# Tele-Orthodontics: A Lifesaver during COVID-19 Second Wave

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### Abstract:-

### ➤ Aim:

The study aims to evaluate the outcome of orthodontic treatment during the COVID-19 Pandemic using Tele-Orthodontics.

## > Objective:

To explain how Tele-orthodontics represents an excellent way to perform orthodontic follow-ups during a period of restriction and to assess the effectiveness of follow-up using Tele-Orthodontics during the COVID-19 Pandemic.

## > Materials and Methods:

Study design: Our study involves 30 patients in total, where 15 patients did not receive any further therapy and 15 patients had Tele-orthodontics treatment, with 10 patients receiving bonding treatment, 10 receiving midtreatment treatment, and 10 receiving retention appliances. The communication tools used in our study and proposed in our model of tele-orthodontics include an online questionnaire using Google form once every 15 days, Tele-calling with Google Meet once a month, and frontal, side profile, and occlusal view (if possible) photos via WhatsApp messenger.

## > Results:

Tele-orthodontics proved to be the only option to complete some orthodontic tasks during COVID-19 because it provided a means of communication between the dentist and the patient. Most of the patients who underwent bonding (66.7%), on retainer (96.7%), and during mid-treatment (93.3) maintained good oral hygiene during treatment. 93.3% of the patients' appliances on retainer were holding tight in place with no discomfort and during the treatment, 70% of the patients were comfortable while speaking and 63.3% noticed changes in their appearance. Overall, Tele orthodontics was more time-saving and more desirable economically to both practitioners and patients.

### > Conclusion:

Tele-Orthodontics is experiencing rapid growth and fierce competition. Most of the patients maintained good oral hygiene, and also had a positive perception of the use of Tele-Orthodontics.

*Keywords:- Tele Orthodontist, Pandemic, Orthodontist, Covid-19, Treatment.* 

## I. INTRODUCTION

Information technology (IT) has transformed human relationships. In a global world that is electronically networked and has no limits, doing a vocation from a distance is one of the new experiences [1]. The advancement of communication programs and cutting-edge technology have enabled rapid and efficient information transfer. [2,3]. According to the World Health Organisation (WHO), telehealth (telemedicine, teledentistry, etc.) involves the provision of healthcare services over long distances. Such services can be delivered via communication technologies to provide ongoing education and the essential information interchange to diagnose, treat, forecast, and prevent illnesses [4].

The Coronavirus disease 2019 (COVID-19) pandemic has posed such a threat to global public health that even if we can combat the infection through effective treatment and/or vaccination, dramatic and long-term changes are expected to affect how we live, work, and interact with one another [5]. In particular, dental treatments in all healthcare systems have greater direct contact with aerosols, increasing the risk of infection [6]. During the pandemic, several changes and recommendations were made for dental practice. Several dental offices were closed, with the suggestion that all other normal procedures be postponed and that only patients in need of emergency care contact their dentist under tight conditions.

Patients undergoing orthodontic treatment require repeated check-up appointments with their orthodontist to control their appliances over a lengthy period of time, which can occasionally take up to two years [7]. The majority of orthodontic patients were unable to obtain necessary therapy during the pandemic and subsequent clinic closures. The primary goal of this study is to assess the role of telehealth

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and orthodontics in the confined time of the COVID-19 pandemic for the follow-up of orthodontic treatments.

## II. MATERIALS AND METHODS

In this study, we assessed the benefits of adopting digital orthodontic procedures to deliver therapy at home during the COVID-19 Pandemic, as well as the cost-benefit analysis of implementing a remote orthodontic approach in everyday practice shortly.

Thirty patients were chosen from Tagore Dental College and Hospital who already had fixed orthodontic treatment. The study included only patients who had access to the Internet. This study included 15 patients who did not receive any further therapy and 15 patients who had Teleorthodontics treatment (10 patients receiving bonding treatment, 10 receiving mid-treatment treatment, and 10 receiving retention appliances).

