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Comparative Evaluation of Patient and Orthodontist Preferences and Attitude in Mandibular Occlusal Photography: Novel Tongue Retractor vs. Conventional Technique

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KEYWORDS

Intraoral photography, mandibular occlusal photograph, tongue retractor, orthodontist preferences, patient comfort, questionnaire study.

ABSTRACT:

Background: Intraoral photography is essential in orthodontics for diagnosis, treatment planning, and documentation. Capturing mandibular occlusal photographs is often challenging due to interference from the tongue, gag reflex, and patient discomfort. Conventional techniques require patients to retract the tongue, which may reduce image quality and increase discomfort. A novel 3D-printed tongue retractor has been designed as an adjunct to the occlusal photographic mirror to improve visibility and comfort. This study aimed to evaluate and compare the preferences and attitudes of patients and orthodontists toward intraoral photographic techniques using a novel tongue retractor versus conventional methods.

Materials and Methods: A prospective comparative questionnaire-based study was conducted with 48 participants (24 patients and 24 orthodontists/postgraduate students). Mandibular occlusal photographs were captured using both the conventional method and the novel tongue retractor-assisted method. Visual Analogue Scales (VAS) were used to assess discomfort, acceptability, and stress. Additionally, patients completed a 7-item questionnaire and orthodontists/postgraduate students completed an 8-item questionnaire regarding their preferences. Data were analyzed using descriptive statistics and unpaired t-tests, with $p < 0.05$ considered statistically significant.

Results: The novel tongue retractor significantly reduced mean scores for discomfort, time needed, nausea, gag reflex, and breathing impairment compared to the conventional method ($p < 0.001$). No significant difference was noted in TMJ discomfort or discomfort during mouth opening ($p > 0.05$). Patient preferences strongly favored the tongue retractor-assisted method for comfort, efficiency, and reduced gag reflex, while conventional techniques were preferred for specific photographic views. Orthodontists and postgraduate students reported significantly less discomfort, reduced gag reflex, and improved feasibility with the novel tongue retractor ($p < 0.05$),

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though some scenarios still favored conventional methods.

Conclusion: The novel tongue retractor improves patient comfort and operator ease in mandibular occlusal photography, making it a valuable adjunct to conventional techniques. While it cannot completely replace standard methods, its use enhances efficiency, reduces stress, and provides superior patient and operator experiences in routine orthodontic practice.

1. Introduction

Clinical photography plays a pivotal role in modern orthodontics, serving as an indispensable tool for diagnosis, treatment planning, and medico-legal documentation. Its integration into orthodontic practice was pioneered by Edward Angle, who first recognized its diagnostic value. Over time, advancements such as Goodlin's standardized methods (1979) have enhanced the reliability and precision of orthodontic records. Furthermore, research has underscored the significance of clinical photography in smile analysis and aesthetic evaluation, solidifying its importance in evidence-based orthodontic and dental practice.[1]

The connection between dentistry and photography dates back to 1840, when the inaugural dental school was established, featuring the world's first photographic gallery operated by a dentist who transitioned into photography. Since that time, photography has remained closely linked to dentistry, playing a vital role in documenting patient records and supporting treatment planning.[2]

In 1848, Dr. Richard Thompson and William Elde from Columbus, Ohio, pioneered the use of before-and-after photographs to document dental procedures, leading to the publication of an article that opened new possibilities in dental diagnosis and treatment planning. In recent times, clinical photography has become a standard tool in the dental field, significantly contributing to case documentation, patient education, and effective communication. Its importance has grown so much that it is now an essential component in making diagnostic and treatment planning decisions.[2]

Digital photography emerged in the mid-1990s with the introduction of digital cameras to the market. Despite their initially low resolution, these cameras quickly attracted attention from both professionals and hobbyists. Over the following decade, digital photography rapidly replaced traditional film photography, especially in scientific and medical fields.

