SARS-CoV-2 and dental treatments

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In recent years, dental care has become more than a necessity treatment. Cosmetic dentistry and regular oral hygiene appointments greatly contribute not only to the health status of the patient, but also to the quality of life. Highly esthetic dental treatments significantly increase a person's self-esteem; conservative and restorative dentistry improve masticatory function, influencing digestion and metabolism, while dental implants successfully replace missing teeth, from single units to full mouth reconstruction.

Infection control has always been the main priority in every dental office. Public health policies regulate all disinfection protocols, from the basic cleaning, chemical disinfection and autoclave sterilization, to the traceability of each sterilization batch. In order to reduce the risk of cross-contamination to a minimum, many instruments have become single use, like endodontic files, scalpel blades, diamond-coated high-speed burs, etc. Other instruments, like bone drills, were redesigned, in order to comply with the sterilization protocols. All these measures, combined with the disinfection of the treatment room, have made dentistry a very safe environment for the patient, with very few documented cases of proven cross-contamination in a dental office.

While the risk of transmitting an infectious disease by using instruments contaminated with infected bodily fluids (such as blood, saliva or pus) is basically inexistent (considering normal disinfection protocols are used), there has been some concern regarding the risk of transmitting

bacteria through aerosols, taking into consideration the fact that in dental practice we use many aerosols-generating maneuvers, especially when using ultrasonic scalers and high-speed turbine. These concerns, which had a foundation in theory, were not proven in practice, and for this reason special protocols were never implemented to deal with aerosols as a potential source of infection.

And then, the SARS-CoV-2 pandemic took Europe and the whole world by storm, with a magnitude which caught almost everyone unprepared. Protocols in every hospital setting and in general in every workplace, even unrelated to healthcare, had to be rewritten, and every profession was re-evaluated from a potential COVID-19 transmission risk. And so, on March 15th 2020, The New York Times published the article "The Workers Who Face the Greatest Coronavirus Risk", in which different professions were given a risk score based on two variables: exposure to disease and physical proximity to others (<https://www.nytimes.com/interactive/2020/03/15/business/economy/coronavirus-worker-risk.html>). Based on this study, the most exposed professionals were dentists (score 97 out of 100) and dental hygienists (score 100 out of 100).

Also, the fact that the novel coronavirus is mainly harbored in the respiratory tract, has generated concerns regarding its transmission through aerosols.

To put all facts together, the dentist, together with the dental assistant, work in very close proximity (less than 50 cm) to the patient's oral cavity and use in their daily practice aerosol-generating procedures for the treatment of patients who may be asymptomatic carriers of SARS-CoV-2, or have a very mild form of infection.

Now, there are 2 major concerns: the protection of the dental workers, who may be at high risk of infection, and the protection of patients, from cross-contamination or from

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acquiring the infection from the dental staff. Different countries have started implementing different policies in dealing with these concerns. As a first measure, all non-essential dental treatments were postponed. Dental practitioners were instructed to use better personal protection equipment (PPE), ideally designed to protect them from aerosols, and treatment rooms were equipped with air sterilizing devices, like ultraviolet lamps, ultraviolet filters and/or nebulization machines. Also, as a recommendation, all aerosol-generating maneuvers were to be avoided. The industry response to this situation was a flooding of social media with commercials to different aerosol-combating devices, like aspiration devices with HEPA filters, glass screens, etc., but all these have no real background and no studies yet to prove their efficiency.

In practice, these restrictions represent a major paradigm change in modern dentistry. While we used to encourage patients to visit the dental office as often as possible, in order to detect any sign of oral disease early, now we tell our patients to avoid coming to the office unless absolutely necessary. We used to recommend a professional cleaning and ultrasonic scaling (if necessary) every 6 months, now we advise against it. We limit treatments to as few appointments as possible, and the adjustment of the personnel to the new PPE has a steep learning curve, making precision dental treatments (such as working with a microscope) even more difficult.

For now, we keep our eyes on the evolution of the pandemic worldwide, and on the announcements regarding a vaccine. But the news so far is not that promising. We can see new cases appearing in countries that had previously managed to stop the epidemic (such as South Korea or China), and a potential vaccine is not that close, since for now we don't have enough data to even declare people who passed naturally through the infection as being permanently immune to reinfection.

So, without an efficient vaccine in the horizon, what is the fate of dentistry? Will we go back to the 19th century, when we only treated teeth after they started to hurt? Will we stop doing oral hygiene, knowing that if we use an ultrasonic scaler we could get a fatal disease? Well, I definitely hope not. Even without a vaccine in the near future, we will have to adapt, and we will have to improve our protocols without altering the quality of the treatments we deliver to our patients, even if that means redesigning from scratch the way dentistry looks today.

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