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### Outcome of surgical emergencies in COVID positive individuals- a Case series

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#### ABSTRACT

**Introduction:** This manuscript will deal with the outcome of emergency surgeries in COVID19 positive individuals. We are under the second wave of COVID pandemic. The research is ongoing regarding the outcome of patients who are undergoing, surgical treatment with COVID Rt-PCR positivity or become COVID positive during early postoperative period.

**Materials and Methods:** All the patients who attended the emergency department of a tertiary care centre were screened for COVID -19 by RT-pcR and the patients who are covid positive but needed emergency surgical procedure were included in the study. A cohort of 49 patients who were COVID positive and needed emergency surgical procedure due to various causes were included in the study.

**Results:** The causes of acute surgical emergencies were acute appendicitis, appendicular perforation, perforative peritonitis, obstructed/ strangulated inguinal hernia, intestinal obstruction, diabetic foot and perianal abscess. Most of the patients belong to the age group between 40 – 70 years. 63.8% were males. The mortality rate was 12.8%. More than one co-morbid condition was present in 8.5% of individuals. Most of the patients got discharged in 10 – 12 days. 40.4% have co morbid conditions like diabetes or hypertension. 8.5% had more than one co morbid conditions. Diabetes was present in 27.7% of cases

**Conclusion:** The mortality was high during the postoperative period of COVID positive cases, extreme care and precaution should be taken to avoid pulmonary complications

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## Introduction

We are under the second wave of COVID pandemic. The research is ongoing regarding the outcome of patients who are undergoing, surgical treatment with COVID Rt-PCR positivity or become COVID positive during early postoperative period. The first case of COVID detected in India on Jan 2020 and in our region on March 23 of 2020. Our hospital was converted into COVID dedicated hospital and all covid protocols were followed and till now we have treated 8650 COVID positive patients. Due to shortage of resources and possible spread of infection, all elective surgeries were postponed. The pulmonary complication was high in the postoperative period among COVID positive patients [1,2]. The surgical practice during COVID

pandemic was altered. All the patients who attended the emergency department were screened for covid positivity with reverse transcriptase-polymerase chain reaction assay in nasopharyngeal swabs and computed tomography of the chest and those patients who are positive but needed urgent surgery were taken up for surgery in the dedicated operation theatre. Only emergency surgeries were taken up after a modified triage. The emergency surgeries were categorised as acute emergency where patients can wait for 6-8 hrs. till the rt-PCR result or hyperacute emergency where the patient can't wait for 6-8 hrs. like haemoperitoneum will be taken up for surgery immediately without waiting for Rt-PCR but considered as COVID positive till the result.



## Results

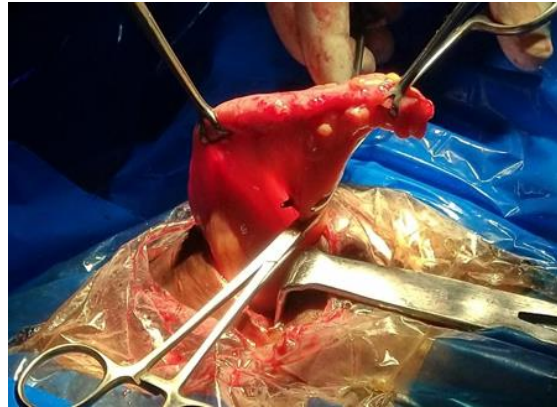
All the patients who attended the emergency department of a tertiary care centre were screened for COVID -19 by RT-pcR and the patients who are covid positive but needed emergency surgical procedure[Fig.1] were included in the study. A cohort of 49 patients who were COVID positive and needed emergency surgical procedure due to various causes were included in the study. The causes of acute surgical emergencies were acute appendicitis, appendicular perforation, perforative peritonitis, obstructed/ strangulated inguinal hernia,

intestinal obstruction, diabetic foot and perianal abscess..19.1% of patients had history of fever and only 2.1% had myalgia. 61.7%, the diagnosis of COVID confirmed by Rt-PCR and others by CT findings CORAD 5 or 6]. Patients were followed up for 3 months.

Most of the patients belong to the age group between 40 – 70 years. 63.8% were males. The mortality rate was 12.8%. More than one co-morbid condition was present in 8.5% of individuals. Most of the patients got discharged in 10 – 12 days. 40.4% have co morbid conditions like diabetes or hypertension. 8.5%

had more than one co morbid conditions. Diabetes was present in 27.7% of cases. But, 29.8 % had increased blood sugar levels which ranged from 150 – 534. History of fever was present in 19.1% of patients and only 2.1% have a history of myalgia. D-Dimer and Duration of

illness have a significant negative correlation [correlation coefficient= -0.601; p-value= 0.039]. There is significant difference in the mean HB values of expired and discharged patients. The mean Hb% in patients who died was 16.8mg%.



