

Laparoscopic Appendectomy in the Pediatric Population It's Advantages, Disadvantages and Difficulties

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Abstract

Introduction: Open appendectomy remains the gold standard for the treatment of appendicitis. Postoperative complications of open appendectomy are more severe than laparoscopic appendectomy (LA), and this is observed even in those patients with negative appendectomy. Laparoscopic appendectomy (LA) offers numerous advantages for children with appendicitis, it's crucial to acknowledge potential limitations and disadvantages compared to traditional open surgery.

Aims and Objectives: To comprehensively evaluate the use of laparoscopic appendectomy in the paediatric population, including its advantages, disadvantages, and potential difficulties encountered during the procedure.

Objectives of the study

Primary objectives: To study the advantages, and disadvantages of laparoscopic appendectomy in children.

Secondary objective: To study the difficulties of Laparoscopic Appendectomy in the paediatric population.

Material and Methods

Study Design: A quasi-experimental study.

Study Site: The study will be conducted in the outpatient department (OPD) in a tertiary health care centre in Maharashtra.

Study Population: This study consists of the paediatric patients (age group: 6-12 years) admitted to the outpatient department (OPD) at the tertiary care Centre with simple appendicitis.

Study Duration: The study will be conducted for 18 months from 1st July 2022 to 31st January 2024.

Sample Size and Sampling Method: The sample size is determined by the Complete Enumeration method.

Result: Total of 50 participants in the study. There are 25 male participants, which is 50% of the total. There are 25 female participants, which is also 50% of the total. The Pelvic position group has 4 participants, which is 8% of the total. The preileal, paracaecal and postileal position group has 2 participants each, which is 4% each of the total.

Discussion: Laparoscopic appendectomy is safe, feasible, and effective procedure in the management of complicated appendicitis in children.

Keywords: Appendix, Hernias, Large Incisions, Laparoscopic Appendectomy, Paracaecal

Introduction

The treatment of appendicitis, once synonymous with large incisions and prolonged recovery times, has undergone a dramatic transformation in recent decades. Laparoscopic appendectomy, a minimally invasive approach to removing the appendix, has revolutionized surgical practice and significantly improved patient outcomes. This introduction delves into the fascinating history of this groundbreaking technique, highlighting key milestones and pioneers who shaped its evolution.

The history of laparoscopic appendectomy is a testament to the relentless pursuit of innovation in surgical care. From its humble beginnings to its current widespread adoption, this technique has revolutionized the treatment of appendicitis and continues to evolve, offering patients faster recovery times, improved comfort, and overall better outcomes.

Laparoscopic appendectomy has become the gold standard for treating uncomplicated appendicitis in many parts of the world.

The sharp sting of appendicitis in children meant facing the traditional ordeal of open surgery. Large incisions, prolonged recovery times, and the potential for complications were unfortunate realities. However, a revolution has quietly transformed the landscape of paediatric appendicitis treatment: laparoscopic appendectomy (LA).

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Inclusion Criteria

- 6-12 years Patients with complaints of pain in the abdomen (right iliac fossa) with USG suggestive of appendicitis.

Exclusion Criteria

- Patients with age less than 6 years (because of the non-availability of small laparoscopic instruments at the institute) and age more than 12 years.
- Any patient who does not give consent to be part of the study.

Statistical analysis

- Data will be recorded in a predesigned case

Result

Table 1: Age-wise distribution of Study participants

Sn.	Age Groups (YEARS)	Frequency (N=50)	Percentage (%)	Mean Age
1	06-09	5	10%	11.25+/-1.34
2	10-12	45	90%	
	Total	50	100%	

The table shows the age-wise distribution of 50 study participants. The 06-09 years age group has 5 participants, which is 10% of the total. The mean age for this group is 11.25 years with a standard

record form compiled in Microsoft Excel version 2018 and analysed.

- Descriptive statistics for quantitative variables will be represented as mean +/- SD.
- Qualitative variables will be represented as frequency & percentages.
- Fisher test or Chi-square test will be used to test the association of columns and rows in tabular data, in the case of qualitative, categorical data.
- Pearson or Spearman correlation will be done, depending on the normality of the distribution, to evaluate the correlation of any variable.
- Graphical representations will be done wherever applicable. The level of significance will be considered as $P < 0.05$.
- Data will be analysed using Graph pad prism software version 3.06

deviation of 1.24 years. The 10-12 years age group has 45 participants, which is 90% of the total.

