

# Management Of Appendiceal Mass In Children And Adults: Our Experience

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## Abstract

This is a retrospective study based on the number of patients treated in the general surgical department for appendiceal mass, in children and in adults alike from January 2000 to December 2005.

In a way, clinical presentations and morbidities differ from patient to patient and that is why we took a closer look at this study and literature. This goes to support the motion that the management of these cases should be considered individually.

Material/methods: We have taken to present the analysis of 35 cases of periappendiceal mass out of 537 appendicitis patients hospitalized in our department. Data analysis were obtained from our computer documentation (Microsoft Excel), and patients' charts.

Results: Men were affected more than women. Recurrent rate of acute appendicitis was 8.3%. The complication rates for patients who underwent emergency appendectomies were higher than for those with interval appendectomies 36.3% v 16.7%. Interval appendectomy was not necessary in 58.3% of the patients operated upon, while 20.8% of the patients operated upon could have been at a risk recurrent appendicitis.

Conclusions: Our experiences are depicted in our conclusions, which go to support the view that interval appendectomy should be considered individually depending on the clinical findings.

## INTRODUCTION

There have been many controversies on this issue, as to whether an interval appendectomy is necessary after a conservative management appendiceal inflammatory mass or not. There are many options in the management of the appendiceal mass. These, however, depend on the surgeon's experience and preference in dealing with such a case. Some prefer a conservative method, admitting the patients to the ward, and treating the patients with an intra-venous antibiotic coverage<sup>(1,2,3,4,5,6,7)</sup>. Others prefer an operative intervention, including the drainage of the appendiceal mass and conservative treatment, and later an interval appendectomy depending on the results of colonoscopy or barium enema which could help in excluding other underlying lesions<sup>(8)</sup>. Some others argue for a definite operative intervention during the primary admission. This is more so in children<sup>(9)</sup>.

## MATERIALS AND METHODS

Data from patients' charts / clinical data bases pertaining relevant variables were reviewed retrospectively.

Over the past six years, from the year 01/Jan. 2000 to 31/Dec./2005, we admitted and treated 537 patients with symptoms of acute appendicitis. Among those were 35 patients with diagnoses of periappendicular inflammatory mass. The mode of diagnosis was basically clinical findings and with the help of ultrasonographic imaging for confirmation. The number of 35 patients was just 6.5% of the total. In this, we had patients with age ranges of:

a) Patients from the age of 3-15 years n=11 (31.4%), in this group, 7 boys and 4 girls.

b) Patients from the age of 16-79 years n=24 (68.6%), in this group, 17 males and 7 females

On admission, the presenting signs and symptoms were vomiting, often in younger children but not prominent in mature adults and aged patients. Nausea, loss of appetite, fever of an average of 38.5°Cel., tenderness and a palpable mass on the right lower abdomen, high leucocytes in blood count >18,000 cells/mm<sup>3</sup>, on the average. (range 11,5- 31,500 )

The total number of females was  $n=11$ , age range (5-79), the mean age was  $37.2 \pm 3.6$  years

The total number of males was  $n=24$ , age range (3-60), and the mean age was  $29 \pm 3$  years.

Traditionally, we managed the adult patients conservatively, with a non-operational intervention initially. However, all the children up to the age of 15 years were treated operationally on the first admission after a triple antibiotic coverage. Augmentin and Metronidazole were routinely administered. On admission, the treatment consisted of bed rest, no oral intake of food and fluids, while an intravenous fluids of about 50ml -100ml /kg/24h was administered depending on the clinical state of the patient. We also used non-steroidal antiinflammatory/analgesic drugs in these patients. Generally, we performed a laparotomy after 6-72 hours from the time of admission of those children.

The operation time was about 50 minutes on the average. We always tried to dissect free the inflammatory mass from the surrounding healthy tissues. That however, required a very careful handling and manipulation. We almost always used the trans-peritoneal access. After a copious lavage and irrigation of the peritoneum, a drainage tube was installed around the area, including the pouch of Douglas.

