Research Article

Reliability of AI-Based Occlusal Adjustment Recommendations in Full Mouth Rehabilitation Cases

Dr. Manjinder Singh[1*], Dr. Amanat Kaur Randhawa[2], Dr. Vritti Aggarwal[3], Dr. Alok Suman[4], Dr. Milind Rajan[5], Dr. Yashodhara Shah[6]

[1*]3rd Year Resident, Department of Prosthodontics and Crown & Bridge, Luxmi Bai Institute of Dental Sciences, Patiala, Punjab, India. Email Id: manjinder0571@gmail.com
[2]2nd Year Resident, Department of Prosthodontics and Crown & Bridge, Luxmi Bai Institute of Dental Sciences, Patiala, Punjab, India. Email Id: randhawaamanat730@gmail.com
[3]2nd Year Resident, Department of Prosthodontics and Crown & Bridge, Luxmi Bai Institute of Dental Sciences, Patiala, Punjab, India. Email Id: vrittiaggarwal5@gmail.com
[4]Assistant Professor, Department of Prosthodontics Crown and Bridge, Buddha Institute of Dental Sciences and Hospital, Patna - 800026, Bihar, India. Email Id: aloksuman12feb@gmail.com
[5]Associate Professor, Department of Pediatric and Preventive Dentistry, School of Dental Sciences, Krishna Vishwa Vidyapeeth Deemed to be University, Karad, Maharashtra India. Email Id: milindrajan00@gmail.com
[6]Associate Professor, Department of Public Health Dentistry, Dr. D. Y. Patil Vidyanagar, Sector - 7, Nerul, Navi Mumbai - 400 706, Maharashtra, India. Email Id: yashodhara.shah@dypatil.edu

Corresponding Author: Dr. Manjinder Singh, Email Id: manjinder0571@gmail.com

ABSTRACT

Full mouth rehabilitation (FMR) is a complex prosthodontic procedure that aims to restore oral function, occlusal stability, aesthetics, and biological health in patients presenting with extensive tooth wear, multiple missing teeth, altered occlusal relationships, and compromised dentition. Occlusal adjustment is an important component of FMR because premature contacts, occlusal interferences, discrepancies in centric relation and maximum intercuspation, and inappropriate distribution of occlusal forces may compromise the longevity and function of definitive restorations. Conventional occlusal adjustment is largely dependent on clinical examination, articulating paper, shimstock, mounted diagnostic casts, intraoral evaluation, and the experience of the treating clinician.

The integration of artificial intelligence (AI) into digital dentistry has introduced new possibilities for automated occlusal analysis and treatment planning. AI-based systems can process intraoral scans, digital articulations, occlusal contact maps, three-dimensional dental models, jaw-tracking information, and other digital records to identify potentially abnormal contacts and generate recommendations for occlusal adjustment. Recent evidence indicates that AI and digital occlusal technologies may improve efficiency and reproducibility; however, their reliability varies according to the data source, scanner, software, clinical situation, and complexity of the occlusal problem.

This article discusses the principles of occlusion in full mouth rehabilitation, conventional methods of occlusal adjustment, digital occlusal analysis, applications of AI in occlusal assessment, AI-based occlusal adjustment recommendations, parameters used to assess reliability, clinician–AI agreement, advantages and limitations, and future perspectives. Particular emphasis is placed on the distinction between contact detection and clinical occlusal diagnosis, as these should not be considered equivalent. Current evidence suggests that AI-based recommendations may serve as a useful decision-support tool, but final occlusal adjustment should remain under clinician supervision.

KEYWORDS: Artificial intelligence; Occlusal adjustment; Full mouth rehabilitation; Digital occlusion; Intraoral scanner; Occlusal contacts; Prosthodontics; Machine learning; Reliability; Generative artificial intelligence

INTRODUCTION

Full mouth rehabilitation represents one of the most challenging procedures in restorative and prosthodontic dentistry. It involves the comprehensive restoration or replacement of multiple teeth while simultaneously establishing an acceptable relationship between the maxillary and mandibular dentitions.[1] The treatment may involve fixed prostheses, implant-supported restorations, direct and indirect restorations, occlusal reconstruction, and management of tooth wear.[2]

A successful full mouth rehabilitation requires careful evaluation of the patient's existing occlusion, vertical dimension, centric relation, maximum intercuspation, anterior guidance, posterior support, functional movements, and distribution of occlusal forces.[3] Occlusal errors introduced during provisionalization or definitive restoration may result in discomfort, restoration fracture, tooth mobility, muscle tenderness, temporomandibular symptoms, or accelerated mechanical complications.Traditionally, occlusal adjustment is performed using articulating paper, occlusal films, shimstock, wax records, mounted casts, clinical examination, and selective grinding. Although these methods remain clinically useful, interpretation can be influenced by operator experience, saliva, paper thickness, biting force, tooth morphology, and the difficulty of distinguishing clinically significant contacts from simple markings.[2,3]

Digital dentistry has transformed the acquisition and analysis of occlusal information. Intraoral scanners can generate three-dimensional dental models, while computerized occlusal analysis systems can provide information regarding contact distribution and timing.[4] Digital technologies also permit integration of intraoral

scans with CAD/CAM and virtual articulators. Artificial intelligence has further expanded these capabilities by allowing software to automatically recognize dental structures, analyze digital occlusal relationships, identify contact patterns, and potentially recommend areas requiring occlusal adjustment.[2,5]

IMPORTANCE OF OCCLUSAL ANALYSIS IN FULL MOUTH REHABILITATION

Occlusal analysis is required to evaluate:

