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Mini Review

Covid Safe Orthodontics: A Review of Principles & Practices.

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Introduction

	ORTHODONTIC CONDITION	INTERVENTION
EMERGENCY	• Miniscrews: Gingival embedment, Loosening, Infection, Bleeding • Broken Fixed functional appliances • Trauma involving the face during fixed orthodontic appliance therapy	Should connect with hospital emergency settings and attended to immediately
URGENT	Orthodontic wire, piercing or impinging on the oral mucosa.	• Try putting the wire back to the tube using tweezer. • Thin guage wire: if rotated- use tweezer to place the wire back in place • If extended- cut using a nail clipper • Thick guage wire: use relieving wax or wet cotton or non sugar chewing gum to cover the poking end
	Ligature wire poking	• Tuck the wire back using tweezer/ back of pencil/spoon • Use wax to cover the sharp end
	Broken bracket	• If still hanging on the wire cover with wax • If causing trauma: guide with video to remove it from the mouth.
	Removable appliances	If broken or loose or ill fitted: stop wearing the appliance
	Loose bands	• If not deformed, try pusing it back on the tooth. • Avoid sugary diet and maintain good oral hygiene.
	Orthodontic treatment causing latrogenic effects	Talk with the orthodontist and according to nature and extent of problem, schedule a physical appointment
ELECTIVE	• Conditions that can remain stable for a long time. • Orthodontic wire changes during levelling phases • Bonding and debonding procedures • Finishing and detailing procedures • Delivery of clear aligners	• Scheduled for physical appointments when regular dental services are restored • Continue using the last set of aligners.

Figure 1: Triage.

With more than 116 million positive cases and 2.5 million deaths across the world due to coronavirus outbreak, the COVID-19 has rapidly spread across various countries in the past one year [1]. Lockdowns, quarantines, and social distancing had become the norm across the globe leaving only essential services to work. Lower respiratory tract infections including fever, coughing, sneezing, fatigue are the primary symptoms of coronavirus disease [2]. These can vary from being asymptomatic to mild change in sense of smell and taste to acute respiratory distress that might be further complicated by sepsis and multi organ failure leading to death [3,4]. The virus has been reported to be highly contagious even during its latency period and the incubation period can be anywhere between 2 weeks to 3 weeks [5]. Dental departments including the orthodontists face a higher risk of disease transmission because of the nature of dental procedures, getting exposed to aerosols and droplets splashing from patient's mouth. The transmission can be multifold in a dental clinic occurring from treating an asymptomatic patient to the operator, from operator to other healthcare workers in the facility, forwarding to other patients and from one patient to another [6]. We as dentists have extensively known the basic principles of personal protection to prevent acquisition and transmission of various biological infections possible during different dental procedures. It is, however, important to re-evaluate the infection control measure within our practice to prevent the cross-infection and contamination of this highly contagious infection (Figures 1 & 2). The aim of this article is to enlist what all procedures and precautions that can be taken by orthodontists at various levels to reduce and minimize the transmission of this virus.

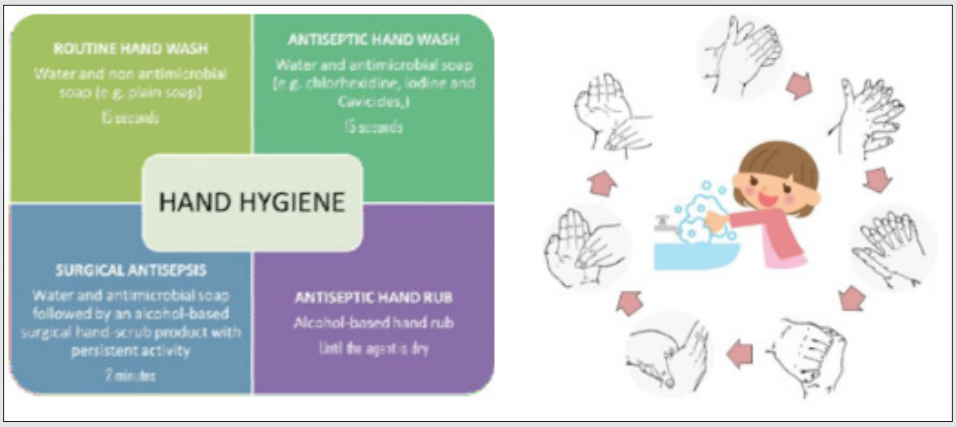

Figure 2: Triage.

This article is divided into sections for protocols and safety measures according to different aspects of the practice: Triage, Operatory, Hygiene Protocols, Treatment procedures, Sterilization and Infection control. The very first step of any patient in the OPD demands careful screening and sterilization to avoid any unnecessary risk exposure. The dental procedures are divided into three categories. According to the urgency and associated risk of infection the treatment should be undertaken [7]. Keeping the doors opened at all times and using foot pedals wherever needed will reduce the transmission through these areas of contact. It is advisable to keep the exchange of currencies to bare minimum and make arrangements for online transactions of treatment charges. Similarly, all the treatment procedural updates can be made computerized or can be voice recorded.

