FREQUENCY OF PERFORATED APPENDIX IN CASES OF ACUTE APPENDICITIS

Fazal Manan, Sajad Mohammad Khan, Waqar Alam Jan

ABSTRACT

Objective: To determine the frequency of perforated appendix in cases of acute appendicitis.

Material and Methods: This was a descriptive case series and was conducted in surgical department of Postgraduate Medical Institute, Lady Reading Hospital, Peshawar from January 2011 to February 2012. Total 200 cases of acute appendicitis in which appendectomy was performed during the study period.

Results: A descriptive case series comprised 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.

Conclusion: Perforated appendicitis is a frequent complication of acute appendicitis.

Key Words: Appendix, Acute, Appendectomy.

INTRODUCTION

The appendix is a derivative of the midgut along with the ileum and ascending colon. The appendix in adults can vary widely in length from 2 to 22 cm but average about 9 cm in length. Although appendicitis has been a common problem for centuries, it was not until the early 19th century that the appendix was recognized as an organ capable of causing disease[1].

Appendicitis is one of the most common acute abdominal states of illnesses[2]. Serial examinations and investigations increase diagnostic accuracy, but this causes delay, which may result in gangrene and perforation[3].

Mortality and morbidity rates for perforated appendicitis have dropped dramatically over the past century. The length of hospital stay and morbidity in patients with perforated appendicitis still far exceed those for acute appendicitis.

In most cases, the diagnosis of appendicitis is established by history and physical examination. Despite the widespread use of various advanced diagnostic tools, the diagnosis of appendicitis and distinguishing perforated from acute simple appendicitis are not always easy. Early diagnosis of perforated appendicitis is important for reducing morbidity rates. If the physician anticipates a perforated appendicitis in a patient, initiating appropriate antibiotics preoperatively are mandatory for reducing complications due to perforation[4].

Address for Correspondence:
Dr. Fazal Manan
Room No. C-15, TMO Doctor Hostel
PGMI LRH Peshawar.
Cell No: 03028340703
E-mail: drmanan1@hotmail.com

The management of perforated or gangrenous appendicitis varies somewhat from that of acute non-perforated disease. In these patients, the appendix has already perforated, so the need for urgent intervention is relatively less obvious. Patients with perforated appendicitis will often have a longer duration of symptoms, high grade fever, and raised white blood cell count. Most of these patients are volume depleted and need intravenous fluid resuscitation before operative intervention[1]. Acute appendicitis is usually diagnosed and managed easily with a low mortality and acute appendicitis is the commonest emergency and the most common cause of acute abdomen in-turn is acute appendix[5].

Appendicitis has male to female ratio 3:2 and is the most common in teen-agers[4]. The lifetime risk for appendicitis is 8.6%, and 6.7% for male and female respectively morbidity rate. However, it may occasionally become extraordinarily complicated and life threatening[6,7].

There are many factors that are associated with perforation but there is no single factor that independently predicted perforation of appendicitis. Delay in intervention due to late presentation to hospital is an important preventable factor[8].

The rationale of the study was to find out the frequency of perforated appendix in cases of acute appendicitis. This not only helped us to find out perforated appendix in time but its early management reduced the morbidity and mortality associated with the perforated appendix.

MATERIAL AND METHODS

This was a descriptive case series and was conducted in surgical department of Postgraduate Medical Institute, Lady Reading Hospital Peshawar from January

2007 to February 2008. Total 200 cases of acute appendicitis in which appendectomy was performed during the study period.

All patients with acute appendicitis (diagnosed on clinical, physical and radiological basis) in whom appendectomy was performed. All patients of both sexes (male and female) above the age of 5 years. Already admitted cases of perforated appendicitis.

All the patients with acute appendicitis who came to OPD or Emergency department were admitted in surgical department and after taking informed consent from patients or from their relatives, each patient fulfilling the inclusion criteria, was thoroughly examined by taking a detailed history and complete physical examination. Pre-operative investiagaitons like ultrasound, leukocyte count, neurophil percentage and C-reactive protein (CRP) and Alvarado score was used to diagnose acute appendicitis in these patients. In all these patients, open appendectomy was performed. Type of appendicitis was determined by the surgeon at the time of operation. If free rupture of intraluminal contents was found, the appendicitis was considered perforated. All patients suspected for perforated appendix were put on intravenous antibiotics preoperatively and continued for 5-7 days postoperatively depending on the gernal condition of the patient. The preoperative, intraoperative and postoperative findings of appendicitis and other demographic information regarding age, sex, address, signs and symptoms, were noted. Then frequency of perforated appendicitis was determined among all the case of acute appendicitis in whom open appendicectomy was performed. All these patients were followed up in ward for any postoperative complications.

