Revista Habanera de Ciencias Médicas

YEAR 2020
19(2) MARCH-APRIL
ISSN 1729 - 519X

ecimed

CLINICAL AND PATHOLOGICAL SCIENCES
REVIEW ARTICLE

Risks and challenges for dental professionals in addressing COVID-19

Riesgos y retos para los profesionales de las disciplinas estomatológicas ante la COVID-19

Denia Morales Navarro[1]

[1]Universidad de Ciencias Médicas de La Habana, Facultad de Estomatología "Raúl González Sánchez". La Habana, Cuba.

How to cite this article

Morales Navarro D. Risks and challenges for dental professionals in addressing COVID-19. Rev haban cienc méd [Internet]. 2020 [cited]; 19(2):e3256_E. Available from: http://www.revhabanera.sld.cu/index.php/rhab/article/view/3256

Received: March 29th, 2020.
Approved: April 15th, 2020.

ABSTRACT

Introduction: Dental procedures involve frequent exposure to saliva, blood and other fluids, so there is a risk of nosocomial infection with COVID-19.

Objective: To describe the transmission of COVID-19, measurements and current situation in dentistry.

Material and methods: A bibliographic review was carried out in April, 2020. Journals from the Web of Sciences were fundamentally evaluated. All publications included were from 2020, in English and Spanish. Descriptors such as: "coronavirus infections" and "transmission" were used.

Development: The angiotensin-II converting enzyme has a level of expression in oral tissues that is higher in the tongue. Saliva is a means of transmission. Many health workers have been infected and died during the pandemic. Dental patients and professionals can be exposed to viruses that infect the oral cavity and the respiratory tract; therefore, recommended

measures include cessation of elective activities, use of barrier elements, and aerosol control.

Conclusions: Saliva is the main means of transmission by COVID-19 in dentistry and the aerosols originated in the care increase the risk of contamination. Recommended measures include using means of protection and carrying out surface disinfection. Many countries suspended dental care, except for urgent care.

Keywords: coronavirus infections; severe acute respiratory syndrome; pandemics; transmission; patient-to-professional infectious disease transmission; dental staff; protection; health personnel.

RESUMEN

Introducción: Los procedimientos estomatológicos implican exposición frecuente a saliva, sangre y otros fluidos, por lo que existe riesgo de infección nosocomial con COVID-19.

Objetivo: describir la transmisión de la COVID-19, medidas y situación actual en estomatología.

Material y Métodos: se realizó una revisión bibliográfica en abril de 2020. Se evaluaron fundamentalmente revistas de la Web of Sciences. Todas las publicaciones incluidas fueron de 2020 en inglés y español. Se emplearon descriptores como: "coronavirus infections" y "transmission".

Desarrollo: la enzima convertidora de angiotensina II tiene un nivel de expresión en tejidos bucales y es mayor en la lengua. La saliva es un medio de transmisión. Muchos trabajadores sanitarios se han contagiado y fallecido durante la pandemia. Los pacientes y profesionales de estomatología pueden exponerse a virus que infectan la cavidad bucal y el tracto respiratorio y las medidas recomendadas incluyen el cese de las actividades electivas, uso de elementos de barrera y control de aerosoles.

Conclusiones: la saliva es el medio de transmisión principal por COVID-19 en estomatología y los aerosoles originados en la atención aumentan el riesgo de contaminación. Las medidas recomendadas incluyen emplear medios de protección y desinfección de superficies. Muchos países suspendieron la atención estomatológica, a excepción de la urgente.

Palabras clave: infecciones por coronavirus; síndrome respiratorio agudo grave; pandemias; transmisión; transmisión de enfermedad infecciosa de paciente a profesional; personal de odontología; protección; personal de salud

INTRODUCTION

In December 2019, a group of pneumonia cases occurred in Wuhan City, Hubei Province, central China.[1,2] Epidemiological evidence suggested that most of these patients had visited a local seafood market in Wuhan,[3] where live animals were also sold.[4] The coronavirus identified as causing the disease was initially named as the novel coronavirus (2019-nCoV) by the World

Health Organization, which officially named the disease as a coronavirus disease 2019 (COVID-19), and the Coronavirus Study Group of the International Committee proposed to name the new coronavirus as SARS-CoV-2.[1] An outbreak of SARS-CoV-2 infection has developed and spread to various countries.[5]

Dentists are an important component of the health system and carry out their work in different scenarios both in direct patient care in dental clinics and hospitals, and as an active part of the basic health team that participates in preventive or other work. Being health workers highly vulnerable to SARS-CoV-2 infection, the motivation to carry out this research arises with the **objective** to describe the transmission of COVID-19, measures and current situation in dentistry.

MATERIAL AND METHODS

A bibliographic review of the transmission of COVID-19, measurements and current situation in dentistry was performed.

Impact journals from the Web of Sciences, publications from international scientific organizations and societies were evaluated. The selection of organizations and associations was based on their prestige as international benchmarks within the guild, using the Google search engine for their location and consultation. A total of 21 publications were obtained from scientific organizations and societies that reported the topic addressed, prepared by expert committees, in both Spanish and English.

PubMed/Medline databases were examined, using descriptors such as "coronavirus infections", "severe acute respiratory syndrome", "transmission"; "Infectious disease transmission, patient-to-professional", "dental staff" and "protection". Publications in both English and Spanish were included. The Boolean operators AND, OR and NOT were used. The advanced search strategy was used to select the articles. Once the bibliography was chosen, a content analysis of the different articles was carried out and the most relevant information was selected according to the objective of the full-text work. The methodological quality or validity of the studies was considered. All included works were published in 2020.

As a result of the search, 57 articles were obtained, which were screened in order to keep only those that best described the elements of the review. In this way, the study was limited to 34 articles.

From the reading, interpretation, analysis and integration of the information from each source, the results were reflected in the text.

