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Moving Forward in Times of COVID -19 Pandemic - Oral & Maxillofacial Surgical

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Abstract
The rampant spread of novel COVID-19 pandemic, has challenged the medical fraternity to an unparalleled degree.In these unprecedented times doctors of all specialities including OMFS surgeons are faced with dilemmas over patient management, staff safety, safety of patients and maximize use of available resource. The agenda is to protect patients as well as the medical staff from unnecessary infection, and to keep the healthcare system running effectively. Efforts should be made to provide best evidence based care, and stratify patients on a case by case basis.Aim of this review is to stockpile, converse and debate aspects of the management of patients in oral and maxillofacial surgery during the COVID-19 pandemic.

Introduction
The spread of the COVID-19 is a major challenge for healthcare systems worldwide. The case fatality rate of COVID-19 increases with age. However, it is clear from the aggressive behavior character of the pandemic that healthcare workers are prone in 29% of the cases, which is inexplicably high *(Wang et al., 2020)*. Inescapably, healthcare workers are in close proximity with infected patients. B Anesthetist, ENT surgeons, dentists, oral and maxillofacial surgeons especially have to be aware of the new challenges that the risk ofvirus transmission between patients and medical staff, and viceversa, imply *(Peng et al., 2020)*. Physicians and other health care workers who routinely indulge in examinations and procedures within the head and neck region and airway are at particularly high risk of exposure and infection from aerosol.
Transmission of the virus seems tooccur mainly by respiratory droplets *(Lu et al., 2020; vanDoremalen et al., 2020)*. Concepts have to be developed that take into account the possible need for triaging patients according to the degree of urgency of treatment in the field of oral and maxillofacial surgery.Here,we highlight common procedures that should be considered and present a draft on which to base decisions using the best available evidence.
This is a highly fluid situation, it is likely that these recommendations will change based on emerging evidence, the infection overload, and medical infrastructure.Currently, specific

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guidelines and recommendations are just surfacing.Limited clinical evidence, differing points of view regarding the adequate handling of some scenarios.

What Is COVID-19?

According to recent research, similar to SARS-CoV and Middle East respiratory syndrome coronavirus (MERS-CoV), SARSCoV- 2 is zoonotic, with Chinese horseshoe bats (Rhinolophussinicus) being the most probable origin (Chan et al. 2020; Lu et al. 2020) and pangolins as the most likely intermediate host.

Incubation Period.

The incubation period of COVID-19 has been estimated at 5 to 6 d on average, but there is evidence that it could be as long as 14 d, which is now the commonly adopted
duration for medical observation and quarantine of (potentially) exposed persons *(Backer et al. 2020; Li et al. 2020).*

THE POSSIBLE TRANSMISSION ROUTES OF 2019-NCOV

The common transmission routes of novel coronavirus include direct transmission (cough, sneeze, and droplet inhalation transmission) and contact transmission (contact with oral, nasal, and eye mucous membranes). Although common clinicalmanifestations of novel coronavirus infection do not include eye symptoms, the analysis of conjunctival samples from confirmed and suspected cases of 2019-nCoV suggests that the transmission of 2019-nCoV is not limited to the respiratory tract, and that eyeexposure may provide an effective way for the virus to enter the body.*(Lu, C.-W., Liu, X.-F. & Jia,2020).*

GENERAL CONSIDERATIONS

Tele Medicine

The principle of reducing staff members in face-to-face contact, and reducing the amount of patient exposure is a critical step in flattening the curve in medical fraternity. Good communication together with apt radiology team support can provide sound diagnosis and treatment planning.

Triage and prioritizing of procedures in Oral and Maxillofacial surgery

Paucity of resources can require rescheduling of elective surgery in order to curb the load on the healthcare system. It is important to have a clear and well communicatedconcept for prioritizing procedures in oral and maxillofacial surgery (Table 1).

Although it might be easy to distinguish between elective and emergency procedures, the need for interventions of intermediate and urgent priority might be blurred sometimes. It is important to stress that decisions regarding performing surgery or cancelling it should be made dynamically *(CFMMServices, 2020).*It is important to avoid a loss of resources by providing access to similar or identical procedures being offered by different specialties.

