Original Article

Timing of surgery as a predictive factor of complicated appendicitis and postoperative outcome

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Abstract

Aims: The association between time to appendectomy and risk of complicated appendicitis and the effect of preoperative delay on postoperative outcome in appendectomy.

Settings and Design: An institution based prospective study, performed during a 2 Year period of august 2016 to august 2018. Data collected from patients who have undergone appendectomy for appendicitis at NRI general hospital.

Methods and Material: Patients admitted with appendicitis and have undergone appendectomy form august 2016 to August 2018 at NRIGH. Patients of age 9 years and above who have undergone appendectomy and interval appendectomy for appendicitis were included in the study. Patients who undergone appendectomy for causes other than appendicitis have been excluded from the study.

Results: Surgery performed 38 hours after the onset of symptoms is associated with a higher risk of complications like surgical site infection, ileus and faecal fistula. Also, when the presentation is delayed, the risk for pathological progression to complications like perforation, gangrene, abscess formation and peritonitis increases.

Conclusions: Early surgery decreases the risk of complications in appendicitis. Appendicitis getting complicated and postoperative complications are more common with delay in surgery from the time of onset of symptoms.

Keywords: Appendicitis, delay in surgery, complicated appendicitis, postoperative complications.

Key Message: Increase in the timing of surgery from the onset of symptoms is associated with higher risk of complicated appendicitis and postoperative complications.

Introduction

Acute appendicitis is one of the most common causes for the presentation of acute abdomen¹. Delay in diagnosis and surgery result in perforation, which rises by 5% for each 12-hour

period after 36 hours of the onset of the symptoms². Many studies support emergency appendectomy to avoid perforation of appendix^{3,4}. Certain studies reveal that there is an increase in the risk of complications with delay in surgery^{5,6}.

The concept of emergency appendectomy has been recently challenged by studies, which suggested that acute appendicitis could be treated medically and delaying surgery did not show any increasing morbidity^{7,8}. These studies suggest unnecessary surgery can cause postoperative ileus. Early presentation and preoperative diagnosis of complicated appendicitis will aid in immediate surgical intervention and prevention of impending peritonitis. Delay in presentation is also associated with a longer period of hospitalization and greater utilization of healthcare resources.

Subjects and Methods

This study was performed from August 2016 to August 2018. Data was collected from patients who have undergone appendectomy for appendicitis at NRI general hospital, Chinakakani. Patients who have undergone appendectomy for appendicitis and patients who underwent interval appendectomy were included in the study. Patients who underwent negative appendectomy and patients who underwent appendectomy for cause other than appendicitis were excluded from the study. Patients diagnosed with appendicitis were started on antibiotics and laparoscopic or open surgery was done. Patients with an Alvarado score less than 7 and patients with were managed conservatively and planned for interval appendectomy. Patients with appendicular abscess were started on antibiotics, managed conservatively and planned for interval appendectomy. On diagnosis of appendicitis the pathological progression of the disease was noted in relation to the delay in the surgery from the time of onset of symptoms was noted. Perforated appendicitis, appendicular abscess and gangrenous appendicitis were considered as complicated appendicitis. Post operatively patients were monitored and wound care done. Postoperative complications such as wound infection, faecal fistula formation, ileus were noted and managed.

Results

A total number of 50 patients were admitted with a primary clinical diagnosis of suspected acute appendicitis during the study period from August – 2016 to August– 2018

Table1: Age and Sex Distribution of Study Participants (n=50)

AGE	SEX		TOTAL	
	MALE	FEMALE	NUMBER	PERCENT
10-19	13	04	17	34%
20-29	10	06	16	32%
30-39	06	03	09	18%
40-49	03	01	04	08%
50 and above	03	01	04	08%
total	35	15	50	100%

Of the study population of 50, with a male predominance of 35 patients and 15 patients were female. With a higher occurrence in the age groups 10-19 years of age followed by 20-29 years of age.

Table 2: Time of presentation from the onset of Symptoms

Timing of presentation from onset of symptoms	No. of patients	Percentage
<24hours	18	36%
24-48 hours	26	52%
>48 hours	06	12%

18 patients presented to the emergency department within 24 hours from the onset, 26 patients within 24- 48 hours.6 patients were started on conservative management, 6 patients presented to the emergency department 48 hours after the onset of symptoms.