DEVELOPMENT

Cellular receptor of the virus and behavior in the oral cavity

Xu et al.[6] express that the angiotensin-II converting enzyme (ACE2) is probably the cellular receptor for SARS-CoV-2. It plays a crucial role in the entry of the virus into the cell to cause the final infection. Expression and distribution of ACE2 in the human body may indicate possible

routes of SARS-CoV-2 infection. Organs with cells with high expression of ACE2 should be considered as a high potential risk of SARS-CoV-2 infection.

The results of Xu et al.[6] validated the expression of ACE2 in the oral cavity and indicate that the level of expression of ACE2 in the oral tissues was higher in the tongue than in the jugal or gingival. These findings indicate that the oral cavity could be considered a potentially high risk for infectious susceptibility to SARS-CoV-2 and provide evidence for future prevention strategies in dental clinical practice as well as in daily life. The SARS-CoV-2 oral transmission route should not be excluded.

For Peng et al.[7] the high affinity between the ACE2 protein and the SARS-CoV-2 suggests that the population with the highest expression of ACE2 could be more susceptible to the virus. He adds that ACE2 receptors are found abundantly in the epithelium of the salivary gland duct and are likely to be early targets of infection, although this has not been confirmed so far.

Saliva as a means of virus transmission

Respiratory viruses can be transmitted directly or indirectly through saliva,[7] which is particularly important for the dental profession. In this regard, Gu et al.[8] add that the SARS-CoV-2 sequence could also be detected in the self-collected saliva of the majority of infected patients, and that the monitoring of serial saliva samples showed a decrease in the viral load in saliva after hospitalization. An additional positive viral culture suggests the possibility of infection of the salivary gland and a possible transmission by this route.

Sabino-Silva et al.[9] suggest that there is a minimum of three different pathways for the virus to present itself in saliva: first, from contamination in the lower and upper respiratory tract that enters the oral cavity along with the frequently exchanged liquid droplets. Secondly, due to its presence in blood, it is possible to access the mouth through the crevicular fluid, a specific exudate from the oral cavity that contains local proteins derived from the extracellular matrix and proteins derived from serum. Finally, due to infection of the major and minor salivary glands, with the subsequent release of particles in the saliva through the salivary ducts.

Risk of transmission to the health personnel

Infections of health workers are an ominous finding in any emerging infection.[10] Exposure and possible infection of health workers remain extremely worrisome.[11]

A vice minister of China, at the National Health Commission, said that 1,716 health workers had been infected in the country until February 11, 2020, of whom 6 died.[12] The same institution reported on February 14, 2020 that transmission among health workers occurred in 3,8 % of COVID-19 patients.[1] Guan et al.,[13] in a study of 1099 COVID-19 patients from mainland China until January 29, 2020, found that 3,5 % were health workers; while Wang et al.[14] report that of the 138 patients in their study, 40 were health workers (29 %) who were infected in the hospital: 31 (77,5 %) worked in general wards, 7 (17,5 %) in the emergency department and 2 (5 %) in the intensive care unit.

A Korean article[15] reports that, in an institution, more than 10 doctors or nurses contracted

COVID-19 while providing care to patients and that emergency doctors and technicians also became infected with the virus while transporting patients. In an investigation of 30 infected patients (22 doctors and 8 nurses), Liu et al.[16] consider that the health personnel have a higher risk of contagion and that infection rates are associated with contact time and the amount of aspirated virus.

In the dental field, Meng et al.[17] publish figures of the staff confirmed with COVID-19 at the School and Hospital of Stomatology, Wuhan University: 1 doctor (preventive dentistry), 2 nurses (prosthetics), 1 librarian, 1 nurse (Oncological surgery), 1 office worker, 1 doctor (Research) and 2 doctors from satellite clinics.

The author considers that the contagion figures published speak for themselves of the vulnerability of health personnel in the COVID-19 pandemic, and of the need to raise awareness and strictly comply with the organizational measures of services and individual protection.

Risk of nosocomial infection by COVID-19 in dental settings

Aquino-Canchari[18] agrees that this outbreak is a reminder for dentists and other health professionals to follow biosafety regulations, since the practice is exposed to a wide variety of microorganisms: spores, fungi, protozoa, bacteria and viruses such as SARS-CoV-2. In this sense, Li and Meng[19] state that it is urgent to implement strict and efficient infection control protocols in this environment.

For the Centers for Disease Control and Prevention[20] of United States, dental care has unique characteristics that justify additional infection control considerations. Caring for patients requiring transmission-based precautions is not possible in most dental settings, as they are not designed or equipped to provide this standard of care. For example, most dental settings do not have airborne infection isolation rooms or single patient rooms, do not have a respiratory protection program, and do not routinely store N95 respirators.

Dental procedures involve face-to-face communication with patients and frequent exposure to saliva, blood, other body fluids, and the management of sharp instruments. Pathogenic microorganisms can be transmitted through inhalation of airborne microorganisms that can remain suspended for long periods, direct contact with the patient's blood, oral fluids or other materials, contact of the conjunctival, nasal or oral mucosa with drops and sprays containing microorganisms generated from an infected individual and propelled at close range by coughing and speaking without a mask, and indirect contact with instruments contaminated and environmental surfaces.[7] For Meng et al.[17] dental patients who cough, sneeze, or receive treatment, including the use of a high-speed handpiece or ultrasonic instruments, cause their secretions, saliva, or blood to form sprays in the surroundings. The dental appliance could become contaminated with various pathogenic microorganisms after use or be exposed to a contaminated clinical environment. Subsequently, infections can occur through the puncture of sharp instruments or direct contact between the mucous membranes and contaminated hands.

Sabino-Silva et al.[9] consider that there is a need to increase research for the detection of SARS-CoV-2 in oral fluids and its impact on transmission, which is crucial to improve prevention strategies, especially for dentists and health professionals. Saliva can play an essential role in transmission from person to person.

Measures to be taken by the dental staff

The American Dental Association[21] recommends the use of telecommunication technology to evaluate cases and thus limit office visits to only those who need urgent or emergency care. This can facilitate advice, triage and direct interaction planning if necessary.

It is imperative that professionals are familiar with how the disease spreads, how to identify patients with COVID-19, and what additional protective measures should be taken during practice to avoid transmission.[7] According to the author, it is important to keep us informed by consulting scientific publications and reliable sources of information.