Figure 1: Age-wise distribution of Study participants.

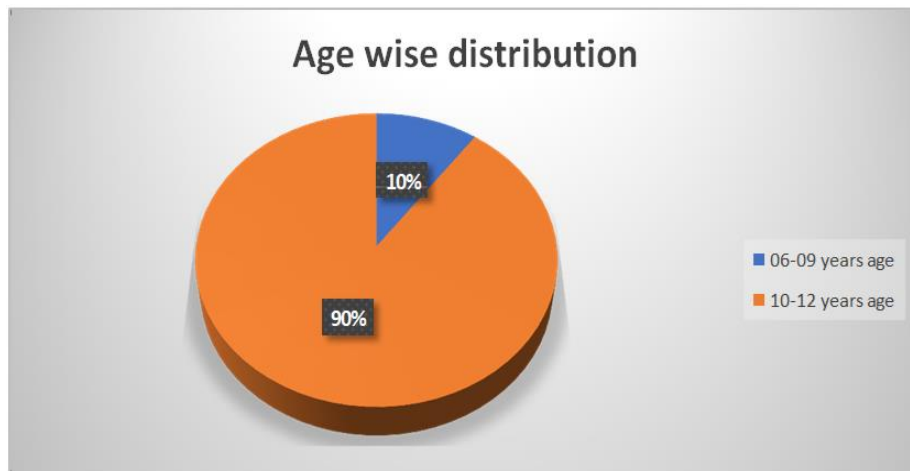


Table 2: Gender-Wise Distribution of Study Participants

Sn.	Gender	Total	Percentage (%)
1	Male	025	50%
2	Female	025	50%
	Total	50	100%

The table shows the gender-wise distribution of 50 study participants. This indicates that the study has an equal representation of male and female participants.

Figure 2: Gender-wise distribution of Study Participants

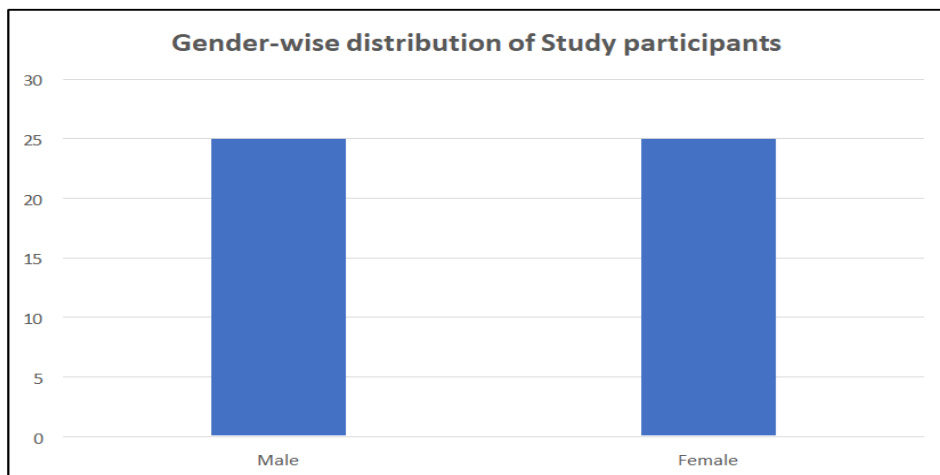


Table 3: Appendix Position-Wise Distribution of Study Participants

Sn.	Appendix position	Frequency (N=50)	Percentage (%)
1	Retrocecal	40	80%
2	Pelvic	04	8%
3	Paracaecal	02	4%
4	Preileal	02	4%

5	Postileal	02	4%
	Total	50	100%

The participants are divided into five groups based on the position of the appendix: The Retrocecal position group comprises 40 participants, which is 80% of the total. The Pelvic position group has 4 participants, which is 8% of the total. The preileal, paracaecal and

postileal position group has 2 participants each, which is 4% each of the total. This indicates that the majority of the study participants have a Retrocecal appendix position.

