

Prosthodontic practice challenges post COVID-19 outbreak

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Introduction

The novel Severe Acute Respiratory Syndrome Corona Virus 2 (SARS-CoV-2) has rapidly developed into a worldwide pandemic and become a public health crisis of global concern. Due to the widespread transmission and dental practice specificities including the generation of aerosols throughout dental procedures, dental healthcare professionals and patients are facing increased risk of SARS-CoV-2 infection and infection spread.

Oral health care has its own specificities, especially taking into account dental procedures performed on elderly patients above 65 years of age with additional co-morbidities such as: diabetes, pulmonary or cardiovascular disabilities, making them more vulnerable to SARS-CoV-2 infection and worse prognosis. Geriatric patients most commonly need prosthodontics treatment including removable, complete or partial dentures (RPDs). Prosthodontists are facing significant challenges in controlling SARS-CoV-2 infection as their great exposure to aerosols and blood during tooth preparation for crown and bridge manufacturing, and to high concentration of abundant saliva in trays and dentures while producing removable dentures as well. The prosthodontic treatment is usually performed during multiple visits and the safety measures must be undertaken for any single visit not for the patients only, but for the medical staff as

well. The process of removable (partial or complete) and fixed dentures (dental crowns or bridges) manufacturing includes not only the prosthodontist and assistant, but lab technician and lab supervisor as well. As a result, the prosthodontic treatment is more complex, with more professionals involved, thus increasing the possibility for SARS-CoV-2 contamination and infection spread. (Sekhsaria et al., 2020) The aim of this study was to emphasize the influence of SARS-CoV-2 in changes of prosthodontic clinical practice.

Transmission routes of COVID-19 in dental clinics

Prosthodontic procedures are associated with risk of COVID-19 infection due to the face-to-face contact, common exposure to blood, saliva and instrument handling. Dental specialists and patients could be exposed to pathogenic microorganisms that infect oral cavity and respiratory tract. These microorganisms could be suspended in the air for long periods and could be transmitted through airborne spread. Moreover, dentists could be exposed to direct contact with oral fluids, blood, or contact with nasal, mucosal or conjunctival droplets and aerosols from infected patients due to short distance, especially if the dentist is working without proper self-protection, e.g. not wearing a mask or contact with contaminated instruments or surfaces. It has

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been confirmed that salivary gland epithelial cells can potentially be infected by SARS-CoV-2 virus and become a key source of the virus in saliva. The latest research data suggest that some virus strains could be present in the saliva up to 29 days (Peng et al., 2020). The working surface area could be contaminated for prolonged period with small particles of droplets and aerosols mixed with potentially infected patient's saliva or blood spread with high-speed turbine that works with running water.

Essential in obtaining, COVID-19-safe and sterile working environment in prosthodontic office is contentious disinfection, as well as wearing self-protection by the dental specialist. Critical step in this procedure is appropriate education for the patient, advising especially the elderly patients to disinfect the dentures at home regularly, as well as before sending them to the clinic due to ill-fitting of partial denture/complete denture (RPD/CD) and immediately reject denture wearing if infected with COVID-19. In order to obtain minimization of viral load in the operatory Negative ion generators and devices equipped with High Efficacy Particulate Air (HEPA) filters are recommended as they can efficiently remove particles less than 0.3 microns in size, in the surrounding air in the dental/laboratory offices. Prosthodontic specialist, nurses and dental technician, are obliged to reduce all elective treatment procedures that are associated with aerosol production and handle emergency situations only, with complete personal protection wearing special gloves, N95 mask, face shield, protective suit, head cap and shoe cover. It is recommended patients to be covered with a full length drape with their hands tucked in, a head cap and goggles. The oral mucosa could be disinfected with the Betadine solution while face skin surrounding the mouth opening could be wiped before commencing the procedure. Additional mandatory pre-procedural rinse is inevitable for microbial reduction in oral cavity, but instead of 1% hydrogen peroxide or 0.2% povidone iodine should be used as COVID-19 is proven as oxidation susceptible virus. These emergency situations are correlated with lost or fractured partial denture/complete denture RPD/CD by patients and the standard laboratory protocol should be followed with proper disinfection of the impression and casts. (Alharbi et al., 2020). In urgent situations associated with dislocated crown, fixed partial dentures (FPD) or implant prosthesis, patients are advised to safely keep the prosthodontics material in a box with butadiene solution. The dental appointment is

recommended only after confirmation that the patient is healthy and COVID-19 negative.

Conclusion

No universal or national protocols and guidelines have been accepted or implemented for dental care provision for suspected or active virus infractions during epidemic, pandemic or global disaster. As a result of such deficiencies, prosthodontics care has been substantially declined or even completely forbidden for a period of 3 months in our country and in many COVID-19 affected countries.

The progressive spread of SARS-CoV-2 virus has made substantial changes in everyday prosthodontic clinical practice in order to obtain safe environment for patients and dental professionals. Number of precautions and safety measures have been recommended and implemented after COVID-19 became pandemic. According to the relevant recommendations, all patients should be considered as potentially infected by COVID-19 and prosthodontics team must use complete personal protection and follow strict procedures, obtaining safe working operations.

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