

# Unusual Histopathological Findings in Cases with a Preliminary Clinical Diagnosis of Acute Appendicitis: What was Expected, What Did We Discover?

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## ABSTRACT

**Introduction:** The most common cause of acute abdomen is appendicitis. Besides lymphoid hyperplasia and fecalith, less common lesions such as diverticulum, endometriosis, infectious agents, preneoplastic and neoplastic lesions are also in the etiology of acute appendicitis. Our aim is to document the findings after histopathological examination of appendectomy materials and to detect the lesions, which we call other diagnoses.

**Methods:** The findings were divided into four groups as acute appendicitis, perforated appendicitis, lymphoid hyperplasia and “other diagnosis” in the appendectomy materials. Other diagnoses were also divided into two subgroups: Group 1 consisted of cases of acquired and anatomical abnormalities, chronic appendicitis, infectious agents and miscellaneous lesions. Group 2 consisted of serrated lesions, carcinomas, neuroendocrine neoplasia, mesenchymal tumor and secondary neoplasia.

**Results:** Our study was conducted in 4,335 appendectomy materials and there were 562 (12.96%) cases in the “other diagnosis” group. Group 1 consisted of cases with diverticula (5.74%), fibrous obliteration (2.84%), skip lesion of ulcerative colitis (0.02), granulomatous inflammation (0.07%), enterobius vermicularis (0.55%), endometriosis externa (0.16%), and amyloid deposition (0.05%), while group 2 comprised cases with hyperplastic polyp (0.53%), sessile serrated adenoma (0.83%), low-grade mucinous neoplasia (0.28%), neuroendocrine cell proliferation (0.28%), neuroendocrine tumor (NET) (1.2%), gastrointestinal stromal tumor (0.02%), and secondary neoplasia (0.39%).

**Conclusion:** In our study, most commonly, we detected diverticula and the most frequently found neoplastic lesion was NETs. Recently, due to the increased awareness of the presence of serrated lesions, the rate of diagnosis of these cases has also increased. In addition to neoplastic lesions detected because of histopathological examination of appendiceal materials, lesions characterized by parasitosis, endometriosis externa and granulomatous inflammation, as well as cases that require sustained treatment and follow-up will not be skipped.

**Keywords:** Acute appendicitis, amyloid, endometriosis externa, neuroendocrine tumor, serrated lesion, low-grade mucinous neoplasia

## Introduction

The most important factor causing appendicitis is luminal obstruction. The factors responsible for its formation include lymphoid hyperplasia in those under 20 years of age and fecaloid plug in the elderly, although rare lesions such as parasites and neoplasia are also seen, albeit rarely (1-4).

Despite the advances in imaging methods, histopathological examination maintains its importance in guiding diagnosis and treatment in appendectomy materials (5). In addition to confirming the diagnosis of appendicitis, a histopathological examination can also enable the recognition of less common lesions (1-4,6). Rare lesions detected in appendectomy materials are diverticulum, fibrous obliteration,

infectious agents, endometriosis externa, and preneoplastic and neoplastic lesions such as serrated lesions, low-grade mucinous neoplasia (LGMN), neuroendocrine neoplasia, mesenchymal tumor, and secondary neoplasms. The reported incidence rates for such lesions range from 0.9% to 8.3% in the literature (1,2,5). While some studies reported that the most common among these lesions were enterobius vermicularis, it was fibrous obliteration in some others (1,2,5). The most common neoplasm was neuroendocrine tumor (NET), followed by LGMN (2,4-6).

We described rare lesions that were diagnosed during routine histopathological examinations of appendectomy materials and play a role in the etiology of appendicitis and present them with clinical and epidemiological findings.



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## Methods

The study involved patients who were operated on with a diagnosis of acute appendicitis between January 2011 and June 2021. Incidental appendectomy materials performed during other surgical procedures were also included (such as colorectal and gynecological cancer surgery). The cases' demographic characteristics (age and gender) were retrieved from the hospital's electronic record system. All sections of biopsy materials (hematoxylin-eosin (H&E) and histochemical and immunohistochemical markers) were reviewed.

Based on the histopathologic findings, the appendectomy specimens were classified into four groups; acute appendicitis, perforated appendicitis, lymphoid hyperplasia and "other diagnosis". The other diagnoses category was also classified into two subgroups (3,4).

