

Customized Orthodontic Triage During COVID-19 Pandemic

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Abstract

COVID-19 pandemic necessitates streamlining patient influx in orthodontic office to avoid cross infection between patients, clinicians, and dental health care workers. A customized orthodontic triage has been proposed in this article to schedule patient appointments through priority triaging and, at the same time, provide self-care advice, virtual assistance, and remote monitoring for patient management in elective circumstances.

Keywords

COVID-19, orthodontic emergency, orthodontic triage, pandemic, SARS-CoV-2

Introduction

Airborne spread of SARS-CoV-2, as acknowledged by WHO, has compelled dental health regulatory bodies to advise suspension of all elective and routine dental procedures, including orthodontic treatment, and render only emergency treatments. Experimental in vitro evidence of high SARS-CoV-2 viral load and prolonged stability up to 3 h in aerosols (<5 µm) using 3-jet Collison nebulizer,¹ further supports precautionary measures during aerosol-generating procedures in orthodontic office. Furthermore, possibility of cross-transmission among clinicians, dental health care workers, and patients in an orthodontic office is intensified due to the following factors:

1. Children comprise majority of orthodontic patients, but studies show that many COVID-19 patients in this age group remain asymptomatic, despite being highly contagious during the incubation period.²
2. Huge inventory of orthodontic supplies and instruments demand strict sterilization protocols.²
3. Likely presence of SARS-CoV-2 receptor–angiotensin-converting enzyme-2 (ACE2) on tongue and buccal mucosa of patients.² In addition, patient's saliva can remain positive for SARS-CoV-2 even after the patient is asymptomatic or tests negative for nasopharyngeal swabs (NPS).³
4. Aerosol-generating procedures like prophylaxis with ultrasonic scaler, bonding/debonding with high-speed handpiece may generate splatter contaminated

with patient's blood/saliva. Aerosols may reach as far as 2 m from the patient's mouth with microbial intensity being highest when farthest from the patient. It may possibly be found on scrubs, nose, and chest of doctors and even contaminate the waterline.²

Common guidelines issued by regional health regulatory bodies for orthodontic treatment during the pandemic^{1,2}:

1. Avoidance of orthodontic bonding, debonding, and other aerosol-producing procedures and use of 3-way syringe, high-speed air-rotor and ultrasonic scalers.
2. If necessary, these procedures must be carried out in isolated rooms with negative suction and high particulate air filtration system, following proper personal protective equipment (PPE) guidelines, including N95 mask, cover all gown with headcover or hood, double gloves, and eyes or face shield.
3. Orthodontic treatment can broadly be categorized under emergency, urgent, delayed, and minimal treatment needs, as per severity (Table 1).

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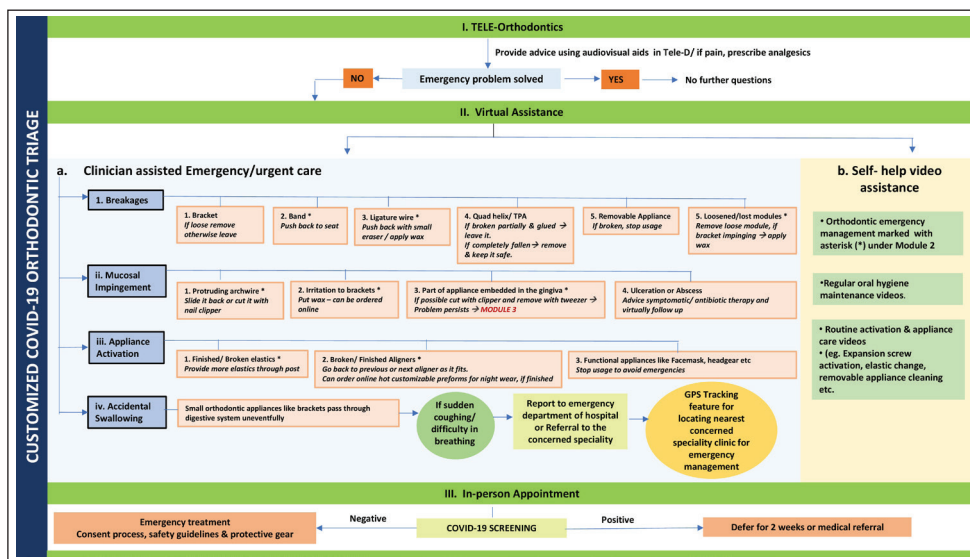
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Table I. Orthodontic Issues or Emergencies Based on Urgent Treatment Need