The effects of advances in digital recording technologies are visible in different sectors. Dentistry is an important example of digital dental photography (DDP), which has become an essential part of orthodontic treatments. DDP enables clinicians to record key stages of treatment. It also contributes to the orthodontic discipline in aspects including communication with patients, self-check of specialists, treatment planning, and provision of the treatment for clinical research, education, and marketing purposes to increase the patient's motivation and cooperation during the process.[3]

In the orthodontic Practice, at least four extra oral i.e. front at rest, front at smile, left lateral, oblique and five intraoral photographs i.e. right occlusion, left occlusion, front occlusion, maxillary arch and mandibular arch is recommended.

A common challenge in capturing mandibular occlusal photographs is interference from the tongue and patient discomfort. To take this photograph, a palatal mirror is positioned with its wider end resting on the distal surfaces of the last molars. It is then tilted upward, with the patient's mouth fully open, until the mirror contacts the incisal edges of the upper front teeth. The patient is instructed to elevate the tongue and breathe through the nose, while the retractor is pulled downward and away from the teeth. Traditionally, patients are asked to retract the tongue behind the mirror, often causing discomfort and reducing image quality. Achieving optimal images becomes especially difficult in individuals with macroglossia, limited motor control, or certain syndromes.

To overcome this challenge, a newly developed tongue retractor specifically for occlusal photography can be highly beneficial. Its unique design ensures the tongue is held gently yet firmly away from the area being

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photographed, offering excellent visibility and enhanced control throughout the imaging process.

This retractor is a 3D-printed Polyethylene terephthalate glycol (PET-G) thermoplastic polyester, crafted through Fused Deposition Modelling (FDM) technology that offers chemical resistance, durability, and formability. This innovative tongue retractor weighs 13 gm and has a triangular shape with 18 mm height, 30mm and 18mm length of base and apex respectively and 24mm width. It has Clip-On Design that can be attached on the posterior side of the mirror.

This study aims to evaluate the preferences and attitudes of patients and orthodontists toward the intraoral photographic technique with a novel tongue retractor compared to the conventional photographic technique for capturing mandibular occlusal photograph in orthodontic patients.

2. Material And Methods

This prospective comparative questionnaire-based study was conducted in the Department of Orthodontics and Dentofacial Orthopaedics, K. M. Shah Dental College and Hospital, Sumandeep Vidyapeeth Deemed to be University, Piparia, Waghodia, Vadodara, Gujarat – 391760, after obtaining ethical approval from the Sumandeep Vidyapeeth Institutional Ethical Committee (SVIEC/ON/DENT/RP/FEB/24/36).

Study Design: Prospective comparative study.

Study Location: Department of Orthodontics and Dentofacial Orthopaedics, K. M. Shah Dental College and Hospital, Sumandeep Vidyapeeth, Piparia, Waghodia, Vadodara, Gujarat – 391760.

Study Duration: 14 months.

Sample Size: A total of 48 participants were included, with 24 patients (Group 1) and 24 orthodontists/postgraduate students (Group 2). The sample size was calculated using OpenEpi software (v3.0) at 95% confidence interval and 80% power, based on the study by Alessandro Mangano et al.

Sample Distribution:

Group 1: Patients about to begin fixed orthodontic treatment.

Group 2: IOS-registered orthodontists and postgraduate students.

Inclusion Criteria

Patients (Group 1):

1. Patients beginning fixed orthodontic treatment.
2. Good oral health.
3. Mouth opening between 40–60 mm.
4. Normal tongue anatomy and function.

Orthodontists/Postgraduate Students (Group 2):

1. IOS-registered orthodontists with clinical experience in intraoral photography.
2. IOS-registered postgraduate students with clinical experience in intraoral photography.

Exclusion Criteria

Patients (Group 1):

1. Macroglossia, tongue-tie, or anomalies affecting tongue position.
2. Neuromuscular disorders affecting oral or tongue movements.
3. Limited mouth opening making intraoral photography unfeasible.
4. Prior experience of intraoral photography.
5. Patient authors/applicants.

