

Frequency of Appendicular Perforation in Acute Appendicitis Patients

Appendicular
Perforation in
Acute
Appendicitis

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ABSTRACT

Objective: To find out the frequency of appendicular perforation among patients with acute appendicitis.

Study Design: Descriptive cross-sectional study

Place and Duration of Study: This study was conducted at the Surgical Department of MTI, Lady Reading Hospital from 1st August 2020 to 31st January 2021.

Materials and Methods: This study was designed to determine the frequency of appendicular perforation in acute appendicitis patients. A total of 91 patients of both genders admitted and scheduled for appendectomy were enrolled.

Results: The mean age of study participants was 32.6±9.3 years. In our study 55 (60.4%) patients were male and 36 (39.6%) patients were female. 59 (64.8%) patients were admitted from emergency unit while 32 (35.2%) patients were admitted via OPD. During surgery, perforated appendix was recorded in 24 (26.4%) patients.

Conclusion: The frequency of appendiceal perforation is relatively high in our population who are subjected to appendectomy. It was found significantly higher in older age groups (p value <0.001), although perforation was seen more often in male patients but association with gender was insignificant (p value 0.810).

Key Words: Appendicitis, perforation, appendectomy, appendiceal perforation

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INTRODUCTION

Appendicitis is the inflammation of the appendix that was first described by Reginald Fitz.¹ It is the leading cause of acute abdominal pain in young patients admitted to the hospital.² It is often regarded as disease of young age with 90% diagnosed in children & young adults and only 10% in patients above the age of 60 years.^{3,4} In USA, the risk of developing acute appendicitis is around 8.6% for male population and 6.7% for female population but in comparison the incidence of acute appendicitis is low in Asia and Africa because of their more fibrous diet.⁵

There is wide geographical discrepancy in signs & symptoms, diagnostic investigations and treatment of acute appendicitis that is linked to the economic status of the countries.⁶

Acute appendicitis is often diagnosed clinically without any difficulty.⁷ Shchatsko et al⁸ demonstrated in their study that pain in right iliac fossa with increased total leukocytes count and raised neutrophils levels were the commonest presenting features in patients who were operated. Abdelahim et al⁹ reported that Alvarado score of ≥ 7 was associated with positive findings on exploration. In cases of vague presentation admitting the patient for observation is prudent, and increases the safety as well as the precision of diagnosis.¹⁰ In equivocal cases some institutions are taking the help of Ultrasound as a first line imaging followed by Computed tomography as a second option in diagnosing appendicitis.^{11,12}

Despite being one of the leading causes of acute abdomen, the diagnosis of acute appendicitis is still difficult.² Delay in the diagnosis of acute appendicitis often contributes to higher incidence of perforation.¹³ Appendicular perforation is a complication of the acute appendicitis in which intraluminal contents leak into abdominal cavity resulting in peritonitis and grievous outcomes. The mortality risk of acute non-gangrenous, acute gangrenous and acute perforated appendicitis is less than 0.1%, 0.6% and around 5% respectively.¹⁴ The rate of appendiceal perforation in adults is 28.5%.¹⁵

Various predictors of appendiceal perforation are anorexia, fever $\geq 38^{\circ}\text{C}$, male gender, pain duration and pre-hospital delay. It is difficult to ascertain when exactly the symptoms started and hence one cannot calculate the pre-hospital course of such patients

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accurately. Some authors evaluated the pre-hospital course and the elapsed time from presentation to start of appendectomy but they faced various difficulties like small sample size and bias in reviewing the time and previous medical record. Among laboratory findings increased leucocyte count with neutrophilia plus increased levels of C-reactive proteins also predict the severity and increased risk of complications.^{13,16}