Fecal-oral transmission of the virus has been disclosed, underscoring the importance of hand hygiene for dental practice. Although this is the routine prerequisite for it, compliance is relatively low, posing a major challenge for infection control during the transmission period of the epidemic. More care should be taken so that professionals avoid touching their own eyes, mouth and nose.[7]

The use of barrier protective equipment, which includes goggles, masks, gloves, hats, face shields, and clothing, is recommended for all care, as well as antimicrobial mouthwash before dental procedures. However, chlorhexidine, which is commonly used as a mouthwash in dental practice, may not be effective in removing the SARS-CoV-2. Since the virus is vulnerable to oxidation, pre-procedure mouthwash containing oxidizing agents such as 1 % hydrogen peroxide or 0,2 % povidone is recommended to reduce salivary viral load.[7]

The use of rubber dams can significantly minimize the production of aerosol or splashes contaminated with saliva and blood. When applied, an extra high-volume suction for aerosols and splashes should be used during procedures along with regular suction. In this regard, Meng et al.[17] state that variable volume ejectors are necessary. If rubber dam isolation is not possible, the use of hand-held devices, such as scrapers, is recommended to minimize aerosol generation as much as possible.[7]

The Council of Dentists of Spain[22] communicates that rotary instruments that are not provided with a non-return valve can suck up debris, bacteria and viruses, contaminating the air and water circuits and producing an increased risk of cross infection.

Meng et al.[17] add that cough-inducing procedures should be avoided (if possible) or performed with caution. Intraoral x-ray examination can stimulate saliva secretion and cough, so extraoral imaging studies, such as panoramic radiography and cone beam tomography, are appropriate alternatives during the COVID-19 outbreak. For emergency treatment, patients could be cared for in an isolated, well-ventilated room or in rooms with negative pressure.

If an extraction is required, it is preferred to use

absorbable suture. For patients with soft tissue facial contusion, it is recommended to rinse the wound slowly and use the saliva ejector to avoid aerosol formation. Medical institutions must take strict and effective disinfection measures in both clinical settings and public areas. The latter and appliances should also be cleaned and disinfected frequently, including door handles, chairs and desks. The elevators must be disinfected regularly. People who take them should correctly wear masks and avoid direct contact with buttons and other objects.[7]

Medical waste (including disposable protective equipment after use) should be transported to the temporary storage area of each institution. The instrument and reusable items should be properly cleaned, sterilized, and stored.[7]

Wang et al.[23] advise helping children develop good oral and dietary habits, such as tooth brushing and flossing, to avoid oral disease and emergencies.

Regarding laboratory articles, Hurley et al.[24] encourage the maintenance of good practice of decontamination of impressions, prosthetics and orthodontic appliances to prevent all types of cross infection, and for the International Association for Dental Research,[25] in regions that are heavily affected with COVID-19, patients in waiting rooms should also wear medical masks.

Regarding the management of orthodontic emergencies, Caprioglio et al.[26] recommend using telecommunications technology to advise patients on how to prevent and cope with it, and thus decrease patient attendance to the clinic. In relation to broken or disruptive functional devices, it is advisable to suspend use for the time being; and in the case of the use of fixed appliances, orthodontic relief wax may be recommended as a temporary solution when they produce soft tissue trauma due to wire ends or ligatures.

Situation of dental practice in some countries

According to Napimoga and Ribas de Freitas,[27] various dental associations around the world recommended or even compelled dentists to postpone elective procedures on March 16, 2020. In Wales, UK, the Health and Social Services Group,[28] issued a statement to all dental primary care teams on March 23, 2020, stating the "Red Dental Alert Level COVID-19", which meant that dental services should contribute to the national effort to reduce the spread of COVID-19 and its impact on the population. In another statement,[29] the objective of the phase was established to provide urgent and emergency dental services only and to minimize the transmission of Coronavirus for all dental procedures by stopping all routine activity, eliminating aerosol generation procedures in primary care. While, for England, on March 25 it was communicated that all non-urgent routine dental care, including orthodontia, should be suspended and deferred until otherwise indicated and that a remote emergency care service should be established, which would provide a telephone evaluation for patients with urgent needs.[30]

The Chilean College of Dentists[31] reported on March 29, 2020 that within the scope of COVID-19, there is a lack of full-time dental emergency centers operating in all regions of the country.

The Centers for Disease Control and

Prevention[32] of the United States recommended on March 27 that, to protect personnel and preserve personal protective equipment and patient care supplies as well as expand the hospital capacity available during the COVID-19 pandemic, dental facilities were to postpone elective procedures, surgeries and non-urgent dental visits, and to prioritize urgent and emergency procedures now and for the next few weeks.

Specific measures for Maxillofacial Surgery

According to the author's opinion, it should be clarified that in Cuba, Maxillofacial Surgery is a dental specialty and that surgeons generally work in hospital institutions, assuming oral, traumatic and oncological head and neck surgery, among others. All this makes them governed by hospital organization systems, but without losing the dental essence.

According to Kowalski et al.,[33] otolaryngologists, head and neck and maxillofacial surgeons are exposed to the highest risk of infection while caring for COVID-19 positive patients, and their protection should be considered a priority in current circumstances.

The Royal College of Surgeons of Edinburgh[34] advises that potential COVID-19 infection should be considered in all patients and that guidelines should be followed and common sense needs to be applied to clinical settings at risk. While Royal College of Surgeons,[35] exposes that the surgical workforce will have to adapt during the COVID-19 pandemic. The priorities are: maintaining the capabilities of emergency surgery, protecting and preserving the surgical workforce, and fulfilling alternative surgical and non-surgical roles.

Magennis[36] recommends that the number of consultations be restricted and that the hospital stay be shortened to the maximum, as well as that the health personnel be restricted. Surgeries should be as brief as possible. It is advisable to shorten waiting times and take measures for vulnerable groups (older people and comorbid patients who do need care) to maintain social distance.