Orthodontists/Postgraduate Students (Group 2):

1. Non-IOS registered orthodontists or students.
2. No clinical experience in intraoral photography.

Procedure Methodology

All participants were informed about the aims and methodology of the study, and written informed consent was obtained.

For patients (Group 1), mandibular occlusal photographs were captured at two time points:

T1 (Conventional technique): An intraoral photographic mirror with lip retractor was used. Camera settings: aperture F/22, shutter speed 1/200, ISO 100, manual mode, magnification ratio 1:3. Photographs were taken at a 90° angle ensuring visibility of the last molar.

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Figure 1: Mandibular occlusal photograph captured with conventional technique.

Figure 2: Novel Tongue Retractor

T2 (Novel tongue retractor-assisted technique): After two hours, the mandibular occlusal photograph was repeated with the tongue retractor attached to the mirror, using the same camera settings.

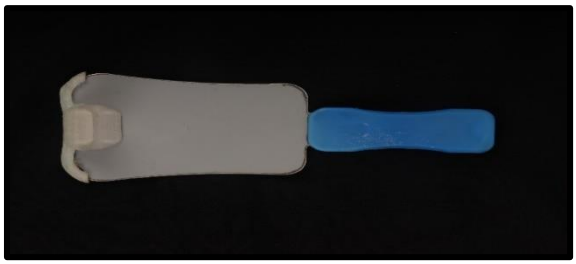

Figure 3: Final assembly of intra oral occlusal photographic mirror with novel tongue retractor.

Figure 4: Mandibular occlusal photograph captured with Intra oral Photographic technique with novel tongue retractor as an adjunct to occlusal photographic mirror

Both patients (Group 1) and orthodontists/postgraduate students (Group 2) completed validated Visual Analogue Scales (VAS) to assess attitude, acceptability, discomfort, and stress for each technique.

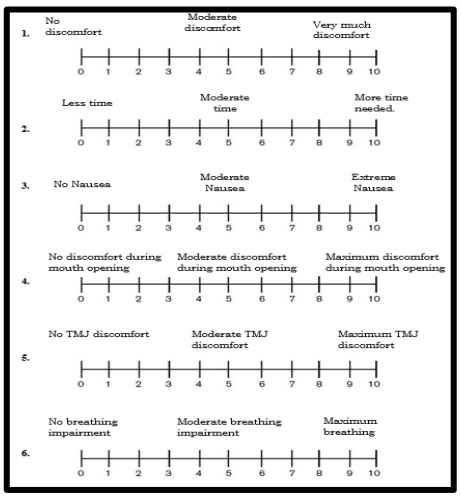

Figure 5: VAS to Evaluate Patients Attitude and Discomfort

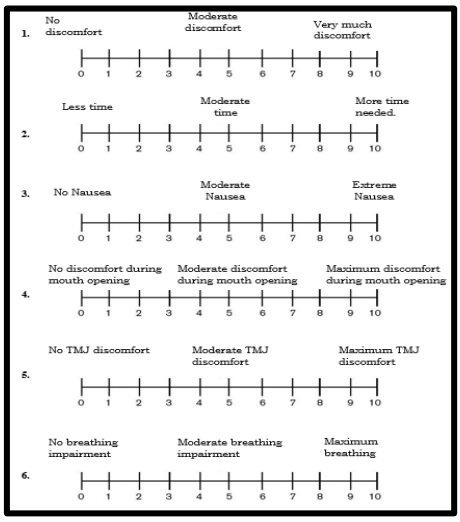

Figure 6: VAS to Evaluate Orthodontist's &/Or Post

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In addition, participants responded to structured questionnaires:

