



**ORIGINAL RESEARCH PAPER**

**Surgery**

**OUTCOME OF EMERGENCY SURGERY IN COVID-19 POSITIVE PATIENTS: EXPERIENCE IN A TERTIARY CARE CENTRE IN NE INDIA .**

**KEY WORDS:** Covid-19 positive-surgery- morbidity-ASA class-mortality.

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**ABSTRACT**

**Background:** The COVID-19 pandemic led to a halt to almost all kinds of surgery throughout India. There was increased risk of requirement of ICU care and high rate of mortality. Surgical interventions in emergency situations were necessary to save life. The outcome in covid positive patients undergoing emergency surgeries has not been well studied during the initial stage of outbreak. The aim of this study was to determine the outcomes of emergency surgery in covid-19 positive patients. **Materials and methods:** A retrospective review was performed of all COVID-19 positive patients undergoing emergency intervention during June 2020 to August 2020 at a teaching hospital in North East India. Details and conditions of patients at the time of surgery are retrieved retrospectively from available medical records. Clinical characteristics and mortality were analysed. **Results:** There were 28 patients who underwent emergency surgeries during the period. There were 10 females and 18 males with age group varied between 10 to 72 years. The majority of patients 13(46%) were in American Society of Anaesthesiologists (ASA) class 3. All patients were treated in ICU & Covid care wards post operatively. The mean length of stay was 14 days. There were 5 deaths (18%) in the study group. All of the patients were in ASA class 2 or 3. The odd ratio for mortality with ASA Class 3 was 6 (p value: 0.1528; 95% CI of 0.47-327.10). All the patients with poor results were associated with co-morbidities with odd ratio of 6. (P value: 0.1528; 95% CI of 0.47-327.1). **Conclusions:** In this analysis it was found that emergency surgical interventions were feasible with all precautions. The mortality was associated with high ASA class, co-morbidities and extremes of ages.

**INTRODUCTION:**

The COVID-19 pandemic resulted in a halt to all kinds of surgery in India and the world. However, the surgical interventions in emergency situations were carried out to save life. The outcome in covid positive patients undergoing emergency surgeries has not been well studied during the period or before. The ventilator-associated barotrauma, hyper-coagulable state from the COVID-19 infections, high ASA grade, systemic inflammatory response secondary to surgical trauma, additional exposures to nosocomial COVID-19 strains were thought to be contributing factors in the outcome of Covid 19 positive patients (1,2). However, Surgical interventions in emergency situations were necessary to save life. The aim this study was to determine the outcomes of emergency surgery in covid-19 positive patients at a single institution treating a large numbers of COVID 19 positive patients at the height of the pandemic.

**MATERIALS AND METHODS:**

A retrospective review was performed of all patients who had undergone surgery between June 2020 and August 2020 at a teaching hospital in NE India. This hospital treated a large number of COVID-19 positive patients during the height of the pandemic. Routine surgical procedures were discouraged during the period. All patients documented with PCR confirmed positive COVID-19 with emergency surgical intervention were included in this analysis. Demographic details and conditions of patients at the time of surgery including associated co-morbidities with outcomes were retrieved from available medical records. Post operative course, ICU requirement and mortality rates were analysed. A total number of 28 patients had undergone emergency surgical intervention during the period. There were 10 females and 18 males in the age group varied from 20 to 72 years. The patients contacted the COVID19 infection either before or after hospitalization. Positive nasopharyngeal swab polymerase chain reaction (PCR) within 14 days before

emergency surgery and 21 days post operative test with negative results were included in the study. Patients reported from peripheral hospital were confirmed at routine PCR test at the time of admission. Surgical interventions with covid19 infection were similar to classical procedures conducted for acute situation. None of the patient presented with obvious pulmonary signs of covid pneumonia. A multidisciplinary team consisting surgeons, anaesthetists and pulmonary medicine expert made the decision for active intervention considering the clinical situations. The risk associated with covid positivity of the patients, ASA grading, associated co-morbidity were considered for determination of outcome. P value and 95% confidence Interval (CI) were determined with fisher's exact test.

The team performing surgery were equipped with full PPE kits. There was limited use of electrocautery to reduce aerosol viral dispersal. Laparoscopic procedure were not considered for fear of aerosol transmission. Special precautions were taken by the anaesthetists for protection against aerosol transmission.

**RESULTS:**

All the patients undergoing surgery were taken post operative care in Covid ICU. Two of the patients required ventilatory support. The average length of hospital stay was 25 days. All patients with good result were tested Covid negative with PCR at the time of discharge. The patients with poor results were elderly associated with co-morbidities and high ASA grade 3 status. Patients with poor results developed severe respiratory tract infection followed by endotoxic shock. There were 5 deaths (18%) in the group. All of the patients were in ASA class 2 or 3. The odd ratio for mortality with ASA Class 3 and class 1-2 was 6 (p value: 0.1528; 95% CI of 0.47-327.10). All the patients with poor results were associated with co-morbidities with odd ratio of 6. (P value: 0.1528; 95% CI of 0.47-327.1). The table 1 shows the demographic details, clinical situations, surgical procedures,

postoperative events including ICU requirement, associated co-morbidities and the 30 days outcome.

