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The effect of accelerated orthodontic treatment on periodontal health as perceived by orthodontists and periodontists

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Abstract
Introduction: Orthodontic treatment aims to align teeth, improving aesthetics and function, but traditional methods can be time-consuming and have side effects like gingival recession and bone resorption. Accelerated orthodontic treatments, such as micro-osteoperforation and Corticotomy, reduce treatment time but raise concerns about their impact on periodontal health. Researchers previously studied mainly focusing on treatment speed, often overlooking the effects on supporting structures, and lack a multidisciplinary perspective. For this reason, this study was planned to determine orthodontists' and periodontists' perspectives towards accelerated orthodontic treatment, identifying gaps and promoting safer, more effective practices by integrating periodontal health into orthodontic care.
Methodology: An online Google form was circulated from July to September 2024. The questionnaire consisted of 10 multiple choice questions. Observational cross-sectional study were used & level of significance was set at $p<0.05$.
Results: The response rate was 77.85%. Most respondents, 82.1%, accurately recognised accelerated orthodontics as a surgical procedure. This data reveals that there is a dominant belief that rapid orthodontic procedures are particularly beneficial for adult patients where the severity of the orthodontic issue and the overall dental health condition is the influencing factor.
Conclusion: Most orthodontists and periodontists had the knowledge regarding accelerated orthodontic techniques. A majority of the participants, specifically 54.6%, indicated that individuals with prior periodontal problems can still undergo the orthodontic treatment using accelerated methods, as long as there is vigilant supervision.

Keywords: Accelerated orthodontic treatment, rapid orthodontics, interdisciplinary study, periodontal complications

Introduction

Rationale: Orthodontic treatment aims to align and straighten teeth to improve both aesthetic appearance and oral function. Traditional orthodontic methods can be time-consuming, often requiring several years to achieve desired results [1]. Long-term disadvantages of conventional orthodontic treatment such as predisposing the patient to inflammatory changes, gingival recession, and bone resorption had been a major concern to the patients [2]. To address this, accelerated orthodontic treatments have emerged, offering promising techniques to reduce treatment duration by maximizing the biological response significantly. Methods such as micro-osteoperforation, corticotomy, and the use of vibratory devices are among the approaches utilized to expedite tooth movement. However, the rapidity of these treatments raises concerns regarding their impact on periodontal health [3]. Periodontal health, which encompasses the health of the gums and supporting structures of the teeth, is crucial for the long-term success of orthodontic treatment and overall oral health.
There are hardly any previous study in India which has investigated orthodontist's and periodontists' knowledge and attitude toward orthodontic acceleration procedures. Earlier cited studies on rapid orthodontics have largely focused on its efficacy in reducing treatment duration, emphasizing the speed and convenience for patients. However, these studies often overlook the potential consequences on periodontal health, a critical aspect for the overall success of orthodontic care.

While traditional orthodontic treatment has well-documented side effects such as caries, root resorption, and gingival recession, the accelerated methods pose additional concerns regarding their impact on the supporting structures of the teeth. Many researchers often lack sufficient data from a multidisciplinary viewpoint.

To overcome these limitations, this study aims to evaluate both orthodontists' and periodontists' knowledge and perceptions of the periodontal effects of accelerated orthodontic treatments [4]. By incorporating insights from both specialties, this research seeks to provide a more holistic and nuanced view of how these treatments influence periodontal health, thereby contributing to safer and more effective orthodontic practices [5].

Objectives

i) To assess the knowledge of orthodontists and periodontists regarding accelerated orthodontic techniques [6].
ii) To compare the perceptions of orthodontists and periodontists on the necessity of interdisciplinary collaboration for managing periodontal health in patients undergoing accelerated orthodontics [7].

Methodology

1. Study design- Cross sectional study.
2. Study setting & participants.

The procedure and protocol of the present study were approved by Institutional ethical committee. The survey lasted for 12 weeks from July 2024 till end of September 2024. The study population comprised all orthodontists and periodontists practicing in India. The questionnaire consisted of 10 multiple choice questions which was designed and administered virtually (Google form) to orthodontists and periodontists. The questionnaire obtained information on participants' data, knowledge, attitude and perception towards accelerated orthodontic. Statistical analysis was performed using calculated using OpenEpi, Version 3, open-source calculator SSPropor in reference to the study conducted by Umeh OD, Ndukwe AN, Isiekwe IG, daCosta OO, Utomi IL, Sanu OO. The significance level was 0.05 for all statistical analysis.

Study size

The sample size was measured using the following formula:
Sample size (n) = [DEFF*Np(1-p)]/ [(d2/Z21-α/2*(N-1)+p*(1-p)] , where

DEFF	Design effect (for cluster surveys)	1
N	Population size (For finite population correction factor or FPC)	1000000
p	Hypothesized % frequency of outcome factor in the population	83.3% +/- 5
d	Confidence limits as % of 100(absolute +/- %)	5%
n	Sample Size for Various Confidence Levels	95%

Sample Size = 214.

