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RESEARCH ARTICLE

GUIDELINES FOR TREATMENT MODALITIES TO BE ADOPTED BY ORAL AND MAXILLOFACIAL SURGEONS IN THE CURRENT PANDEMIC SCENARIO OF COVID-19

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Abstract

Oral Maxillofacial Surgery is a branch of dentistry which deals with a wide array of procedures starting from prophylactic removal of a tooth to the management of emergency trauma. While the widespread of the Covid-19 pandemic, dental procedures except emergencies are been encouraged and carried on through telephonic consultation, the oral surgeons are liable to attend to an emergency despite the outburst of pandemic, our article focuses on the basic guidelines which are to be followed by the professionals to prevent themselves from getting affected by the virus while attending to emergency services.

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Introduction:-

An outbreak of the novel Coronavirus disease (COVID-19) originated in Wuhan, China which is rapidly spreading to multiple countries worldwide currently^{1,2}. Operating room (OR) is the workhouse of every surgical specialist, and in present scenario, it is important to take very stringent actions and adhere to certain guidelines without any loop holes.

The oral and maxillofacial surgeons are a specialized category of healthcare worker who must inevitably come into contact with the oral cavity, first airways and with patient's secretions (such as saliva, mucus, blood) during the diagnosis and treatment process, thus putting them in a situation of high risk of getting infected, in turn, a source of contagion³. There is a high viral burden in the nose and the aerosolized form of the virus can persist for up to 3 hours in the air and 48 to 72 hours on select surfaces.

Infection control measures are necessary to prevent the virus from further spreading and to help control the epidemic situation⁴. The risk of infection during the diagnosis and treatment of oral diseases was also quickly assessed, suspending non-urgent outpatient oral treatments and maintaining the main emergencies of the oral and maxillofacial district represented by trauma, malignant neoplasms, and infections, which require timely treatment.

This article exclusively addresses the dilemma of maxillofacial surgeons while approaching the patients during Covid-19 pandemic.

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Materials And Methods:-

Modes of spread

According to the current researches, COVID-19 virus is transmitted between humans through respiratory droplets and other physical contact routes

Droplet transmission occurs when a person comes in close proximity to an infected person with respiratory symptoms (e.g. coughing or sneezing)

Respiratory droplets (which are generally considered to be $> 5-10 \mu\text{m}$ in diameter), transmission can also occur when someone comes in contact with surfaces touched by infected person with the virus contaminating the surface

Airborne transmission is different from droplet transmission as it refers to the presence of microbes within droplet nuclei, which are generally considered to be particles $< 5\mu\text{m}$ in diameter, procedures such as Endotracheal intubation, bronchoscopy, open suctioning, administration of nebulized treatment, manual ventilation before intubation, turning the patient to the prone position, disconnecting the patient from the ventilator, non-invasive positive-pressure ventilation, tracheostomy, and cardiopulmonary resuscitation are at high risk.

There have been no reports of faecal-oral transmission of the COVID-19 virus to date.

Diagnostic Tests For COVID-19

At least, respiratory samples should be collected:

upper respiratory specimens: nasopharyngeal and oropharyngeal swab or wash in ambulatory patients and/or lower respiratory specimens: sputum (if produced) and/or endotracheal aspirate or bronchoalveolar lavage in patients with more severe respiratory disease.

Nucleic acid amplification tests (NAAT) for COVID-19 virus, Serological testing and Viral sequencing, are some of the effective tests to detect the virus.