Operatory

1. Alternate dental chairs should be made working in case chambers are not present in the department [8].
2. Artificial partitions or room dividing boards could be used to contain the aerosols generated.
3. The held able areas should be covered with plastic clingfilm and changed after every patient.
4. Before and after any procedure the dental chair should be disinfected with phenolics, iodophors or chlorine containing compounds (Table 1).

Hygiene Protocols

1. Hand hygiene is the most effective method of reducing the risk of the transmission of disease [9].
2. Hand Hygiene is MANDATORY before putting on and after removing gloves, and after inadvertent barehanded touching of contaminated surfaces or objects or after completing laboratory activities.
3. It is also RECOMMENDED after sneezing, coughing, blowing the nose or combing hair and after contact with your own face.
4. Hand wash should be done by patient and operators before entering and after leaving the operatory at all times.

Personal Protection Protocols

Personal Protection equipment should be in place for all the operators and dental auxiliaries including the helpers and cleaners. Since there is a cost associated with standard PPE kits, we can try to minimize the expenditure by following certain simple protocols. Mucosal surfaces of the eyes, mouth, and nose are vulnerable areas for contagious agents spread by patient saliva, aerosols and orthodontic supplies and instruments (Figures 3 & 4). Appropriate attire in the clinic protects the operator from contamination by aerosols and splatter which might get carried outside the clinical environment. Either protective eyewear or a chin-length plastic face shield must be worn during dental procedures. A face shield does not substitute for a surgical mask. Protective eyewear must possess side shields. Departmental scrubs should be made mandatory. It should be worn at all times in the department and sterilized on a daily basis. Gowns must be changed at least daily or more often if they are visibly soiled. Used gowns should never be stored with other personal clothing. Fluid resistant gowns must be worn for all patient treatment and clean-up [10].

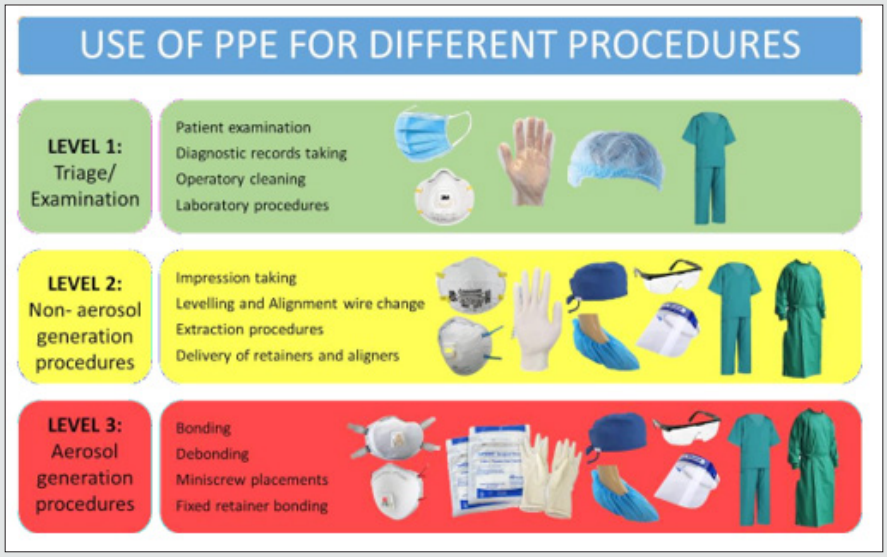

Figure 3:

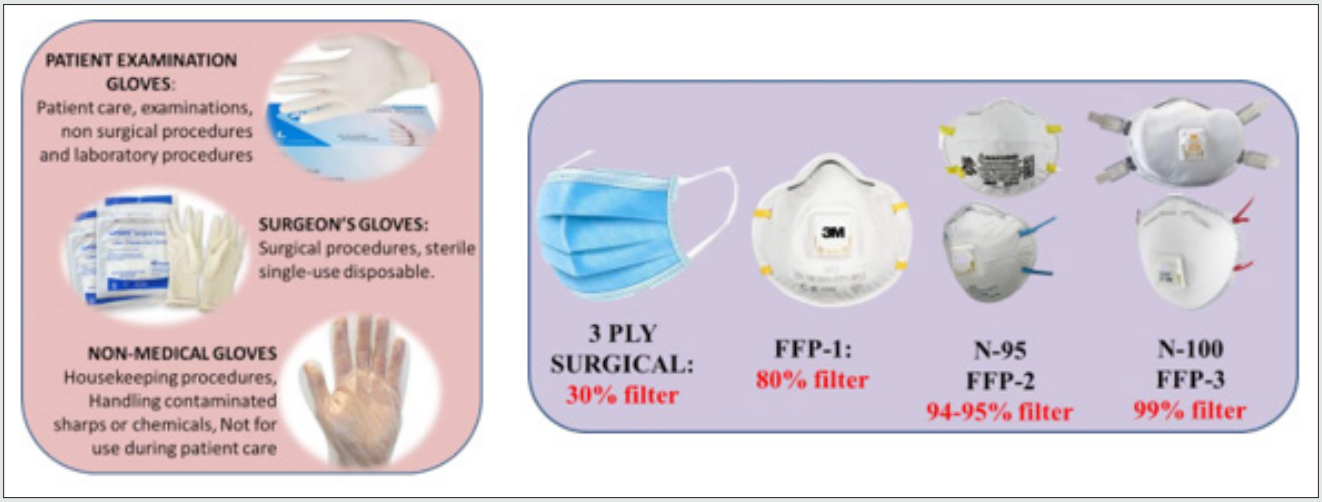

Figure 4:

