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Covid 19 Protocols in Maxillofacial Surgery Practice

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I. Introduction

The first reported case of Covid 19 is at Wuhan,Hubei province China in november,2019 .As it is novel corona virus the reseaerchers were unware of clinical features and treatment measures.The Chinese center for disease control and prevention announced covid 19 as a causative pathogen in January 8,2020 . From December,2020 the disease presented as a major public health challenge to other parts of the world (Phelan et al,2020) . COVID-19 has been recognized in 34 countries, with a total of 80,239 laboratory-confirmed cases and 2,700 deaths on February ,2020 ,followed by o march ,2020 WHO declared this disease as a pandemic (WHO 2020b).The disease is produced by a highly contagious zoonosis produced by SARS –COV- 2 that can spread from human to human through respiratory secretions.The most susceptible group of the population are young age child ,elderly people and people with associated co morbidities. There is an important risk of contagion for healthcare workers such as anesthetists, dentists, head and neck surgeons, maxillofacial surgeons, ophthalmologists and otolaryngologists.Health workers contributes to 3.8% to 20 % of the infected population.The first reported physician fatality is in wuhan china is of an otolaryngology physician in January ,2020 (chang et al,2020)

To limit the exposure to the infected environment ,treatment procedure has been categorized as Elective and Emergency procedure . Due to the characteristics of practice in the dental speciality and maxillofacial surgery ,the risk of cross infections is high . Maxillofacial surgeons who deal with major emergency procedures , considering the characteristics of the procedures there is high risk of cross infections .Since, a step ahead protective guidelines and modified treatment protocols to be followed for the clinical management of patients as well as protective and prophylactic measures to the surgeons. This article is a compiled enumeration of functioning and aseptic measures put forward by the evident organizations to be followed in clinical setup,protective and prophylactic measures for surgeons as well as for patients,operation theatre protocols and Recent advances.

Virus Structure

According to studies ,SARS COV2 is a zoonotic virus similar to SARS COV and Middle East Respiratory Syndrome(MERS) mostly originated in Chinese horseshoe bats (Rhinolophus sinicus).There are six strains of species to cause pathologies in human .Four of these are:OC43,HKU1,NL63 and 229E ,other two strains are MERS Corona virus and SARS corona virus.The virus is structurally made RNA viral particles responsible for causation of respiratory ,hepatic enteric and nuerological disorders.

Mode of Transmission

Based on the epidemiologic research ,covid 19 outbreak started by transmission from animal to human ,sustained by human to human spread(chang et al,2020) .It is believed that its interpersonal transmission occurs mainly by respiratory droplets and contact transmission. Most virus is detected in nasopharyngeal and oropharynx secretions . According to researchers,Covid 19 is transmitted through droplets and contact routes .Airborne transmission is not shown ,as it is different from droplet transmission as it refers to the presence of microbes within droplet nuclei which is less than 5 μm can transmit to more than 1 meter .In an investigation of

75,465 positive cases of covid 19 no evidence to show it as airborne(WHO,2020).The outbreak has become a clinical threat to general population and healthcare workers worldwide .

As in maxillofacial surgery procedures aerosol transmission of the virus is possible , as aerosol generated by high speed micromotor handpiece and close contact operating with head and neck region .As the armamentarium used can be contaminated by various pathogenic organisms after use or contaminated working environment .Extensive transmission of covid 19 virus through clinical OPD,dental chair,dental equipments and instruments has been described .In a study from Singapore,viral RNA has been detected in all surfaces (handles,light switches,hand rails,interior doors and windows ,toilet bowl,sink basin)of the isolation ward in which patient admitted .Thereafter, infection can occur through sharp instrument punctures or contact with mucous secretions or by direct hand contact .So to shield the transmission follow international recommendations and guidelines by WHO and other research investigations in the speciality .

Reccommended Measures

Recommended measures for management of patients in clinical setup

The main route of transmission of coronavirus is by respiratory droplets and contact transmission precautionary measures to be taken from clinical setup to clinical working area .All clinical staff and doctors shoud follow principles of standard precautions :precautionary measures for patients,personel protection , hand hygiene , environment management,,cleaning and disinfection of materials and equipments , waste management .

