

Appendicitis and its Surgical Management Experience at The University of Maiduguri Teaching Hospital Nigeria

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ABSTRACT

BACKGROUND: Acute appendicitis and its complications is still the most common cause of acute abdominal pain that will require surgical intervention in most parts of the West African sub- region. This study is a review of our management and outcome of acute appendicitis in the University of Maiduguri Teaching Hospital [UMTH].

METHOD: A retrospective and prospective audit of all patients with acute appendicitis seen and managed over an 8- year period [2002-2009 inclusive] in the UMTH is presented. Materials used included patients demographic variables, clinical presentation, laboratory data, operative findings and treatment outcome.

RESULTS: One thousand two hundred and fifty- seven patients were studied. These were 426(33.9%) males and 831(66.1%) females; a male to female ratio of 1:2. The mean age was 32.4 15.0 years. All the patients were admitted with abdominal pain that was initially located at the right iliac fossa in 480(38.2%), periumbilical in 393(31.3%) and diffused in 351(27.9%) patients. Vomiting 85.7%, fever 73.0% and anorexia 49.0% were the most frequent symptoms. The mean duration of illness was 72 hours. Right iliac fossa pain and tenderness were present in 1112 (88.46 %) patients. The total white cell count was significantly raised ($p < 0.05$). All the patients had appendicectomy, 295 (23.47%) of the appendices were perforated at operation and 200 (15.9%) of the removed appendices had no histological evidence of inflammation. The complication rate was 36.2% and wound infection (28.3%) was the most common. The mean hospital stay was 3 days. There were 12 deaths; a mortality rate of 0.9%; mostly patients with ruptured appendix and peritonitis.

CONCLUSION: The diagnosis of appendicitis is clinical and supported by a raised total white cell count with neutrophilia. The negative appendicectomy rate of 15.9% falls below the range reported in other studies. More than a fifth of the appendices were perforated and mortality was low.

KEY WORDS: acute appendicitis, appendicectomy, outcome, Maiduguri

INTRODUCTION

Acute appendicitis and its complications is still the most common cause of acute abdominal pain that will require surgical intervention in many parts of the West African sub- region^{1,2}. Strangulated groin hernias especially the indirect inguinal type has for a long time been the leading cause of acute abdomen among Africans; until the last few decades when acute appendicitis and its complications became very common here as in the western world³, this may be attributed to changes in diet, due to westernization of native African communities. Developments in both surgical facilities and expertise have led to more herniorrhaphies been safely performed in many urban centers, leading to a drastic reduction in the incidence of strangulated external abdominal hernias. The same cannot be said about acute appendicitis, whose aetiology is relatively not as the former, nor its diagnosis straight forward in many instances especially in children, the elderly and females. As a result delay in diagnosis and resulting rupture, with appendicular abscess, mass, localized or generalized peritonitis are still common place⁴. Imaging techniques are not easily interpreted either and the expertise for that is far between in a typical setting.

The surgeon depends mostly on clinical findings to make a diagnosis in most instances. The negative appendectomy rate has been reported to range between 10 and 25 % in the West African sub region⁵. Many studies have supported clinical findings, the use of abdominal ultrasound scan, CT to make a correct preoperative diagnosis in 90-95% of cases⁶. Despite its accuracy in diagnosis the cost of CT can be prohibitive. Rarer causes of acute appendicitis; like schistosomiasis and other helminthic infestations have also been reported in Africa⁷ and other parts of the world. Obstruction with faecolith and hyperplastic lymphoid tissue is a more common pathology than phlegmon in Africa as in other parts of the world. The aim of this study is to review of our management and outcome of acute appendicitis in the University of Maiduguri Teaching Hospital [UMTH].

PATIENTS AND METHODS

One thousand two hundred and fifty-seven patients with clinical features of acute appendicitis, seen and managed at the UMTH between January 2002 and December 2009 were retrospectively (2002-2006) and prospectively (2007-2009) studied. Thirty-three patients were excluded

