ORIGINAL RESEARCH

Assessment of outcome of perforated appendicitis

[1]Dr. Rahul Pramod Patil, [2]Dr. Prateek Thakur

[1]Associate Professor, [2]Assistant Professor, Department of General Surgery, Krishan Mohan Medical College & Hospital, Mathura, Uttar Pradesh, India

Corresponding Author
Dr. Prateek Thakur
Assistant Professor, Department of General Surgery, Krishan Mohan Medical College & Hospital, Mathura, Uttar Pradesh, India

Received: 22 November, 2021 Acceptance: 25 December, 2021

ABSTRACT

Background: The most frequent cause of acute abdominal pain that necessitates surgical intervention is still acute appendicitis, which is also the most frequent general surgical emergency encountered in the majority of hospitals. The present study was conducted to assess outcome of perforated appendicitis. **Materials & Methods:** 58 patients with perforated appendix of both genderswere treated surgically. Parameters such as symptoms, mean duration of the hospital stay, surgical site infection, early complication and late complications were recorded. **Results:** Out of 58 patients, 32 were males and 26 were females. Symptoms were fever in 31, vomiting in 45, pain in abdomenin 58, loose stools in 6, distension of abdomen in 4 patients. Duration of hospital stay 3-5 days in 7, 5-10 days in 25 and >10 days in 26. Surgery performed was appendicectomy in 50, right hemicolectomy in 5 and tube cecostomy in 3. Early complications were surgical site infection in 4, wound dehiscence in 1, intestinal obstruction in 2, faecal fistula in 3 and death in 1. Late complications were intestinal obstruction in 2, intra-abdominal abscess in 1 and incisional hernia in 1 patient. The difference was significant (P< 0.05).Alvarado score 4-5 was seen in 4, 6-7 in 24 and 8-9 in 30 patients. The difference was significant (P< 0.05). **Conclusion:** A significant contributing element to appendicular perforation and its unfavorable consequences was the prehospital delay. Patients who presented late and had symptoms of generalized peritonitis and an appendix base perforation had a greater rate of morbidity and a longer hospital stay.

Keywords: acute appendicitis, right hemicolectomy, faecal fistula

INTRODUCTION

The most frequent cause of acute abdominal pain that necessitates surgical intervention is still acute appendicitis, which is also the most frequent general surgical emergency encountered in the majority of hospitals.[1] Patients most frequently arrive complaining of fever, stomach pain, and vomiting. Complications such as gangrene, perforation, peritonitis, and abscess formation result from delayed presentation.[2] The longer the symptoms last, the higher the percentage of perforations. Even though the death rate has significantly decreased recently, appendicular rupture still has a high morbidity risk.[3]

Inflammation of appendix is associated with obstruction in 50 to 80% of cases, mostly due to fecolith less commonly due to tumor, gall stone or worms.[4] Continuous secretion of mucinous fluid in an obstructed viscus leads to increase in intraluminal pressure sufficient to cause collapse of draining veins this leads to ischemic injury to the appendix.[5] Ischemia favors bacterial proliferation with additional inflammatory edema and exudation. Further hampering the blood supply. When acute appendicitis progresses to perforation, the consequences often lead to prolonged and difficult convalescence or even death.[6] A major cause of increased morbidity in perforated appendicitis is the delayed presentation with associated underlying co-morbidities.[7,8]The present study was conducted to assess outcome of perforated appendicitis.

MATERIALS & METHODS

The study was carried out on 58 patients with perforated appendix of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. All patients were treatedsurgically. Parameters such as symptoms, mean duration of the hospital stay, surgical site infection, early complication and late complications were recorded. Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 58		
Gender	**Male**	**Female**
Number	32	26

Table I shows that out of 58 patients, 32 were males and 26 were females.

