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CONSIDERATIONS ON ENDODONTIC CARE IN TIMES OF SARS CoV-2 PANDEMIC

Endodontic Care in Sars Cov-2 Pandemic

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Abstract

The severe acute respiratory syndrome of the new coronavirus, SARS CoV-2, which became a pandemic, was first reported in Wuhan, Hubei, China in December 2019. It can cause mild symptoms, but in some cases it can cause serious complications, leading to death. The disease spreads through aerosol droplets and has estimated incubation period between 2 and 14 days (a period in which the patient has high potential to infect other people). Endodontists have high risk of exposure to COVID-19 when compared to other health professionals, since most of the work involves the generation of aerosols and care for patients in emergency situations, such as symptomatic irreversible pulpitis, symptomatic apical periodontitis, acute apical abscess and traumatic dental injuries, is imperative. Thus, this critical review addresses considerations about endodontic care in times of pandemic, whose emergencies imply real need for treatment, as well as the care that must be adopted in order to minimize risks for both professionals and patients who seek the resolution of their clinical pain conditions.

Indexing terms: COVID-19; coronavirus; dental practice; dentistry; Endodontics.

Introduction

The severe acute respiratory syndrome of the new coronavirus - SARS CoV-2 (COVID-19), was first reported in Wuhan, Hubei, China, in December 2019 [1] and since then it has become a public health crisis worldwide [2], being declared a pandemic by the World Health Organization (WHO) on March 11, 2020. Although COVID-19 infections in humans generally cause mild symptoms in most cases, in some situations, it may cause serious complications, leading to death [3].

The disease spreads through aerosol droplets [4] and has estimated incubation period of 2 to 14 days [5]. It is known that patients without symptoms or who are during the virus incubation period have the potential to infect other people [5].

Thus, the American Dental Association (ADA) and the Centers for Disease Control and Prevention (CDC) recommend to oral health professionals extreme caution and warn them to limit dental work strictly to situations of dental emergencies [6,7], since aerosol is the source of COVID-19 spread, in addition to other viral infections, which puts dentists and other dental professionals on the first line of the risk exposure scale [8].

The aerosol produced by dental practice instruments can remain in the air and surfaces for several hours [9] and although the operator can be unhurt if well protected during therapeutic practice, the air will remain contaminated, representing a risk to operators after removal of personal protective equipment (PPE) and for the next patient [10].

Thus, patients with non-urgent oral conditions should temporarily avoid attending the dental office [11]. In addition, as the understanding of this new disease is evolving, dental practices should be prepared to identify possible COVID-19 infection and refer the patient with suspected, confirmed or history of COVID-19 infection to appropriate treatment centers [12].

In this pandemic, it is necessary to reduce face-to-face consultations to decrease the risk of infection, and teleodontology can be an alternative for dentists to investigate the need for treatment and ensure continuity of care [13,14], especially for COVID-19 patients or those suspect to be infected [14]. However, if there is need for treatment, at this epidemic moment, every patient should be considered potentially infected with the virus because the clinical presentations of this disease can be dynamic and therefore there are chances that dentists will treat some patients with asymptomatic COVID-19 infection, and all dental practices need to review their infection control policies, engineering controls and supplies [12]. Therefore, every patient must be considered potentially infected with this virus, and all dental practices need to review their infection control policies, engineering controls and supplies [12].

In view of the above, this critical review aims to present considerations about dental care in time of pandemic, specifically, endodontic care, whose urgencies imply real need for treatment.

Considerations on Dental Care in Endodontics

Studies addressing important aspects of COVID-19 regarding clinical severity, extent and types of transmission, as well as the most appropriate treatment, have been carried out worldwide since the beginning of the disease [4] and until now, there is no consensus on dental treatment protocols that must be adopted for COVID-19 patients [15].

However, it is imperative that the dentist, especially endodontists, take appropriate measures to keep themselves protected [2,13] and also ensure the

maintenance of patients' health in the dental environment, since only protective measures do not guarantee the non-contamination of other patients [13.16].

Endodontists have higher risk of exposure to COVID-19 when compared to other health professionals, since most of the work involves the generation of aerosols and the care of patients with dental pain is imperative. In addition, close and prolonged face-to-face contact between patient and dentist during endodontic treatment creates a high risk for cross-infection [4,17].

Protection guidelines for dental care during the COVID-19 pandemic are being formulated based on grouping patients according to their health condition and considering the risks and benefits of the necessary procedures [18]. Most studies recommend the postponement of elective dental treatment, focusing on emergency care only [12,19], since endodontic infections can cause severe pain and endodontic emergencies are considered an important category of dental emergencies [2].