Definitely, it makes sense to assignprocedures such as removal of teeth and related complications suchas bleeding, treatment of localized abscesses in the oral cavity, treatment of pulpitis, etc to general dentistry. On the other hand, oral and maxillofacial surgery should focus on malignancies, deep head and neck space infections, or Acute maxillofacial trauma.

However, from a certain point of time onward, COVID-19 should no longer hamper comprehensive patient treatment, including elective surgery. As soon as possible, adequate infrastructures have to be implemented that respect the new requirements*(Meng et al, 2020).*

Personal protective equipment (PPE)

Personal protective equipment should be chosen depending on the plannedprocedure and the

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infection status of the patient (Table 2). Need for training of the staff concerning donning, doffing, and disposing of the equipment.Hand hygiene should be performed prior to donning and immediately after removing any kind of personal protective equipment.

It must be ensured that cleaning and disinfection procedures are followed consistently and correctly in the examination room after each patient *(World Health Organization, 2016).*

When performing a clinical examination wearing a surgical mask, the use of protective eyewear (goggles/ face shield), gloves, gown, cap is recommended.

Antiseptic mouth rinse is believed to reduce the viral load in the oral cavity. There is also a recommendation to use hydrogen peroxide or povidone- iodine solutions *(Kohn et al, 2003; Maruiet al, 2019; Peng et al, 2020).*

Table 1
Recommendations for the management of surgical procedures in oral and maxillofacial surgery during the COVID-19 pandemic.

Priority	Examples of procedures	Recommendation
Low (elective surgery) otherwise healthy patient	Orbital decompression (visual acuity not affected) Orthognathic surgery Primary and secondary surgery for cleft lip and palate malformations Secondary reconstructive procedures (free/pedicled flaps) Surgery for temporomandibular pathologies that cause limited pain Treatment of craniofacial malformations without sleep apnea/elevated intracranial pressure	Deferral of surgery until COVID-19 pandemic situation has settled
Low (elective surgery) COVID-19 patient	Orbital decompression (no affectation of visual acuity) Orthognathic surgery Primary and secondary surgery for cleft lip and palate malformations Secondary reconstructive procedures (free/pedicled flaps) Surgery for temporomandibular pathologies that cause limited pain Treatment of craniofacial malformations without sleep apnea/elevated intracranial pressure	Deferral of surgery until COVID-19 pandemic situation has settled
Intermediate otherwise healthy patient	Benign, slowly growing tumors Closed fractures with limited impairment of function Larger cystic lesions Surgery for temporomandibular pathologies that cause severe pain Treatment of craniofacial malformations with sleep apnea/elevated intracranial pressure	Deferral of surgery until COVID-19 pandemic situation has settled as long as risks of deferral are under control
Intermediate COVID-19 patient	Benign, slowly growing tumors Closed, non-functional fractures Larger cystic lesions Surgery for temporomandibular pathologies that cause severe pain Treatment of craniofacial malformations with sleep apnea/elevated intracranial pressure	Deferral of surgery until COVID-19 pandemic situation has settled as long as risks of deferral are under control; recovery from COVID-19 should be confirmed
Urgent otherwise healthy patient	Deep head and neck infections without risk of airway obstruction Malignant tumors with/without reconstructive procedures Orbital decompression (reduction of visual acuity) Open, comminuted fracture Tracheotomy (airway obstruction expected)	Surgery
Urgent COVID-19 patient	Malignant tumors with/without reconstructive procedures Orbital decompression (reduction of visual acuity) Open, comminuted fractures Tracheotomy (airway obstruction expected)	Surgery; recovery from COVID-19 should be confirmed Surgery
Emergency otherwise healthy patient	Deep head and neck infections with risk of airway obstruction Severe hemorrhage	Surgery
Emergency COVID-19 patient	Deep head and neck infections Severe hemorrhage	Surgery

(Zimmermann M, Nkenke E, 2020)

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Aerosol-generating procedures

The fact that there are a high number of asymptomatic Covid-19 positive patients, all patients should be assumed to be infective *(Rothe et al., 2020) (Table 2).*

Aerosol-generating procedures require special awareness in every patient with uncertain infection status. These procedures are associated with an increased risk because of airborne transmission of the virus and require additional measures *(World Health Organization, 2020a).*

The number of staff members in the operating room should be limited to a minimum. The operating room should be equipped with adequate ventilation. Besides eye protection and gloves, respirators of a high protection level (FFP3/N99/equivalent) and waterproof gowns should be used.

