

# ACUTE APPENDICITIS IN THE AGED

**Jinda Aekthong**

*Nakhonpathom Hospital*

Acute appendicitis is one of the most commonest emergency surgical condition and is, above all, a disease of young persons which causes the possibility of its occurrence in aged patients often to be overlooked. Delayed diagnosis and treatment of appendicitis is not infrequent in their case for this reason.

The manifestation of appendicitis in aged persons has some special features which may contribute to delayed diagnosis. On the other hand, rapid diagnosis of their appendicitis would be particularly desirable because in aged people concomitant, complicating diseases are not rare and their physiological reserves are often too small to tolerate any delay. It follows that early diagnosis of this disease in aged persons possesses great significance in regard to surgery, hospitalization, and occurrence of complications, as well as mortality.

## Material and method

In Nakhonpathom hospital, Nakhonpathom province 3,618 patients were operated on for acute appendicitis during a five year period (Jan, 1988 to Dec, 1992). Of these, 220 (6.08%) were 60 years of age and over. These 220 patients constitute the series studied in this report.

A control series, also comprising 220 patients with acute appendicitis but under 60 years, was

collected from the same period and were picked without selection.

A comparison was made between the two series in the endeavor to elucidate the differences which might exist between them in respect to the kind and duration of symptoms, clinical findings, fundamental laboratory examinations, operative complications and mortality. Only patients actually subjected to operation for appendicitis and in whom inflamed appendix was established at operation were accepted in both series.

## Results

96 (43.6%) were male, 124 (56.4%) were female in the aged group and there were 130 males (59.1%) and 90 females (40.9%) in the control group. The age ranged from 60 to 85 (mean 66) years of age in the study group whereas 7 to 60 (mean 26) years old in the control group.

The symptoms of appendicitis in aged persons do not seem to differ from the usual symptoms of the disease. Table 1 reveals that typical abdominal pain occurred in 54% of the aged patients and 63% of the control group. Vomiting, and signs indicative of inflammation (Table 2) such as elevated temperature and leukocytosis were also the highly constant features in the disease of the aged patients. Also other symptoms appear to parallel those in the

**Table 1** Frequency of various symptoms of appendicitis

	Aged patient		controls	
	No.	%	No.	%
typical abdominal pain	119	54.1	139	63.2
local pain only	71	32.3	47	21.3
indefinite abdominal pain	30	13.6	34	15.5
Vomiting	92	41.8	112	50.9
Nausea	63	28.6	101	45.9
Diarrhea or Constipation	43	19.5	39	17.7
Fever	72	32.7	79	35.9
Urinary disorder	13	5.9	7	3.2

**Table 2** Signs of inflammation

	Aged patient		Controls	
	No.	%	No.	%
Body temperature < 37 ° C	52	23.6	61	27.7
37-38 ° C	103	46.8	102	46.3
> 38 ° C	65	29.5	57	25.9
Leukocyte count < 8,000	39	17.7	51	23.1
8,000-10,000	40	18.2	47	21.3
10,000-15,000	94	42.7	90	40.1
>15,000	47	21.4	32	14.5

**Table 3** Duration of symptom

	Aged patient		Controls	
	No.	%	No.	%
Duration of symptom 0-1 Day	73	33.2	91	41.4
1-2 Day	65	29.5	76	34.5
2-3 Day	26	11.4	36	16.4
> 3 Day	36	16.4	17	7.7

**Table 4** Status of appendix observed at operation and mortality

	Aged patient		Controls	
	No.	%	No.	%
Acute inflamed	81	36.8	126	57.3
Gangrene	74	33.6	78	35.4
Perforated	65	29.5	16	7.3
Death	13	5.9	2	0.9

**Table 5** Concomitant complicating disease in Aged patient

Concomitant disease	No. of patient	%
Cardiovascular disease	52	23.6
Diabetes	17	7.7
Renal disease	14	6.4
Pulmonary disease	13	5.9
Cerebrovascular disease	5	2.3
Other significant disease	21	9.5
Total	118	46.9