Figure 3: Appendix position-wise distribution of Study Participants

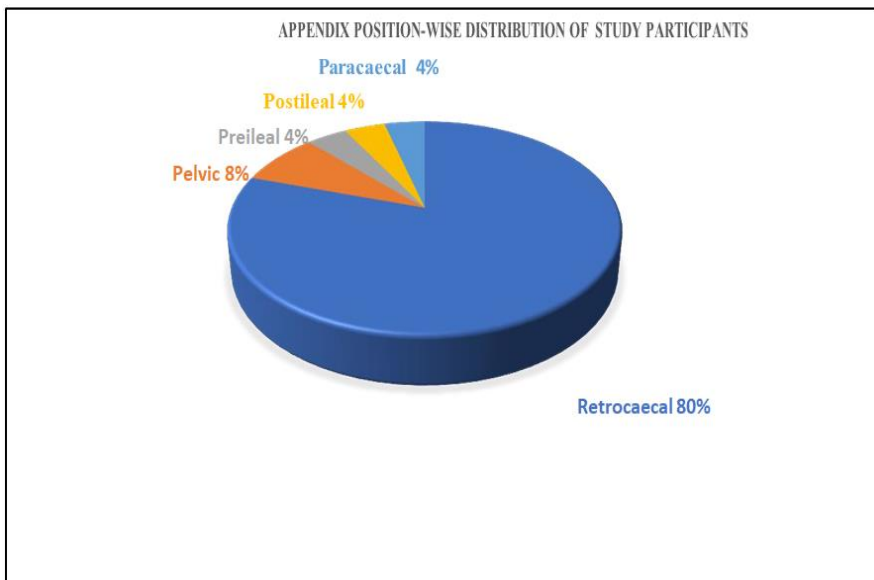


Table 4: Blood Loss-Wise Distribution of Study Participants

Sn.	Blood Loss	Total	Percentage (%)
1	<50 ml	049	98%
2	50-100 ml	001	02%
	Total	50	100%

This table shows the distribution of study participants based on their blood loss during a medical procedure. As you can see, the majority of participants (98%)

experienced blood loss of less than 50 ml. Only a very small percentage (2%) experienced blood loss between 50 and 100 ml.

Figure 4: Blood Loss-wise distribution of Study participants.

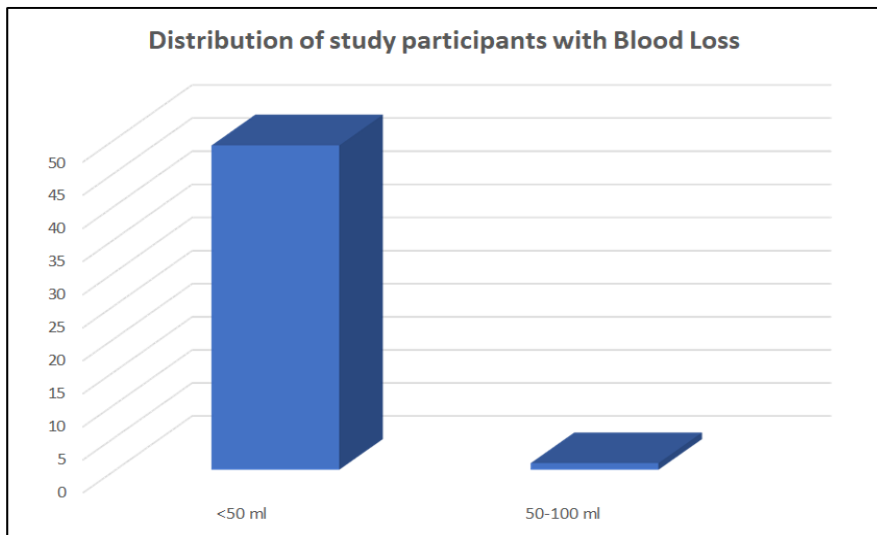


Table 5: Wound Site Infection-Wise Distribution of Study Participants

Sn.	Wound site infection	Total	Percentage (%)
1	Present	02	4%
2	Absent	48	96%
	Total	50	100%

There are a total of 50 participants in the study.

The group where wound site infection is present comprises 2 participants, which is 4% of the total. The group where wound site infection is absent has 48

participants, which is 96% of the total. This indicates that the majority of the study participants did not have a wound site infection.