Results

Two hundred and eighty questionnaires were emailed to orthodontists and periodontists; two hundred and eighteen were completed giving a response rate of 77.85%. Participants speciality description is given in Table no. 1

Table 1: Distribution of Respondents by Specialty

Characteristics	Response	Frequency	Percent	p value
Speciality as	Orthodontists	113	51.8	<0.001
	Periodontists	105	48.2	
	Total	218	100.0	

Table 2: Age wise distribution of participants are summarized

Characteristics	Response	Frequency	Percent	p value
Age	<30 years	45	20.6	<0.001
	30-40 years	143	65.6	
	>40 years	30	13.8	
	Total	218	100.0	

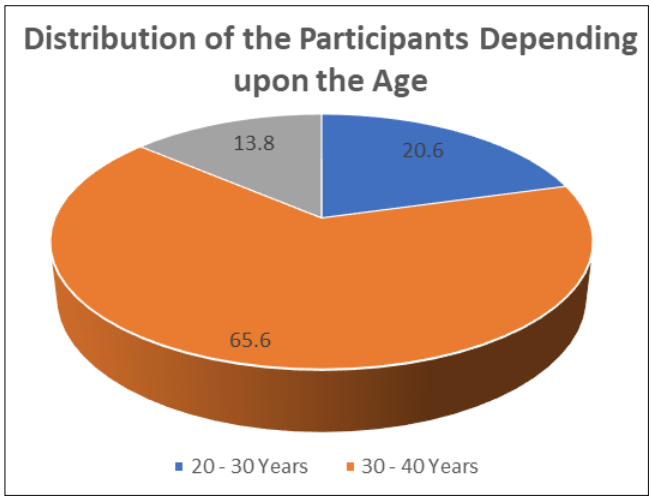

Fig 1: Maximum participants in our study belonged to 30-40 years of age- 143 (65.6%)

Table 3: Distribution of participants based on gender is summarized

Characteristics	Response	Frequency	Percent	p value
Gender	Male	129	59.2%	<0.001
	Female	89	40.8%	
	Total	218	100.0%	

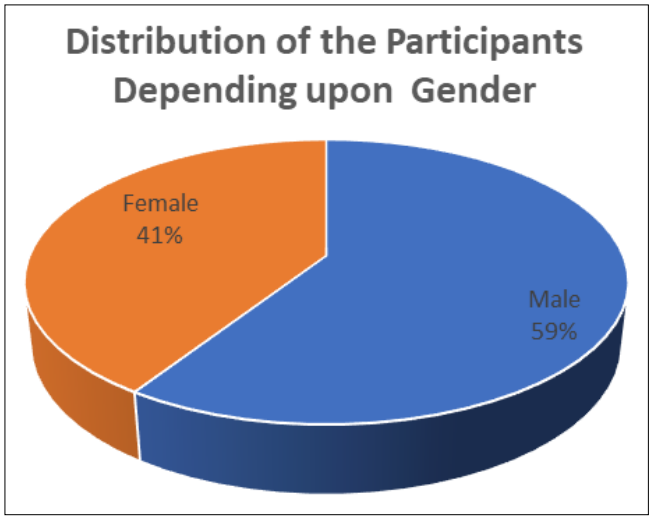

Fig 2: Of the 218 participants there were 129 (59.2%) Male and 89 (40.8%) Female Participants.

Distribution of responses provided by participants are summarized in Table 4.

The study provides valuable insights into knowledge and attitudes towards accelerated orthodontics. A significant 82.1% of respondents recognized it as a surgical procedure, with 76.6% identifying adults as the group benefiting the

most. The severity of the orthodontic issue and overall dental health were key factors in determining the suitability of accelerated methods, according to 89% of participants. Nearly all respondents (98.2%) acknowledged that these techniques speed up tooth movement, while only a few felt they had no effect or slowed down progress. Corticotomy-assisted orthodontics was preferred by 75.2% for maintaining periodontal health. Interdisciplinary collaboration was deemed moderately important by 66.1% of participants. Additionally, 54.6% believed that individuals with previous periodontal issues could still undergo accelerated orthodontic treatment, provided they are closely monitored. The significance of all the above-mentioned data came out to be <0.001.

