

Original Research Article

Evaluation of emergency general surgery operations in COVID-19 patients in a pandemic hospital: a single center experience

Ismail Hasirci*, Mehmet E. Ulutaş, Gürcan Şimşek, Alpaslan Şahin,
Kemal Arslan, Mehmet A. Eryılmaz

Department of General Surgery, City Hospital, Health of Sciences University, Konya, Turkey

Received: 29 March 2021

Revised: 17 May 2021

Accepted: 18 May 2021

***Correspondence:**

Dr. Ismail Hasirci,

E-mail: drihasirci@hotmail.com

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ABSTRACT

Background: During the pandemic, the decision on delaying elective surgeries was implemented country-wide, and emergency surgeries were excluded from this scope. In this study, the patients diagnosed with COVID-19 and who underwent an emergency general surgery operation were evaluated regarding indications, demographic characteristics, and preoperative and postoperative clinical features.

Methods: In the study, emergency surgeries performed by the department of general surgery between 1st June and 30th September, when our center cared only patients diagnosed with COVID-19, were reviewed retrospectively.

Results: A total of 13 patients, 7 women and 6 men, were included in this study. The most common surgical diagnosis was acute appendicitis (9/13). For all of the patients with appendicitis, a conventional appendectomy procedure was performed. 2 patients were diagnosed with an incarcerated femoral hernia and then operated (2/13). One patient was operated on due to a sharp object injury, and one due to an acute abdomen caused by a perforation. Only 3 of the operated patients developed postoperative wound site complications (23%). No mortality was observed by the end of a 15-day follow-up.

Conclusions: The most common cause of emergency surgeries during the pandemic, changelessly, remains to be acute appendicitis. Besides, cases of trauma, perforated peptic ulcer, and incarcerated hernia are also commonly encountered. While the pandemic continues full steam, these conditions that are associated with the pandemic but among causes of mortality and morbidity other than COVID-19 and that may require an emergency surgery should be considered. All emergency surgical procedures should continue to be performed punctually by using necessary protective types of equipment.

Keywords: Emergency surgery, COVID-19, Pandemic

INTRODUCTION

The pressure on healthy systems caused by the COVID-19 pandemic has made delaying of elective surgeries and procedures a current issue worldwide.¹ In Turkey, the first case of COVID-19 was detected on 11th March 2020, and since this time, a total of 2,470,901 cases have been detected. Currently, 12.2% of the positive cases are detected in the Western Anatolian region, in which our city is located. Since the beginning of the pandemic, our hospital has become the most important tertiary

healthcare center in providing health services for COVID-19 cases. To date, more than three thousand COVID-19 patients have been treated and followed-up in an inpatient or outpatient setting. The only center serving as a pandemic hospital in our region is our hospital. Therefore, our center has high reliability for data regarding the pandemic.

During the pandemic, the decision on delaying elective surgeries was implemented country-wide, and emergency surgeries were excluded from this scope. This decision

was also implemented in our center, and necessary interventions to emergency cases continued to be performed as a tertiary pandemic hospital.

Our study will represent the patients diagnosed with COVID-19 which admitted and underwent emergency surgery after our center began to serve only as a pandemic hospital. With this study, which indicates emergency surgery among the patients diagnosed with COVID-19, demographic characteristics of these patients and their preoperative and postoperative clinical features will be represented in detail.

With this study, we aimed to evaluate the patients diagnosed with COVID-19 and who underwent emergency surgery.

METHODS

This study includes a retrospective evaluation of the surgeries performed in the department of general surgery between 1st August 2020 and 1st December 2020, when our center Konya training and research hospital cared for only patients diagnosed with COVID-19.

The approval of the local ethics committee was obtained for our study (Number: E-46418926-050.01.04--13957).

Since only emergency operations were performed, all operated patients were included in the study. The examined parameters included patients' demographic data, how the preoperative diagnosis of COVID-19 was established, comorbidities, indications for surgery, preoperative imaging methods, infectious parameters, surgical procedures performed, need for intensive care postoperatively, duration of hospital stay, and postoperative morbidity and mortality status. Because the patients were COVID-19 positive, the surgery and postoperative follow-ups and all other procedures were performed with all protective measures taken by using protective types of equipment.

