Original Research Paper

Volume-9 | Issue-3 | March-2019 | PRINT ISSN - 2249-555X

General Surgery

A COMPARATIVE STUDY OF OPEN Vs LAPAROSCOPIC APPENDICECTOMY IN TERTIARY CARE HOSPITAL IN RAYALASEEMA REGION

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KEYWORDS :

INTRODUCTION

Appendix, this underdeveloped residuum of the caecum has no known function and is commonly termed as a 'vestigial' organ, yet diseases of the appendix loom large in surgical practice; and appendicitis continues to be the most common acute abdominal condition that requires immediate surgical treatment. [1]

Appendicectomy has been one of the commonest emergency procedures in surgery. Appendicectomy may be performed as a laparoscopic or as an open operation. The debate about the choice of open versus laparoscopic appendectomy for the treatment of appendicitis remains a major point of controversy among surgeons

Open appendicectomy (OA) through laparotomy has been the gold standard for more than a century as far as surgical removal of appendix is concerned. [2]

Laparoscopy in turn allows examination of the entire peritoneal space, making it exceptionally useful to exclude other intra-abdominal diseasewhereas visualization of these structures would not be possible through a right lower quadrant incision. We find it to be technically simpler in most patients, particularly the obese, and have been impressed with our ability to discharge patients within several hours of the operation.

Review of the world literature suggests that definitely the trend is moving from open to LA. [3]

AIMS AND OBJECTIVES

- The aim of this study was to compare and evaluate the effectiveness of laparoscopic and conventional "open" appendicectomy in the treatment of acute appendicitis with reference to:
- Duration of Hospital stay
- Duration of Operation
- Intraoperative complications
- Post operative Pain and analgesic requirement
- Post operative Regain of bowel sounds
- Time to full recovery
- Cosmetic benefits

MATERIALS AND METHODS

This is a prospective study. This study consist of 100 patients treated with appendicectomy (50 open and 50 laproscopic) in our hospital.
Open appendicetomy was performed through a muscle splitting incision in the right iliac fossa. The mesoappendix and the appendix were ligated and the stump was routinely not buried.

Laparoscopic appendicectomy was performed by a standard technique, that is intraperitoneal appendicectomy.

Method of collection of data :

All the patients with suspected Appendicitis underwent routine lab investigations , operated by either open or laparoscopic appendicectomy and data collected regarding post operative pain and analgesic requirement, post operative regain of bowel sounds upto discharge and followed upon an outpatient basis for 1 to 4 weeks after discharge and their subjective opinions on cosmetic results and return to regular work were taken.

Routine lab investigations, CT,BT,chest X ray,renal function tests, USG abdomen are done.

Post operative pain measured by pain rating scale(visual analogue scale,VAS). Visual analogue scale line is 15 cm long with vertical mark at each end with numbers 0 and 100 or 0 and 10, and a verbal description. The verbal descripption must be in absolute terms(eg: worst pain imaginable) and terms such as worst pain in this present episode must be avoided.

Data analysis :

Collected data is analysed by comparison between outcomes. Statistical analysis will be done using chi-square test for qualitative data and unpaired *t*-test for quantitative data. $P<0.05$ was considered statistically significant.

Inclusion criteria

- Patients proven to have acute appendicitis on clinical examination followed by USG.
- Patients between the ages of 10 and 60
- Patient willing to be enrolled in study and have signed the consent form.
- Patient with no other systemic illness.

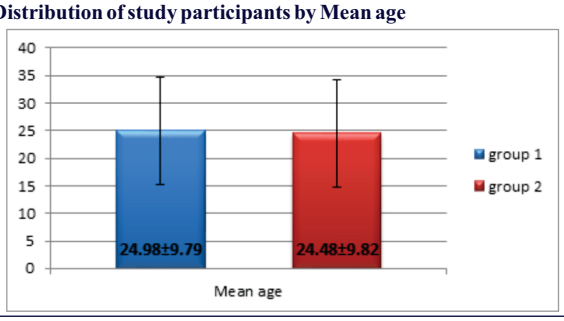
Exclusion criteria

- History of previous abdominal surgery.
- Age less than 10 years and above 60 years
- Pregnant females.
- Patient not willing to be enrolled in study
- Patients with acute appendicitis with associated co morbidities like Diabetes Mellitus, Hypertension.
- Patients with symptomatology similar to acute appendicitis such as renal colic , ovarian pathologies and others were excluded after preliminary investigations.