Grant et al.[37] recommend that all routine elective surgical procedures, including dental ones, should be canceled and rescheduled when safe management strategies have been clearly identified. Likewise, the Spanish Society of Oral and Maxillofacial Surgery of the Head and Neck[38] recommends reviewing the schedule of all elective surgeries to minimize, postpone or cancel non-essential interventions until the peak of the epidemic is considered to have been overcome. It also recommends reducing the stays of admitted patients, minimizing the coincidence of doctors in the same room, that patients enter the hospital unaccompanied, the suspension of clinical sessions, multidisciplinary committees and all classroom teaching activities aimed at residents and students of undergraduate and postgraduate courses. It is recommended to optimize the organization of work so that the residents who come to the hospital are as few as possible and each one has a specific work objective previously marked. During the watch, unnecessary walks by the emergency service

should be avoided.

Procedures should be limited to those involving urgent airway management, epistaxis, surgical management of facial fractures that require internal skeletal fixation, and oncological procedures in which delayed management could affect the final results. Contact with the patient should be limited to surgeons older than 60 years, immunosuppressed, chronic lung disorders or multiple comorbidities. The number of residents and auxiliary personnel should be as limited as possible.[37]

Yang et al.[39] recommend, according to their experience in the diagnosis and management of Maxillofacial Surgery patients during the prevention and control of the present pandemic in China, that patients who do not require emergency care with stable vital signs that require interventions, surgical procedures (closed fractures, non-life threatening oral or facial infections, or odontogenic infections) require a COVID-19 screening test and preoperative evaluations to avoid unnecessary exposure to it. It should be noted that the types and patterns of fever in patients with maxillofacial trauma or infection can be distinguished from those due to COVID-19 through extensive history taking, clinical examination, laboratory tests, and radiographic investigations. Additionally, it highlights that the supply of blood and blood products, as well as multidisciplinary support and care for the seriously ill patients, may be affected in the epidemic; therefore, treatment plans should be kept as simple as possible.

In this sense, Coccolini et al.[40] support the idea and add that the use of resources should be carefully considered when planning surgical procedures, particularly with regard to materials, personnel, devices, intensive care beds, blood components, etc. Regarding surgical management, they advise:

- Use disposable and minimal material for each intervention.
- Transport personnel must be the same from the origin of the transport to the destination.
- Once the patient has entered the operating room, the doors must be closed.
- The personnel involved in the intervention must not leave the operating room during the procedure.
- The clinical documentation must remain outside the operating room.
- After each procedure, all personnel involved, whenever possible, should take a shower.
- The recovery phase after surgery must be performed in the operating room.

For a surgical case, Grant et al.[37] add that the operating room team must be outside the door for 20 minutes before entering it after intubation. After this time, you must enter with the use of adequate protection measures. The reason for this is that after an aerosol generation procedure, the virus could be present. All unnecessary personnel should be out of the room for extubation, and an oxygen mask should be placed on the patient's face after removing the tube to mitigate aerosol formation with coughing.[37]

For the treatment of head and neck cancer, the British Association of Head and Neck

Oncologists[41] recommends making local contingency plans. Daytime surgery should be prioritized where feasible (for example, wide local excision without reconstruction), restriction or interruption of surgical procedures requiring postoperative in intensive care units, consider the possibility of reducing the duration of surgery whenever possible, restrict non-essential personnel in the operating room. For non-surgical management, the restriction or discontinuation of chemoradiotherapy should be considered in favor of radiotherapy alone, consider hypo-fractionated radiotherapy courses in appropriate patients and delay in the initiation of palliative chemotherapy in asymptomatic individuals.

Bartlett et al.[42] state that treatment decisions must be made on a case-by-case basis. Knowledge of the biology of each cancer, alternative treatment options, and current institutional policies for the pandemic must be considered. In this sense, Ansarin[43] states that ethically, it is difficult to define the correct compromise between the necessary treatments for cancer and the risk of infection. The biology of the tumor, the health of the patients, and the "viral" integrity (nature free of COVID-19) of the hospital must be considered in treatment decision-making.

De Felice et al.[44] agree with the aforementioned, pointing out that in Italy the majority of patients are diagnosed with advanced-stage head and neck cancer and should receive treatment as soon as possible. So, during this pandemic period these patients represent a major clinical problem. The multidisciplinary team must weigh the risks and benefits for patients when deciding whether to modify the treatment approach individually. The following should be considered: i) omitting systemic therapy for patients ≥70 years or younger with comorbidities, such as diabetes and cardiovascular disease. ii) omitting cisplatin-based induction chemotherapy. iii) short overall treatment time. iv) delay postoperative radiation therapy in patients with salivary gland tumors for up to 12 weeks after surgery. v) develop an online surveillance plan.

Among the procedures for managing aerosol-generating airways, The Royal College of Surgeons[45] lists tracheostomy, intubation, extubation, and related procedures, open aspiration, and manual ventilation.

To perform tracheostomy, the patient should be sedated, pre-oxygenated, and ventilation should be maintained before an incision is made in the trachea to minimize aerosol formation.[37] Coincidentally, Pichi et al.[46] express that surgical tracheostomy in sedated and intubated patients is preferable to that of the awake patient for whom the cessation of air flow cannot be obtained and the emission of drops is inevitably greater.

Suction should be limited as much as possible. Bipolar cauterization is preferred over monopolar. Closed suction systems for tracheostomy care are preferred.[37]

The Spanish Society of Oral and Maxillofacial Surgery of the Head and Neck[47] advises regarding the performance of tracheostomies:

- Percutaneous surgery is performed to avoid dispersal of aerosols and minimize bleeding into the respiratory tract.
- If this is not possible, use standard

tracheostomy surgical material.

- To the extent possible, avoid electric, ultrasonic or coagulation cutting and coagulation systems that can spread aerial macroparticles.
- Preferably use cold material and conventional hemostasis systems
- Use closed circuit aspiration systems with antiviral filter.
- Perform the tracheostomy in the operating room or isolated room and if possible with a negative pressure system.
- The minimum necessary personnel should stay during the technique.
- Perform the tracheostomy by the most experienced staff using the shortest possible time.
- Use appropriate protection measures.

