

## Appendiceal Mass Management at Bahri Teaching Hospital: Results of a Prospective and Retrospective Clinical Study

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**Abstract:** Acute appendicitis is the commonest cause of acute abdomen that necessitates surgical intervention. Appendiceal mass (AM) can complicate 2%-10% of patients with acute appendicitis. The treatment of AM is controversial. The aim of the present study was to describe the modalities of management of AM at a single teaching hospital; and to establish its prevalence and possible causes. **Methods and Subjects:** This is a prospective and retrospective descriptive clinical study; implemented at Bahri teaching hospital, during one year. Out of the 274 patients who were diagnosed with acute appendicitis, 94 developed AM (34.3%). Age range was 13 – 65 years. 47% of the patients were under 20 years of age. The male to female ratio was 2.9:1. 56.4% of patients received treatment for their present illness before the diagnosis of AM. The AM was diagnosed clinically in more than 55% of the patients. About ¾ of the patients were treated conservatively, 16% were treated by immediate appendicectomy and 6.4% underwent appendicectomy after failure of the conservative treatment. Only 33% of the patients underwent interval appendicectomy. The incidence of AM in BTH is high compared to the 10% worldwide, possibly due to the late presentation, misdiagnosis and the inappropriate treatments. Our modes of managing AM are comparable to other international studies. Only 33% of the patients underwent interval appendicectomy, this finding put the interval appendicectomy in question.

**Keywords:** appendiceal mass, incidence, causes, non-operative, operative, management

### INTRODUCTION & BACKGROUND

The life-time incidence of acute appendicitis (AP) is 7%- 8% with the highest incidence during the second and third decades. Acute inflammation of the vermiform appendix can sometimes be walled off by the body defense mechanisms leading to formation of an inflammatory mass (phlegmon) or a localized circumscribed abscess [1,2]. These two conditions together with the perforation of the appendix represent the complicated appendicitis. The appendiceal mass (AM) can be of two types: 1- Appendiceal phlegmon is an inflammatory mass formed of the perforated appendix, nearby viscera and the greater omentum. 2- Appendiceal abscess, which is a pus containing collection formed of the walled-off perforated appendix to form a circumscribed abscess. The prevalence of the AM is 3.8% - 10%, and the prolonged duration of the symptoms (>3 days) should raise the suspicion of AM [1, 2, 4, 5].

The management of the Appendiceal mass is controversial; immediate appendicectomy may be technically difficult and it is associated with more complications especially in the inexperienced hands. Sometimes the exploration of AM may end with right

hemicolectomy due to distortion of the anatomical structures or the suspicion of malignancy [1,3,4]. Advocates of the surgical treatment of the AM say that it confirms the immediate exclusion of other serious conditions and it provides definitive treatment at the initial presentation [4,5].

The conservative, nonsurgical, treatment of AM since its introduction by Ochsner in 1901 (nil by mouth, intravenous antibiotics, bed rest, close observation by chart followed by interval appendicectomy, after resolution of the symptoms and signs within 6-8 weeks) proved to be effective and safe [5]. Nowadays the conservative management of the AM is easier because the CT scan and ultra sound enabled the surgeons to accurately diagnose and differentiate the condition, and because the new generation of antibiotics that make the non-surgical treatment of AM feasible. The traditional conservative treatment of the AM is followed by elective interval appendicectomy to prevent recurrence of symptoms, perform surgery in less hazardous conditions and to exclude other pathological conditions [1, 2, 6]. Recently advocates of the conservative treatment of AM found that interval appendicectomy is not necessary, instead a close follow

up clinically and by images is safe and spares the need for surgery with its potential complications [1, 2, 7-11].

Diagnosis of the AM is made by the presence of a palpable mass on clinical examination before or after anaesthesia; or it is detected by ultra sound or CT scan. Less commonly the mass can be discovered at surgical exploration of the abdomen. Failure of the non surgical treatment of the AM entails appendectomy, after a period of antibiotic therapy, during the same hospital stay. AM can be drained either percutaneously or by surgical exploration in 20% of patients [1]. This modality of treating AM may be complicated by: sepsis, intestinal fistula, small bowel obstruction and recurrence of the symptoms [1, 2].

Immediate surgical treatment of AM is associated with more than three folds morbidity. Whereas the conservative treatment has 93% success rate and it is associate with lower morbidity and shorter hospital stay compared to the surgical treatment. Failure rate of the conservative non-surgical treatment of the AM is about 7.2% and it is related to the diameter of the mass (abscess > 4cm).Recurrence of symptoms after conservative treatment is 3% -25%, and it is associated with faecoliths. Recurrence commonly occurs during the first 6 months after the initial attack and is a milder one. Elective interval appendectomy is associated with 11% morbidity [1-4].

