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Review Article

Emergencies and Urgencies in Orthodontics and their Home Management during COVID-19: A Review

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ABSTRACT

Introduction: The outbreak of corona virus disease in 2019 has brought immense struggle in the routine life of each and every individual across the globe. Dental healthcare is no exception to that. India is facing second wave of corona virus pandemic. With the lockdown in place in order to prevent the spread of corona virus, dental services cannot be provided instantly to the individuals in need. Emergencies during on-going orthodontic treatment are not uncommon and these emergencies demand prompt orthodontic management for the relief of pain and discomfort. Because of closure of dental services, these emergencies have to be dealt at-home by the patient which is to be done under the constant surveillances of an orthodontist. This article provides a brief overview of the emergencies that are to be expected during various phases of orthodontic treatment and methods to manage these emergencies at home by the patient during lockdown and quarantine.

Review: This review includes publications in English and non-English languages that matched the search terms up to 25th April, 2021. Studies were retrieved from the following databases: PubMed, MEDLINE, Scopus, Cochrane and Google Scholar. The search was conducted using the following terms: COVID-19; dentist; oral; orthodontic; management; infection control; contamination; risks and transmission; emergencies; protocol; tele orthodontics. Articles that fall within the scope of this review were included and retrieved in full text. References of those articles were screened as well.

Conclusion: Orthodontic urgencies and emergencies including severe pain and discomfort can be managed at-home under the proper guidance of the orthodontist. Although the treatment process may get delayed because of breakage of appliances while attempting to manage the condition at home, but relief of undue pain and discomfort should be the primary concern of an orthodontist.

Keywords: Orthodontic emergencies; COVID-19; Pandemic; Lockdown; Quarantine; Ligature; Elastic module; Orthodontic bands; Removable appliances; Separator

INTRODUCTION

American Dental Association defined 'dental emergency' as potentially life threatening which require immediate treatment. It includes uncontrolled bleeding, soft-tissue infection with intraoral or extra oral swelling that may compromise the airway or trauma involving facial bones compromising airway. Whereas 'dental urgency' is defined as conditions which require immediate attention to alleviate severe pain and risk of infection. Orthodontics is a branch of dentistry wherein the treatment span usually lasts for 2 to 3 years varying with each individual case [1]. During this treatment span a number of orthodontic urgencies and emergencies may arise requiring prompt orthodontic care for their management. These are usually associated with severe pain, bleeding, discomfort or any hindrance occurring while chewing of food. Usually, emergencies during orthodontic treatment is rare but urgencies are quite frequent and they shouldn't be ignored as it may damage the rapport that the orthodontist builds up since the beginning of the treatment, also, it may create mistrust between

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the orthodontist and the patient. Losing confidence and belief in the appliance or the orthodontist may be the next consequence of ignorance or delayed management of these emergencies.

When timely attended to, orthodontic urgencies may exponentially increase the trust and confidence of the patient on their dentist or the appliance, giving them the assurance that their pain and discomfort is the priority for their dentist and thus motivating them for continuation of orthodontic treatment [2]. Patients report with more on time appointments, maintain good oral hygiene, are more compliant with the use of intraoral elastics, and thus are motivated for early completion of treatment. This would reduce deviation from the normal course of treatment and thus prevent prolonging of treatment time. The novel Corona Virus Disease (COVID-19) is a viral disease affecting almost every country in the world with a sharp increase in the number of cases with every passing day. This pandemic began in the year 2019, and since then, every country is struggling to control the spread of this disease. The most common route for transmission of Corona virus according to WHO (2020) is airborne transmission, droplet transmission, and aerosol transmission. Because of the high infectivity of the virus, several countries are adopting measures such as lockdown, quarantine and social distancing. Among these methods, is country-level termination of dental services except for emergency treatment [3].

Currently, the number of cases is showing an exponential growth in India with almost every sector badly affected by the disease. India is facing the second nationwide wave of Covid-19 pandemic which has prompted reimposition of strict curbs, including partial and complete lockdown, to tackle the condition. As Covid-19 virus is present in the saliva and orthodontic procedures such as making alginate impressions, bonding procedure, cementation etc. may generate aerosols which pose an enormous threat for the healthcare professional to be exposed to the deadly virus. This virus is also known to remain viable in aerosol for up to 3 hours with half-life of more than 5 hours on stainless steel and plastic surfaces. As a result, any patient in the vicinity of the COVID positive individual or any healthcare professional working in the same environment even after the infected individual has departed, is at a great risk of getting infected [4]. Once it is airborne, the virus can transmit from one healthcare worker to another, from healthcare worker to patient, or from patient to patient within the same unit. An orthodontist usually treats several patients belonging to a variable age group including infant, children and adults. This increases the risk of spreading infection within the orthodontic clinic. Recent studies have shown that children may remain asymptomatic carrier of covid-19 virus and can transmit the virus in the absence of symptoms. With nationwide lockdown in place again in 2021, orthodontic treatment span has increased along with orthodontic emergencies and urgencies as appointments are being rescheduled. The objective of the review is to provide insights on the orthodontic emergencies and urgencies and their management that the patients can attempt during lockdown [5].

