



ORIGINAL ARTICLE

Patients' preference and acceptance towards surgical vs nonsurgical modalities of accelerated orthodontic treatment.

Muhammad Uzair¹, Sadaf Arshi², Sana Masood³, Iqra Asif⁴, Arisha Siddiqui⁵, Junaid Tariq⁶

Article Citation: Uzair M, Arshi S, Masood S, Asif I, Siddiqui A, Tariq J. Patients' preference and acceptance towards surgical vs nonsurgical modalities of accelerated orthodontic treatment. *Professional Med J* 2025; 32(02):228-234. <https://doi.org/10.29309/TPMJ/2025.32.02.8803>

ABSTRACT... Objective: To determine patients' preferences toward accelerated orthodontic treatment modalities and evaluate factors that influence the choice of acceleration technique. **Study Design:** Cross-Sectional Survey. **Setting:** Department of Orthodontic A Private Dental University. **Period:** September 2024 to October 2024. **Methods:** Data was collected after the ethical approval of the study. Participants were provided informed consent before the study began. Adult patients seeking orthodontic treatment were requested to complete a questionnaire that included questions on age, gender, level of education, and basic questions about orthodontic therapy. The questions were relevant to modalities of rapid orthodontics treatment. Before answering questions on the modalities, participants were provided a brief description of the clinical process and images of a real procedure. The orthodontist conducted the description and photography sessions. **Result:** The median age reported is 20 years (IQR: 3) with 59.6% female and 40.4% males in the sample. Most participants were matric/intermediate qualified (65.5%), while 17.5% were undergraduates and 17% were graduates. A majority (86.4%) preferred non-surgical procedures aimed at being anxiety-free (38.1%). Participants choosing surgical procedures primarily did so to reduce treatment time and achieve faster outcomes. A statistically significant effect was found in opinion about time reduction if accelerated orthodontic surgical or non-surgical treatment modalities are applied (p -value <0.001). **Conclusion:** The study concluded that non-surgical approaches to accelerate tooth movement are frequently considered by adult orthodontic patients.

Key words: Accelerated Orthodontics, Orthodontic Tooth Movement, Patient Preference About Orthodontics Treatment Modalities.

INTRODUCTION

Orthodontic treatment is mainly aimed at generating a more esthetically pleasing and functionally effective dental complex that necessitates a series of choices and processes to understand various disciplines closely linked to orthodontics including shape, pattern, development and growth of the dentofacial complex and movement of teeth.^{1,2} Alveolar bone remodeling is the significant component of orthodontic tooth movement, which interfere with biological pathways affecting activity of bone cells and expedite tooth movement.³ There are various surgical and non-surgical modalities to accelerate orthodontic treatment. Among the surgical means, corticotomy and corticision or pericision are the preferred and most widely used

methods, whereas low-level lasers and vibration techniques are the most commonly non-surgical methods to accelerate orthodontic treatment.⁴ It is imperative to address that there is a rise in the percentage of adult patients seeking orthodontics treatment demanding a shorter time of treatment. Hence a shorter duration in orthodontic therapy with the desired outcome reflected an important goal in the course of the orthodontic treatment. In comparison with other types of dental treatment, orthodontic treatment requires the involvement of the patient in decision-making and long-term compliance for the success of treatment.⁵ Achieving desired treatment outcomes is more challenging for orthodontic patients and parents who do not have a clear insight of the length of duration of the treatment, the likelihood of teeth

1. MOrthRCSed, MFDRSCSi, MFDRSed, Head Orthodontic, Baqai Dental College, Karachi.
2. M.Sc, Senior Lecturer Community and Preventive Dentistry, Dr Ishrat-ul-Ebad Institute of Oral Health Sciences, Dow University of Health Sciences, Karachi.
3. BDS, MDS Trainee Community and Preventive Dentistry, Dr Ishrat-ul-Ebad Institute of Oral Health Sciences, Dow University of Health Sciences, Karachi.
4. BDS, House Officer, Baqai Dental College, Karachi.
5. BDS, House Officer, Baqai Dental College, Karachi.
6. BDS, Senior Registrar Orthodontics, Baqai Dental College, Karachi.