Osher,[48] on behalf of the British Association of Oral & Maxillofacial Surgeons, advises regarding tracheostomy that care should be taken not to pierce the endotracheal tube cuff when performing the procedure; if possible, stop ventilation while making a window in the trachea and verify that the cuff is still inflated before resuming ventilation. Ventilation should cease prior to insertion of the tracheostomy tube and ensure rapid and accurate placement of the tracheostomy tube with rapid inflation of the cuff.

In the field of urgent trauma care, it should be noted that working near the airways and airway interventions such as chin lift or mandibular thrust may expose you to an increased risk of airborne infection. [49]

For Edwards et al.,[50] most oral lacerations do not need to be closed. Local wound care with saline or chlorhexidine rinses twice daily for one week will suffice for the vast majority of these injuries, although complex tongue injuries are more likely to require closure. Regarding the management of nasal fractures, nasal manipulation is considered high risk for exposure and aerosol formation of secretions. Delayed management of all nasal fractures should be seriously considered. An exception would be drainage of a septal hematoma. If choosing to treat a nasal fracture or drain a hematoma, consideration should be given to avoiding the use of aerosol medications for intranasal vasoconstriction and anesthesia. Topical local anesthesia with vasoconstrictor is preferred.

The procedures must be performed by an experienced surgeon, with a minimum number of assistants. In general, closed procedures are preferred if an internal fixation is not required for reduction stability.

Specific recommendations based on the anatomical region of the fracture:

Mandibular:

1. Consider closed reduction with self-drilling maxillo-mandibular set screws.
2. Preferably use a scalpel over monopolar cauterization for incisions of the mucosa.
3. Employ bipolar cauterization for hemostasis in the lowest power setting.
4. Use self-drilling screws to fix monocortical screws.
5. When drilling is required, limit or eliminate watering.

6. If drilling is required, consider a battery powered low speed drill.
7. If a fracture requires internal skeletal fixation, consider placing the fixation screws intraorally, then place an occlusive dressing over the mouth and use a transcutaneous approach instead of an extended intraoral approach.
8. If an osteotomy is required, consider an osteotome instead of an electric saw.[37]

Third facial half

1. Consider closed reduction only if the fracture is stable after reduction.
2. Avoid intraoral incision if two-point fixation is sufficient for stabilization.
3. Use a scalpel instead of monopolar cautery for incisions of the mucosa.
4. Avoid repeated suction and irrigation.
5. Use bipolar cauterization for hemostasis at the lowest power setting.
6. The use of self-drilling screws is preferred.
7. If an osteotomy is required, consider an osteotome instead of a power saw or high-speed drill.[37]

The National Health Service[51] of England states that the decision to perform surgical or conservative treatment must consider the available facilities. As the health system is put under more pressure, there may be a shift towards non-surgical care, which can reduce the hospital burden and protect the individual from longer exposure in a hospital, as well as free beds for more urgent cases.

We agree with Ng Shan Hua et al.[52] that communication channels must be maintained to ensure the accurate and timely dissemination of information between departments in the volatile and dynamic environment of an epidemic. This ensures updating, prevents miscommunication or confusion from unverified sources of information (especially in the age of social media), and helps build trust and visibility in hospital leadership. Without a doubt, the pandemic has caused unprecedented adaptations in the management of medical care, either locally or globally.[53]

Situation of Cuban dentistry

In Cuba, the National Strategic Plan for Confronting COVID-19 was designed in January 2020, which involves all the Organizations of the Central State Administration, Companies, the Non-State Sector and the general population.[54]

The reorganization of hospital services has been carried out in stages, and those activities that could be displaced for other times have also been postponed. As for high-risk services, such as dental services, it was decided to stop them on March 24, 2020, except for emergency services.

Dental students, and dentists from the health areas, have been called by the Cuban Ministry of Public Health to carry out research work on Acute Respiratory Infections. The Maxillofacial Surgery services ensure cancer and emergency care, maintaining care for the population and complying with individual and social protection measures.

We agree with Peñarrocha Diago et al.[55] that dentistry is going to undergo important changes in the coming months, which requires information, reliable scientific articles, consensus on the risk of infection, and treatment protocols. The bibliographic review provides scientifically

supported theoretical knowledge, which has emerged from prestigious international publications, as well as recommendations from renowned foreign organizations and societies. This review is limited by the restricted amount of existing scientific articles on COVID-19 and the dental practice.

CONCLUSIONS

Saliva is the main means of transmission for COVID-19 in dentistry and the aerosols originated in the care increase the risk of contamination. Recommended measures include using means of protection and surface disinfection. Many countries suspended dental care, except for urgent care.

REFERENCES

1.Guo YR, Cao QD, Hong ZS, Tan YY, Chen SD, Jin HJ, et al. The origin, transmission and clinical therapies on coronavirus disease 2019 (COVID-19) outbreak – an update on the status. Military Med Res [Internet]. 2020 [Cited 24/03/2020];7:11:[approx. 1 p.]. Available from : https://mmrjournal.biomedcentral.com/articles/10.1186/s40779-020-00240-0

2. Bajema KL, Oster AM, Mc Govern OL, Lindstrom S, Stenger MR, Anderson TC, et al. Persons Evaluated for 2019 Novel Coronavirus — United States, January 2020. MMWR Morb Mortal Wkly Rep [Internet]. 2020 [Cited 24/03/2020];69(6):166–170. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7017962/

3. Xu XW, Wu XX, Jiang XG, Xu KJ, Ying LJ, Ma CL, et al. Clinical findings in a group of patients infected with the 2019 novel coronavirus (SARS-Cov-2) outside of Wuhan, China: retrospective case series. BMJ [Internet]. 2020 [Cited 24/03/2020];368:m606. Available from: https://www.bmj.com/content/368/bmj.m606.long

4. Chen N, Zhou M, Dong X, Qu J, Gong F, Han Y, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. Lancet [Internet]. 2020 [Cited 24/03/2020];395(10223):507-13. Available from: https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30211-7/fulltext

