Acute appendicitis in the elderly; Pakistan Ordnance Factories Hospital, Wah Cantt. experience

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Abstract

Objective: To review the clinical experience in diagnosis, management and outcome of elderly patients presenting with acute appendicitis at the Pakistan Ordnance Factories Hospital, Wah Cantt.

Methods: All patients of age 60 years and above presenting with abdominal pain were prospectively reviewed. Patients who were diagnosed as acute appendicitis were included in this case series which was conducted at Pakistan Ordnance Factories Hospital, Wah Cantt, from December 2006 to May 2008. Detailed history and clinical examination, co-morbid conditions, clinical manifestations and post-operative outcome were recorded. The diagnosis was made on the basis of history and clinical examination. The diagnosis was also confirmed on histopathology. All the details were recorded on a questionnaire. Approval from our own ethical committee was taken. SPSS 16 was used for statistical analysis.

Results: A total of 75 patients presented with acute abdominal pain. Of them 42 were admitted with tenderness in right iliac fossa and lower abdomen. Finally, 36 (48%) were diagnosed as acute appendicitis and were included in the study. There were 20(56%) men and 16(44%) women with age range of 60 to 78 years and a mean age of 65.5±4.2 years. Associated illness occurred in 25(70%) patients. Symptoms included abdominal pain in 32(90%), nausea in 17(48%), and emesis in 9(25%) patients. Signs included right lower quadrant tenderness in 26(74%) patients, leukocytosis in 17(47.2%), and fever (>99'F) in 11(30.5%). Laparoscopy was used as an important diagnostic as well as therapeutic modality. Of the patients, 9 (25%) had gangrenous appendix, while 12 (33.3%) had perforated appendix. A total of 12 (33.4%) patients developed complications. Hospital stay was considerably increased in patients with a delayed diagnosis (5-7 days), perforations (5-9 days) and post-operative complications (5-15 days). One patient, a known case of ischaemic heart disease, died of cardiopulmonary arrest.

Conclusion: Acute appendicitis needs to be considered in the differential diagnosis of all patients with abdominal pain. A high index of suspicion is necessary to guard against mis-diagnosis, especially in the elderly. Delays in presentation and diagnosis are associated with higher rates of perforation and, hence, higher morbidity. Repeated clinical examination, a high index of suspicion and urgent investigations are necessary for a correct and rapid diagnosis.

Keywords: Acute appendicitis, Elderly age, Gangrene, Perforation. (JPMA 62: 946; 2012)

Introduction

Approximately 7% of the population will have appendicitis in their lifetime[1] with the peak incidence occurring between the ages of 10 and 30 years.[2] Evaluating an elderly patient who presents with abdominal pain is a difficult challenge and one that we will be faced more often as the mean age increases. Understanding why elderly patients present differently than their younger counterparts can improve the outcomes by minimising diagnostic mistakes and delays in treatment. Appendicitis is a disease also occurring in the elderly, and is subject to both delayed presentation and diagnosis. When compared to the younger generation, the elderly have much higher morbidity and mortality rates. The risk of perforation in the elderly population is reaching levels up to 70%, and morbidity and mortality in the elderly remains significant at 28-60% and 10% respectively.[3]

The differential diagnoses of acute appendicitis are numerous and vary significantly.[4] Despite technological advances, the diagnosis of appendicitis is still based primarily on the patient's history and physical examination.[5]

In approximately 20% of all cases, however, the diagnosis is incorrect and patients undergo surgery without having acute appendicitis.[6,7] Prompt diagnosis and surgical referral will reduce the risk of perforation and prevent complications. The elevated rate of appendectomies without histological evidence of acute inflammation, especially in

young women, and the high perforation rate in children and elderly patients reflect poor diagnostic accuracy.[8]

The objective of this study was to review the clinical experience of Pakistan Ordnance Factories Hospital in diagnosis, management and outcome of patients presenting with acute appendicitis aged 60 years and above.