All the studied variables that are, type of appendicitis, type of incision, position of appendix, presenting complaints, preoperative, intraoperative and postoperative findings, laboratory findings, radiological findings were analyzed for descriptive statistics. Frequencies, percentages were calculated for all these variables and mean, ± standard deviation was calculated for age. For sex distribution male to female ratio was calculated. Because of the nature of the study (descriptive case series) formal statistical tests were not applied. Data analysis was done by computer programme SPSS version 12 for windows.

RESULTS

In majority of patients, 178(89%) pain in the right iliac fossa and nausea was presenting complaint. In 10 (5%) patients pain in whole abdomen and vomiting was complaining at presentation. Peri-umiblical pain shifted to the right iliac fossa was found in 8(4%) cases. Pain epigastrium and vomiting was noted in 4(2%) cases (Table 3).

To confirm the diagnosis of acute appendicitis, laboratory investigation like Total Leukocyte counts (TLC) was done in all (100%) cases. Alvarado score was also done in all (100%) cases of acute appendicitis. Ultrasound abdomen was done in all (40%) female patients to exclude the other causes of abdominal pain and in 4(2%) cases ovarian cyst was responsible for abdominal pain. X-ray abdomen was done in 10(5%)

Table 1: Frequency of perforated Appendicitis and other findings in cases of acute appendicitis (n=200).

Finding	No. of patients	Percentage
Acutely inflamed	162	81%
Perforated appendix	16	08%
Gangrenous appendix	16	08%
Appendicular mass	06	03%
Total	200	100%

Table 2: Age distribution of patients (n=200).

Age ranges	No. of patients	Percentage
14-20 years	54	27%
21-25 years	78	39%
26-30 years	38	19%
31-35 years	30	15%
Total	200	100%

Minimum age= 14 years
Maximum age= 35 years
Average age= 24.08 years
± SD 5.56083

Table 3: Presenting complaints of patients (n=200).

Symptoms	No. of patients	Percentage
Pain in right iliac fossa and nausea	178	89%
Pain in whole abdomen	10	05%
Periumbilical pain radiating to the right iliac fossa	08	04%
Pain epigastric and vomiting	04	02%
Total	200	100%

Table 4: Investigations done in patients (n=200).

Symptoms	No. of patients	Percentage
Total leukocyte counts (TLC)	200	100%
Alvarado Score	200	100%
Ultrasound abdomen	80	40%
X-ray abdomen	10	05%
Total	200	100%

Table 5: Type of incisions (n=200).

Type of Incision	No. of cases	Percentage
Gridiron	178	89%
Midline	10	05%
Muscle cutting	06	03%
Lanz's incision	06	03%
Total	200	100%

Table 6: Per-operative findings of position of appendix (n=200).

Position	No. of cases	Percentage
Retrocecal	180	90%
Pelvic	16	08%
Paracecal	04	02%
Total	200	100%

Table 7: Postoperative complications (n=200).

Complications	No. of cases	Percentage
Wound infection	04	02%
Intestinal Obstruction	02	01%

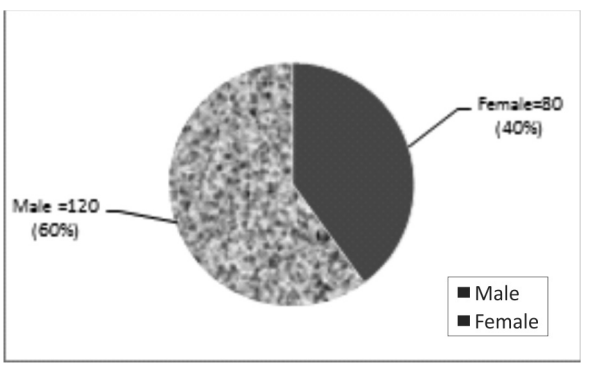

Figure 1: Gender distribution of patients (n=200)
Male to female ratio=1.5:1

patients in whom pain in whole abdomen and vomiting were the chief complaints (Table 4).

In majority 178(89%) patients, Gridiron type of incision was made for appendicectomy. Muscle cutting type of incision was made in 6(3%) cases. Lanz's incision was made in 6(3%) cases (Table 5).

