



Tele-orthodontics: A Future in Covid19 Era.

Deepika R.S Bais, Sandhya Maheshwari, Grateful star suting, Aiswareya G,
Senior Resident, Department of Orthodontics and Dental Anatomy, Dr. Z. A. Dental College, Aligarh Muslim University, Aligarh, India..

Professor and Chairman, Department of Orthodontics and Dental Anatomy, Dr. Z. A. Dental College, Aligarh Muslim University, Aligarh, India.

Junior Resident, Department of Orthodontics and Dental Anatomy, Dr. Z. A. Dental College, Aligarh Muslim University, Aligarh, India.

Junior Resident, Department of Orthodontics and Dental Anatomy Dr. Z. A. Dental College, Aligarh Muslim University, Aligarh, India.

Submitted: 05-01-2022

Revised: 15-01-2022

Accepted: 18-01-2022

ABSTRACT:

Tele-orthodontics in COVID-19 has worked as a boon for many during the COVID-19 pandemic. It has been reducing the patient's anxiety and uncertainty during this difficult time via teleconsultation for one who was already undergoing orthodontic treatment. This pandemic has brought many changes in our day-to-day life, but with the advent of newer technology and internet facilities, online consultation from orthodontists for troubleshooting has become ease. Frequent visit to the hospital increases the risk of infection transmission to the dentist/ orthodontist as well as the patient because, the dental procedure has to operate in the mouth, with the higher risk of spread of infections. As, SARS-CoV-2 virus affects the respiratory system with high virulency and high dissemination, through the modes of diffusion, i.e, droplets of saliva released during talking, sneezing, or coughing stance a greater risk of being transmitted. As a result, dental offices have temporarily halted all deferred operations in order to prevent the spread of the infectious virus. So, for now, only dental emergencies are managed. Tele-orthodontics combines experience, technology, and connectivity to make orthodontic consultations more convenient for patients. It can also be used to educate the public and raise awareness. So, with the help of remote monitoring which includes Emails, MMS, WhatsApp, phone calls, zoom meeting, and google meet like applications can for teleconsultation. Several authors investigated the attitudes of orthodontists and general dentists toward teledentistry and discovered that they favour the use of teledentistry to make orthodontic appointments more accessible to dentists and patients, especially during this period of the Covid19 pandemic, when dentistry is most at risk due to the fact that it is a droplet infection. Therefore, Tele-orthodontics helps in reducing

patients physical visits, chances of exposure, time as well as travelling charges.

Keywords: Tele-orthodontics, Tele-dentistry, E-consultation, Covid19 pandemic.

I. INTRODUCTION:

Tele-dentistry refers to using the Internet to seek advice that could be of assistance to a patient, as well as taking continuing education course available online. These two activities are, in reality, Web browsing and learning from distance, respectively. Tele-dentistry is a fusion of telecommunications and dentistry that entails sending clinical data and ideas over far distances for dental monitoring. A part of it is tele-orthodontics which uses expertise, technology and communication to provide orthodontic care for the patient, to deliver public education and for creating awareness among population. The idea of teledentistry has been supported by many orthodontists and general dentists in providing orthodontic consultation more available to dentists and patients especially during this period of Covid19 pandemic where, dentistry is at the highest risk as it is a droplet infection.

In recent centuries, there were several pandemics that were accountable for a high mortality rate and grave declined in socioeconomic status in those countries affected by it. In the current scenario, despite recent developments in medicine that can cure and prevent different diseases, a novel SARS-coV-2 pandemic has caught everyone's attention, to the point where the entire planet has been forced to suspend all operations in order to avoid the virus's spread. (1) This virus belongs to the high-risk Coronaviridae family, which widely affects the respiratory system. So, during this COVID19 pandemic era where the dental practice is at high risk because of the high virulency and increased



dissemination of virus, through the modes of salivary droplets produced during sneezing or coughing have an increased tendency of being transmitted among health care workers, who operate in close proximity to patients' mouth, using air rotors that contain aerosol and thus have a higher risk of infection. The virus can be transmitted by minute aerosol particles that hang in the air before dropping to the ground as heavier droplets. (2).