Patients and Methods

All patients above 60 years of age with acute abdominal pain presenting at the hospital between December 2006 and May 2008 were initially included in this descriptive case series . Sampling was done by convenient sampling technique. POF Hospital is a 600-bed tertiary care hospital with fully-equipped Surgical ICU and two surgical units with a total of 80 beds. It covers Wah and its surrounding areas, including Hassan Abdal, Taxilla, Haripur, Havelian etc.

Patients diagnosed with diseases other than appendicitis or negative appendicectomy were later excluded from the study. Information obtained included detailed history, examination, co-morbidities, time from the onset of symptoms to admission and signs. For most of the patients, the primary admission diagnosis was established in the emergency department by a surgical resident. For the remainder, the primary admission diagnosis was established by the surgical specialist. The diagnosis was based on history and clinical examination.

All the appendicectomy specimens were sent for histopathology. Patients with confirmed diagnosis of acute appendicitis either clinically such as gangrene, perforation or histopathologically proven specimens were included in the study. Following definitions were used; Fever: more than 99°F and leukocytosis, more than 11,000/mm.[3]

A proforma was devised to record all signs and symptoms, age at presentation, provisional diagnosis, mean hospital stay, histopathology record, type of incision and procedure and post-op complications. In patients with doubtful diagnosis, ultrasound abdomen and laparoscopy was also done. Statistical analysis was done with SPSS 16.0.

Results

During the study period a total of 75 patients presented with acute abdomen. Of them, 42 (56%) patients were admitted with tenderness in right iliac fossa. Finally, 36 (48%) patients aged 60 years and above had final diagnosis of acute appendicitis. There were 20 (56%) men and 16 (44%) women with an age range of 60 to 78 years and mean age of 65.5±4.2 years. Associated illness occurred in 25 (70%) patients with a few having more than one co-morbid condition (Table-1).

The mean duration of symptoms was 4±1 days. Almost half the patients presented late with more than 2 days of symptoms before hospital admission. All the patients had pain as the predominant presenting symptom. This was in the right iliac fossa in 24 (66%) patients, lower abdomen in 6 (17.5%), right hemi abdomen in 2 (6%), and diffused in 4 (10.5%). Other symptoms were nausea in 17 (48%), and emesis in 9 (25%). Signs included right lower quadrant tenderness in 26 (74%) patients, leukocytosis in 16 (47.2%), and fever (>99'F) in 11 (30.5%). No patient had leucopenia or hypotension. Two (5.5%) patients had high-grade fever suggestive of septicaemia and perforated viscus and were found to have perforated gangrenous appendix. No appendicular mass or abscess was seen.

Out of the 36 patients, clinical diagnosis of acute

Table-1: Co-morbidities in elderly patients with acute appendicitis.

Co-morbidities	n = 25
Diabetes Mellitus	10 (40%)
Hypertension	16 (64%)
Ischaemic heart disease	13 (52%)
Bronchopulmonary disease	7(28%)
Renal Insufficiency	4 (16%)

Table-2: A comparison of different aspects and presentations of Acute Appendicitis study at POF Hospital with different international studies.

	POF Hospital (2006-2008)	Luncã et al. (2004)[13]	Hui et al (2002)[21]	Lee et al. (2000)[20]
Type of study	Descriptive (case series)	Retrospective	Retrospective	Retrospective
No. of Patients	36	63	95	130
Duration of Study	2 year	5 years	10 years	10 years
Age Group (Years)	60 and above	60 and above	70 and above	60 and above
Co-morbidity	70%	60%	75%	—
Clinical Acute appendicitis	61%	69%	74%	64%
Pain Right Iliac fossa	66%	41%	83%	69%
Nausea	48%	49%	43%	—
Vomiting	25%	—	20%	26%
Fever	30%	49%	31%	33%
Leukocytosis	47%	69%	72%	—
Laparoscopy	19%	—	34%	—
Perforation	33%	31%	68%	—
Complications	33%	34%	37%	28%