Correspondence Address:
Dr. Sadaf Arshi
Dow University of Health Sciences,
Ojha Campus, Karachi, Pakistan.
sadafuzair2010@gmail.com

Article received on: 03/10/2024
Accepted for publication: 09/12/2024

extraction, and potential pain and discomfort when eating, speaking, and cleaning their teeth than it is for those who have had enough mental preparation before orthodontic treatment.⁶

These surgical techniques have numerous advantages over conventional orthodontic treatment such as shorter treatment time, safer dental arch expansion and tooth movement and improved stability after orthodontic treatment. The corticotomy technique is appreciated for the controlled surgical damage.⁷ Corticision or pericision is another used surgical technique. In addition, non-surgical techniques including low-level laser therapy (to stimulate angiogenesis and osteoclastogenesis) and vibration (a device that needs to be worn by the patient for a certain duration of time each day) have been proposed to accelerate orthodontic treatment.⁸ Majority of the young together with orthodontists reported a higher rate of acceptability for non-surgical methods, predictable to demographic aspects like age, gender, ethnic background, educational level, and cost of the treatment.⁹ These factors play a noteworthy part in the anticipation of the patient seeking orthodontic treatment. According to Uribe and colleagues, patients prefer shorter treatment durations, as seen by their willingness to spend almost 20% more on painless treatment with a shorter duration of time.¹⁰

With increased emphasis on the provision of “patient-centered” care, this study aimed to evaluate the preference choices of young adult patients for selecting surgical or non-surgical treatment choices to accelerate the orthodontic tooth movement. Eventually, these outcomes will have a pronounced consequence on the direction of the orthodontic practice. Orthodontists need to put the workforce in the right direction to unravel the challenges between meeting patients’ concerns and reducing the time for orthodontic treatment.

METHODS

A cross-sectional survey was the design of the study. Data was gathered from the Orthodontic department of a private dental university. The data was gathered from September 2024 to October

2024. Using an Open epi sample size calculator with a 95% confidence interval, 80% power of the study, anticipated 46% frequency of outcome, and 5% level of significance, the estimated sample size is 382. However, in account of any missing data, the sample increased by 15%, which is 441.¹¹

The sample of 441 adult orthodontic patients was collected through the non-probability convenience sampling technique. The adult orthodontic patients who consented to participate and were literate or coherent with the study objectives were included in the study. The exclusion criteria were illiterate patients or those having any symmetry and craniofacial deformity or syndromes.

Informed consent was taken from the participants before initiation of the study. Before answering the questions regarding the modalities, a concise explanation of the clinical procedure as well as pictures of an actual procedure were shown to the participants. This description and photographs sessions were conducted by the Orthodontist. It was ensured that there was voluntary participation, anonymous questionnaires, and no personal information was collected. Study participants seeking orthodontic treatment were requested to fill out the questionnaire; which included questions regarding age in years, gender, and educational level, and relevant questions about orthodontic treatment and modalities of accelerated orthodontics treatment. The validated questionnaire was adopted for the survey from a previous study.¹⁰ The questionnaire for the patients comprised close-ended questions on demographics, length of orthodontic treatment, and preference to choose the different treatment modalities to accelerate tooth movements. Rank-order questions for the procedures are included in the questionnaire in the Likert scale (five-point scale to encourage a higher response rate and be user-friendly).

Data / Statistical Analysis

The software used for data analysis was IBM SPSS Base Licensed version 21. Frequencies and percentages was reported for qualitative variables. While median was reported for

quantitative variable. Chi-square test was conducted for categorical variables.

Ethical Approval

The ethical approval was obtained by the Ethical Review Board (ERB) of Baqai Medical University, Faculty of Dentistry with reference no. (BDC/ERB/2024/0027).

RESULTS

The data does not follow the normality (Shapiro-Walk test p-value < 0.001) so the median for variable age is reported as 20 (IQR:3). The entire sample (n=441) comprised of 59.6% females (n=263) as compared to 40.4% males (n=178). The educational status of the study participants was mostly matric/interqualified 65.5% whereas undergraduates were 17.5% and graduates were 17%. The majority of the sample selected non-surgical procedures(86.4%) over surgical intended for anxiety-free (38.1%). Whereas, those participants who had selected surgical procedures opted for it mostly due to time reduction to achieve treatment outcomes (Table-I).