Table II Assessment of parameters

Parameters	Variables	Number	P value
Symptoms	Fever	31	0.05
	Vomiting	45	
	Pain in abdomen	58	
	Loose stools	6	
	Distension of abdomen	4	
Duration of hospital stay (days)	3-5 days	7	0.74
	5-10 days	25	
	>10 days	26	
Surgery	Appendicectomy	50	0.01
	Right hemicolectomy	5	
	Tube cecostomy	3	
Early complications	Surgical site infection	4	0.88
	Wound dehiscence	1	
	Intestinal obstruction	2	
	Faecal fistula	3	
	Death	1	
Latecomplications	Intestinal obstruction	2	0.57
	Intra-abdominal abscess	1	
	Incisional hernia	1	

Table II, graph I shows that symptoms were fever in 31, vomiting in 45, pain in abdomen in 58, loose stools in 6, distension of abdomen in 4 patients. Duration of hospital stay 3-5 days in 7, 5-10 days in 25 and >10 days in 26. Surgery performed was appendicectomy in 50, right hemicolectomy in 5 and tube cecostomy in 3. Early complications were surgical site infection in 4, wound dehiscence in 1, intestinal obstruction in 2, faecal fistula in 3 and death in 1. Late complications were intestinal obstruction in 2, intra-abdominal abscess in 1 and incisional hernia in 1 patient. The difference was significant (P< 0.05).

Graph I Assessment of parameters

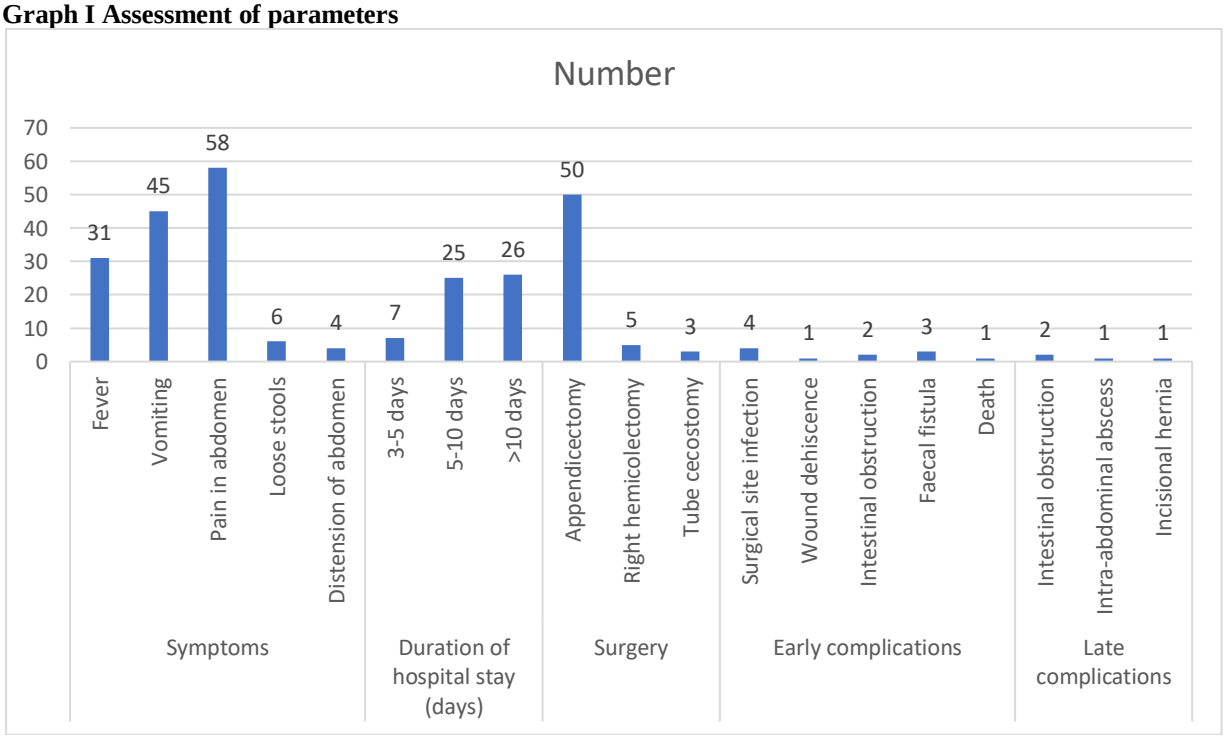

Table III Alvarado Score

Alvarado Score	Number	P value
4-5	4	0.02
6-7	24	
8-9	30	

Table III shows that Alvarado score 4-5 was seen in 4, 6-7 in 24 and 8-9 in 30 patients. The difference was significant (P< 0.05).

