

Surgical Protocols for Handling Covid-19 Positive Patient

Dr. Sharanya Ray
(MBBS) Flat 603, Tower 7,
Urbana NRI Complex, Anandapur,
Kolkata India, Pin Code- 700107

Abstract:- The covid 19 pandemic taught us the importance of using human and financial resources to the utmost. It has become very critical to understand the ability of our healthcare professionals and surgeons and to ensure their functionality during this time. Although it is not primarily a surgical entity, it has affected the surgical department in several ways. Both medicine and surgical departments have joined hands and are together fighting this disease. WHO and the government has laid down several guidelines and protocols for in and out of hospitals which are to be followed strictly. Several initiatives have been taken to reduce the risks and severity of this life threatening disease. This article aims to list down all the clinical and non clinical protocols which the hospitals should incorporate in their daily lives to face this pandemic.

Keywords:- Covid 19, Surgical Protocol, Management, Precautions, Hospital challenges.

I. INTRODUCTION

Corona virus disease (covid-19) is a life threatening disease caused by severe acute respiratory syndrome corona virus 2 (SARS-CoV-2). This virus is contagious in nature which means it spreads through contact and is one of the fastest modes of transmission. After the first case detected in china the word covid-19 never went off our memory. It has shaken the world entirely, not only physically but mentally also. (“Corona virus disease 2019 - Wikipedia,” n.d.) Months after the lockdown started, psychiatrists had a bunch of patients with one or the other mental conditions which included anxiety attacks, behavioural changes, depression, and many more.

Hospital staff who are serving the covid positive patients are always at a high risk of coming in contact with the virus, although there are guidelines as to how to protect yourself but the risk still remains. (Salari et al., 2020) The front line workers are fighting this disease for the people without caring about their own lives.

Many people lost their jobs because of the financial crisis due to corona virus spread, also creating havoc in not only the young entrepreneurs but the top ones as well.

Even such common symptoms like fever and cough, tend to do a lot more inside the body.

The virus mainly infects the sinus, nose and throat and then spreads to windpipe and finally lungs. The virus after entering the body, attaches itself to ACE2 enzyme and enters the host cell. ACE2 is present in the alveolar cells of

the lungs. The virus also infects the gastrointestinal system. This virus tends to attack the myocardial tissues as well and thus some covid positive patients are seen with thrombosis as well as venous thromboembolism. This virus in some cases have also been associated with kidney failures in patients with no kidney problems. It is said that the novel corona virus cannot enter the central nervous system but low levels of this virus is found and confirmed in some patients who died of covid. Even though the virus has been found in the cerebrospinal fluid but how it has reached there is still unknown. The virus is also thus extracted in the blood samples, feces samples, and adipose tissue. (“Coronavirus disease 2019 - Wikipedia,” n.d.)

Chest CT scans show ground glass opacities in the early stages and as the disease reaches its final stage, consolidation appears in the lung images. This is not a routine screening but it does help in finding out the progression of the disease.

The standard and most commonly used method for testing and diagnosing the disease is through rt-PCR. This test is famous for detecting viral RNA fragments. But this test also has a drawback. It does not detect the infectious virus and thus cannot tell about the time period till which the patient is positive. Blood tests are also ineffective because they are time taking.

Covid-19 has reached a stage where all the health care workers are loaded with work and responsibility to serve their very best of knowledge to save lives. Doctors all around the world are giving their blood and sweat to help people fight this life-threatening disease.

II. DISCUSSION

Safe management of a patient has become a challenge for the front line doctors. This has led to the death of many doctors due to the disease. For safe management, having the right protocol is very important.

There are certain rules and regulations which are being followed amid pandemic situations; surgical protocols being one of them. These include triage areas, emergency departments, consultation rooms, induction rooms, operating rooms, and recovery rooms in every hospital treating covid patients.

III. CHALLENGES FACED BY HOSPITALS

There are several challenges faced by hospitals which need to be looked after.

- Non clinical challenges
 - Control of infection
 - Availability of equipments
 - Availability of doctors
 - Maintenance of proper sanitisation
 - Uncooperative families
- Clinical challenges
 - Decisions regarding intubation
 - Management of airway
 - Formation of infectious disease team
 - Management of cardiac arrest
 - Exposure minimisation
 - Family interactions
 - Moral and ethical issues
 - Wellbeing of hospital staff

Specific protocols have been listed out to face these challenges successfully as discussed below.

