

Dentistry in Istanbul during the COVID-19 Pandemic Periods: A Multi-disciplinary Overview

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ABSTRACT

The purpose of this article is to provide information about dentistry in Istanbul during the period from the beginning of the COVID-19 pandemic to the present day.

Problems that were not addressed or were attempted to be treated remotely with medication in the period of March-June 2020, when there was complete lockdown, worsened for patients and dentists. In patients in whom the problems need to be addressed immediately, measures have been taken by both physicians and patients, and emergency and non-invasive treatments have been initiated. As of September 2020, HES (Hayat Eve Sığar-Life Fits into Home) code system has been introduced throughout the country. This system allows individuals in the community to be questioned in terms of the risk of COVID-19. Since then, routine treatments have been gradually started in all disciplines of dentistry with all preventive measures.

Consequently, during the COVID-19 pandemic in Istanbul, dentists have introduced new prevention methods into routine practices in addition to standard infection prevention methods. It is believed that all dentists will comply with the changes in the prevention method made during this period and more intensive measures will be taken to not interrupt patient treatments in the future.

Key Words: COVID-19, Dentistry, HES code.

Introduction

The World Health Organization announced in January 2020 that a disease that originated in China's Wuhan-Hubei region in late 2019, acts on the respiratory tract and progresses with severe pneumonia, has affected the whole world and has been declared as a pandemic owing its rapid spread in a short time [1-3].

The disease caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), initially named 2019-nCoV, was later renamed Coronavirus Disease 2019 (COVID-19) [4].

The early clinical findings of this virus, which can be transmitted easily with close contact from person to person, may be nausea, vomiting, fever, dry mouth, muscle pain, cough, disturbance, and loss of smell [5]. In the following period, patients suffer from respiratory distress, weakness, and malaise and may die from acute respiratory distress syndrome, multiple organ failure, arrhythmia, and shock in the late period; abnormal lung on chest Computed Tomography (CT) (icy appearance) images are indicate of the definitive diagnosis of the disease [6].

COVID-19 virus primarily causes infection in the upper and lower respiratory tract. Therefore, the viral load in the mucosa of the nasal cavity, pharynx, and oral cavity is extremely high [7-10].

Dentists and healthcare professionals can easily get infected by bacteria and viruses that infect the respiratory tract. This situation can become even more dangerous for physicians who are in face-to-face contact with their patients; those who are in constant contact with saliva, blood, and other body fluids; and those who use sharp instruments owing to working in the mouth and surrounding tissues [4,11-14]. Hand hygiene

and the use of gloves and masks, which have an indispensable place in dentistry practice, have been replaced by more advanced protection measures during pandemic periods [15].

Owing to the lack of an effective treatment for COVID-19 infection, social distancing, lockdown, and Personal Protective Equipment (PPE) are of great importance for both physicians and patients [15]. Each country has introduced different measures to respond to emergencies and to protect healthcare workers within the framework of recommendations made based on previous pandemics [16,17]. The purpose of our evaluation is to provide information about dentistry during the pandemic in Istanbul, one of the busiest metropolises in the world.

COVID-19 in Istanbul

The first COVID-19 case in Turkey was reported in March 2020 and since then, the country has been taking measures and a complete lockdown was imposed between March and June 2020. After the Ministry of Health declared the COVID-19 pandemic in Turkey in March 2020, all dental schools, state-affiliated dental health centers, and 90% of private clinics stopped dental examinations and treatments between March and June 2020. Training and briefings in dental faculties and dental chambers have been conducted online and practices have been stopped. Telemedicine, which has now become a routine practice and will play a big role in patients' treatments from now on, has gained great importance, and the majority of patients have been prescribed medicine remotely during this period [18]. With telemedicine, the frequency of patients coming to the clinic reduced. State-affiliated dentists have been at the forefront of filiation screening since March 2020. Since June 2020, most of the dental faculties have

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started to work according to a rotation system, only emergency treatments were performed while canceling elective procedures, and they gradually increased work volume. Most private clinics which were closed from March to June were prioritized emergency procedures and non-invasive multidisciplinary approaches after this period. In the first months, the patients who needed to visit for treatment were questioned on the phone whether they had COVID-19. Since September 2020, patients have been asked for Life Fits into Home (HES) codes. HES is an application that allows you to securely share whether you are at any risk in terms of COVID-19, when you are in a public space requiring transportation, corporate visit, or individual communication during the retrained social life period, thus supporting the follow-up of the pandemic [19].

Although there have been general dentists/specialists who died owing to the pandemic, there have also been those who accepted the severity of this incident and quit the profession. Conversely, the physicians who decided to work received trainings with the assisting health personnel that emphasized the importance of standard infection prevention methods as well as additional methods and started to work by increasing the highest level of protection measures.