5. Liu YC, Liao CH, Chang CF, Chou CC, Lin YR. A Locally Transmitted Case of SARS-CoV-2 Infection in Taiwan. N Engl J Med [Internet]. 2020 [Cited 24/03/2020];382(11):1070-2. Available from: https://www.nejm.org/doi/full/10.1056/NEJMc2001573

6. Xu H, Zhong L, Deng J, Peng J, Dan H, Zeng X, et al. High expression of ACE2 receptor of 2019-nCoV on the epithelial cells of oral mucosa. Int J Oral Sci [Internet]. 2020 [Cited 24/03/2020];12:8. Available from: https://www.nature.com/articles/s41368-020-0074-x

7. Peng X, Xu X, Li Y, Cheng L, Zhou X, Ren B. Transmission routes of 2019-nCoV and controls in dental practice. Int J Oral Sci [Internet]. 2020 [Cited 24/03/2020];12:9. Available from: https://www.nature.com/articles/s41368-020-0075-9

8. Gu J, Han B, Wang J. COVID-19: Gastrointestinal manifestations and potential fecal-oral transmission. Gastroenterology [Internet]. 2020 [Cited 24/03/2020];158(5):e1-e20. Available from:

https://www.gastrojournal.org/article/S0016-5085(20)30281-X/pdf?referrer=https%3A%2F%2Fwww.ncbi.nlm.nih.gov%2F

9. Sabino-Silva R, Gomes Jardim AC, Siqueira WL. Coronavirus COVID-19 impacts to dentistry and potential salivary diagnosis. Clin Oral Investig [Internet]. 2020 Feb [Cited 24/03/2020];22(2):1619-21. Available from: https://link.springer.com/article/10.1007%2Fs00784-020-03248-x

10. Heymann DL. Data sharing and outbreaks: best practice exemplified. Lancet [Internet]. 2020 [Cited 24/03/2020];395(10223):469-70. Available from: https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30184-7/fulltext

11. Emerging understandings of 2019-nCoV. Lancet [Internet]. 2020 [Cited 24/03/2020];395(10221):311. Available from: https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)30186-0/fulltext

12. Koh D. Occupational risks for COVID-19 infection. Occup Med (Lond) [Internet]. 2020 [Cited 24/03/2020];70(1):3-5. Available from: https://academic.oup.com/occmed/article/70/1/3/5763894

13. Guan WJ, Ni ZY, Hu Y, Liang WH, Ou CG, He JX, et al. Clinical Characteristics of Coronavirus Disease 2019 in China. N Engl J Med [Internet]. 2020 Feb [Cited 24/03/2020];382:e18. Available from: https://www.nejm.org/doi/full/10.1056/NEJMoa2002032

14. Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J, et al. Clinical Characteristics of 138 Hospitalized Patients With 2019 Novel Coronavirus–Infected Pneumonia in Wuhan, China. JAMA Mar [Internet]. 2020 [Cited 24/03/2020];323(9):809-902. Available from: https://jamanetwork.com/journals/jama/fullarticle/2761044

15. Huh S. How to train health personnel to protect themselves from SARS-CoV-2 (novel coronavirus) infection when caring for a patient or suspected case. J Educ Eval Health Prof [Internet]. 2020 [Cited 24/03/2020];17:10. Available from: https://www.jeehp.org/DOIx.php?id=10.3352/jeehp.2020.17.10

16. Liu M, He P, Liu HG, Wang XJ, Li FJ, Chen S, et al. Clinical characteristics of 30 medical workers infected with new coronavirus pneumonia. Zhonghua Jie He He Hu Xi Za Zhi = Chinese Journal of Tuberculosis *and* Respiratory Diseases [Internet]. 2020 [Cited 24/03/2020];43(0):E016. Available from: https://www.ncbi.nlm.nih.gov/pubmed/32164090

17. Meng L, Hua F, Bian Z. Coronavirus Disease 2019 (COVID-19): Emerging and Future Challenges for Dental and Oral Medicine. J Dent Res [Internet]. 2020 May [Cited 24/03/2020];99(5):481-487. Available from: https://journals.sagepub.com/doi/full/10.1177/0022034520914246?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%3dpubmed

18. Aquino-Canchari CR. Coronavirus COVID-19 y su repercusión en la Odontología. Rev Cubana Estomatol [Internet]. 2020 [Cited 30/03/2020];57(1):[approx. 1 p.]. Available from: http://www.revestomatologia.sld.cu/index.php/est/article/view/3242

19. Li ZY, Meng LY. The prevention and control of a new coronavirus infection in department of stomatology. Zhonghua Kou Qiang Yi Xue Za Zhi [Internet]. 2020 Feb [Cited 30/03/2020];55(0):E001. Available from: http://rs.yiigle.com/yufabiao/1181133.htm

20. Centers for Disease Control and Prevention. Dental Settings. Interim Infection Prevention and Control Guidance for Dental Settings During the COVID-19 Response [Internet]. Atlanta: Centers for Disease Control and Prevention; 2020 [Cited 30/03/2020]. Available from: https://www.cdc.gov/coronavirus/2019-ncov/hcp/dental-settings.html

21. American Dental Association. COVID-19 coding and billing interim guidance. Chicago IL: American Dental Association; 2020 [Cited 30/03/2020]. Available from: https://success.ada.org/~/media/CPS/Files/COVID/ADA_COVID_Coding_and_Billing_Guidance.pdf

22. Consejo de Dentistas de España. Informe técnico del Consejo General de Dentistas de España. El nuevo Coronavirus 2019-nCOV y el manejo del paciente dental. Madrid: Consejo de Dentistas de España; 2020 [Cited 24/03/2020]. Available from: https://gacetadental.com/wp-content/uploads/2020/03/INFORME-TE%CC%81CNICO-DEL-CONSEJO-GENERAL.pdf

23. Wang Y, Zhou CC, Shu R, Zou J. Oral Health Management of Children during the Epidemic Period of Coronavirus Disease 2019. Sichuan Da Xue Xue Bao Yi Xue Ban [Internet]. 2020 Mar [Cited 30/03/2020];51(2):151-4. Available from: https://www.ncbi.nlm.nih.gov/pubmed/32220180