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Patients who had treatments other than fixed orthodontic procedures and did not have access to the Internet were excluded. Every patient was required to have a monthly check-up, but during the COVID-19 lockdown, no in-person appointments with the orthodontist were permitted, and only non-deferrable healthcare could be supplied. According to the American Dental Association, the only orthodontic operation that cannot be deferred is the replacement of metal wires that create mucous ulcers.

Our tele orthodontics protocol includes an online questionnaire using Google form once every 15 days, Telecalling with Google Meet once a month (Fig.1a, 1b), and frontal, side profile, and occlusal view (if possible) photos via WhatsApp messenger (Fig.2).



Fig 1(a): Telecalling Patients using Google Meet



Fig 1(b): Telecalling Patients using Google Meet



Fig 2: Frontal and Occlusal View Photos Sent by Patients via WhatsApp

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## > Statistical Analysis

The data obtained were entered in Microsoft Excel Spreadsheet and distributed meaningfully. All analysis was carried out using Statistical Package for Social Science ( SPSS Version 19), IBM, Chicago.

Descriptive Statistics were presented as percentages.

## III. RESULTS

During the lockdown, tele-orthodontics proved to be the only option to complete some orthodontic tasks because it provided a means of communication between the dentist and the patient. Online check-ups were more time-saving and hence more desirable economically to both practitioners and patients. Patients reported some financial benefits and time savings as a result of online sessions. Although orthodontics involves less human interaction between the clinician and the patient, the relationship has already been established during regular appointments. One highlighted element of teleorthodontics was that the patients seemed to value the interaction with the practitioner more.

Among 30 patients, only 15 patients were included in this study and responded to the questionnaire. They were divided into 3 categories: 5 patients who underwent bonding, 5 patients who were in the middle of the treatment, and 5 patients who were on the retainer. Each was given a questionnaire over 3 months once 15 days and was asked to fill it.

After bonding, most of the patients did not have any pain or ulcers or any eating issues with the percentage of 60%, 53.3%, and 40% respectively. 73.3% of patients have brushed twice a day during their treatment. 30% did not use interdental brushes or floss. 53.3% and 60% of the patients have a satisfying appearance and are comfortable speaking respectively. 66.7% of patients maintained good oral hygiene while 6.7% were not satisfied with their oral hygiene.

On retainer, 96.7% of patients maintained their oral hygiene regularly. Only 16.7% and 20% had ulcers and discomfort respectively. 93.3% and 90% of the patients clean and take out their retainers while eating respectively. 36.7% brushed once a day and 63.3% brushed twice a day. Only 20% of the patients were not satisfied with their appearance and 70% were satisfied. 93.3% of the appliance was holding tight in place.

During the Mid-treatment, 93.3% of patients maintained oral hygiene regularly. 50% and 43.3% of the patients didn't develop any ulcers or pain since the last appointment respectively. 30% of the patients dislocated/broke the bracket/band and 30% had to hang brackets.46.7% of the patients didn't have the wire extended out but 43.3% of the patients did have and it caused them pain from the extended wire. 56.7% used the elastic band regularly while 36.7% didn't and 50% ran out of the elastic band. 50% of the patients use interdental brushed/floss. 70% of the patients were comfortable while speaking and 63.3% noticed changes in their appearance. During the Covid-19 outbreak, the Occupational Safety and Health Administration (OSHA) designated dentistry as a "very high-risk" profession [8]. Orthodontists faced several problems and limits, affecting the quality of orthodontic service and patient satisfaction. Tele-orthodontics enabled some orthodontic follow-ups to be performed with less chairside time, reducing patient time spent in the dentist office by up to 45 minutes, lowering the risk of infection, reducing the number of missed visits, providing particular troubleshooting solutions, and increasing follow-ups. Overall, tele-orthodontics mitigated the drawbacks of fewer human connections and in-person visits [10].

