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Oral Surgery and COVID-19 pandemic

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Abstract

The present outbreak of the 2019 coronavirus strain (COVID-19) constitutes a public health emergency of global concern. Oral surgeons are faced with emergency situations that they must manage. In this paper, we review the updated evidence and recommendations to allow oral surgeons to continue working in a safe conditions.

Keywords: COVID-19, transmission, personnel protective equipment, oral surgery

Introduction

In late December 2019, an outbreak of an unknown disease called pneumonia of unknown cause occurred in Wuhan, Hubei province, China [1]. The outbreak has rapidly evolved, affecting other parts of China and many countries worldwide in Asia, Europe, North and South America, Australia and Africa. On 11 March 2020, WHO labelled the COVID-19 outbreak as a pandemic [2].

A few days later, the causative agent of this mysterious pneumonia was identified as a novel coronavirus (nCoV) by several independent laboratories [3, 4]. The causative virus has been temporarily named as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and the relevant infected disease has been named as coronavirus disease 2019 (COVID-19) by the World Health Organization, respectively [3].

While the outbreak has had many impacts, here we focus in particular on the impact COVID-19 is having on oral surgery staff safety and, by extension, their willingness to continue to work.

Modes of transmission of the COVID-19 virus

Respiratory infections can be transmitted through droplets of different sizes: when the droplet particles are $>5-10\ \mu\text{m}$ in diameter they are referred to as respiratory droplets, and when they are $<5\ \mu\text{m}$ in diameter, they are referred to as droplet nuclei [5]. The origin of droplets can be nasopharyngeal or oro-pharyngeal, normally associated with saliva. According to current evidence, COVID-19 virus is primarily transmitted between people through respiratory droplets and contact routes [6, 7]. In an analysis of 75,465 COVID-19 cases in China, airborne transmission was not reported [8].

A recent publication in the *New England Journal of Medicine* has evaluated virus persistence of the COVID-19 virus [9]. In this experimental study, aerosols were generated using a three-jet Collision nebulizer and fed into a Goldberg drum under controlled laboratory conditions. This is a high-powered machine that does not reflect normal human cough conditions. Further, the finding of COVID-19 virus in aerosol particles up to 3 hours does not reflect a clinical setting in which aerosol-generating procedures are performed—that is, this was an experimentally induced aerosol-generating procedure [10]. This is an important issue in oral surgery.

In addition, the asymptomatic incubation period for individuals infected with COVID-2019 has been reported to be ~1–14 days, and after 24 days individuals were reported, and it was confirmed that those without symptoms can spread the virus [11]. To *et al.* reported that live viruses were present in the saliva of infected individuals by viral culture method [12].

Splatters created during oral surgery procedures, are like aerosols, also contaminated by respiratory pathogens [13].

Well conducted studies are needed to investigate the potential diagnostic of COVID-19 in saliva and its impact on transmission of this virus,

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which is crucial to improve effective strategies for prevention, especially for dentists and healthcare professionals that perform aerosol-generating procedures. Saliva can have a pivotal role in the human-to-human transmission, and salivary diagnostics may provide a convenient and cost-effective point-of-care platform for COVID-19 infection [14].

Patient management and COVID-19

Dentistry-related quality control centers and professional societies in many provinces and cities have put forward their recommendations for dental services during the COVID-19 outbreak, which, as supplementary measures, should be helpful in ensuring the quality of infection control [15].

Teleconsultation

The American Association Of Oral and Maxillofacial surgeons recommend that:

- The prescription is issued for a legitimate medical purpose by a practitioner acting in the usual course of his/her professional practice.
- The telemedicine communication is conducted using an audio-visual, real-time, two-way interactive communication system.
- The practitioner is acting in accordance with applicable federal and state laws [16].

If an emergency or urgent dental patient does not have a fever and is otherwise without even mild symptoms consistent with COVID-19 infection (e.g., fever, sore throat, cough, difficulty breathing), they can be seen in dental settings with appropriate protocols and PPE in place. The same protocol is applied for patient who have fever strongly associated with dental emergency but with no other signs/symptoms of COVID-19 infection.

For all patients who exhibit signs and symptoms of respiratory illness, the patient should be referred for emergency care where appropriate Transmission-Based Precautions are available [17].