Oral and Maxillofacial Surgery and COVID-19

During the period of complete lockdown due to the COVID-19 pandemic (March 2020-June 2020), all elective procedures in oral and maxillofacial surgery were canceled and emergency cases were evaluated *via* telephonic examination methods referred to as telemedicine. In telemedicine, patients were questioned; analgesics were prescribed to patients with pain; anti-inflammatory analgesics and antibiotics were prescribed for patients with signs of infection; and patients with bleeding complaints were explained about the measures they could employ according to the bleeding characteristics. In patients who could not be relieved with the recommended measures, severe pain and excessive bleeding were treated with conservative methods, and their long-term treatments were postponed [20-31].

All patients admitted for treatment are considered infected and social distance is maintained as much as possible. FFP 3/ N95 respirator or double mask, protective clothing/overalls, headgear, and goggles/visors are used without omitting any PPE [32]. In oral and maxillofacial applications, oral surgeons should use appropriate personal protection equipment according to the condition of the cases [33].

Operations for impacted partially buried wisdom tooth that cause problems have been performed by applying coronectomy in some cases. Postponed biopsies were obtained, large cysts were reduced by drainage and marsupialization, and their further growth was prevented. Head and neck infections were drained, and the active teeth and infection foci were cleaned. Treatments related to tooth extraction, oroantral fistula, and alveolitis were performed. Treatment options were self-tapping IMF screws for fractures in the lower and upper jaw and Ivy eyelet wiring for dislocation. In addition to these, non-emergency orthognathic patients have been postponed. Bipolar cautery is used at a low power level to provide hemostasis. Resorbable suture materials are preferred to prevent the patient from coming back unless there is an emergency. A scalpel is used to make incisions, thereby reducing the need for irrigation and aspiration [34]. Patients are followed-up online; if complications develop, the patient is called back. Although local anesthesia is the preferred anesthesia method,

when deemed necessary, experienced general anesthesiologists are used. The surgical team comprising minimum individuals comes to the bedside of the patient 20 min after intubation [34].

Corticosteroids are widely used in the symptomatic treatment of severe pneumonia in patients with COVID-19; however, the rate of bacterial infections is higher in patients receiving corticosteroid therapy [35]. In addition, these patients may be at an increased risk of steroid-induced osteonecrosis [36]. Caution should be exercised against corticosteroid use in patients with COVID-19. Therefore, drugs used by patients before surgical intervention are carefully questioned, and preventive measures are taken by evaluating the patients in terms of both the susceptibility to bacterial infection and the risk of developing alveolitis after tooth extraction.

During the COVID-19 pandemic, depending on whether the orofacial infection is deep or superficial, antibiotics and analgesics were primarily prescribed for emergency applications. In these cases, paracetamol and NSAIDs can be used as pain relievers in combination or individually in other pain cases [37]. In addition, azithromycin, which is important in dental practice, can be used as an antibiotic; amoxicillin or clindamycin can also be prescribed depending on the case [38].

Operative Dentistry/Endodontic and COVID-19

After the complete lockdown period in Istanbul, the conditions for admission of patients to clinics have changed as of June 2020 and the treatments have been started by physicians equipped with PPE, assuming that each patient would be COVID-19 positive and according to the degree of urgency [39-42].

Because the virus remains on contaminated surfaces for a long time, the rate of infection with this virus is high for physicians, assistants, and patients who come into contact with these surfaces during this period. The use of rotary instruments and air-water spray that causes the formation of bio-aerosols is minimized. For cavity preparation and caries removal, instead of using an aerotor, low-speed micro motor and excavator are preferred and a traumatic restorative procedures (ART) or chemo mechanical methods are used whenever possible. In treatments, four-hand dentistry is performed with well-trained assisting personnel to reduce the areas of exposure to infection and to work comfortably, and if it is necessary to use a rotary instrument, an additional aspirator such as an extra oral dental suction system that absorbs bio-aerosols formed in the environment is used. Along with a powerful unit aspirator system, the surgical aspirator is used as an additional saliva sucker. The use of rubber dam remarkably prevents the spread of pathogenic microorganisms from splashing oral fluids [43-46]. The use of the rubber dam cover is not only limited to endodontic but also restorative procedures. If a rotary instrument is used, the saliva sucking aspirator under the rubber dam functions in the mouth, whereas the assistant physician uses the surgical aspirator as a second aspirator and aspirates the working area over the rubber dam [47]. Temporary fillings of advanced caries with glass ionomer cement and canal treatments with calcium hydroxide have been the most common applications in restorative dentistry and endodontic. Extra oral imaging systems such as OPG or CT imaging are preferred as diagnostic tools to eliminate the risks of possible cough-gag reflex and cross-infection caused by the RVG sensor during intraoral radiography. In cases where periapical radiography is mandatory, the

sensor is covered in two layers and procedures are performed to prevent patient's nausea reflexes. Similar reflexes may occur during measurement for indirect restorative procedures in sensitive patients. To prevent these, attention is paid to choosing the right size of spoon and an anesthesia is applied to prevent the gag reflex, if necessary.

