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ORIGINAL ARTICLE

Frequency of Perforated Appendix During Appendecectomy

IFTIKHAR AHMED[1], SAIRA MAHMOOD[2], ASMA BIBI[3], MEMOONA JAVED[4], ALTAF HUSSAIN JATOI[5], FAHAD HAFEEZ KHAN[6]
[1]*Associate professor Akhter Saeed Medical College Rawalpindi*
[2]*Assistant Professor Rawal Institute of Health Sciences A*
[3]*Associate Professor, General Surgery HBS Medical and Dental College Islamabad*
[4]*Senior registrar Akhter Saeed Medical College Rawalpindi*
[5]*Head of Department Surgery & Allied Syed Abdullah Shah Institute of Medical Sciences Sehwan*
[6]*General Surgeon DHQ Teaching Hospital Timmergara*
Correspondence to: Iftikhar Ahmed, Email: driftkhar29@gmail.com

ABSTRACT

Background: The acute appendicitis is commonest surgical emergency in world; there is growing awareness about the significant morbidity and mortality of perforated appendix. We performed this study to determine the frequency of perforation in acute appendicitis in our set up.

Methods: Total patients included were 100 in this cross sectional study. All patients were above 14 year of age, both gender who were assessed by history, physical examination and relevant investigations undergoing appendectomy for acute appendicitis.

Results: Total number of patient with perforation were 26 (26%) out of 100 operated for appendectomies. All the patients were above 14 years of age. Frequency of perforation of appendix was different according to the age, sex, time of presentation, and TLC count.

Conclusion: In order to reduce high percentage of perforated appendix, steps should be taken to sensitize the patients to present early, early referral to surgeons, for quick diagnosis and urgent treatment.

Keywords: Acute appendicitis, perforated appendix, appendectomy, appendicular mass.

INTRODUCTION

The patients who visit with acute abdominal pain in the emergency department diagnosed most commonly as acute appendicitis (AA) [1] with a lifetime risk of almost 1 in 11 persons[2]. The rate of acute appendicitis is 7 – 50 patients per 100000 per year in developed countries as it is declining there, with a peak between the ages of 10 and 30 years[3].

The Acute Appendicitis diagnosed on clinical background is often challenging, it depends on the history, clinical examination, laboratory investigations, and radiological findings. There are different scoring systems to diagnose AA which are helpful in diagnosing it. Most scoring systems are simple and user-friendly, which are being used in various hospitals around the globe to diagnose and predict the risk of AA, but no one is accepted widely[4]. The strategy of confirmatory test, such as ultrasound (US), computed tomography (CT), and magnetic resonance imaging (MRI) has very good role in diagnosing AA but it is not authenticated. It is still challenging to diagnose AA. Some guidelines are established which advice the use risk categorization is established on clinical findings, others are following standard imaging in all patients[5]. Widely used Scoring systems to diagnose acute appendicitis include the Alvarado score, Raja Isteri Pengiran Anak Saleha Appendicitis score (RIPASA) Appendicitis Inflammatory Response score[5,6], and adult appendicitis score (AAS). Different rules have been described to predict it clinically during the past decades[7]. Most of the scoring systems provides the evidence for risk stratification without imaging features. Selective imaging has been proposed for practicing such clinical scoring systems; patients may be classified as low-risk, intermediate risk or high risk after calculation of score and it may need further investigation and imaging for the diagnosis of acute appendicitis, in low risk and intermediate risk patients, and a high-risk patients may result in direct surgical exploration[8]**.** There are different guidelines some use clinical scoring systems for the diagnosis of AA and standard imaging is used by others in all patients.

It is challenging decision as whether to operate or not even with all the improvements in the diagnostic process. The interest has been developed to management uncomplicated AA without operation, for past 20 years, the cost of surgical interventions and postoperative complications may be the reasons to think on non-operative management of AA, as minimally invasive techniques are increasing continuously[9, 10].

Non operative treatment with antibiotics is reported 60 years ago in uncomplicated AA, which is increasing. But it is important to exclude the patients of complicated AA, as the rate of complication is higher in this group as Acute Appendicitis due to fecolith[11]**.** The two different entities are uncomplicated and complicated appendicitis. The Appendix which is phlegmonous and inflamed but it does not have necrosis and perforation is uncomplicated appendicitis, but focal or transmural necrosis is present in complicated appendicitis, which may perforate in the end. It is very important to differentiate both entities, as the uncomplicated appendicitis may be treated conservatively with antibiotics, but complicated appendicitis needs emergency surgery with the exception of periappendicular abscess[12]. Conservative management of uncomplicated appendicitis has very good outcomes which are reported in recent studies as well; but it is still challenging to predict complicated appendicitis preoperatively[13]. Sequel of perforated appendix is associated with increased economic burden due to prolonged hospital stay. The morbidity and mortality may occur even with treatmentl[14]. Laparoscopic appendectomy is recent advance in medical science, as the incidence of wound infection is lower, stay in hospital is shorter, and quality of life scores are better as compared to open appendectomy[15].

The objective or rationale of this study was to calculate the percentage of perforated appendix in patients who present late (after 24 hours of onset of symptoms) during the course of their disease.