At present, thestandards for the protection of airborne diseases are divided into (yang F et al)

General protection: wearing work clothes, disposable sur-gical masks, wearing latex gloves when necessary;First level protection: wearing work clothes, disposablework caps, disposable surgical masks, disposable isolationclothes and disposable latex gloves

Second level protection: wearing disposable working cap,medical protective mask (N95), protective glasses, protectiveclothing or protective screen, disposable protective cloth-ing or disposable impermeable isolation clothing, disposablelatex gloves, and disposable shoe covers if necessary

Third level protection: on the basis of second level pro-tection using full face shield, full face respirator or positivepressure head cover.The oral and maxillofacial medical staff should choosethe appropriate personal protection according to differentexposure risks

Recommended measures in the patient waiting area and diagnosis room

There should be a precheckup triage area outside the clinic where patient will be evaluated before entering the clinic by a set of questionnaire and temperature checkup can be done. If the patient is eligible to enter the clinic advice the patient to wash hand with handwash and wear mask and gloves to the patient. Entry should be from one door and exit to be from another door .The patient waiting area should be spacious and seating arrangements should be done following social distancing norms.Common touched areas like door knobs,reception table,chairs should be sprayed regularly by auxillary staff with 5% sodium hypochlorite.Pens ,patient records and appointment registershould be handled by the auxillary staff and can be kept in formalin chamber .Allow patient in waiting area 20 mins before procedure.

If the patient is having any history of Covid 19 and cured ,patient can be kept in separate isolated waiting area.

Recommended measures to be followed in clinical working room

Prior to the entry to clinical working area patient to be screened by using any ‘online virtual screening platform’,appointment based practice should be followed.Working room should be provided with windows open for cross ventilation and air disinfection.

Infrastructural modification

If possible, electrostatic adsorption air steriliser or circulating air ultraviolet air sterilizer can be used for air disinfection. There is no air sterilizer to use ultraviolet lamp for irradiation, and the ultraviolet lamp needs to be used in the unmanned state. Preoperative antimicrobial mouth rinse can reduce the number of microbes in the oral cavity (Kohn et al. 2003; Marui et al. 2019). Procedures that cause coughing should be avoided or performed cautiously (WHO 2020a). Intraoral x-ray examination is the most common radiographic technique in dental imaging; however, it can stimulate saliva secretion and coughing (Vandenberghe et al.2010) OPG and Cone Beam Ct can be alternatives and can be advised to prevent close contact and patient coughing.

In order to limit the infection ,the school and hospital of Stomatology,Wuhan university has shared its suggestions and experiences :

1. Six handed dentistry should be followed
2. Additional space between operating chairs shoulde be allowed
3. Handpieces should be equipped with anti reflux devices to avoid contamination and cross infections

4. Use saliva ejectors with high volume can reduce production of droplets and aerosols.
5. Preoperative antimicrobial mouth rinse can be given
6. Absorbable sutures are preferred
7. Appointing patient procedure with aerosol generation at the end of the day.

Recommended Measures for Surgeon and Minor oral surgical procedures

Surgeon as well as the assistant should wear triple layered protection gowns ,double gloves,head caps,shoe cover are recommended to prevent fomite based transmission.Clinicians working with aerosol generated procedure should wear full face shields with visors.Proper donning and doffing of PPE should be followed to prevent transmission of corona virus.India recently designed a safety box 'ARBAT BOX' for performing difficulty bronchoscopy procedure in suspected or confirmed covid 19 cases.This box can be used for minor oral surgical procedures if aerosols are generating.As head and neck surgeons if to be operated with emergency covid 19 positive case can use Level 2 Hazmat suit which is free from atmospheric air breathing.Use single use disposable diagnostic instruments and Surgical instruments should be packed and sterilized All operatory chair switches/buttons should be wrapped with plastic wrappers..Intraoperatively,Handling syringes and surgical instruments to be done at atmost care to prevent sharp puncture . Postoperative review visits can be avoided unless there is any complication ,can use E consultation for contacting patients and advising them for further care Use high speed evacuation system to be used when using handpieces,micromotor,three-way syringes. All instruments should be sterilized before and after the procedure.Postoperatively,before doffing of PPE remove the double glove and wear the Nitrile gloves for handling and disposing the instruments and materials.After procedure ,surgical instruments and handpieces should be immersed in sodium hypochlorite +detergent for 24 hrs then transferred to ultrasonic cleaner next day.Instruments which is contaminated by blood,saliva.gingival fluid should be autoclaved at 121ºC for 30 mins.Disposable instruments ,plastic wrapers,patient apron and other materials should be disposed in bio-medical waste container or bags with labelled prominently with biohazard symbol, should be packed separately for each patient.