Variables	Frequency (n)	Percentage (%)
Preference		
Surgical	60	13.6
Non-surgical	381	86.4
Surgical Methods		
Corticotomy	31	51.7
Corticision/periocision	29	48.3
Reason for Selecting Surgical Method		
Less time is required to achieve the outcome	30	50.0
Short follow-up	13	21.7
Less compliance is needed	17	28.3
Non-Surgical Procedures		
Vibration method	169	44.6
Low-level laser therapy	212	55.4
Reason for Selecting Non-Surgical Method		
Less painful and non-invasive	136	35.7
Ease with daily chores	66	17.3
Anxiety free	145	38.1
Low cost	34	8.9

Table-I. Preferences of study participants for treatment modalities (n=441)

Responses from the study participants regarding accelerated orthodontic treatment reported 76.9% (n=339) of participants were concerned about the long duration of orthodontic treatment, while 23.1% (n=102) were not. Out of the total sample, 88.9% (n=391) expressed apprehension about pain and discomfort associated with orthodontic treatment, though 11.3% (n=50) did not. It was found that 53.3% (n=235) are aware of accelerated orthodontic tooth movement procedures, while 46.7% (n=206) are not, showing no large difference in the knowledge of accelerated tooth movement. Additionally, if treatment duration is halved, 79.1% (n=349) would choose accelerated orthodontic treatment, whereas 20.9% (n=92) would not. 81.9% (n=361) are concerned about the additional cost of accelerated orthodontics, while 18.1% (n=80) are not (Table-II).

There was no statistically significant effect of gender and educational status of the study participants on the selection of surgical and non-surgical treatment choices (Table-III).

When the effect of the responses of the study participants was checked in the surgical /non-surgical group, there was a difference in opinion about time reduction if accelerated orthodontic surgical or non-surgical treatment modalities were applied (p-value <0.001), whereas other responses were not found significant (Table-IV).

DISCUSSION

There is a rising demand for orthodontic treatment among patients of all ages, including adults. However, duration may not be unappealing to adults as comprehensive orthodontic treatment usually requires two or three years of active tooth movement.¹¹ Additionally, orthodontic appliances may increase the risk of white spot lesions, caries and other complications therefore reducing treatment time may mitigate these risks and increase the willingness of orthodontic treatment especially among adults.¹² There is a growing interest reported in adjunct procedures either surgical or non-surgical to accelerate the tooth movement.¹³

Variables		Frequency (n)	Percentage (%)
Orthodontics is a long-duration treatment does the duration of treatment concern you?	Yes	339	76.9
	No	102	23.1
Orthodontic treatment is associated with pain and discomfort does it concern you?	Yes	391	88.9
	No	50	11.3
Do you know about accelerated orthodontic tooth movement procedures?	Yes	235	53.3
	No	206	46.7
If accelerated orthodontic treatment procedures reduce the treatment duration by half, will you choose?	Yes	349	79.1
	No	92	20.9
Accelerated orthodontics is an additional treatment cost, which is an additional cost concern to you.	Yes	361	81.9
	No	80	18.1

Table-II. Responses of the study participants to questions related to accelerated orthodontic treatment (n=441)

Variables		Surgical n (%)	Non- Surgical n (%)	Total n (%)	P-Value
Gender	Male	27(45)	151(39.6)	178(40.4)	0.431
	Female	33(55)	230 (60.4)	263(59.6)	
	Total	60	381	441	
Educational status	Matric/inter qualification	43(71.7)	246 (64.4)	289(65.5)	0.538
	Under-graduate	8 (13.3)	69(18.1)	77(17.5)	
	Graduate	9 (15)	66 (17.3)	75(17)	
	Total	60	381	441	

p-value calculated by using χ^2 for categorical variables

Table-III. Effect of gender and educational status of study participants on the selection of surgical /non-surgical treatment choices (n=441)

Variables		Surgical n (%)	Non- Surgical n (%)	Total n (%)	P-Value
Orthodontics is a long-duration treatment does the duration of treatment concern you?	Yes	47 (78.3%)	292 (76.6%)	339 (76.9%)	0.773
	No	13 (21.7%)	89 (23.4%)	102 (23.1%)	
Orthodontic treatment is associated with pain and discomfort does it concern you?	Yes	54 (90%)	337 (88.5%)	391 (88.7%)	0.725
	No	6 (10%)	44 (11.5%)	50 (11.3%)	
Do you know about accelerated orthodontic tooth movement procedures?	Yes	30 (50%)	20 (53.85%)	235 (53.8%)	0.583
	No	30 (50%)	176 (46.2%)	206 (46.7%)	
If accelerated orthodontic treatment procedures reduce the treatment duration by half, would you choose?	Yes	31 (51.7%)	318 (83.5%)	349 (79.1%)	<0.001*
	No	29 (48.3%)	63 (16.5%)	92 (20.9%)	
Accelerated orthodontics is an additional treatment cost, which is an additional cost concern to you.	Yes	46 (76.7%)	315 (82.7%)	361 (81.9%)	0.261
	No	14 (23.3%)	66 (17.3%)	80 (18.1%)	

