



## Perspective

## Experience of a surgeon at the emergency department during COVID-19 pandemic

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## ABSTRACT

**Introduction:** The COVID pandemic, which started on 11th March as per the World Health Organization, has resulted in a drastic change in health care delivery, including emergency services. Most health workers have deviated towards COVID care delivery; only a few were available for non-COVID conditions. All elective and non-essential services were postponed resulting in the increased burden of the emergency department. The emergency department had to provide essential emergency care with available staff without exposing them to the virus. Triaging of the patients was modified according to the needs.

**Methods:** The statistics of the emergency department of this period (April and May 2020) are compared with the same period of previous years (2018–2019) with the number of patients, indications, and complications. The methods of triaging and preparation were discussed.

**Discussion:** The number of patients admitted to the emergency department (ED) was low during the COVID pandemic. Nevertheless, they got admitted with complications due to delay in accessing the health care facility. Patients with diabetic foot ulcers were also presenting late, leading to an increased number of the forefoot and below knee amputations. In trauma, the emergency department has maintained the same death rate as previous years by giving great care. The indications for tracheostomy were worrisome because it would have been prevented if the patients presented early. Pediatric patients were also presented late, resulting in increased mortality. Some cancer patients also presented with a complication in the emergency department because of the postponement of elective surgeries.

**Conclusion:** There is a delay in accessing the health care delivery for non-COVID conditions resulting in more amputations of limbs and resections of the bowel. So the type of care in the emergency department was changed due to atypical presentation and complicated cases. It is necessary to ensure the provision of high quality health care delivery to non-COVID patients also.

## 1. Introduction

The novel Coronavirus cases were first identified in Wuhan, China, in November 2019. World Health Organization (WHO) named the virus as COVID – 19 in February 2020 and announced a pandemic on 11th March. The first case in India was reported on January 30, 2020. Furthermore, as of now, 2.53 million people got infected by the virus. There are two main transmission routes for the COVID-19, by aerosolization with droplet infection and direct contact modes of transmission, with the virus remaining viable for a significant interval of time [1]. The virus is transmitted via droplets within proximity during coughing and sneezing, and the droplet can enter through the eyes,

mouth, and nose of a nearby patient. Thus, the recommendation was to maintain a distance of 6 feet between individuals.

The rapid change in the situation from April–May 2020 resulted in drastic healthcare delivery changes, especially in Surgery's emergency department. A decision to suspend all elective and non-essential procedures was made to save the resources and prevent exposure to the virus [2]. As the pandemic progresses, all doctors, including those from non-clinical departments, are being distributed in managing the patients suffering from the COVID virus on the wards. Since the emergency services need to be provided to the community, great care was taken to utilize the available staff, to provide measures to prevent the exposure of the health care workers to the virus.

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## 2. Aim

To highlight the surgeon's experiences in the emergency department to tackle the cases during the COVID pandemic and discuss the atypical presentation of acute surgical emergency cases and their management.

### 2.1. Triageing

Since most of the doctors and other health care workers are shifted to manage the COVID patients, the emergency department had to be managed with minimal available staff without exposing them to the virus. Within the emergency department of Surgery, many changes happened to start from triage to managing cases. Triageing of the patients who came to the emergency department is modified and was triaged as (a) The patients with hyperacute conditions like abdominal stab injury which require urgent surgical care whose treatment cannot be delayed or deferred (b) The patients with acute conditions like acute appendicitis which require surgical treatment but can be delayed for 6–24 h. (c) The patients with non-life threatening conditions for which the treatment can be delayed. High-risk procedures that produce aerosols such as endotracheal intubation, extubation, suctioning, endonasal/transoral procedures, and Tracheostomy were identified, and specific standard operating protocols developed. Since it was told that the laparoscopic procedures were at high risk of exposure and transmission of the COVID-19 virus, all laparoscopic procedures were postponed.

### 2.2. Preparation

All surgical staff was trained in appropriate donning and doffing techniques, and an anteroom was provided for donning and doffing. The operating rooms (ORs) were divided as COVID operating room where only COVID positive surgeries were done. COVID suspect operating room was all hyperacute cases were done, which had no time to wait for the results Rt-PCR and non-COVID operating room where Rt-PCR negative cases were done [3].

