

## Complicated appendicitis in Children in Aba, Nigeria

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### ABSTRACT

**Introduction:** Acute appendicitis is one of the most common abdominal emergencies globally. Etiology remains poorly understood with few advances over the past decades. Obtaining a confident pre-operative diagnosis remains a challenge, as appendicitis must be entertained in any patient presenting with an acute abdomen. A clinical classification is used to stratify management based on simple (non-perforated) and complex (gangrenous or perforated) inflammation, although many patients remain with an equivocal diagnosis, which remains one of the most challenging dilemmas. The aim of the study is to evaluate the management and outcome of complicated appendicitis at the Abia State University Teaching Hospital Aba Nigeria. **Methodology:** A prospective analysis of all children treated for appendicitis at the Abia State University Teaching Hospital Aba between 2016 and December 2018. Proforma was opened for demographic data, clinical presentation, diagnosis, treatment, complication and outcome. **Results:** A total of 100 children aged between 2 and 15 (mean  $8.7 \pm 2.8$ ) years, comprising 60 males and 40 females with male/female ratio 3:2 had appendectomy which accounted for 8% of total pediatric operations and 40% of pediatric abdominal operations. Only 40 (40%) children presented during the first episode of symptoms and in clinically stable state while 60 (60%) were referred after wrong diagnosis and treatment by general practitioners which resulted in different complications ranging from appendix abscess 10 (10%), appendix mass 15 (15%), perforated appendix 30 (30%), gangrenous appendix 5 (5%). These influenced post operative outcome with wound infection recorded in 20 (20%), wound break down 10 (10%), septicemia 15 (15%), pelvic abscess 5 (5%) and death 1 (1%). These were not recorded among those who presented early who also had significantly lower duration of hospitalization and cost of treatment. **Conclusion:** Late referral due to paucity of knowledge, long referral chain and low index of suspicion was rampant which significantly increased associated morbidities and mortality among children managed with appendicitis **Keywords:** Appendicitis, children, complicated

### INTRODUCTION:

Appendicitis, the inflammation of vermiform appendix which can be acute, sub-acute or recurrent, is associated with high morbidity which can be prevented by timed appendectomy.[1] The incidence has been reported to be high in developed cities where diet is rich in fat and low in roughages[2]. Although the exact incidence in sub-Saharan Africa is not known due to poor data base, it has been

reported to be lower than in developed countries [3]. Whereas appendectomy done on clinically stable children with mildly inflamed appendix have favorable outcome, the reverse is the case in perforated or gangrenous appendix in clinically compromised children who may develop life threatening complications after surgery. Literatures searched on pediatric appendicitis in this sub-region showed a

progressive increase in incidence from early 1960, but these have had minimal effect on increasing awareness [4-5]. As a result, severe morbidity resulting from delayed or wrongly managed cases suspected to be due to other causes of abdominal pain are increasing and have become worrisome. Moreover, African diets have been westernized and enteric infections/ infestation has been on the decline due to improved standard of living. The need to reappraise the differential diagnosis of abdominal pain in children in this sub-region is overdue.

### METHODOLOGY:

A prospective analysis of all children treated for appendicitis at the Abia State University Teaching Hospital Aba between 2016 and December 2018. Proforma was opened for demographic data, clinical presentation, diagnosis, treatment, complication and outcome. Data was analyzed with SPSS version 17 for proportion and percentages.

