Appendectomy in Appendiceal Parasitosis: A Retrospective Analysis

Arifa Manzoor, Faran Khan

ABSTRACT

Objective To evaluate the role of parasitic infestation in the etiology of acute appendicitis.

Study design Descriptive case series.

Place & Duration of study Department of Surgery, Pakistan Institute of Medical Sciences Islamabad, Pakistan, from January 2012 to June 2014.

Methodology A retrospective analysis of histopathology reports of 1617 appendix specimens of patients of all ages and gender who underwent appendectomy for acute appendicitis was done. Detail histopathology reports of 65 cases with appendiceal parasitosis were examined. Data were analyzed through IBM SPSS version 20.

Results A total of 65 specimens of appendiceal parasitosis amongst 1617 appendectomy cases produced a frequency of 4.02%. Mean age group of patients with appendiceal infestation was 14.38 ± 9.83 year with an overwhelming (50.76%) presenting in the second decade of life. Male to female ratio was 1.24:1. Normal histology (n=39, 60%) was most frequently reported followed by lymphoid hyperplasia (n=18, 27.6%) whereas only 07 (9.85%) cases of parasitic infestation had acute or acute suppurative appendicitis.

Conclusions Appendiceal parasitosis may result in symptoms mimicking acute appendicitis without causing acute inflammation of the appendix so it cannot be considered conclusively in the etiology of acute appendicitis. Medical therapy must be instituted for cases of parasitic infestations.

Key words Appendiceal parasitosis, Parasitic Infestations, Acute appendicitis, Histopathology, Enterobius vermicularis.

INTRODUCTION:

Appendectomy is one of the most frequently performed operations in the general surgery departments all over the world.1 The incidence of appendectomy is 12 % for men and 25 % for women and the lifetime risk of acute appendicitis is 8.6 % and 6.7 % for men and women, respectively.2 Appendicitis is primarily a disease of adolescents and young adults with a peak incidence in the second and third decades of life.3 A variety of neoplastic and inflammatory conditions can mimic acute appendicitis. Clinical diagnosis of acute appendicitis is routinely done on history especially of migratory pain and elicitation of physical signs. Leukocytosis helps to reinforce the clinical diagnosis both in children and adults.4 Out of reported 250,000 appendectomies performed worldwide annually, about 15% are carried out on non-appendiceal pathologies.5 In literature there is a consensus on luminal obstruction being the most common cause of acute appendicitis. Luminal obstruction is mostly caused by fecal impactions and lymphoid hyperplasia. Rare and uncommon causes include enterobiasis, ascariasis, balantidiasis, actinomycosis, taeniasis, schistosomiasis, amebiasis, trichuriasis, blastocystis hominis, tuberculosis, etc.6,7 Luminal obstruction by the parasites may be the cause of pain without acute appendicitis. Worldwide the rate of parasitic

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Infestation presenting as acute appendicitis varies from 0.2-41.8% and rates of inflammation in infested specimens ranged from 13-37%. Appendiceal parasitosis is almost never suspected or diagnosed preoperatively so postoperative histopathology is the only definitive means to confirm the presence of parasites. Majority of appendectomies with parasitic infestations turn out to have no pathological evidence of acute inflammation. The objective of this study was to determine the role of parasites in the etiology of acute appendicitis especially in children and adolescents.

**METHODOLOGY:**
This descriptive case series involved retrospective analysis of 1617 patients who underwent appendectomy for acute appendicitis at Pakistan Institute of Medical Sciences, Islamabad, from January 2012 to June 2014. The diagnosis of acute appendicitis was based on history and clinical examination, elevated white blood cell count, and in most cases strengthened by ultrasonography. All surgically removed specimens were sent for histopathology at the Pathology department of hospital where haematoxylin and eosin stained sections were made and studied. Detailed reports were generated and uploaded on Hospital Management Information System (HMIS). Data were retrieved from HMIS and collected on a proforma.

Demographics and detailed histopathology of shortlisted cases with parasite infestations were studied. The diagnosis of acute appendicitis on histopathology was made when a polymorphonuclear neutrophil infiltrate was observed in mucosa or deep layers. Histopathological classification of appendix specimens with parasites was: normal histology, lymphoid hyperplasia, acute appendicitis, acute suppurative appendicitis and eosinophilia. The cases with normal histology were reported as negative appendectomies. Collected data were coded, entered and statistically analyzed using International Business Machines Statistical Package for the Social Sciences (IBM SPSS) version 20.0. Data for continuous variable like age were reported as the mean ± standard deviation. Categorical variables were expressed as frequency and percentage. Bar graph and tables were used to present the data.

