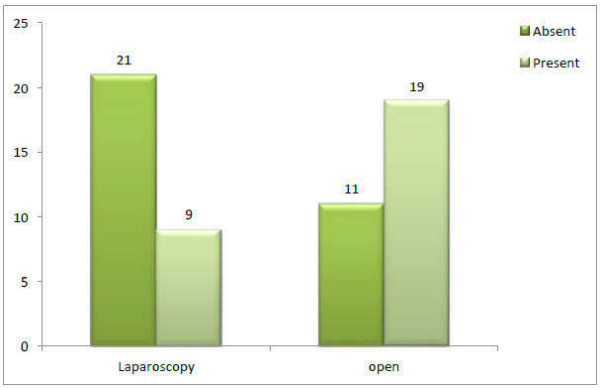

Fig. 1: Guarding

In the study, 21(70%) patients in laparoscopic and 20 (66.7%) patients in open group had inflamed appendix in USG.

Table 2: Post op Pain

Post-op Pain	Laparoscopy		Open		P-value
	N	%	N	%	
I	19	63.3	0	0	0.0001
II	11	36.7	7	23.3	
III	0	0	8	26.7	
IV	0	0	15	50	

In the study, the mean pain score was 1.31±0.49 in the laparoscopic group. The mean pain score in the open group is 3.27± 0.828. The difference is significant (p<0.0001).

Table 3: Complication

	Laparoscopy		Open		
	N	%	N	%	
Vomiting	6	20	16	53.3	0.007
Fever	4	13.3	8	26.7	0.1
Wound Infection	1	3.3	8	26.7	0.1

In the study, 6 patients in the laparoscopic group (20%) and 16 patients in the open group (53.3%) have post op vomiting. The difference was significant (p<0.007). 8 patients in the open group (26.7%) and 1 patients in the laparoscopic group (3.3%) have post op wound infection. The difference was significant (p<0.01). 8 patients in the open group (26.7%) and 4 patients in the Laparoscopic group (13.3%) have post op fever.

Table 4: Length of hospital stay and surgery duration

	Type of Surgery	N	Mean	Std. Deviation	Std. Error Mean	P
Stay	Lap	30	1.77	0.728	0.133	0. 0001
	Open	30	7.73	1.363	0.249	
Duration of surgery						
	Lap	30	36.17	12.225	2.232	0. 0001
	Open	30	17.5	5.211	0.951	

The mean hospital stay score was 1.77 days in the laparoscopic group and 7.73 days in the open group. The parameter difference is significant (p<0.0001) The mean score for duration of time of surgery was 36.17 minutes in the laparoscopic group and 17.5 minutes in the open group. The difference was significant (p<0.0001)

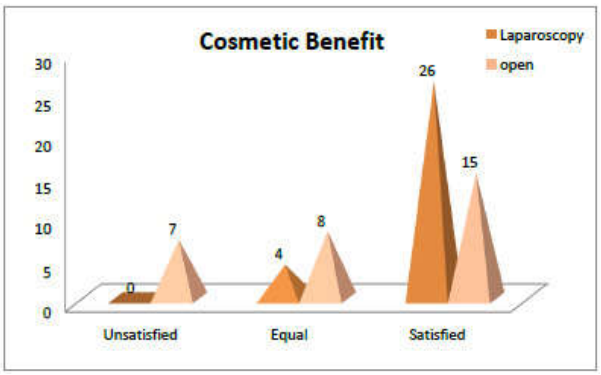

Fig. 2: Cosmetic Benefit

DISCUSSION

In our study, the mean post op pain score was recorded at the end of 24 hours for laparoscopic appendectomy is 1.37±0.49 and for open appendectomy is 3.27±0.828. The parameter difference is significant p<0.0001. The long incision in open appendectomy and stretch of muscles during open procedure leads to this difference. Similar other studies like Ortega ae *et al.*[4] was supported in favor in laparoscopic in terms of post op pain score.

In the study, the mean hospital stay score was 1.77 ± 0.728 days in the laparoscopic group and 7.73 ± 1.363 days in the open group. The difference was significant (p<0.0001). Studies like Attwood se et al,[5] in favor for laparoscopic group in terms of hospital stay.

In the laparoscopic group, 26 (86.7%) patients were satisfied with cosmetic benefit, 4 (13.3%) patients were equivocally satisfied, 0 patients were unsatisfied. In the open group,15 (50%) patients were satisfied, 8 (26.7%) were equivocally satisfied, 7 (23.3%) patients were un satisfied with cosmetic benefit. The study show that laparoscopic group had better cosmetic results. Whereas Ignacio RC wt al.[6] study shows that no difference in cosmetic benefit outcome between the 2 groups.

In the study, The mean score for duration of time of surgery was 36.17±12.25 minutes in laparoscopic group and 17.5 ±5.211 minutes in the open group. The parameter difference was significant p< 0.0001. The mean duration of time of surgery was 68 minutes in the laparoscopic group and 58 minutes in the open group in Ortega ae et al[4] study design.

CONCLUSION

Laparoscopic appendectomy is better than open appendectomy in the properly selected patients of acute appendicitis at the cost of increase in the duration of the time of surgery.

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