## Discussion

### *Acute appendicitis .*

There was 5 cases of acute appendicitis[Fig.2] who were Rt-PCR positive of Radiologically Corad 4or 5 were taken as COVID positive cases and admitted in the emergency department. In that two patient had appendicular abscess and one had appendicular perforation. The increased incidence of complications may be due to delayed presentation or due to the effect of COVID. But only 2 cases had elevated total count [ $>11,000$ ] and elevated NLR ratio

[ $>3$ ]. Two cases of acute appendicitis had Comorbid condition [DM] and the outcome in both of them was good. One patient of acute appendicitis who was also diabetic died on the 2<sup>nd</sup> Postoperative day due to ARDS. Blood sugar, LDH and total count were elevated for the patient with appendicular abscess who was treated conservatively and discharged on the 11<sup>th</sup> day of hospitalisation. It is unclear that elevated TC level may be due to appendicular abscess or due to COVID infection.

### *Intestinal obstruction*



Totally 15 cases of intestinal obstruction[Fig.3] with COVID positive got treated. In these series, the most common cause of intestinal obstruction

was obstructed hernia. Since the elective surgeries were postponed due to want of hospital resources and manpower, the patients

with hernia are presenting with complications like obstruction and strangulation. 25% of obstructed hernia were presented with strangulation which led to resection and anastomosis of the bowel. Most common hernia which presented with obstruction and strangulation was inguinal hernia followed by incisional hernia. Only two patient had comorbidities, but four patient had raised blood glucose levels which may be due to COVID induced hyperglycaemia. 4 patient had elevated total count and five patients had increased NLR ratio. But the mortality was nil.

### **Diabetic foot syndrome**

Seven cases of diabetic foot with COVID were treated in these series. 4 patient had elevated total count and three had increased NLR ratio. 3 patients underwent Below knee amputation for diabetic foot as the limbs were not salvageable. Most of them presented late because of the pandemic. The mortality was 0% after 3 months of follow up.

### **Polytrauma**

Three patients presented with multiple injuries were found to be COVID positive. One had laceration of muscle depth on the lateral aspect of neck, one patient had splenic laceration, one had gastric perforation and another one had Liver laceration. Since most cases of multiple injuries were treated on day care basis, we didn't do Rt-PCR routinely if not symptomatic, in order to minimise the workload of the staff. Those who needed inpatient care were admitted and RTPCR and/or CT chest was done. The patients were presented late with signs of peritonitis and hence not able to do conservative line of management. For splenic laceration, splenectomy was done. Patient with gastric perforation [2x2cm perforation at the anterior gastric wall with mesenteric tear] had primary perforation closure with posterior gastro jejunostomy. Abgel packing was done for liver laceration [ grade II].



### **Perforative Peritonitis**

We did 4 cases of perforative peritonitis including GB perforation. Duodenal Ulcer perforation[Fig.4] was most common. DU perforation was treated by Graham's patch closure. For gall bladder perforation, cholecystectomy was found. The patient with DU perforation died on the day of surgery and NLR was high [9.8] for that patient. We didn't know whether COVID or sepsis caused death of this patient.

### **Miscellaneous surgical cases**

Other cases who got admitted with COVID positivity included 3 cases of Necrotising fasciitis, one case of advanced oesophageal cancer, one case of advanced gallbladder cancer and one case of advanced periampullary growth with obstructive jaundice. The patient with periampullary growth with obstructive jaundice was a diabetic and died due to septic encephalopathy. One case of psoas abscess, 2 cases of breast abscess, a case of liver abscess

and two cases of scrotal abscess underwent incision and drainage.

In our case series, even though postoperative mortality was 12.8% which is high compared to pre pandemic [4-6%], it is lower than other studies in the west [2,3]. The increased mortality may be due to the altered immune response of the host or due to pulmonary complications of the COVID virus or the disease per se [because of late presentation]. In our study, D.dimer and duration of illness have a significant negative correlation [correlation coefficient= -0.601; p-value= 0.039]. When we followed up the patients for 3 months, the mortality was nil after discharge from hospital. Mortality was high within 24 hrs of surgery.

### **Conclusion**

Since, the mortality was high during the postoperative period of COVID positive cases, extreme care and precaution should be taken to avoid pulmonary complications. All the surgeries unless otherwise needed to save the life of the patient, should be postponed till the patient recovers from COVID and the D.dimer and CRP levels return to normal.

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### **Availability of data and materials**

Data will be available on request

### **Conflict of interest**

The authors declare that there is no conflict of interest

### **Informed consent**

Informed consent was obtained wherever it is necessary

### **Ethical approval and ethical number provided by the review board**

Ethical approval obtained.

Name of the ethical Committee: Institutional Ethics committee, Tirunelveli Medical College

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### **Human rights statement**

There is no violation of human rights

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