DISCUSSION

The most frequent reason for urgent intra-abdominal surgery is acute appendicitis. According to the traditional pathophysiologic model of acute appendicitis, the risk of perforation rises with the amount of time that passes between the onset of the illness and treatment.[9,10] A number of factors, such as the disease itself, patient characteristics, availability to medical care, and features of the health care system, can cause delays at any point in the process from symptom start to presentation, evaluation, and treatment. Perforation of gangrenous appendix carries significant risk of morbidity and mortality.[11] Overall rate of perforated appendicitis is 25.8% of the total cases. There are many factors that are associated with perforation but there is no single factor that independently predicted perforation of appendix.[12]The present study was conducted to assess outcome of perforated appendicitis.

We found that out of 58 patients, 32 were males and 26 were females.Symptoms were fever in 31, vomiting in 45, pain in abdomenin 58, loose stools in 6, distension of abdomen in 4 patients. NaderanMet al[13]in their study investigated the patient's history and physical examination information to find out risk factors associated with complicated appendicitis. In this study, two hundred patients who were admitted with complicated appendicitis (including abscess, phlegmon, and generalized peritonitis) were retrieved from the database. Two hundred patients with non-complicated acute appendicitis were randomly selected from the same period. These two groups were compared in terms of demographic characteristics, past medical history, and presenting symptoms. A multivariate analysis model using binary logistic regression and backward stepwise elimination was made. Based on multivariate analysis, risk factors for complicated appendicitis included presenting with epigastric pain (OR=3.44), diarrhea (OR=23.4) or malaise (OR=49.7), history of RLQ pain within the past 6 months (OR=4.93), older age (OR=1.04), being married (OR=2.52), lack of anorexia (OR=4.63) and longer interval between onset of symptoms and admission (OR=1.46). Conversely, higher (academic) education was associated with decreased odds for complicated appendicitis (OR=0.26) in patients in our study.

We found that duration of hospital stay 3-5 days in 7, 5-10 days in 25 and >10 days in 26. Surgery performed was appendicectomy in 50, right hemicolectomy in 5 and tube cecostomy in 3. Early complications were surgical site infection in 4, wound dehiscence in 1, intestinal obstruction in 2, faecal fistula in 3 and death in 1. Late complications were intestinal obstruction in 2, intra-abdominal abscess in 1 and incisional hernia in 1 patient. Drake FT et al[14]evaluated whether there is an association between time and perforation after patients present to the hospital.A total of 9048 adults underwent appendectomy (15.8% perforated). Mean time from presentation to OR was the same (8.6 hours) for patients with perforated and nonperforated appendicitis. In multivariate analysis, increasing time to OR was not a predictor of perforation, either as a continuous variable (odds ratio = 1.0 [95% CI, 0.99-1.01]) or when considered as a categorical variable (patients ordered by elapsed time and divided into deciles). Factors associated with perforation were male sex, increasing age, 3 or more comorbid conditions, and lack of insurance.

Ghag et al[15]evaluated the relative importance of these determinants, effect of preoperative delay, prehospital antibiotic therapy with postoperative morbidity of perforated acute appendicitis. Patients were divided into two groups (Perforated and non-perforated). Patients found eligible as per inclusion and exclusion criteria were included. 150 cases were studied with median age being 35 years. Male preponderance was noted. Symptom duration was higher in perforated appendicitis. Patients with perforated appendix had high Alvarado score. Appendicectomy was the most common surgical procedure. Probe tenderness was seen in maximum patients. Extraluminal air and periappendiceal inflammation were statistically significant predictors for appendiceal perforation. Korner H et al[16]investigated epidemiological characteristics in terms of the age- and sex-specific incidence in patients with perforated and nonperforated appendicitis. They found that perforated appendicitis occurred in 19%, with higher rates in small children and the elderly, irrespective of gender. A high diagnostic accuracy was not associated with an increased rate of perforation. In small children and the elderly, the diagnostic accuracy was low and the perforation rate high. Patients with perforation had a significantly longer duration of symptoms as well as in-hospital observation time than did patients with nonperforated appendicitis. Perforated appendicitis showed a different incidence pattern than nonperforated appendicitis and was associated with a significantly longer duration of symptoms and in-hospital observation time, probably due to patient-related factors.