For this reason, dental offices postponed all deferrable procedures in order to stop the spread of the infectious virus with exception in dental emergency cases that are being managed with the aid of Emails, MMS, WhatsApp, Phone Calls, Zoom Meeting and Google Meet applications. Cook coined the word "tele-dentistry" in 1997, defining it as "the method of using video-conferencing technology to diagnose and provide treatment advice over a distance." This showed that tele-dentistry could lower overall patient care costs while still offering dental care to people residing in rural and outlying areas. With the advancing of technologies, new opportunities for tele-dentistry have been established, such as technologies that are available in present which begins to alter the dynamics of dental care delivery (3)(4). During this pandemic, tele-dentistry will offer new ways to improve patient treatment and diagnosis before adequate medication and vaccination are available.

Various literatures have been published regarding tele-dentistry which mainly focused on prevention and precaution to be taken for dental caries by evaluating the population residing in remote areas, while there is very limited articles about the application of tele-dentistry in orthodontics which is limited to diagnosis and the treatment planning phase (5). Despite the paucity of evidence supporting an optimal representation of tele-orthodontics, and an underlying tradition that ultimately renders greater significance to the clinical visit, which we cannot be denied, declined, or minimised, the perception of situations such as the COVID-19 pandemic compelled us to use modern techniques and approaches to contemplate and adopt the orthodontic treatment plan. During this pandemic, it became evident that follow-up of orthodontic patients who were already under treatment cannot be stopped. As a result, adequate steps against viral infections have made the use of tele-dentistry, specifically tele-orthodontics, a safer option, but it is unavailable for all cases and for extended period.

Tele-orthodontics as a part of tele-dentistry:

Tele-orthodontics is a wide concept that comprise the use of information technology to include orthodontic care, guidance, or treatment without the need for in-person contact. Sharing digital documents and connecting through the internet can be used for consultations and treatments. In order to facilitate orthodontic treatment, it can also be used in conjunction with general dentists. Several websites and Android applications (Dental monitoring app, Clincheck app, Smile consult app) are available for the same, all of which have a dedicated team in charge of providing proper consultation. Emails, MMS, WhatsApp, Zoom Meeting, and Google Meet-like apps can all be used for the same purpose (8).

In the year 2000, orthodontists who were supervising general dentists to render dental care to patients who had restricted access to orthodontic treatment had a successful outcome. During the retention period, patients were often subjected to basic remote control by asking patients to send their images instead of visiting the clinic. However, the term "tele-orthodontics" has only been used in a few instances. A crucial foundation for the advancement of prescription devices, individualised appliance programmes, and direct aligner therapy.. (9)(10).

Treatment based on the expected outcome of a patient's reaction to treatment is one of the disadvantages of conventional orthodontics. Generally, patients are required to visit the dental clinic in which average time frame is allotted to every patients, rather than the specific period of time for each patient and treatment needs which thus increases the chances for exposure to the doctor as well as patients. With the emergence of tele-orthodontics, planning the clinical visits of patients can be managed according to the situation and the requirement, that will enhance the work efficiency and safety by reducing the in-office visits. This not only benefit the dentists/orthodontists by minimizing treatment time, but also enhance patient comfort and safety (11). For example, by assessing the patient in photographs or video-conferencing one can decide the need for changing wires, mechanics and even repair that might require the in-office visit. One can also do consultation to assess the need for orthodontic treatment planning.

According to Berndt Fetal.(12), interceptive orthodontic procedures performed by well-trained dentists and remotely monitored by orthodontists by the way of tele-orthodontics are a possible approach to alleviate the extent of malocclusion in underserved children when in-



office visits to an orthodontist are not feasible during this pandemic period.

Procedures that can be performed with Tele-orthodontics:

Benefits of Tele-orthodontics includes reduction in chair side time and time spent in the clinic by the patients up to 45 mins for follow-up appointments that will reduce the risk of infection, minimizes missed appointments, and increased follow-ups for dental phobic patients.

