

## Aftermath of Covid-19 Pandemic on oral surgery and orthodontic practices in northern India

### ABSTRACT:

The scuttlebutt is already churning out projections about what the post COVID-19 work environment might look like. While we get 'old-school' in tackling challenges, we may also want to consider getting 'tech savvy' in regards to oral health delivery via teledentistry for prior consultation ultimately decreasing footfall in OPDs. The COVID-19 outbreak serves as both a reminder and an opportunity to assist. This is an ever evolving dynamic situation, and recommendations discussed herein are based on the best currently available information. However, the decision of the treatment of patients still rests with the individual practitioner. The blanket instruction is to dodge all aerosol related procedures in dental setups. It's dentist prerogative to install all fail-safes and perform restorative procedure requiring AGPs with all efforts to mitigate the risk of transmission of the SARS-Cov-2 virus and for minimal working times with the appropriate PPE and infection control protocols. Even when not using AGPs, it is important that robust infection control measures are employed as this isn't a perfect world, and we're still in the throes of a pandemic, making it imperative to cultivate the right mind-set within ourselves. The intent of the present review is to consider changes in the clinical oral and maxillofacial surgery and orthodontic workflow and, allow for a smoother transition, with less risk to our patients and healthcare personnel.

**Keywords:** COVID-19, Oral Surgery, Orthodontics, recommendations

### Introduction:

Epidemic diseases that disseminate across a whopping region of the world, such as the 1918 influenza pandemic (Spanish flu), the 2009 flu pandemic (H1N1), and the current 2019 coronavirus disease (COVID-19) emerged in the city of Wuhan, Hubei Province, China, has shaken the whole world signaling a challenge to healthcare resources. Spill over happens when such viruses make a jump over from animals to humans due to factors such as mutations in the virus or increased contact between humans and animals. While the SARS coronavirus is thought to have evolved from infecting bats to civet cats to humans in the Guangdong province of southern China in 2002, the MERS evolved from bats to camels to humans in Saudi Arabia in 2012. Research suggests that the original source of the virus that caused COVID-19 was bats and pangolins might have acted as intermediaries (1). The mutation and natural selection might have taken place either inside pangolins or in humans after transfer from pangolins. Some of the changes will be more drastic than others and some will be longer lasting than others.


The COVID-19 pandemic becomes a prolonged crisis as waves of disease rock the globe for longer than anyone was prepared for. Mounting deaths, social unrest, and economic freefall become prominent. The invisible enemy is everywhere, and paranoia grows. Significant uncertainty surrounds what the "new normal" could look like for firms beyond the COVID-19 crisis, particularly in terms of health care. Perhaps better anticipation and adaptation to dramatic changes, increased agility and resilience, can turn uncertainty into advantage. In words of Sir Winston Churchill, never

**<sup>1</sup>VARIYTA, <sup>2</sup>CHHABRA M., <sup>3</sup>NARULA R.**

<sup>1,3</sup>Department of Oral and Maxillofacial Surgery Guru Nanak Dev Dental College and Research Institute, Sunam Baba Farid University of Health Sciences, Faridkot, Punjab  
<sup>2</sup>Department of Orthodontics and Dentofacial Orthopaedics Desh Bhagat Dental College and Hospital, Mandi Gobindgarh Desh Bhagat University, Mandi Gobindgarh, Punjab

**Address for Corresponding :** Dr. Variyta  
 Guru Nanak Dev Dental College and Research Institute, Sunam  
 Email : varivta95@gmail.com

**Received :** 5 Dec. 2020, **Published :** 31 Dec. 2020

Access this article online	
<b>Website:</b> <a href="http://www.ujds.in">www.ujds.in</a>	<b>Quick Response Code</b> 
<b>DOI:</b> <a href="https://doi.org/10.21276/ujds.2020.6.3.25">https://doi.org/10.21276/ujds.2020.6.3.25</a>	

