

ORIGINAL ARTICLE

PATTERN OF PRESENTATION AND OUTCOME OF PEDIATRIC APPENDICITIS: A REGIONAL HOSPITAL EXPERIENCE

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Abstract

Background: Acute appendicitis in children is a common presentation and its diagnosis is majorly clinical; evaluating the pattern of presentation can be challenging especially dealing with a child with abdominal pain. This study evaluates our experience on the pattern of presentation and outcome of appendicitis in children.

Methods: This is a descriptive study that involves retrospective review of 218 paediatric cases from January 2006 to November 2009 in Midwestern Regional Hospital Limerick, Ireland. Patient age ranged 2 to 14 years. Signs, symptoms, investigation, surgery, histology findings, post operative length of stay, complication and histology report were analysed to determine the pattern and outcome.

Results: Out of 218 patients, 130 were males and 88 females with age range from 2 to 14 years, 175(79.4%) had pain on their right lower quadrant and 45(20.6%) had the classical periumbilical pain that radiated to the right iliac fossa along with 33(15.4%) patients that had anorexia. Eleven patients (5.1%) presented with diarrhoea while 7(3.7%) had constipation. Raised white cell count was seen in 146(67%) of the patients. Open appendectomy was done in 162(74.3%) patients, whereas 52(24%) had laparoscopic appendectomy including conversion rate of 7.7% (4 conversions). Histology finding of normal appendix was 27(12.4%), perforated and gangrenous appendix was found in 12(5.6%) and 10(4.3%) patients respectively. Wound infection occurred in 17 cases (7.8%) with 4(1.8%) and 2 (0.9%) cases of intra-abdominal and pelvic abscess respectively. The average post operative length of stay was 3 days except for complicated cases that were more than 5 days.

Conclusions: Pediatric appendicitis is a common surgical emergency that requires prompt diagnosis majorly based on clinical presentations. Wound infection and dehiscence are common complications and laparoscopic appendectomy is safe.

Key Words: appendicitis, pediatric, appendectomy.

Introduction

Acute appendicitis is the most common cause of emergency abdominal surgery in childhood in United States. (1) Appendicitis has a male to female ratio of 3:2 and is most common in teens and twenties with life time risk of 8.6% for males and 6.7% for females. (2) There is high rate of morbidity and mortality of acute appendicitis in children mainly due to delayed diagnosis. (3) In one-third of children with acute appendicitis, the appendix perforates before surgery. (4) In young and toddler, the risk of perforation at the time of diagnosis is very high due to uncommon pattern of presentation in this age group and difficulty in differentiating appendicitis from other causes of abdominal pain in children. These difficulties likely contribute to 28% to 57% rates of initially misdiagnosed appendicitis in children younger than 12 years. (5)

Obtaining accurate history from children is a

challenge to doctors, however abdominal pain is a nearly universal symptom in older children which can classically begin as poorly defined midabdominal or periumbilical that often migrate to the right lower quadrant. Fever is a common and non-specific symptom but tympanic thermometers are often unreliable especially in the hands of untrained operators. (6) Axillary temperature can be misleading, as it is almost universally lower than core body temperature. (7) However the history of tactile fever should not be dismissed as parents are fairly reliable judges of fever in their children. (8)

Methodology

This descriptive study was conducted at the Department of Surgery in Midwestern Regional Hospital Limerick in Ireland which is one of the busiest acute surgery units in Ireland that provides acute surgical services among others. Charts of children between the ages of 2 and 14 years from January 2006 to November 2009 were retrospectively reviewed. Inclusion criteria include all pediatric patients who presented with features of acute appendicitis including right iliac fossa pain, fever, nausea, vomiting and raised white cell count while exclusion criteria were suspected cases of appendicitis that were managed conservatively. The pattern of presentation of clinical signs and symptoms, type of surgery (open or laparoscopic), operative findings, histology report, complications and pre operative length of stay were analysed.