General Guidelines For Dental And Medical Practitioners

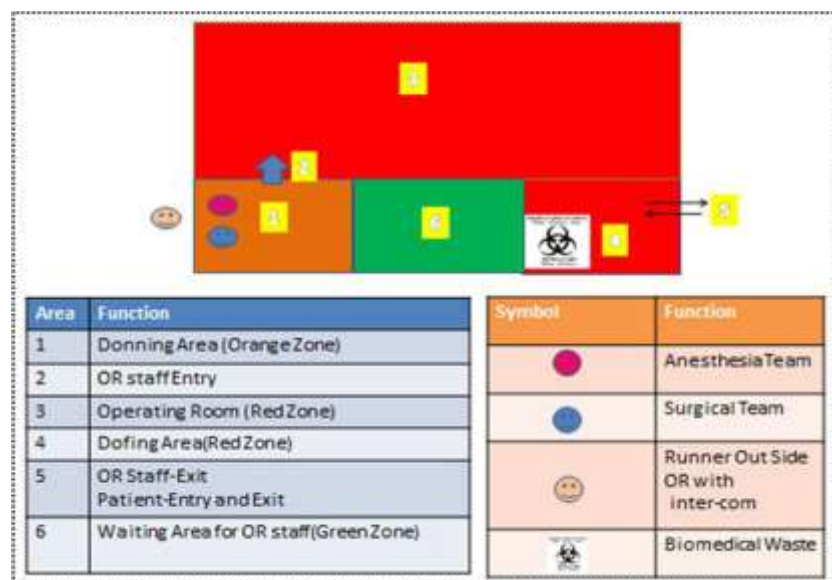
1. Reception area /Waiting hall:-Sanitisation should be done time to time and sitting arrangement should be done maintaining social distancing.
2. A person should be appointed to ensure that the patient is wearing face mask, gloves and maintaining social distancing. Each patient had to undergo thermal screening.
3. Before screening all the patients should be given a form in which all demographical details including his/her travel history (domestic/international/train/bus/airway mode) should be mentioned.
4. Between each appointments and OT the whole working area should be sanitized.
5. Patient suffering from Diabetes, Renal, liver diseases should be taken special care off. A special area should be kept ready for screening and treatment of such kind of patients.

Specific Guidelines For Surgical Management

Maintaining asepsis has to be strictly followed

OT Prerequisites

1. Spacious Operating room with at least 2 attached rooms for donning and doffing of personal protective equipments (PPE).
2. OR to follow concept of orange zone (sterile donning area), green zone (waiting area for OR staff) and red zone (contaminated area) as described in Fig. 1⁵.
3. Arrangement of biomedical waste management inside OR (respective color bins and bags with sodium hypochlorite in it).



Arrangement Of Or Equipments

1. Minimal fomite-bearing surfaces in OR (equipments, extra medications and surgical material not to be used in the ongoing surgery to be removed from OR and kept separately in the store room).
2. It is recommended to use OR having laminar air flow system and HEPA filter (0.1 micron efficiency)⁶ is recommended relative to surrounding air. A high frequency of air changes (25 per hour) rapidly reduces viral load within the OR.
3. Prefer not to use air conditioners inside OR and in areas of possible air contamination.
4. Aerosol barrier box an innovative modified design (SAAS box) of Arbat's safety box⁷ to be installed on OR table. It allows placement of patient's head and neck region under a transparent box with gloved hands along the sides. The surgeon can operate through the gloved hands area in a closed chamber. It reduces the splatter of any aerosols into the immediate environment of the patient and surgeon.
5. High-volume suction to be one-third prefilled with povidone-iodine solution. The povidone-iodine solution is believed to have virucidal effects and reduces viral load in aerosols produced by suction machine.
6. A high-quality HMEF (heat and moisture exchanging filter) rated to remove at least 99.97% of airborne particles of 0.3 microns or greater should be placed between the face mask and the breathing circuit or between the face mask and the reservoir bag as applicable. Insert bacterial viral filter to the expiratory limb of the breathing circuit apart from the heat and moisture exchanger (HME)⁸.