IV. NECESSARY PROTOCOL FOR HOSPITALS

- All the patients should be tested for covid-19 at the time of hospital administration.
- Keeping a record of all the patients with their names and address.
- Checking the temperature of everyone entering the hospital with a temperature gun.
- Informing the local health authorities about each positive case in that hospital.
- Assessment of the patient about his clinical status is necessary before shifting the patient to covid facility.
- If a pregnant woman turns out to be covid-19 positive, a separate facility should be provided to take good care of maternal and fetal and uterine contraction monitoring as well as fetal monitoring.
- Less interaction of family members should be made mandatory in order to prevent the spread of disease.
- If there is a need to refer the patient to a complete isolation facility, the arrangements should be made prior to the patient being transported.
- All standard precautions should be followed during transportation.
- All the contacts of the patients should be recorded and should be quarantined for at least 14 days and must be informed to the local authorities.
- Close contacts of the patient should be kept on hydroxy chloroquine for a period of 7 days
- Hospital staff are encouraged to monitor their own health at all the time for the appearance of symptoms and report them at the earliest.
- In order to save exhaustion of essentials, a well-planned management of availability of resources should be done. ("COVID-19 Guidance for Surgeons," 2020)

V. SPECIFIC SURGICAL CONDITIONS TO BE CONSIDERED

- Hemorrhoidal Necrosis

Most of the hemorrhoidal conditions do not require an operation. This varies from surgeon to surgeon. If possible, appropriate management under local anaesthesia is accurate. Emergency surgical management must be reserved in cases of excessive bleeding or if the medical management is unresponsive.
- Perianal Abscess

Superficial and localised abscesses can be incised and drained with local anaesthesia based on the surgeons decision. This technique should not be delayed if the abscess is very large to avoid invasive infections. If the operative rooms are not available, then alternative methods must be used. One of the commonest alternatives is percutaneous drainage.
- Infection of Soft Tissues

Patients who are troubled with soft tissue infections or necrosing soft tissues should go for emergency debridement.
- Inflammation of pancreas with or without necrosis

If the patient is suffering from pancreatitis with necrosis, then antimicrobial treatment is considered. The best approach which is recommended is percutaneous drainage, or by interventional radiologic techniques. I/R techniques are mostly preferred in covid positive cases because there is always a risk of aerosolization with endoscopic procedures.
- Obstruction of the intestine

Patients presenting with complaints of perforation, ischemia, loop obstruction or any obstruction because of incarcerated hernia must be taken for surgery without any delay.
- Inflammation of appendix

Patients with this condition can be treated with medications instead of surgery. Antibiotics are used as first line drugs. Appendectomy is usually preferred in later stages or with worsening symptoms. If there is a case of associated appendicolith, then antibiotics can lead to a lot of complications. In short all patients must get iv antibiotics till they are clinically improving. If there is a perforation, it can be managed by percutaneous drainage or operative procedure based on the condition of the patient.
- Gallbladder Stones and Choledocholithiasis

Patients with stones in their gallbladder who cannot pass their stones naturally are recommended with ERCP with removal of sphincter. This is followed by elective cholecystectomy. In covid positive patients, special precautions must be taken for ERCP as it is considered as an aerosolising method.
- Inflammation of diverticulum

Diverticulitis if uncomplicated can be treated by usual care which basically include antibiotics. If the patient complains of purulent peritonitis, they should be referred for surgery. According to Hinchev classification , grades 1 and 2 of this disease must be treated with drainage with antimicrobial drugs. Patients who are unresponsive

to non operative methods but proceed to operative methods immediately.

VI. SURGICAL PROTOCOL FOR HOSPITALS

It is important to understand that protecting covid negative patients is as important as providing adequate care for covid positive patients. Demarcated channels for both categories of patients must be taken care of in order to achieve the smooth functioning of the hospital as well as health care professionals. Planned management and segregation is important to treat patients wisely as well as to take care of non-infected patients.

Allocated covid operational areas are a must in a hospital so as to ensure full support to the patients and maximum protection to non infected individuals.