**Table 1: Age and sex distribution**

Age	male	Female	Total
1-5	10	5	15
6-10	30	25	55
11-15	20	10	30

**Table 2: Clinical features**

Clinical features	Number	Percentage
Abdominal pain	100	100
Fever	80	80
Loss of appetite	80	80
Nausea	70	70
Vomiting	60	60
Constipation	40	40
Diarrhea	20	20
Right iliac fossa tenderness	90	90
Generalized tenderness	60	60
Guarding	70	70
Mass	30	30

### RESULTS:

A total of 100 children aged between 2 and 15 (mean  $8.7 \pm 2.8$ ) years, comprising 60 males and 40 females with male/female ratio 3:2 had appendectomy which accounted for 8% of total pediatric operations and 40% of pediatric abdominal operations. Only 40 (40%) children presented during the first episode of symptoms and in clinically stable state while 60 (60%) were referred after wrong diagnosis and treatment by general practitioners which resulted in different complications ranging from appendix abscess 10 (10%), appendix mass 15 (15%), perforated appendix 30 (30%), gangrenous appendix 5 (5%). These influenced post operative outcome with surgical site infection recorded in 20 (20%), wound break down 10 (10%), septicemia 15 (15%), pelvic abscess 5 (%) and death 1 (1%). These were not recorded among those who presented early who also had significantly lower duration of hospitalization and cost of treatment.

**Table 2: Diagnosis of complicated appendicitis**

Diagnosis at presentation	Number of patients	percentage
Perforated appendix	30	50
Appendix mass	15	25
Appendix abscess	10	17
Gangrenous appendix	5	8

**Table 3: Complications**

Surgical site infection	20	33
Wound breakdown	10	17
Septicemia	15	25
Residual abscess	5	8

## DISCUSSION:

Rightly timed appendectomy, open or laparoscopic, is the gold standard treatment of inflamed appendix with an excellent outcome in experienced hands [8]. Neglected or wrongly managed appendicitis which allow preoperative complications to occur is associated with life threatening post operative morbidity as shown in this study and others [9]. Of the 100 children treated in this series, only 40 (40%) presented early while 60 (60%) presented late with preoperative complications that influenced post operative outcome. This is similar to findings reported by Osifo and co-workers in Benin Nigeria. Elmore et al reported 49% complicated appendicitis: 11% by gangrene, 33% perforation and 4% pelvic abscess. The age/sex distribution of affected children in this study is similar with earlier reports but the incidence was much higher than what was observed by earlier authors.[10]

The rate of perforation was 30% in this series which is higher than 23.2% reported by Edino et al in Kano North-central Nigeria. In developed countries rates of between 6-65% have been quoted. Delayed presentation, fulminant disease, misdiagnosis, or failure to accept medical treatment, are contributory factors to high perforation rates. Perforation rates are much higher in the very young and the elderly, where

diagnosis is often difficult leading to perforation rates as much as 80% in some reported series. Therefore a more aggressive approach should be used in advanced age individuals and children[11].

Appendiceal abscess. This series showed a 5% incidence of pelvic abscess which is similar to findings of Livingstone et al in which pre-surgery intra-abdominal or pelvic abscess is found in 3.8% of patients and Elmore 4% presenting with appendicitis and should be suspected in those presenting with a palpable mass. Whilst pre-hospital delay was considered a traditional risk factor, evidence of disconnect between the strata of disease severity means that some patients may be at risk of abscess formation despite prompt treatment. The importance of diagnostic imaging facilities in such cases have been documented which would prevent negative appendectomy when there is diagnostic[12-13]. Therefore, exploratory laparotomy which was diagnostic as well as therapeutic was used more often in this series and others, in order to avoid further delay particularly in children with features of peritonitis.

Consequent on wrong diagnosis and late referrals, post-operative surgical site infection in 20 (33) children, wound break down 10 (17%),

septicemia 15 (25%) and residual pelvic abscess 5 (8) were recorded which were very challenging to manage and these resulted in prolonged hospitalization with resultant increment in treatment bills as also reported by earlier researcher[14].

## CONCLUSION:

Complicated appendicitis leading due to perforation, abscess, gangrene and mass continue to be a persistent health scourge in our sub-region. The persisting problem is due to late referral due to paucity of knowledge, long referral chain and low index of suspicion was rampant which significantly increased associated morbidities and mortality among children managed with complicated appendicitis.

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