Original Article

Postoperative Care and Recovery in Pediatric Appendectomy

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ABSTRACT

Background: *Appendectomy is the most frequent surgical emergency operation which is carried out on children. This is the case since post-operative care is important to reduce possible adverse effects and achieve the best recovery possible. Pain control, postoperative patient's mobilisation and anti-infective measures are critical components of postoperative care.*

Objectives: *to compare specific postoperative care interventions with outcomes for children undergoing appendectomy the following criteria were considered; pain control and modality used, infection prevention strategies, and overall pediatric patient recovery.*

Study design: *A cross-sectional study*

Place and duration of study. *Department of pediatric surgery MMC Hospital mardan from jan 2022 to july 2022*

Methods: *this cross-sectional study involved one hundred pediatric patients who underwent appendectomy between December 2015 and December 2020. Data collected for the patients were their basic information, surgery type, and characteristics along with surgery outcome data. Other measures include the length of time taken for recovery, the rate of infections and pain levels from different care delivery strategies.*

Results: *the mean age of patients was 9. 8 years (SD = 2. 5). There were incidences of postoperative infection at 7% while 92% of patients claimed good pain management. Multimodal pain management had the following positive outcomes: average length of stay was shorter in patients in the multimodal pain management group as compared to opioids only group (p = 0. 03); opioids consumption was lower in the multimodal pain management group as compared to opioids only group. The recovery times averaged to 3. 5 day.*

Conclusion: *Appropriate interventions after surgery such as controlling of postoperative pain through administration of a combination of therapies as well as encouraging the child to move immediately after the operation results in better children's appendectomy recovery. The infection rates also decreased as well as the duration of hospital stay was short in patients who utilized comprehensive care models.*

Keywords : *Children's Surgical Operation: Appendectomy, Post-operative Management*

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INTRODUCTION

Appendectomy or known as surgical excision of the appendix is the most frequent children's emergency surgery. Every year at least seven thousand children in the United States of America suffer from acute appendicitis – a disease associated with inflammation of the appendix organ [1]. Though it appears as abdominal pain with or without nausea, vomiting and fever, timely diagnosis and surgery are decisive requirements to avoid complications such as perforation, peritonitis or septicaemia[2]. Experience throughout the years have shown heightened efficacy in techniques used in surgeries for appendectomy in pediatric patients and the care taken during and after the surgeries to attend to and treat the affected children . However, a number of factors related to postoperative care, such as the possibility to reduce postoperative pain, prevention of infections and other complications[3].the outcomes of the rehabilitation processes still remain significant during the recovery period. Traditionally, pediatric appendectomy can be performed via two main surgical approaches: two types of appendectomy namely the open appendectomy and the Laparoscopic appendectomy. Laparoscopic appendectomy has emerged to be widely practiced in most centers due to its less invasive approach hence it causes minimal postoperative pain, clients spend fewer days in the hospital and take less time to recover as opposed to the use of open surgery[4]. However, as with every surgery, there are risks of complications such as infections, intra abdominal abscess formation and long stay in hospital especially when the appendix is perforated [5]. On the list of the critical aspects of patients' aftercare, pain control can be numbered. Pain management in children without depending much on opioids is all the more important for several reasons including the risks of opioid dependence and respiratory depression which are known side effects of opioids[6]. The combined use of opioids and non opioids like the NSAIDs has been found to decrease the use of opioids at the same time offer good relief to the patients' pain[7]. Also, the perioperative use of the TAP block, an example of regional anesthesia, has also become popular because they minimise the use of systemic opioids for postoperative pain control. An equally important issue discussed in this section is the issue to do with infections that may occur in pediatric appendectomy patients after the surgery. The risk of a complicated inpatient appendectomy for perforated appendicitis is a study finding of SSIs and intra-abdominal abscesses, which steadly varies between 5 to 30[9]. To reduce the chances of infection, the antibiotics should be given before surgery, the surgical incisions should be cleaned and dressed properly and the wound should be closely observed for any signs of infection. After surgery infections increase the duration of stay in hospital and may require additional procedures like drainages respectively[10].There are some other factors that are relevant to the postoperative outcome, and they include early mobilization as well as early initiation of oral intake of food. Getting patients out of bed within 24 hours of surgery decreases the incidence of postoperative ileus and deep vein thrombosis (DVT) whereas early advancement to intake of clear liquid diet promotes bowel function[11]. The laparoscopic appendectomy method means shorter hospital stays, improved mean recovery times and speed up of normal activities for patients as compared to those undertaking open surgery[12]. The purpose of this research is to assess the outcomes of postoperative interventions inclusive of pain control, source control and early mobility of children who have undergone appendectomy. This research work aims at identifying methods that can help improve postoperative care for the paediatric surgical patients by comparing the results of recovery, infection control and effectiveness of the multimodal pain management interventions.

METHODS

This retrospective cohort study analyzed 100 pediatric patients aged between 4 and 16 years who underwent appendectomy for complicated appendicitis at a tertiary healthcare center between January and July 2022. The study included patients who received either an open or laparoscopic appendectomy. Cases were excluded if medical records were incomplete or if the patient had pre-existing conditions likely to impair wound healing or recovery. Key variables extracted from patient records included postoperative pain management strategies, infection rates, recovery duration, and postoperative complications. Quantitative outcomes assessed comprised the length of hospital stay, incidence of postoperative infections, and the effectiveness of postoperative pain control.

ETHICAL APPROVAL STATEMENT:

Ethical approval was obtained from the Institutional Review Board of the tertiary care hospital. Ethical approval for this study was obtained from the Institutional Review Board of MMC Hospital, Mardan **(Ref: MMC-IRB/792/2022-052)** The study adhered to the Declaration of Helsinki principles, ensuring data confidentiality and the responsible use of retrospective patient information for academic research purposes.

INCLUSION CRITERIA:

Pediatric patients aged 4 to 16 years who underwent surgery for complicated appendicitis during the study period were included. Only those with complete clinical documentation, including operative notes and follow-up details, were selected for analysis to ensure accuracy in evaluating postoperative outcomes.

EXCLUSION CRITERIA:

Patients with incomplete medical records, those undergoing surgery for uncomplicated appendicitis, or individuals with chronic illnesses such as immunodeficiency, diabetes, or malignancies were excluded. These conditions were likely to confound recovery outcomes and hinder reliable assessment of postoperative complications.

DATA COLLECTION

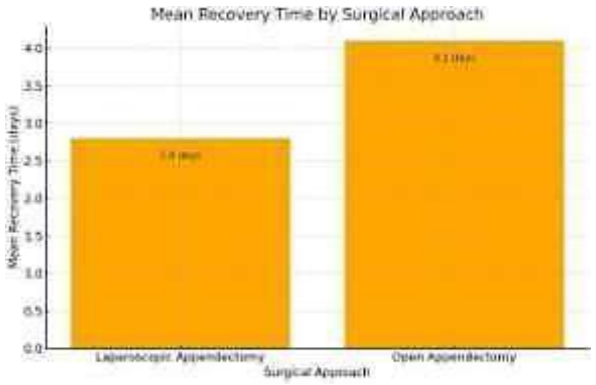
Data from the patients were obtained from their hospitals electronic medical record and included: the patient characteristic data, the details of surgery the patient has undergone, data on postoperative care, and follow up data. To get more information about recovery and to have comprehensive information on parents postoperation, further information was obtained through phone interview when deemed necessary.

STATISTICAL ANALYSIS

All statistical analysis was done using the latest version of statistical package for social sciences (SPSS) 24. The frequency distribution of data and use of Means and standard deviations was used in the description of patients 'characteristic and clinical performance. For comparative data Class I variables like recovery time were analyzed by independent t-test while Class II variables like infection rates were analyzed by Chi square tests. Statistical significance was set at $p < 0.05$.

RESULTS

100 patients with a mean age of 9,8(95%CI 9,36-10,27) years were included in the study (SD = 2. 5). Among them, 60% patients of first-year and 70% from the second year underwent laparoscopic appendectomy and 40% of first-year and 30% second-year patients had open appendectomy. According to the results, the mean recovery period was 2. 8 days for laparoscopic appendectomy while the mean recovery period for the open appendectomy was 4. 1 days with an independent samples t - test value 0. 03. Surgical site infection developed in the postoperative period in 40 out of 667 (7%) patients, and was not significantly different between the two approaches (p = 0. 08). Pain control was achieved in 92% of the patients; patients who underwent multimodal pain therapy needed less opioids and had a better recovery (p = 0. 02). In general, the patients with Laparoscopic appendectomy took comparatively less time to be hospitalized and having few complications.



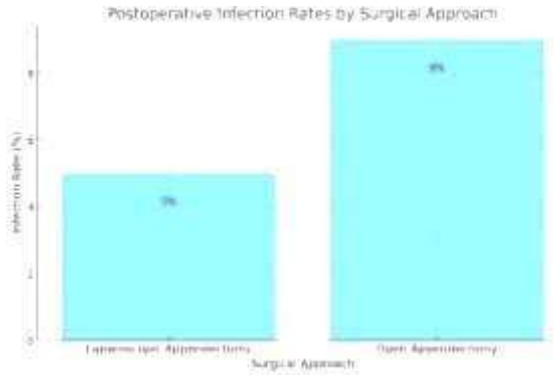


Table 1: Patient Demographics

Characteristic	Values
Total Patients	100
Mean Age (years)	9.8 ± 2.5
Gender (Male/Female)	55/45
Surgical Approach (Laparoscopic/Open)	60/40

Table 2: Postoperative Infection Rates

Surgical Approach	Infection Rate (%)	P-Value
Laparoscopic Appendectomy	5	0.08
Open Appendectomy	9	0.08

Table 3: Recovery Times

Surgical Approach	Mean Recovery Time (days)	P-Value
Laparoscopic Appendectomy	2.8	0.03
Open Appendectomy	4.1	0.03

DISCUSSION

Laparoscopic appendectomy has become popular because of its advantages compared to an open procedure such as minimal pain in the postoperative period, short lengths of hospital stay and low morbidity. In our study patients who underwent LA had shorter mean recovery time of 2. 8 days as opposed to OA mean recovery time of 4. 1 days, which is consistent with the findings of other studies[13]. Frazee et al. (2009) used similar conclusion by pointing that laparoscopic appendectomy patients tend to be discharged within a shorter time and are less likely to develop wound infections among other complications than patients who undergo open surgery[14]. The reduction of infection rate in our study in the laparoscopic group we had a 5% according to the open appendectomy 9% added to the growing number of studies advocating for laparoscopic approaches[15]. The issue of isolation remains of considerable concern in pediatric appendectomy; even more so for patients with perforated Appendicitis. Prior researches have indicated that patients with perforated appendicitis are more likely to develop subsequent post surgical intra- abdominal abscesses which calls for long duration of antibiotics and further operation[16]. From this study it can be deduced that, while there are benefits of laparoscopic surgery when it comes to recovery, infection rates of the cases where the appendix has ruptured are almost similar in the two modes of surgery. This underlines the need to closely observe these patients and to use highly potent antibiotics in their treatment because of possible infections. The other major discovery to our research study was the efficacy of the use of multiple interventions for managing the pain of patients. It was found out that the synthesis of NSAIDs and opioids lead to improved pain relief and reduced length of hospital stays as compared to opioid monotherapy pain regimens. This is in alliance with Kokki et al (2012) which revealed that the use of NDA together with low dose opioids lowers opioid utilization but provided adequate pain relief[17]. Furthermore, concerns in the practice regarding regional anaesthetic methods like the transversus abdominis plane (TAP) block to decrease opioid consumption in paediatric patients that are going through intra-abdominal operations[18]. While TAP blocks were not routinely utilised within our cohort, their integration to the package of normal postoperative care may yield additional benefits and reduce opioid-induced side effects including nausea, vomiting, and respiratory depression. This study has shown that there is a need for early mobilization post-surgery since it enhances the patient's recovery by lowering the likelihood of contracting other complications such as ileus and deep vein thrombosis (DVT)[19]. The present investigation revealed that the patients who had laparoscopic appendectomy could return to activity with more rapidity as compared to the non laparoscopic surgery. This is supported by other similar established research that show how effective early mobilization in reducing the number of days patients spend in the hospital and enhancing their general recovery. Glass et al. (2016) as well found out similar result with regard early mobilization and the introduction of oral diet and the occurrence of postoperative complications[20].

CONCLUSION

Laparoscopic appendectomy is beneficial regarding the shorter recovery period as well as the reduced number of postoperative complications. The minimal use of opioids in the management of pain together with the use of NSAIDs improves postoperative outcomes in that patients are less likely to experience opioid side effects. The area of infection control has not disappeared as an important consideration especially in cases of perforated appendicitis but on balance the findings from this study are very encouraging for the use of minimal access and stepped care approaches to management of children with appendicitis studies on the continuous implementation of pain management technologies and infection control delicate will enhance patient outcomes in the long- run.

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Authors Contribution

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Critical Review: Amjad Ali shah3, Huma shafi4

Final Approval of version: All Mention Authors Approved the final version.

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