Table 4: (Original)

Characteristics	Response	Frequency	Percent	p value
Which of the following best defines accelerated orthodontics?	Orthodontic treatment completed in a shorter duration without surgery	35	16.1	<0.001
	Traditional orthodontic treatment without any modifications	2	0.9	
	Orthodontic treatment performed at a slower pace	2	0.9	
	Orthodontic treatment involving surgery	179	82.1	
Which patient demographic might benefit the most from accelerated orthodontics?	Adults	11	5.0	<0.001
	Teenagers	40	18.3	
	Young children	167	76.6	
	Elderly	0	2.3	
What factors should be considered when determining the suitability of a patient for accelerated orthodontics?	Age and gender	5	2.3	<0.001
	Severity of orthodontic issues & overall oral health	194	89.0	
	Income level & insurance coverage	1	0.5	
	Patients' preference	18	8.3	
How does accelerated orthodontics affect the rate of tooth movement?	Slows down tooth movement	2	0.9	<0.001
	Speeds up tooth movement	214	98.2	
	Has no effect on tooth movement	1	0.5	
	Causes tooth movement in wrong direction	1	0.5	
Which invasive accelerated orthodontic technique do you think is most beneficial for maintaining periodontal health?	Propel	12	5.5	<0.001
	Piezocision	22	10.1	
	Corticotomy assisted orthodontics	164	75.2	
	Micro-osteoperforation	20	9.2	
What concerns do you have about the impact of accelerated orthodontic techniques on periodontal health?	Increased gum recession	18	8.3	<0.001
	Potential for bone loss	45	20.6	
	High inflammatory changes	8	3.7	
	No significant concerns	16	7.3	
How often do you think periodontal assessments should be performed during accelerated orthodontic treatment?	Every visit	53	24.3	<0.001
	Every 3 months	91	41.7	
	Every 6 months	71	32.6	
	Only when there are periodontal issues	3	1.4	
What measures do you think are necessary to minimize periodontal complications during accelerated orthodontic treatment?	Regular periodontal checkups	73	33.5	<0.001
	Enhanced oral hygiene	25	11.5	
	Other (please specify)	2	2.8	
	Multiple options selected	112	0.9	
How do you rate the importance of interdisciplinary collaboration between 1s and 2 in managing patients undergoing accelerated orthodontics?	Extremely important	66	30.3	<0.001
	Moderately important	144	66.1	
	Slightly important	8	3.7	
Would you recommend accelerated orthodontic techniques to a patient with existing periodontal issues?	Yes, with close periodontal monitoring	119	54.6	<0.001
	Yes, without any additional precautions	2	0.9	
	No, it is not suitable for such patients	60	27.5	
	Not sure, would need more information	37	17.0	

Discussion

The significance level of all the below-mentioned data is <0.001.

The study results provide valuable understanding of the knowledge and attitudes about accelerated orthodontics. Most respondents, 82.1%, accurately recognised accelerated orthodontics as a surgical procedure, whereas the remaining 16.1% thought it can also be performed without surgery [8]. The majority of respondents, 76.6%, selected adults as the category that would derive the greatest advantage from such approaches [9]. This data reveals that there is a dominant belief that rapid orthodontic procedures are particularly beneficial for adult patients, whereas just 5.0% of respondents believe that the service is particularly relevant for small children.

The factors often seen as influence in the appropriateness for fast orthodontics were the severity of the orthodontic issue and the overall dental health condition, as reported by 89.0% of the participants [10]. Additionally, 8.3% of the respondents listed patient preference for the length of the treatment. Accelerated orthodontics is reported to enhance the pace of tooth movement by 98.2% of participants, while only a small number of respondents indicated that it either slows down or has no impact [11].

A significant majority of 75.2% expressed a preference for corticotomy-assisted orthodontics as the most beneficial invasive rapid orthodontic approach for preserving periodontal health [12]. In contrast, a smaller percentage of 10.1% supported piezocision, 9.2% supported micro-osteoperforation, and 5.5% supported Propel.

With regard to periodontal health, the level of concern varied:

up to 60.1% of respondents had selected multiple options, indicating worry about numerous possible dangers.[13] The primary worries were as follows: 20.6% reported bone loss[14] and 8.3% reported gum recession [15], while a small minority of 7.3% expressed no concern about significant risks. Regarding the dimension of periodontal monitoring, 41.7% of respondents expressed the view that monitoring should occur every three months, whereas 24.3% advocated for it to be done at every visit. Among the responses, 33.5% of the participants regarded regular periodontal check-ups as the most effective method for reducing issues during expedited orthodontic treatment. On the other hand, 11.5% of the respondents indicated that enhanced oral hygiene practices were important.

With respect to inter-disciplinary collaboration, a significant proportion of the participants, namely 66.1%, considered it to be of moderate importance [16]. However, a smaller percentage, 30.3%, saw it as highly important in the management of patients undergoing rapid orthodontics. Finally, a majority of the participants, specifically 54.6%, indicated that individuals with prior periodontal problems can still undergo the orthodontic treatment using accelerated methods, as long as there is vigilant supervision.[17] Conversely, 27.5% of the respondents believed that this procedure was not suitable for such a patient, and 17.0% were unaware of this limitation since they expressed a need for more information.

