

PARADIGM SHIFT IN PROSTHODONTIC PRACTICE DURING COVID-19

Dr. Sandeep Fere ¹, Dr. Suresh Kamble ², Dr. Ajit Jankar ³, Dr. Bhushan Bangar ⁴, Dr. Susheen Gajare ⁵, Dr. Pratish Kawade ⁶

¹ Reader, ² Principal & Professor, ³ Professor & HOD, ^{4,5} Reader, ⁶ PG Student
Dept of Prosthodontics, MIDSR Dental College, Latur.

Abstract:

The COVID-19 virus has been circulating rapidly across world in recent months. WHO declared COVID-19 as a pandemic due to the alarming levels of spread and severity. It spread by transmission various routes such as air-borne, contact spread, by contaminated surface. The dental health workers are the most frequently getting affected during dental procedure as dentist are in close contact to saliva, blood, and oral cavity. During this, Prosthodontist are more susceptible to COVID-19 virus because of aerosols during tooth preparations, implant placement. There are many standard operative protocols given by various institute for safety of doctors. This study provides brief details on the potential source of COVID-19 spread in the setup of Prosthodontics for patient care and clinical strategies.

Keywords: COVID-19, Pandemic, Dentistry, Aerosols, Transmission, Prosthodontics

Corresponding Author: Dr. Pratish Kawade, PG Student, Dept of Prosthodontics, MIDSR Dental College, Latur. Email id.: pkawade7@gmail.com

INTRODUCTION:

A new human coronavirus, also referred to as Extreme Acute Respiratory Syndrome Corona Virus 2 (SARS-CoV-2), was announced by the Chinese Centre for Disease and Prevention in January 2020 as the causative microorganism of the COVID-19 outbreak.¹ The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was declared a pandemic in March 2020 by the World Health Organization. This spread rapidly and globally, affecting the health of people. COVID-19 related mortality is mild, with high propagating capacity. Symptoms of COVID-19 include fever, fatigue, dry cough, and dyspnoea.² Most infected people show mild to moderate respiratory illness. People with underlying systemic diseases such as Diabetes Mellitus, heart diseases, and respiratory disease are at higher risk of mortality.^{3,4}

Currently, there are no specific vaccines or other therapies developed for COVID-19 until now. In the current COVID-19 pandemic, Dentists,

auxiliaries, and patients undergoing the dental procedure are at a high risk of cross-infection.⁵ During dental treatment procedures, contact occurs mostly with the patient's saliva, oral cavity, blood. Saliva is rich in COVID-19 viral load.^{6,7} and of which, many patients are asymptomatic, which are carriers and spread viral infection mostly. Hence, during dental treatment and patients visiting the dental office must be treated with care and precautions. Prosthodontics, which is a specialty of dentistry that deals with services to the mature age group in the form of Complete Denture, Removable Denture, Implant-supported Prosthesis, and Crown and Bridge to replace missing teeth.

The challenge to a Prosthodontist is much more because of the high concentration of copious saliva in trays & dentures, exposure to blood during pre-prosthetic surgeries and implant placement, and exposure to aerosols during tooth preparation for crown and bridge. Prosthodontics mostly requires more than one appointment to complete treatment.

The Prosthodontics treatment undergoes multiple human chains like a patient, doctor, assistant, lab technician, etc. So Prosthodontics should take proper care of the COVID-19 virus during the treatment.

1. TRANSMISSION ROUTES OF COVID-19^{2,8}

A. Air-born:

The microorganism can be transmitted through the air by cough, sneezing, or talking without the mask that can remain suspended in the air for long periods. This is the most common route of transmission of microorganisms. In dentistry aerosols (a suspension of fine particles or liquid droplets in air or another gas) are most commonly seen.

B. By contact spread:

In dentistry, frequently direct or indirect contact with human fluid, contaminated instruments and patient's material may be a possible way to spread microorganisms.

C. By contaminated surface:

During the dental procedure, a large number of aerosols are produced from the oral cavity spread across the environment and settle down on different objectives when a healthy person contacts the same object, the chances of transmission of microorganism increases.

STANDARD OPERATIVE PROTOCOL

Protocols for patient:^{9,10}

1.	Initial tele-screening of dental patients to identify suspected COVID-19 carriers
2.	Considering recently recovered patients as potential virus carriers for at least 30 days after the recovery confirmation by a laboratory test.
3.	Proper record, address, contact details are of paramount importance, as incubation period of SARS-CoV-2 may extend over 2 weeks, a positive response any of the above queries mandates deferring the appointment for at least 2 weeks and should motivated for self quarantine at isolated place for minimum 2 weeks ^{7,11,12} .

4.	Those patient who are fit for appointment should instructed to wear a surgical mask, be instructed to arrive on time of appointment, and should come alone.
6.	The waiting area should be properly ventilated with at least 2-3 feet space between each seating position without any paper, magazines, toys or any material
7.	Schedule appointment such that it minimizes possible contact with other patients in the waiting room.
8.	Contactless thermal screening and pulse oximeter should be used and allow only patient who have more than 90% oxygen saturation.
9.	Patients should be instructed for hand sanitization and proper hand washing as soon as he/she enters the clinic.
10.	Make sure to motivate patient for minimize the appointment as possible as.
11.	Encourage and educate the patients to pay the fees by Digital routes
12.	After treatment is done ask patient to hand sanitization again to avoid spread.