Questionnaire To Evaluate Patient's Preference About Intra Oral Photographic Technique for Lower Occlusal Photograph	**Questionnaire To Evaluate Orthodontist's &/Or Post Graduate Student's Preference About Intra Oral Photographic Technique for Lower Occlusal Photograph**
1. Which intra oral photographic technique do you prefer in the case of repeating the mandibular occlusal photography procedure?	1. Which intra oral photographic technique do you prefer in the case of repeating the mandibular occlusal photography procedure?
2. Which intra oral photographic technique is more comfortable from point of comparison of two intra oral photographic technique for capturing mandibular occlusal photograph?	2. Which intra oral photographic technique is more comfortable from point of comparison of two intra oral photographic technique for capturing mandibular occlusal photograph?
3. Which intra oral photographic technique do you suggest for someone in need of intraoral photographs for undergoing orthodontic treatment?	3. Which intra oral photographic technique do you suggest for a colleague in need of intraoral photographs for patients undergoing orthodontic treatment?
4. Which intra oral photographic technique do you prefer from point of time involved with intra oral photography procedure?	4. Which intra oral photographic technique do you prefer from point of time involved with intra oral photography procedure?
Which intra oral photographic technique do you prefer from point of the size of the tongue retractor used in your mouth during intra oral photographic technique for capturing mandibular occlusal photograph?	5. Which intra oral photographic technique do you prefer from point of the size of the tongue retractor used in your mouth during intra oral photographic technique for capturing mandibular occlusal photograph?
6. Which intra oral photographic technique do you prefer from point of having difficulty in breathing during intra oral photographic technique for capturing mandibular occlusal photograph?	5. Which intra oral photographic technique do you prefer from point of the feasibility during intra oral photographic technique for capturing mandibular occlusal photograph?
6. Which intra oral photographic technique do you prefer from point of having nausea during intra oral photography procedure for capturing mandibular occlusal photograph?	7. Which intra oral photographic technique do you prefer from point of having difficulty in placement of photographic assembly during intra oral photographic technique for capturing mandibular occlusal photograph?
	8. Which intra oral photographic technique do you prefer from point of having gagging reflex during intra oral photography procedure for capturing mandibular occlusal photograph?

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Statistical analysis

Data were analyzed using IBM SPSS Statistics for Windows, version 21.0 (Armonk, NY: IBM Corp.). Descriptive statistics (mean, SD, frequency, percentage) were calculated. The Kolmogorov-Smirnov and Shapiro-Wilk tests were applied for normality. An unpaired t-test was used to compare the two photographic techniques. Statistical significance was set at $p < 0.05$.

3. Result

Table 1 presents the intergroup comparison of attitude, acceptability, feelings, and stress perceived by patients between the conventional intraoral photographic technique and the novel tongue retractor as an adjunct. The results show that the novel tongue retractor method had significantly lower mean scores for discomfort (3.75 ± 0.89 vs. 6.33 ± 0.87, $p < 0.001$), time needed (3.83 ± 1.09 vs. 5.50 ± 0.83, $p < 0.001$), and nausea (3.54 ± 0.83 vs. 6.50 ± 0.97, $p < 0.001$) compared to the conventional technique. However, no significant differences were observed between the two groups in terms of discomfort during mouth opening ($p = 0.364$) and TMJ discomfort ($p = 0.860$).

Table no 1: Comparison of Attitude, acceptability, feelings and stress perceived by patients between conventional intraoral photographic technique and novel tongue retractor as an adjunct to intraoral photographic technique.

Parameter	Method	N	Mean	Std. Deviation	t value	p value
Discomfort	Conventional intraoral photographic technique	24	6.3333	.86811	10.139	<0.001*
	Novel tongue retractor as an adjunct to intraoral photographic technique	24	3.7500	.89685		
Time Needed	Conventional intraoral photographic technique	24	5.5000	.83406	5.948	<0.001*
	Novel tongue retractor as an adjunct to intraoral photographic technique	24	3.8333	1.09014		
Nausea	Conventional intraoral photographic technique	24	6.5000	.97802	11.281	<0.001*
	Novel tongue retractor as an adjunct to intraoral photographic technique	24	3.5417	.83297		
Discomfort during mouth opening	Conventional intraoral photographic technique	24	5.0833	.71728	0.918	0.364
	Novel tongue retractor as an adjunct to intraoral photographic technique	24	4.8750	.85019		
TMJ discomfort	Conventional intraoral photographic technique	24	5.1250	.79741	0.177	0.860
	Novel tongue retractor as an adjunct to intraoral photographic technique	24	5.0833	.82970		
Breathing Impairment	Conventional intraoral photographic technique	24	6.7917	.72106		