- Triage rooms- Triage rooms are made in which the patient is first assessed, screened, initially examined, and categorized into two groups- having symptoms and without symptoms. This is an important step in order to decide the fate of the patient's residence. The positive patient is then shifted to isolation and the negative patient is then taken to ward with regular or non-Covid patients. All the doctors present with the patient must wear PPE kits which should at least include a surgical mask, regular AAMI level II gown, goggles or full face shield, and gloves.(Awad et al., 2020)
- Procedure rooms- Designated minimal procedure rooms must be made for covid positive patients so as to prevent contact transmission of virus from an infected individual to a healthy individual. All health care officials who are serving the covid positive patients should wear a PPE (personal protection kit) at all times of the procedure which should include Fitted, NIOSH-certified N-95 mask or surgical mask, regular AAMI level-II gowns, eye protection: goggles or full face shields and gloves. (Awad et al., 2020)
- Preoperative rooms- Proper preoperative rooms must be demarcated in every hospital so as to prevent any kind of further infections. All doctors and staff who are treating the patients must wear PPE kits with N-95 masks at all times, eye protection goggles or face shields, AAMI level III gowns which are disposable, fluid-resistant shoes that must be worn which can be easily contaminated and hand hygiene must be considered. (3)
- Operative rooms- Operative rooms should be most taken care of. Planning is the most important aspect of preventing virus contact. (Awad et al., 2020),(Coccolini et al., 2020)
 - Well ventilated operating rooms will be perfect so that it creates positive pressure in the room.
 - Equipment in the room must be strictly limited to that case only.
 - Equipment should be kept in another trolley which should be sanitized properly and should be used in the same operating room.
 - The surgery team should be limited and no extra person should be there in the room.
 - Operating room gates should be closed and no one should be allowed to enter or leave the room until the surgery is completed.
- Once anyone goes out of the room, he/she should not be allowed to re-enter the room.
- Doctors and nurses in the operating room should wear NIOSH certified N-95 masks, eye protection goggles, and face shields. Disposable AAMI level III surgical gowns, double surgical gloves, shoes worn should be fluid-resistant and hand hygiene is a must before and after using PPE kits.
- The use of electrocautery should be minimised and contact time must be less so as to emit less surgical smoke.
- After the procedure is completed the room must be strictly sanitised.
- Waste disposal should be done very carefully; all contaminated instruments should be disposed off with proper labels.
- The waste containers should be sealed properly before sending it to the collection point.
- PPE disposal should be done in separate IRHW (Infected Risk Health Waste) containers.
- Staff involved in shifting of the patient should wear different PPE kits inside and outside the room.
- Postoperative rooms- postoperative rooms are also an important part in handling surgical patients infected with coronavirus. (Awad et al., 2020)
- All doctors and staff visiting the patient should wear PPE kits with N95 masks.
- As surgical patients take more time for their recovery and the complications are also at a very high risk, doctors and staff must be ready for any known complications that may happen over the recovery period.
- In cases of postoperative fever and any one of the symptoms of respiratory tract infection, laboratory tests for coronavirus disease must be done without delay.
- Suspected cases or confirmed cases should be isolated immediately.
- Monitoring the postoperative patient is important for the vitals and health of the patient.
- Visitors should be limited or avoided so as to avoid any other nosocomial infection.
- Since the immune system of a postoperative patient is vulnerable, electrolyte balance should be maintained and fluid hydration as well as appropriate nutrition should be taken care of.
- Frequent monitoring of pulse, blood pressure, oxygen saturation, respiratory rate, temperature, c reactive protein, ferritin levels, and lab reports for covid infection should be done strictly, and at regular intervals.
- Patients at a severe stage of covid 19 should be checked for hyper inflammation markers which include increased ferritin levels, decreased platelet counts, and increased LDH levels in the body.
- Followup for the patient should be done on a severity basis. Only the more severe patients should be appointed for the hospital checkups. The less severe ones should be attended through telemedicine.

VII. CERTAIN RISKS

There are certain risks that are present in spite of taking all preventive measures, they should be kept in mind as well.