The possible clinical conditions that constitute endodontic emergencies include symptomatic irreversible pulpitis, symptomatic apical periodontitis, acute apical abscess and traumatic dental injuries [4]. When studying the characteristics of dental emergencies during the COVID-19 epidemic in Wuhan, China, Yu et al. [2] found that only dental emergency cases were referred to the hospital during online health consultations. They concluded that most dental emergencies were of endodontic origin (50.6%), including symptomatic irreversible pulpitis, symptomatic apical periodontitis, acute apical abscess and traumatic dental injuries. Bai et al. [11] observed that the frequency of endodontic emergencies and the proportion of patients with acute pain were significantly higher in 2020 than the same period in 2019.

Emergency dental care for a positive COVID-19 patient may be necessary and, to date, there is no consensus on dental treatment protocols for an infected patient [15], but the advice is not to provide care in a primary dental environment, since the COVID-19 patient is classified as having a level-three biosafety risk, which means that procedures involving microbes can cause serious and / or potentially lethal diseases through the airways [20]. In these cases, the hospital environment is the most appropriate for providing frequent air renewal, reducing the risks to the health of professionals [15,21].

Considerations on Suggested Protocols

Yang et al. [16] and Ather et al. [12] suggest that three simple assessments should become routine. The first and most important is the patient's history, preferably remotely, which can be performed by phone or video call. With this, it is possible to know if the patient has had contact with other infected people or shows symptoms that may suggest COVID-19 infection, or even if he / she has already had the disease.

Then, checking the patient's temperature before entering the dental office and, finally and most importantly, the performance of a quick test in the office environment in order to verify whether the patient is infected or not [12,16], because rapid and accurate detection is essentially to limit the spread of the virus, in addition to reducing the waiting period, allowing immediate intervention for negative cases [4].

In situations where rapid tests are inconclusive or positive, care should be postponed and the patient referred to the doctor or health care provider for additional tests to confirm that the patient has COVID-19 and to ensure that he / she is properly treated and clinically isolated [12,16]. The current standard approach for COVID - 19 screening requires real-time reverse transcriptase polymerase chain reaction (rRT-PCR) test. However, according to Sharma et al. [4], this approach depends on high-cost facilities, well-trained staff and generally demands more time.

Studies have shown promising results is testing the diagnosis of coronavirus through saliva, such as the loop mediated isothermal amplification - LAMP [22,23] and microfluidic RT-PCR devices - Lab-on-a-chip tests [1] .

According to Yu et al. [2], reducing care time and controlling exposure to the virus are two relevant ways to reduce the risk of contamination during endodontic treatment. The most recent recommendations regarding the use of personal protective equipment (PPE) for dental emergencies include the use of N95 disposable masks, goggles, disposable gloves and caps, shoe protection, face shields and use of cloaks [15,19]. However, in the case of endododontic emergency care for positive COVID-19 patients, the recommendation is total protection for face and eyes against aerosols, through the use of full face masks with air purifier, which provide protection five to ten times higher than the N95 mask [15].

With regard to radiological examination, pre-treatment radiographs should be limited to extra-oral techniques only, as intraoral radiography can stimulate vomiting and / or cough reflex [24]. The use of computed tomography is also an alternative that can be considered [2], despite the high cost.

Another recommended preoperative approach is to rinse the patient's mouth with hydrogen peroxide and / or povidone-iodine in order to decrease the viral load in saliva [18,19]. The use of 0.12% chlorhexidine dodigluconate, in turn, still lacks more robust scientific evidence [18].

Isolation barriers such as dykes or rubber sheets should be used during clinical care in endodontics, because, although they are not able to limit aerosol diffusion by themselves, they can drastically reduce or even eliminate the presence of salivary components in the aerosol [2, 12].

For cases of vital pulp or pulpitis, pulpotomy or pulp capping can be useful in terms of shortening treatment time [2]. In COVID-19 patients, once initial emergency pulpectomy or pulpotomy has been performed, definitive treatment should be postponed until the patient recovers, which must be at least three days after symptoms disappear [7]. However, it may be prudent to postpone this procedure for at least a month [15], since the time during which the virus can remain active in the patient remains unknown [25]. In addition, the single file systems can be used in endodontic treatment as another alternative to decrease clinical time [26], in addition to avoiding the risk of contamination during resterilization [2].

The post-care period must involve patient care and supervision, as well as environmental disinfection procedures [18]. In addition, waste management must be carried out in a safe manner, and must be conditioned in impermeable bags, made of material resistant to rupture and leakage, and placed in closed containers until collection by specialized services [18].

It is noteworthy that changes in biosafety protocols during the COVID-19 pandemic, the increase in PPE values, and the need to purchase new equipment such as thermometers have significantly increased the costs of dental treatments [27].

Concluding remarks

The main recommendations point out that endodontic care should only be performed in cases of patients with clinical pain conditions, and in cases of COVID-19 patients, the orientation is not to provide care in a primary dental environment, but in a hospital environment.

Currently, the main challenge is the development of a vaccine against SARS CoV-2. Dentists should focus not only on dental treatment and risk reduction, but

also be aware of patients' psychological state. Further studies should be carried out using approaches to mitigate aerosol transmission and reduce the risks of COVID-19 contamination.

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