With the outbreak of COVID-19, we've developed an orthodontic treatment plan that incorporates traditional orthodontics with tele-orthodontics, which involves interactive techniques, to help us complete clinical procedures during the prolonged lockdown time and in the future. Various forms of procedures that can be conducted using tele-orthodontics/computer mediated technology, including aligners, palatal expanders, and practical appliances therapies, as well as fixed multibracket appliances, under which there might be phases that can be completed entirely with elastics and no in-office interventions. Furthermore, it is benefited for growing patients to have their early general screening who is unable to schedule a timely dental appointment. Telematic methods such as video meetings may be used to record an obvious malocclusion and draw an initial diagnosis, issues associated with breathing habits, mastication and swallowing patterns, and overall oral health.

Overall, the benefits of tele-orthodontics outweigh the drawbacks of less in-office consultations and visits.

Advantages of Tele-orthodontics- the future of dental digitalization:(14)

During this lockdown, tele-orthodontics was one of the methods to carry out some of the orthodontic procedures, as it offers a mode of interaction among patient and dentist, and to analyse and solve issues. In spite of having certain limitations, tele-orthodontics can be advantageous in many ways.

The following are examples of tasks that can be completed both in and out of the office:

- 1) Evaluating and explaining treatment plan,
- 2) Inform consent,
- 3) Instructions on how to use the trays and how to get them delivered by mail and delivery systems,
- 4) Demonstration of elastics use,
- 5) Follow-ups,
- 6) Orthodontic consultations and emergency consultations, aligners, practical appliance therapy, and palatal extension.

7) Interception of developing malocclusion, to reduce the future severity by counselling about the parafunctional and other habits.

8) One of the advantages found was the patient's parents were relaxed by the possibility to obtain solution of their problems and during the lockdown, the patients maintained their composure.

Other advantages, that are beneficial in terms of practitioner and patients are:

- 9) Reduced personal contact so, there is minimal risk of infection.
- 10) Less missed appointments with more counselling opportunities.
- 11) Incitement and prevention with frequent reminder to maintain oral hygiene.
- 12) Less chairside time and reduced cost.
- 13) Shorter appointments.
- 14) Reduced the anxiety in phobic patients and their parents.
- 15) Saving time in travelling and in-office visits.
- 16) Specific advantage to the practitioner is reduced additional cost of PPE kit, mask, disposable head and shoe covers etc, especially during post emergency phase.

The dental tasks that must be done in clinics are the first visits and evaluations, impression making, bonding of brackets and bands, proximal stripping and progression of the wires.

Ethics in Tele-orthodontics(litigation and legislation):(15)(16)

"Members shall protect confidentiality of medical records," states Principle III, Advisory Opinion B of the American Association of Orthodontists Principles of Ethics and Code of Professional Conduct (adopted 1994, revised through 2009).

The confidentiality of patient's medical information must be addressed when utilizing tele-orthodontics. The patient's privacy is respected, patient's data must be adequately secured whenever obtained, transferred or saved in a tele-orthodontic records.

The following are commonly used identification hiding strategies:

- 1) Hide all contact details such as Mobile and fax numbers, mail addresses and medical records numbers.
- 2) Remove residential information that is less than a state, such as the street, city, field, and full pin code from the patient's home address.
- 3) Hide all dates related to secured health information such as date of start of treatment and date of birth.



- 4) IP addresses and URLs should be removed.
- 5) Remove certain aspects of full-face photos and other similar images and any distinctive identifying characteristics.

II. CONCLUSION:

Tele-orthodontics is an important help in the time of COVID19 lockdown and its post-occurrence period due to the need to respect safety distance or social distancing and the patient's fear of infection spread. It is revealed to be a useful assist in pursuing certain orthodontic services during an emergency, and this technique will continue to be useful to clinicians in the future, particularly in the immediate aftermath of an emergency. Tele-orthodontics allows the orthodontist to complete the requisite number of check-ups while saving time and reducing the risk of infection for both the patient and the orthodontist. It can also be thought of as an ideal option and extension of standard times for both the orthodontist and the patient, minimising time and money spent while maintaining orthodontic efficiency. Tele-orthodontics is important in all emergency stages, not just for the continuity of orthodontic procedures, but also to inform patients and their parents about the success of their smile from a psychological perspective.