**How to cite this article:** Variyta, Chhabra M., & Narula R. (2021). Aftermath of Covid-19 Pandemic on oral surgery and orthodontic practices in Northern India. UNIVERSITY JOURNAL OF DENTAL SCIENCES, 6(3). 102-107

waste a good crisis, which sounds less palatable but equally valid as such situations create a watershed for growth. Therefore, rapid answers are needed and the solution may well be found outside the usual compass. The prevalent situation is a question of solidarity. This cannot be solved by WHO alone, or one industry alone. It requires all of us working together to ensure all countries can protect the people who protect the rest of us by laying focus on monitoring, containing, and mitigating the spread of the virus.

The intent of the present review is to consider changes in the clinical oral and maxillofacial surgery and orthodontic workflow and, allow for a smoother transition, with less risk to our patients and healthcare personnel. The following recommendations have taken into consideration the fiscal impact as well as need for ethical, medical and social responsibility to limit the spread of novel corona virus. It will take forethought and strategic planning to ensure a fast, efficient and successful recovery. The dental operatories should gear themselves for watchfulness. As we plan our patient care activities, unorthodox workflows for each setting—emergency room, outpatient clinic with and without ambulatory anesthesia, OR, and inpatient wards/ICU— must be considered. Surgical procedures themselves offer finite scope for change without impacting clinical outcomes.

### **Moving from Scenarios to Decisions in Oral and Maxillofacial Surgical practice:**

What we have is a comprehensive approach to scenario planning. The triaging of patients, taking exposure history, classifying procedures as emergency, urgency, and elective, as per the guidelines is the need of the hour.

Practices involving the nasal-oral-endotracheal mucosal region escalate the risk due to aerosolization of the virus which is known to be in high concentration in these areas when paralleled to swabs from the lower respiratory tract. General axiom states that viral particles outlast in the air for at least 3 hours, if not longer, when aerosolized. Emergency procedures should be narrowed to those involving airway management, epistaxis, and invasive management of facial fractures which require ORIF, any swelling compromising swallowing and/or breathing and oncologic procedures in which a delay in management could affect ultimate outcome. The time till clear management strategies are identified, both the CDC (Centers for Disease Control) and the AOCMF (5,8) have endorsed that all elective procedures should be

postponed/ rescheduled during the pandemic. It's pertinent to adhere to the one-stop treatment protocol and ensure the shortest treatment time, along with the ability to manage any complication that arises from the procedure.

For procedures under General Anesthesia, intubation is preferred over placement of LMA. Meanwhile, curb the amount of mask/bag ventilation prior to intubation, and avert jet ventilation, suction as scanty as necessary to mitigate aerosolization(2). Use short term paralytic agents to lessen coughing. Also, prefer most experienced member of the team to perform intubation as it's not trial and error epoch at this time.

The operating team should hold up for 20 minutes before entering OR, following intubation. After this 20-minute delay, breeze in with appropriate PPE (FFP2/N95 or PAPR/CAPR), reason being that after an aerosol generating procedure (AGP), the virus could be present(9). 99% of pathogens should be clear in 14 minutes, and 99.9% by 21 minutes, based on the OR air exchange per hour. All inessential personnel should remain outdoors at the time of extubation and an oxygen mask should be placed over the face after the tube is withdrawn to mitigate aerosolization with coughing.

For airway management, tracheotomy can be speculated in patients with stable pulmonary status but should not take place sooner than 2-3 weeks from intubation and, preferably, with negative COVID-19 testing. Abstain from tracheotomy in COVID-19 positive or suspected patients during periods of respiratory instability or heightened ventilator dependence. The decision for percutaneous or open approach for the procedure is at the forethoughtfulness of the surgeon. In the hands of an experienced surgeon, an open approach may lead to less potential aerosolization, and therefore less risk. The patient should be preoxygenated, ventilation held, and paralyzed before the trachea is incised to minimize aerosolization. Choose cuffed, non-fenestrated tracheotomy tube. Closed suctioning systems are favored for tracheotomy care. Avoid circuit disconnections(3,4). The bipolar electrocautery is recommended for the hemostasis and monopolar for incision, both at low power, preferring extraoral to intraoral approach, relying on cold instrumentation. Once the tracheotomy tube is disconnected from mechanical ventilation, place a heat moisture exchanger (HME) with viral filter or a ventilator filter. Advance the tube distally prior to incising the trachea, to avoid creating a hole in the ETT balloon (6).