Emergency	Urgent	Delayed	Minimal
<ul style="list-style-type: none"> Accidental swallowing Chances of inhalation of foreign body Abscess 	<ul style="list-style-type: none"> Severe pain Broken band that cannot be seated back Broken appliance; embedded in gingiva Protruding wire impinging mucosa 	<ul style="list-style-type: none"> Finished or broken elastics Appliance activation Finished or broken aligners Use of functional orthopedic appliances 	<ul style="list-style-type: none"> Loose modules Debonded bracket attached to archwire Broken band which can be seated back

Source: The classification in the Table is original but the various orthodontic emergencies were compiled from online resources available from American Association of Orthodontist, British Orthodontic Society, and Royal College of Surgeons of England.

**Figure 1.** Customized COVID-19 Orthodontic Triage

Source: Online resources available from American Association of Orthodontists, British Orthodontic Society, and Royal College of Surgeons of England. Suri et al¹ and Caprioglio et al.⁴

Note: The figure depicts 3 sequential modules of orthodontic emergency/urgent care. Module II is further divided into clinician-assisted virtual care and self-help patient videos.

Need for Development of Customized Orthodontic Triage

The pandemic has affected more than 27 million people all over the world, and India being the second most affected country has more than 4 million confirmed cases with 72,775 deaths reported to WHO until September 8, 2020. While most of the confirmed cases are asymptomatic but contagious,² it is important to schedule priority triage in appointments. The authors have thus proposed a customized orthodontic triage for patient management in orthodontic emergencies, minimal in-person contact, as well as ensuring regular maintenance.

Customized orthodontic triage for orthodontic emergency/urgent care (Figure 1) is divided into 3 basic modules^{1,4}:

1. Module I: Tele-orthodontics

Preliminary patient queries handled with tele-dentistry and virtual assistance,^{4,5} including audiovisual aids, photo sharing, and video calling.

2. Module II: Virtual assistance

This comprises further 2 components.

a. *Clinician-assisted virtual assistance:* Management of different situations such as breakages, mucosal impingement, appliance activation, and accidental swallowing with virtual instructions by the clinician.

b. *Self-help video assistance:* Videos for patient help regarding some emergency situations marked with asterisk (*) in clinician-assisted virtual care (eg, protruding archwire, loosened modules, etc), preventive oral hygiene maintenance to routine appliance care and activation.

3. Module III: Appointment scheduling

If the condition progresses in severity beyond virtual assistance, patient can be scheduled for an in-person assessment and management after proper COVID-19 screening and consent process.

Future Scope

- The tele-dentistry initiatives by various Indian national institutes like Dr. Z.A. Dental College and Hospital, Aligarh Muslim University (AMU) (AMU News, available at <https://www.amu.ac.in/about3.jsp?did=2321>) and Faculty of Dentistry, Jamia Millia Islamia (JMI), New Delhi (Press Release, available at <https://www.jmi.ac.in/bulletinboard/press-releases/list/latest>) can be made robust by incorporating the proposed orthodontic triage to ensure efficient emergency care to ongoing orthodontic patients.^{1,3,4}
- The modified orthodontic triage can be developed into an integrated software for e-orthodontic or mobile (m)-orthodontic triage during the COVID-19 pandemic, comprising interactive communication modes, GPS tracking, as well as artificial intelligence for automated solutions.

Conclusion

The current pandemic situation has made social distancing the new norm for preventing cross infection. The customized orthodontic triage for efficient patient management, while regulating patient influx in an orthodontic office, has 4 components catering to different orthodontic emergencies. It, also, has a future scope of being incorporated into an integrated software capable of automation and self-help videos for maintenance in e-health or m-health alternatives.

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Author Contributions

Sana Bint Aziz substantially contributed to the concept or design of the work, drafted the article and revised it critically for important intellectual content, and approved the version to be published.

Priyanka Kapoor substantially contributed to the concept and design of the work, drafted the article and revised it critically for important intellectual content, and approved the version to be published.

Declaration of Conflicting Interests

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