LITERATURE REVIEW

In the situation, wherein lockdown is to be imposed with halt of dental services, the patient should be provided with sufficient amount of orthodontic wax, elastics, medications for pain etc. so that the patient can manage any discomfort or pain themselves at home. The patient should be instructed in advance of the urgencies that might occur and to contact the clinician as soon as any discomfort or pain is felt. The instructions which are to be given:

- Maintenance of oral hygiene-Patient is advised to brush 3 times a day with standard toothbrush, followed by use of interproximal brush. As an adjunct, use of a fluoride mouthrinse eg. Fluoriguard (225 ppm), once a day is to be used.
- Low sugar diet-Intake of balanced diet with low content of sugar. Fizzy drinks should be avoided in particular.
- Soft consistency food item-Hard and sticky food items are to be avoided to prevent breakage of brackets [6].

In the event of occurrence of any orthodontic emergency, the patient should immediately report to the clinician with the details of

- Chief complaint
- Site
- Onset
- Whether associated with bleeding or not?
- Whether associated with pain or not? If yes, details about the type, severity and associated symptoms.
- Is it obstructing the normal functioning of mastication?
- Photograph or video taken by the patient displaying the problem [7].
- Does the patient have the appropriate armamentarium for its management (pencil eraser, cotton bud, orthodontic wax, tweezer)?

After obtaining detailed information about the complaint that the patient has, the clinician should decide whether the emergency can be managed by the patient at home or whether a thorough orthodontic care is required. Taking into consideration the ongoing pandemic, majority of the orthodontic emergencies should be managed in the home under the constant counsel of the clinician. Before beginning of any procedure, disinfection of tweezer, nail cutter, scissor etc. should be performed by boiling the instrument in 100°C water for 30 min. Only in the case of severe pain, bleeding or to save a tooth a scheduled appointment is to be given for its management.

Irritation

Cause: Irritation due to contact of orthodontic bracket/band or arch wire with inner lips/cheek can occur during initial stages of orthodontic treatment before the patient gets adjusted to the new appliance [8].

Solution: The patient is asked to dry the metal component of the appliance which is in contact with the irritated mucosa. This is followed by softening of small piece of orthodontic relief wax by manipulating it between the index and thumb finger. Application of the wax over the bracket or wire that is causing

the irritation. Topical anaesthetic gels like Orabase or Mucopain can provide relief from mouth sores.

Loose Ligature

Cause: Ligature ties can become loose on consumption of hard or sticky foods. During initial stages of treatment, due to active movement of tooth, the ligature ties may become loose.

Solution: The ligature can be removed with the use of a sterile tweezer. If the end of the ligature is irritating the mucosa, it can be bent towards the tooth and away from the lips and cheek with a cotton bud or a pencil eraser.

Debonded Bracket

In a study done by Paula Cotrin et al on Brazilian population, they found that the debonding/breakage of orthodontic bracket were the most common orthodontic emergency.

Cause: Diet involving hard and sticky food. Improper bonding technique. Inadequate bite raise leading to premature contact. Trauma in the orofacial region during sports.

Solution: The debonded bracket doesn't usually cause any pain if it remains flush with the tooth, but it may cause discomfort to the patient. It is suggested to leave the bracket attached to the archwire until next appointment is scheduled [9]. If the bracket is impinging the mucosa, the orthodontist can guide the patient to cut the elastic module or ligature circling the bracket using scissors with narrow tip to free the bracket from the archwire. With the help of tweezers, the cut module/ligature is gently removed from the bracket upon which the bracket can be removed from the archwire. If a bracket or tube which is used to anchor the elastics is broken, the use of elastics should be stopped immediately and the clinician is informed about it. If the last bracket or tube of the arch is lost, the bracket or tube can be removed and the extra wire is cut with the help of a nail clipper.

Loose Bands

Cause: Improper band pinching. Faulty molar band size selection. Improper cementation. Consumption of hard and sticky food item.

Solution: If the bands have become loose, they tend to get embedded in the gingiva on mastication. This may cause severe pain to the patient and if left unattended, may cause gingival recession [10].

Thin wire: The wire can be cut using nail cutter or sharp scissors where the wire is entering the molar tube. Topical local anaesthesia such as mucopain is applied on the gingiva beneath the tubes to avoid pain during removal. The back of a teaspoon can be used to engage the lower edge of the band on the cemented side. Slowly pushing movements can be applied away from the gingiva to dislodge the band. Once the band is loose it can be separated from the tooth with the help of tweezers.

Thick wire: If the wire is thick, it may not be possible to cut the wire, so it may have to be left in its position till further appointment. The patient is instructed to maintain good oral hygiene to avoid food lodgement and decay underneath the bands.

