

## A Comparative study between OPEN and LAPAROSCOPIC APPENDICECTOMY at a Tertiary Care Teaching Hospital in East Godavari.



### General Surgery

#### KEYWORDS:

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#### ABSTRACT

Since 1987, laparoscopy has emerged as a new technique both for the diagnosis and treatment of acute appendicitis. The superiority of laparoscopic appendectomy over conventional appendectomy continues to be a cause of some debate. There are a number of theoretical advantages for the laparoscopic approach including decreased incidence of wound affection, less pain and reduced hospitalisation.

Our institution is well equipped with a laparoscopic surgical unit since 2006 as well as senior staff trained in laparoscopy. This study was chosen to evaluate laparoscopic appendectomy in a prospective and scientific fashion with respect to the above factors as well as others, thus aiding to substantiate facts, rectify errors of learning curve as well as to install a broader interest in laparoscopy with respect to other surgeries as well.

#### AIMS AND OBJECTIVES OF THE STUDY

- To study the period of hospital stay in each group.
- To study the duration of surgery in each group.
- To study the intra and post-operative morbidity in each group.
- To study the duration of drug use in each group.

#### PATIENTS AND METHODS

##### BACKGROUND:

In our hospital, Konaseema Institute of Medical Sciences & Research Foundation (KIMS & RF), Amalapuram, the laparoscopic surgical unit started functioning by the year 2006-2007. Some of our staff had undergone a basic training in laparoscopy from various other institutes and were making use of the facilities in our hospital. After a two year period of learning curve laparoscopic surgeries were being done on a regular basis. Laparoscopic appendectomy along with other surgeries like laparoscopic cholecystectomy and diagnostic laparoscopy are being done.

Open appendectomies are also being done quite frequently electively as well as on an emergency basis by some surgeons. This study was thus taken up to evaluate the outcome of both groups in a prospective scientific manner.

##### TYPE:

This is a prospective study which includes all patients admitted for elective appendectomy during a two year period from 2014 to 2016.

##### PATIENTS:

All patients between 15 years to 65 years were included in the study as paediatric laparoscopic surgery has not been attempted in our hospital. The patients requiring emergency appendectomy were excluded as emergency laparoscopic appendectomy is not done in our hospital. Only those admitted for elective appendectomy are included in the study – i.e., those who had a clinical diagnosis of acute appendicitis 1-2 months prior and whose symptoms had subsided and were readmitted for interval appendectomy.

##### METHODS:

The patients were admitted on an outpatient basis and each one underwent a detailed interview regarding the presenting illness and other relevant details and a detailed clinical examination as per a pre written proforma.

They were explained the nature of the disease and were told the two available types of surgeries for appendectomy and written informed consent was taken.

The patients were randomized based on the surgeon available and the surgeon's preference at the time of the surgery – which varied based on the number of elective surgeries for that day.

##### Conversion to open cases:

These included laparoscopic appendectomy which had difficulties and that require conversion to open but were included under the laparoscopic group.

##### Duration of hospital stay:

It is taken as the number of days from date of surgery to date of discharge.

##### Duration of surgery:

This is locked from the time of incision or Veress needle application till the dressing of the wound.

##### Number of days drugs were used:

This is calculated as the number of days drugs were given (both parenterally and orally) and divided into two groups i.e. antibiotics and analgesics.

##### Cosmesis:

At the 3 week follow up patients were asked as to the satisfaction regarding the operative scar and were tabulated as – Unacceptable/ Average/ Acceptable / Good / Excellent.

##### Histopathology:

All excised specimens were sent for histopathology and were confirmed as inflamed appendices.

##### Statistical analysis:

The results obtained were tabulated and analysed by standard statistical procedures. (SPSS Software: Version 19)

##### Conclusions:

The results were compared to other related studies and conclusions were drawn.

##### OBSERVATIONS AND RESULTS

The study was conducted prospectively within the said time frame of 2014-2016. A total of 286 patients were admitted in the department as per the inclusion criteria.

Of these 286 cases, as per the availability of the laparoscopic surgeon and O.T staff and the prior permission of the anaesthesiologist, 34 cases underwent laparoscopic appendectomy. Out of these 34 cases, 2 cases were converted to open appendectomies, but were included in the laparoscopic list.