Since there is no time to wait for the Rt-PCR result, which took 6–8 h, all cases with hyperacute conditions like stab wounds of the neck were treated as though it is COVID positive. All the health care workers involved in the surgical procedure were instructed to wear enhanced personal protective equipment, including the PPE, N-95 mask, and face shield [4]. The operating theatre staff was limited to only essential persons like senior anesthetists, senior surgeons, surgical residents, anesthesia technicians, and staff nurses. The surgical resident was not allowed the lead role to minimize the operating time by which the exposure time. Hence all the cases, including minor cases, were led by the surgical consultant. The surgical team waited outside until the intubation was done using minimal personnel. The intubation and

extubation were done only when it is the only choice of anesthesia and done using a specially designed hood (Fig. 1).

Operating in full PPE (Fig. 2) was really challenging for us. It was exhausting, as it significantly reduced the clarity of verbal communication between the team members with increased chances of surgical error.

## 3. Discussion

### 3.1. General surgery

In the emergency department, the common general surgical emergencies will be acute appendicitis, obstructed hernia, incisional hernia, perforative peritonitis, intestinal obstruction, and torsion Testis, acute cholecystitis, acute pancreatitis blunt injury and abdominal stab injury, and soft tissue injury. When we compared the statistics from previous years (2018 and 2019) of the same months (April and May), we found certain significance in some areas this year. Generally, the number of patients admitted to the emergency department was low compared to previous years, which may be due to lockdown or the fear of infection with COVID or fear of the availability of resources for non-COVID conditions among people of the community.

The patients admitted for acute appendicitis was low compared to the previous years. However, 30.8% of patients admitted (Fig. 3) were presented with appendicular abscess compared to 1.34%–2.53% in previous years, and it is statically significant ( $p = < 0.00001$ ).

The number of patients presented with obstructed Inguinal hernia was low (7) compared to previous years (23 & 32). However, the percentage of obstructed inguinal hernia with gangrene of the bowel was high (42.9%) compared to previous years (8.7% & 9.3%), which is statically significant ( $p = 0.046$ ). Furthermore, there was also a delay in the presentation of perforative peritonitis and intestinal obstruction after the onset of symptoms.

This delayed presentation of surgical emergencies may be due to the COVID pandemic's effect on the health-seeking behavior or difficulty in accessing the health care facility as most of the beds are converted into COVID beds, and health care workers were focussing only on COVID [5].

The number of diabetic ulcers presented to the emergency department was high compared to the previous years (Fig. 4). The degree of involvement of the limbs with ulcers ranged from Wagner's grade III to grade V, resulting in the increased number of major amputations like forefoot or below knee amputations to save the life of the individual. The limbs would have been salvaged if they came earlier.



Fig. 1. Specially designed hood for intubation.



Fig. 2. Operating in full PPE.

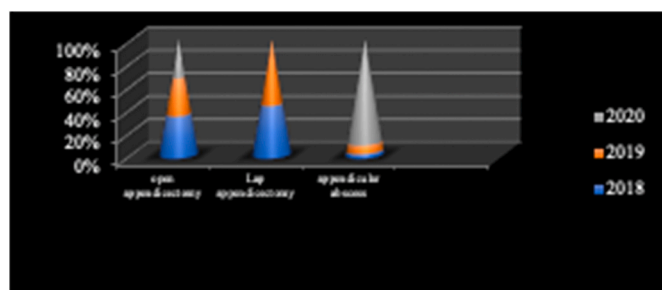


Fig. 3. Different mode of presentation of acute appendicitis at each year.

### 3.2. Trauma

Our trauma team treated the trauma patients in the emergency department. All trauma patients were treated as a hyperacute emergency and were further triaged into (1) those requiring conservative and supportive care, (2) those requiring operative management, (3) those requiring intensive care. The health care workers were allotted according to the need to minimize the exposure of COVID-19.

The number of trauma patients was low compared to previous years, and the p-value is 0.00001, which is significant, and this low incidence of trauma cases may be due to the effect of lockdown. This low incidence of trauma surely reduced the work burden of emergency department staff. However, the death rate is the same (2.28%) as that of previous years (2.67%–3.25%), which signifies the hard work of health care workers of the emergency department even with hurdles (wearing PPE, minimal number of staff and risk of exposure to COVID - 19) during COVID pandemic.