Table-IV. Cross-tabulation to assess the effect of responses of study participants regarding Orthodontic treatment (n=441)

*p-value calculated by using χ^2 for categorical variables

The majority of the sample selected non-surgical procedures (86.4%) over surgical intended for anxiety-free (38.1%). Whereas, those participants who had selected surgical procedures opted it mostly due to time reduction to achieve treatment outcomes. This result of the study was aligned with the result of the comparative study, conducted in Jeddah, Saudi Arabia, 2019, majority of the respondents preferred less invasive, nonsurgical techniques and procedures as they affirmed the orthodontic treatment as a lengthy duration treatment. Similarly, the participants in the current study expressed concerns about long treatment duration.⁹

Among the choices between surgical approaches, the majority of the sample opted for corticotomy as compared to periocision, similarly in non-surgical approaches, they opted more for low-level laser therapy (LLLT). This was in agreement with a study by Mehar A. et. al. reported high frequency of study participants were in favor of corticotomy and low-level laser therapy as surgical and non-surgical approaches.¹⁴

Correspondingly, the findings from a cross-sectional study conducted in Baghdad showed that patients preferred non-invasive and non-surgical procedures to shorten treatment. Customized appliances were favored by 38.4% of participants, followed by intraoral vibrating devices at 38.1%, periocision at 8.2% and corticotomy at 5.9%.¹⁵

This inclination of the study participants towards non-surgical procedures could be attributed to several reasons including fear of pain and discomfort during surgery, posing low risks during and after surgery, delayed recovery after surgical procedures, systemic complications and disruption to the daily lives that can hamper to keep a balance between professional or personal responsibilities and treatment, especially in adult orthodontic patients. This clear trend towards less invasive procedures in the current study is aligned with existing literature suggesting that non-surgical procedures are perceived as more convenient and safer alternatives as compared to surgical interventions. Therefore, these findings

stress the importance for orthodontists to remain updated on the preferences of patients and the development of non-surgical acceleration techniques. It is highly recommended to incorporate such approaches to reduce the treatment time and enhance patient experience by aligning the expectations of patients and treatment modalities. A deep insight into long-term outcomes and acceptance of patients with these acceleration techniques could be achieved by further studies that will guide evidence-based practice.

About 76.7% of the respondents agreed that the extent of orthodontic treatment is too long and about 79.1% would choose the accelerated orthodontic treatment modalities if the duration is reduced to half. Moreover, a statistically significant difference was observed in the selection of non-surgical over the surgical treatment modalities among the study participants. This preference suggesting the potential reduction in the duration of treatment is a motivating factor for the patients when evaluating their treatment options. This implicates the patient-centered approach in orthodontic care balancing treatment efficiency with efficacy and patient comfort and satisfaction.¹⁶

Accelerated orthodontic treatment can be particularly benefitted to adult patients, whose lower rate of local tissue metabolism and regeneration contrast with those of adolescent. In addition, adults are more prone of developing periodontal complications and other time-dependent side – effects, such as oral hygiene and root resorption problems. Hence, expediting treatment in adults offers significant practical advantages.¹⁷

The limitation of the study was the choice between surgical and non-surgical treatments that involve multiple factors like clinical indication, perceived risks and cost of the treatment, with patient-specific dental health considerations, leading to limited insight into the true decision-making process. The variability of existing knowledge of the treatment alternatives of the study participants could significantly affect their choices. This study recorded one-time preferences that might change

over time. However, further researches with the same objective in a retrospective study design are recommended to generalize the results.

CONCLUSION

Adult orthodontic patients preferred non-surgical over surgical procedures to accelerate tooth movement, considering non-surgical procedures as anxiety-free. However, most adult orthodontic patients welcome treatments that minimize anxiety and speed up the time required to achieve desired results.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

SOURCE OF FUNDING

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.






Copyright© 09 Dec, 2024.