Clinical significance

Conducting this study holds significant clinical value. It enables the collection of diverse, large-scale data from specialists across different regions, providing a broader understanding of professional insights. It helps to identify knowledge gaps, misconceptions, or different opinions between these two specialties, fostering better interdisciplinary collaboration. Understanding how accelerated orthodontic techniques impact periodontal health is crucial, as these methods are becoming increasingly popular.

By evaluating specialists' knowledge and perceptions, this research can highlight areas for further education and the need for updated clinical guidelines. Additionally, the study contributes to improving patient care by ensuring that accelerated orthodontic treatments are implemented with a clear understanding of their potential periodontal consequences, helping minimize risks like gingival recession, bone loss, and periodontal complications during treatment.

Conclusion

a) Most orthodontists and periodontists had the knowledge regarding accelerated orthodontic techniques
b) A significant majority of 75.2% expressed a preference for corticotomy-assisted orthodontics as the most beneficial invasive rapid orthodontic approach for preserving periodontal health.
c) A significant proportion of the orthodontists and periodontists, namely 66.1%, considered it to be of moderate importance on the necessity of interdisciplinary collaboration for managing periodontal health in patients undergoing accelerated orthodontics.
d) A majority of the participants, specifically 54.6%, indicated that individuals with prior periodontal problems can still undergo the orthodontic treatment using accelerated methods, as long as there is vigilant supervision.

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Data Availability: The data used to support the findings of this study are made available from the corresponding author upon request.

Conflicts of Interest: The authors declare no conflicts of interest.

References

1. Cunningham SJ, Hunt NP. Quality of life and its importance in orthodontics. Available from: S.Cunningham@eastman.ucl.ac.uk
2. Al-Attar AM, Al-Shaham S, Alikhani M, Raptis M, Zoldan B, *et al*. Effect of micro-osteoperforations on the rate of tooth movement. American Journal of Orthodontics and Dentofacial Orthopedics. 2013;144(5):639-648. DOI: 10.1016/j.ajodo.2013.06.017.
3. Rekhi U, Catunda RQ, Gibson MP. Surgically accelerated orthodontic techniques and periodontal response: A systematic review. European Journal of Orthodontics. 2020, 103. DOI: 10.1093/ejo/cjz103.
4. Preoteasa CT, Ionescu E, Preoteasa E. Risks and complications associated with orthodontic treatment; c2012.
5. Talic NF. Adverse effects of orthodontic treatment: A clinical perspective. Saudi Dental Journal. 2011;23(2):55-9.
6. Alfuriji S, Alhazmi N, Alhamlan N, Al-Ehaideb A, Alruwaithi M, Alkatheeri N, *et al*. The effect of orthodontic therapy on periodontal health: a review of the literature.
7. Umeh D, *et al*. An evaluation of knowledge, attitude, and practice of accelerated orthodontics amongst orthodontists. West Afr J Med.; c2024.
8. Romero M. Surgical solutions to periodontal complications of orthodontic therapy. Journal of Clinical Pediatric Dentistry. 2000;24(3):159-163.
9. Baumrind S, Korn EL, Boyd RL. Apical root resorption in orthodontically treated adults. American Journal of Orthodontics and Dentofacial Orthopedics. 1996;110(3):311-320.
10. Van Gastel J, Quirynen M, Teughels W, Carels C. The relationships between malocclusion, fixed orthodontic appliances and periodontal disease: a review of the literature. Australian Orthodontic Journal. 2007;23(2):121-129.
11. Ericsson I, Thilander B. Orthodontic forces and recurrence of periodontal disease: an experimental study in the dog. American Journal of Orthodontics. 1978;74(1):41-50.
12. Goyal A, Kalra JPS, Bhatiya P, Singla S, Bansal P. Periodontally accelerated osteogenic orthodontics (PAOO) - A review.
13. Dannan A. An update on periodontic-orthodontic interrelationships. Journal of Indian Society of Periodontology. 2010;14(1):66-71.
14. Bragger U, Lang NP. The significance of bone in periodontal disease. Seminars in Orthodontics. 1996;2(1):31-38.
15. Alexander SA. Effects of orthodontic attachments on the gingival health of permanent second molars. American Journal of Orthodontics and Dentofacial Orthopedics. 1991;100(4):337-340.
16. Davis SM, Plonka AB, Fulks BA, Taylor KL, Bashutski

J. Consequences of orthodontic treatment on periodontal health: clinical and microbial effects.
17. Bimstein E, Becker A. Malocclusion, orthodontic intervention, and gingival and periodontal health. Periodontal and Gingival Health and Diseases: Children, Adolescents, and Young Adults, 2001.

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