**Table 6** Postoperative complications in Aged patient

	No. of patient	%
Wound infection	31	14.1
Intraabdominal abscess	16	7.3
Cardiac failure	14	6.3
Respiratory failure	9	4.1
Renal failure	6	2.7
Diabetic ketoacidosis	4	1.8
Total	80	36.4

**Table 7** Hospital stay in aged patient

	No. of patient	%
1 - 5 days	33	15
6 - 10 days	131	59.5
more than 10 days	56	25.5

control series.

The duration of symptoms (Table 3) did not reveal any significant differences between the series either. However, the observation has to be made in this connection that the patient's accurate history is more difficult to take in the case of aged than of younger persons.

Perforation is a really striking characteristic notable in the series of aged patients (29.5%) when compared to the rate of perforation in the control group (7.3%) (Table 4).

Thirteen deaths (5.9%) occurred in the group of aged patients but only 2 (0.9%) deaths in the control series. The causes of death of the aged patients were due to a true sequela of appendicitis in 7 patients who got severe peritonitis and septicemia. The other 6 patients were died from concomitant disease such as cardiovascular disease (3 patients), respiratory failure from chronic obstructive lung disease (2 patients) and renal shut down (1 patient). One patient in the control group died of severe peritonitis and sepsis and another died from cardiac complication.

Nearly half of the aged patient (46.9%) presented concomitant, complicating disease, which were distributed as table 5 shows. These disabling

diseases necessitated special treatment.

Postoperative complications occurred in 80 aged patient (37%). Since the disease was rather advanced in old subjects, the commonest complications were infections, occurring either in the wound or as an intraabdominal abscess in 47 patients (21.3%). Other complication included cardiac failure in 14 patients (6.3%), Respiratory failure in 9 patients (4.1%), renal failure in 6 patients (2.7%) and diabetic complication in 4 patients (1.8%).

The hospitalization period of the aged patients was longer than usual. Only 15% of them being discharged after the normal period of five days. Another 59.5% within ten days, and the remaining 25.5% after a period longer than ten days.

## Comment

With increasing longevity, the incidence of appendicitis in the older aged group is rising. In these series 6% of patient with acute appendicitis were over 60 years of aged whereas other series had identified the incidence of 4.2%<sup>1</sup>, 4.5%<sup>2</sup>, and 5.8%<sup>3</sup>.

Symptoms of appendicitis in aged patients seem to be similar to those of younger patients. Abdominal pain starting in the entire abdominal region and later moving down to the right was the

main symptom also in aged patient (54%). Similar observation have been made by Hubbell, et al<sup>4</sup>. There is some disproportion between clinical symptoms and operative finding in aged patient<sup>5</sup>. In spite of frequently rather severe changes in the appendix, the cardinal symptoms are often weak. In the aged person localization of abdominal pain usually occurs later than in young patient<sup>3</sup>. According to Williams and Hale<sup>6</sup>, it is due to indefiniteness of the symptoms that diagnosis errors are more frequent in the case of old than of young patient (25.5% and 5.5%, respectively).

The fever and leukocytosis reaction caused by the inflammation was fully comparable in both aged and control series of the present study. Goldenberg<sup>5</sup>, too, found that aged patient reacted earlier by leukocytosis. Fever (Body temperature more than 37° c) occurred in aged patients in this report in 76.3%, against only 5% in Goldenberg's<sup>5</sup> and 5% in Williams and Hale's series<sup>6</sup>.