The first group includes acquired and anatomical abnormalities, chronic appendicitis, infectious agents, and miscellaneous lesions. The second group, which includes preneoplastic and neoplastic lesions, includes serrated lesions, carcinoma, neuroendocrine neoplasia, mesenchymal tumors, and secondary neoplasia.

On microscopic examination, fibrous obliteration in the first group was divided into subtypes as central obliterative neuroma, intramucosal appendiceal neuroma and submucosal obliterative neuroma. Additional studies on the etiology of granulomatous appendicitis in the group defined as chronic appendicitis included endoscopic examination as well as microbiologic examinations for infectious agents (tuberculosis, etc.). In the second group, the positivity of the surgical margin and the mucosal depth of the lesion (lamina propria or muscularis mucosa location) were evaluated in LGMN, which is among the neoplastic lesions. In NET cases, tumor size of 2 cm or more, mesoappendiceal or vascular invasion and positive surgical margin, which are among the risk parameters for recurrence, were evaluated. In addition to location, size and mitotic activity, which are prognostic factors defined for GIST, were evaluated.

Finally, the cases included in both groups were grouped as pediatric (0-17 years) and adult (18 years and older) according to age. Informed consent was obtained from the patients for the publication of this study. The ethics committee approval was granted by the Ethics Committee of University of Health Sciences Turkey, Okmeydanı Training and Research Hospital (approval number: 810, date: 23.01.2018).

## Statistical Analysis

The data were presented with frequency distribution (number, percentage) for categorical variables, and descriptive statistics (mean, standard deviation) for numerical variables. An Independent sample t-test was used to determine whether there was a difference between the two groups. The level of significance was  $p < 0.05$  in the statistical evaluation.

## Results

### General Characteristics of Appendectomy Materials

The study included appendectomy materials from 4,335 cases. Of the cases, 2,379 (54.9%) were male and 1,956 (45.1%) were female. Their age ranged from 2 to 90 years.

Histopathological examination revealed that 3,256 patients (75.11%) were in the acute appendicitis group (acute + suppurative), 418 (9.64%) were in the perforated appendicitis group, 99 (2.29%) were in the lymphoid hyperplasia group, and 562 (12.96%) were in the "other diagnoses" group.

The general distribution of diagnoses based on histopathological examination of appendectomy materials is given in Table 1.

### The Group of "Other Diagnoses"

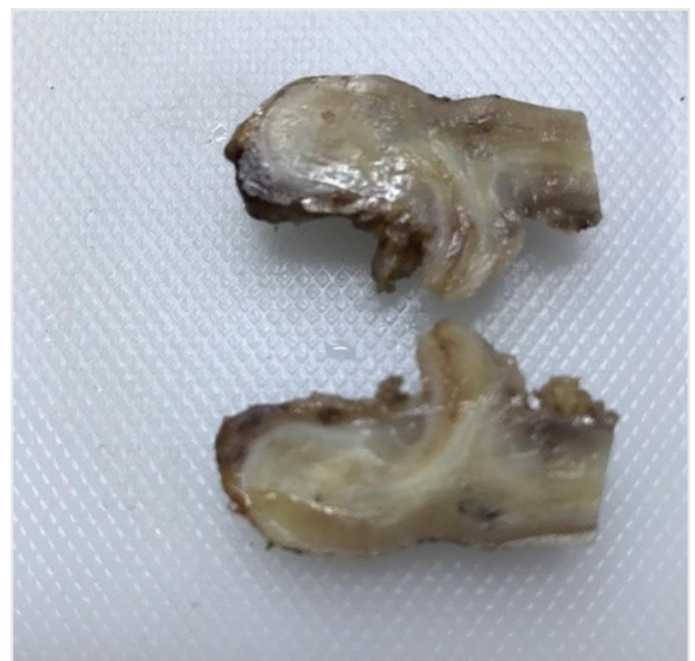
Thirty of 562 cases were in the pediatric age group in this group. Of the cases, 372 (66.2%) were male and 190 (33.8%) were female. The age ranged from 4 to 90 years.

In the first group, diverticulosis (n=249, 5.74%) (Figure 1) and fibrous obliteration (n=123, 2.84%) in the subgroup of acquired and anatomical anomalies, skipped lesion of ulcerative colitis (n=1, 0.02%) and granulomatous inflammation (n=3, 0.07%) in the subgroup of chronic appendicitis, enterobius vermicularis (n=24, 0.55%) in the subgroup of infectious agents, endometriosis externa (n=7, 0.16%) (Figure 2) and amyloid deposition (n=2, 0.05%) (Figure 3) in the subgroup of miscellaneous lesions were included.

In the second group including the preneoplastic lesions and tumors, hyperplastic polyp (n=23, 0.53%) and sessile serrated adenoma (SSA)

**Table 1. The distribution of patients according to diagnosis**

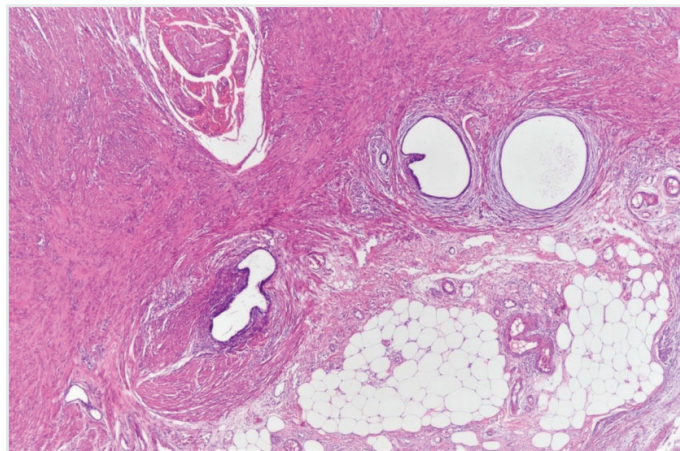
	n	%
Acute appendicitis (acute + suppurative)	3,256	75.11
Perforated appendicitis	418	9.64
Lymphoid hyperplasia	99	2.29
Other (unusual) diagnoses	562	12.96
Total	4,335	100



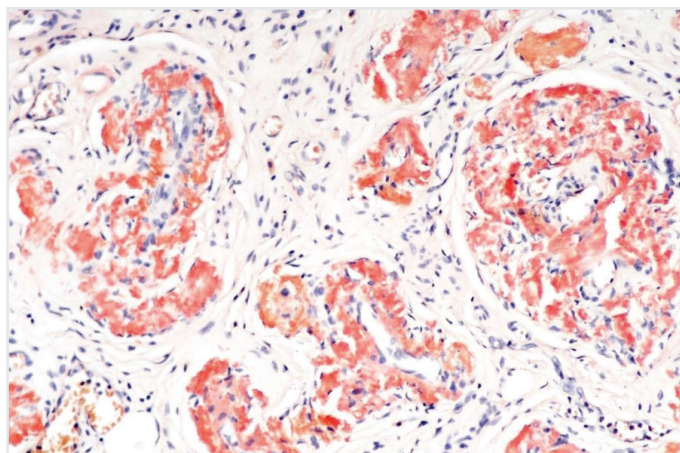
**Figure 1.** Diverticulosis found incidentally in the sections of the appendix



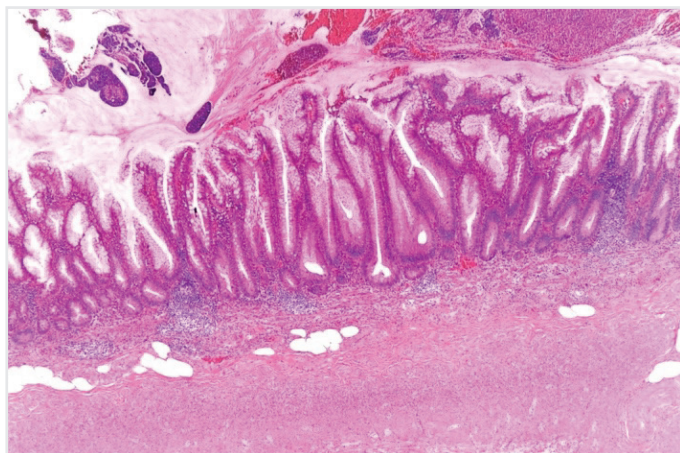
(n=36, 0.83%) in the subgroup serrated lesions (Figure 4), LGMN (n=12, 0.28%) in the subgroup carcinoma (Figure 5), neuroendocrine cell proliferation (NCP) (n=12, 0.28%) and NET (n=52, 1.2%) in the subgroup neuroendocrine neoplasia, gastrointestinal stromal tumor (GIST) (n=1,



**Figure 2.** Endometriosis externa. The presence of endometrial glands and stroma in the appendiceal wall (H&E, x40)  
H&E: Hematoxylin and eosin



**Figure 3.** Amyloidosis. Amyloid deposits found in vascular walls (Congo red, x200)



**Figure 4.** Sessile serrated adenoma. Showing abnormal crypt proliferation, elongation and basal crypt dilatation (H&E, x40)  
H&E: Hematoxylin and eosin

0.02%) in the subgroup of mesenchymal tumors (Figure 6) and secondary neoplasm (n=17, 0.39%) subgroups were involved.

#### Clinicopathological Features of the Other Diagnoses Group

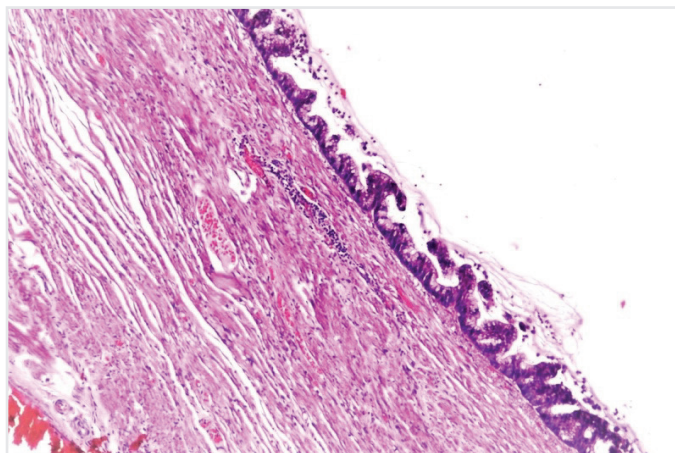
While endometriosis externa, amyloid deposition, LGMN and secondary neoplasia were observed more frequently in women, diverticula, fibrous obliteration, skip lesion of ulcerative colitis, granulomatous inflammation, enterobius vermicularis, hyperplastic polyp, SSA, NHP, NET and GIST were more often observed in men.

Histopathological examination revealed that diverticulum, which was in the subgroup of acquired and anatomical abnormalities in the first group, was the most common rare lesion with a rate of 5.74%. Fifty-six (22.5%) of the cases had perforation and 39 (15.7%) had inflammation. NET, SSA, NCP, and endometriosis externa were secondary lesions accompanying the diverticulum. In the fibrous obliteration group, there was central obliteration, one of its subtypes, in 114 (92.7%) cases, whereas nine (7.3%) had intramucosal obliteration with nodular proliferation.

In the second group, a case with a diagnosis of hyperplastic polyp in the serrated lesion group was accompanied by NCP, while other lesions accompanying the SSA were diverticulum, NCP and GIST. Cases with a diagnosis of hyperplastic polyp were mostly in their 50s, and cases with a diagnosis of SSA were in their 59s. There was no significant difference in terms of mean age ( $p=0.089$ ) and gender ( $p=0.155$ ).

In LGMN cases, the lesion is limited to the muscularis propria. No positive surgical margin, appendiceal rupture, mucin, or atypical cells outside the appendix were detected. Two of the cases with LGMN in the carcinoma subgroup were accompanied by NET as secondary neoplasia.

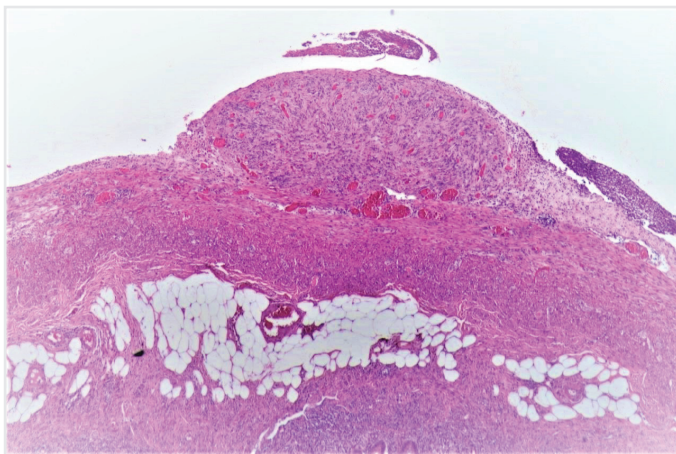
Hyperplastic polyps and diverticula were other accompanying lesions in two of the cases diagnosed with NCP in the subgroup of neuroendocrine neoplasia. The number of cases diagnosed with NET was 52, and 45 of the cases were grade 1 (G1) and seven were G2. The mean tumor diameter was 0.68 cm (0.1-2.5 cm). Tumor size was 2 cm and in two cases. The tumor was located in the apex of 37 cases, in the body part of ten, and the apex + body part of five. The tumor spread to the mucosa



**Figure 5.** Low-grade mucinous neoplasm. Showing fibrous stroma covered by dysplastic epithelial cells (H&E, x20)  
H&E: Hematoxylin and eosin

in nine, submucosa in five, muscle in 18, and subserosa/mesoappendix in 20. There was no vascular invasion and the surgical margins were free. Accompanying lesions were the diverticulum, LGMN, and SSA. We did not find a significant difference between the cases diagnosed with NET and NCP in terms of mean age ( $p=0.333$ ) and gender ( $p=0.739$ ). Similarly, there was no significant difference between the cases diagnosed with NET G1 and G2 in terms of mean age ( $p=0.382$ ) and gender ( $p=0.397$ ).

GIST, which is in the mesenchymal tumor subgroup, was centered within the muscularis propria reaching up to the subserosa. The tumor at the apex was 0.3 cm in diameter and was accompanied by SSA as a secondary lesion. Mitosis was not observed.



**Figure 6.** Gastrointestinal stromal tumor. The tumor was located in the subserosal layer of the appendix (H&E, x100)  
H&E: Hematoxylin and eosin

Cases in the secondary neoplasia subgroup were detected in incidental appendectomy materials, and primary neoplasia foci originated from the upper and lower gastrointestinal tract (GIT) and female genital tract.

In the pediatric age group, cases with diverticulum ( $n=13$ ), enterobius vermicularis ( $n=8$ ), NET ( $n=5$ ), SSA ( $n=2$ ), endometriosis externa ( $n=1$ ), and NCP ( $n=1$ ) were detected.

The classification and clinicopathologic characteristics of patients with “other diagnosis” in Table 2, 3 and the data on accompanying secondary lesions are in Table 4.

### Discussion

Histopathological examinations of appendectomy materials also allow the detection of rarely seen additional pathological conditions that are not grossly noticed (5). In our study, microscopic examination revealed acute and perforated appendicitis as well as lymphoid hyperplasia and other (miscellaneous) lesions. In a histopathological examination, appendicitis can be classified as acute focal, acute suppurative, and perforated appendicitis, according to its stage and frequency (7). According to the stages of appendicitis, acute appendicitis took the first place and our incidence rates were similar to the literature.

Lymphoid hyperplasia stands out among the factors in the etiology of appendicitis and is observed as a physiological response rather than inflammation. It has been described to be particularly associated with viral gastroenteritis and mesenteric adenitis (3,8). The frequency has been reported to be 6% (8). Lymphoid hyperplasia, which was found in the lowest group (2.3%) in our study, was also lower than the literature. Lesions such as diverticulum, fibrous obliteration, infectious

**Table 2. Demographic and clinicopathologic characteristics of patients classified as group 1**

		Age	M (n)	F (n)	Total (n, %)
	Diverticulum	40.33±16.49	179	70	249 (5.74)
Acquired and anatomical anomalies	Fibrous obliteration	42.90±19.17	81	42	123 (2.84)
Chronic appendicitis	Ulcerative colitis (skipped lesion)	79	1	0	1 (0.02)
	Granulomatous inflammation	35.00±14.11	2	1	3 (0.07)
Infectious agents	Enterobius vermicularis	24.67±13.89	17	7	24 (0.55)
Miscellaneous disorders	Endometriosis externa	38.57±19.07	0	7	7 (0.16)
	Amyloid deposition	77.00±18.38	0	2	2 (0.05)

M: Male, F: Female

**Table 3. Demographic and clinicopathologic characteristics of patients classified as group 2**

		Age	M (n)	F (n)	Total (n, %)
Serrated lesion	Hyperplastic polyp	50.22±16.31	17	6	23 (0.53)
	Sessile serrated adenoma	59.14±20.97	20	16	36 (0.83)
Carcinoma	LGMN	51.17±17.06	4	8	12 (0.28)
	NCP	31.58±12.57	8	4	12 (0.28)
Neuroendocrine neoplasms	NET GI	37.60±17.98	33	12	45 (1.04)
	NET GII	31.29±14.63	4	3	7 (0.16)
Mesenchymal tumor	GIST	77.00	1	0	1 (0.02)
Secondary neoplasms	Upper and lower GIT and female genital system	55.65±12.81	5	12	17 (0.39)

M: Male, F: Female, LGMN: Low-grade mucinous neoplasm, NCP: Neuroendocrine cell proliferation, NET: Neuroendocrine tumor, G: Grade, GIST: Gastrointestinal stromal tumor, GIT: Gastrointestinal tract



**Table 4. Data on accompanying secondary lesions**

	Endometriosis externa	NCP	NET	GIST	SSA
Diverticulum	1	1	5	-	4
Hyperplastic polyp	-	1	-	-	-
SSA	-	-	1	1	-
LGMN	-	-	2	-	-

NCP: Neuroendocrine cell proliferation, NET: Neuroendocrine tumor, GIST: Gastrointestinal stromal tumor, SSA: Sessile serrated adenoma, LGMN: Low-grade mucinous neoplasm

agents, endometriosis externa, serrated lesions, LGMN, neuroendocrine neoplasia, mesenchymal tumor, and secondary neoplasms that mimic the clinical manifestations of appendicitis observed less frequently and the incidence of these lesions has ranged from 0.9% and 8.3% in the literature (1-6). We classified this group as other (unusual) diagnoses. The incidence rate was 12.96%, above the literature data.

Diverticulum, a lesion in the subgroup of acquired and anatomical abnormalities, is rare and its frequency varies between 0.014% and 2% (9,10). It was the most common rare lesion we detected in our study and its rate was higher than the literature data. Two types are defined: Congenital and acquired (9). The congenital type is a true diverticulum and is very rare. Our study included cases diagnosed with an acquired type of diverticulum, there were no cases with a diagnosis of congenital type. Increased intraluminal pressure is thought to play a role in the etiology of the acquired diverticulum. In addition to fecaloid material, lesions such as adenoma LGMN, and NET (10,11) can cause increased intraluminal pressure. Our study also supports these data, and the accompanying lesions in some cases were NET, NCP, SSA, and endometriosis externa. It is usually seen after the third decade and was found in a similar age group in our study. Although usually asymptomatic, complications of the diverticulum include inflammation and, to a lesser extent, perforation. The mortality risk due to perforation is higher than in cases of acute appendicitis without diverticulum. Our results included perforation as well as inflammation. Serous mucin deposits that may occur because of perforation may lead to a misdiagnosis as LGMN. Therefore, diverticulum should always be considered in the differential diagnosis (11). While hyperplastic changes in the epithelium, mucosal neuroma-like proliferation, and fibrosis are observed in the diverticulum, the dysplastic epithelium observed in LGMN is important in this distinction. We did not have a diverticulum case misdiagnosed as LGMN in our study. Fibrous obliteration is observed more frequently than diverticulum and has an incidence rate of up to 10% in the literature (1,3,7). The incidence of fibrous obliteration was quite low in our study compared with the literature (2.84%). Fibrous obliteration, also called appendiceal neuroma, is a lesion whose frequency increases with age. Accordingly, it was detected more frequently in the fourth decade and in our study. Three structural patterns are observed in the histopathological examination of fibrous obliteration, which is thought to develop because of neurogenic proliferation (7). The most common pattern is the central obliterative neuroma, which is followed by the intramucosal appendiceal neuroma. Intramucosal ones are well-circumscribed and have a nodular growth pattern between the crypts. The third pattern is the submucosal obliterative process,

which is localized but with indistinct borders. Among these structural patterns, the central obliterative neuroma constituted most our cases. An intramucosal neuroma was observed at a lower rate and submucosal neuroma was not detected.

The chronic appendicitis subgroup involved skip lesions of ulcerative colitis and granulomatous inflammation. Appendiceal involvement of ulcerative colitis can be observed in cases with pancolitis or cases with left side or rectum involvement as skip lesion (12). Histopathological examination reveals active inflammation with crypt abscess, panmucosal plasmacytosis, and crypt distortion (3). In addition to these findings in appendiceal sections, crypt atrophy and one focus of pyloric gland metaplasia were noted in our single case with a diagnosis of ulcerative colitis. Granulomatous inflammation is also observed in appendectomy materials at rates varying between 0.1-2%. Infectious agents (such as *Mycobacterium tuberculosis* and *Schistosoma*) and non-infectious factors (such as Crohn's disease, sarcoidosis, and foreign body reaction) are involved in the etiology (1,3,13). Geographic distribution can be decisive in terms of factors (13). Definitive diagnosis requires long-term follow-up and sometimes additional investigation (5). The rate we found in our study was 0.07%, which was below the literature data. And additional examinations for the definitive diagnosis in these cases did not lead to a conclusion regarding the etiology.

*Enterobius vermicularis*, which is in the infectious agent subgroup, is the most common helminthic agent of GIT. It is the most common infectious agent among rare lesions detected in appendectomy specimens. Its incidence varies between 0.2-3.8% (3,14). Our rate of *enterobius vermicularis* found to be consistent with the literature data. The literature data also report different parasitic agents such as *Schistosoma*, *Ascaris lumbricoides*, and *taenia*; however, we only found one agent (1,3).

In our study, the subgroup of miscellaneous diseases included endometriosis externa and amyloid deposition. Localized endometrial tissue outside the uterine cavity, which is called endometriosis externa, is rare in the GIT and is observed in 10% of women with endometriosis (3,15,16). Endometriosis externa, mostly observed in the rectum and sigmoid colon, is very rare in the appendix and included in the literature as case reports (16). The number of cases in this group was very low in our study. Systemic amyloidosis is characterized by the extracellular deposition of the insoluble fibrillar protein aggregates (17). GIT involvement is common. It can cause upper and lower gastrointestinal bleeding, motility disorders, severe malabsorption, infarction, and perforation (18). One of our cases was operated on for ischemia and the other for a colon tumor. There was an eosinophilic hyalinized deposit compatible with amyloid, which also showed positive staining with Congo red on the vessel walls of their appendectomy materials. Because of additional examinations, the findings observed in both cases were interpreted as secondary amyloidosis.

Serrated lesions, previously defined as mucosal hyperplasia or metaplasia, are now divided into three groups as hyperplastic polyps, SSA, and traditional serrated adenoma (TSA) (19). These lesions are rare in the appendix and their true incidence remains unknown. However, there has been an increase in these lesions recently because of increased

awareness (20) and a study reported that these lesions were detected in approximately 7% (20). The frequency of serrated lesions was less in our study compared to that in the literature. However, the number of cases diagnosed was higher recently than in previous years. Our study included cases diagnosed with hyperplastic polyp and SSA and there was no case with a TSA diagnosis. Among serrated lesions, SSA and TSA are considered precancerous and it has been suggested that these appendiceal lesions shows more aggressive behavior (20). It has been reported in the literature that polyps can be observed along the colon and appendix and that may be a part of serrated polyposis syndrome (21). Polyps are mostly in SSA morphology and colon adenocarcinoma development is common in these cases. Therefore, a total colonoscopic examination is recommended especially in cases diagnosed with SSA and TSA accompanied by dysplasia (19). We detected no dysplasia or malignancy with SSA in our cases.

LGMM is among mucinous epithelial tumors with a frequency of less than 1%. It is detected incidentally during surgery for other reasons in 15-20% of cases (4,22). The rate of LGMM in our study was consistent with the literature. As long as dysplastic epithelium is not observed at the surgical margin, appendectomy is considered sufficient in the treatment. In these cases, positive surgical margins, appendiceal rupture, presence of mucin outside the appendix, or atypical cells and pseudomyxoma peritonei may increase the development of potential malignancy (22). The cases diagnosed in our study were limited to the muscularis propria and the surgical margins were negative. Some studies have reported very rare appendiceal collision tumors, which consist of histologically different tumor types and are included in the LGMM tumor group (23,24). In these studies, reported as case reports, LGMM is mostly accompanied by NET. NET was the accompanying secondary tumor in both of our cases in the category of collision tumors.

NCPs, which are included in the neuroendocrine neoplasia group and detected incidentally in the appendix wall, are defined as a proliferative phenomenon similar to early NCP seen in other organs of the GIT (4). There is no clear information about the underlying medical or genetic structure that may predispose to this proliferation. It is observed as patchy groups smaller than one millimeter and is called incidental NCP. Our study included ten cases in this category.

NET, which is in the neuroendocrine neoplasia group, is the most common primary tumor of the appendix (1,4). Its incidence in appendectomy materials varies between 0.3-2.3%. The frequency of our cases diagnosed with NET in our study was consistent with the literature data. It is usually observed between the ages of 30-40. The NET cases in our study were in a similar age range. NETs with a tumor size of less than 1 cm are also usually detected incidentally in approximately 70% of cases (4). As in our study, they were mostly localized at the apex. In these tumors, where metastasis is very rare, appendectomy is considered sufficient for the treatment (1). A tumor size of 2 cm or more, mesoappendix or vascular invasion, and positive surgical margins are risky parameters for recurrence (4). We did not find any other risk factors predicted for recurrence, except for the presence of mesoappendix invasion and a tumor size of 2 cm and observed above in a few of our patients with NET.

GIST is the most common primary mesenchymal tumor of the GIT. While it is frequently observed in the stomach and small intestine, it is very rare in the appendix (25-27). The number of reported cases is less than 100 in the literature. Besides location, size and mitotic activity are factors that play a role in determining the behavior of GIST (25). However, since it is rarely observed in the appendix, there are no definite data on its behavior. As in our case, it is more common in men and has a size of less than 3 cm.

Secondary neoplasms are rare in the appendix and may originate from the GIT, urogenital tract, ovary, lung, and gallbladder. Metastatic tumors can most commonly be seen as serosa involvement due to transcoelomic spread (28). In our study, secondary neoplasms originated from the GIT and female genital tract and were detected in incidental appendectomy materials accompanying primary tumor resections.

Acute appendicitis is one of the most common diseases requiring surgical treatment in the pediatric age group as well (29). *Enterobius vermicularis* is detected more frequently among rare lesions in this age group (29). The most common lesion was the diverticulum in our study, followed by *enterobius vermicularis*, NET, SSA, endometriosis externa, and NCP, in order of frequency. Among these lesions, SSA is very rare in this age group. It is recommended to examine the entire appendix and follow up the case closely, particularly in those with dysplasia findings (30). In our study, the appendiceal materials diagnosed SSA were completely examined. There was no sign of dysplasia.

#### Study Limitations

The limitations of this retrospective study include the inaccessibility of macroscopy materials and the fact that sampling was performed by different pathologists.

#### Conclusion

Lesions classified as "other diagnostic" are usually detected incidentally during histopathological examination of appendectomy materials. Among the "other diagnostic" group, the most common lesion was the diverticulum, and the most common neoplastic lesion was NET in our study. These lesions may also coexist together, and mentioning such concomitant lesions in pathology reports will provide more accurate frequency rates. Thus, besides neoplastic lesions; in cases such as parasites, endometriosis externa and granulomatous inflammation, the treatment and follow-up of the patients will continue as recommended by the clinician. As in our study, due to the raising awareness of serrated lesions, the rate of diagnosis of these cases will increase.

**Ethics Committee Approval:** The ethics committee approval was granted by the Ethics Committee of University of Health Sciences Turkey, Okmeydanı Training and Research Hospital (approval number: 810, date: 23.01.2018).

**Informed Consent:** Informed consent was obtained from the patients for the publication of this study.

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Collection or Processing - S.Ş.E., A.D., A.A.; Analysis or Interpretation - S.Ş.E., A.D., G.K., A.A.; Literature Search - S.Ş.E., A.D., G.K.; Writing - S.Ş.E., A.D., G.K.

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