



Parasitosis in Appendectomy Cases

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ABSTRACT

Aim: Obstruction of lumen of appendix vermiformis causes inflammation and requires surgery. The study aimed to detect any parasitosis in appendiceal specimens brought to pathology laboratory.

Method: A total 916 appendectomy specimens from Faculty of Medicine at Inonu University between 2002 and 2005 were examined for inflammation and luminal parasitosis.

Result: Adult worms and eggs of *Enterobius vermicularis* were detected in 23 (2.5%) of all cases, while *Taenia* spp. were found in only 2 (0.2%) cases. Also parasites were found in 8 of (2.0%) of 391 construction appendicitis, and in 5 (1.3%) of 384 acute appendicitis cases. Moreover, plasma cells and polymorphonuclear leukocytes were observed, respectively, in 18, and 2 of Appendix vermiformis cases with parasite. Eosinophils in lamina propria were detected in all cases.

Conclusion: Therefore, the intestinal parasitosis should be considered in the differential diagnoses of appendicitis. Education on how to prevent parasitosis should be included in training programs to avoid any unnecessary surgery.

Key words: Appendectomy specimen, inflammation, intestinal parasite, surgery.

Apendektomi Olgularında Parazitöz

Amaç: Apendiks vermiformisin lümeninin tıkanması inflamasyona neden olur ve operasyon gerektirir. Bu çalışmada patoloji laboratuvarına götürülen apendiks örneğinde parazitöz varlığının tespiti amaçlandı.

Metod: İnönü Üniversitesi Tıp Fakültesinde 2002-2005 yılları arasında toplam 916 apendektomi örneği inflamasyon ve luminal parazitöz yönünden incelendi.

Bulgular: *Enterobius vermicularis*in erişkin kurt ve yumurtaları toplam vakaların 23 (%2,5)'inde tespit edilirken, tenya türleri sadece vakaların 2 (%0,2)'sinde bulundu. Ayrıca 391 konstrüksiyon apandisitinin 8 (%2,0)'inde ve 384 akut apandisitinin 5 (%1,3)'inde parazit bulundu. Aynı zamanda sırasıyla 18 ve 2 parazitli apendiks vermiformis vakasında plazma hücreleri ve polimorfonükleer lökositler izlendi. Lamina propria eozinofiller tüm vakalarda tespit edildi.

Sonuç: Bu nedenle intestinal parazitler apandisitinin ayırıcı tanısında değerlendirilmelidir. Gereksiz cerrahileri önlemek için parazitözlerin nasıl engelleneceğine dair eğitim programları içersine yerleştirilmelidir.

Anahtar kelimeler: Apendektomi örneği, inflamasyon, intestinal parazit, cerrahi

INTRODUCTION

The prevalence of intestinal cases is closely related with socio-economic conditions, eating and hygienic habits, climate, environmental conditions, infrastructure, and literacy. Turkey is among the countries where parasite contamination is most prevalent (1-3). Cyst and trofozoid forms of protozoon parasites in intestines, and adults, larvae and eggs of helminthes can settle in appendix vermiformis (4-7). Lumen obstruction of appendix vermiformis can also cause inflammation and requires immediate surgery (2). This study aimed in appendix vermiformis brought to pathology laboratory to detect, whether was parasites in the patients that underwent operation due to the diagnosis of appendicitis.

MATERIALS AND METHODS

Materials

A total 916 appendiceal specimens examined in Pathology Department in Faculty of Medicine at Inonu University between 2002 and 2005 were reevaluated in terms of inflammation and luminal parasitosis. The current study comprised 508 male and 408 female patients living in Malatya, aged between 0 and 61.

Histological Diagnosis

Tissue specimens brought to pathology laboratory were examined after hematoxylen-eosin (HE) staining.

Statistical Analysis

Values were given as numbers and percentages. The results were assessed by using chi-square test for independent samples. $p < 0.05$ was considered statistically significant. Statistical analysis was performed using SPSS 10.0 for Windows.

RESULTS

Parasites were found in 25 (2.7%) out of 916 examined appendectomy specimens. Adult worms (Figure 1) of *Enterobius vermicularis* were detected in 23 (2.5%) of all cases, and *Taenia* spp. eggs (Figure 2) were found in 2 (0.2%) cases. Plasma cells and polymorphonuclear leukocytes were observed in 18 and 2, respectively, of parasite-detected appendix vermiformis cases, while eosinophils in lamina propria were detected in all cases. No significant difference was detected between the incidence rates in terms of gender (Chi-square=0.022, $p > 0.05$) (Table 1). Similarly, any significant difference was not observed between the incidence rates in terms of age (Chi-square=2.38, $p > 0.05$) (Table 2).

