

# Acute Eosinophilic Appendicitis: An Unusual Variant of Appendix Inflammation

## *Akut Eozinofilik Apendisit: Apendiks Enflamasyonunun Nadir Bir Tipi*

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### ÖZET

Akut eozinofilik apandisit apendiks enflamasyonunun nadir bir şekli olup, literatürde sekiz olgunun yer aldığı yalnız bir çalışma bulunmaktadır. Tipik histolojik özellikleri; apendiks muskuler tabakasında nötrofil invazyonu olmaksızın yoğun eozinofil infiltrasyonu ve ödem olmasıdır ve patogeneğinde tip 1 hipersensitivite rol oynamaktadır. Bu olgu sunumunda, amebiyazise sekonder hipersensitivite nedeniyle geliştiğini düşündüğümüz eozinofilik apandisit vakasını sunmaktayız.

**Anahtar Kelimeler:** *Apendisit, Hipersensitivite, Eozinofili, Amebiyazis*

### ABSTRACT

Acute eosinophilic appendicitis is a rare variant of appendix inflammation and there is only one study in the literature presenting eight cases. Typical histological features include intense eosinophil infiltration and edema in muscular layer of appendix without neutrophil infiltration and type I hypersensitivity is responsible for its pathogenesis. In the present case report, we present a case of acute eosinophilic appendicitis that developed on an allergic background caused by amebiasis.

**Key words:** *Appendicitis, Hypersensitivity, Eosinophils, Amebiasis*

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### Introduction

Appendicitis is the most common reason for acute abdominal pain.<sup>1</sup> In the Western countries, the risk for individuals to develop acute appendicitis is 7% during their lifetimes.<sup>1,2</sup> The etiology of acute appendicitis is not known, but probably it is multifactorial; luminal obstruction, diet and family factors are responsible.<sup>3</sup> On the other hand, some studies have proposed that acute appendicitis occurs with type I hypersensitivity due to eosinophilic infiltration in muscular layer at early stages of disease. Thus, inflammation is triggered by type I hypersensitivity and infection is then added to the picture.<sup>4,6</sup> In some cases, type I hypersensitivity response is more severe, eosinophil-edema lesion of the appendicitis occurs without supervening infection. Such lesions are referred to as “acute eosinophilic appendicitis” (AEA).<sup>4</sup> In the view of this theory, factors triggering the allergic reaction in gastrointestinal system, in particular parasitic infestations should be taken into consideration.

### Case

A 34-year-old male patient was admitted to the outpatient clinic of general surgery department due to pain and tenderness in his right lower quadrant of the abdomen. His abdominal pain worsened within the last two days and the patient did not have nausea, fever or diarrhea. His medical history was not significant. On his physical examination, vital findings were stable and pain with the palpation of the right lower quadrant associated with rebound tenderness was present at McBurney’s point. In his laboratory tests; white blood cells was 12.600 mm<sup>3</sup>, hemoglobin was 14.2 mg/dL, hematocrit was 41.3, platelet was 245.000 mm<sup>3</sup> and eosinophils were not observed (89/mm<sup>3</sup>). Abdominal ultrasonography revealed fluid and heterogeneity in the pericecal area and abdominal tomography was recommended due to suboptimal visualization of appendix by ultrasonography. In abdominal tomography, appendix was dilated and the diameter of its largest part was 1.2 cm; the findings were considered to the favor of acute appendicitis (Figure 1). Moreover, as the clinical and radiological findings of the patient were suggestive of acute appendicitis, he underwent emergent appendectomy operation. Mc Burney’s incision was performed. During exploration, appendix was extremely edematous and enlarged (Figure 2). Exudation or suppuration was not observed on the

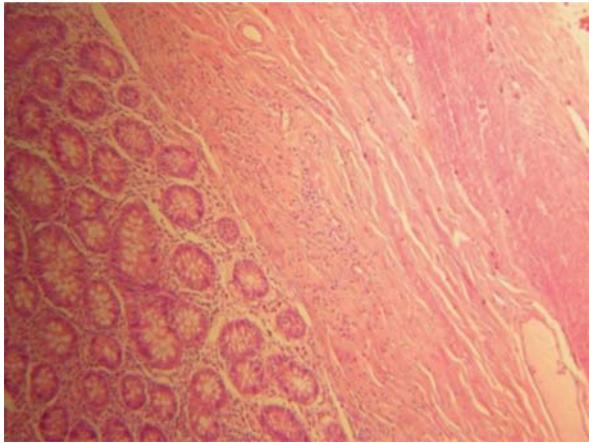


*Figure 1. Enflame ve büyümüş apendiksin abdominal tomografi koronal kesitte görünümü.*

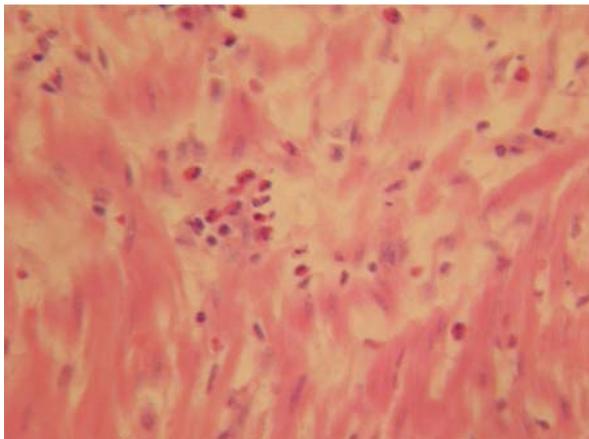


*Figure 2. Apendiksin apendektomi sırasında görünümü. Apendiks ödem ve eozinofilik infiltrasyona bağlı ileri derecede büyümüştür*

surface of the appendix. After appendectomy, serosa and muscular layer of appendix was observed to be thickened and edematous. No postoperative complication occurred during the follow-up period. Histopathologic examination of the surgical specimen revealed intense eosinophilic infiltration and edema in serosa and muscular layer of appendix (Figure 3,4).