The remaining 252 cases underwent open appendectomy as per the standard procedure mentioned in the materials and methods and data was collected.

For the purpose of comparison, the sample size of O.A. cases were made equivalent to the L.A. cases. For this the 'systematic sampling technique' was used, in which every 7<sup>th</sup> case was selected for the study.

Finally all the observations of these 68 cases selected for the study were tabulated and conclusions drawn. The following are the details of the results:

Total Cases studied	68
No. of open appendectomy cases	34
No. of laparoscopic cases	34

(Of which 2 were converted to open)

**Sample size:**

The sample size was 68 cases. Of which 34 underwent laparoscopic appendicectomy and 34 underwent open appendicectomy. Out of the 3 L.A. cases, 2 cases were converted to O.A. This was due to uncontrolled bleeding intraoperatively and difficult adherent retrocecal appendix respectively.

**Observations on duration of surgery:**

**Table 1: Duration of surgery in study**

	L.A.	O.A.	P Value
Duration of surgery in minutes (standard deviation)	87.4 (25.53)	40.9 (10.42)	t = 9.83 P < 0.0001

As per the method, the duration of surgery was clocked from the time of incision to the final dressing. Thus the time for giving anaesthesia was excluded.

**Observations on the period of hospital stay:**

**Table 2: Period of hospital stay in study**

	L.A.	O.A.	P value
Period of hospital stay (in days) (standard deviation)	3.74 ( 1.46)	7.5 (2.0)	t = 8.85 P < 0.0001

Patients were discharged not based on the suture removal time but when they were ambulant and comfortable to go home. Sutures were removed on an O.P basis for both groups. The period of hospital stay was calculated from the day of surgery.

The L.A. group observed an average mean period of hospital stay of 3.74 days versus a mean of 7.5 days in the O.A. group.

The duration of hospital stay was more in cases that developed stitch abscess and wound infection. Also patients in the L.A. group were ambulant by the 2<sup>nd</sup> day and required less parenteral medications.

**Observations on the days on antibiotics usage**

**Table 3: Days of antibiotics usage in study**

	L.A.	O.A.	P Value
Days of antibiotics usage (Standard deviation)	6.1 (0.3)	8.3 (0.7)	t = 16.84 P < 0.0001

**Observations regarding the days of analgesic usage**

**Table 4: Days of analgesic usage in study**

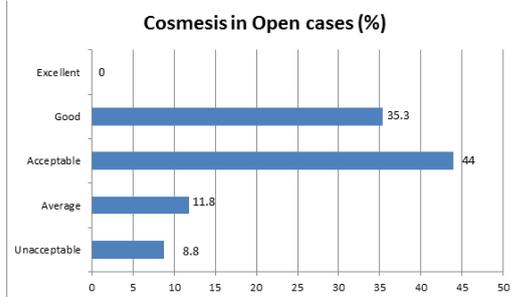
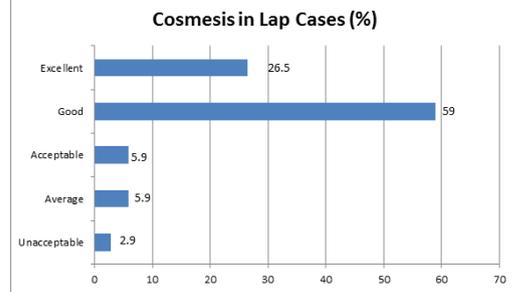
	L.A.	O.A.	P Value
Days of analgesic usage (Standard deviation)	2.97 (0.76)	4.9 (0.8)	t = 10.19 P < 0.0001

**Observations regarding intra-operative and post-operative complications**

**Table 5: Complications of open cases**

Complications	No. of Cases (%)
1. Stitch abscess	3 (8.8%)
2. Wound infection	4 (11.8%)
3. Delayed healing	1 (2.9%)
4. Retrocecal adherent	3 (8.8%) appendix
5. Intra-op bleeding	1 (2.9%)

**Observations on following up:**



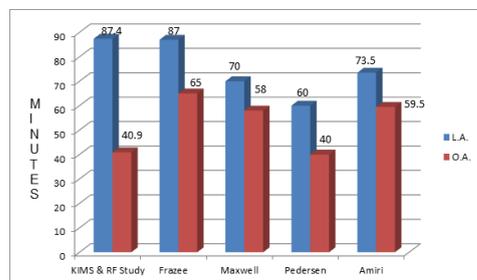
**Bar Chart I: Cosmesis in operated cases**

**DISCUSSION**

This study was conducted in our hospital Konaseema Institute of Medical Sciences and Research Foundation (KIMS & RF), Amalapuram within a time frame of 2014 to 2016. In this time frame, the department of surgery conducted 34 cases of laparoscopic appendicectomies electively all of which were included in the study. 34 cases of electively conducted open appendicectomies were selected randomly (as mentioned in the observations).

During this research period some studies which are cited as references gave some contrasting conclusions such as a study which was published by Namir Katkhouda<sup>(8)</sup> et al, concluded that L.A. was not superior to O.A. Such studies were found to be very limited in number and a majority stated the benefits of L.A. over O.A.

The observations and calculated means were subjected to statistical significance test called the **students 't' test**. The result showed that the differences were significant.

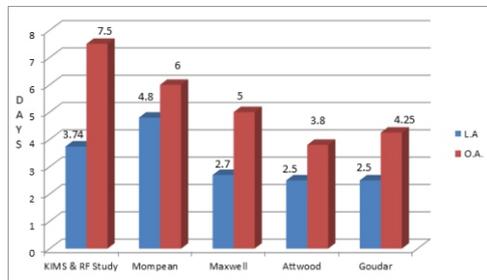


**Bar Chart 2: Duration compared with other studies**

Other studies quoted in literature on the duration of surgery – Frazee<sup>(1)</sup> showed 65 minutes versus 87 minutes in (open versus laparoscopic). Nour Al Huda Amiri<sup>(6)</sup> showed 59.5 versus 73.5 min. Attwood<sup>(7)</sup> showed 51 minutes versus 61 min. (O.A. vs L.A.). Kum<sup>(4)</sup>, Mompean<sup>(5)</sup> and Hellberg<sup>(2)</sup> studies showed around 15 minutes lesser time in the laparoscopic group compared to KIMS & RF study of 87.4 minutes.

The duration of surgery is longer by around 10-15 minutes in the KIMS & RF study as compared to the other studies. This can be attributed to the less number of cases conducted laparoscopically in KIMS & RF and hence a steeper learning curves for the surgeons.

The duration of hospital stay in the KIMS & RF study showed a double again but this time O.A. cases stayed 7.5 days versus L.A. cases 3.74 days. The patients were discharged when they were ambulant and comfortable and were asked to come back for suture removal.



**Bar Chart 3:** Period of hospital stay compared with other studies

As to the reasons why KIMS & RF study showed a 2-4 days extra in discharging the cases post operatively especially O.A. cases can be attributed to the higher incidence of wound infection, the reluctance of the patients and their bystanders to go home – many of them needed an auspicious day to go home, and most of them were agriculturists and daily wage earners so were not in a hurry to return to work. Some patients wanted to go home only after suture removal.

On comparing other studies, the complications were slightly higher especially wound infection. This can be attributed to the poor hygiene of most patients and their low socio economic status in spite of the meticulous care taken pre and intra-operatively.

**Table 6: KIMS & RF study parameters compared with other studies**

Study	No. of patients O/L (Conversion rate %)	Operation time (Minutes)	Length of Hosp. stay (days) O/L	Return to routine (days) O/L	Wound infection % O/L
KIMS & RF (2014-2016)	34/34 (5.9%)	40.9/87.4	7.5/3.74	--	23.5/11.8
Fraze <sup>(1)</sup>	37/38	65/87	2.8/2	2/14	8/5
Kum <sup>(4)</sup>	57/52	40/43	4/3	30/17	9/0
Mompean <sup>(35)</sup>	100/100	46/51	6/4.8	--	7/1
Attwood <sup>(7)</sup>	32/30	51/61	3.8/2.5	16/10	3/0
Hellberg <sup>(2)</sup>	256/244 (12%)	35/60	--	--	--

All 'P' values < 0.05

A study published by Frazee<sup>(3)</sup> et al in April 2016 also threw light on Outpatient laparoscopic appendectomies stating Outpatient laparoscopic appendectomy can be performed with a high rate of success, low morbidity, and low readmission rate.

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