Regulations For Ot Staff

1. Minimal staff in OR . Intubation and extubation to be done by highly trained professionals to minimize the risk of aerosol contamination
2. During intubation and extubation, only anesthesia team should stay inside OR. The surgical team has to wait in the waiting area and allowed to enter after 20 min of completion of intubation. The contaminated aerosols settle down from the air during this period, thus reducing exposure to the surgeon.⁹
3. Anesthesia team to monitor patient from waiting to be sitting behind transparent barrier. This reduces the exposure time for the anesthetists.

Anesthesia Protocols

1. At the time of intubation and extubation, only limited auxiliary staff should be allowed in OR.
2. All the staff in the OR must wear PPE (a fit-tested N95 mask, face shield or goggles, hazmat suits and gloves and shoe covers).
3. Extubation of all cases in the OR suite itself at the end of surgery.
4. Avoid awake fiber optic intubation and preferably use video laryngoscope¹⁰.
5. Preoxygenate with minimal gas flow possible, i.e., less than 6 L per min, ensure good seal with face mask.
6. Rapid sequence induction to be encouraged to reduce the need for mask ventilation.

Surgical Protocols**Operating Room Discipline**

1. All surgeons to use positive air pressure respirators (PAPR) in addition to suggested PPE.
2. Surgical team to wait in waiting area (green zone) during intubation and extubation and to enter 20 min after procedure.
3. Extraoral approaches to facial skeleton should be encouraged as it will reduce contact with the saliva.
4. Oral and nasal cavity to be packed with bio-occlusive dressing.
5. Avoid use of high-power drills, oscillating saw and forceful irrigation which are potential instruments for aerosol infection.
6. Use of self-drilling IMF screws for inter-maxillary fixation (IMF) should be encouraged.

Postoperative Preparation Recommendations For Or

1. All OR surface to be considered as contaminated after surgery.
2. Surgical and anesthesia team should remove PPE and leave the OR only after the patient has been moved out of the OR
3. All the surfaces to be sprayed with sodium hypochlorite (1%).
4. Monitors and screens to be sprayed with alcohol based solutions
5. Both HME filters and the soda lime should be changed
6. Fogging can be a good alternative to fumigation as it generates fog or mist formed by ultralow-volume (ULV) uniform submicron-size liquid particles (dry fog) and possesses no risk to lungs. Various chemicals are used for fogging procedure like glucoprotamine, glutaraldehyde, hydrogen peroxide, silver nitrate. OR to be fumigated and sealed for 24 h, Formaldehyde should be discouraged because it is a carcinogen and affects the lungs which in turn are the target organs for covid.

Discussion:-

The novel corona virus has changed our understanding and approach of the healthcare system, and the delivery of maxillofacial surgical procedures is no more an exception. As an oral and maxillofacial surgeon, it is our duty to maintain the safety of ourselves, our auxiliary staff and our patients from cross-contamination. Optimization and upgradation of infection control protocol in operating room during the Covid-19 pandemic are mandatory. Confirmed modes of viral transmission are primarily contact with contaminated environmental surfaces and aerosolization. Microorganisms that include the novel corona virus are not visible to naked eye and hence requires a very stringent approach to tackle. Pederson et al. conducted a video audit of operating room procedures and suggested deep surface cleaning to be augmented with UV light disinfection¹¹. Australian Society of Anesthesia advises that extubation should take place in the operating theater, and it is recommended that recovery of the patient also take place in the operating theater if resources allow. It is mandatory for every one of us to calculate the break even and propose revised remunerations for the surgical procedures. Airway compromise is always a risk in maxillofacial trauma, and as emergency procedure, tracheostomy might be required. Cook et al. suggested a deep

tracheal swab to be taken and sent for COVID testing. They also suggested insertion of nasogastric tube at the time of tracheostomy to prevent aerosolization in ward¹².

Conclusion:-

We intend to create maximum awareness for the oral maxillofacial surgeons who are liable to attend to an emergency by following the guidelines mentioned in this article. Further safety to be extended to every staff, family members, nurses, students and every other individual taking part in treating emergencies. We wish for your safety while attending to situations of urgent need and emergency.

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