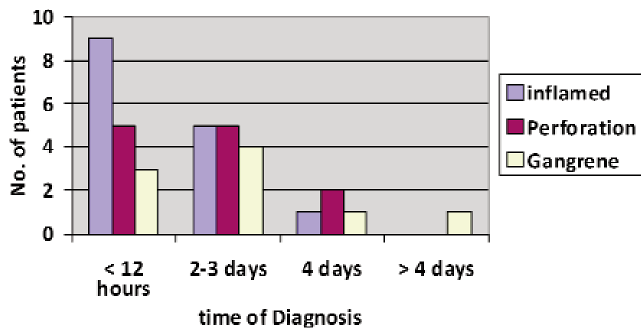

Figure: per-operative findings of appendicitis according to time of operation.

appendicitis was made in 24 (66%), which was later confirmed by histopathology. Other investigations, including ultrasound abdomen, Barium studies and erythrocycle sedimentation rate (ESR) were done in the rest of the patients to rule out other diseases.

When uncomplicated appendicitis or localised peritonitis was suspected, a right grid iron incision was made. When a generalised peritonitis was suspected, a midline laparotomy incision was performed. Laparoscopy was also performed in cases where no diagnosis could be made which gave promising results as a diagnostic as well as therapeutic modality. A total of 7 (19.4%) patients underwent laparoscopy. Six (16.6%) appendicectomies were performed laparoscopically while 1 (2.7%) was managed by right grid iron incision, thus preventing a large midline or right paramedian incision.

Fifteen (41.6%) patients presenting with classical signs or high suspicion of acute appendicitis were operated upon within 12 hours of admission, while 16 (44.4%) patients were operated on day 2-3 after ultrasound examination, detailed lab reports and repeated examination by surgical specialists. Four (11.1%) patients were operated on day 4 and 1 (2.7%) was operated on day 5. Pre-operative parenteral antibiotics were given to all the patients. Antibiotics were started only after the confirmation of diagnosis.

Among the 36 patients operated upon for acute appendicitis, 15 (41.6%) had acutely inflamed appendix, 9 (25%) had gangrenous appendix, while 12 (33.3%) patients had perforated appendix (Figure). Localised pus collection was seen in 4 (11.1%) perforations and generalised peritonitis in 2 (5.5%) as confirmed on laparoscopy. Pus was drained, abdominal cavity was washed with normal saline and no drain was placed.

Hospital stay in patients with uncomplicated appendicitis was 2-3 days following surgery, whereas it was 4-6 days in cases of gangrenous appendicitis, and 7-10 days in cases of perforated appendix. Hospital stay was also prolonged in patients who developed post-op complications.

A total of 12 (33.4%) patients developed complications; 9 (25%) patients developed surgical complications — wound infection in 8 (22.2%), and pelvic abscess in 1(2.7%). Other complications included urinary retention in 4 (11.1%), ileus in 2 (5.5%), arrhythmias in 2 (5.5%), lower respiratory tract infection in 2 (5.5%) patients and sepsis in 1 (2.7%). One patient with a history of ischaemic heart disease died of cardiopulmonary arrest.

Discussion

This study was performed to highlight the experience of acute appendicitis in elderly patients. . In our study 24 (66%) patients presented with pain in the right iliac fossa and less than half of the patients presented with features typical of acute appendicitis which is comparable to other international studies (Table-2). In our study 9 (25%) had gangrenous appendix, while 12 (33.3%) patients had perforated appendix with a few having both gangrenous as well as perforated appendix, and 15 (41.6%) had acutely inflamed appendix, similar to what is found in the literature,[9,10] Our management consisted of surgery as soon as diagnosis was confirmed and the patient was considered fit for general anaesthesia. Right grid iron incision was given in 25 (69%) patients and extended to Rutherford Morrison in 4 (11.1%) patients. Three (8.3%) patients were given right paramedian incision, and 2 (5.5%) were opened by midline incision. Seven (19.4%) patients in our study underwent laparoscopy, and laparoscopic appendicectomy was done in 6 (16.6%) patients with uneventful recovery. The overall complication rate of 12 (34.9%) patients in our series is similar to previous reports of 28-60%[6,11-13] (Table-2). Complication rate was higher in patients with perforated appendix and co-morbid conditions.