On per-operative examination of the appendix the position of appendix was retrocecal in majority of cases that is 180(90%) cases. Pelvic position of the appendix was found in 16(8%) cases. Paracecal position of the appendix was noted in 4(2%) cases (Table 6). Among the postoperative complications wound infection was found in 4(2%) cases. While only 2(1%) cases came with intestinal obstruction (Table 7).

A descriptive case series comprised 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 (Table 1).

Out of 200 cases of acute appendicitis in this study, 120 (60%) were males and 80 (40%) were female. The male to female ratio was 3:2 (Graph 1). In this study the youngest patient was 14 years of age and the oldest patient was 35 years of age. The mean age was 24 years ± SD 5.56083. The maximum number of patient, 78 (39%), were in the age group of 21-25 years, followed by 54 (27%) patients in age group of 14-20 years. There were 38% (19%) cases in the age group of 26-30 years and 30 (15%) were in the age group of 31-35 years (Table 2).

DISCUSSION

Acute appendicitis is the most common cause of acute abdominal pain. Early diagnosis and management decrease morbidity and mortality. Diagnosis is usually based on clinical data, history and physical examination[9]. Appendectomy has been the treatment for acute appendicitis for over 120 years[10]. Open appendectomy is still the most common method of treatment of acute appendicitis[11].

Abdominal pain is one of the most common chief complaints in patients presenting to the emergency department and, among the diagnoses of abdominal pain, appendicitis is the most common surgical condition[11].

The diagnosis of appendicitis in our setup is clinical and based mainly on the combination of abdominal pains, signs of peritoneal irritation, and a raised total white cell counts with neutrophilia. This mode of presentation is similar to that seen in other communities. The considerable morbidity and appreciable mortality from acute appendicitis in our community are due mainly to the late presentation of our patients[12].

Serial examinations and investigations increase diagnostic accuracy. But this causes delay, which may result in gangrene and perforation. It is concluded that patients delay was not associated with advanced appendicitis. It is recognizable clinically and gets operated two hours earlier on average. There is a significant lag period of observation leading to a physician delay in simple appendicitis, contributing possibly to, increased morbidity[13]. In our series perforated appendix frequency was 8%. A local study reported that out of 200 cases of acute appendicitis, perforated appendix was delivered in 5% patients[5] While in another local study perforation rate was 7.8%[6] So our findings are in consistent with these local studies.

Acute appendicitis was more frequent in male than females in this study. Same results are reported in various local studies[14,15,16,17,18,19]. Despite recent advanc-

es in diagnostic medicine, the diagnosis of appendicitis is still doubtful in a number of cases. Majority of the clinicians relies on their clinical examination strengthened by the laboratory tests[20].

The overall diagnostic accuracy achieved by traditional history, physical examination, and laboratory tests has been approximately 80 percent. The ease and accuracy of diagnosis varies by the patients sex and age, and is more difficult in women of childbearing age, children and elderly persons[21]. Small bowel obstruction post-appendectomy is the third most common complication and has a reported incident of 5% to 15% following complicated appendicitis[22].

The overall postoperative complication rate in our study was very low as 03%. This low rate of postoperative complications is procedure related as we performed open appendectomy in all patients. Wound infection in this study was 02% and only 01% case presented with intestinal obstruction. The data suggest that adding a course of outpatient oral antibiotics, after completing a course of I.V. antibiotics, does not decrease postoperative infectious complications in appendectomised patients[23].

In an international study the postoperative wound infection rates were 15.2% in laparoscopic group (LA) and 30.7% in open appendectomy group (OA). The overall infectious complication rates were 19% in the LA group and 37% in the OA group[24]. In another study the wound infection rate was 6.8% for the LA, and 23% for open group[25].

Antibiotic prophylaxis is effective in the prevention of postoperative complications in appendictomized patients, whether the administration is given pre-post-operatively, and could be considered for routine in emergency appendectomies[26].

CONCLUSION

Acute appendicitis is most common surgical emergency. Perforated appendicitis is a frequent complication of acute appendicitis, more common in age 14-25 years with male predominance.