- A smoke evacuator must be used when electro-cautery is done.
- All the sharp edges of machinery present in the operating room should be sanitised with more care.
- Doctors and staff should be given an extra pair of clothes which they should wear only inside the hospital and should not carry them along back home.
- Ambulatory services should be available in hospitals handling covid suspected or positive patients.
- The ambulance should be well sanitised thoroughly after the transportation of each patient.
- The ambulance should have a doctor and a nurse without fail.
- The doctor, nurse, and the driver should be well protected wearing PPE kits, masks, and gloves.
- The ambulance should be well equipped and all the necessary arrangements should be made beforehand.
- Intubation risk- if a covid positive patient has oxygen saturation $\leq 88\%$ on 6L of oxygen via nasal cannula, intubation is recommended.(Griffin et al., 2020)
- The physician should be informed about the patients who need or who might need intubation.
- There should be a team for the whole intubation process which should have an anaesthesiologists, respiratory medicine doctor, a nurse.
- The patient should be shifted in a negative pressure room for the procedure.
- The team must be fully protected with PPE kits, N95 mask, gloves, face shields, and ventilated shoes.
- The patient should be sedated and given vasopressor medications before starting the procedure.

VIII. CONCLUSION

The protocols laid down must be incorporated by the hospitals strictly and proper training of the involved surgeons as well as healthcare professionals must be looked upon with dedication. In-hospital covid positive patients must be kept separate from other patients and all surgical as well as hospital protocols must be properly instituted. Established plans to perform surgeries on covid positive patients must be precise. This article helps us understand how several departments of pulmonary, anaesthesiology, cardiology, surgical, critical care units, palliative, nursing and respiratory therapy are working together to fight this disease. All hospitals and their staff should keep in mind the respective protocols while handling each patient effectively and will give in their hard work and dedication to achieve the best outcomes possible.

• Conflict of Interest :

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article

• Funding :

The author (s) received no financial support for the research, authorship and /or publication of this article.

REFERENCES

- [1.] Awad, M.E., Rumley, J.C.L., Vazquez, J.A., Devine, J.G., 2020. Perioperative Considerations in Urgent Surgical Care of Suspected and Confirmed COVID-19 Orthopaedic Patients: Operating Room Protocols and Recommendations in the Current COVID-19 Pandemic. *JAAOS - J. Am. Acad. Orthop. Surg.* 28, 451–463. <https://doi.org/10.5435/JAAOS-D-20-00227>
- [2.] Coccolini, F., Perrone, G., Chiarugi, M., Di Marzo, F., Ansaloni, L., Scandroglio, I., Marini, P., Zago, M., De Paolis, P., Forfori, F., Agresta, F., Puzziello, A., D'Ugo, D., Bignami, E., Bellini, V., Vitali, P., Petrini, F., Pifferi, B., Corradi, F., Tarasconi, A., Pattonieri, V., Bonati, E., Tritapepe, L., Agnoletti, V., Corbella, D., Sartelli, M., Catena, F., 2020. Surgery in COVID-19 patients: operational directives. *World J. Emerg. Surg.* 15, 25. <https://doi.org/10.1186/s13017-020-00307-2>
- [3.] Coronavirus disease 2019 - Wikipedia [WWW Document], n.d. URL https://en.wikipedia.org/wiki/Coronavirus_disease_2019 (accessed 12.20.20).
- [4.] COVID-19 Guidance for Surgeons: Background, American College of Surgeons, Centers for Medicare and Medicaid Services, 2020.
- [5.] Griffin, K.M., Karas, M.G., Ivascu, N.S., Lief, L., 2020. Hospital Preparedness for COVID-19: A Practical Guide from a Critical Care Perspective. *Am. J. Respir. Crit. Care Med.* 201, 1337–1344. <https://doi.org/10.1164/rccm.202004-1037CP>
- [6.] Salari, N., Khazaie, H., Hosseini-Far, A., Khaledi-Paveh, B., Kazemini, M., Mohammadi, M., Shohaimi, S., Daneshkhan, A., Eskandari, S., 2020. The prevalence of stress, anxiety and depression within front-line healthcare workers caring for COVID-19 patients: a systematic review and meta-regression. *Hum. Resour. Health* 18, 100. <https://doi.org/10.1186/s12960-020-00544-1>