Date Accepted for Publication: 5th April, 2012
NigerJMed 2012: 223-226

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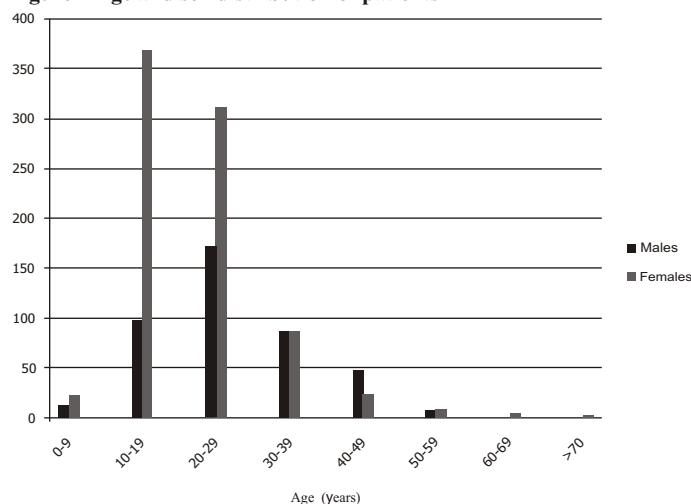
from the study because of incomplete records. All patients that had features suggestive of acute appendicitis but resolved without appendectomy and those with appendix mass or abscess were also excluded. The data collected included age, sex, clinical presentation, duration of symptoms, laboratory and other investigation results, operative findings, histopathological reports and outcome of management. These were analyzed for descriptive statistics by the SPSS soft ware version 16.0 for windows. The patients underwent open appendectomy along standard lines, except when there was rupture with localized or generalized peritonitis. Antibiotics (intravenous metronidazole and cefuroxime) were given to all patients routinely. Where a preoperative diagnosis of localized or generalized peritonitis is strongly indicated a laparotomy was done via a right paramedian or midline subumbilical incision with appendectomy and profuse peritoneal lavage. This group of patients was placed on intravenous metronidazole and ceftriazone.

RESULTS

Age and sex distribution:

One thousand two hundred and fifty- seven patients were studied during the eight -year period, comprising 426(33.9%) males and 831(66.1%) females giving a male to female ratio of 1:2. The mean age was 32.4 ± 15.0 years (range 4-77). One thousand one hundred and sixty-five (92.7%) patients were below 40 years of age and the peak incidence of acute appendicitis was found in the age group 20 to 29 years; (N= 485; 38.6%). Children below the age of ten years were 36(2.8%) in number. **Fig. 1**

Figure 1 Age and sex distribution of patients



Range= 4- 77 years, Mean = 23.4 +/- 9.4 SD, 11 Cases were associated with pregnancy

Clinical presentation:

All patients were admitted with acute abdominal pains of less than 72 hours duration. Abdominal pain starting in the right ileal fossa was found in 480 (38.2%) patients, 393 (31.3%) had initial pain in the central periumbilical

Table 2 Clinical Presentation of 1257 patients with acute appendicitis

Symptoms	Frequency (%)
Abdominal pain	1257(100)
Fever	1115 (88.7)
Nausea	493(39.2)
Vomiting	856(68.1)
Anorexia	643(51.2)
Constipation	271(21.6)
Diarrhea	252(20.1)
Headache	100(8.0)
Dysuria	128(10.2)

region and 351 (27.9%) had diffuse/ generalized abdominal pain. The rest 33(2.6%) had pain in the right loin and both quadrants of the lower abdomen. The details of the clinical features are depicted in **Table 2**. Vomiting 85.7%, fever 73.0% and anorexia 49.0% were the most frequent symptoms. The mean duration of illness was 72 hours. Right iliac fossa pain and tenderness were present in 1121 patients (89.2 %). The total white cell count was significantly raised in over 50% of the patients ($p = 0.05$).

Operative findings/treatment and outcome

One thousand two hundred and fifty-seven patients had appendicectomy performed mainly via the Lanz 1101 (87.6%) and Grid Iron 64(5.1%) incisions, except where there was suspected rupture when a mid-line abdominal incision was used. Four hundred and ninety (39.0%) patients had perforated appendicitis at operation (**Table 3**) and 200 (15.9%) of the removed appendices had no histological evidence of inflammation (**Table 4**). 90% of patients with non inflamed appendices were females. 11(0.87%) of the patients were pregnant women.

Table 3 Patients with ruptured appendicitis

Age (years)	Males	Females	Total (%)
0-9	22	12	34(11.5)
10-19	76	22	98(33.2)
20-29	87	11	98(33.2)
30-39	54	-	54(18.3)
40-49	11	-	11(3.7)
Total	250(84.7%)	45(15.2%)	295 (100)

Perforation rate = 23.46%

There were 11 (0.8%) cases of schistosomal appendicitis, due to infestation by schistosoma mansoni. The postoperative complication rate was 36.2% (455). The postoperative complications are shown in **Table 5**. The common ones included wound infection in 356(28.3%), enterocutaneous fistula 13(1.03%), and intraabdominal abscesses in 38(3.0%) patients. The average stay in hospital was 3 days. There were 12 deaths giving an overall mortality rate of 0.9%; mostly from complications of rupture. The Histology reports are depicted in **Table 4**.