On the clinical landscape, conservative treatment to preserve form and function must be pioneered based on critical clinical judgement. Closed reduction of fractures (using IMF screws, Bridle wire stabilization or Eyelet wiring) should be reasoned over open surgery where stability can be achieved without ORIF resulting in a shortened operating time and thus facilitating early discharge.

Conditions in which ORIF is absolute necessity, transcutaneous approach (after applying a bio-occlusive dressing over the mouth post IMF) should be preferred over an intraoral approach. Limit or eliminate irrigation and consider a battery powered low speed drill, whenever required. When going for open surgery, scalpel should be preferred over monopolar cautery and repeated suction/irrigation should be minimized. If osteotomy is required, consider osteotome instead of power saw.

For midface fractures, consider using Carroll-Girard screw for reduction, and avoid intra-oral incision, if two-point fixation (rim and ZF) is sufficient for stabilization. Contemplate delay of non-functional frontal bone/sinus fractures. Endoscopic endonasal procedure and the associated instrumentation (power micro debridors) carry a very high risk of aerosol generation and should be avoided if possible. Absorbable sutures should be preferred to minimize unnecessary footfall for their removal.

For Oncologic Care, opt for treating cases in which a worse outcome is expected if surgery is delayed more than 6 weeks (eg; SCC of the oral cavity, oropharynx, larynx, hypopharynx), cancers with impending airway compromise eg; Papillary thyroid cancer, high grade or progressive salivary cancer, T3/T4 melanoma, salvage surgery for recurrent/persistent disease, high grade sino-nasal malignancy without equally efficacious non-surgical options. However, if non-surgical therapy is equivalent to surgery + radiation, non-surgical therapy is recommended.

The recent state of affairs coerces the need to strike a balance between the safety of the healthcare professionals yet providing optimum dental care to the patients requiring emergency intervention.

### **Recommendations on Orthodontic practice and action plan:**

From an orthodontic panorama, justifiable emergencies may include the skewing of an orthodontic appliance into the gingiva or oral mucosa leading to severe pain and or infection,

circumstances related to dental trauma, or conditions where a lack of management would be harmful to the patient.

Manoeuvre orthodontic emergencies using circumstance-specific protocols. Ply active patients with recommendations on treatment progression either on an as-needed individual basis or in a communication provided to all patients (eg; when to stop turning an expander, what to do when the patient has reached their final aligner, etc.). Counsel them to always perform hand hygiene and clean their appliances regularly by wiping with alcohol, and to store them in their cases (10,11).

Teledentistry has already helped decongest the operatories as compared to the pre-pandemic times and it may emerge well as the most transformative change to provide health care. It's the need of hour to guide patients that more or less all orthodontic appliances can be left in situ for some months without detriment to the patient if he/she continues with the cut-and-dried after care instructions, for instance-maintaining oral hygiene and thwarting snacking on sugars and aerated drinks. Also, avoid indulging in sticky and hard foodstuffs in order to obviate breakage of the brace wire or fracture brackets (debond) off a tooth. Patients should be abetted to perform optimal self-care to come to grips with trouble caused by loose bands/brackets or prominent arch wires in order to decrease the footfall in the OPD.

Short term management of orthodontic emergencies can be done at home. Topical anesthetic (eg; Orabase) can be applied in small amounts to the ulcerated surface/ mouth sores with a cotton swab to provide relief. Small piece of rolled relief wax can be pinched over the bracket or long wire that is irritating lip and/or cheek. Make sure to inform precociously that the orthodontic wax that is accidentally swallowed is harmless.

