

Frequency, Causes and Outcomes of Delayed Appendectomy in Patients with Acute Appendicitis

SHAHID HUSSAIN MIRANI¹, DILEEP KUMAR², AZAD ALI LASHARI³

¹Associate Professor, Department of Surgery Unit-1, Ghulam Muhammad Mahar Medical College Sukkur

²Associate Professor of Surgery Ward 2, Jinnah Sindh Medical University/Jinnah Postgraduate Medical Centre Karachi

³Associate Professor, Department of Surgery, Khairpur Medical College Khairpur Mir's

Correspondence to: Dr. Shahid Hussain Mirani, E-mail: srgmirani@gmail.com, Cell 0300-8317731

ABSTRACT

Aims: To determine the frequency and causes of delayed appendectomy also examine the outcomes associated with delayed appendectomy in patients presented with acute appendicitis.

Study Design: Retrospective/Observational

Place and Duration of Study: Ghulam Muhammad Mahar Medical College Hospital, Sukkur from 1st January 2017 to 31st December 2019.

Methodology: Two hundred and ninety patients of both gender presented with acute appendicitis with ages 18 to 45 years were included in the study. Patients detailed demographic including age, sex, body mass index and complete blood count were recorded after taking written consent. All patients had gone through appendectomy under general anaesthesia. Frequency of delay in appendectomy and its causes were recorded. Patients received appendectomies after 12 hours of symptoms onset were considered as delayed. Outcomes such as hospital stay, wound infection, and perforation were examined.

Results: There were 182 (62.75%) male while females were 108 (37.24%) with mean age 32.48±4.62 years. Mean BMI was 25.24±2.04 kg/m². Delayed appendectomy was found in 72 (24.83%) patients. Misdiagnosed was the commonest cause of delay appendectomy found in 34 (47.22%) patients followed by afraid of operation in 20 (27.78%) and self medication in 13 (18.06%) patients. Patients with delayed appendectomies had higher perforation rate as compared to patients with no delay [24 (33.33%) vs 22 (10.09%)] p-value <0.05. Hospital stay was lower in patients received appendectomy within 12 hours as compared to delayed (1.89±1.03 days vs 2.76±1.44 days) p-value <0.05. Wound infection in delayed appendectomies found in 5 (6.94%) while in not delayed patients it was found in 4 (1.83%) patients the difference was not statistically significant.

Conclusion: Frequency of delayed appendectomy was high and misdiagnosed was the commonest cause of delayed appendectomy. Delayed appendectomy was significantly associated with perforation and longer hospital stay.

Keywords: Appendectomy, Delayed, Misdiagnosed, Perforation, Hospital Stay, Wound Infection

INTRODUCTION

The most common non-elective procedure performed by general surgeons is an appendectomy for acute appendicitis.¹ In general, an appendectomy has been approved within a few hours of diagnosis and a delay in the operation will result in an increase in morbidity.^{2,3} The gold standard treatment for acute appendicitis is called immediate appendectomy. Delays in diagnosis and care are generally believed to lead significantly to an increased incidence of perforated appendicitis, which raises morbidity in patients.⁴

Delays in diagnosis and surgery can lead to increased morbidity and death. In patients of older age groups the mortality rate is more than 20%, leading to delays in diagnosis, hospitalization and deferred treatment.⁵ In this age group, the heavy occurrence of co-morbidities and a large variety of variations contribute.⁶ There are many causes of delayed diagnosis and maladministration, including household delays, local physicians, quacks, homoeopathic patients and health care providers. Complex appendicitis can result in mortality, long-term residency and financial burden. Differential diagnosis of acute appendicitis, such as urinary tract infections, inflammatory pelvic diseases, ovarian cysts and gastroenteritis are other causes which are responsible for delays.⁷ There is also concern about unspecific pain and patient delay.⁸

We conducted present study with aimed to determine the frequency and causes of delayed appendectomy and its effects on postoperative outcomes.

MATERIALS AND METHODS

This study was conducted at Ghulam Muhammad Mahar Medical College Hospital, Sukkur from 1st January 2017 to 31st December 2019. A total of 290 of both gender presented with acute appendicitis with ages 18 to 45 years were included in the study. Patients detailed demographic including age, sex, body mass index and complete blood count were recorded after taking written consent. Pregnant women, patients with gangrenous appendicitis, and those with no consent were excluded. All patients received appendectomy under general anaesthesia. Frequency of delay in appendectomy and its causes were recorded. Patients received appendectomies after 12 hours of symptoms onset were considered as delayed. Outcomes such as hospital stay, wound infection, and perforation were examined. Data was analyzed by SPSS 24.0. Chi-square test was applied to compare the outcomes between delayed and not delayed appendectomies patients and P<0.05 was considered as significant.