24. Hurley S, Rooney E, Reece C. Update to general dental practices and community dental services regarding the emerging COVID-19 situation [Internet]. London: NHS; 2020 [Cited 30/03/2020]. Available from: https://www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/03/Issue-2-Preparedness-letter-for-primary-dental-care-20-March-2020.pdf

25. International Association for Dental Research. Journal of Dental Research publishes COVID-19 guidelines from researchers based in Wuhan, China [Internet]. Geneva: International Association for Dental Research; 2020 [Cited 30/03/2020]. Available from: https://www.fdiworlddental.org/news/20200317/journal-of-dental-research-publishes-covid-19-guidelines-from-researchers-based-in

26. Caprioglio A, Pizzetti GB, Zecca PA, Fastuca R, Maino G, Nanda R. Management of orthodontic emergencies during 2019-NCOV. Prog Orthod [Internet]. 2020 [Cited 15/04/2020];21(1):10. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7137858/

27. Napimoga MH, Ribas de Freitas AR. Dentistry vs Severe Acute Respiratory Syndrome Coronavirus 2: How to face this enemy. RGO. Rev Gaúch Odontol [Internet]. 2020 [Cited 30/03/2020];68:e20200011. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1981-86372020000100700&lng=en&nrm=iso&tlng=en

28. Health and Social Services Group. All Primary Care Dental Teams in Wales [Internet]. United Kingdom: Health and Social Services Group; 2020 [Cited 30/03/2020]. Available from: https://gov.wales/sites/default/files/publications/2020-03/covid19-red-dental-alert-level_1.pdf

29. Jones R, Johnson I, Wilson M. All Wales Clinical Dental Leads COVID-19 Group [Internet]. United Kingdom: British Dental Association; 2020 [Cited 30/03/2020]. Available from: https://gov.wales/sites/default/files/publications/2020-03/red-alert-guidance.pdf

30. Hurley S, Neligan M. Update to general dental practices and community dental services regarding the emerging COVID-19 situation [Internet]. United Kingdom: NHS; 2020 [Cited 30/03/2020]. Available from: https://www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/03/issue-3-

preparedness-letter-for-primary-dental-care-25-march-2020.pdf
31. Colegio de cirujanos dentistas de Chile A. G. Covid-19: Situación de las atenciones odontológicas en la red pública y privada.. [Internet]. Santiago de Chile: Colegio de cirujanos dentistas de Chile A. G. ;2020 [Cited 30/03/2020]. Available from: http://www.colegiodentistas.cl/inicio/2020/03/29/covid-19-situacion-de-las-atenciones-odontologicas-en-la-red-publica-y-privada/
32. Centers for Disease Control and Prevention. Recommendation: Postpone Non-Urgent Dental Procedures, Surgeries, and Visits [Internet]. Atlanta: Centers for Disease Control and Prevention; 2020 [Cited 30/03/2020]. Available from: https://www.cdc.gov/oralhealth/infectioncontrol/statement-COVID.html
33. Kowalski LP, Sanabria A, Ridge JA, Ng WT, de Bree R, Rinaldo A, et al. COVID-19 pandemic: effects and evidence-based recommendations for otolaryngology and head and neck surgery practice. Head Neck [Internet]. 2020 [Cited 15/04/2020];147:84-5. Available from: https://www.ncbi.nlm.nih.gov/pubmed/32270581
34. The Royal College of Surgeons of Edinburgh. Intercollegiate General Surgery Guidance on COVID-19 update [Internet]. Edinburgh: The Royal College of Surgeons of Edinburgh; 2020 [Cited 30/03/2020]. Available from: https://www.rcsed.ac.uk/news-public-affairs/news/2020/march/intercollegiate-general-surgery-guidance-on-covid-19-update
35. Royal College of Surgeons. Guidance for surgeons working during the COVID-19 pandemic [Internet]. London: Royal College of Surgeons; 2020 [Cited 30/03/2020]. Available from: https://www.rcseng.ac.uk/coronavirus/joint-guidance-for-surgeons-v1/
36. Magennis P. BAOMS –Guidance for the care of OMF Sand Oral Surgery patients where COVID is prevalent. London: OMF; 2020 [Cited 30/03/2020]. Available from: https://www.baoms.org.uk/_userfiles/pages/files/professionals/covid_19/baoms_omfs_general_covid19_guidance_from_baoms_final_updated.pdf
37. Grant M, Schramm A, Strong B, Buchbinder D, Ellis E, Wolvius E, et al. AO CMF international taskforce recommendations on best practice in maxillofacial procedures during the COVID-19 pandemic. Davos: AO CMF; 2020 [Cited 27/03/2020]. Available from: http://go.aocmf.aofoundation.org/e/700333/d-19-task-force-guidelines-pdf/g1mvl/61102499?h=-eYVnEGEkhxh1bgDrWgiBKTZpO4sSBIW2j9bn0f0PVw
38. Sociedad Española de Cirugía Oral y Maxilofacial de Cabeza y Cuello. Recomendaciones SECOMCYC en relación con la cirugía y covid-19. Recomendaciones generales de actuación en zonas con baja afectación por pandemia. Madrid: SECOMCYC; 2020 [Cited 27/03/2020]. Available from: http://www.secom.org/wp-content/uploads/2020/03/1.-RECOMENDACIONES-GENERALES-SECOMCYC-ACTUACION-COVID-19.pdf
39. Yang Y, Soh HY, Cai ZG, Peng X, Zhang Y, Guo CB. Experience of Diagnosing and Managing Patients in Oral Maxillofacial Surgery during the Prevention and Control Period of the New Coronavirus Pneumonia. Chin J Dent Res [internet]. 2020 [Cited 15/04/2020];23(1):57-62. Available from: https://cjdr.quintessenz.de/cjdr_2020_01_s0057.pdf
40. Coccolini F, Perrone G, Chiarugi M, Di Marzo F, Ansaloni L, Scandroglio I, et al. Surgery in COVID-19 patients: operational directives. World J Emerg Surg [Internet]. 2020 [Cited 15/04/2020];15(1):25. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7137852/
41. British Association of Head and Neck Oncologists. BAHNO statement on COVID-19 Initial guidance for head and neck cancer management during Covid-19