DISCUSSION

In the present study a total of 916 appendectomy specimens were examined. Parasites were found in lumen in 25 (2.7%) of the cases. Adult worms and eggs of *E. vermicularis*, and *Taenia* spp. were found in 2.5% and 2%, respectively, of all cases. Comparison of both the rates of parasitism and gender, and the rate of parasitism and age revealed no significance. Moreover, of the cases in whose appendix vermiformis parasite was detected, 18 had plasmocytes, and 2 had polymorphonuclear leukocytes, while eosinophils in lamina propria were detected in all.

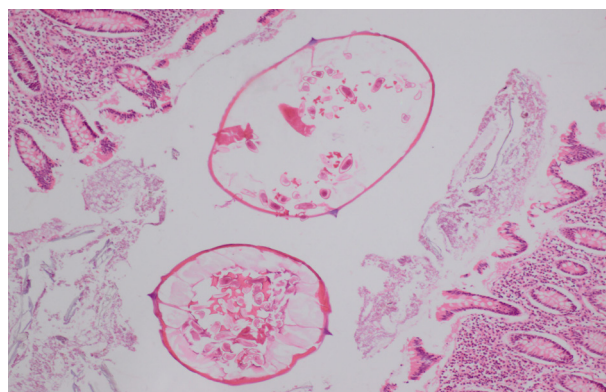
The rate of parasitosis in appendectomy specimens varied between 0.46% and 40% in similar studies reported in the literature (8-12). On contrary to these reports, Pamir et al. (13) denied any parasitism in their 71 appendectomy specimens. Moreover, Pannchalingam et al. (14) reported to have found an *E. vermicularis* during

Table 1. Distribution of parasite percentage according to gender

Gender	Positive n(%)	Negative n(%)	Total n
Male	13(2.6)	495(97.4)	508
Female	12(2.9)	396(97.1)	408
Total	25(2.7)	891(97.3)	916

laparoscopic appendectomy. Beredesen et al. (15) found *E. vermicularis* in 12.5% of the appendices removed from children. Various results obtained from former studies are probably due to the characteristics of the regions, including socio-economical conditions, eating habits, type of parasite, living standards and the sample of the study.

Taking into account the findings of our present study, we concluded that the cases with lymphatic hyperplasia cause unnecessary surgery, resembling acute appendicitis symptoms and findings. Therefore, intestinal parasitosis should be considered in differential diagnosis of appendicitis. Nutting et al. (16) described an unusual case of an 11-year-old girl who had right lower quadrant pain due to unilateral salpingitis, suppurative omentitis and periappendicitis, and the etiologic agent was the parasite *E. vermicularis* in that case. Sah and Bhadani (17) reported *E. vermicularis* was found more frequently (8.45%) in uninflamed and histologically normal appendices when compared with those with inflammation and histopathologic findings of acute appendicitis (0.56%).

**Figure 1.** *E. vermicularis* adult X100 (HE*)

*HE: Hematoxylen-eosin staining.

Table 2. Distribution of parasite percentage according to age groups

Age Groups	Positive n(%)	Negative n(%)	Total n
0-20	4(1.5)	261(98.5)	65
21-40	11(3.5)	301(96.5)	12
41-60	5(2.7)	180(97.3)	85
>61	5(3.2)	149(96.8)	54
Total	25(2.7)	891(97.3)	16

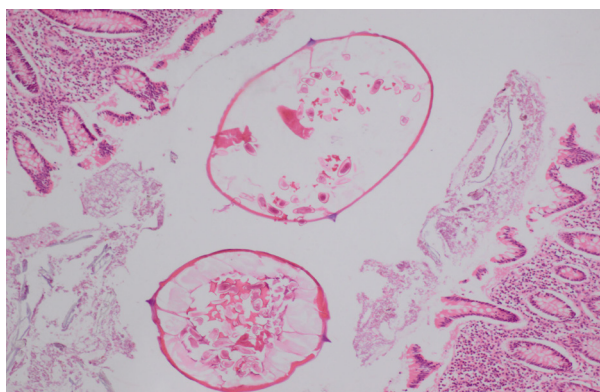
In conclusion, prevention of parasitosis employing training programs is suggested to decrease the number of unnecessary appendectomy operations.

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**Figure 2.** *Taenia* spp. eggs X100 (HE*)

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