

Appendicitis in Children: Audit of outcome in Kosti- Teaching Hospital

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Abstract

Introduction: Appendicitis is the most common cause of the acute surgical abdomen in children. It accounts for approximately one-third of childhood hospital admissions for abdominal pain.

Objectives: To audit the outcome of management of children presenting with abdominal pain suspicious of acute appendicitis.

Patients and Methods: This is a retrospective study of 67 children admitted and treated for acute appendicitis in Kosti Teaching Hospital from January 2005 to December 2007. Symptoms, signs, details of management and results of follow up were studied.

Results: Boys comprised 45 (67.16%). Age ranged from 4 – 15 years (mean 11.13 ± 2.59) years. 44(65.67%) of children had acute, 16(23.88%) perforated appendicitis, 3(4.48%) appendiceal mass, appendix single patient (1.49%) had appendiceal abscess and 3(4.48%) normal. Five patients (7.46%) developed postoperative complications but no mortality was encountered.

Conclusion: In spite of advances in means of diagnosis appendicitis remains a clinical diagnosis with excellent outcome if diagnosed and treated promptly.

Key words: Appendicitis, appendicular abscess, appendicular mass.

Acute appendicitis was first described by Fitz in 1866¹. Appendicitis is the most common cause of surgical abdomen in children and accounts for approximately one- third of childhood hospital admissions due to abdominal pain². The classical presentation of the disease is well known. However, the signs and symptoms of appendicitis in children may deviate from classical description. The child's clinical condition at the time of diagnosis can vary substantially across a spectrum of severity, from minimally symptomatic children with normal laboratory studies to those with bowel obstruction and frank septic shock. Likewise, intra-operative findings vary widely. The surgeon may encounter anything from normal appendix to "hostile abdomen" with purulent fluid throughout the peritoneal cavity and adhesions between bowel loops³.

Objectives: To audit the outcome of management of children presenting with abdominal pain suspicious of acute appendicitis.

Patients and Methods

This is a descriptive retrospective study held in Kosti Teaching Hospital during the period January 2005 to December 2007. Children with non complicated acute appendicitis and

perforated appendicitis underwent immediate surgery in form of formal appendicectomy. Patients with appendiceal abscess and appendiceal mass received treatment in form of drainage of abscess and conservative treatment respectively and later on underwent appendicectomy. Antibiotics prescribed included Metronidazole and second generation cephalosporin (cefuroxime). The surgical incisions were either Gridiron incision or a midline incision. Age, sex, symptoms, physical findings, white blood cells count, intra-operative findings, duration of hospital stay and postoperative complications were reviewed.

Results

A total of 67 patients were included in this study. There were 45 (67.16%) boys. The mean age \pm standard deviation (SD) was 11.13 ± 2.59 (range of 4-15) years. The presenting symptoms are shown in table (1). Abdominal pain which started in the periumbilical area was found in 41(61.19%), at right lower quadrant in 15(22.39%), at the supra-pubic area in 4(5.97%), at the epigastric area in 3(4.47%), at right hypochondrium in 2(2.99%) and all over the abdomen in 2(2.99%) patients.

Table1: symptoms at time of presentation.

| Symptoms | No.1= 67 | (%) |
|-------------------|----------|-------|
| Abdominal pain | 67 | 100 |
| Nausea & vomiting | 52 | 77.61 |
| Anorexia | 42 | 62.69 |
| Bowel disturbance | 16 | 23.88 |
| Dysuria | 8 | 11.94 |

Analysis of physical signs is depicted in table 2. The mean of white blood cells counts was $9,804 \pm 5,162$ (range is 4000-32000). In 47(70.15%) children the physical findings were localized to right iliac fossa and in 20(29.85%) children the physical findings were generalized all over the abdomen. Analysis of intra-operative findings was shown in table 3.