The duration of symptoms was nearly the same in this aged and control series, but the appendicitis appeared to progress to the perforated stage more often and more rapidly among the aged. In the present series only about one out of three aged patients' was operated on at the propitious stage of the disease, while this was the case in more than one half of the control series. In 29.5% of the aged patients the disease had advanced to perforation of the appendix. Reports to be found in the literature are unanimous in stating higher frequency of severe degrees of inflammation among the aged than among the young patient<sup>1,7</sup>. In Thorbjarnarson and Loehr's<sup>3</sup> aged series perforation was recorded in more

than 50%, in Goldenberg's<sup>5</sup> in 55%, in Williams and Hale<sup>6</sup> in 60% and in Peltokallis and Jauhainen<sup>2</sup> in 32%. The cause responsible for rapid spread of inflammation in aged persons can mostly be found in the appendix itself. Its lumen is often narrowed and even obliterated after previous inflammation. Sclerosis of the arteries of the appendix may also account for rapid spread of inflammation in the appendices of the aged. The element of impaired supply, intraluminal obstruction and structural weakness of the wall are the principal factors in producing early perforation in the older age group. This series clearly demonstrates that appendicitis develops to the perforation stage more often and rapidly in aged patient than in younger ones and the symptoms were approximately consistent with operative findings in aged persons.

The mortality of aged appendicitis patients (5.9%) is nearly about seven times that of the young patients (0.9%) in this study. The study of Clements, et al<sup>8</sup> it was five fold, in Ross et al<sup>9</sup> it was 16 fold and in that of Peltokallio<sup>2</sup> it was seven times that of the entire number. In 7 of the 13 deaths the appendicitis itself was responsible by causing severe peritonitis and septicemia. Uncontrolled infection, which was the principal cause of death in early time, is only rarely the direct cause of death nowadays because of appropriate and effective potent antibiotics are available. Cardiac and pulmonary disease are the important direct cause of death at present especially latent, untreated heart failure are dangerous<sup>3</sup>.

Surgery has to be taken without delay in the case of aged patient. Early operation is the sole means by which the operative mortality can be

lowered. Age should no longer be considered as a contraindication to operation, but rather as an accentuated surgical condition.

Complications occur in 36.4% in aged appendicitis patients in this series and infection played the greatest role. Antibiotics are indicated in all instances for prevention of intraperitoneal and pulmonary complications in the aged. Once perforation has occurred, every older patient should be treated as a potential cardiac patient. Correction of fluid electrolyte imbalance must be managed with caution to avoid overburdening the circulatory system<sup>3</sup>.

The hospitalization period of aged patient is longer than that of normal appendicitis series. 15% of aged patient in this study were discharged within the normal five days; in the series of Thorbjarnarson and Loehr<sup>3</sup> two thirds of the patients had to stay in the hospital longer than two weeks. The average hospitalization period in the series of Reeves, et al<sup>7</sup> was 25 days. The longer length of stay in the aged patient were effluenced by the more severity of the disease, the concomitant disease, more complication, less organ reserves and sometimes from the convince of the patient's relatives for feeling safe.

## Summary

A group of acute appendicitis patients over 60 years was compared to an unselected group of equal, composed of patient under 60 years. There were 220(6%) patients who were over 60 years from the total 3618 cases of acute appendicitis subjected to surgery during a 5 years period.

In respect to its symptoms, the picture of appendicitis in aged person does not much differ

substantially than that of appendicitis in younger persons. The symptoms such as typical abdominal pain, nausea, vomiting as well as the body temperature and leukocytosis induced by inflammation were fully comparable in the group of aged patient and in the control group.

Inflammation appear to progress more rapidly to the gangrenous and perforation in aged persons. Of the aged patients' appendices, 29.5% had already perforation at the time of operation, compared to 7.3% in the control group. Intensive efforts towards early diagnosis and prompt operation are indicated in aged case.

Postoperative complication occurred in 36% of aged patient and only 15% of the aged patient were discharged from the hospital within the normal five days.

The mortality in aged patient is remarkably high(5.9%). However concomitant complicating disease were often as responsible for death as the fundamental itself. Both preoperatively and postoperatively, great attention should be paid to such disease especially latent, unrecognized heart failure and respiratory problems.

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