RESULTS

There were 182 (62.75%) male while females were 108 (37.24%) with mean age 32.48±4.62 years. Mean BMI was

25.24±2.04 kg/m². 170 (58.62%) patients received laparoscopic procedure while 110 (41.38%) received open method (Table 1). Delayed appendectomy was found in 72 (24.83%) patients. Misdiagnosed by medical practitioner was the commonest cause of delay appendectomy found in 34 (47.22%) patients followed by afraid of operation in 20 (27.78%), self medication in 13 (18.06%) patients, and quacks medication in 7 (9.72%) patients (Table 2).

Patients with delayed appendectomies had higher perforation rate as compared to patients with no delay [24 (33.33%) vs 22 (10.09%)] p-value <0.05. Hospital stay was lower in patients received appendectomy within 12 hours as compared to delayed (1.89±1.03 days vs 2.76±1.44 days and P value <0.05. Wound infection in delayed appendectomies found in 5 (6.94%) while in not delayed patients it was found in 4 (1.83%) patients the difference was not statistically significant (Table 3).

Table 1: Demographic information of the patients

Variable	No.	%
Mean age (years)	32.48±4.62	-
Mean BMI (kg/m ²)	25.24±2.04	-
Gender		
Male	182	62.75
Female	108	37.24
Type of appendectomy		
Laparoscopic	170	58.62
Open	110	41.38

Table 2: Frequency and causes of delayed appendectomy

Variable	No.	%
Delayed appendectomy		
Yes	72	24.83
No	218	75.17
Causes of delayed (n=72)		
Misdiagnosed	34	47.22
Afraid of operation	20	27.78
Self medication	13	18.06
Quacks	7	9.72

Table 3: Comparison of outcomes between delayed appendectomy and not delayed appendectomy

Variable	Delayed	Not Delayed	P-value
Perforation	24 (33.33%)	22 (10.09%)	0.034
Hospital stay (days)	2.76±1.44	1.89±1.03	0.02
Complications			
Wound Infection	3 (4.16%)	4 (1.83%)	0.24
Appendicular abscess	4 (5.56%)	1 (0.46%)	0.07

DISCUSSION

Appendectomy has still been the most common non-elective surgical procedure performed by general surgeons.⁷ It is usually prepared at the time of diagnosis as appendicitis and done within hours to prevent the progression of inflammation. However, the quality of antibiotics is improved in the last few decades and interval appendectomy is shown better outcomes than early operation. In a recent study, peri-appendiceal abscess in selected cases could be managed by nonsurgical treatment without interval appendectomy.⁹ In the present study, we found that majority of patients 62.75% were males while

females were 37.25% with average age 35 years. These results were comparable to some previous studies.^{10,11}

In present study delayed appendectomy was found in 24.83% patients who presented 12-48 hours after symptoms on set. We found that among patients with delayed presentation the most common cause was misdiagnosed by medical practitioner, local doctors found in 34 (47.22%) patients followed by afraid of operation in 20 (27.78%), self medication in 13 (18.06%) patients, and quacks medication in 7 (9.72%) patients. A study conducted by Khan et al¹² reported that among 115 delayed presented patients the most frequent cause was quacks in 32.17% followed by misdiagnosed by physician in 26.08%, refusal of surgery in 13.04% and self medication found in 13.04% patients. Ingraham et al¹³ reported in their study that 15.1% patients underwent appendectomy more than 12 hours.

A study conducted by Khadim et al¹⁴ demonstrated that 21% of appendectomies patients show delayed management despite more than 48 hours. In their study delay diagnosis was found in 68% patients and patient behaviours were most frequent causes in delayed appendectomies.

In our study delay in the appendectomy has shown significant impact on favourable outcomes (p value <0.05) which is comparable with some studies that supported that the outcomes of immediate or prompt appendectomy were better than the outcomes of immediate or prompt appendectomy were better than those of delayed appendectomy produced more postoperative complication.¹⁵ On the other hand, Abou-Nukta et al¹⁶ suggested that there was no significant difference of outcomes between early and delayed appendectomy. The present study demonstrates that patients with delayed appendectomies had higher perforation rate as compared to patients with no delay [24 (33.33%) vs 22 (10.09%)] p-value <0.05. Hospital stay was lower in patients received appendectomy within 12 hours as compared to delayed (1.89±1.03 days vs 2.76±1.44 days) p-value <0.05. Wound infection in delayed appendectomies found in 5 (6.94%) while in not delayed patients it was found in 4 (1.83%) patients the difference was not statistically significant. A meta-analysis study done by Li et al¹⁷ demonstrated that no significant difference was observed regarding incidence of complicated appendicitis between delayed and early appendectomy group. Another study by Lee et al¹⁸ reported that overall elapsed time from onset of symptoms to surgery was positively associated with advanced pathology, increased number of complications, and prolonged hospital stay.