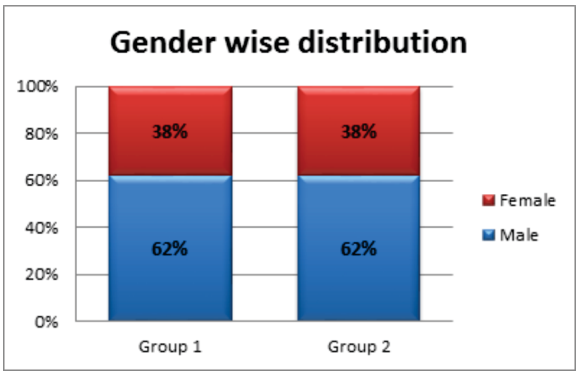
OBSERVATIONS AND RESULTS

The study included 100 patients divided into two groups, group 1 contains 50 patients in whom performed open procedure. Group 2 contains 50 patients in whom performed laparoscopic procedure. The observations appreciated in the two groups were presented below.

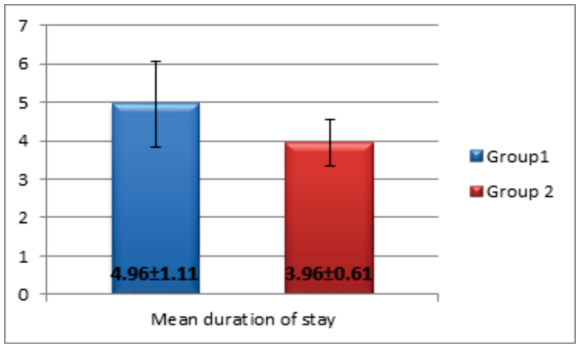
Distribution of study participants by Mean age



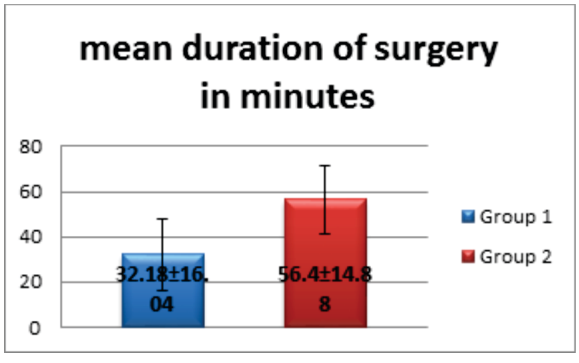
Distribution of study participants by Gender



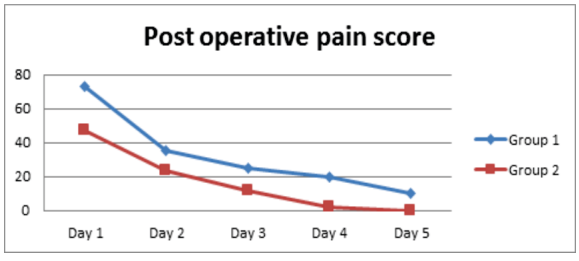
Distribution of study participants by Mean duration of the stay



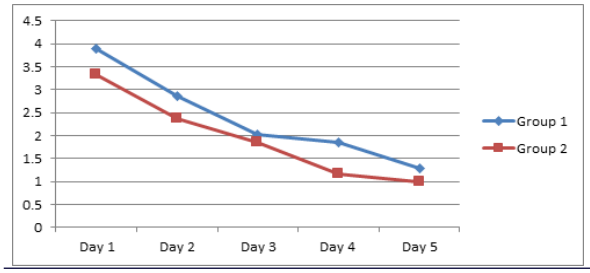
Distribution of study participants by Mean duration of the surgery



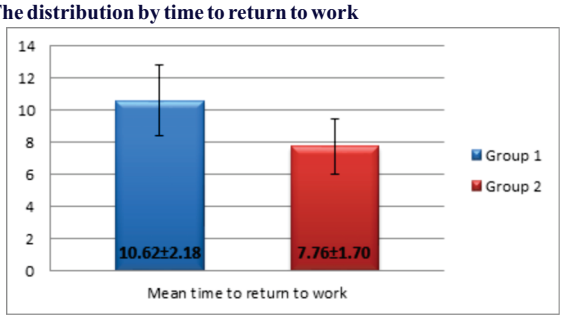
Line diagram showing the distribution by Post-operative pain score