Descriptive statistics, including means, standard deviations, medians, minimums, maximums, frequencies, and rates, were calculated. Statistical package for the social sciences (SPSS), version 22.0 (SPSS Inc., Chicago, IL, ABD) program was used for analyses.

RESULTS

A total of 13 patients, 7 women, and 6 men, were included in this study. Their mean age was 42.5. A total of 3 patients had comorbidities (HT, DM).

In Table 1, patients' comorbidities, route of admission, when the diagnosis of COVID-19 was established, a diagnostic method for COVID-19, preoperative laboratory values, the imaging method used for preoperative diagnosis, anesthetic procedure, duration of

hospital stay, postoperative complications, and mortality rates are represented.

Table 1: General characteristics and demographic data.

Characteristics	Min-max	Median	Average±SD N (%)
Age (years)	17-89	39	42.5±19.9
Gender			
Male			6 (46.2)
Female			7 (53.8)
Presentation			
Emergency unit			10 (77)
Referred patients			3 (23)
COVID-19 diagnosis status at admission			
Diagnosed			12 (92.3)
Newly diagnosed			1 (7.7)
Hospital stay (days)	2-9	4	4.1±2.1
Comorbidity			3 (23)
Preoperative diagnosis method			
X-ray			1 (7.7)
USG			8 (61.5)
CT			4 (30.8)
Covid diagnosis method			
Polymerase chain reaction (PCR)			10 (77)
CT			3 (23)
Anesthesia type			
Spinal anesthesia			10 (77)
General anesthesia			3 (23)
Postoperative ICU requirement			3 (23)
Preoperative laboratory values			
Preoperative WBC value	3.6-14.9	12.7	11.3±3.5
Preoperative lymphocyte value	0.5-4.7	1.2	1.5±1.1
Preoperative neutrophil value	1.3-12.6	9.7	8.8±3.5
Preoperative CRP value	3-342	18	99.4±124.4
Complication			
Surgical site infection			3 (23)
Mortality			0

Ten of the patients were admitted to the emergency department with the development of complaints while receiving outpatient treatment for COVID-19. However, three of them were the patients who were diagnosed based upon results of thorax CT scans taken in other hospitals and then referred to our center.

The diagnosis of COVID-19 was established with PCR test in 10 patients and with thorax CT scan in 3 patients.

Three of the patients were followed-up postoperatively in the intensive care unit and then transferred to the ward.

The cases were operated under spinal anesthesia and general anesthesia. Almost all of the cases of acute appendicitis (8/9) and all of the incarcerated femoral hernia cases were operated under spinal anesthesia. Only one case of acute appendicitis complicated with ileus underwent laparotomy under general anesthesia, and appendectomy was performed. Other cases operated under general anesthesia were patients with perforated peptic ulcer and small intestine injury due to sharp object injury. The rate of spinal anesthesia thusly was 77%.

In Table 2, patients' operations and indications for operations are shown. The most common surgical diagnosis was acute appendicitis (9/13). All cases of appendicitis underwent a conventional appendectomy procedure. Three of the cases of appendicitis presented as complicated cases (33%). These cases were found intraoperatively to have perforated appendicitis. This was a high rate, as reported in the literature.²

Table 2: Diagnoses and surgical procedures applied.

Operation indication	Surgical procedure	Number of patients
Acute appendicitis	Appendectomy	9
Incarcerated femoral hernia	Plug mesh hernioplasty	2
Pectic ulcer perforation	Graham patch repair	1
Sharp injury	Ileum primer repair	1
Total		13

Two patients were diagnosed with an incarcerated femoral hernia and then operated on (2/13). Because strangulation was not detected in incarcerated bowel segments, only hernia repair was performed (plug mesh hernioplasty).

One patient admitted with a sharp object injury, mostly involving the abdomen (1/13). This patient was determined to have an ileal injury. Because only two hours had passed since the event, the abdominal cavity was clear, and only primary repair was performed.

One patient had an acute abdomen, and because gastric perforation was detected on the tomography taken, the patient was operated on (1/13). A Graham patch repair was carried out.

No problem occurred during the follow-up of the patients. The patients were switched to a full feeding regime and then discharged with a cure.

All patients were recommended to stay in quarantine for 14 days after discharge. Then, outpatient clinic follow-ups continued. Only 3 of the operated patients developed

postoperative complications (23%). They were superficial wound site infections that developed in 3 of the cases of appendicitis. These complications were resolved with outpatient dressing and medical treatments. No repeat surgical procedure was required. Other patients developed no morbidity. No mortality was observed by the end of a 15-day follow-up.