CONCLUSION

The frequency of delayed appendectomy was high and misdiagnosed was the commonest cause of delayed appendectomy. Delayed appendectomy was significantly associated with perforation and longer hospital stay.

REFERENCES

1. Tan V, Stavignon T, Chadad M, Dugue L. How can this be possible appendicitis after right colectomy? how this can be possible? J Vasc Surg 2014; 151(6):477-8.

2. Yardeni D, Hirschl RB, Drongowski RA, Teitelbaum DH, Geiger JD, Coran AG. Delayed vs immediate surgery in acute appendicitis: do we need to operate during the night? *J Pediatr Surg* 2004;39(3): 464-9.
3. Eidar S, Nash E, Sabo E, Matter I, Kunin J, Mogilner JG, et al. Delay of surgery in acute appendicitis. *Am J Surg* 1997;173(3): 194-98.
4. Cervellin G, Mora R, Ticinesi A, Meschi T, Comelli I, Catena F, et al. Epidemiology and outcomes of acute abdominal pain in a large urban emergency department: retrospective analysis of 5,340 cases. *Ann Transl Med* 2016;4(19): 362.
5. Bhangu A, Søreide K, Di Saverio S, Assarsson JH, Drake FT. Acute appendicitis: modern understanding of pathogenesis, diagnosis, and management. *Lancet* 2015; 386(10000): 1278–87.
6. Aswad S, Ahmad A, Ahmad S, Ali S, Ahmad S. Causes of delayed presentation of acute appendicitis and its impact on the mortality and morbidity. *J Ayub Med College Abbottabad* 2015;27(3):620-3.
7. Adamu A, Megatari M, Lawat K, Illyasu M. Waiting time for respectively emergency surgery Zaria Nigeria. *Health Sci* 2010;10(1):46-53.
8. Khalil J, Muqim RU, Impact of delay in acute appendicitis. *Pak J Surg* 2010;26(1)31-5 11.
9. Jalil A, Shah SA, Saaiq M, Zubair M, Riaz U, Habib Y. Seeking Alverado scoring system in prediction of acute appendicitis. *J Physician Surg Pak* 2011;21(12);753-5.
10. United Kingdom National Surgical Research Collaborative. Bhangu A. Safety of short, in-hospital delays before surgery for acute appendicitis: multicentre cohort study, systematic review, and meta-analysis. *Ann Surg* 2014;259(5):894–903.
11. Lugo JZ, Avgerinos DV, Lefkowitz AJ, Seigeman ME, Zahir IS, LO AY, et al. Can interval appendectomy be justified following conservative treatment of perforated acute appendicitis? *J Surg Res* 2010;167(1):91-4.
12. Khan J, Ali A, Sarwar B. Causes of Delayed presentation of acute appendicitis and how it affects morbidity and mortality. *JSMC* 2018; 8(1): 34-7.
13. Ingraham AM, Cohen ME, Bilimoria KY, Ko CY, Hall BL, Russell TR, et al. Effect of Delay to operation on outcomes in adults with acute appendicitis. *Arch Surg* 2010;145(9):886-92.
14. Kadhim A, Alshalah M, Kamil A. Causes and prevention of missing a diagnosis and late management of acute appendicitis. *Med J Babylon* 2016; 13: 370-7.
15. Andersson RE. Does delay of diagnosis and treatment in appendicitis cause perforation? *World J Surg* 2015; 40: 1315–7.
16. Abou-Nukta F, Bakhos C, Arroyo K, Koo Y, Martin J, Reinhold R, et al. Effects of delaying appendectomy for acute appendicitis for 12 to 24 hours. *Arch Surg* 2006;141(5):504–7.
17. Li J, Xu R, Hu DM, Zhang Y, Gong TP, Wu XL. Effect of delay to operation on outcomes in patients with acute appendicitis: a systematic review and meta-analysis. *J Gastrointest Surg* 2018; 23(1): 210-23.
18. Lee JM, Kwak BS, Park YJ. Is a one night delay of surgery safe in patients with acute appendicitis? *Ann Coloproctol* 2018;34(1):11-5.