While acute appendicitis is primarily a disease of the younger population, with only 5% to 10% of cases occurring in elderly persons, the incidence of appendicitis in older patients seems to be increasing with an increase in life expectancy. Less than half of the elderly patients with acute appendicitis present with the classical signs and symptoms including nausea, vomiting, loss of appetite and migrating pain.[14] Perforated appendicitis and septic progression is the main cause of undesirable outcomes. The risk of perforation in the elderly population is high, reaching levels of up to 70% in some reports,[15,16] and only one-tenth show increased lucocytosis

Only 50% to 60% of patients have a classic presentation of appendicitis - poorly localised periumbilical pain followed by nausea and vomiting with subsequent migration of pain to the right lower quadrant. Other patients may present with pain in the right upper quadrant. As opposed to the classical migration of pain from the epigastrium to the right iliac fossa, elderly patients may more frequently have localised pain in the right iliac fossa from the onset.[17] Unusual presentations of appendicitis tend to occur when the appendix is in a retrocecal location, when the patient is at an extreme of age.[18] When compared with younger patients, however, the

elderly are less likely to have all, or even most of these features in a convenient 'diagnostic package.'[19]

The orthodox treatment comprises appendectomy as it provides a prompt and definitive treatment and also eliminates the risk of further attacks of appendicitis. However, associated risks include post-operative wound infection, fistula formation and ileus as well as anaesthetic problems. In the elderly, the morbidity may be even higher, especially if there are co-existent medical conditions. All these factors must be taken into consideration when planning emergency surgery.[20,21] Laparoscopy has the potential advantage of aiding in diagnosis as well as providing an opportunity for treatment, but it has not been evaluated in older patients. Laparoscopic appendicectomy has been shown in some series to offer more rapid recovery and less post-operative pain compared with the open approach.[22] However, these benefits were not demonstrated in all studies and several studies have shown an increased risk of postoperative abscess formation in patients who have perforated appendicitis treated laparoscopically. Some authors have found a significant reduction in number of unnecessary laparotomies, and an overall improvement of diagnoses in such situations.[11,23,24] Progress has been made in the treatment of acute appendicitis. In 1944, the mortality of the acute appendicitis was 2.4%; today this figure is less than 1% in the general population.[15,16,25] Despite such progress, morbidity and mortality in elderly remains significant at 28-60% and 10% respectively.[16,20,25] The vermiform appendix of the elderly patient develops vascular sclerosis, narrowing of the lumen by fibrosis, the muscular layer is infiltrated with fat and there is a structural weakness with tendency towards early perforation. Elderly patients sometimes do present in advanced stages of disease which also leads to high morbidity and complications. Advancing age adversely affects clinical diagnosis, the stage of disease and the outcome. Perforated appendicitis and septic progression is the main cause of undesirable outcomes. Diagnostic studies may cause further delay in definitive management, and associated illnesses increase operative risks.[16] Urgent investigations, therefore, are necessary in the elderly to reach a definitive diagnosis promptly.

Conclusion

Acute appendicitis in the elderly remains a challenge for practicing surgeons and continues to be associated with high morbidity and mortality. With increasing life expectancy, more such cases are likely to be encountered in the future. A careful examination of elderly people presenting with atypical abdominal pain and the avoidance of delayed diagnosis for a septic abdomen are extremely important in the prevention of severe morbidity and mortality.

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