### 3.3. Ear, nose, and throat

Tracheostomy, endonasal, and oropharyngeal procedures are aerosol generating procedures that pose a high risk of exposure to COVID - 19. The otolaryngologist did the procedures with minimal staff and extended personal protective equipment to avoid exposure. Foreign bodies from the ear, nose, and cricopharynx were removed endoscopically. Even though the incidence of patients who required tracheostomy was very low, Tracheostomy's indications included CSOM and retropharyngeal abscess, which was worrying. These indications of tracheostomy were preventable in normal circumstances.

### 3.4. Neurosurgery and cardiothoracic surgery

Their role in the emergency department remained with the same indications as in previous years. Since both treat operatively, do aerosol generating procedures, they were provided with extended personal protective equipment and only essential staff in the operating room and intensive care unit.

### 3.5. Pediatric surgery

Babies with congenital anomalies were prime patients in the emergency department. During this COVID pandemic, children with strangulated hernia resulting in resection of the intestines, torsion testis resulting in Orchidectomy, and necrotizing enterocolitis resulting in laparotomy were the life-threatening emergencies. Due to the delay of parents accessing the health care facility because of fear of infection with COVID -19 [6].

### 3.6. Urology

Acute retention of urine and injury to the genitals were common urological emergencies, and it continued to be the same in the COVID pandemic.

### 3.7. Surgical gastroenterology

Usually, the surgical gastroenterologist has a minimal role at the emergency department, except for consultation. Since all elective procedures, including cancer surgeries, were postponed during the COVID pandemic, most cancers of the gastrointestinal system presented at a later stage with a complication like intestinal obstruction, perforation, and bleeding leading to increased mortality.

## 4. Conclusion

The COVID pandemic has brought major changes in health care delivery, including the emergency department in the form of reduced personal, scarce resources, and the risk of exposure to COVID-19 infection. The indications and practices were also changed dramatically in the emergency. People continue to get sick with occasional infections, endocrine disorders like diabetes, and chronic conditions like cancers. When the patients presented with atypical presentation and complications, the type of care in the emergency department changed.

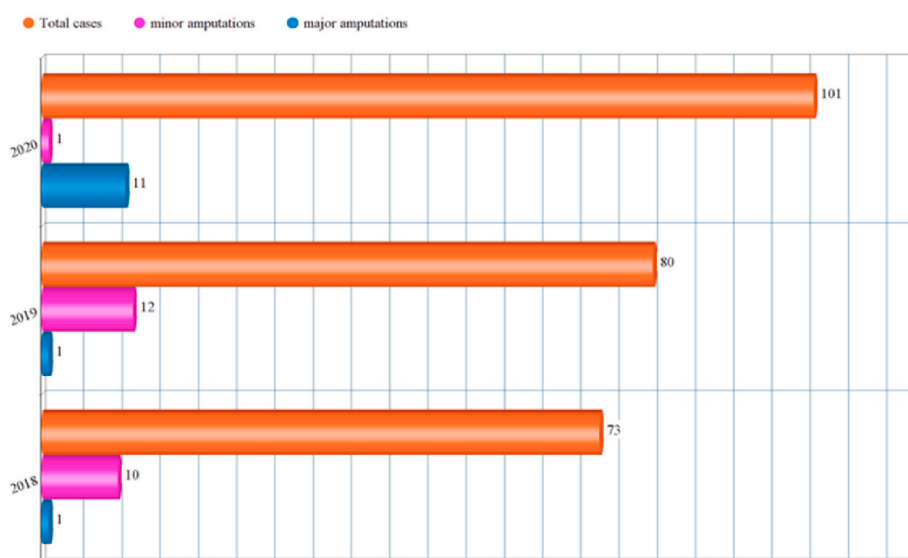


Fig. 4. Proportion of Diabetic ulcers which underwent major and minor amputations.

So, there is a need to prevent the delay in accessing health care facilities and maintain high-quality health care for non-COVID conditions.

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Consent Obtained

### Author contribution

Dr. B.M. Pabithadevi – study concept, data collection, data analysis and interpretation, writing the Manuscript

Dr. Alex Arthur Edwards – study concept, writing the Manuscript

Dr. Athisayamani — data collection, data analysis and interpretation  
Dr. Theodar Robinson – data collection, data analysis and interpretation

### Registration of Research Studies

1. Name of the registry:
2. Unique Identifying number or registration ID:
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### Guarantor

Dr. pabithadevi B. Mehanathan

### Declaration of competing interest

The authors declare that there is no conflict of interest.

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