Table 4 Histopathology of appendectomy specimens

Histopathology	Frequency (%)
Acute inflammation	437 (34.7)
Ruptured acute appendicitis	295(23.4)
Acute inflammation + faecolith	211(16.8)
Schistosomal appendicitis	11(0.8)
Negative	303(24.1)
Total	1257(100)

Table 5 Postoperative complications

Postoperative complication	Frequency (%)
Wound infection	356 (28.3)
Wound dehiscence	48(3.8)
Intra-abdominal abscess	38(3.0)
Faecal fistula	13(1.0)

DISCUSSION

One thousand two hundred and fifty-seven patients had appendectomies carried out over an 8-year period in our hospital, giving a yearly incidence of 157 patients. Appendicitis and its complications accounts for over 30% of all cases of acute abdominal pain in Maiduguri. This is in keeping with similar studies from Kano³ and Lagos⁸ in Nigeria and Kumasi⁹ in Ghana. There also seem to be an increasing incidence of acute appendicitis

in developing countries as compared to developed nations where the incidence is declining^{10,11}. Many studies have attributed this change in incidence to the westernization of indigenous African diets. The 10-19 year age group accounted for most of the cases, in many similar reports^{3,5,12}. In our series however, the peak incidence was among patients aged 20 to 29 years. More than 90% of our patients were below the age of 40 years, in keeping with other studies^{3,5}.

The diagnosis of acute appendicitis is usually clinical, the patient presenting with an initial dull peri-umbilical pain that latter shift to the right iliac fossa, with maximum tenderness at the McBurney's point. The clinical features in our patients were not different from other studies. Pain was common to all patients. Other important symptoms were anorexia, fever, vomiting, nausea and constipation. This seemingly straight forward diagnosis can be made difficult by inflammatory processes from adjoining structures and in Maiduguri, an arid zone of north eastern Nigeria, right distal ureteric stones have on many occasions presented like acute appendicitis. A plain radiograph and abdominal ultrasound scan helps to locate a stone in the urinary tract.

Diagnostic investigations are of limited use in acute appendicitis, though a skilled use of the ultrasound compliments clinical diagnosis and improves diagnostic accuracy and patient management of those with suspicion of acute appendicitis^{13,14}. The same cannot be said of a KUB (Kidney Ureters and Bladder on plain abdominal radiograph) except when a faecolith is seen in the right lower quadrant. A faecolith is seen in less than 10% of patients with acute appendicitis, but when present, it is almost pathognomonic. Abdominal ultrasound scan is routinely done whenever possible in the preoperative period, but negative result did not influence the operative management in our practice. Computerized tomography (abdominal CT) scan have been shown in many studies to enhance the diagnostic accuracy¹⁵. Studies in the Asia have consistently shown that 80-85% of adults with acute appendicitis have Leucocytosis of greater than 10,500cells/mm³ with marked neutrophilia^{16,17}. In tropical Africa, a smaller percentage (30-40%) has Leucocytosis¹⁸, the reason for this marked difference is not clear. Sixty percent of available full blood count (FBC) results in our patients had raised WBC (white blood cell) counts with neutrophilia. It is not always possible to have this test carried out in the preoperative period in our center because of inadequate facilities and man power. The presentation may be complicated by perforation or rupture of the appendix, and this occurs in 20- 27% of patients, which is similar to 23.4% in this study^{4,18,19}.

Most surgeons advocate appendectomy as soon as the diagnosis of acute appendicitis is made in order to prevent

perforation and subsequent peritonitis. This has justified a negative appendectomy rate of about 15-25% in many centers^{20,21}. The negative appendectomy rate of 24.1% in this series is similar to that reported by Osime *et al*²²; in Benin and Edino *et al*³ in Kano Nigeria.

There are few complications following appendectomy in most centers and the mortality rate is usually less than 1% in keeping with findings from this study⁵. Wound infection is the most frequent complication and is mostly seen in patients with ruptured appendices^{22,23}.

The histopathological findings are that of acute inflammation with obstructing faecalith, lymphoid hyperplasia, and ruptured acute appendicitis. There were 11 cases of schistosoma mansoni causing appendicitis, this is not a usual finding, but has been reported from parts of the world where schistosomiasis is endemic and the United States^{24,25}.

CONCLUSION

The presentation of acute appendicitis in Maiduguri is the same with other parts of Africa. There is low negative appendectomy rate and so is the morbidity and mortality. This may be because most of our patients are domicile in urban Maiduguri where there is a lot of awareness of the symptoms and treatment of appendicitis.

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