**RESULTS:**
A total of 1617 specimens were obtained at open and laparoscopic appendectomies. A total of 65 (4.02%) contained parasites on histopathological examination. Out of 65 cases, 55.4% (n=36) were males and 44.6% (n=29) females. Male to female ratio was 1.24:1. Their ages ranged from 2 year to 60 year with a mean age of 14.38±9.83 year. Appendiceal parasitosis mostly occurred in second decade of life, accounting for 50.76% (n=33) of the patients followed by those in first decade 36.76% (n=24) (Figure I).

Sixty-two samples were reported to contain enterobius vermicularis worm while 3 had ova of enterobius vermicularis in the lumen. Normal histology was reported in majority (60%) of the patients followed by lymphoid hyperplasia (27.6%). Table I shows the breakdown of histopathology reports.

Faecolith was present in 39 out of 65 parasitic infestations. Table II gives the distribution of parasitic infested samples with or without faecolith in relation to the histopathology reports. Acute appendicitis was reported in 3 cases each with and without faecoliths.

**DISCUSSION:**
Enterobius vermicularis, commonly known as pinworm or threadworm, is estimated to affect up to 209 million people globally and is considered to be the most common helminth infection. This parasite has the propensity to colonize people without causing much specific symptoms. It commonly causes benign symptoms like pruritis ani and restless sleep but can conveniently mimic acute appendicitis leading to negative appendectomy. In a study from Islamabad’s urban and suburban population sample of 1350, enterobius vermicularis was found amongst 13.5% of the population.

The documented infestation in appendix was first reported by Still in late 19th century. The actual role of parasitic infestation as a co-factor in
Acute appendicitis might be due to obstruction of the lumen by parasites or secondary inflammation by the presence of parasite and/or its ova in the lumen. The presence of parasitic infestation may create acute infection by obstructing the lumen or leading to a secondary inflammation.

Akbulut S et al did a literature review using PubMed and Google Scholar to detect the unusual findings in the histopathologies of appendix specimens. Amongst 128 studies published between January 2000 and November 2010, there were 389 cases of enterobius vermicularis (0.48%). Our study showed a higher frequency of appendiceal parasitosis as compared to other studies carried out internationally. Though normal histology (60%) has been predominantly reported, as is the case in our study, but the pathological spectrum ranged from acute appendicitis to acute suppurative appendicitis and can lead to serious complications like gangrene and life-threatening peritonitis. Lymphoid hyperplasia is common in children as well as in gastrointestinal obstructions. In a study by Akbulut S et al there was evidence of acute inflammation in 12 cases while in 25 cases there was no pathological change. Analysis by de Silva DF revealed acute neutrophilic inflammation in the appendix wall in 12 of the 24 specimens and lymphoid hyperplasia in 10 of the 24 appendices. Gangrenous appendicitis was diagnosed in three cases in our study. Parasitosis may be a cause of symptoms resembling acute appendicitis without mucosal invasion by the parasite.

We have also studied the presence of faecoliths along with parasites considering faecoliths as important etiology of acute appendicitis. In our study, 25 cases of normal pathology had no faecoliths while 14 cases had both faecoliths and parasites, while equal number of acute appendicitis and lymphoid hyperplasia were reported in cases with or without faecoliths. In such cases, acute appendicitis can be attributed to luminal obstruction by either of the causes. One case of acute suppurative appendicitis had lumen filled with enterobius vermicularis ova.

Parasitic infestation must be kept in the differential diagnosis of appendicitis with high index of suspicion in patients with doubtful clinical findings, normal white cell count and increased eosinophils, especially if right iliac fossa pain is recurrent. Patients should receive antihelminthic treatment in cases of appendiceal parasitosis. This study has limitations of being retrospective and single centered. In view of the important role of our findings in prevention of negative appendectomy and definitive

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<th>Histopathology</th>
<th>Infestation</th>
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<tr>
<td></td>
<td>Worm(n)</td>
<td>Ova(n)</td>
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<tr>
<td>Normal Histology</td>
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<tr>
<td>Lymphoid Hyperplasia</td>
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<td>Acute Appendicitis</td>
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<td>Acute Suppurative Appendicitis</td>
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<td>Eosinophilia</td>
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<td><strong>Total</strong></td>
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<th>Histopathology</th>
<th>Faecolith</th>
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<tr>
<td></td>
<td>Present (n)</td>
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<td><strong>Total</strong></td>
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treatment of infestations, a prospective, longer duration and multicenter studies on this subject is thus warranted.

CONCLUSIONS:
Symptoms of infestation can mimic acute appendicitis. With a frequency of 4.02% of appendiceal parasitosis amongst our population therefore we should always keep parasitic infestation in differential diagnosis of acute appendicitis especially in children and adolescents.

REFERENCES: