ORIGINAL ARTICLE

Evaluation of the appendectomy cases performed under emergency conditions during the COVID-19 pandemic and discussed with the pathology reports

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ABSTRACT

BACKGROUND: The aim of this study is to examine the cases underwent appendectomy during the COVID-19 pandemic and to discuss the pathology reports of patients.

METHODS: During the COVID-19 pandemic, the pathological reports of the appendectomy materials of 588 patients over the age of 15 who applied to the emergency department between January 1, 2020, and June 1, 2021, were examined. A total of 565 patients with a diagnosis of acute (AA), subacute (SA), or perforated appendicitis (PA) were included and divided into three groups according to diagnosis. Twenty-three patients were excluded from the study due to other pathologies. The age, gender, duration of pain, ASA score, operational technique, operation time, Clavien-Dindo score, hospitalization time, post-operative complications, pre- and post-operative PCR and thoracic tomography findings in suspected cases of COVID-19, and laboratory and radiological findings of patients were retrospectively analyzed.

RESULTS: Of 565 patients diagnosed with appendicitis, 464 (82.1%) had AA, 35 (6.2%) SA, and 66 (11.7%) PA. The median age of the PA group was higher than in the AA group (p=0.0139). The incidence of diabetes mellitus in the PA group and of asthma in the SA group were highest among other groups (p=0.004 and 0.0037, respectively). The duration of pain was longer in the SA and PA groups than the AA group (p<0.0001), therefore, the patients applied to hospital later than the acute group. The rate of thorax CT-positive scans was 1.6% in patients suspected for COVID-19 (p=0.066). While laparoscopic surgery was preferred over 70% in all groups, the rate of conventional surgery (21.1%) in the AA group was highest and of transition from laparoscopic to open surgery was highest in the PA group (10.6%) (p<0.0001). Hospitalization duration was longest in the PA group (p<0.0001).

CONCLUSION: COVID-19 pandemic not only changes all routines of social life but also complicates the treatment and management of cases with AA symptoms applied to hospital under emergency conditions. Follow-up of the appendectomy specimen is crucial in terms of excluding other pathologies.

Keywords: Appendectomy; appendicitis; COVID-19; pathology.

INTRODUCTION

Beginning from December 2019, the coronavirus disease 2019 (COVID-19) has caused serious worldwide health issues affecting millions of people.[1] The common symptoms of COVID-19 are respiratory problems including cough, fever, muscle or body aches, headache, and sore throat, however, some gastrointestinal symptoms such as abdominal pain, nausea, and vomiting were also reported.[2] These symptoms are the common symptoms of acute appendicitis, a disease that is the cause of more than half of acute abdomen diseases in adults,[3] which complicates the correct diagnosis in the

Cite this article as: Sevinç MM, Karagülle OO, Kaya R, Ertürk C, Doğan S. Evaluation of the appendectomy cases performed under emergency conditions during the COVID-19 pandemic and discussed with the pathology reports. Ulus Travma Acil Cerrahi Derg 2022;28:703-710.

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Ulus Travma Acil Cerrahi Derg 2022;28(5):703-710 DOI: 10.14744/tjtes.2022.16287 Submitted: 24.10.2021 Accepted: 03.02.2022

emergency rooms early in the pandemic. Therefore, several infections or diseases might have had a delayed diagnosis and management in the clinic.

The routines of applying to the hospital have been changed due to the fear of viral contamination during the COVID-19 pandemic, so the diagnosis, treatment, and follow-up of patients with different manifestations have become more challenging. Elective interventions have been postponed giving care of patients with COVID-19.[4] Given a ratio of negative appendectomy reported as 15% in the Turkish population,[5] the operative treatment remains the first-line choice for nearly all cases of AA in Turkey although there are recommendations for conservative management with antibiotics in early periods of the pandemic in other countries.[6] The impact of altered routines and recommendation due to the COVID-19 pandemic on surgical practice in Turkey has not yet been fully presented. The present study was aimed to examine the cases that underwent an appendectomy due to subacute appendicitis (SA), acute appendicitis (AA), and perforated appendicitis (PA) during the COVID-19 pandemic, accompanied by pathology reports.

MATERIALS AND METHODS

Patients

The data of 588 patients over the age of 15 who applied to the emergency department during the COVID-19 pandemic between January 1, 2020, and June 1, 2021, and who underwent an appendectomy with a pre-diagnosis of appendicitis were retrospectively analyzed. Of all patients, 565 cases were reported as appendicitis due to pathological reports, and 23 cases with other pathologies were excluded from the analysis. A total of 565 patients diagnosed with appendicitis were divided into three groups according to the pathological examination: AA, SA, and PA.

The patients were diagnosed with a physical examination, laboratory findings that included complete blood counts and biochemical analysis, abdominal ultrasonography (USG), and abdominal computerized tomography (CT) for suspected COVID-19 patients. Pre-operative chest CT and real-time polymerase chain reaction (PCR) test were performed under emergency conditions based on the presence of suspected symptoms. All patients were treated with the appendectomy at 6–8 h after diagnosis to minimize the hospitalization period during the pandemic.

This study was approved by the Clinical Research Ethical Committee of University of Health Sciences Istanbul Training and Research hospital (Project no: 2905, Date: 13.08.2021). The investigation confirms the principles outlined in Helsinki Declaration approved in 1975.

Data Collection

All demographic characteristics, ASA score, comorbidities, duration of pain until admission to the hospital, the findings of imaging, PCR positivity for COVID-19 before and after the operation, the pre-operative laboratory findings, the surgical technique, duration of operation, duration of hospitalization, post-operative complications, Clavien-Dindo score, and presence of drainage were collected from the database of hospital and compared according to the pathological classification of appendicitis.

The Clavien-Dindo score has been widely used throughout surgery for grading the adverse events and consists of 5 grades: Grade 1 implies the normal postoperative course; Grade 2 implies the conditions requiring the pharmacological treatment, Grade 3 covers the conditions where medical treatment is inadequate and requires surgical or endoscopic intervention, Grade 4 includes the organ dysfunctions, and Grade 5 is the death of the patient.[7]

Statistical Analysis

Statistical analysis was performed by GraphPad InStat ver. 3.06 (GraphPad Inc., CA, USA) program. The normality test was performed by Kolmogorov–Smirnov test. The normally distributed continuous variables were compared by one-way ANOVA and variations between groups were compared by Tukey-Kramer multiple comparison test. Non-normally distributed continuous variables were compared by Kruskal–Wallis test (non-parametric ANOVA) and variations between groups were compared by Dunn's multiple comparisons test. Categorical variables were compared by the Chi-square test for independence. $P<0.05$, $p<0.01$, and $p<0.001$ were accepted as statistically significant.

RESULTS

Overall, of 565 patients who were diagnosed with an appendicitis, 35 (6.2%) were diagnosed with SA, 464 (82.1%) were diagnosed with AA, and 66 (11.7%) were diagnosed with PA. Examining the pathological specimens of 23 patients excluded from the study, endometriosis was reported in three patients, *Enterobius vermicularis* cluster in one patient, heterotopic ossification in two patients, serrated adenoma in three patients, hyperplastic polyp in two patients, B-cell lymphoma in two patients, neuroendocrine tumor in four patients, mucinous adenocarcinoma in two patients, neuroma in one patient, mucocele in one patient, and diverticulitis in two patients.

The demographics and pre-operative clinical data of patients are presented in Table 1. The median age was higher among the patients in the perforated group compared with those in the acute group ($p=0.0139$). The female patients were mostly diagnosed with SA (54.3%) while male patients were mostly diagnosed with AA and PA (72.2% and 74.2%, respectively). No statistical significance was found between groups.

The physical examinations of most patients in all groups were ASA 1 score while 22.9% of the subacute group, 26.3% of the

acute group, and 16.7% of the perforated group showed ASA 2. About 1.3% of the acute group and 4.5% of the perforated group showed ASA 3 (Table 1).

No differences were found between groups regarding the comorbidities except the ratio of diabetes mellitus which was higher in the perforated group (p=0.004) and the ratio of asthma which was higher in the subacute group (p=0.0037) compared to the other groups (Table 1).

Examining the duration of pain, it was observed that the patients in the subacute and perforated groups applied to the hospital later than the acute group and suffered from pain for a longer period (p<0.0001). Comparing the pathology reports of appendectomy materials with the pre-operative USG results, only 5.7% of the patients in the SA group could be correctly diagnosed by USG, while 15.3% in the acute group and 7.6% in the perforated group had an exact diagnosis (p<0.0001) (Table 1).

Table 1. The demographic and pre-operative clinical characteristics of patients according to the pathological classification

	Total (n=565)	Subacute (n=35)	Acute (n=464)	Perforated (n=66)	p-value
Age (years)					
Median (Min–Max)	30 (16–85)	32 (17–59)	29 (16–85)	33* (18–80)	0.0139
Gender, n (%)					
Male	400 (70.8)	16 (45.7)	335 (72.2)	49 (74.2)	0.0032
Female	165 (29.2)	19 (54.3)	129 (27.8)	17 (25.8)	
ASA score, n (%)					
1	415 (73.5)	27 (77.1)	336 (72.4)	52 (78.8)	0.0176
2	141 (24.9)	8 (22.9)	122 (26.3)	11 (16.7)	
3	9 (1.6)	0 (0)	6 (1.3)	3 (4.5)	
Comorbidities, n (%)					
Diabetes mellitus	12 (2.1)	0 (0)	7 (1.5)	5 (7.6)	0.004
Hypertension	28 (4.96)	1 (2.9)	21 (4.5)	6 (9.1)	0.234
Asthma	10 (1.8)	3 (8.6)	5 (1.1)	2 (3.0)	0.0037
COPD	1 (0.2)	0 (0)	1 (0.2)	0 (0)	0.897
CAD	9 (1.6)	1 (2.9)	7 (1.5)	1 (1.5)	0.827
Thyroid disease	6 (1.1)	1 (2.9)	4 (0.9)	1 (1.5)	0.502
Renal disease	2 (0.4)	0 (0)	1 (0.2)	1 (1.5)	0.235
Others	19 (3.4)	2 (5.7)	15 (3.2)	2 (3.0)	0.725
Duration of pain (days)					
Median (Min–Max)	1 (1–14)	2** (1–8)	1 (1–14)	2*** (1–7)	<0.0001
USS, n (%)					
Subacute	4 (0.7)	2 (5.7)	2 (0.4)	0 (0)	<0.0001
Acute	85 (15.0)	3 (8.6)	71 (15.3)	11 (16.7)	
Perforated	7 (1.2)	0 (0)	2 (0.4)	5 (7.6)	
N/A	469 (83.0)	30 (85.7)	389 (83.8)	50 (75.8)	
Abdominal CT, n (%)					
Subacute	28 (4.96)	10 (28.6)	18 (3.9)	0 (0)	<0.0001
Acute	403 (71.3)	9 (25.7)	357 (76.9)	37 (56.1)	
Perforated	22 (3.9)	1 (2.9)	4 (0.9)	17 (25.8)	
N/A	112 (19.8)	15 (42.9)	85 (18.3)	12 (18.2)	
Thorax CT, n (%)					
COVID-19 (+)	9 (1.6)	2 (5.7)	5 (1.1)	2 (3.0)	0.066

ASA: American Society of Anesthesiologists; USS: Ultrasonographic scan; N/A: Not available or cannot be examined; CT: Computerized tomography; COPD: Chronic obstructive pulmonary disease; CAD: Coronary arterial disease; PCR: Polymerase chain reaction; COVID-19: Coronavirus disease 2019. *P<0.05, **p<0.01, ***p<0.001 versus acute group.

Table 2. The intraoperative and post-operative data of patients according to the pathological classification

	Total (n=565)	Subacute (n=35)	Acute (n=464)	Perforated (n=66)	p-value
Technique, n (%)					
Laparoscopic	435 (76.99)	27 (77.1)	361 (77.8)	47 (71.2)	<0.0001
Open	116 (20.5)	6 (17.1)	98 (21.1)	12 (18.2)	
Laparoscopic to open	14 (2.5)	2 (5.7)	5 (1.1)	7 (10.6)	
Duration of operation (min)					
Median (Min–Max)	30 (12–140)	30 (15–70)	30 (12–120)	45***,††† (20–140)	<0.0001
Duration of hospitalization (day)					
Median (Min–Max)	2 (1–18)	2 (1–18)	2 (1–16)	5***,††† (2–14)	<0.0001
Complications, n (%)					
None	522 (92.4)	32 (91.4)	442 (95.3)	48 (72.7)	<0.0001
Bleeding	1 (0.2)	0 (0)	1 (0.2)	0 (0)	0.897
Ileus	10 (1.8)	0 (0)	2 (0.4)	8 (12.1)	<0.0001
Infection	3 (0.5)	0 (0)	2 (0.4)	1 (1.5)	0.476
Abscess	15 (2.7)	2 (5.7)	9 (1.9)	4 (6.1)	0.076
Hematoma	3 (0.5)	0 (0)	3 (0.6)	0 (0)	0.720
Subdermal collection	3 (0.5)	0 (0)	3 (0.6)	0 (0)	0.720
Others	8 (1.4)	1 (2.9)	2 (0.4)	5 (7.6)	<0.0001
Clavien-Dindo grade, n (%)					
I	550 (97.3)	33 (94.3)	456 (98.3)	61 (92.4)	0.0186
II	1 (0.2)	0 (0)	1 (0.2)	0 (0)	
IIIA	9 (1.6)	1 (2.9)	5 (1.1)	3 (4.5)	
IIIB	3 (0.5)	1 (2.9)	1 (0.2)	1 (1.5)	
V	1 (0.2)	0 (0)	0 (0)	1 (1.5)	
Drainage, n (%)	143 (25.3)	9 (25.7)	81 (17.5)	53 (80.3)	<0.0001
Post-operative PCR					
COVID-19 (+), n (%)	1 (0.2)	0 (0)	1 (0.2)	0 (0)	<0.0001

CRP: C-reactive protein; PCR: Polymerase chain reaction; COVID-19: Coronavirus disease 2019. *P<0.05, **p<0.01, ***p<0.001 versus acute group. †P<0.05, †††p<0.001 versus subacute group.

Abdominal CT achieved the correct diagnosis in 28.6% of the patients in the subacute group, 76.9% in the acute group, and 25.8% in the perforated group (p<0.0001).

Among the patients with a pre-diagnosis of appendicitis during the pandemic, the rate of COVID-19 positivity reported in thorax CT scans taken under the emergency conditions according to the symptomatic status of patients was 1.6%, and no significant difference was found between the groups (p=0.066) (Table 1). PCR test which was performed for the suspicious patients based on the post-operative symptoms and findings was positive in only one patient in the acute group (Table 2).

The pre-operative laboratory findings of patients are presented in Table 3. As expected, the amounts of leucocytes, neutrophils, direct and total bilirubin, CRP and procalcitonin were higher in the perforated group compared with the other groups (p<0.001) (Table 3). The number of lymphocytes was higher in the subacute group and lower in the perforated group compared with the acute group (p<0.0001). In addition, no significant difference was seen between the groups when comparing the platelet level (Table 3).

As indicated in Table 2, mostly preferred surgical technique was laparoscopic surgery for all groups with a ratio of over 70%. The ratio of open surgery (McBurney incision) was higher in the acute group (21.1%) compared with other groups (p<0.0001). The ratio of transition from laparoscopic to open surgery was higher in the perforated group (10.6%) compared with the other groups (p<0.0001) (Table 2).

The duration of operation and post-operative hospitalization was longer in the perforated group compared with the

Table 3. The pre-operative laboratory findings of patients according to the pathological classification

	Total (n=565)	Subacute (n=35)	Acute (n=464)	Perforated (n=66)	p-value
Leucocytes (×10⁹/L)					
Mean±SD	13.92±4.2	10.88±3.5***	13.95±4.1	15.29±5.0*,†††	<0.0001
Neutrophils (×10⁹/L)					
Mean±SD	10.96±4.2	7.50±3.1***	10.99±4.0	12.61±4.6**,†††	<0.0001
Lymphocytes (×10⁹/L)					
Mean±SD	1.99±0.9	2.52±0.9**	2.00±0.9	1.61±0.8**,†††	<0.0001
Platelets (×10⁹/L)					
Mean±SD	258.49±59.6	275.2±54.8	257.4±57.9	257.4±72.3	0.233
Direct bilirubin (mg/dL)					
Median (Min–Max)	0.18 (0.0–1.64)	0.185 (0.02–0.49)	0.16 (0.0–0.7)	0.23*** (0.0–1.64)	0.0013
Total bilirubin (mg/dL)					
Median (Min–Max)	0.675 (0.1–3.6)	0.6 (0.1–3.5)	0.6 (0.1–3.6)	1.09***,††† (0.2–3.2)	<0.0001
CRP (mg/dL)					
Median (Min–Max)	30.32 (0.2–435.94)	40.7 (1.8–204.39)	14.35 (0.2–400)	184.93***,† (4.1)	<0.0001
Procalcitonin (µg/L)					
Median (Min–Max)	0.0 (0.0–13.99)	0.0 (0.0–0.651)	0.0 90.0–13.99)	0.0***,††† (0.0–13.547)	<0.0001
Pre-operative PCR	6 (1.1)	2 (5.7)	4 (0.9)	0 (0)	0.032
COVID-19 (+), N (%)					

CRP: C-reactive protein; PCR: Polymerase chain reaction; COVID-19: Coronavirus disease 2019. *P<0.05, **p<0.01, and ***p<0.001 versus acute group. †P<0.05, †††p<0.001 versus subacute group.

other groups (p<0.0001). The most frequent post-operative complication was ileus formation in the perforated group (12.1%) while none of the patients in the subacute and 0.4% of patients in the acute group had ileus (p<0.0001). A significantly higher rate of intra-abdominal drainage catheter was observed in 80.3% of the patients with PA compared to the other groups (p<0.0001) (Table 2).

Most of the patients in all groups showed Clavien-Dindo Grade I while one male patient with Grade V in the perforated group died due to multiple organ failure (Table 2). On the 3rd day of the appendectomy, this 58-year-old patient developed shortness of breath, cough, and hypertensive attack and showed COVID-19 findings detected in the tomography. The patient had a history of COPD and hypertension and showed the findings in pre-operative thorax CT which were inconsistent with COVID-19. The patient who was operated on for PA was intubated due to the pulmonary findings and intensive care indication. In the follow-up of the patient, no extra-abdominal pathology could be detected, and the patient was treated by the infectious diseases unit due to COVID-19. The patient died on the post-operative 30th day due to multiple organ failure.

DISCUSSION

Appendicitis is an inflammatory disease characterized by increased intraluminal pressure as a result of obstruction of the lumen of appendix vermiformis. It is one of the most common causes of acute abdominal pains requiring surgery.[8] Although the most common cause of appendicitis is the inflammation caused by fecaloid and lymphoid hyperplasia, other causes including neoplasia or infestation can also be observed in histopathological examinations. Therefore, this examination gains importance in the management of appendicitis.[9] In the present study, 565 cases who underwent an appendectomy during the COVID-19 pandemic were examined and the pathological samples were reported as AA in 82.1% of patients, as SA in 6.2%, and as PA in 11.7%.

In the literature published 20 years ago, the overall incidence of perforation was reported to be 16–39% of appendicitis cases,[10,11] which was lower among our patients. The reason for this may be the developing technology in clinics and the ease of access to health services. About 3.9% of the pathological reports of our cases were reported as other causes. Among the neoplasms observed in the appendectomy material, the most common histopathological type was reported to be carcinoid tumor, and its incidence was 0.3–0.9%.[12,13] In our study, it was found as 0.6% which was in parallel with the literature. Approximately 7% of the young population is operated on with the diagnosis of appendicitis.[14] Commonly, the age range for appendicitis is between the ages of 10 and 30 due to the development of lymphoid tissue, and it is observed

more frequently in males as 1.2 times of those in females.[15] In our study, the median age among pathological cases was 30 years for all groups, and the median age in the PA group was 33 years, which was significant compared to the acute group. In the literature, the incidence of appendicitis has been reported to be 6.7% in women and 8.6% in men,[16] and incidence of perforation was reported to elevate with aging.[17] Although acute or PA was observed more frequently in males in our study, there was no statistically significant difference between the groups in terms of gender.

Early surgical interventions to prevent the complications of appendicitis result in 8–30% negative laparotomy,[8,18,19] however, PA is detected more in the clinical examinations due to the reasons of delay in the diagnosis or admission to the hospital. Using the radiological advances, the rate of negative appendectomy in CT evaluations has decreased to under 2%.[20] In the present study, the reasons why there was no reported normal appendicitis among the cases were suggested to be the indications of symptomatic appendicitis which became evident due to the late admission to the hospital or the high accuracy of tomography, and the subacute diagnosis of some cases. We consider that the rate of PA reported as 11.7% may be due to the late admissions to the hospital during the COVID-19 pandemic.

In the present study, the accuracy of pre-operative CT results compared with the post-operative pathological diagnoses was statistically significant in all groups of patients evaluated with abdominal CT. According to the post-operative pathological results of the cases evaluated by USG, the highest accuracy was found in the acute group with a rate of 15.7%, and those of 5.7% in the subacute group and 7.6% in the perforated group. In the literature, the sensitivity and specificity of USG were determined as 75% and 86%.[19] We suggest that the reason for these low rates of accuracy is that USG is relatively subjective, and the tomographic imaging is more accurate in the evaluations in emergency conditions during the COVID-19 pandemic.

In the literature, the ASA score was suggested to be a superior indicator for the duration of hospitalization and post-operative complications of appendicectomy.[21] Diabetes mellitus is associated with adverse events or complications in various gastrointestinal diseases and diabetic patients showed a higher risk for the development of complicated acute appendicitis and a subsequently longer hospital stay than non-diabetic patients.[22] In our study, no difference was observed between the groups in terms of ASA score, but the rate of asthma in the subacute group and diabetes mellitus in the perforated group was significantly higher in terms of comorbidity.

Leukocytosis is one of the most frequently used laboratory parameters, and its sensitivity is reported between 19% and 60% in the literature. Although leukocytosis is usually detected in the hemogram, the inflammatory parameters are not indicative of appendicitis.[23] It is known that the leukocytosis and CRP values measured in the beginning and follow-up period are supportive in the diagnosis of appendicitis.[24] It is known that CRP elevates later than the leukocyte levels and its specificity is higher in the patients with PA.[25] On the other hand, some studies revealed the relationship between the bilirubin value and appendicitis.[26] In our study, data supporting the given information, that is, the leukocyte, neutrophil ratio, direct and total bilirubin, CRP, and procalcitonin values were found to be statistically significant in the PA group.

It has been reported in the literature that the lymphocyte counts may reduce in cases of AA and PA.[5] In line with the literature, the lymphocyte count was higher in the subacute group than in the acute group and lower in the perforation group. There are studies about the use of neutrophil/lymphocyte ratios as a marker to determine the severity of AA, giving a ratio of 8 and above in the cases with perforated/gangrenous appendicitis, and the data in our study are in line with these studies.[27] Although a significant relationship was found between the neutrophil/lymphocyte ratio and PA in a study by Yardımcı et al.,[27] contrary to our study, no meaningful data could be obtained regarding a decrease in the lymphocyte counts.

Examining the duration of abdominal pain, the median duration until the hospital admission was 2 days in the subacute and perforated groups, which was significantly higher than in the acute group. Patients are waiting for the application to hospital until 7–8 days in the subacute and perforated groups. The reason for this was suggested to be the fear of contamination in the hospital during the COVID-19 pandemic, instead of using analgesics for the pain.

Since SARS-CoV-2 infection can present with symptoms including abdominal pain and diarrhea, an evaluation in emergency conditions has become more complex.[2] In hospitals where rapid antigen testing is not available for emergency cases, the patients are also evaluated with a pre-operative tomography. Although the throat and nasal swabs are collected, PCR tests do not give rapid results depending on the hospital burden. Furthermore, the accuracy rates of these tests are not high enough. In our study, thorax CT imaging was performed in the patients admitted to the emergency room and diagnosed with appendicitis, according to their symptomatic status or contact history, and the COVID-19 findings in imaging were found to be 1.6% in all groups and 1.1% in the AA group, but no significant difference was found between the groups, suggesting that these rates are low due to the PCR findings inconsistent with tomography and the low accuracy rate of PCR.

Recent publications reported that laparoscopic surgery is highly preferred for appendicitis.[28] In our study, laparoscopic surgery was also preferred by 77% as a surgical technique during the pandemic period. Conventional surgery and spinal

anesthesia were preferred in cases where thorax CT findings were suspected to be COVID-19 or in positive cases according to the quick PCR test. In addition, it was determined that laparoscopy was preferred primarily (71.2%) even for the perforated cases, and the rate of transition from laparoscopy to open surgery was 10.6%, which was significantly higher compared to other groups. In the literature, this rate of transition was reported to be between 1% and 16%.[29] The preference for laparoscopy in our study is high probably due to the clinical-based experience. In addition, the duration of operation and hospitalization was significantly higher in the perforated group, and there were cases whose surgery was prolonged to 140 min. Although the operations were performed in the clinic experienced in the laparoscopic surgery, prolonging the intubation period in the appendectomy may increase the risk of COVID-19 transmission during the pandemic period.

In our study, only one patient was reported as in Clavien-Dindo Grade V and deceased. In a study in Israel investigating the frequency of AA during the pandemic, it was reported that the mortality rate increased in cases with a Clavien-Dindo grade of III and above.[30] In the same study, the reason of the decrease in the number of appendicitis cases, especially at the beginning of the pandemic, was discussed that people did not leave the house due to fear of infection, the use of analgesics, and generally symptomatic cases applied to the hospital.[30] We suggest that the high number of our cases may depend on that the patients with a pre-diagnosis of appendicitis were not operated in the state hospitals and were referred to our clinic.

Conclusion

The COVID-19 pandemic not only changes all the habits of social life but also complicates the management of the patients with AA symptoms who apply to the hospital under emergency conditions. As a result, the follow-up of the appendectomy material is important in terms of excluding the other pathologies in the patients with appendicitis.

The manuscript was accepted as an oral presentation in the 18th Turkish Colon and Rectum Surgery Congress in 30 Nov-4 Dec 2021 in Antalya, Turkey.

Ethics Committee Approval: This study was approved by the University of Health Sciences Istanbul Training and Research Hospital Clinical Research Ethics Committee (Date: 13.08.2021, Decision No: 2905).

Peer-review: Internally peer-reviewed.

Authorship Contributions: Concept: M.M.S., O.O.K.; Design: M.M.S., O.O.K., R.K.; Supervision: O.O.K., R.K., C.E., S.D.; Resource: M.M.S., C.E., S.D.; Materials: M.M.S., O.O.K., R.K., S.D.; Data: O.O.K., R.K.; Analysis: M.M.S., O.O.K.; Literature search: O.O.K., S.D.; Writing: M.M.S., O.O.K.; Critical revision: M.M.S., O.O.K., R.K., S.D., C.E.

Conflict of Interest: None declared.

Financial Disclosure: The authors declared that this study has received no financial support.

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ORİJİNAL ÇALIŞMA - *ÖZ*

COVID-19 pandemisi sürecinde acil şartlarda yapılan apendektomi olgularının patoloji raporları eşliğinde değerlendirilmesi

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AMAÇ: Bu çalışmanın amacı COVID-19 pandemisi sırasında apendektomi yapılan olguları incelemek, hastaların patoloji raporlarını tartışmaktır.
GEREÇ VE YÖNTEM: COVID-19 pandemisi sırasında 1 Ocak 2020–1 Haziran 2021 tarihleri arasında acil servise başvuran 15 yaş üstü 588 hastanın apendektomi materyallerinin patolojik raporları incelendi. Akut (AA), subakut (SA) veya perfore apandisit (PA) tanılı 565 hasta çalışmaya dahil edildi ve tanılarına göre üç gruba ayrıldı. Yirmi üç hasta, diğer patolojiler nedeniyle çalışma dışı bırakıldı. Hastaların yaş, cinsiyet, ağrı süresi, ASA skoru, ameliyat tekniği, ameliyat süresi, Clavien-Dindo skoru, hastanede yatış süresi, ameliyat sonrası komplikasyonlar, şüpheli COVID-19 olgularında ameliyat öncesi ve sonrası PCR ve torasik tomografi bulguları, laboratuvar ve radyolojik bulguları geriye dönük olarak incelendi.
BULGULAR: Apandisit tanısı alan 565 hastanın 464'üne (%82.1) AA, 35'ine (%6.2) SA ve 66'sına (%11.7) PA tanısı kondu. PA grubunun medyan yaşı AA grubuna göre daha fazlaydı (p=0.0139). PA grubunda diabetes mellitus ve SA grubunda astım insidansı diğer gruplar arasında en yüksekti (sırasıyla p=0.004 ve 0.0037). SA ve PA gruplarında ağrı süresi AA grubuna göre daha uzundu (p<0.0001), bu nedenle hastaların akut gruba göre hastaneye daha geç başvurduğu belirlendi. COVID-19 şüphesi olan hastalarda toraks BT taraması pozitif olanların oranı %1.6 idi (p=0.066). Tüm gruplarda %70'in üzerinde laparoskopik cerrahi tercih edilirken, AA grubunda en fazla konvansiyonel cerrahi (%21.1) yapıldığı ve PA grubunda laparoskopik cerrahiden açık cerrahiye geçiş oranının diğer gruplara kıyasla en yüksek (%10.6) olduğu tespit edildi (p<0.0001). Hastanede kalış süresi PA grubunda en uzundu (p<0.0001).
TARTIŞMA: COVID-19 pandemisi sadece sosyal hayatın tüm rutinlerini değiştirmekle kalmamış, acil şartlarda hastaneye başvuran AA semptomlu olguların tedavisini ve yönetimini de zorlaştırmıştır. Apendektomi piyeslerinin takibi diğer patolojilerin dışlanması açısından önemlidir.
Anahtar sözcükler: Apandisit; apendektomi; patoloji; COVID-19.

Ulus Travma Acil Cerrahi Derg 2022;28(5):703-710 doi: 10.14744/tjtes.2022.16287