REFERENCES:

- [1]. ADA. https://success.ada.org/~media/CPS/Files/COVID/ADA_COVID_Coding_and_Billing_Guidance.pdf.
- [2]. MEZA-PALMA, L. & ROSALES-SALAS, J. Teledentistry Protocol for Patient Assistance in Emergency Dental Management. Quarantine COVID-19 (SARS-CoV-2). Remote Categorization of Dental Emergency and Assistance (C.R.U.D.A. for its Spanish acronym). *Int. J. Odontostomat.*, 14(4):529-537, 2020.
- [3]. Cook J, Mullings C, Vowles R, Ireland R, Stephens C. Online orthodontic advice: a protocol for a pilot teledentistry system. *Journal of telemedicine and telecare* 2001;7.6:324-333.
- [4]. Stephens C, Cook J, Mullings, C. Orthodontic referrals via TeleDent Southwest. *Dental Clinics of North America*, 2002;46.3:507-520.
- [5]. Telles-Araujo GT, Caminha RDG, Kallás MS, Santos PSDS. Teledentistry support in COVID-19 oral care. *Clinics (Sao Paulo)*. 2020 Jun 12;75: e2030. doi: 10.6061/clinics/2020/e2030. PMID: 32555951; PMCID: PMC7279626.
- [6]. Irving M, Stewart R, Spallek H, Blinkhorn A. Using teledentistry in clinical practice as an enabler to improve access to clinical care: A qualitative systematic review. *Journal of telemedicine and telecare* 2018;24.3: 129-146.
- [7]. Gupta G, Vaid N. The world of orthodontic apps. *APOS Trends Orthod.* 2017;7(2):73-79. <http://dx.doi.org/10.4103/2321-1407.202608>.
- [8]. Ismaeel Hansa, Steven J. Semaan, Nikhilesh R. Vaid, Donald J. Ferguson, Remote monitoring and "Tele-orthodontics": Concept, scope and applications, *Seminars in Orthodontics*, Vol 24, Issue 4, 2018, Pages 470-481.
- [9]. Jampani ND, Nutalapati R, Dontula BS, Boyapati R. Applications of teledentistry: A literature review and update. *J Int Soc Prev Community Dent.* 2011;1(2):37-44. doi:10.4103/2231-0762.97695.
- [10]. Estai M, Kanagasingam Y, Tennant M, Bunt S. A systematic review of the research evidence for the benefits of teledentistry. *Journal of telemedicine and telecare* 2018;24.3:147-156.
- [11]. Mandall NA, O'Brien K.D, Brady J, Worthington HV, Harvey L. Teledentistry for screening new patient orthodontic referrals. Part 1: A randomised controlled trial. *British dental journal* 2005;199.10:659-662.
- [12]. Berndt J, Leone P, King G. Using teledentistry to provide interceptive orthodontic services to disadvantaged children. *American Journal of Orthodontics and Dentofacial Orthopedics* 2008;134.5:700-706.
- [13]. Ghai S. Teledentistry during COVID-19 pandemic. *Diabetes Metab Syndr.* 2020 Sep-Oct;14(5):933-935. doi: 10.1016/j.dsx.2020.06.029. Epub 2020 Jun 16. PMID: 32593116; PMCID: PMC7297180.
- [14]. Saccomanno S, Quinzi V, Sarhan S, Laganà D, Marzo G. Perspectives of tele-orthodontics in the COVID-19 emergency and as a future tool in daily practice. *European Journal of Paediatric Dentistry.* 2020 Jun;21(2):157-162. DOI: 10.23804/ejpd.2020.21.02.12.
- [15]. Kotantoula G, Haisraeli-Shalish M, Jerrold L. Teleorthodontics. *Am J Orthod Dentofacial Orthop.* 2017 Jan;151(1):219-221. doi: 10.1016/j.ajodo.2016.10.012. PMID: 28024777.



- [16]. Dental Council of India, Covid-19 Guidelines for Dental Colleges, Dental Students and Dental Professionals by Dental Council of India, Dental Council of India, New Delhi, India, 2020, <http://dciindia.gov.in/Admin/NewsArchives/DCI/Guidelines/on/COVID-19.pdf>.