Bahri teaching hospital (BTH) is a tertiary health care facility with a capacity of 500 beds that comprise all medical subspecialties. It represents one of the main teaching hospitals that serve more than 5 million inhabitants of the capital of Sudan. There is Accident & emergency department that deal with all the emergencies with a separate operating theatre, where all emergency surgical interventions of all surgical subspecialties are performed.

The aims of the present study were to describe the modalities of treating the AM at BTH and to determine its prevalence and its possible causes.

#### **METHODS AND SUBJECTS**

This is a prospective and retrospective descriptive clinical study conducted during November 1 2013 and October 31, 2014, at a single teaching hospital (BTH).

A special data collection sheet was designed for collection of the data from the records of the patients, who were diagnosed with AM at the accident& emergency department (A/E). The data were collected retrospectively during November and December

2013. Due to some missing data in the records of the patients; starting from January 2014 to October 2014 the data were collected prospectively. The data collection sheet included information about the demographic aspect of the included patients; then the presenting symptoms and its duration. History of being treated or seen by a doctor before presenting to the A/E and whether he/she received any treatment for his/her present complaints, and what type of treatment. The sheet contained also information about the method of diagnosing the AM and how it was treated. The last part of the data collection sheet included the mode of follow up of the patient and whether he/she had interval appendectomy. All the emergency appendectomies were performed in the A/E department, whereas the elective appendectomies were performed in the main theatre complex within the scheduled operation list. Data were analyzed for descriptive statistic and the frequency, percentage and mean  $\pm$  standard deviation were obtained where appropriate and *t* test was used to compare results.

The study was approved by the ethical committee of BTH and by the research committee of the faculty of medicine of Alzaeim Alazhari University All the included patients were consented by an informed written consent.

#### **RESULTS**

The number of the patients who were diagnosed with acute appendicitis, during the study period was 273. Out of the total number, 94 patients had AM (34.3%). Age range was 13-65 years; about 47% of the patients were under 20 years of age. Table 1 shows the analysis of the patients` age groups. About three quarters (74.5%; no 70) were males. This makes a male to female ratio of 2.9:1.

The presenting symptoms of the patients with AM were: right iliac fossa pain in 36.6%. More than 50 patients (54.3%) presented with pain, nausea and fever. Out of the total number of the patients with AM 50.2% were seen by a doctor, for their present complaints, before being diagnosed with AM, and 56.4% of the patients received treatment for their present illness before presenting to the A/E department. Out of the 53 patients who received treatment 45.7% received antibiotics, 8.5% received Antimalarial treatment and 2.1% received other treatments. Recent past history of similar symptoms was recorded in 40.4% of patients. The signs elicited on abdominal examination of the patients with AM were tenderness at right iliac fossa in 90.4%, at suprapubic region in 5.3%, in the right hypochondrium in 2.1% and 2.1% of the patients with AM had generalized abdominal tenderness.

**Table-1: shows the age distribution of the patients with appendiceal mass.**

| Age groups     | Number of patients | Percentage % |
|----------------|--------------------|--------------|
| 13- 20 years   | 43                 | 45.7         |
| 21-30          | 33                 | 35.1         |
| 31-40          | 11                 | 11.7         |
| 41-50          | 4                  | 4.3          |
| Above 50 years | 3                  | 3.2          |
| Total          | 94                 | 100          |

The AM was diagnosed clinically on abdominal examination in 57.4% of patients, by ultra sound in 34%, CT scan in 3.2% and the AM was discovered during abdominal exploration in 5.3% of

patients. About ¾ of the patients were treated conservatively. Table 2 illustrates the modes of treatment of patients with AM.

**Table-2: the mode of management of patients with appendiceal mass.**

| Mode of treatment          | Number of patients | Percentage % |
|----------------------------|--------------------|--------------|
| conservative               | 70                 | 74.5         |
| surgical                   | 15                 | 16           |
| Conservative then surgical | 6                  | 6.4          |
| No answer                  | 3                  | 3.2          |
| Total                      | 94                 | 100          |

The mean hospital stay for the conservative treatment group was  $5.4 \pm 2.65$  days, and that for the surgical treatment group was  $7.13 \pm 3.91$  days.  $P = 0.054$ . Patients who had a period of conservative treatment and then surgery had longer hospital stay 12.33 days.

The follow up of the patients who had conservative treatment was by clinical examination in 48.9% of the patients, or by ultra sound in 17.0% and it was by clinical examination and ultra sound in the rest of the patients. Only 33% of the patients with AM underwent interval appendicectomy during the study period. All the primary surgical treatment of the AM were performed by consultants in the A/E theatre complex whereas, the interval appendicectomies were performed by registrars, medical officers and house officers under supervision, within a scheduled operating list in the main theatre complex.

