Occurrence of Perforated Appendicitis in Patients Subjected to Appendectomy for Acute Appendicitis

Abstract

Objective: To determine the frequency of perforated appendicitis among patients subjected to appendectomy for acute appendicitis.

Methodology: A cross-sectional research was performed at the Department of Surgery, Bolan Medical College, Quetta between June 2019 to March 2021. In this study a total of 195 patients were observed. All patients were subjected to detailed history and examination. Standard preoperative procedures were adopted. Data including age, gender, height, weight, BMI were recorded in the proforma.

Results: In this study mean age was 30 years with SD± 12.54. Sixty two percent of patients were male and 38% of patients were female. Nine percent of patients had perforated appendicitis while 91% of patients did not have perforated appendicitis. Sociodemographic such as gender and age did not significantly correlate with the incidence of perforation in patients with acute appendicitis.

Conclusion: Our study concludes that the frequency of perforated appendicitis was 9% among patients subjected to appendectomy for acute appendicitis.

Keywords: perforated appendicitis, acute, appendicitis.

Introduction:

One of the most frequent gastrointestinal disorders to present to medical facilities is acute appendicitis, which is documented in roughly 250,000 and 40,000 instances annually in the US and England, respectively [1,2].One of the most frequent cause of abdominal across all age groups and in around 10% of operations is acute appendicitis [3]. It disproportionately affects men, with a M:F ratio of 1.4:1 [1].Appendectomy is the surgical method for treating appendicitis, or appendix inflammation [4]. Appendicitis is placed among one of the most common surgical emergencies having a 12-percent lifetime risk for males and a 25-percent lifetime risk for females [5].Amyan, who was an English Army surgeon, was the first man to remove a ruptured appendix without using anesthetics [4, 6]. The surgical treatment used to resolve difficult appendicitis (51 percent) is a complex appendectomy [7]. Perforated or gangrenous appendicitis with or without localized or diffused peritonitis falls under the category of difficult appendicitis [8]; fecal peritonitis, empyema, abscess development are also included in this group [9].The most usual complicated appendicitis (31.3 percent and 14.9 percent) [10] is perforation of an inflamed appendix [10]. It impacts people between the ages of 10 and 30 and is associated with high global morbidity and mortality rate (5] [11].

The goal of the current study is to determine the frequency of perforated appendicitis in patients who undergo appendectomy. The consequences can become more serious if the appendix is not treated or diagnosed in a timely manner, which can lead to additional inflammation and eventually necrosis of the inflamed appendix.

Moreover, once perforated, the complications rate is even worse due to fecal peritonitis which may be life threatening. This study will provide us with the latest and updated information about the local magnitude of perforated appendicitis among patients with acute appendicitis subjected to appendectomy. This updated information will be shared with other health professionals and

surgeons for up gradation of their knowledge and practice. Furthermore this study will also help for future research on perforated appendicitis in patients with acute appendicitis and preventive strategies.

Methods and Materials

Cross-sectional research was performed at the Department of Surgery, Bolan Medical College, Quetta between June 2019 to March 2021. The ethical and institutional approval was obtained from the ethical review committee prior to data acquisition. The sample size was 195 patients, as calculated using select statistics software by keeping the proportion of perforated appendicitis during appendectomy to be 14.9%, [10], 95% confidence interval and 5% margin of error. A non randomized consecutive sampling technique was employed to recruit the patients.

All the individuals undergoing open appendectomy for acute appendicitis, between the ages of 18-65 years, irrespective of sex were included in the study. Patients who were on steroids for the last one month were excluded from the study.

All admitted patients underwent extensive physical examination, biochemical evaluation, and radiological investigations to confirm diagnosis. Before the data was collected

Participants were given an explanation of the study's goals, benefits, and open appendectomy technique, and signed informed consent was acquired. All patients underwent thorough examinations and histories. Standard preoperative procedures were adopted. All of the procedures were carried out by a general surgeon fellow of CPSP who determined whether or not there was a perforated appendix. The patient's profoma asked for the patient's age, height, gender, name and BMI. The study's bias and effect modifiers were rigorously limited by enforcing an exclusion criterion.

SPSS version 22 was used for analyzing the data. Mean ± SD were calculated for continuous variables such as height, BMI, eight, age and duration of appendicitis. Appendicitis duration, gender, age and BMI were used to stratify perforation in order to examine the effect modification. A p-value of 0.05 was deemed significant for post stratification chi-square test. Tables and charts were used to present all of the findings.

Results

In this study, a total of 195 patients were enrolled. A mean age of 35 ± 12.54 years was observed. The majority of the patients were male and aged between 31 to 40 years. Duration of appendicitis among 195 patients was analyzed as 113(58%) patients had appendicitis <24 hours while 82(42%) patients had appendicitis >24 hours. Mean duration of appendicitis was 24 hours with SD ± 3.95 as illustrated in Table 1.