Loose Bands of Appliance(Tpa, Quad Helix, Lingual Arch, Tongue Crib etc.)

Solution: If one of the two molar bands becomes loose, the loose band should be repositioned by pushing it towards the molar to stabilize it temporarily. If both the bands are loose completely and is impinging on the gingiva, it should be removed slowly and kept safely in a container and presented to the orthodontist in the next appointment.

Ligature Wire Ends

Cause: The ends of ligature wire not tucked in properly.

Solution: The ends can be bent towards the tooth and away from the lips and cheek using a cotton bud or eraser pencil or the back of the teaspoon. In the situation wherein, the ligature wire breaks during tucking, the wire is safely removed from the bracket. Orthodontic wax, cheese wax can be used to cover the end for improved comfort.

ACCIDENTAL SWALLOW

Any orthodontic bracket, tube, bite raising materials or module may get detached from the tooth surface and if swallowed accidently is usually passed though the digestive tract uneventfully. Laxatives can also be prescribed for easy and fast passage of the ingested metal. Only in cases where after swallowing the patient feels difficulty in breathing or has sudden coughing, they are referred to a hospital for an X-ray to determine the position of the bracket [11, 12].

Broken Bonded Retainer

Cause: Incorrect bonding procedure. Hard and sticky food consumption.

Solution: Completely broken the patient should remove the entire retainer to avoid any impingement and accidental ingestion of the retainer. Broken from one or two teeth only- the patient should try to bend/push the protruding wire using pencil with rubber end or tweezers so that it doesn't hurt. It can also be attempted to cut the retainer from only these teeth with a tweezers and nail clippers/scissors. Orthodontic wax or silicone can be used temporarily till next appointment.

Gingival Pain or Swelling

Cause: Part of orthodontic appliance embedded in the gingiva. This is followed by severe pain and infection surrounding the embedded part. Lodgement of food beneath the bracket or surrounding the bands.

Solution: An attempt to remove such an appliance especially a piece of wire can be made by using a sterile clipper to cut it or a sterile tweezer to pull it out.

Lost Ligature or Elastic Modules

Cause: The most probable reason could be accidental ingestion of the module during chewing of food.

Solution: If a rubber or wire ligature is lost or totally disengaged, the clinician is to be informed about the module. It does not require any emergency management.

Seperators

Cause: Placement of separators between the adjacent teeth for banding of the molars are sometimes very painful because of the constant pressure against the tooth.

Solution: After 4 hrs and 24 hrs of placement of separator high levels of discomfort is usually felt by the patient. This can be reduced by analgesics (400 mg ibuprofen orally 1 hour preoperatively). The separators are kept intraorally for 5 days. They should not be left in the oral cavity for extended period of time since their action is not self-limiting.

Breakage of Removable/ Functional Appliance

Cause: Decreased strength of the appliance because of reduced thickness. Biting on hard food items.

Solution: Cease further wearing of the appliance. The broken parts are to be kept safely in a container and is to be presented to the clinician in the next appointment.

Elastic Depletion

Cause: Insufficient amount of elastics provided to the patient by the operator. Injudicious use of the elastics that are provided.

Solution: The operator must be informed about the depletion so that he/she can dispatch elastics to the patient. The patient can be asked to keep the used elastics back in the container to be reused in case of emergency. In a situation where operator is unable to dispatch the required item, it can be ordered from online service providers [13].

Dental Pain Immediately after Appliance Placement or Activation

Cause: Moderate to severe discomfort and pain in the initial stage of fixed orthodontic treatment is usually expected which might last for more than 1 month.

Solution: Patient is informed prior to appliance delivery or activation about the possibility of occurrence of pain and discomfort. Consumption of soft foods can minimize pain. Consumption of cold beverages and food items can also reduce the severity of pain. If the pain is severing in nature, patient is asked to consume analgesia such as paracetamol or ibuprofen along with clear instructions to consume only when the pain is unbearable.

Trapped Soft Tissue onto Fixed Appliance Following Trauma

Cause: Occasionally after falls and being 'hit in the face', the lip or cheek may become embedded onto the fixed appliance; with patient complaining 'lip/cheek got stuck on the brace'. This may cause tremendous pain and hinders the normal functioning of oral cavity even including speech and mastication.

Solution: This requires scheduled appointment with the clinician to safely disengage the soft tissue from the brace. This could be done by administering appropriate Local Anaesthesia in order to disengage the soft tissue without discomfort. Stitches may be necessary under certain circumstances.

CONCLUSION

With the COVID-19 pandemic affecting every continent globally, the healthcare professionals, and the patient all should work in unison to control the transmission of this disease. In case of any emergency, the patient, the orthodontist and staff, all should work in synchrony to manage the emergency following the COVID-19 protocol and guidelines. As much as possible situation should be tackled at home under constant guidance and surveillance of the orthodontist. Only the cases that cannot be solved *via* teleorthodontics should be given a scheduled appointment and treated following the necessary protocol.

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