**Table :1. Patient Demography, Preoperative Diagnosis, Surgical Procedures & Results.**

Descriptions	N	Surgical Procedure	Results		
Total patients	28		COVID ICU requirement (Days in average)	Good	Poor
Age in years	20-72				
Male	18				
Female	10				
Diagnosis					
Acute Appendicitis	3	Appendicectomy	nil	03	00
Peptic ulcer perforation	1	Exploratory laparotomy, Repair and peritoneal toilet	10	01	00
Acute Intestinal Obstruction	3	Resection anaestomosis/ Ileostomy/Colostomy	10	03	00
Abdominal Trauma	4	Exploratory laparotomy followed by splenectomy/repair of urinary bladder	14	05	01 (post splenectomy , pulmonary complication )
Neuro-surgery (Non Traumatic)	4	Clot evacuations for SDH	14	00	02 (Elderly i/c DM) (Ventilatory support Pop),
Obstructed Hernia	4	Herniorrhaphy	10	03	01 (DM)
Malignant Obstructions	3	Ileostomy only	14	03	01 (AKI)
Others	6	Amputation/soft tissue Repair etc	12	05	01 (AKI)
Total	28	Surgery in Covid patients	10-14	23(82)	5(18)
ASA Class	Mortality OR with Class 3: 6 ; p Value: 0.1528; 95% CI: 0.47-327.10				
ASA 1	3		Nil		
ASA 2	12		10		1
ASA 3	13		14		4
Co-morbidities	Mortality OR with co-morbidities: 6; p Value:0.1528; 95% CI:0.47-327.10				
DM	3			2	2
Hypertension	8			8	
AKI	2			2	2

**NB: AKI: Acute Kidney Injury, DM : Diabetes Mellitus, Pop: Post operation.**

**DISCUSSION:**

During the pandemic of Covid 19 it was suggested to defer all kinds of surgical intervention. This refer to the experience of similar corona virus infection in middle east with high fatality and transmissibility rates in 2015(3,4).A multi hospital study from China reported 20% mortality rate in 34 patients undergoing surgery in covid patients(4,5).The patients were associated with multiple co-morbidities. In present study there were mortality of 28%. The patients with poor results were associated with multiple co-morbidities and ASA class 2or 3. In another study there were 10 % fatality involving varied surgical interventions with 20% of them requiring ICU admissions where 14% of them had fatal outcome (4,6).In the present study two of five patient with fatal result were treated with ventilatory support. Co-morbid conditions contribute increased fatality rates in Covid-19 patients (5).In the present study patients with with poor results were elderly. Identification of risk factors may improve the outcome (7). In present study all 28 Covid patients undergoing emergency surgical interventions were treated in covid care facilities for an average of 14 days. This is in conformation of other study (8). Most retrospective studies have found increased risks of pulmonary complications and mortality after surgery in COVID-19 patients(9).In a large prospective multi-centre study, postoperative pulmonary complications occurred in 39.5% and mortality occurred in 11% of patients (9).Mortality in this study showed a high incidence of 28% which were associated with pulmonary complications, endotoxemia contributed with co-morbid conditions. Urgent surgery, SARS-CoV-2 virus infection contribute to a significantly

higher than expected post operative morbidity and mortality. Secondary “cytokine storm”, endothelial injury, micro-angiopathy and complex interaction of the virus with the immune system could cause significant deterioration of the postoperative course especially in elderly patients and/ or with associated diseases (10,11,12). In the present study patient with fatal results were elderly with pulmonary complications. In one study it was observed that the patients with COVID-19 infection had greater 30-day mortality than those without (12.6 versus 4.6 per cent). Those positive for COVID-19 had more complications with 41.5 versus 23.9 per cent; OR 1.61, 1.11 to 2.33 (13,14). This conforms the present study although it was found statistically insignificant. In a retrospective cohort study of 10 940 surgical patients comprising 1:1 covid positive and negative patients , it was suggested that COVID-19 infection positivity was an independent risk factor for increased perioperative mortality. The overall mortality rate in the study with COVID-19 (14.8%) was more than double that of COVID-19 (7.1%) negative patients (15). The present study confirms the high peri operative mortality in covid positive surgical patients.

**Limitations:**

This is a single centre retrospective study involving a small sample size in a limited time period. Statistical analysis were not possible. However it determine the feasibility of intervention in a pandemic situation where surgery was deferred during initial period of covid-19 infection.

**CONCLUSIONS:**

Post operative outcome of covid-19 positive patients undergoing emergency lifesaving surgery were analysed. Surgical interventions in emergency situation were feasible under all precautionary measures. The co-morbidity, extreme of ages contribute to its fatality. Endotoxemia and pulmonary complications were main area of concern in determining the outcome in patients undergoing emergency surgical interventions.

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