Protocols for Doctors and Clinic Operator:^{2,7,13,14}

1.	All doctors and staff should wear complete PPE kit and should be trained for sanitization and infection control.
2.	While consulting patient, use separate screening or apply the barrier between doctor and patient with transparent plastic.
3.	Use minimal staff with proper alternative to them with a good rest so that symptoms can detect earlier if someone get infected.
4.	Covid related posters or videos should display or shown in clinic or work place.
5.	Before doing patient a proper hand sanitization should be done
6.	After every splatter related /aerosol generating treatment, strict fumigation needs to be done.
7.	Hand pieces, burs, diagnostic instruments, etc., have to be stringently autoclaved, in sealed pouches.
8..	Used burs should be soaked in a proper disinfectant solution after scrubbing prior to

	autoclaving or dispose it if possible.
9.	Before beginning the procedure, patient should also be covered with a full length drape, head cap and goggles.
10.	After clinical procedure if impression is taken it should be properly disinfected in various disinfect like 2% Glutaraldehyde or Chlorine compounds for 10 minutes.
11.	Ensure suction pumps are flushed with chemical cleaning solution as per manufacturer's instructions.
12.	Prepare a checklist to assess and complete the closure of dental practice at the end of the day
13.	If not an emergency advice the treatment from home itself.

Protocols for Prosthodontic emergencies:

As 'emergency' may not apply to Prosthodontic treatment in the true medical sense, there are many situations in which Prosthodontist attention is required urgently. Urgent care is needed for the patient so that he can carry his normal function without any disturbance.

1.	Denture fracture due to dental trauma and repair of broken denture.
2.	Ill fitting denture.
3.	If ulceration due to the sharp edge of prosthesis or teeth.
4.	Final crown/bridge repair or cementation if the temporary restoration is lost or broken.
5.	Problem with implant and implant supported denture.
6.	The need for temporary or immediate dentures.

Protocols for Laboratory Technician^{1,5,7,8,11,12}

1.	Practice social distancing.
2.	Routine temperature checks as well as the pulse oximeter readings should be done.
3.	Staff should be minimum as required for the work.
4.	Hand sanitizers are to be placed at vantage points and hand should be washed frequently by using soap and water after every case and avoid touching to eyes and face.
5.	The protective garment, mask and eyewear

	should be wearing in the laboratory.
6.	While using the trimmers and buff the fragments are sucked out using a high vacuum suction.
7.	All lab personnel without exception should observe the proper infection control protocols, including wearing personal protective equipment.

Protocols for disinfection of laboratory:

1.	All the dental impressions, casts, prosthesis or appliances should be thoroughly disinfected prior to handling both at the clinic or operatory, on acceptance of the work at the lab and prior to delivery.
2.	Laboratory surfaces can be disinfected using the disinfectant spray or surface wipes
3.	The dental laboratory should be fumigated on a regular basis.
4.	The lathe machine should be cleaned and disinfected daily.
5.	Pumice must not be used for more than one case.
6.	Non-sterilizable instruments such as some face bow components must be cleaned with soap.
7.	Articulators can be disinfected by spraying with a hospital-level disinfectant.
8.	Separate polishing attachments should be kept for all cases coming in the lab.

Hand hygiene and Personal Protective Equipment (PPE) instructions:^{7,8,10,14}

The importance of hand hygiene for both the practitioner and the associated staff is crucial.

Hand hygiene procedure should be done before and after the following procedure:

- Before and after the removal of PPE.
- Following the washing of dental instruments.
- Before contact with instruments that have been steam-sterilized.
- After cleaning or maintaining decontamination devices used on dental instruments.
 1. Mild soap should be used when washing hands. Ordinarily, the hand-wash rubbing

action should be maintained for about 20 seconds.

2. Prevent recontamination of washed hands; disposable paper towels should be used for drying the hand.
3. Fingernails should be kept clean, short, and smooth. Dental procedures staff should not wear nail varnish and false fingernails.
4. Before carrying out hand hygiene, rings, bracelets, and wristwatches should not be worn by staff undertaking clinical.

Management of Medical Waste:^{2,9,12,15}

1. Before any inappropriate accumulation, dental office waste should be routinely transported to the institution's temporary storage facility.
2. Dental waste resulting from suspected patient's treatment is considered medically infectious waste strictly disposed of under the official instructions using double-layer yellow medical waste package bags.
3. Follow all OSHA and the local municipal guidelines for biohazard waste.
4. Treat waste contaminated with blood, body fluids, secretions, and excretions as clinical waste, under local regulations. Discard single-use items properly.

Conclusion:

The rapid spread of the COVID-19 pandemic is associated with an increased possibility of the clinician getting exposed to COVID-19 from infected patients. Each patient should undergo proper screening of symptoms before the treatment. There is no such universal safety protocol for the dentist and dental auxiliaries in this pandemic situation. Various committees give different guidelines for dental hospitals and private practitioners for safety precautions. This can help to reduce transmission and break the chain of transmission of infection. So it is more important for dental professionals to take all precautions in their routine practice and additional safety measures during treatment.

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