

Review Article

COVID-19 Pandemic : Impacts on General Surgical Practices

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Introduction : SARS CoV-2 virus is a novel RNA virus, and many of its characters and behaviours are yet to be explored. During this COVID-19 pandemic, there are inundation of recommendations and guidelines. Most of the recommendations have advised postponement of non-essential elective surgery. We continued our emergency and elective surgical works as followed in certain countries, e.g. South Korea and Singapore.

Methods : The records of our hospital were reviewed to retrieve the number of daily COVID-19 patients hospitalized, those requiring surgical management and those discharged home

Results : During the period from March 25 to August 31, 2020, we have tested (RT-PCR) 892 admitted patients, out of them eighteen came positive (~ 2%); three patients were admitted in emergency basis, rest were for elective surgeries. Except one surgical resident, no HCW of our department was COVID positive during this period.

Conclusion : From our experiences, during the said period, we came into conclusion that in no way elective surgeries should be avoided. It will ensure the best care for the non-COVID surgical patients, helps to ease future load and save many lives from denial death. If we maintain simple precautions, then elective surgical services can easily run without special equipment and theatre.

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Key words : SARS CoV-2 virus, COVID-19 outbreak, surgical practices, Lockdown, Postponement.

SARS CoV-2 virus is a novel RNA virus, and many of its characters and behaviors are yet to be explored. COVID-19 or Coronavirus Disease 2019 has got variable impact over different geographical location of the world. WHO (World Health organization) declared a pandemic on 11th of March, 2020¹.

During this COVID-19 pandemic, there are inundation of recommendations and guidelines²⁻⁴. Most of the recommendations have advised postponement of non-essential elective surgery. Moreover, the impact of COVID-19 pandemic and total "Lockdown" in India^{5,6} on surgical practice is widespread ranging from patient mobility due to lack of transport, workforce and staffing issues.

We continued our emergency and elective surgical works as pre-pandemic days as followed in certain countries, eg, South Korea and Singapore, who have continued their elective surgery throughout the COVID-19 outbreak²⁻⁴.

This article is based on sharing information about experiences of the authors from the general surgical departments at Institute of Post Graduate Medical Education & Research, Kolkata which is a teaching, tertiary care hospital during this virus pandemic and "Lockdown".

Usage of Surgical Facilities at Our Institution During Total Lockdown and Unlock :

Government of India (GOI) had declared complete nationwide "Lockdown" from March 25 2020; initially it was for fourteen days,

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Editor's Comment :

- Avoiding elective surgeries not only increased the tremendous future load, but it also increased the morbidity and mortality of the sufferers due to non-COVID ailments.
- It hampered the training opportunity of Resident doctors. If we maintain simple precautions, then elective surgical services can easily run without special equipment and theatre.

but gradually it was extended to May 31 2020 in a phase wise manner (Table 1). Complete lockdown severely affected all sectors especially healthcare facilities by limiting the movement of the entire country population, assumed to control the spread of pandemic; it was declared when the confirmed COVID-19 cases was 500 approximately^{5,6}.

Most of the teaching hospitals across India immediately stopped admitting elective surgical cases and operations as per advisory of GOI; as per Indian Council of Medical Research (ICMR) and GOI, "the medical infrastructure in the country needs to be prepared for any possible influx of patients on account of COVID-19. In this context, the following interventions are proposed up to 31st March 2020. They will be reviewed as per the evolving situation. *Non-essential elective surgeries should be postponed*"⁷.

From the beginning of Lockdown, as our hospital was designated as non-COVID-19 hospital and we continued to offer surgical services to the people. All emergent and scheduled operations were going on. But we noticed that there was a steep fall in numbers; both in emergent and scheduled operations. Due to total Lockdown there was inaccessibility to transport, people were unable to reach the healthcare facility and moreover fear of getting infected.

As we reviewed our database, we have noticed that the numbers of patients attending for surgeries were increasing slowly after Unlock started from June 1, 2020 but not reaching to the pre-Lockdown stage. This might be due to non-availability of full public transport, containment zones and moreover less bed availability as the bed numbers were reduced due to rearrangements of beds like allotting some beds in transitional area.