Table2: physical signs at time of presentation.

| Signs | No.= 67 | (%) |
|---------------------------------|---------|-------|
| Tenderness | 57 | 85.07 |
| Rebound tenderness | 59 | 88.06 |
| Guarding | 42 | 70.15 |
| Fever $\{>37^{\circ}\text{c}\}$ | 44 | 65.67 |
| Rigidity | 18 | 26.87 |

Table3: final diagnosis at time of operation

| Intra-operative findings | No.= 67 | (%) |
|--------------------------|---------|-------|
| Acute appendicitis | 44 | 65.67 |
| Perforated appendix | 16 | 23.88 |
| Appendiceal mass | 3 | 4.48 |
| Normal appendix | 3 | 4.48 |
| Appendiceal abscess | 1 | 1.49 |

The mean (\pm SD) hospitalization period was 2.04 ± 1.21 (range is 1-5) days. Two patients developed postoperative wound infection and one patient had prolonged postoperative ileus. Two patients developed during follow up adhesive intestinal obstruction that responded well to conservative management. No patient developed postoperative intra-abdominal abscess and no patient in our study group died.

Discussion

Appendicitis is the most common cause of surgical abdomen in children and accounts for approximately one- third of childhood hospital admissions for abdominal pain². The male to female ratio of childhood appendicitis encountered in our study is comparable with that reported by others⁴⁻⁹. The mean age of this group of children was not different from that reported by Richard H. Pearl et al¹⁰.

History and physical examination are traditionally the best diagnostic tools for appendicitis in children and adults¹¹. The initial symptoms in those patients, listed in order of frequency, were periumbilical pain or right lower quadrant pain, nausea, vomiting and anorexia. James F. Densler et al⁴ reported a similar manner of symptoms. Roy R. Marreo jr et al¹² recorded that over 95% of his patients presented with right lower quadrant pain and over 85% of patients had a history of nausea, vomiting and anorexia.

The physical signs we have elicited in our patients were comparable to those reported by others^{12,13}. So, the clinical picture of acute appendicitis in children in this series did not differ from that worldwide.

The mean of white blood cells count of our cases was lower than those reported by others^{4,6,11}. When the white blood cells count was evaluated based on race, African American patients had a relative leukocytosis compared with white ones¹². This is thought to be genetically mediated in African American as no other cause could be identified¹⁴.

The acute non perforated appendicitis was reported in 24%-68% of patients^{4,10,11,13}, perforated appendicitis in 17.5% - 52%^{4,10,11,13,15-18}, while normal appendix was reported in a range from 2%-12% of the patients^{10, 11,13,19,20}. In contrast, we had three patients with normal appendix, two of them had mesenteric lymphadenitis and in one, no pathology was encountered intra-operatively. James F. Densler et al⁴ reported mesenteric adenitis in 19% of his study group. In spite of frequency of appendicitis, the disease is still responsible of errors in surgical diagnosis.

George Sakelaris et al¹³ reported that 21% of his study group had an appendiceal abscess / mass. Our study showed that 5.97% of children had an appendiceal abscess / mass (table 3). Irritability of child, inability of proper communicate with parents, atypical presentation and administration of antispasmodic or analgesic somewhere before arrival to surgical department may delay the diagnosis and hence appendicitis presents in advanced stages of the disease.

A clinical practice guideline was used utilizing selective computed tomography (CT) and ultrasound scan (US) for the evaluation of children with suspected appendicitis¹⁵. In contrast, because of lack of these sophisticated technologies, we depend on meticulous history and physical examination. Postoperative complications in form of an intra-abdominal abscess, prolonged ileus and adhesive intestinal obstruction requiring laparotomy were reported¹³. FA Abantanga⁷ in Kumasi- Ghana described postoperative complications consisted of superficial surgical site infection, deep surgical site infection and incomplete wound dehiscence. Postoperative complications encountered in this series were not major ones “no one needed reoperation”. All patients with superficial wound infection received local drainage and antibiotics.

No patient in this study group died, similar outcome was reported by others^{13,15} but some centers reported single death in their series^{7,11}. The outcome of the management of pediatric appendicitis in this series was satisfactory because; there was no major postoperative complication, short hospital stay, low perforation rate in comparison to others^{7,13,15} and zero mortality rates.

Conclusion

In spite of advancement in the means of investigations, acute appendicitis in children remains a clinical diagnosis with an excellent outcome.

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