An antibiotic therapy was continued until fever subsided, which occasionally occurred on the average in about 76 hours. Bowel functions returned at about 72 hours post-operation, and food by mouth was generally begun after flatus was passed, which was noted at an average period of 72 hours, and food was continued, if well tolerated. This depended basically on when the patients' pains subsided, with less palpable mass on the right iliac fossa. The mean period of hospital treatment was about  $10 \pm 2$  days. The post operation morbidity was mainly

wound suppuration, that was noted in 3/11 patients=27.3%, and thus mandated a longer hospital stay. An antibiotic therapy was continued for an average of 7 days more than those without this morbidity. We did not record any deaths.

In the adults, conservative treatment was continued until the clinical state of these patients improved. That was when the white blood cells count, body temperature normalized, and the appendiceal mass was less tender and with a clear reduction in size. This was usually confirmed clinically and with the help of the ultrasonographic investigation. Until normal diet was well tolerated and pain in the right iliac fossa abated, these patients remained in the hospital. The

range of (7-30 days) was noted with an average stay of 13 days.

Elective interval appendectomy was planned for in-patients at an interval of 6-12 weeks post-primary admission and this of course was in patients within the age range of 16-79 years. The mean age was  $39 \pm 5$  years. The number of males to females was 17 to 7.  $n=24$ . One patient did not report for the elective operation. That was a female patient aged 79. Two (8.3%) male patients aged 28 and 34 had to be operated during the third and fifth weeks respectively because of episode recurrent appendicitis. They recovered without any serious morbidities, apart from a urinary tract infection in one of the patients.  $N=1$  (4.2%)

The operations were carried out after a one short intravenous antibiotic coverage. We traditionally use Amoxicillin/Clavulanate potassium 1,2g. iv (after excluding allergy to these drugs), 30 minutes before the operation.

The average operation time was 30 minutes. The mean hospital stay was  $4 \pm 1$  days.

We had a few morbidities in these patients. One female patient,  $n=1$  (4.2 %) 72 years old had a mucinous adenocarcinoma of the appendix, and needed a right hemicolectomy. Another female patient,  $n=1$  (4.2%) aged 69 years, had an appendiceal carcinoid, less than 1cm in size, but had no signs of carcinoid syndrome earlier. We found no signs of metastases in either of these patients. In the remaining 19 patients, during operations, we noted that in  $n=9$  (37.5%) of those patients, had totally destroyed and absorbed appendix. In  $n=5$  (20.8%) of the patients, we noticed that they had fibrosis and obliteration of the appendices, without patent lumens, as confirmed by histopathological examinations. In the remaining 5/24 (20.8%) of the patients, histopathologic investigations revealed patent lumens of their appendices, but we did not record complaints of attacks of pain in any of these patients prior to interval appendectomies

## RESULTS

In this study we noted that males were more affected than females as in children and adults alike. The recurrent rate was  $2/24 = 8.3\%$  in adults.. Those younger patients who had operative interventions on admission had a higher morbidity rate of 27.3%, mainly due to wound suppurations. One of those young patients,  $1/11 = 9\%$  who underwent emergency appendectomies had a urinary tract infection. One patient,  $1/24$  (4.2%), operated for recurrent appendicitis had a

urinary tract infection.

In another patient, 1/24=(4.2%) who had an elective interval operation, we noted urinary tract infection. In the female patient (4.2%) with a right hemicolectomy, we noted right sided pneumonitis. One patient, 1/24 (4.2%), had wound infection after the interval appendectomy. We did not record any deaths.

### DISCUSSION

Acute abdomen remains one of the major challenges for the general surgeon. The need to carry on with an emergency operation should depend on the clinical findings rather than statistical or additional investigations like the laboratory or radiological results. These investigations should rather serve as an aid to confirming the diagnosis<sup>(11,12)</sup>. Inflammatory changes typical of acute appendicitis were observed as consequences of luminal obstructions by these authors<sup>(13,14,15)</sup>. They concluded that luminal obstruction leads to secretion of mucus and fluid, with a consequence of rise in luminal pressure. If this rise in pressure exceeds pressure within the submucosal venules and lymphatics, it causes obstruction of outflow of blood and lymph, which in turn leads to an increase in pressure of the appendiceal wall. When capillary pressure is exceeded, mucosal ischaemia, inflammation and ulceration result. When bacterial overgrowth ensues within lumen, then starts an invasion of the mucosa and the submucosa by these bacteria. This leads to transmural inflammation, edema, vascular stasis and necrosis of the muscularis. The end result of this is perforation. In one sequence of events, the outpouring of neutrophils, and inflammatory mediators from these structures would lead to local inflammatory adhesions and walling of the inflammatory mass. All these sequences lead to periappendiceal abscess/phlegmone. An ideal diagnosis should be by clinical and sonographic investigations.<sup>(Willemsen PJ, et al.-16)</sup>