Evaluation of patient

During the outbreak of COVID-19, dental clinics are recommended to establish precheck triages to measure and record the temperature of every staff and patient as a routine procedure. Precheck staff should ask patients questions about the health status and history of contact or travel [18]. Patients and their accompanying persons are provided with medical masks and temperature measurement once they enter to the clinic. Patients with fever should be registered and referred to designated hospitals. If a patient has been to epidemic regions within the past 14 d, quarantine for at least 14 d is suggested. In areas where COVID-19 spreads, nonemergency dental practices should be postponed [19].

It was reported that dental practice should be postponed at least 1 month for convalescing patients with SARS [20]. It is unknown yet whether the same suggestion should be recommended for patients with COVID-19.

Protection of healthcare personnel

Hand hygiene has been considered the most critical measure for reducing the risk of transmitting microorganism to patients [21]. COVID-19 can persist on surfaces for a few hours or up

to several days, depending on the type of surface, the temperature, or the humidity of the environment [22].

As respiratory droplets are the main route of COVID-19 transmission, particulate respirators (e.g., N-95 masks authenticated by the National Institute for Occupational Safety and Health or FFP2-standard masks set by the European Union) are recommended [23].

According to the 'Technical Guidelines for Use of Personal Protection Equipment for Healthcare Personnel for COVID-19 (Trial)' issued by the Ministry of Health of the People's Republic of China, recommendations are presented in the table 1. [24].

Oral surgery procedures and COVID-19

Since COVID-19 may be vulnerable to oxidation, use 1.5% hydrogen peroxide (commercially available in the US) or 0.2% povidone as a preprocedural mouthrinse. There are no clinical studies supporting the virucidal effects of any preprocedural mouthrinse against COVID-19. [17].

Extraoral dental radiographs, such as panoramic radiographs or cone beam CT, are appropriate alternatives to intraoral dental radiographs during the outbreak of COVID-19, as the latter can stimulate saliva secretion and coughing [17].

Patients could be treated in an isolated and well-ventilated room or negatively pressured rooms if available for suspected cases with COVID-19. [23].

The oral surgeon must make efforts to reduce aerosol production as much as possible, and he or she should prioritize the use of hand instrumentation [17]. Anti-retraction functions of handpieces may provide additional protection against cross-contamination. The use of high-volume evacuators should be preferred [17].

If needed, absorbable suture is preferred. Life-threatening cases with oral and maxillofacial compound injuries should be admitted to the hospital immediately, and chest CT should be prescribed if available to exclude suspected infection because the RT-PCR test, besides time-consuming, needs a laboratory with pan-coronavirus or specific COVID-19 detection capacity [25].

The cleaning and disinfection policy and practice for different levels of risk areas:

- In low risk area (not accessible for patient): use water-detergent for cleaning 1 to 2 times per day.
- In medium risk area (accessible for normal or stable patient):
 - Clean floors with 500 mg/l chlorine-containing disinfectants; contact time of approximately 30 minutes is recommended.
 - Contact time of approximately 10 to 30 minutes is recommended for surfaces disinfection followed by cleaning with water for 1 to 2 times per day.
- For high risk area (infected or contaminated areas: operating room...): the latest protocol is performed after each procedure, with respect of mentioned action time before subsequent procedure. [24].

In light of the controversy regarding whether ibuprofen should be used for patients with a COVID-19 infection, it is recommended to use ibuprofen as normally indicated when managing any type of pain [17].

Table 1.

Risk of exposure	Types of contact and exposure	Relevant procedures	Personal protective equipment										
			Hand hygiene	Scrubs	Surgical caps	Surgical mask	respirators	Gloves	Disposable gowns	Hazmat suit	Face shields/ eyes googles	Plastic disposable overshoes	
Low risk	Indirect contact	Health education, history taking, ward rounds, preoperative consent taking											
Moderate risk	Direct contact with patients. Non-aerosol-generating invasive procedures	Physical examination, fine needle aspiration, injection, wound dressings	R	R	R	R						R	
High risk	Normal patients with contact and exposure to aerosol and body fluids	Nasopharyngeal and oral suctioning, dental treatment, incision and drainage, wound irrigation, use of rotary handpiece system,	R	R	R	R		S	R	S		R	S
	Aerosol-generating upper respiratory tract procedures in PUI	Endotracheal intubation, airway suctioning in patients who are not adequately screened prior to admission due to acute and severe illness or suspected COVID-19 cases	R	R	R			R	R	R	S	R	S

R: recommended
S: selection based on risk exposure

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