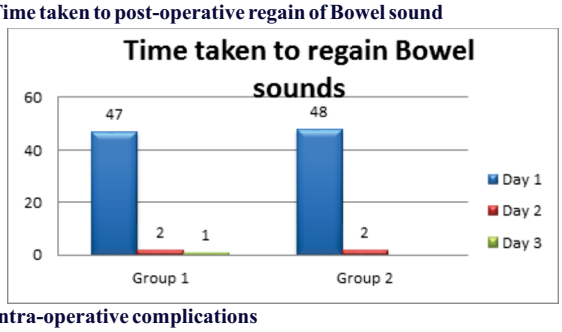
Line diagram showing distribution by Post-operative Analgesia score



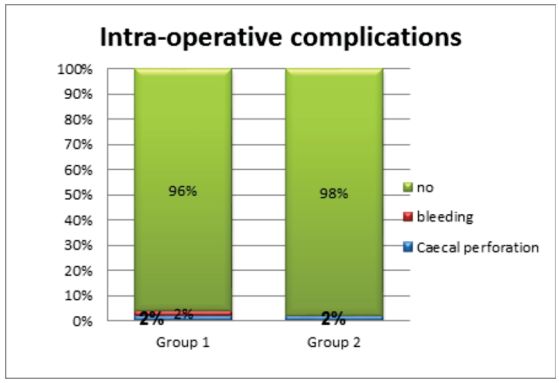
The distribution by time to return to work



Time taken to post-operative regain of Bowel sound



Intra-operative complications



DISCUSSION

Laparoscopic appendicectomy has not generated much interest as compared to laparoscopic cholecystectomy because many surgeons can perform an open appendicectomy through a small incision, in relatively less operating time and with low costs. But laparoscopy has its role in obese patients ,so that patient becomes ambulatory in 24 hours.It has less post operative pain witha potential advantage in sub hepatic appendix, less wound related complications and better cosmesis. As the world is going towards minimally invasive procedures, I would like to compare the advantages and disadvantages of time proven conventional open appendicectomy versus laparoscopic appendicectomy.

AGE DISRTIBUTION:

Although appendicitis can strike at any age,it is most common between ages of 5 and 40 with median age as 25. In my study I have compared the patients between the ages of 10 years and 60 years.

Mean age of patients included in Open group is 24.98+_9.79 and mean age of patients included in laparoscopy group is 24.48+-9.82.

SEX DISTRIBUTION:

It is well known that inflammation of appendix is more common in males than in females. In my study I have included equal number of males-31 (62%) and females-19 (38%) to both open and laparoscopy group with a ratio of 1.6:1.

COMPARISON OF MEAN DURATION OF HOSPITAL STAY

In my study mean duration of hospital stay for Open appendicectomy is 4.96±1.11 days and for laparoscopic appendicectomy is 3.96±0.61 days with a p-value of <0.001,indicating significantly shorter hospital stay for Laparoscopy group.

This longer hospital stay in Open group compared to Laparoscopy

group also has been reported in other studies

COMPARISON OF MEAN DURATION OF OPERATION

Laparoscopic procedure is more time consuming than open procedure.

STUDY	MEAN DURATION OF OPERATION(MINUTES)	
	OA	LA
Jamy L. Yong et al6	60	80
Sandeep Thakre et al7	45.7	60.8
Dr Mayank Gupta et al8	31.96+/-7.11	54.7+/-18.33
Mansab ali et al9	49.9	48.78
Present study	32.18+/-16.04	56.4+/-14.88

COMPARISON OF POST-OPERATIVE PAIN SCORES

In open procedure most of the patients relieved of the pain by fourth day, but in laparoscopic procedure pain was relieved on third day itself.

STUDY	MEAN POST OPERATIVE PAIN SCORES(VAS 0-10 SCALE)	
	OA	LA
S Carbin joseph et al5	2.7+/-0.9	1.3+/-0.5
Sandeep Thakre et al7	4.8	3.2
Minne L et al10	3.7	4
Present study	3.7+/-2.5	2.8+/-1.70

COMPARISON OF POST OPERATIVE ANALGESIA SCORES

Post operative analgesia score was more in open procedure compared to laparoscopic procedure. The difference in analgesia score is highly significant statistically in all days except day 3. ($p<0.001$)

In a prospective study **Frazee RC et al**[4], **S Carbin Joseph et al**[5] showed post operative analgesic required was more in open group as compared to laparoscopic group. It is proved that laparoscopic procedures cause less postoperative pain than open

COMPARISON BETWEEN TIME TO RETURN TO WORK

In my study mean time to return to work is 10.62±2.18 days for open appendicectomy and 7.76±1.70 days for laparoscopic appendicectomy, the difference being highly significant statistically
This finding is consistent with findings in other studies,

STUDY	TIME TO RETURN TO WORK(DAYS)	
	OA	LA
S Carbin Joseph et al	13.7+/-3.15	8+/-3.15
Sandeep thakre et al	10.9	9.6
Nour et al	11+/-4.1	11+/-4.8
Present tudy	10.62+/-2.18	7.76+/-1.70

COMPARISON OF POST OPERATIVE REGAIN OF BOWEL SOUNDS

In my study 47 patients(94%) of open appendicectomy and 48 patients(96%) of lap appendicectomy group regained bowel sounds on first post operative day and very few patients regained bowel sound on day 2, prolonged ileus seen in 1 patient of open appendicectomy. Two groups doesn't show any significant difference with p-value 0.646 (NS) in regain of bowl sounds.