Aerosol-generating procedures include, tracheostomy care, airway suctioning, abscess drainage, wound irrigation, use of ultrasonic/piezoelectric devices, use of high-speed handpieces. *(Christian et al., 2004; Fowler et al,2004; Conly, 2006; World Health Organization, 2020b).*

Table 2

Recommended personal protective equipment (PPE) for healthcare workers modified from World Health Organization (WHO) and European Centre for Disease Prevention and Control (EDCD) guidance.

Setting	Activity	Type of PPE
Inpatient unit		
Patient room/examination room	Any activity that does not involve contact with COVID-19 patients	Medical mask/FFP1 respirator
Patient room/examination room	Providing direct care to COVID-19 patients	FFP2 respirator/N95 respirator/equivalent Gown Gloves Cap Eye protection (goggles/face shield)
Patient room/examination room	Aerosol-generating procedures performed on COVID-19 patients	FFP3 respirator/N99 respirator/equivalent Gown Gloves Cap Eye protection (goggles/face shield) Apron
Operating room (with negative pressure)	Any type of surgery performed on COVID-19 patients	FFP3 respirator/N99 respirator/equivalent Disposable sterile gown Sterile gloves Surgical hood cap Eye protection (googles/face shield)
Outpatient units		
Consultation room	Clinical examination of patient without respiratory symptoms	Medical mask/FFP1 respirator Gloves
Consultation room	Clinical examination of suspected (with respiratory symptoms)/confirmed COVID-19 patients	FFP2 respirator/N95 respirator/equivalent Gown Gloves Cap Eye protection (goggles/face shield)

European Centre for Disease Prevention and Control: Infection prevention and control for COVID-19 in healthcare settings; March 2020

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Operative Procedures—General Considerations

At present, no specific guideline is in place for the protection of oral and maxillofacial surgeons dealing with procedures in the head and neck area and specifically in the oral cavity. A number of Oral and maxillofacial procedures are prone to exposure of airway and mucosal surfaces and generating aerosols. Based on the guidelines of national authorities, all elective procedures that can be safely rescheduled. If an operative procedure involving the mucosa of the head and neck is planned, the following considerations are recommended.

COVID-19 Status

It is imperative to obtain a proper history with regards to travel, contact, and recent upper respiratory tract infections.

Depending on the associated risk factors, age, co-morbidities and speciality recommendations determine the COVID-19 status of the patient beforehand following national recommendations.

If a patient tests positive, a careful assessment of risk to the patient and health care workers should be performed by a multidisciplinary team before the operation is recommended.

Patient Transport

Sufficient protection during the transfer of covid-19 positive patients/ patients of unknown infection status after a high-risk procedure is critical. Definite protocols should be established with the nursing staff, recovery unit, anesthesia unit, and infection control personnel. Non-intubated patients could be transferred while wearing a surgical mask (not an N95 mask) if tolerated. Intubated patients should be transported with an intensive care unit ventilator (dry circuit, filter in place) and not with a bag-valve mask, which breaks the closed circuit. Appropriate PPE should be donned by all health care workers participating in the transfer. *(JAMA Otolaryngol Head Neck Surg. Published online March 31, 2020.)*

Intubation and Extubation Procedures

In all surgical procedures involving the upper airway, synchronization with the anesthesia unit is significant. During intubation and extubation, all nonessential staff should leave the Room andonly return after the airway is secured. Anybody who is present should maintain appropriatePPE.

Precautions in the operating room

An emergency patient that leaves no time for testing should be treated as being infective.For patients who are infected with Covid -19, some special precautions have to be followed in the operating room. They should wear FFP2 respirator without valve and a gown when they arebrought to the operating room. The staff that is responsible for thetransfer needs to wear an FFP2 respirator with valve, as well as agown and gloves.High-risk operations or operations in patients with knownCOVID-19should be performed in a designated operating room with negative pressures(American College of Surgeons. COVID-19:guidance for triage of non-emergent surgical procedures). Before entering the operating room, every staff member needs to put on the personal protective equipment. Besides an FFP3 respirator, it is also important to wear a face shield. The surgical team should not be present in the operating room during intubation as well as extubation. At any time, the number of staff members in the operating room should be minimal. The personal protective equipment of the surgical team should be completed by a water-tight sterile gown. Whenever possible an experienced team should perform the surgery. If an extra-oral approach is a relevant alternative to an intraoral one, it should be preferred. Reducing aerosol formation toa minimum should be a priority. Excessive water cooling for handpieces, saws, ultrasonic devices, and piezoelectric devices should be avoided. Instead of drilling screw holes, self-drilling screws should be used. The use of osteotomes should be considered wherever possible. Electric cautery should be avoided or performed with the lowest power possible and a