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	Novel tongue retractor as an adjunct to intraoral photographic technique	24	3.9583	.90790		

*p value <0.05 statistically significant

Table 2 presents the patient preferences regarding intraoral photographic techniques for capturing mandibular occlusal photographs. The findings show that a significantly higher proportion of patients preferred Option B (Novel Tongue Retractor as an Adjunct) in Q1 (75.0%), Q2 (83.3%), Q3 (66.7%), and Q7 (70.8%) ($p < 0.05$ for all), whereas Option A (Conventional Intra Oral Photographic Technique) was unanimously chosen in Q4 (100%), and was also strongly preferred in Q5 (87.5%) and Q6 (62.5%) ($p < 0.05$).

Table no 2: Patient preferences about intra oral photographic technique for Capturing mandibular occlusal photograph

Question No.	Options	Frequency	Percentage	P Value
Q1	A	6	25.0	**P<0.05**
	B	18	75.0	
Q2	A	4	16.7	**P<0.05**
	B	20	83.3	
Q3	A	8	33.3	**P<0.05**
	B	16	66.7	
Q4	A	24	100.0	**---**
Q5	A	21	87.5	**P<0.05**
	B	3	12.5	
Q6	A	15	62.5	**P<0.05**
	B	9	37.5	
Q7	A	7	29.2	**P<0.05**
	B	17	70.8	

*p value <0.05 statistically significant

Table 3 shows no statistically significant difference between Group 1 & Group 2 across the all-time interval (T0-T4) with p value greater than 0.05 indicating that both Groups had similar Stability over the time (T0-T4). Table 3 presents the comparison of attitude, acceptability, feelings, and stress perceived by orthodontists and postgraduate students between the conventional intraoral photographic technique and the novel tongue retractor as an adjunct. The results show that the novel tongue retractor method had significantly lower mean scores for discomfort (3.83 ± 1.09 vs. 5.50 ± 0.83, $p < 0.001$), time needed (3.75 ± 0.89 vs. 6.33 ± 0.86, $p < 0.001$), gag reflex (3.75 ± 0.89 vs. 5.12 ± 0.67, $p < 0.001$), discomfort during mouth opening (4.87 ± 0.85 vs. 5.50 ± 0.83, $p = 0.013$), TMJ discomfort (3.83 ± 1.09 vs. 5.12 ± 0.79, $p < 0.001$), and breathing impairment (3.95 ± 0.91 vs. 5.29 ± 0.85, $p < 0.001$) compared to the conventional technique.

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Table no 3: Comparison of Attitude, acceptability, feelings and stress perceived by Orthodontist and/or Post Graduate Student between conventional intraoral photographic technique and novel tongue retractor as an adjunct to intraoral photographic technique.

Parameter	Method	N	Mean	Std. Deviation	t value	p value
Discomfort	Conventional intraoral photographic technique	24	5.5000	.83406	5.948	<0.001*
	Novel tongue retractor as an adjunct to intraoral photographic technique	24	3.8333	1.09014		
Time Needed	Conventional intraoral photographic technique	24	6.3333	.86811	10.139	<0.001*
	Novel tongue retractor as an adjunct to intraoral photographic technique	24	3.7500	.89685		
Gag Reflex	Conventional intraoral photographic technique	24	5.1250	.67967	5.986	<0.001*
	Novel tongue retractor as an adjunct to intraoral photographic technique	24	3.7500	.89685		
Discomfort during mouth opening	Conventional intraoral photographic technique	24	5.5000	.83406	2.571	0.013*
	Novel tongue retractor as an adjunct to intraoral photographic technique	24	4.8750	.85019		
TMJ discomfort	Conventional intraoral photographic technique	24	5.1250	.79741	4.685	<0.001*
	Novel tongue retractor as an adjunct to intraoral photographic technique	24	3.8333	1.09014		
Breathing Impairment	Conventional intraoral photographic technique	24	5.2917	.85867	5.227	<0.001*
	Novel tongue retractor as an adjunct to intraoral photographic technique	24	3.9583	.90790		