Table 1^{5,6}:

Date :	
Nationwide lockdown	
Phase 1: 25 March 2020 – 14 April 2020 (21 days)	
Phase 2: 15 April 2020 – 3 May 2020 (19 days)	
Phase 3: 4 May 2020 – 17 May 2020 (14 days)	
Phase 4: 18 May 2020 – 31 May 2020 (14 days)	
Unlock	
Unlock 1.0: 1 June 2020 – 30 June 2020 (30 days)	
Unlock 2.0: 1 July 2020 – 31 July 2020 (31 days)	
Unlock 3.0: 1 August 2020 – 31 August 2020 (31' days)	
Unlock 4.0: 1 September – 30 September 2020 (30 days)	
Location	India
Caused by	COVID-19 pandemic in India
Goals	To control the spread of coronavirus outbreak in India.
Methods :	
■ Ban on people from stepping out of their homes	
■ All services and shops closed except pharmacies, hospitals, banks, grocery shops and other essential services	
■ Closure of commercial and private establishments (only work-from-home allowed)	
■ Suspension of all educational, training, research institutions	
■ Closure of all places of worship	
■ Suspension of all non-essential public and private transport	
■ Prohibition of all social, political, sports, entertainment, academic, cultural, religious activities	
Status	Partially Lifted

Strategical Patterns followed in Our Institution :

Outpatient Department (OPD) Management :

As per Centers for Disease Control and Prevention, "most hospitals have to cancel or reduce nonurgent outpatient visits as part of their COVID-19 containment strategy. Surgeons should prioritize urgent or emergency visits and procedures. Elective and nonurgent admissions should be rescheduled⁸."

But we continued our usual OPD services as before but we only allowed asymptomatic, afebrile patients in our OPDs. Any suspected patient was referred to the designated "fever clinic".

Maintaining the six feet social distancing, we were running the OPD with surgical masks and gloves only; except for most essential

close clinical examination we use full personal protective equipment (PPE).

Apart from the routine disease-related queries, we mandatorily asked questions about recent travel and contact histories (both patients and the family) with people especially from containment zones; this is unique for COVID-19 that even some asymptomatic or mild symptomatic patients can be highly contagious⁹.

Inpatient Department (IPD) Management:

Patients with no history of close contact with confirmed or suspected COVID-19 patients and with no fever or respiratory symptoms were admitted for elective surgeries in a designated transitional area. If they were tested (RT-PCR) negative, they were shifted to the main surgical wards; protocols for emergency patients were also same but no emergent procedures were delayed for RT-PCR test results. All emergency and trauma patients were suspected as potentially infectious and they were managed with full PPE.

As surgeons and other HCWs of the department are at high risk of being infected and limited supply of PPE and N95 masks in our institution, we judiciously used them according to risk level.

1. For daily rounds and activities at surgical wards with asymptomatic, RT-PCR negative patients; we strictly took primary protection with disposable surgical mask, cap, latex gloves and surgical gowns.

2. Full PPE with N95 mask was required for airway care, collecting airway samples or intubation of trachea and Ryle's tube introduction.

3. The transitional area where waiting for results of RT-PCR reports, all activities were done with full PPE.

Emergency Surgeries :

1. We admitted all kinds of critical and trauma patients who need emergent surgical care even they might have so called COVID symptoms and signs; we managed them with full PPE and did immediate surgical interventions, if needed. During this pandemic, need for emergency surgery should be considered as a priority for admission.

2. All patients who needed emergency surgery had to complete pharyngeal swab sampling before surgery (if possible), or it was done later. No routine X-ray or CT scan of chest was done. Patients were placed in the transitional area; all HCW wore full PPE who would manage the emergency patients in the transitional wards, during transport and in theaters¹⁰.

3. After the operation, the patients were returned to the original transitional ward. After the test results came negative, they were transferred to main wards.

Elective Surgeries :

1. The American College of Surgeons (ACS) advises to postpone nonurgent surgeries during the beginning of the pandemic of COVID-19. They have classified surgeries into various tiers according to the urgency of surgery. Up to Tier 2b (most elective surgeries like hernia), they are advising postponing of surgery. For Tier 3a and 3b, where most cancer surgeries will fall, ACS is not advising postponement at the moment though it may change⁴.

According to guidelines from the Indian Council of Medical Research, all high-risk patients undergoing elective surgery should undergo RT-PCR test for COVID-19 before surgery⁷.

2. No special measures were taken in our operating theaters as per literature:

Laminar air flow should be used, and air supply should be closed after operation. Peracetic acid air is used for fumigation. The operating theater should be cleaned and disinfected and high-efficiency filter changed. Cleansing should be done using detergent and water followed by use of with 1000 ppm bleach solution for all hard surfaces in the operating theater. The disinfection time should be longer than 30 min. The operating theater should be closed for at least 2 h, and the next operation should be performed after laminar flow and ventilation being turned on¹⁰.