Figure 5: Wound site infection-wise distribution of Study Participants

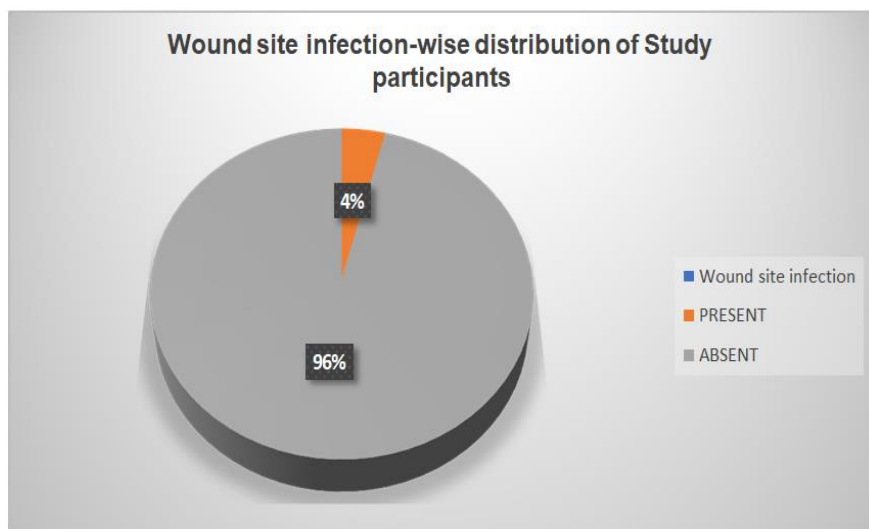


Table 6: Distribution of study subjects as per the postoperative course

Sn.	Details	Laparoscopic appendectomy (LA) Mean + SD
1	Time to resumptions of oral feeds (days)	1.1± 0.202
2	Duration of hospital stay	1.3 ± 0.4
3	Time to return to normal duties	9 ± 2.1

Table 6 summarizes the average time it took study participants to resume certain activities after their laparoscopic appendectomy (LA) surgeries.

Table 7: Length of Hospital Stay (Days)-Wise Distribution of Study Participants

Sn.	Duration	Discharge day
1	Mean	1.3
2	Median	1
3	Minimum	1
4	Maximum	2
5	Standard Deviation	0.458
6	Range	1-2

Table 7 compares the average length of hospital stay for participants who underwent Laparoscopic appendectomy. Participants who had simple appendectomies stayed in the hospital for an average of 1.3 days, with a standard deviation of 0.45 days.

Table 8: Clinical Effect Indexes Laparoscopic Appendectomy

Sn.	Characteristics	Laparoscopic Appendectomy			
		Minimum	Maximum	Mean	Std. Deviation
1	Time to get out of bed (day)	0.75	1.00	0.95	± 0.101
2	Time to take food (day)	1.00	1.5	1.1	± 0.202
3	Catheterization time (day)	0.50	0.75	0.625	± 0.126
4	Time to take antibiotics (day)	3.50	4.00	3.75	± 0.252
5	Length of Incision (cm)	1.0	1.5	1.1	± 0.202
6	Volume of Bleeding (ml)	20	80	26.4	± 13.51ml

On average, patients could get out of bed within 0.95 days, with a slight variation of +/- 0.101 days. Most patients started eating after around 1 day after operation, with a small standard deviation indicating consistent timing. Urinary catheters were generally removed after 0.63 days on average, with a small variation. Antibiotic use continued for an average of 3.75 days, with some variation in individual durations. Laparoscopic incisions

were small, averaging around 1.1cm with some variation. The average blood loss during surgery was 26.4ml, with a range of 13-40 ml.

Discussion

- Minimally invasive: Laparoscopic surgery offers significant advantages over open surgery in children, as it results in:

- Smaller incisions: This leads to less pain, faster recovery, and improved cosmetic outcomes. (Sarkar et al., 2015)
- Reduced risk of post-operative complications: Such as wound infections, adhesions, and hernias. (Sarkar et al., 2015)
- Earlier discharge from hospital: Enabling faster return to normal activities. (Sarkar et al., 2015)
- Improved visualization: Laparoscopy provides magnified views of the surgical field, enhancing precision and potentially reducing the risk of surgical complications. (Bhatia et al., 2012)
- Faster return to bowel function: Studies have shown that children undergoing laparoscopic appendectomy tend to regain bowel function sooner compared to open appendectomy. (Cheng et al., 2014) This can be particularly beneficial in reducing postoperative discomfort and hospital length of stay.

Conclusion

The data strongly supports the overall effectiveness and efficiency of laparoscopic appendectomy in this paediatric population. Adult laparoscopic instruments can be used effectively in this paediatric population

The minimal disruption, low surgical impact and rapid recovery confirm the advantages of this approach compared to open surgery.

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