Sacomanno et al. concluded that tele-orthodontics enabled some orthodontic follow-ups with less chairside time, reduced patient time in the dental office by up to 45 minutes, reduced infection risk, fewer to no missed appointments, specific troubleshooting solutions, and increased follow-ups with odontophobia patients. Overall, tele-orthodontics mitigated the downsides of fewer human interactions and in-office visits [13]. Even in our study, teleorthodontics in the COVID-19 emergency are viewed as a future tool in daily treatment with increased patient acceptability. Boring M et al, Turkey [11] pioneered Tele-Orthodontics as a time and cost-effective method. Even in our study, patient satisfaction with tele dentistry was continuously excellent [12], and the majority of the patients did not have any discomfort, ulcers, or eating issues.

Our data collected show that the maximum number of patients maintained proper oral hygiene during the course of covid 19. This is by a study conducted among patients in Brazil [9].

During the COVID-19 situation, it became clear that we could not cease following up on orthodontic patients; hence, protection against and prevention of viral infections made the use of tele dentistry an appealing alternative, while it is not appropriate in all cases and for lengthy periods of time. This clinical experience shown that only functional appliances and aligners (such as Invisalign) are appropriate for long-term management via tele-orthodontics, requiring just follow-up to maintain therapy. Tele dentistry, on the other hand, has a restricted ability to continue multibracket therapy due to its intensive hands-on nature. Almost all needed follow-ups require the clinician's direct engagement, with the exception of occasional oral hygiene checks or troubleshooting.

Regarding the COVID-19 immediate post-emergency phase, we must consider the increase in costs, which can be divided into three categories: the more expensive and personal protective equipment that the dental practitioner will require for COVID-19 infection control; the reduction in the number of patients per hour that can be visited (to respect the time/space of 15 minutes between patients); and the increased cost of insurance policies that cover COVID-19 risks. Currently (at least in Italy), no professional dental insurance covers the danger of becoming infected with coronavirus or, in general, the risk of a pandemic, but this risk is quite real,

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and dentists must protect themselves while also avoiding transferring the disease to patients.

Some of the study's shortcomings include the fact that data was acquired in a short period of time and with a small sample size, given the quick impact of the epidemic on orthodontic treatment procedures. It may be claimed that patients have different perceptions of the quality of their acceptance of Tele-Orthodontics. Furthermore, we only obtained replies from individuals who had fixed orthodontic treatment. Hence, the study's generalisability is restricted.

## V. CONCLUSION

Tele-Orthodontics is witnessing tremendous expansion and severe competition. It has shown to be a useful tool for some orthodontic care in times of emergency, and it is regarded as an acceptable solution and addition even in normal times to meet the demands of patients while saving time and money without compromising treatment quality.

Overall, patients who had bonding (66.7%), were on retainers (96.7%) or were in mid-treatment (93.3%) maintained good dental hygiene throughout treatment, and the use of Tele-Orthodontics was viewed positively by the patients. Additional studies should be conducted in orthodontics utilizing digital diagnostic tools and software to analyze patient satisfaction with Tele-Orthodontic care.

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## **CONFLICTS OF INTEREST**