p value <0.05 statistically significant

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Table 4 presents the preferences of orthodontists and postgraduate students regarding intraoral photographic techniques for capturing mandibular occlusal photographs. The results indicate that Option A (Conventional Intra Oral Photographic Technique) was preferred in Q1 (54.2%), Q3 (54.2%), Q4 (100%), Q5 (87.5%), Q6 (50.0%), and Q7 (66.7%), whereas Option B (Novel Tongue Retractor as an Adjunct) was more commonly chosen in Q2 (83.3%) and Q8 (79.2%). The differences in responses for all questions, except Q4, were statistically significant ($p < 0.05$).

Table no 4: Orthodontist and Post Graduate Student preferences about intra oral photographic technique for Capturing mandibular occlusal photograph

Question No.	Options	Frequency	Percentage	P Value
Q1	A	13	54.2	**P<0.05**
	B	11	45.8	
Q2	A	4	16.7	**P<0.05**
	B	20	83.3	
Q3	A	13	54.2	**P<0.05**
	B	11	45.8	
Q4	A	24	100.0	**---**
Q5	A	21	87.5	**P<0.05**
	B	3	12.5	
Q6	A	12	50.0	**P<0.05**
	B	12	50.0	
Q7	A	16	66.7	**P<0.05**
	B	8	33.3	
Q8	A	5	20.8	**P<0.05**
	B	19	79.2	

p value <0.05 statistically significant

4. Discussion

Intraoral photography is an essential part of orthodontic diagnosis, treatment planning, and documentation. However, patient discomfort, gag reflex, nausea, and technical difficulties during image capture often limit the effectiveness of conventional techniques. To overcome these challenges, a novel tongue retractor has been introduced as an adjunct to conventional intraoral photography. The present study aimed to evaluate and compare patient- and operator-related parameters, including discomfort, acceptability, stress, and preferences, between the conventional intraoral photographic technique and the novel tongue retractor-assisted technique.

In the present study, significant differences were observed in patient-reported outcomes between the two techniques. The novel tongue retractor group demonstrated significantly lower mean scores for discomfort, time required, and nausea when compared to the conventional

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method ($p < 0.001$). This indicates that the adjunctive use of a tongue retractor not only minimized patient discomfort but also enhanced efficiency and reduced gag reflex. In contrast, no significant difference was observed between the two methods with respect to discomfort during mouth opening and TMJ-related discomfort, suggesting that the tongue retractor does not adversely affect mandibular movements or TMJ loading.

Patient preferences further reinforced these findings. A majority of participants expressed a preference for the tongue retractor-assisted technique in questions related to ease, comfort, and reduced gag reflex, whereas conventional methods were more strongly preferred in certain situations, such as specific photographic views (Q4 and Q5). These results suggest that while the novel tongue retractor improves patient experience in most aspects, certain traditional techniques remain indispensable for achieving specific photographic requirements.

From the perspective of orthodontists and postgraduate students, the novel tongue retractor also demonstrated significant advantages. Operators reported significantly lower scores for discomfort, time consumption, gag reflex, TMJ discomfort, and breathing impairment with the retractor-assisted method ($p < 0.05$ for all). This highlights that the adjunct technique not only benefits patients but also facilitates better working conditions for clinicians by reducing the technical challenges encountered with conventional methods. However, it is noteworthy that conventional photography was still preferred by clinicians for some parameters, reflecting that the tongue retractor may serve as a complementary rather than a complete replacement technique.

The present study's findings are in agreement with previous research that emphasized the importance of reducing patient discomfort and gag reflex during intraoral photography to enhance overall clinical efficiency and patient compliance. By reducing stress factors, the adjunct use of tongue retractors could contribute to improved quality of records, thereby aiding diagnosis and treatment monitoring.