3. No special system was installed in our operating rooms for scheduled operations. We did not develop a dedicated COVID-19 operating space. If any patient found to be positive after operation, we used to sterilize the area as usual; it happened in three of our cases after emergency surgical interventions.

4. We admit asymptomatic patients with no history of contact/ travel for elective surgeries in transitional area. When they were tested negative, they were shifted to main surgical wards and we treat them as normal patients as before. We had not followed tertiary protection measures for anesthesia and surgical procedures for elective procedures.

Postoperative Management :

Apart from standard postoperative care, we closely monitored their oxygen saturation and look for symptoms, suspicious for Covid-19. Patients who developed cough with fever after surgery, HRCT chest and repeat RT PCR test was performed and assessed accordingly.

MATERIALS AND METHODS

• It was an institution based, retrospective observational study

conducted in General Surgery department of Institute of Post Graduate Medical Education & Research, Kolkata.

- The records of our hospital were reviewed to retrieve the number of daily admissions, those requiring surgical management and those discharged home.

- Furthermore, all the records of surgical procedures performed during study period were reviewed.

- Surgical team members who acquired COVID-19 infections within 14 days of surgery was only included in the study.

Study Period :

- The period of study was 25th march,2020 (Beginning of 1st lockdown) to 31st August,2020(end of Unlock 3.0)

Aim of the Study :

- To study Trends of cases during lockdown and Unlock period in Covid-19 pandemics and compare with the previous year data(2019).

- To study risk of exposure to Health Care worker while handling surgical Patients.

- Sharing experiences of the authors from the general surgical departments at tertiary care hospital during this virus pandemic and "Lockdown".

RESULTS

	25.3-31.3.2020	1.4-30.4.2020	1.5-31.5.2020
Patients admitted (n)			
OPD	21	83	70
Emergency	25	85	69
Total	46	168	139
Elective Surgeries			
	39	80	69
Emergent Surgeries			
	05	67	40
Total surgeries	44	147	109

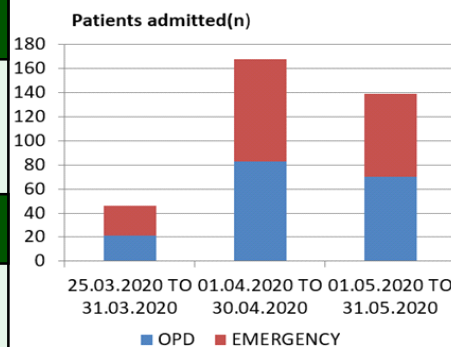


Table 2(A) : Details of operations performed during Lockdown (25.03.2020 – 31.05.2020)

	25.3-31.3.2019	1.4-30.4.2019	1.5-31.5.2019
Patients admitted (n)			
OPD	52	273	241
Emergency	46	125	167
Total	98	398	408
Elective Surgeries			
	46	208	217
Emergent Surgeries			
	32	102	122
Total surgeries	78	310	339

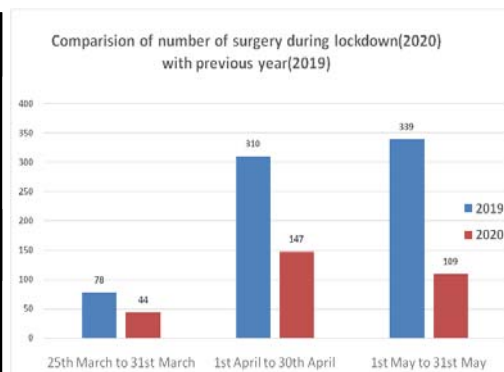


Table 2(B) : Details of Operation performed previous Year(2019)

Table 3(A) : Details of operations performed during Unlock (01.06.2020 – 31.08.2020)

	1.6-30.6.2020	1.7-31.7.2020	1.8-31.8.2020
Patients admitted (n)			
OPD	144	174	123
Emergency	82	80	154
Total	226	252	275
Elective Surgeries			
	136	179	169
Emergent Surgeries			
	49	69	67
Total surgeries	185	248	236

Table 3(B) : Details of Operation performed previous Year (2019)

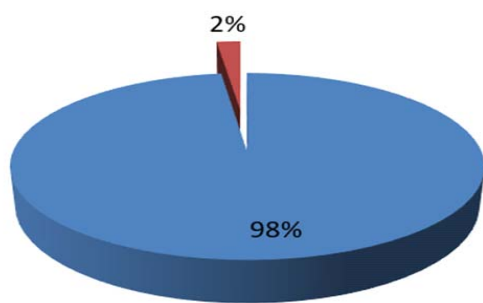
	1.6-30.6.2019	1.7-31.7.2019	1.8-31.8.2019
Patients admitted (n)			
OPD	245	275	253
Emergency	126	112	136
Total	371	387	390
Elective Surgeries			
	214	252	225
Emergent Surgeries			
	109	103	119
Total surgeries	323	355	344