Orthodontic Treatment Procedures

1. Most routine orthodontic procedures fall under Level 2 of treatment stages [11-13].
2. Following table lists stepwise precautions to be taken for every orthodontic procedure along with minimal requirement of PPE for the same.

Table 1:

	Guidelines/ Precautions	Minimally Must PPE
Pre-Appointment Triage	**Careful screening**: Thorough history of any past respiratory infections, or travel	**For the patient:**
	Any positive history of:	3 ply surgical mouth mask
	either residing in community outbreak area, participation in gatherings of unrelated people, visit to any COVID 19 known case self- quarantine, secure clearance, screen again	Non-surgical, non-powdered gloves
	respiratory symptoms or temperature in last 48 hours refer to hospital for management	Neatly tied hair
		Hands to be washed and sanitized
	Before entering the premise	**For the operator:**
	Disinfectant booths- 0.1% sodium hypochlorite or UV light	Patient examination gloves
	Hand sanitization- 70% alcohol based hand rub or 1% Dettol	FFP 1 or Surgical mask
	Mouth rinse- 0.2% povidine iodine	Dental scrubs without plastic gowns
	Maximum of one attendant allowed in waiting area	Head cap with neatly tied hair
	No jewellery or accessory to be worn or no bags, purse, files, books etc to be carried along	
	Waiting time to be kept nil.	
Non-Aerosol Generating Procedures	**Levelling & alignment:** Start with Square or rectangular NiTi wires if possible, to avoid emergency slippage. Distal ends to be cut flushed to avoid impingement.	**For the patient:**
	Use ligature wires to tie the archwires	Non-surgical, non-powdered gloves
	Reverse curve wires: if used should be attended regularly.	Neatly tied hair
		Hands to be washed and sanitized
	Space gaining methods:	**For the operator:**
	Proximal stripping to be avoided	Surgical gloves
	Use of opening loops instead of open coil spring.	FFP 2 or N95 mask
	Defer the extractions for a later time. If needed, proper surgical protocols to be followed and completed in one day to reduce exposure.	Dental scrubs with plastic gowns and shoe cover
	Activations for expansion screws to be continued only when close monitoring is possible.	Protective eye wear
	Space closure could be done with closing loops or tiebacks to increase the interval time.	Head cap with neatly tied hair
	An extra set of retainers to be given in case one breaks and appointment needs to be delayed.	

Aerosol Generating Procedures	**Impression taking** sterilized trays to be used. Before pouring with plaster, washing with running water and then sterilizing using 0.1% sodium hypochlorite solution	**For the patient:**
	Bonding: For cleaning the tooth surface, a minute of brushing with pumice followed by rinsing and blot drying using cotton rolls.	Neatly tied hair
	After etching, use wet cottons remove the etchant from tooth surface.	Hands to be washed and sanitized
	Use two sets of instruments which should be autoclaved before every patient	**For the operator:**
	Avoid miniscrew placement and associated mechanics due to risk of failure and other associated emergency complications associated with it.	Surgical gloves
	Debonding: Extra precautions to be taken in such cases. Use high volume vacuum suction.	FFP 3 or N100 mask
	Essix retainer could be a better alternative to fixed reatainer to avoid unnecessary aerosol generation.	Dental scrubs with waterproof plastic and surgical gowns and shoe cover
		Protective eye wear with face shield
		Head cap with neatly tied hair

Sterilization

1. A pre-procedural mouth rinse with an oxidizing mouthwash such as 1.5% H2O2, 1% povidine-iodine, or even HOCl acid may prove beneficial, since it has been suggested that the coronavirus could be vulnerable to oxidation.
2. Hypochlorous acid (HOCl) is a weak acid created when chlorine dissolves in water to form a hypochlorite. It can be mixed fresh and used within 90 minutes.
3. UV sterilizers, or autoclaves should be used for sterilizing orthodontic instruments after every patient.
4. 2% Gluteraldehyde can be used for sterilizing alginate impressions, burs, preformed bands, photographic retractors also.

Conclusion

These are the strenuous times of transition and adaptation to a new lifestyle, new form of human interactions, new way of working as responsible society and human beings is what we need the most. We need to be better equipped to deliver treatments with all the customary precautions as we become more aware of our actions and how our actions affect each other's well being too.

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