The complications developed after emergency treatment of the AM included: surgical site infection in 12 patients of the surgically treated patients with AM (80%). One patient, from the surgical treatment group developed wound dehiscence.

## DISCUSSION

The presenting symptoms and signs in our patients with AM, were similar to other studies [1, 2, 6, 12]. The fact that only 5.3% of the AM were discovered during surgical exploration, indicates that the clinical diagnosis of AM is straightforward if correlated with the typical history, and augmented by ultra sound or CT scan. CT scan is not commonly used, in our hospital, for diagnosing acute appendicitis due to the high cost;

delay in providing the definitive treatment and for the risk of radiation, especially in young patients.

The modalities of treating AM in our hospital do not differ from other studies. Husain et al reported 42.5% of patients had conservative treatment and 47, 5% underwent surgical treatment. Okafor et al. reported a rate of 6.7% for immediate surgery and 76% for non-surgical treatment [4, 12]. The traditional conservative treatment of AM is adopted by 67% of the Surgeons in the Mid Trent region of England. Whereas only 13.5% of the Surgeons in the same region of England would manage AM by immediate surgical exploration [2, 6]. The non-operative management of AM in young adults is associated with high effectiveness and low incidence of life-time recurrence (10% - 20%). In elderly patients the management of AM necessitates special consideration and further investigation to rule out other serious pathological conditions. In the premenopausal females the management of AM can be affected by the possibility of other gynaecological conditions and by the impact of the surgical operation on the subsequent fertility; for this reason many Surgeons opt for operative management of AM, either immediately by laparoscope or electively after a period of antibiotics therapy [2].

Other modalities of AM management include: Emergency laparoscopic appendicectomy is emerging as a new safe treatment modality for the appendiceal mass, and may prove to be more cost-effective than conservative treatment even without interval appendicectomy as it is associated with a much shorter hospital stay and obviates the need for long intravenous antibiotic therapy. It further obviates the need for

interval appendicectomy [5]. Percutaneous Catheter drainage of the appendiceal abscess is a modality of treating appendiceal abscess that obviates the need for emergency appendicectomy and it can be performed under Ultra Sound or CT scan guide without general anaesthesia [13].

The failure rate of the conservative treatment of the AM in our hospital is comparable with other studies. The failure of the conservative treatment is associated with appendiceal abscess > 4 cm in diameter [1, 3, 4]. The hospital stay following conservative treatment of AM is significantly shorter than that for surgical treatment ( $P = 0.05$ ) and this is inconsistency with other studies [1,4,5].

The prevalence of the AM in our hospital is high compared to 10% worldwide. Tannaury et al. reported a prevalence of 3.8% - 5% and Mishikhes reported a rate of 2% – 10%. This high prevalence can be attributed to the delayed presentation of the patients and to miss diagnosing the condition. The finding that 53 patients received treatment for their present complaints, before being diagnosed as having AM, contributed in the delay of presentation and diagnosis. Patients` delayed presentation is associated with the development of AM. [1,3, 6, 12] The fact that more than half of the cases of AM were missed diagnosed raises a big question mark. Is this due to the high burden on the A/E department, or to the unawareness of the symptoms and signs of the early presentation of the acute appendicitis? Is it due to the limited capacity of the accident and emergency (A/E) department? , that restricts admission of patients for a period of observation; or it is a result of the fear of having a high rate of negative appendicectomy? A period of close clinical observation before prescribing any treatment for patients with equivocal symptoms and signs of acute appendicitis can reduce this high prevalence of AM. Which is better and cost effective for the patient and the hospital administration to have a high rate of AM or a high rate of negative appendicectomy? This issue warrants further study and investigation.

The finding that two thirds of the patients had no interval appendicectomy after conservative management of AM, question the necessity of the elective interval appendicectomy after complete resolution of the AM [5]. Anderson [3] reported an incidence of 1.2% of malignancy in appendixes removed during emergency treatment of AM. Tannoury [1] reported that 75% - 90% of the interval appendicectomies in adults were unnecessary and that the possibility of missing a malignant disease, if the appendix left, is about 2%. In North America interval appendicectomy, after successful conservative management of AM, is routinely performed by 86% of surgeons, and its reported complication was 12% - 23% [14]. Does this justify routine interval appendicectomy? It is safer to adopt a policy of

adequate follow up clinically and by images and to intervene only when symptoms persist or recur.

## CONCLUSION

Conservative, non-surgical management of AM is the commonest practice at Bahri teaching hospital. It is safe, effective and followed by less morbidity. The immediate surgical treatment of AM should be performed by experienced surgeons for patients who develop early recurrence, those who had prolonged unresolved mass and after failure of the conservative treatment. Further studies are warranted to investigate the necessity of the interval appendicectomy after successful conservative treatment of AM.

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