MATERIALS AND METHODS

This descriptive Cross-sectional study was conducted at Surgical Department of MTI, Lady Reading Hospital from August, 2020 to January, 2021 after obtaining necessary Ethical approval from the IREB department (Ref: No.461/LRH/MTI). A total of 91 patients were enrolled in this study after obtaining informed written consent from every participant. Sample size was calculated using WHO calculator using 95% confidence level while taking expected rate of appendicular perforation as 28.5%⁽¹⁵⁾ and taking 8% absolute precision. The Sampling technique was a consecutive non-probability sampling. All patients within age range of 20-50 years of both genders and presenting to the emergency department with acute appendicitis who underwent appendectomy were included in the study. Any patient with co-morbid condition like diabetes mellitus, hypertension, cardiac diseases was excluded from the study. All investigations needed were carried out such as complete blood picture (raise white blood cell and neutrophil count), ultrasound abdomen. Biopsy was taken for histopathological confirmation. Data of all the patients as name, age, gender, clinical findings, investigations, diagnosis, and operative procedure about appendicular perforation was recorded.

The data was entered into and analyzed using SPSS-23. The outcome variable i. e. presence of appendicular perforation was stratified by age and gender. Post-stratification Chi square test was applied and significance level was set at ≤ 0.05 . All the data was presented in tables.

RESULTS

Table No.1: Age groups wise stratification of perforated appendix (n=91)

Age (years)	Perforated Appendix		P value
	Yes	No	
<30	5 (12.5%)	35 (87.5%)	<0.001
30-40	4 (17.4%)	19 (82.5%)	
>40	15 (53.6%)	13 (46.4%)	

The mean age of study participants was 32.6 ± 9.3 years. Male patients (60.4%) outnumbered the females (39.6%) in this study. 59 patients (64.8%) were admitted from emergency unit and during surgery, perforated appendix was recorded in 24 (26.4%) patients. The subsequent tables elaborate age, gender, and source of admission wise stratification of perforated appendix (Tables 1-3).

Table No.2: Gender wise stratification of perforated appendix (n=91)

Gender	Perforated Appendix		P value
	Yes	No	
Male	15 (27.3%)	40 (72.7%)	0.8
Female	9 (25%)	27 (75%)	

Table No.3: Source of admission wise stratification of perforated appendix (n=91)

Source of admission	Perforated Appendix		P value
	Yes	No	
OPD	6 (18.8%)	26 (81.2%)	0.2
Emergency	18 (30.5%)	41 (69.5%)	

DISCUSSION

Acute appendicitis is one of the commonest reasons leading to emergency abdominal operations in everyday life.¹⁷ The pathophysiology of appendicitis suggests that the likelihood of appendicular perforation increases with elapsed time from the start of symptoms to the treatment received. Various patients and disease factors as well as access to and quality of the health care can result delay in treatment increasing the risk of perforation. Researchers have observed that the risk of perforation increases with delay in diagnosis and treatment.¹⁸ Similarly, studies have also linked appendicular perforation with diminished access to health care.¹⁹

Several studies demonstrated that progression of appendicitis from its onset to perforation occurs in timely manners and that several patients may recover without any surgery²⁰, hence the gold standard treatment of acute appendicitis set off early appendectomy to prevent this progression.

Due to this wide variation in occurrence of perforated and non-perforated appendicitis, many authors disagree in their opinion that time to appendectomy is the main driving factor leading to perforation.^{21,22} Some studies suggest that perforation is not time dependent and that it may have already occurred before the development of symptoms because of distinctive host microbiological or inflammatory responses.²³

In this study we found the frequency of perforated appendix to be 26.4% which was encountered more often in male patients. Perforated appendicitis was significantly higher in older age but insignificant in gender, as has also been reported by others.²⁴ Invasive procedure like diagnostic laparoscopy would not help to reduce the risk of perforation in doubtful cases, as several patient related factors are involved.

CONCLUSION

The frequency of appendiceal perforation is relatively high in our population who are subjected to appendectomy. It was found significantly higher in

older age groups >40 year (p value <0.001), although perforation was seen more often in male patients but association with gender was insignificant (p value 0.8).

Author's Contribution:

Concept & Design of Study: Rahmat Ullah Shah
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