Pandemic in consultation with BAHNO, ENT-UK & BAOMS. London: British Association of Head and Neck Oncologists; 2020 [Cited 30/03/2020]. Available from: https://www.baoms.org.uk/_userfiles/pages/files/professionals/bahno_covid19.pdf

42. Bartlett DL, Howe JR, Chang G, Crago A, Hogg M, Karakousis G, et al. Management of Cancer Surgery Cases During the COVID-19 Pandemic: Considerations. Ann Surg Oncol [Internet]. 2020 Apr [Cited 15/04/2020];27:[approx. 2 p.]. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7141488/

43. Ansarin M. Surgical management of head and neck tumours during the SARS-CoV (Covid-19) pandemic. Acta Otorhinolaryngol Ital [Internet]. 2020 [Cited 15/04/2020];40:[approx. 2 p.]. Available from: https://www.actaitalica.it/article/view/783/354

44. De Felice F, Polimeni A, Valentini V. The impact of Coronavirus (COVID-19) on head and neck cancer patients' care. Radiother Oncol [Internet]. 2020 [Cited 15/04/2020];147:84-5. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7138158/

45. The Royal College of Surgeons. ENTUK Guidelines for changes in ENT during COVID-19 Pandemic. London: The Royal College of Surgeons; 2020 [Cited 30/03/2020]. Available from: https://www.entuk.org/entuk-guidelines-changes-ent-during-covid-19-pandemic

46. Pichi B, Mazzola F, Bonsembiante A, Petruzzi G, Zocchi J, Moretto S, et al. CORONA-steps for tracheotomy in COVID-19 patients: A staff-safe method for airway management. Oral Oncol [Internet]. 2020 [Cited 15/04/2020];105:104682. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7136881/

47. Sociedad Española de Cirugía Oral y Maxilofacial de Cabeza y Cuello. Recomendaciones SECOMCYC en relación con la cirugía y covid-19. Recomendaciones para la realización de traqueotomías en relación a pacientes infectados por coronavirus covid-19. Madrid: SECOMCYC; 2020 [Cited 27/03/2020]. Available from: http://www.secom.org/wp-content/uploads/2020/03/2.-RECOMENDACIONES-SECOMCYC-TRAQUEOTOMIA-EN-COVID-19-1.pdf

48. Osher J. Guidance for Personal Protective Equipment for OMFS examination & procedures during Covid19 Crisis. London: OMFS; 2020 [Cited 30/03/2020]. Available from: https://www.baoms.org.uk/_userfiles/pages/files/professionals/covid_19/guidance_for_personal_protective_equipment_for_omfs_procedures_during_covid19_crisisdocx.pdf

49. Sharma D, Rasmussen M, Han R, Whalin M, Davis M, Kofke WA, et al. Anesthetic Management of Endovascular Treatment of Acute Ischemic Stroke During COVID-19 Pandemic: Consensus Statement from Society for Neuroscience in Anesthesiology & Critical Care (SNACC)_Endorsed by Society of Vascular & Interventional Neurology (SVIN), Society of NeuroInterventional Surgery (SNIS), Neurocritical Care Society (NCS), and European Society of Minimally Invasive Neurological Therapy (ESMINT). J Neurosurg Anesthesiol [Internet]. 2020 Apr [Cited 15/04/2020];32(2):93-185. Available from: https://journals.lww.com/jnsa/Abstract/publishahead/Anesthetic_Management_of_Endovascular_Treatment_of.99076.aspx

50. Edwards SP, Kasten S, Nelson C, Elner V, McKean E. Maxillofacial Trauma Management During COVID-19: Multidisciplinary Recommendations. Facial Plast Surg Aesthet Med [Internet]. 2020 [Cited 15/04/2020];22(3): [approx. 1 p.]. Available from: https://www.liebertpub.com/doi/pdfplus/10.1089/fpsam.2020.0158

51. National Health Service. Clinical guide for management of patients requiring oral and

maxillofacial surgery during the coronavirus pandemic. London: National Health Service; 2020 [Cited 30/03/2020]. Available from: https://www.england.nhs.uk/coronavirus/wp-content/uploads/sites/52/2020/03/Specialty-guide-OMFS-and-coronavirus-v1_23-March.pdf

52. Ng Shan Hua A, Chew MH, Charn TC, Wong MK, Wong WK, Lee LS. A cut above COVID-19- surgical perspectives from a public health institution in Singapore during a coronavirus epidemic. ANZ J Surg [Internet]. 2020 [Cited 15/04/2020];90(3):[aprox. 1 p.]. Available from: https://onlinelibrary.wiley.com/doi/epdf/10.1111/ans.15904

53. Hussain K, Dewan V, Ali T, Al Shakarchi J. The impact of the COVID-19 pandemic on the provision of surgical care. J Surg Case Rep [Internet]. 2020 [Cited 15/04/2020];2020(4):[approx. 1 p.]. Available from: https://academic.oup.com/jscr/article/2020/4/rjaa087/5816562

54. MINSAP. Protocolo vs COVID-19 [Internet].La Habana: MINSAP; 2020 [Cited 15/05/2020]. Available from: https://instituciones.sld.cu/facultadfinlayalbarran/files/2020/04/Protocolo-Cuba-vs-COVID-4-4-2020.pdf

55. Peñarrocha Diago M, Torres Lagares D, Aloy Prósper A, López Valverde A, Barrionuevo Clusellas J, Somoza Martín M, et al. ¿Cómo debemos tratar los cirujanos bucales a nuestros pacientes durante y tras la pandemia de coronavirus? ¿Cómo contribuir a que disminuya la pandemia?. Gaceta Dental [Internet]. 2020 [Cited 27/03/2020];3:[approx. 1 p.]. Available from: https://gacetadental.com/wp-content/uploads/2020/03/CirujanosBucalesPandemia.pdf.pdf

Conflict of interests

The author declare that she has not conflicts of interest.