DISCUSSION

SARS-CoV-2 is a virus that is transmitted via droplets and contact, although it cannot be neglected that it may be transmitted via the fecal-oral route and via aerosols. In an international guideline on COVID-19, avoiding laparoscopy is recommended due to the risk of aerosol formation and viral transmission.³ Therefore, it was stated that it is needed not to prefer laparoscopy commonly and, if it will be performed, to manage laparoscopic gasses well, especially during evacuation.⁴⁻⁶ In some previous studies other than this, it has been suggested that laparoscopic approaches may be preferred and that there is no clear evidence that it increases the risk of COVID-19.^{7,8} It is a fact that while it is reported that laparoscopy may have these risks for the surgical team, it provides more rapid recovery and more rapid discharge of the patients.⁹ In conclusion, there is no consensus on whether laparoscopy is recommended; however, the consensus that surgical teams should take necessary measures for protection against the potential aerosol virus during surgery is clear.⁸

In surgery and anesthesiology guidelines published in our country and all over the world, it was recommended to continue with medical treatment as long as possible, to prefer anesthesia procedures not involving intubation if the surgery is inevitable, and to prefer conventional methods rather than laparoscopic procedures due to risk of transmission.¹⁰⁻¹² We, thus, treated all cases of appendicitis by operating with conventional methods (9/9).

The most common cause of admission was acute appendicitis, the most common surgical emergency before the pandemic. Some studies suggest follow-up with outpatient or inpatient medical treatments for the treatment of cases of appendicitis.^{13,14} However, considering educational level, challenges in admitting the hospital's hospital, and communication problems in our region, such treatment protocol was not followed. Considering patient density and the pressure on the health system caused by the pandemic, the means of treating the patients with surgical methods were followed. As a result, the cases of appendicitis were treated for a mean of 4.1 (± 2.2) days and then discharged.

Appendectomies were performed under spinal anesthesia in 8 patients and, due to being a case of complicated appendicitis, under general anesthesia in 1 patient. Considering the published guidelines, no laparoscopic surgical procedure was performed.

Although the most common cause of admission was acute appendicitis, two patients with an incarcerated femoral hernia, which is more uncommon in routine clinical practice, were treated. Because strangulation was not detected, hernia repairs were carried out, and the patients were then discharged with a cure.

Despite communal restrictions imposed during this period, it should be considered that cases of blunt and penetrant trauma may also be encountered. Nevertheless, although its incidence was lower than normal, 1 of our cases was operated on due to ileal perforation caused by penetrant sharp object injury, and primary repair was carried out.

Perforated peptic ulcers, among common surgical emergencies, also were a condition we encountered. One patient was found to have a perforated peptic ulcer in the gastric antrum, after which the Graham patch repair procedure was successfully performed, and the patient was discharged with a cure.

Studies are reporting postoperative complications and worse clinical course in COVID-19 patients in the literature, whereas there are also contradicting authors.¹⁵ In a study conducted by Zhao and colleagues, it was reported that there was no direct evidence showing that surgical treatment led to side effects in acute abdomen patients with COVID-19 pneumonia.¹⁶ There were similar findings in our study as well. We had no severe morbidity or mortality. Only 3 of our patients developed wound site complications grade 1 and 2 according to Clavien-Dindo classification. This study's limitations include a limited number of patients, being a single-center study, lack of randomization, and retrospective design of the study.

CONCLUSION

Considering all these, the most common cause of emergency surgeries during the pandemic, changelessly, remains to be acute appendicitis during the pandemic, same as before. Besides, cases of trauma, perforated peptic ulcer, and incarcerated hernia are also commonly encountered. Particularly during this period, it should be considered that cases of appendicitis may present with more complicated manifestations.

It should be remembered that emergency general surgery cases resume while the pandemic continues full steam. All emergency surgical procedures should continue to be performed punctually by using necessary protective equipments.¹⁷

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee. Number: E-46418926-050.01.04-13957).

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Cite this article as: Hasircı I, Ulutaş ME, Şimşek G, Şahin A, Arslan K, Eryılmaz MA. Evaluation of emergency general surgery operations in COVID-19 patients in a pandemic hospital: a single center experience. *Int Surg J* 2021;8:2267-71.