.After patient leaving the room ,fumigate the room with foggers with Nuetralise residual formalin gas with ammonia by exposing 250 ml of ammonia per litre of formaldehyde.

Recommended Measures for Surgeon and Major Surgical Procedures

The course of covid 19 will prolong and adequate protective measures to be followed .As there are assymptomatic carriers and possibility of community transmission all patients reporting should be considered as Covid positive and treat with adequate precautionary measures ,especially in case of an emergency posted procedure.

Surgical team as well as the anesthesia team both are in risk of exposure to virus ,as they areworking together in closed ventilated area.

Guidelines to be followed :

- Screening of the patient to be done for Covid 19 and with test report and proper history only patient to be admiited preoperatively in hospital .

- Limit the bystanders with the patient and visitors should not be allowed .Give a proper counseling to the patient as well the bystander regarding handhygiene techniques ,social distancing and infection control methods.

- Staff involving the tests ,history taking and counseling should be documented

- In case of emergency admission of patient to hospital ,patient to be shifted to isolation rooms with all necessary equipments separately .

- Transfer to OT can be done through a specific way,entry and exit of patients should be through two different ways,afterwards sanitation of the way to be done .

- It is advised that surgical procedures should be done in a dedicated operation theatre , with fully equipped and infection control methods achieved.Same OR and same anaesthesia machine should be used for all suspected cases until the duration of epidemic.
- Theatre should have negative pressure ventilation relative to surrounding area.

- Minimise the number of personel in the OT,avoid repeated exit and entry to OT.
- All equipments ,Surgical instruments ,body fluids ,guaze packs should be consideres as biohazard and disposed by current available recommendations.
- Aerosol and droplet transmission is an important in theatre,while intubation or tracheostomy,only required personnel should be allowed inside others can wait,soon after intubation surgeons can join in OT.

- All staff in OT should wear a fit tested N 95 mask,face shields or goggles,gowns and gloves.

Intraoperative measures
Prefer extraoral approaches to facial skeleton .This will reduce contact with saliva

Pack oral and nasal cavity with biocclusive dressing,if an extra oral approach

Avoid usage of high power drills,oscillating saw

Electrosurgery can be minimized as it can cause particle aerosolisation .Use smoke evacuators if using monopolar diathermy pencils.Avoid long dissecting toimes on the same spot.

Avoid sharp injury to protective equipments especially gloves and body protection .

Use povidine iodine (10%) and hydrogen peroxide (3%) in irrigation solution to minimize viral load in aerosols.

Use selfdrilling IMF screws for intermaxillary fixation .

Shifting to Postoperative care Unit

Once the patient recovered should shift to isolation room.A separate team waiting outside OT have to shift the patient ,all personnel should wear Personel Protective Equipment as recommended by CDC .

Cleaning and Disinfection of OT
The operation theatre should be cleaned as per bio hazard cleaning protocol.Cleaning staff will use N95 mask ,face shield, googles , gowns and house keeping gloves.
Proper cleaning thrice through surfaces of screens,keyboards,cables,monitor and anaesthesia machine.
All unused items on the drug tray and airway trolley should assumed as contaminated and discarded.
Depending on the air exchange of OT the next patient can be taken one hour after extubation of previous case.

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