REFERENCES

1. Lally KP, Cox CS, Andrassy RJ. Appendix. In: Townsend CM, Beauchang RD, Evers BM, Mattox KI, eds. Sabiston's textbook of surgery: the biological basis of modem surgical practice. 17th ed. Philadelphia: Saunders, 2004. 1381-99.
2. Ruber M, Berg A, Ekerfelt C, Olaison G, Andersson RE. Different cytokine profiles in patients with a history of gangrenous or phlegmonous appendicitis. Clin Exp Immuno12006; 143: 117-24.
3. Fahim F, Shiljeel S. A comparison between presentation time and delay in surgery in simple and advanced appendicitis. J Ayub Med Coll 2005; 17: 37-9.
4. Demircan M, Cetin S, Uguralp S, Sergin N, Karaman A, Gozukara EM. Plasma D-lactic acid level: a useful marker to distinguish perforated from acute simple appendicitis. Asian J Surg 2004; 27: 303-5.
5. Dado G, Anania G, Baccarani U, Maracotti E, Donini A, Resaliti A, et al. Application of clinical score for diagnosis of acute appendicitis in childhood: a retrospective analysis of 197 patients. J Pediatr Surg 2000; 35: 1320-2.
6. Briston N. Treatment and management of acute appendicitis. Nurs Times 2004; 100: 34-6.
7. Khanna S, Khanna S, Vij S. No clip, no ligature laparoscopic appendectomy. Surg Laparosc Endosc Percutan Tech 2004; 14: 201-3.
8. Bekele A, Mekasha A. Clinical profile and risk factors for perforation of acute appendicitis in children. East Aft Med J 2006; 83: 434-9.
9. Salari AA, Binesh F. Diagnostic value of anorexia in acute appendicitis. Pak J Med Sci 2007; 23: 68-70.
10. Styrud J, Eriksson S, Nilsson I, Ahlberg G, Haapaniemi S, Neovius G, et al. Appendectomy versus antibiotic treatment in acute appendicitis: a prospective multicenter randomized controlled trial. World J Surg 2006; 30: 1033-7.
11. Hou SK, Chern CH, How CK, Kao WF, Chen JD, Wang LM, et al. Diagnosis of appendicitis with left lower quadrant pain. J Chin Med Assoc 2005; 68: 599-603.
12. Ohene- Yeboah M, Togbe B. An audit of appendicitis and appendicectomy in Kumasi, Ghana. West Afr J Med 2006; 25: 138-43.
13. Fahim F, Shiljeel S. A comparison between presentation time and delay in surgery in simple and advanced appendicitis. J Ayub Med Coll 2005; 17: 37-9.
14. Nabipour F, Daneshtalab B. Histopathological features of acute appendicitis in Kerman - Iran. Rawal Med J 2005; 30: 53-5.
15. Shafiq M. Prevalence of obstructive and non-obstructive appendicitis in appendicectomy specimens. J Med Sci 2006; 14: 30-4.
16. Jamal S, Amin M, Salim M, Mehmood A. Clinicopathological diagnosis of acute appendicitis after emergency appendicectomy. Rawal Med J 2005; 30: 56-8.
17. Bhutta IA, Nawaz F, Mustafa J, Muddassir N. The role of high resolution ultrasonography in the diagnosis of acute appendicitis. J Rawal Med Coll 2004; 8: 87-9.
18. Gulzar S, Vmar S, Dar GM, Resheed R. Acute appendicitis importance of clinical examination in making a confident diagnosis. Pak J Med Sci 2005; 21: 125-32.
19. Ahmad N, Abid KJ, Khan AZ, Shah STA. Acute appendicitis incidence of perforated appendicitis. Ann KE Med Coll 2004; 10: 356-8.
20. Khan MN, Davie E, Irshad K. The role of white cell

count and Creactive protein in the diagnosis of acute appendicitis. J Ayub Med Co1l2004; 16: 17-9.

21. Old JL, Dusing RW, Yap W, Dirks J. Imaging for suspected appendicitis. Am Fam Physician 2005; 71: 71-8.

22. Khairy GA, Afzal MF, Murshid KR, Guraya S, Ghallab A. Post appendectomy small bowel obstruction. Saudi Med J 2005; 26: 1058-60.

23. Taylor E, Berjis A, Bosch T, Hoehne F, Ozaeta M. The efficacy of postoperative oral antibiotics in appendicitis: a randomized prospective double-blinded study. Am Surg 2004; 70: 858-62.

24. Lin HF, Wu JM, Tseng LM, Chen KH, Huang SH, Lai IR. Laparoscopic versus open appendectomy for perforated appendicitis. J Gastrointest Surg 2006; 10: 906-10.

25. Yagmurlu A, Vermon A, Barnhart DC, Georgeson KE, Harmon CM. Laparoscopic appendectomy for perforated appendicitis: a companson with open appendectomy. Surg Endosc 2006; 20: 1051-4.

26. Andersen BR, Kallehave FL, Andersen HK. Antibiotics versus placebo for prevention of postoperative infection after appendicectomy. Cochrane Database Syst Rev 2003; CD001439.