MATERIAL AND METHOD

This is a cross sectional study, which was conducted in the department of surgery, Farooq Hospital Rawalpindi between January 2023 to September 2023. After taking consent & approval from ethical committee, 100 patients above 14 year of both genders who were undergoing appendectomy for acute appendicitis were included in this study. All the patients who presented with pain right iliac fossa were included in the study. Patients below the age of 14 years, those who refused to consent and those who had some other pathology confirmed on laboratory investigations were excluded from this study. Patients were selected using consecutive sampling method & the data was collected from patients file from the record office. The patients were assessed by history, examination and relevant investigations e.g. complete blood count, blood sugar level and urine routine

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examination. Ultrasound abdomen and pelvis in female patients and pregnancy test in females with history of amenorrhoea. Sample size was calculated according to WHO calculator. (ref Dr. Madhukar Rajaram Wagh and Dr. Sunil Joshi. Surgical outcomes in patients with complicated appendicitis treated in medical college & hospital. International Journal of Surgery Science 2020; 4(1): 142-144)

The data was analysed on SPSS version 24, and calculated frequencies, ratios, percentages, means and standard deviation with descriptive statistics. Graphs and tables were used for data presentation such as pie charts. The numerical data such as age was expressed as mean ± standard deviation and percentages, and frequencies of categorical data like gender distribution, complications.

RESULTS

There were 59 male and 41 female in this study. Total patients with perforation were 26(26%). All the patients with the age group more than 14 years were included with the mean age of 25.49 ± 12.32. Total numbers of patients in various age groups with appendectomies are shown in Figure 1. It is noted that maximum number of patients (79) presented with this disease were between the age of 14 to 30 years

Out of these 26 patients with findings of perforated appendix, 18 (69%) were male and 8(31%) were female patients respectively. It was noted that all the patients who are above 61 years old presented with perforated appendex.

Table 1: Frequency of perforated appendix in different age groups (n=100)

No	Age	Number of appendecectomies	Perforated appendex
1	14-20	39	3 (11%)
2	21-30	40	15 (58%)
3	31-40	13	4 (15%)
4	41-50	4	1 (4%)
5	51-60	1	0 (0%)
6	61-70	2	2 (100%)
7	71-80	1	1 (100%)
Total		100	26

In total 26 patients with perforated appendix, 21(81%) patients with findings of perforations presented after 24 hours after the onset of symptoms (table 2). considering total leucocytes count, 02 patients had total leucocytes count less than 5000/ ul, 18 patients had in range of 5000/ul to 15000/ul with mean value of 11541 ± 4249.85, and 06 patients had leucocytes count more than 15000/ul.

Table 2: % of perforated appendix in relation with time of presentation (n=26)

No.	Time of presentation	
1	<12 hours	1 (4%)
2	12-24 hours	4 (15%)
3	>24 hours	21 (81%)
Total		26 (100%)

Chances of complications were maximum in case of perforated appendix and commonest complication was wound infection. 40% of patients who had perforated appendix develop some type of complication and are shown in table 2. Not a single complication was seen in operations where appendix yet not perforated.

Table 2: Chances of complications in perforated appendix.

	Complication	%
1	Chest infection	2 (8%)
2	Post op ileus	2 (8%)
3	Wound infection	6 (24%)

DISCUSSION

In our study, male to female ratio was 59:41 which shows that chances of acute appendicitis are more in males as compare to females. Patrick Téoule and his colleagues conducted a study in 2020 in Germany also got similar results[15].

Our study was conducted in a public sector hospital of a third world where we got a very high number of perforated appendix i.e. 26%. But we surprised to know that the rate of this complication is similar or even higher in other parts of the world. Livingston EH and his team[16] stated that the perforation rate changes from 16% to 40%, with a higher frequency take place in younger age groups (40–57%) and it is(55–70%) older than 50 years. Though the study of Dr Patel[17]showed exactly similar results to our study which is approximately 20–34% and 29.5% by Jochem C[18].

The chances of perforation of appendix increases sharply, according to our study if patient present after 24 hours of onset of symptoms. The factors with markedly increased incidence of perforation in patients with uncomplicated and complicated appendicitis were compared: age ≥40 years (41.1% and 66.7%, respectively; $p = 0.002$), duration of symptoms ≥24 hours (29.8% and 67.3%, respectively; $p < 0.001$)[19].

The laboratory investigations such as total leukocytes (TLC) count or C-reactive protein (CRP) are mostly used as a next step for the diagnosis of acute appendicitis after history and clinical examination. Independently, these are poor discriminators, but these inflammatory markers gain a higher discriminatory power in the diagnosis of acute appendicitis when combined. This combination of WBC and C-reactive protein is not able to sufficiently include or exclude AA as studied by Atema JJ, Gans SL et al. in a study of prospective data, consists of 1024 patients presented with clinical suspicion of acute appendicitis. [20]

Standardized imaging has crucial role in diagnosis of AA, and can be used to diagnose AA with higher accuracy. The standard US equipment and experienced hands can visualise appendix by using a graded compression technique. The abdominal CT scan with contrast in the portal-venous phase can be performed[21]. CT protocols are based on helical scanners with a single or multidetectors and slice thickness of 3–5 mm with an interval of 3–10 mm[22, 23]. It should be kept in mind that patients having clear signs and symptoms with higher risk of appendicitis according to different scoring systems like RIPASA/ Alvarado/AIR/ AAS and younger than 40 years old may not be expensive and time consuming investigations like CT scan[24,25].

CONCLUSION

As all the patients with perforated appendix present late in our study, awareness should be created in public and general practitioners to take early advice with abdominal pain specially if pain persist for more than 12 hours with associated complaints of anorexia, nausea and vomiting.

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