For a part of orthodontic appliance, metallic ligature, broken or loose elastic chain embedded in the gingiva, or hanging freely, leading to severe pain and or infection, could be managed by using a sterile clipper to cut the wire if it is attached to the broken or loose part and remove it from the mouth using sterile tweezers.

For long, hanging gold chains that are severely irritating, take a piece of dental floss that can be threaded through or tied around the last link at the loose end of the chain by the care provider at home, and then tied to a bracket so that it is no longer hanging and causing severe irritation. However, it is not advised to cut the hanging long chain, as there is a risk of aspiration.

If a piece of appliance or a bracket is swallowed, patient should be acquainted about the passage of same through the digestive tract uneventfully. If an object is swallowed, it should be confirmed that the patient did/does not have difficulty breathing or experience sudden coughing after the object was swallowed. In the case of sudden difficulty breathing or sudden coughing following ingestion of the broken appliance or bracket, the patient should go to an emergency department of a hospital. The orthodontist may advise the patient to seek clinical examination and or radiographic assessment in the emergency department of a hospital.

In case of a broken bonded retainer, it should be left outside of the mouth, if the patient cannot be seen in person by the orthodontist. Meanwhile, the patient should be advised to wear their removable retainer (if provided) until their next visit.

If it is not possible to get a replacement retainer one could consider ordering online a 'boil in the bag' (heat mouldable) gumshield to use and wear at night to reduce the risk of relapse (unwanted tooth movement). It should be noted that these appliances aren't specifically designed to hold teeth in position so the manufacturer cannot be held responsible for any relapse. It's pertinent for patient to contact their HCP before investing in this strategy to ensure all aspects of this compromise for retention are understood.

### Alternatives to AGP in the orthodontic setting:

#### 1. Taking impressions

Although impression in itself is not an AGP, but it carries a risk of gag or cough reflex which is an inveterate aerosol risk. Where procurable, an intra oral scan may be preferable (although this does not eliminate the gag/cough risk).

#### 2. Fitting and trimming the acrylic on removable appliances

To layoff the risk of any cross infection, avoid presumption of new appliances to be infection free and adhere strictly to laboratory infection control procedures where pompous high volume suction can be used to minimize the impact of any aerosol generated. Simple fitting and adjustment of a removable appliance is not likely to be an AGP provided no acrylic trimming is required during fitting i.e. after try-in. However, in the case of appliances already being worn by the patient that require repair and refitting, decontamination according to cross infection guidance, before transferring

them to the laboratory for repair, should be efficiently done and considered an AGP(11).

#### 3. Bonding

Conventional acid etch bond up protocols are considered as AGP when using pumice/polishing prior to etching and the 3 in 1 air syringe to rinse the enamel after etching.

Alternative non AGP options are listed, but it should be apprehended that bond strength may be compromised:

Light cured resin modified GIC, can be used without the need for any pre procedural tooth preparation (i.e. pumicing/etching washing/ drying). With these materials there is NO need for a dry field and indeed for successful bonding the enamel surface should remain moist during bonding.

Self-etch primers (SEP) can also be used without the need for etching, washing and drying the enamel, but they require the pellicle to be removed prior to use, usually with a pre procedural enamel preparation such as pumice/polishing of teeth, which would be an unwanted aerosol. Without this stage the bond strength is likely to be reduced. To avoid the use of a pumice/polishing of teeth using a hand piece and 3 in 1 syringe with SEP:

- Wipe the bonding surface of the tooth with a cotton roll prior to applying SEP; suction may be used as this is non AGP.

- The technique for using SEP is also important, with 3-5 seconds rubbing of the SEP to enamel, with re-dip into the SEP reservoir before repeating on each subsequent tooth. Following application of the SEP some manufacturers recommend gentle air drying. This latter stage is potentially an AGP and should be avoided.