In younger children up to the age of 15 years, we operated on all those patients in accordance with findings of other authors.<sup>(Samuel, M et al 9, Lund, DP. Murphy, EU.-17)</sup>. It was obvious from their study that early surgical intervention was beneficial over nonoperative management in their cohort of patients. Also interval appendectomy is recommended after nonsurgical management of appendiceal mass. Ein and Shanding<sup>(7)</sup> however, see it another way round. They do not recommend routine interval appendectomy. They prefer an observatory policy, because only a small number of patients will benefit from the interval appendectomy. We believe, however, from our experiences

that Amoxicillin/Clavulanate potassium (plus Metronidazole) coverage during the pre-operative and post-operative period is favourable as against morbidities like wound infections amongst others, just as the results of other authors<sup>(Ronchetto, F. et al.-18 and Hollwarth, M. Et al.-19)</sup>.

We have kept the tradition of an initial conservative treatment in adult patients with periappendiceal mass with bed rest, intravenous fluids and antibiotics administration, with nil by mouth. Symptoms generally resolve within 7-14 days, and later treatment consists of a definite interval appendectomy in those patients who decide to come for the elective operation within the interval of 6-12 weeks. Before these patients were

discharged, however, a routine ultrasonographic investigation of the abdominal cavity was done but with particular reference to right inguinal fossa. The clinical state of the patients took the upper hand however, before the discharge.

Although our statistics of 6.5% of periappendiceal mass was a bit higher than the 2-6% which literatures cite, the complication rates were comparable. Recurrence in our study showed 2 out of 24 patients, which was just 8.3%. It is perceived that the incidence of recurrence is highest in the first year, with the rates of 2.1%, 5%, 10%, 13.7%, 20%, 25.5%<sup>(2,5,6,8,16)</sup>. Our interval appendectomy had a complication rate of 16.7% compared to 3.4%-19% according to others<sup>(1,2,3,5,16,18)</sup>.

We agree that no matter what mode of treatment which is employed by the surgeons, it is recommended that additional investigations like colonoscopy, barium enema and contrast x-ray of the small and large intestines should be conducted in order to exclude other pathologies like malignancies of the cecum or terminal ileitis or cecal diverticulitis.

This is particularly true in older patients.<sup>(8)</sup> Some recommend the age of over 40 years as the border line for such investigations<sup>(1,21,22,23)</sup>. Although in our study we had no such cases, but we did have one primary adenocarcinoma and a carcinoid tumour in two female patients above the age of 60 years. These findings, however, could not be detected by the above mentioned investigations. With these experiences, we recommend that carefulness should be maintained in elderly patients with periappendiceal mass.

Taking into consideration the totally destroyed appendix of 37.5%, nothing else needed to have been done in these patients. Those with atrophied (fibrosis) appendix, 20.8%

were not in any way threatened by any recurrent attacks of appendicitis. Both groups above, summed up to 58.3 %. They could not have been at a risk of further attacks of recurrent appendicitis. They, therefore would not have needed interval appendectomies either. Those patients with patent lumen of the appendix, 20.8% could be at risk of recurrent appendicitis. They should have needed observation in any way. Those two women(8.3%) with unexpected pathological findings definitely needed the interval appendectomy, for it would not have been possible to discover those pathologies but for the operations. They should count themselves lucky. With those findings, we recommend carefulness in elderly patients. Finally, from this study, patients undergoing interval appendectomy had a lower complication rate than those with emergency appendectomy.(16.7% v 36.3%).

### CONCLUSIONS

The management of appendiceal mass should vary, depending on the clinical findings and the state of the patients concerned, irrespective of age.

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