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smoke evacuation system.During the procedure, leaving or entering the operating roomshould be limited to a minimum. A time interval of 15 min must pass after the patient has left the operating room before cleaning and disinfection can start. Also,waste management must follow well-defined rules *(World HealthOrganization, 2017).*

Soft-Tissue Injuries

Most soft-tissue injuries may be managed by emergency department providers without involvement of the maxillofacial trauma team.Specific guidance includes:

(1) Injuries to critical structures such as the facial nerve (or other cranial nerves), eyelids, lacrimalsystem, and the nose require consultation with themaxillofacial trauma team. Large complex injuries including avulsions would meet these criteriaas well.

(2) Eyelid and lacrimal injuries will require the globe to be investigated for injury.

(3) Most intraoral lacerations do not need to be closed.

Local wound care with saline or chlorhexidine rinses twice daily for a week will suffice for the vast majority of these injuries. Complex wounds of the tongue are more likely to require consideration for closure.

Hard-Tissue (Bony) Injuries

(1) Zygomaticomaxillary complex fractures: Majority of these fractures do not need to be treated in the acute setting. Consideration should be given to delayed management of these fractures, even when esthetic is compromised.

(2) Orbital fractures can be dealt in a delayed fashion. Exceptions to delayed management would be:

(a) trap-door fractures with entrapment of orbital contents;

(b)hematomas/edema leading to vision loss from superior orbital fissure syndrome or orbital apex syndrome.

(3) Nasal fractures: Manipulation of the nose is considered high risk for exposure to and aerosolization of nasal secretions. Consideration should begiven to delayed management of all nasal fractures.

(4) Fractures of the maxilla and mandible, includingdentoalveolar fractures. Consideration should begiven to treating these fractures as conservatively as possible. The risk of exposure of the health-care team should be weighed against the risk of an easily corrected malocclusion. Since most of these fractures if treated in the operating room would requirea nasal intubation, they are considered at very high risk of exposure of health-care workers to aerosols.

Conclusion

The COVID-19 pandemic puts enormous load on the healthcare system. In a practice-changing situation such as this, there is a need for guidance at a time of threatening and ever-changing developments. By adhering to some guidelines for planned routines and procedures, we will be able to provide excellent care and help protect the medical fraternity. This is an evolving and constantly changing situation, and these recommendations are based on the best available information at this time. Please remember, these are recommendations and not mandates and ultimately the decision of the treatment of patients still rests with the individual practitioner. Our primary goal is to provide safe and effective treatments for our patients, while minimizing the risk to the practitioner as much as possible.

References:

1)Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J, et al: Clinical characteristics of 138hospitalized patients with 2019 novel coronavirus-infected pneumonia inWuhan, China. JAMA. https://doi.org/10.1001/jama.2020.1585, 2020