#### 4. Bands

GIC or resin modified GIC can be used as it doesn't require a perfectly dry field on either the tooth or band prior to placement. Refrain from using 3 in 1 air syringe due to the aerosol hazard, however, suction may be used.

#### 5. Repair of brackets mid treatment

A new bracket can be placed if residual composite can be removed by hand. Alternatively, a premolar or molar band using GIC can be placed, or bypass the debonded tooth, using dead coil or sleeve on the wire, or using sectional wires mesial to the debonded tooth.

## 6. Debond

Removal of brackets and wires alone is not considered the AGP part of a debond. Avoid use of a handpiece, (high speed or slow speed, with or without water coolant) ultrasonic scaler or 3 in 1 air/water spray. For patients with poor oral hygiene where the risk of continuing treatment is high, consideration could be given to removing the brackets alone and hand trimming the adhesive carefully using- band removing pliers, Mitchell's trimmers or hand scalers, and adhesive removing pliers.

However, any small remnants of composite left on the enamel surface are likely to be lost over time with tooth brushing.

There is no more enamel loss when using debanding pliers than with slow speed tungsten carbide bur run dry, but take care not to gouge the enamel surface. Pliers should only be used to remove the adhesive on posterior teeth, not the incisors where a Mitchell's trimmer or hand scaler should be used instead.

## 7. Retention

Consideration should be given to use a removable retainer regime. This could be made over the remnants of a broken fixed retainer.

## 8. Repair of Fixed retainers

Removal of adhesive from the retainer wire can be achieved using Weingart or Birdbeak pliers, and HVE (High Volume Evacuation/Suction). Adhesive removal from the lingual surface of the incisors may be achieved using hand scalers or Mitchell's trimmers, or the use of adhesive removal pliers.

### 9. Removal of fixed devices mid treatment

Removal of fixed devices such as Bands, TPA Nance arches, Quad helix and RME devices only becomes an AGP if a handpiece is used to remove the residual cement. As above, consider adhesive removal using hand instruments.

## 10. Aligner Attachments

Placement of aligner attachments can be considered non-AGP if placed using bonding technique as suggested above. Removal of attachments will be non-AGP if using adhesive removal tool as suggested and will only be considered AGP if a hand piece is used to remove the residual composite.

Rigorous disinfection following the completion of any emergency treatment to minimize spread through fomites and environmental surfaces is mandatory to reduce the risk of

cross-contamination and help protect vulnerable patients as well as the orthodontic staff.

1. For photographic retractors, washer-disinfector happens to be the most effective method of decontamination.
2. Autoclave or glutaraldehyde solution can be used to disinfect Orthodontic markers.
3. In order to not affect negatively, the surface characterization of archwires, an autoclave is preferred over cold sterilization.
4. Decontamination does not jeopardize clinical stability of miniscrews or mechanical properties of elastomeric chains.
5. It is safe to use tried-in orthodontic bands after adequate precleaning and sterilization(13).
6. Orthodontic pliers can be sterilized with steam autoclave sterilization, ultrasound bath and thermal disinfection, or disinfected with chemical substances 2% glutaraldehyde or 0.25% peracetic acid. Instrument cassettes can be effectively used, with pliers preferably sterilized in an open position(14).
7. Tungsten carbide debonding burs could be effectively decontaminated from bacterial infection.
8. Any steel wires and appliance parts that were cut or removed should be treated as highly infected medical equipment and disposed of as a medical hazard.