Table 4 : (From 25 March to 31 August, 2020)

Total patients admitted	No of patients tested RT-PCR	Positive results	Percentage
896	892	18	~2%

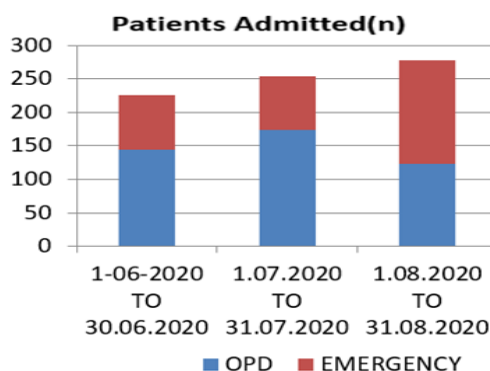
NUMBER OF PATIENTS TESTED RT-PCR

■ NEGATIVE RESULTS ■ POSITIVE RESULTS



DISCUSSION

Most of the recommendations have advised postponement of non-essential elective surgery. Most of the recommendations are based on case series of trivial numbers, case reports based on personal accounts or adept opinions².



We were facing a very critical times during pandemic and avoiding elective surgeries not only increased the tremendous future load, but it also increased the morbidity and mortality of the sufferers due to non-COVID ailments.

In India estimated 505,936 non-emergency surgeries, 51,100 cancer surgeries, and 27,700 obstetric surgeries could have been delayed across India during the twelve-week (48728 total elective surgeries per week) period before and after the peak of the viral outbreak. Worldwide data best estimated to be 28404603 operations would be cancelled or

postponed during the peak 12 weeks of disruption due to COVID 19 pandemic (2367050 operations per week)¹¹.

Moreover, the impact on surgical training during these unprecedented times: the cancellation of elective surgery will adversely impact on training opportunities, particularly for elective workload¹².

We observed that during the total Lockdown days, the numbers of patients (both elective as well as emergency) attending our hospital were very less as compared with pre-pandemic times (Table 2). This might be of fewer access to transport and fear of getting COVID-19 infection.

Everywhere in the world except in few countries, elective surgeries were avoided assuming that COVID-19 respiratory complications might occur postoperatively, viral transmission risk intraoperatively especially with laparoscopic surgeries. In our experiences, this was unjustified and irrational. We agree that some asymptomatic COVID patients are there and if proper precautions and right use of PPE is maintained the risk of transmission from hospital is very much avoidable (Table 4).

Recommendations also suggest to avoid laparoscopic surgeries and surgeries of long durations. Out of six hundred and seventy-two elective surgeries in our series, we have done more than hundred cases of laparoscopic surgeries and long duration operations like Whipple procedures, total thyroidectomy with bilateral neck dissections D2 gastrectomies. We did not feel that it increases

the risk of transmission of COVID as no postoperative elective case was positive in our series. We acknowledged that in the beginning of pandemic and Lockdown, we also avoided laparoscopic surgeries and surgeries of long hours; but from May, 2020 onwards we were doing all kind surgeries.

During the period from March 25 to August 31, 2020 (Data analyzed), we have tested (RT-PCR) eight hundred and ninety-two admitted patients, out of them eighteen came positive (~ 2%); three patients were admitted in emergency basis, rest were for elective surgeries. Except one surgical resident, no HCW of our department was COVID positive during this period (Table 4). That unfortunate event had occurred during a lifesaving resuscitation procedure of a trauma patient, who later tested RT-PCR positive. The resident, in hurry got no time to wear PPE as he remembered.

CONCLUSION

From our experiences and data collected during the said period, we came into conclusion that in no way elective surgeries should be avoided. It will ensure the best care for the non-COVID surgical patients, helps to ease future load and save many lives from denial death.

The percentage of COVID positivity in asymptomatic surgical patients is around two percent. If we maintain simple precautions carefully and properly, then elective surgical services can easily run without special equipment and theaters.

The running of elective surgical services also has a good impact on surgical training and education. The segregation of emergency and elective surgical care helps to protect training for surgeons.

If COVID-19 is likely to become endemic, all the current surgical guidelines need to be revised critically with the focus of resuming all the surgeries. These new guidelines need to be evidence-based and should provide cost effective solutions for effectively preventing disease transmission and cross infection, without excessively escalating the cost of treatment.^[13]

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