*Figure 3. Doku kesitleri apendiks seroza ve kas tabakalarında yoğun eozinofil infiltrasyonu ve ödemi göstermektedir (hematoksilen-eozin boyama, 100X büyütme).*



*Figure 4. Büyük büyütmede eozinofillerin görünümü.*

No luminal obstruction of appendix due to any reason or no infectious agent infiltrating the parenchyma of appendix was observed. The lining epithelium and the epithelial crypts appeared intact. In accordance with these findings, the patient was diagnosed with AEA. Thus, the patient-specific and environmental factors which might have triggered type I allergic reaction in gastrointestinal system in the development of AEA were explored. Direct stool examination was performed in the postoperative period as the patient was residing in an area endemic for parasitic infestations. Stool examination revealed trophozoites of *Entamoeba histolytica* and AEA was considered to be associated with allergic reaction in gastrointestinal system caused by this parasite. For the treatment of amebiasis, the patient was administered oral metronidazole 750 mg 3 times a day

for 10 days. In control examination, there was no finding for amebiasis and the infection has been cured. In the postoperative first month, no pathological finding was obtained in clinical and laboratory examination.

### Discussion

Appendectomy is the most frequently practiced emergent surgical procedure accounting for 1%-2% of all surgical operations.<sup>7-9</sup> Acute appendicitis can occur at any age; however, most commonly occurs at younger ages particularly between 10 and 20 years.<sup>3,7</sup> Although acute appendicitis has been recognized for more than 100 years, its etiology and pathogenesis still remain to be elucidated.<sup>7</sup> However, it has been considered that its etiology is multifactorial and that luminal obstruction, diet, and family factors may play a role in its pathogenesis.<sup>10</sup> Luminal obstruction has been considered to be responsible in the etiology for a long time; however, obstructive factors (fecaloid, foreign body, parasite, tumor or lymphoid follicular hyperplasia) have been determined in only 30%-40% of appendicitis cases.<sup>11,12</sup> Thus, different theories have been proposed for etiopathogenesis of appendicitis. One of these theories is that it may have an allergic origin. The finding of eosinophilic infiltration in muscular layer of appendix in patients with acute appendicitis has suggested that the pathology is triggered by type I hypersensitivity and then supervened by an infection.<sup>4-6</sup> Finding of eosinophilic-edematous foci in most cases with acute suppurative appendicitis supports this theory.<sup>4</sup> According to this theory, if appendix is inflamed as a consequence of allergic reaction without evidence of suppurative infection; this is referred to as AEA.<sup>4</sup> According to the textbook knowledge, determination of neutrophils in muscularis propria layer of appendix is required to make the diagnosis of acute suppurative (phlegmonous) appendicitis.<sup>13</sup> Histopathologic features of AEA include absence of neutrophils, instead presence of intense eosinophilic infiltration in muscularis propria and edema separating muscle fibers.<sup>4</sup> The theory of allergic etiology for acute appendicitis was first suggested by Aravindan.<sup>6</sup> In that particular study, ileal segment together with the appendectomy specimen were examined and eosinophilic infiltration was obtained in this segment.

Thus, type I hypersensitivity was considered to develop not only in appendix but also in neighboring areas such as ileum and cecum.<sup>6</sup> The fact that appendix is the most

affected target organ for allergic reaction has been found to be associated with its smaller dimension compared to colon and small bowel, and with being more affected by impairment in mucosal circulation caused by intense edema and infiltration.<sup>5</sup>

Acute eosinophilic appendicitis was first proposed by Aravindan in 1997<sup>6</sup> and defined by Aravindan *et al.* in 2010.<sup>4</sup> Accordingly, the development of acute appendicitis is triggered by type I hypersensitivity and primarily pathological changes which is characterized by eosinophilic-edematous lesion occur in appendix. If the lesion becomes infected by bacteria, acute suppurative appendicitis occurs and if there is no infection, AEA occurs. The blood eosinophil count first increases and then decreases over time in cases with acute suppurative and eosinophilic appendicitis.<sup>4</sup> On the contrary, eosinophilia persists and does not resolve over time in eosinophilic gastroenteritis cases.<sup>14</sup> Thus, AEA should be evaluated as a variant of acute appendicitis rather than an extension of eosinophilic gastroenteritis.<sup>4,6</sup> In their study conducted on 120 patients undergoing appendectomy, Aravindan *et al.*<sup>4</sup> determined AEA in 8 patients with no history of atopy. In these patients, appendix was extremely enlarged and inflamed and no

surface exudates were noted.

Pathological diagnosis should certainly be obtained in patients who have undergone appendectomy. In addition to the neoplastic diseases of appendix, factors leading to allergic reaction in the gastrointestinal system should be investigated in cases with AEA and in some cases additional therapies may also be required. For instance, parasitic infestations may lead to tissue injury and local irritation in the gastrointestinal tract, particularly in the ileocecal region; thus this should be kept in mind in cases with AEA. If there exists an underlying parasitic infestation, cure is possible with medical therapy, otherwise the diagnosis is missed and complete cure cannot be achieved.

In our case, we explored his gastrointestinal system for parasitic infestations following the diagnosis of AEA and in his direct stool examination trophozoites of *Entamoeba histolytica* were noted. The irritation and allergic reaction in the gastrointestinal system caused by this parasite were considered to be responsible for the development of AEA. Consequently, the patient was administered oral metronidazole therapy for ten days postoperatively and complete cure was achieved.

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