Table 3: Complicated Appendicitis in Relation to in relation to onset of Symptoms

Time of surgery	Gangrene appendicitis	Perforated appendicitis	Appendicular abscess	Total
Within 24 hrs	1	0	0	1
24-48 hours	1	1	1	3
>48 hours	0	2	2	4
				8

A total of 8 patients presented with complicated appendicitis. The progression to complicated appendicitis increased with the delay in presentation at the emergency department. One patient presented with gangrenous appendicitis within 24 hours. In patients who presented between 24- 48 hours, 3 patients presented with complicated appendicitis, 1 patient presented with gangrene appendicitis, 1 patient presented with perforated appendicitis and one patient presented with appendicular abscess. Of the patients who presented after 48 hours from the onset of symptoms

Table 4: Post Operative Complications in relation to timing of surgery

Timing of surgery from onset of symptoms	No. of patients n=50	Complications		
		WI	FF	Ileus
<24 hours	17	0	0	0
24-48 hours	23	1	1	0
>48 hours	04	2	0	0
Interval appendectomy	06	0	0	0

WI – Wound infection; FF- Faecal fistula

Postoperative complications were seen in 2 patients operated 24 hours after onset of symptoms and in 2 patients operated 48 hours after onset of symptoms.

Table 5: Postoperative Complications In Relation To Complicated Appendicitis

	POST OPERATIVE COMPLICATIONS
Complicated appendicitis (n=8)	3 (33%)
Uncomplicated appendicitis (n=42)	2 (4.54 %)

Postoperative complications were more commonly seen in patients who presented with complicated appendicitis.

Discussion

Appendectomy is one of the commonest abdominal surgeries practiced. Emergency appendectomy at the time of diagnosis was the standard of treatment for appendicitis till the last century. Any delay in the surgery was believed to progress to complicated appendicitis such as gangrenous appendicitis, perforated appendicitis and appendicular abscess impending to peritonitis or postoperative morbidity. Various studies have been done to compare the relation of surgery timing in appendicitis and associated complications. A larger number of studies demonstrated that delayed appendectomy caused pathological progression of the disease. Other studies suggested delay in the surgery did not increase complications. The quality of antibiotics was improved over the last few decades and interval appendectomy for periappendiceal abscess had shown better outcomes than early surgeries, suggesting nonsurgical management for abscess followed by interval appendectomy. This study aims at studying the affect of delay in surgery on progression to complicated appendicitis and the relation between timing of surgery and postoperative complications. The present study was compared with other studies.

A total of 50 patients were considered in this study group. The history of the patients was taken and the delay in presentation to the emergency was noted. The time of onset of symptoms was noted (umbilical/RIF pain). Clinical examination and laboratory investigations and meticulous work up were done. Pre operative antibiotics were given and selected patients posted for surgery, either laparoscopic or open. Intraoperative abdominal wash with warm normal saline was given to avoid postoperative complications. Out of a total of 50 patients, 3 patients were diagnosed with appendicular mass and were treated conservatively with antibiotics and planned for interval appendectomy. 3 other patients had an Alvarado score less than 7 and were treated conservatively and planned for interval appendectomy later. 8 cases of the total study

showed complicated acute appendicitis and the remaining 42, uncomplicated acute appendicitis. The study showed that an early intervention and surgery was associated with a better outcome, less postoperative complications and a shorter period of stay in the hospital. Early surgical intervention was associated with only wound infection whereas delaying more than 24 hours was more associated with higher rate of complicated appendicitis and in turn higher complications and morbidity such as faecal fistula.

Table 8: Relation between Presentational delay and Complicated Appendicitis

Presentation Delay	Zitouni H et al		Present Study	
	Complicated	Uncomplicated	Complicated	Uncomplicated
<24 hours	40%	34.7%	5.5%	94.4%
24-48 hours	55.3%	50.6%	11%	88.8%
>48 hours	4.5%	14.7%	50%	50%

Table 9: Postoperative Complications in relation to pre operative delay

POSTOPERATIVE COMPLICATIONS	ZITOUNI H et al	PRESENT STUDY
<24 Hrs	4.8%	0 %
24-48 Hrs	3.4%	8.69%
>48 Hrs	34.2%	50%

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