Results

A total of 218 pediatric patients with age range 2 to 14 years were managed for acute appendicitis in the study period. Male: female ratio was 1.5: 1. Patient less than 2 years was 1 (0.5%), age 3-5 years were 14(6.4%), 6-8 years were 37(17%), age 9-11 years were 94(43.1%) and age 12-14 years were 72(33%). The mean age was 10.1 years, the median and modal age group is 9-11 years. Forty-five (20.6%) presented with classical symptoms of acute appendicitis while 175(79.4%) had right iliac fossa pain. Thirty-three (15.4%) had anorexia while diarrhoea and constipation were found in 11(5.1%) and 7(3.7%) respectively. Almost all that had surgery had right iliac fossa tenderness in various degrees, 93(42.6%) with rebound tenderness and 64(29.4%) had guarding. One hundred and forty-six (66.9%) had leucocytosis while 56(25.2%) had increase in body temperature with 23(10%) with positive urinalysis.

Open appendectomy was done in 162(74.3%) and 52(23.9%) had laparoscopic surgery. There were only four conversions to open. At operation 117(53.7%) had simple appendicitis, 34 (15.6%) had perforated appendicitis, 18 (8.3%) had gangrenous appendicitis and eight (3.7%) had appendix mass. On histology 27(12.4%) had normal appendix, 12(5.6%) were perforated and 10(4.4%) gangrenous. Post operatively 17(7.8%) developed wound infection and four (1.8%) had pelvic abscess. Two (0.9%) had laparotomy

following small bowel obstruction after appendectomy. The lengths of hospital stay range from 2 days to 12 days with an average of three days. There was no mortality recorded.

Discussion

Acute appendicitis in children is a surgical emergency that delay can lead to complication increasing morbidity and mortality. (9) In our experience in the regional hospital, majority of the patients who presented with acute appendicitis are between the ages of 9 and 11 which correlates with international literature. (10) Male to female ratio has been reported to be 3:2 (11) while in our study it is 1.5:1 exactly same when the ratio is further broken down. Abdominal pain in the right iliac fossa was the most frequent symptom in our patients. Although white cell count is routinely used in the diagnosis of acute appendicitis, our study reveal 66.9% had raised white cell count, acute appendicitis is a clinical diagnosis and the specificity of this method is very uncertain. (12)

Laparoscopic techniques have greatly advanced in the past few years however only 56 of cases in our study had laparoscopic appendectomy in comparison with 162 that had open appendectomy possibly because of lack of paediatric laparoscopic instruments. Nevertheless it may still be prefer to open appendectomy especially in female; this can delineate the source of pain. Four cases were converted to open on account of perforation where by the anatomy look obscure and may take a long operative time. Laparoscopic in complicated cases of acute appendicitis in children can be challenging and technically demanding procedure that requires more than basic laparoscopic skills.

The rate of perforation was 5.6% in our study. Studies have shown that up to 21% of patients presenting with acute appendicitis can have perforated appendix. (13) Cases of perforated appendix were more associated with wound infection, pelvic abscess and post operative length of stay more three days. Post operative wound infection is the commonest complication followed by four cases of intraabdominal abscess and two cases of pelvic abscess following perforated appendix. It is reported by Stone et al that at least 80% of intraperitoneal abscess that develop after removal of perforated appendix are in the right lower quadrant or pelvis. (14) Also Shandling et al reported a high complication rate of 46% among patient with perforated appendix who did not receive antibiotics. (15)

We recognize the limitations of our study; our analysis is single institution study, data retrospectively collected with numbers too small to draw conclusions.

Conclusion

Acute appendicitis is a common surgical emergency in children, diagnosis is mainly clinical. Delay in diagnosis and improper treatment can increase morbidity. Laparoscopic appendectomy is a safe alternative for the treatment of both simple and complicated appendicitis and lack of laparoscopic equipment is a limitation to laparoscopic appendectomy in children.

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