Prosthodontics and COVID-19

The prosthodontics procedures especially need to be modified during the COVID-19 for following reasons. The prosthodontists have to deal with saliva- and blood-contaminated articles which are a source of viral transmission. They have to work with bio-aerosol-generating instruments during prosthodontics rehabilitation which are the main source of viral spread [48,49]. The majority of patients with removable prosthodontics belong to the geriatric age group having health problems as a result of aging process and can get this infection easily [50,51]. Almost every prosthodontics treatment demands multiple visits by patients. Prosthodontics treatment (complete denture, partial denture, crown, bridges, inlay, onlay, and implant supported prostheses) need laboratory work which involves multiple professionals such as dentist, dental staff technician, and laboratory staff. More humans in procedures increase the probability of possible contamination. Collection of the dental impression; pouring of the models; fabrication of prosthesis; and finishing, polishing, and delivery of the final work to the clinics require special attention for preventing viral spread [52,53].

At the beginning of the COVID-19 pandemic, during the period when complete lockdown was enforced (March-June 2020), patients whose treatments were previously planned or continued were contacted and recommendations were made about home care for patients who do not need emergency treatment.

Prosthodontics treatment has begun to be performed by prioritizing minimum invasive procedures as of June 2020, and procedures generating bio-aerosol have been prevented whenever possible. The procedures performed during this period are for denture-related traumatic ulcers, repair of broken dentures, the need for temporary or immediate dentures, dislodgement of fixed dental prostheses, crown/bridge repair or cementation of the temporary restoration, and problems with implants or implant prosthesis. Most commonly, the patient presented with symptoms related to prosthetic restoration or dentures.

As of September 2020, when the HES codes of the patients could be questioned, prosthodontics treatment started to be performed gradually under the pandemic precautions as stated in the patient and physician preparation section. All fixed and removable restorations, including the implant prosthesis of the patients, have begun to be made [54].

Whenever possible, disposable instruments have been used to reduce the risk of cross-infection [55,56]. Autoclaved metal impression trays or disposable trays are used. In prosthodontics treatments, everything that goes to and comes from the laboratory is carefully disinfected because it carries a high risk of contamination. Impressions are rinsed to remove saliva, blood, and debris and then disinfected and packed in zip-lock bags before sending to the laboratory for pouring. Work authorization forms are sent in separate zip-lock bags. Disinfection of dental impressions can be performed by immersion or spray. Irreversible hydrocolloids and polyether materials

have a higher risk of distortion after immersion, which is also time-consuming and expensive, with the necessity of disinfectants that can be freshly prepared and immediately discharged [57,58]. Therefore, the impression is disinfected by spraying with a hospital-level disinfectant. Record bases, wax rims, and prostheses are adjusted on priority basis to prevent any modifications after insertion in the mouth. As a conclusion, prosthodontics treatment procedures should be performed with great care and infection control for COVID-19.

Discussion and Conclusion

During the period of March-June 2020, when there was complete lockdown in Istanbul, patients were mainly prescribed medicines to control pain and infection. As of June 2020, although they have been behaving timidly, patients have started to apply to places that have started oral and dental health services owing to their increasing number of problems. Tooth extractions, infection drainage, cyst drainage, and marsupialization; impacted dental operations and coronectomy applications in surgery; temporary fillings with glass ionomer cement of advanced caries and canal treatments with calcium hydroxide paste in restorative dentistry and endodontic, and broken prosthesis repairs, prosthesis alignment, and fallen crown cements have been the most common applications in prosthetics.

Evaluation and treatment of patients are performed under three main headings. The first of these is to obtain an online history from the patient and to inform the clinic about the clinical admission protocol. The second is to apply the admission protocol for patients who have been approved to be admitted to the clinic; ensuring that the patient wears his mask, questioning the HES code, measuring his fever, placing his belongings in bags, asking to maintain social distance whenever possible, and ensuring that the patient washes his hands and brushes his teeth with a disposable toothbrush. In the third part, patients are taken to the treatment room where all the precautions are taken, and they wear protective glasses and they are asked to frequently perform mouthwashes for a prolonged duration.

One of the biggest problems in the dentistry practice is bio-aerosols formed in the environment infecting people fighting with this situation. With prolong and frequently repeated mouthwashes, the amount of microorganisms in the bio-aerosol were reduced, and different applications have been introduced in addition to standard environment disinfection methods. Natural ventilation with open windows and doors and disinfection of the environment with hypo-chlorous acid, ozone, and UV lamps has been the most common methods. The use of FFP 2/N95 mask, gloves, protective clothing, headgear, and visor has become indispensable for the protection of dentists and healthcare professionals from bio-aerosol contamination.

As a result, COVID-19 has prompted dentists in Istanbul to take serious measures in terms of both preparing patients and making their working environments compliant with pandemic rules. Experiences gained from COVID-19 have revealed the need for the dentist to constantly update their knowledge to create a safer treatment environment against future pandemics.

Disclosure Statement

The authors report no conflict of interest.

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