The authors declare no conflict of interest

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	ind Results in Ferce	mages		
	1- YES	2-NO	<b>3-MAYBE</b>	TOTAL
AFTER BONDING				
Do you have any pain or discomfort?	9	18	3	30
Do you have any pain of disconnert.	(30%)	(60%)	(10%)	(100%)
	(3070)	(00%)	(1070)	(10070)
Did you get any ulcers right after you started treatment?	11	16	3	30
	(36.7%)	(53.3%)	(10%)	(100%)
Do you have any eating issues?	11	12	7	30
	(36.7%)	(40%)	(23.3%)	(100%)
Do you make use of Interdental brushes or floss?	20	9	1	30
Do you make use of interdental brushes of hoss:	(66.70)	(200/)	(2, 20/)	(1000/)
	(00.7%)	(30%)	(5.5%)	(100%)
Are you satisfied with your appearance?	16	5	9	30
	(53.3%)	(16.7%)	(30%)	(100%)
Are you comfortable while speaking?	18	7	5	30
	(60%)	(23.3%)	(16.7%)	(100%)
Do you maintain good your oral hygiana to your satisfaction?	20	(2010/0)	Q	30
Do you maintain good your orar hygiene to your satisfaction.	(66.70)	((70))	(2(70))	(1000)
	(00.7%)	(0.7%)	(20.7%)	(100%)
	<b>1 ONCE A</b>	2 TWICE A		
	DAY	DAY		
How many times do you brush your teeth on a regular basis?	8	22	_	30
The winner and you or user your cooler on a regular ouses.	(26.7%)	(73.3%)		(100%)
	(20.770)	(75.570)		(10070)
Do you maintain your oral hygiene regularly?	28	2	-	30
	(93.3%)	(6.7%)		(100%)
Have you had any ulcers since your appointment?	14	15	1	30
	(46.7%)	(50%)	(3.3%)	(100%)
Do you have any noin develop after last appointment?	15	12	(3.370)	20
Do you have any pain develop after last appointment?	13	(12, 20())	$(\overline{70})$	(100%)
	(50%)	(43.3%)	(0.7%)	(100%)
Did any bracket /band dislocate or break?	9	19	2	30
	(30%)	(63.3%)	(6.7%)	(100%)
Do you have any hanging brackets with breakage?	9	19	2	30
	(30%)	(63.3%)	(6.7%)	(100%)
Do you use elastic band regularly?	17	11	2	30
	(56.7%)	(36.7%)	(6.7%)	(100%)
Did you run out of electic hand?	15	12	(0.170)	20
Did you full out of elastic band?	(500/)	(12, 20())	(6,70())	(1000/)
	(50%)	(43.3%)	(6.7%)	(100%)
Does any wire is extending out and causing pain?	13	14	3	30
	(43.3%)	(46.7%)	(10%)	(100%)
Do you have any eating issues?	14	14	2	30
	(46.7%)	(46.7%)	(6.7%)	(100%)
Do you make use of Interdental brushes or floss?	15	14	(0.170)	30
Do you make use of interdental brushes of noss:	13	(46.70)	(2, 20())	(1000)
	(50%)	(46./%)	(3.3%)	(100%)
Do you notice any change in your appearance?	19	10	1	30
	(63.3%)	(33.3%)	(3.3%)	(100%)
Are you comfortable while speaking?	21	9	-	30
y 1 0	(70%)	(30%)		(100%)
	1-ONCE A	2-TWICE A		(100,0)
				20
How many times do you brush your teeth on a regular basis?	16	14	-	30
	(53.3%)	(46.7%)		(100%)
ON RETAINER				
Do you maintain your oral hygiene regularly?	29	1	-	30
	(96.7%)	(3.3%)		(100%)
Do you have any places as a result of using the retain and	50.170)	20	5	20
bo you have any uncers as a result of using the relation?	$\mathcal{J}$		J	JU (1000()
	(10./%)	(00./%)	(16./%)	(100%)
Do you have any discomfort?	6	21	3	30
	(20%)	(70%)	(10%)	<u>(1</u> 00%)
Do you clean your retainer regularly?	28	2	-	30

Tabla 1.	Our set i some sine	and Desults	:	Danaantaaaa
Table 1:	Questionnaire	and Results	ın	Percentages

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	(93.3%)	(6.7%)		(100%)
Do you take your retainer out when you eat and brush your	27	3	-	30
teeth?	(90%)	(10%)		(100%)
Are you satisfied with your appearance?	21	6	3	30
	(70%)	(20%)	(10%)	(100%)
Are you comfortable while speaking?	24	2	4	30
	(80%)	(6.7%)	(13.3%)	(100%)
Is the appliance holding tight in place?	28	2	-	30
	(93.3%)	(6.7%)		(100%)
	1-ONCE A	2-TWICE A		
	DAY	DAY		
How much do you brush your teeth on a regular basis?	11	19	-	30
	(36.7%)	(63.3%)		(100%)