One of the limitations of this study was the relatively small sample size, which may not fully represent the wider orthodontic patient and clinician population. In addition, subjective perceptions of discomfort and acceptability may vary due to individual tolerance levels, gag reflex sensitivity, and operator skill. A larger, multi-centre study with objective measures such as photographic quality assessment and standardized time tracking could provide stronger evidence.

Future research should focus on assessing long-term acceptability of the tongue retractor in routine orthodontic practice, exploring design modifications for enhanced comfort, and validating its usefulness across different age groups and malocclusion types. Furthermore, digital intraoral photography advancements could be integrated with such adjunct tools to further improve clinical efficiency.

5. Conclusion

The present research was undertaken to evaluate and compare the Preferences & Attitudes of Patients & Orthodontists Toward the Conventional Photographic Technique for Capturing Mandibular Occlusal Photograph in Orthodontic Patients and Intraoral Photographic Technique with A Novel Tongue Retractor as an adjunct. With increasing emphasis on improving patient comfort and enhancing clinical efficiency in orthodontic photography, this study aimed to Evaluate the Preferences & Attitudes of Patients & Orthodontists Toward the Intraoral Photographic Technique with A Novel Tongue Retractor Compared to The Conventional Photographic Technique for Capturing Mandibular Occlusal Photograph in Orthodontic Patients.

- Patient Perspective: – The use of the novel tongue retractor significantly reduced discomfort, time needed, nausea, gag reflex, and breathing impairment when compared to the conventional technique. However, no significant difference was noted with respect to TMJ discomfort or discomfort during mouth opening. Patient preference was strongly inclined toward the adjunct technique in most situations, though conventional methods were still favoured for certain photographic views.
- Operator Perspective: – Orthodontists and postgraduate students reported significantly less discomfort, reduced gag reflex, improved efficiency, and fewer difficulties in capturing intraoral photographs with the tongue retractor-assisted method. Nonetheless, conventional techniques were

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preferred in specific scenarios, indicating that the adjunct is best considered a complementary rather than a replacement method.

- Clinical Implication: – The adjunctive use of the tongue retractor improves patient comfort and reduces stress for both patients and operators, thereby facilitating better quality records. While conventional methods remain essential for some views, the tongue retractor offers a valuable adjunct in routine orthodontic photography.

References

1. Suárez-Solís B, Suárez-Fernández C, Suárez-Solís J, Badía A, Olabarria M, Cobo T. Clinical Photography in Orthodontic Practice: Insights from a Nationwide Survey in Spain. Journal of Clinical Medicine. 2025 Mar 14;14(6):1984.
2. Glenner RA. The American dentist: a pictorial history with a presentation of early dental photography in America. (No Title). 1990.
3. Shetty SK. Clinical Photography in Orthodontics. Sch J Dent Sci. 2021 Aug;7:220-3.
4. Çifter M. A qualitative analysis of dental photography in orthodontics: the patient's perspective. BioMed research international. 2018;2018(1):5418592.
5. Albugami RK, Binmahfod NN, Muhsin MA, Bamane RA, Almuqrin AD, Aldahri OA, Pullishery F. Clinical photography knowledge and skills among dental students in Saudi Arabia: A cross-sectional survey. Journal of Pharmacy and Bioallied Sciences. 2021 Jun 1;13(Suppl 1):S801-6.
6. Sandler J, Dwyer J, Kokich V, McKeown F, Murray A, McLaughlin R, O'brien C, O'malley P. Quality of clinical photographs taken by orthodontists, professional photographers, and orthodontic auxiliaries. American Journal of Orthodontics and Dentofacial Orthopedics. 2009 May 1;135(5):657-62.
7. Hayes MH. Experimental development of the graphic rating method. Psychological Bulletin. 1921;18:98-9.
8. Freyd M. The graphic rating scale. Journal of educational psychology. 1923 Feb;14(2):83.