Prolonged ileus may be due to complicated disease and late presentation to hospital itself and does not correlate with type of procedure used. Paralytic ileus is more common when the appendix has perforated

COMPARISON OF INTRA OPERATIVE COMPLICATIONS

The intra-operative complications were very minimal in the both the procedures, even doesn't show difference in inter group comparisons. Caecal injury and bleeding each are noted in 2% of cases of OA and caecal injury is noted in one case out of 50 in LA.

In my study caecal injury during open appendicectomy occurred while trying to separate and extract appendix in subserosal retrocaecal position, and in another patient bleeding source couldnot be detected ,which was subsided after packing the wound for some time. Caecal injury in lap appendicectomy occurred due to usage of monopolar cautery near the base

Abidali Karatparambil et al[11] also reported Overall complication rates were similar in both groups.

But literature says that if any difficulty is encountered it is safe to convert into open appendicectomy as conversion to open procedure is not an admission of failure but is a sensible and mature decision. With experience and operating patients beyond learning curve laparoscopic procedure was proved to be as safe as time tested conventional open appendicectomy procedure.

COMPARISON OF COSMETIC BENEFITS

- Patients during their follow up are asked about their subjective opinion on cosmetic results. When asked about tissue scars, most of the patients in laparoscopic group felt the scar almost negligible one month after discharge, which did not change in open appendicectomy group.
- Wound complication rates such as surgical site infections are more common in open method as compared to laparoscopic method. The lower infection rate in laparoscopic method can be explained by extraction of infected appendix through the lumen of cannula, so that appendix is not in direct contact with skin.
- The other explanation is less tissue handling. More tissue handling and increased tissue trauma and wound haematomas may increase the wound infection rate in open appendicectomy.

SUMMARY

In the present study titled **A COMPARATIVE STUDY OF OPEN Vs LAPAROSCOPIC APPENDICECTOMY IN TERTIARY CARE HOSPITAL IN RAYALASEEMA REGION,** 100 patients with acute appendicitis aged between 10 and 60 years of either sex without any comorbid conditions and without complications were compared and following results obtained

1. The duration of hospital stay was lower in LA group (3.96+/-0.61 days) compared to OA group (4.96+/-1.11 days) and the difference is statistically significant($p<0.001$)
2. The duration of operation is more in LA group (56.4+/-14.88 min) compared to OA group(32.18+/-16.04) and the difference is statistically significant($p<0.001$)
3. Intra operative complications were very minimal in both OA and LA groups and doesnot show difference in intergroup comparisons
4. Post operative pain measured by visual analogue scale were significantly lower in lap group compared to open group on all post op days.($p<0.001$)
5. LA patients required low level of post operative analgesia than OA group and the difference is significant statistically
6. In both LA and OA groups there is no difference observed in regain of bowel sounds and resumption of oral feeds
7. LA group patients attended their regular duties earlier than OA group and the difference is significant statistically
8. LA group patients were more satisfied than OA group in terms of both wound complications and cosmesis

CONCLUSION

This study concludes that even though laparoscopic appendicectomy is a time consuming it is associated with less post-operative pain and reduced analgesic requirement, faster recovery, significantly low wound related complications and infections with better cosmetic benefits

Laparoscopic appendectomy is equally safe, and can provide less post-operative morbidity in experienced hands, as open appendectomy. Most cases of appendicitis can be treated laparoscopically. Since quality of life of the patients was an important aim of this study, monitoring the postoperative pain, postoperative requirement of analgesics showed laparoscopic procedures to have more advantage and give superior results.

Laparoscopic procedures hold promise by decreasing the loss of earning days by an early return of normal activity and shorter hospital stay. Hence it is beneficial in a developing country like ours where majority of the patients are daily wage workers.

Hence LA holds a promising prospect and may replace OA in the near future as the method of choice for effective and qualitative clinical management of appendicitis in emergency and in elective set up.

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