## General Post-procedural Interventions:

By dwelling upon a rotation and reuse strategy, that involves acquiring a set number of N95 masks (at least 5 as per the CDC), and rotating their use each day, allowing them to dry for long enough that the virus is no longer viable, DHCP can cut the chase of supply and demand of PPE. Regardless, FFP/N95 respirators used during aerosol generating procedures or those contaminated with blood, respiratory or nasal secretions, or other bodily fluids from patients should be discarded. Fumigation is impracticable for dental operator; even so, measures such as mopping the floor (triple bucket method) with 1% sodium hypochlorite and disinfecting waterlines with 0.01% sodium hypochlorite can help reduce the risk of cross infection. Devices such as high- and low-speed handpieces, prophylaxis angles, ultrasonic and sonic scaling tips, air abrasion devices, and air and water syringe tips or any dental device connected to the dental air/water system that enters the patient's mouth should be run to discharge water, air, or a combination for a minimum of 20-30 seconds after each patient. Handles or dental unit attachments of saliva ejectors, high-speed air evacuators, and air/water



syringes should be covered with impervious barriers that are changed after each use. If the item becomes visibly contaminated during use, DHCP should clean and disinfect with an EPA-registered hospital disinfectant (intermediate-level) before use on the next patient. All biomedical waste pertaining to patient care should be carefully disposed from time to time through an authorized biomedical disposal agency. All surfaces should be thoroughly disinfected using hospital-grade disinfectants such as sodium hypochlorite. Bleach/sodium hypochlorite should be used at a concentration of 0.1%–0.2% for 1 minute, rather than the typical 0.05% concentration. Ethanol in concentrations of 62%–95% is also recommended to disinfect small surfaces. Hydrogen peroxide vaporizer has also been proposed for post-procedure operatory decontamination. Waterlines that have been used should be adequately purged to prevent a backflow of pathogens, which can harbor in the plastic tubing. All instruments should be properly disinfected and sterilized immediately and all used, as well as unused, disposables that were within the exposed portion of the operatory, should be presumed to be infected and disposed of as infected medical waste.

### References:

1. Zhou P, Yang XL, Wang XG, Hu B, Zhang L, Zhang W, et al. A pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature* 2020; 579:270-3.
2. Ge ZY, Yang LM, Xia JJ, Fu XH, Zhang YZ. Possible aerosol transmission of COVID-19 and special precautions in dentistry. *J Zhejiang Univ Sci B* 2020;1-8.
3. Sean P. Steve, Kasten Christine, Nelson et al - Maxillofacial trauma management during covid-19:multidisciplinary recommendations
4. Bali R, Choudhary K (2020) maxillofacial surgery and COVID-19, The Pandemic!!
5. Indian Dental Association's Preventive Guidelines for Dental Professionals on the Coronavirus Threat, accessed April 13, 2020
6. Susarla SM, Parmar S, Fernandes R. COVID-19 and the craniomaxillofacial surgical community. *Craniomaxillofac Trauma Reconstr* 2020;
7. Diaz A, Sarac BA, Schoenbrunner AR, Janis JE, Pawlik TM. Elective surgery in the time of COVID-19. *Am J Surg [Internet]* 2020; (xxxx): 1-3.
8. American Dental Association (ADA). Constitutes a Dental Emergency? 2020;
9. AO CMF International Task Force. AO CMF International Task Force Recommendations on Best Practices for Maxillofacial Procedures during COVID-19 Pandemic. 1-6.
10. Caprioglio, A., Pizzetti, G.B., Zecca, P.A. (2020), Management of orthodontic emergencies during 2019-NCOV.
11. <https://www.rcseng.ac.u-/media/files/rcs/fds/guidelines/orthodontics-covid19.pdf>
12. Sunjay suri, Yona R Vandersluis, Anuraj S Kochhar, Ritasha Bhasin, Mohamed-Nur Abdallah(2020), Clinical orthodontic management during the COVID-19 pandemic.
13. Carvalho MR, dos Santos da Silva MA, de Sousa Brito CA, Campelo V, Kuga MC, Tonetto MR, et al. Comparison of antimicrobial activity between chemical disinfectants on contaminated orthodontic pliers. *J Contemp Dent Pract* 2015; 16: 619-23.
14. Papaioannou A. A review of sterilization, packaging and storage considerations for orthodont