Table 1. Demographics of the study participants (n=195)

Age (years)	35 ± 12.54
<20 years	14 (7%)
21-30 years	59 (30%)
31-40 years	62 (32%)
41-50 years	41 (21%)

51-65 years	19 (10%)
Gender	
Male	121 (62%)
Female	74 (38%)
Duration	24 ± 3.95
≤24 hours	113 (58%)
>24 hours	82 (42%)
Weight (kg)	68 ± 10.07
Height (meters)	1.5 ± 0.93
BMI	25 ± 5.31
< 25 Kg/m2	88 (45%)
> 25 Kg/m2	107 (55%)
Perforated Appendix	
Yes	18 (9%)
No	177 (91%)

Stratification of perforated appendix with age, gender, duration of appendicitis, BMI is given in table 2. The study did not reveal any correlation between sociodemographic features and perforation of appendix ($p>0.05$).

Table 2. Association between demographics and incidence of perforated appendix

Parameter	**Perforated Appendix**		
	Yes	**No**	**p-value**
Age (years)			0.9962
<20 years	1 (5.56%)	13 (7.34%)	
21-30 years	5 (27.78%)	54 (30.51%)	

31-40 years	6 (33.33%)	56 (31.64%)	
41-50 years	4 (22.22%)	37 (20.9%)	
51-65 years	2 (11.11%)	17 (9.6%)	
Gender			0.9312
Male	11 (61.11%)	110 (62.15%)	
Female	7 (38.89%)	67 (37.85%)	
Duration			0.829
≤24 hours	10 (55.56%)	103 (58.19%)	
>24 hours	8 (44.44%)	74 (41.81%)	
Body Mass Index (BMI)			0.9512
< 25 Kg/m2	8 (44.44%)	80 (45.2%)	
>25 Kg/m2	10 (55.56%)	97 (54.8%)	

Discussion

Around the world, acute appendicitis is still a frequent abdominal emergency. The variable nature of the disease and absence of diagnostic procedures makes it challenging to diagnose the disorder. Although several sophisticated diagnostic methods have been developed as a result of advances in the diagnostic area, the diagnosis of acute appendicitis still poses a challenge for the attending surgeon [12].None of the tests, including CT, NMR or USG can definitively identify appendicitis. These analyses are either too expensive or time-consuming and call for more advanced tools and knowledge. Other investigating tools are either not trustworthy enough or not easily accessible [13,14].

At a time when medical research is progressing at an exponential rate, the diagnosis of acute appendicitis still relies on fundamental tests like the WBC count. Many eminent surgeons and medical professionals have been using various grading systems to combat this in an effort to reduce unfavorable appendectomy outcomes. There has been some remarkable development in the diagnosis of acute appendicitis over the past several decades, yet the percentage of normal appendices reported in various series varies from 8 to 33% [15,16].

Our study shows that the mean age was 30 years with SD± 12.54. Sixty two percent of patients were male and 38% patients were female. Nine percent of patients had perforated appendicitis while 91% of patients did not have perforated appendicitis.

Similar results were observed in another study conducted by Manan F et al [17], in which A descriptive case series of 200 patients presented with acute appendicitis were studied for observing frequency of perforated appendicitis. Out of 200 patients (sample size), 16 (8%) cases were diagnosed as perforated appendicitis, gangrenous were found to be 16 (8%) cases, appendicular mass was recorded in 6 (3%) cases and remaining 162 (81%) cases were found to be acutely inflamed.

The perforation rate was 28.5 percent according to a research by Balogun OS et al [18]. The vast majority of patients (71.1 percent) were male, and the peak age of onset was between 21 and 30 years. Merely 3 (5.1 percent) of the cohorts reported a history of recurring stomach pain.The majority of the patients (44.1%) and (42.4%) fell into the American Society of Anesthesiologists (ASA) II and III classifications. Pelvic abscess (13.5%), wound dehiscence (15.2%) and surgical site infections (SSI) (18.6%) were the most frequent complications found. Male gender, comorbidities, and ASA score were all statistically associated with a higher prevalence of SSI (P = 0.041, 0.037, and 0.03, respectively).The prevalence of pelvic abscess was not reduced by the use of a routine intraperitoneal drain following surgery for ruptured appendicitis. In the population under study, there were no reported deaths. Retrospective research on 655 appendectomies by Njoku et al. (19) found 29 perforation instances, representing a perforation rate of 4.4 percent. Adeyanju and Adebiyi [20] reported a perforation rate of 7.2 percent; their investigation comprised a total of 180 reported appendectomies. A retrospective analysis of 142 appendectomies by Edino et al. [21] found 33 appendiceal perforations overall, with a perforation rate of 23.2%. In Ghana, Yeboa [22] reported 638 appendectomies; 249 of the patients involved appendiceal perforation, with a perforation rate of 39%. 28.5 percent of holes were perforated. Another study discovered a perforation rate of 28.5%.This is considerably less than the amount from Ghana that was cited [17-22] and much higher than what some researchers in Nigeria discovered. The variation observed in these retrospective investigations suggests a diverse referral pattern.

There were some limitations in the study. For instance, due to a small number of patients we could not generalize our findings to a larger population. Thus, further comprehensive multicenter studies are recommended.

Conclusion

Our study concludes that the frequency of perforated appendicitis was 9% among patients subjected to appendectomy for acute appendicitis. We did not find any association of age, gender, duration of illness, and body mass index with perforation of the appendix. We recommend that multicenter research should be conducted to further explore the subject.

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