The shortcoming of the study is small sample size.

CONCLUSION

Authors found that a significant contributing element to appendicular perforation and its unfavorable consequences was the prehospital delay. Patients who presented late and had symptoms of generalized peritonitis and an appendix base perforation had a greater rate of morbidity and a longer hospital stay.

REFERENCES

1. Alvarado A. A practical score for the early diagnosis of acute appendicitis. Ann Emerg Med 1986; 15:557-564.
2. Dixon MR, Haukoos JS, Park IU, Oliak D, Kumar RR, Arnell TD, Stamos MJ. An assessment of the severity of recurrent appendicitis. Am J Surg. 2003;186(6):718-722.
3. Maxwell JM, Ragland JJ. Appendicitis. Improvements in diagnosis and treatment. Am Surg.1991 May; 57(5):282-5.
4. Abdeldaim Y, Mahmood S, Mc Avinchey D. The Alvarado score as a tool for diagnosis of acute appendicitis. Ir Med J. 2007 Jan; 100(1):342.
5. Liang MK, Lo HG, Marks JL. Stump appendicitis: a comprehensive review of literature. Am Surg. 2006; 72(2):162-6.
6. Santos DA, Manunga J Jr, Hohman D, Avik E, Taylor EW. How often does computed tomography change the management of acute appendicitis?, Am Surg. 2009;75(10):918-21.
7. O. Sadr Azodi, D. Lindstrom, J. Adami, R. Bellocco, S. Linder, A. Wladis. Impact of body mass index and tobacco smoking on outcome after open appendicectomy (p.751-757) 12.
8. Baarnes Ba, Behringer Ge, Wheelock Fc, Wilkinsew Surgical sepsis: analysis of factors associated with sepsis following appendectomy. Ann Surg. 1962 Nov; 153:703-712.
9. Herscu G, Kong A, Russell D, Tran CL, Varela JE, Cohen A, Stamos MJ. Retrocecal appendix location and perforation at presentation. Am Surg. 2006 ;72(10):890-3.
10. Perovic Z. Drainage of the abdominal cavity and complications in perforating appendicitis in children. Med Pregl. 2000; 53(3-4):193-6.
11. Korner H, Sondenaa K, Soreide JA, Andersen E, Nysted A, Lende TH, Kjellevold KH. Incidence of acute non-perforated and perforated appendicitis: agespecific and sex-specific analysis. World J Surg. 1997; 21(3):313.
12. D A Hale, M Molloy, R H Pearl, D C Schutt, and D P Jaques. Appendectomy: a contemporary appraisal. Ann Surg. 1997; 225(3): 252-261.
13. Naderan M, Babaki AES, Shoar S, et al. Risk factors for the development of complicated appendicitis in adults. Ulus CerrahiDerg2016;32:37–42.
14. Drake FT, Mottey NE, Farrokhi ET, Florence MG, Johnson MG, Mock C, Steele SR, Thirlby RC, Flum DR. Time to appendectomy and risk of perforation in acute appendicitis. JAMA surgery. 2014 Aug 1;149(8):837-44.
15. Ghag G, Shukla K, Shukla D, et al. A comparative study of perforated and non-perforated appendicitis with respect to clinical findings, radiological findings and post-operative management. Asian Pac J Health Sci 2016;3(4S):5–13.
16. Korner H, Sondenaa K, Soreide JA, Andersen E, Nysted A, Lende TH, Kjellevold KH. Incidence of acute non-perforated and perforated appendicitis: agespecific and sex-specific analysis. World J Surg. 1997; 21(3):313.