REFERENCES

- Zawawi KH. **Patients' acceptance of corticotomy-assisted orthodontics.** Patient Preference and Adherence. 2015 Aug; 12:1153-8.
- Abdullah A, Alshahrani I, Khaled M, Addas S, Shaik F, AlQahtani J. **The tooth size discrepancy among orthodontic patients and normal occlusion individuals from Saudi Arabia: A three-dimensional scan analysis of diagnostic casts.** Contemp Clin Dent. 2020 Apr-Jun; 11(2):141-149.
- Li Y, Jacox LA, Little SH, Ko CC. **Orthodontic tooth movement: The biology and clinical implications.** The Kaohsiung Journal of Medical Sciences. 2018 Apr 1; 34(4):207-14.
- Cassetta M, Giansanti M. **Accelerating orthodontic tooth movement: A new, minimally-invasive corticotomy technique using a 3D-printed surgical template.** Medicina oral, patologia oral y cirugia bucal. 2016 Jul; 21(4):e483.
- Flores-Mir C, Brandelli J, Pacheco-Pereira C. **Patient satisfaction and quality of life status after 2 treatment modalities: Invisalign and conventional fixed appliances.** American Journal of Orthodontics and Dentofacial Orthopedics. 2018 Nov 1; 154(5):639-44.
- Sharma R, Drummond R, Wiltshire W, Schroth R, Lekic M, Bertone M, Tate R. **Quality of life in an adolescent orthodontic population: Invisalign versus fixed appliances.** The Angle Orthodontist. 2021 Nov 1; 91(6):718-24.
- Hoogeveen EJ, Jansma J, Ren Y. **Surgically facilitated orthodontic treatment: A systematic review.** American Journal of Orthodontics and Dentofacial Orthopedics. 2014 Apr 1; 145(4):S51-64.
- El-Angbawi A, McIntyre G, Fleming PS, Bearn D. **Non-surgical adjunctive interventions for accelerating tooth movement in patients undergoing orthodontic treatment.** Cochrane Database of Systematic Reviews. 2023(6):CD010887.
- Linjawi AI, Abushal AM. **Young adults' preferences and willingness to pay for invasive and non-invasive accelerated orthodontic treatment: A comparative study.** INQUIRY: The Journal of Health Care Organization, Provision, and Financing. 2020 Oct; 57:0046958020963595.
- Uribe F, Padala S, Allareddy V, Nanda R. **Patients', parents', and orthodontists' perceptions of the need for and costs of additional procedures to reduce treatment time.** American Journal of Orthodontics and Dentofacial Orthopedics. 2014 Apr 1; 145(4):S65-73.
- Pattanaik S, Veeraraghavan VP, Dasari AK, Patil SR, Alzahrani SG, Fareed M. **Orthodontic treatment in adults: Challenges, outcomes, and factors affecting compliance and satisfaction.** Journal of Orthodontic Science. 2024 May 1; 13(1):14.
- Ganss C, Schulz-Weidner N, Klaus K, von Bremen J, Ruf S, Bock NC. **Caries and white spot lesion trajectories of orthodontic patients across an observation period of 20 years.** Clinical Oral Investigations. 2024 Jun 11; 28(7):367.
- El-Angbawi A, McIntyre GT, Fleming PS, Bearn DR. **Non-surgical adjunctive interventions for accelerating tooth movement in patients undergoing fixed orthodontic treatment.** Cochrane Database of Systematic Reviews. 2015(11):CD010887.
- Mehar A, Gandhi S, Sodawala J, Malhotra H, Swarnakar A, Taksande V. **Perception of orthodontic patients & parents' towards different accelerated orthodontic procedures-A Questionnaire study.** Journal of Advanced Medical and Dental Sciences Research. 2023 Jun 1; 11(6):125-37.
- Al-Attar AM, Al-Shaham S, Abid M. **Perception of Iraqi orthodontists and patients toward accelerated orthodontics.** International Journal of Dentistry. 2021 Apr 29; 2021:1-7.

16. Johal A, Damanhuri SH, Colonio-Salazar F. **Adult orthodontics, motivations for treatment, choice, and impact of appliances: A qualitative study.** American Journal of Orthodontics and Dentofacial Orthopedics. 2024 Mar 22.
17. Gandedkar NH, Dalci O, Darendeliler MA. **Accelerated orthodontics (AO): The past, present and the future.** In Seminars in Orthodontics 2024 Feb 1. WB Saunders.

AUTHORSHIP AND CONTRIBUTION DECLARATION

No.	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Muhammad Uzair	Substantial contribution to conception or design of the work. Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.	
2	Sadaf Arshi	Revising the work critically for important intellectual content, Final approval of the version to be published.	
3	Sana Masood	Analysis and interpretation of data for the work.	
4	Iqra Asif	Acquisition of data.	
5	Arisha Siddiqui	Acquisition of data.	
6	Junaid Tariq	Drafting of the work.	