2) 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 12(9), 2020
3) Lu CW, Liu XF, Jia ZF: 2019-nCoV transmission through the ocular surface must notbe ignored. Lancet 395: e39, 2020
4) Van Doremalen N, Bushmaker T, Morris DH, Holbrook MG, Gamble A,Williamson BN, et al: Aerosol and surface stability of SARS-CoV-2 as comparedwith SARS-CoV-1. N Engl J Med. https://doi.org/10.1056/NEJMc2004973, 2020[Epub ahead of print]
5) CfMM Services: CMS releases recommendations on adult elective surgeries, nonessential medical, surgical, and dental procedures during COVID-19 response;Mar 18, 2020
6) Meng L, Hua F, Bian Z: Coronavirus disease 2019 (COVID-19): emerging and future challenges for dental and oral medicine. J Dent Res. https://doi.org/10.1177/0022034520914246, 2020 22034520914246 [Epub ahead of print]
7) Kohn WG, Collins AS, Cleveland JL, Harte JA, Eklund KJ, Malvitz DM: Guidelines for infection control in dental health-care settings d 2003. MMWR Recomm Rep52: 1e61, 2003
8) Marui VC, Souto MLS, Rovai ES, Romito GA, Chambrone L, Pannuti CM: Efficacyofpreprocedural mouth rinses in the reduction of microorganismsin aerosol: a systematic review. J Am Dent Assoc 150: 1015e1026, 2019e1011
9) World Health Organization: Decontamination and reprocessing of medicadevices for health-care facilities. Genveva: World Health Organization,2016
10) Rothe C, Schunk M, Sothmann P, Bretzel G, Froeschl G, Wallrauch C, et al: Transmission of 2019-nCoV infection from an asymptomatic contact in Germany.NEngl J Med 382: 970e971, 2020
11) Christian MD, Loutfy M, McDonald LC, Martinez KF, OfnerM,Wong T, et al: Possible SARS coronavirus transmission during cardiopulmonary resuscitation. EmergInfect Dis 10: 287e293, 2004
12) Fowler RA, Guest CB, Lapinsky SE, Sibbald WJ, Louie M, Tang P, et al: Transmission of severe acute respiratory syndrome during intubation and mechanical ventilation.Am J Respir Crit Care Med 169: 1198e1202, 2004
13) Conly JM: Personal protective equipment for preventing respiratory infections:what have we really learned? Can Med Assoc J 175: 263, 2006.
14)European Centre for Disease Prevention and Control: Infection prevention andcontrol for COVID-19 in healthcare settings; March 2020.
15) JAMA Otolaryngol Head Neck Surg. Published online March 31, 2020.)
16) American College of Surgeons. COVID-19: guidance for triage of non-emergent surgical procedures. Accessed March 23, 2020. https://www.facs.org/covid-19/clinical-guidance/triage.
17) Zimmermann M, Nkenke E, Approaches to the management of patients in oral and maxillofacial surgery during COVID-19 pandemic, Journal of Cranio-Maxillo-Facial Surgery, https://doi.org/10.1016/j.jcms.2020.03.011.
18)European Centre for Disease Prevention and Control: Infection prevention andcontrol for COVID-19 in healthcare settings; March 2020
19)World Health Organization: Infection prevention and control during health carewhen COVID-19 is suspected: interim guidance, 19 March 2020. Geneva: WorldHealth Organization, 2020a
20)World Health Organization: Rational use of personal protective equipment (PPE) forcoronavirus disease (COVID-19): interim guidance, 19 March 2020. Geneva:World Health Organization, 2020b
21) Facial Plastic Surgery & Aesthetic MedicineVolume 22, Number 3, 2020American Academy of Facial Plastic and Reconstructive Surgery, Inc.DOI: 10.1089/fpsam.2020.0158
22) Chan JF, Yuan S, Kok KH, To KK, Chu H, Yang J, Xing F, Liu J, Yip CC, PoonRW, et al. 2020. A familial cluster of pneumonia associated with the 2019novel coronavirus indicating person-to-person transmission: a study of afamily cluster. Lancet. 395(10223):514–523.
23) Backer JA, Klinkenberg D, Wallinga J. 2020. Incubation period of 2019novel coronavirus (2019-nCoV) infections among travellers from Wuhan,China, 20–28 January 2020. Euro Surveill.

25(5). doi:10.2807/1560-7917.ES.2020.2825.2805.2000062.
24) Lu, C.-W., Liu, X.-F. & Jia, Z.-F. 2019-nCoV transmission through the ocular surface must not be ignored. The Lancet https://doi.org/10.1016/S0140-6736(20)30313-5 (2020).
25)To, K. K.-W. et al. Consistent detection of 2019 novel coronavirus in saliva. Clin.Infect. Diseases https://doi.org/10.1093/cid/ciaa149 (2020).
26) Lu R, Zhao X, Li J, Niu P, Yang B, Wu H, Wang W, Song H, Huang B, ZhuN, et al. 2020. Genomic characterisation and epidemiology of 2019 novel coronavirus: implications for virus origins and receptor binding. Lancet.395(10224):565–574.