- Maximum intercuspation
- Centric relation
- Occlusal contacts
- Premature contacts
- Working-side interferences
- Non-working-side interferences
- Anterior guidance
- Canine guidance
- Posterior disclusion
- Occlusal vertical dimension
- Distribution of occlusal forces
- Contact timing
- Occlusal stability[6]

The objective of occlusal adjustment should not simply be to eliminate every marked contact.
Instead, the clinician must determine whether the contact is:

1. Anatomically appropriate
2. Functionally acceptable
3. Stable
4. Symmetrical where appropriate
5. Consistent with the planned occlusal scheme
6. Associated with excessive force or interference[7]

OCCLUSAL CONSIDERATIONS IN FULL MOUTH REHABILITATION

Centric Relation

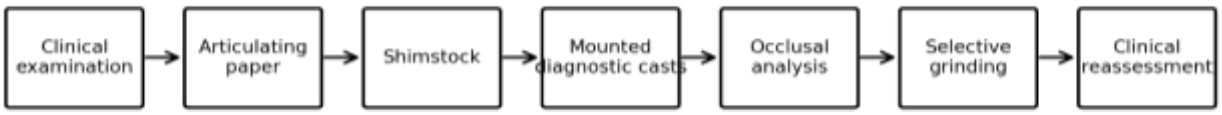
Centric relation represents a repeatable maxillomandibular relationship that is independent of tooth contact.
Its assessment becomes particularly important when:

- Multiple teeth require restoration
- Existing occlusion is unstable
- Extensive tooth wear is present
- Vertical dimension is altered
- Multiple posterior teeth are missing[7,8]

AI systems may analyze digital records corresponding to centric relation and maximum intercuspation; however, the quality of the recommendation depends on the accuracy of the underlying jaw relationship record.

Figure 1. Conventional occlusal analysis workflow in full mouth rehabilitation.

Maximum Intercuspation



Maximum intercuspation represents the position of maximum tooth interdigitation.
AI-based systems may identify:

- Contact location
- Contact area
- Contact frequency
- Interocclusal clearance

- Potential premature contacts

Digital occlusal systems have demonstrated relatively good reliability for identifying contact locations, but evidence remains less consistent for determining exact contact intensity.[9,10]

OCCLUSAL INTERFERENCES

Occlusal interference may occur when a tooth contact interferes with the intended mandibular movement.
Important types include:

1. Centric interference

A premature contact occurring during closure.

2. Working-side interference

An undesirable contact occurring on the working side during lateral movement.

3. Non-working-side interference

An undesirable contact occurring on the non-working side.

4. Protrusive interference

A posterior contact that interferes with the desired anterior guidance during protrusion.

5. Restoration-related interference

Occlusal discrepancies caused by:

- Crowns
- Bridges
- Implant restorations
- Inlays
- Onlays
- Veneers
- Full-mouth prosthetic reconstructions[10,11]

CONVENTIONAL METHODS OF OCCLUSAL ANALYSIS

1. Articulating Paper

Articulating paper is one of the most commonly used methods for detecting occlusal contacts.
It provides:

- Contact location
- Approximate contact distribution
- Visual identification of high spots[12]

Limitations

- Subjective interpretation
- Influence of saliva
- Variable marking intensity
- Difficulty distinguishing force from contact area
- Limited temporal information

2. Shimstock

Shimstock is a thin metallic foil used to determine whether a contact is present.
It is particularly useful for assessing:

- Tooth contact
- Contact retention
- Occlusal stability

However, shimstock does not provide a quantitative measurement of force.

3. Occlusal Wax

Occlusal wax can be used to record the relationship between the arches.

Limitations

- Deformation
- Technique sensitivity
- Limited three-dimensional accuracy
- Difficulty in reproducing dynamic occlusion

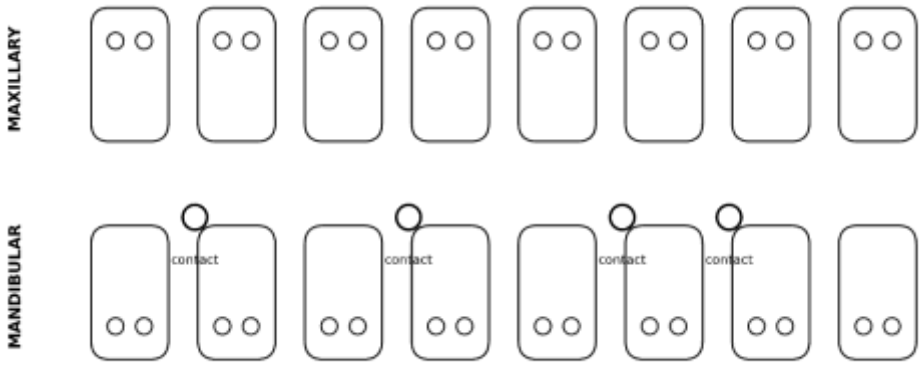
4. Articulated Diagnostic Casts

Mounted casts permit evaluation of:

- Occlusal relationships

- Tooth morphology
- Vertical dimension
- Interarch relationship[13]
- Planned restorative contours

Figure 2.



Schematic representation of occlusal contacts detected in a digital model.

DIGITAL OCCLUSAL ANALYSIS

The development of intraoral scanners and computerized occlusal analysis has enabled occlusal relationships to be recorded digitally.[14]

Digital occlusal technologies include:

- Intraoral scanners
- Digital articulation
- T-Scan
- OccluSense
- Dental Prescale
- Digital jaw tracking
- Virtual articulators
- AI-based occlusal analysis

Recent systematic evidence indicates that intraoral scanners and sensor-based systems generally demonstrate good reliability for identifying occlusal contacts, although their ability to accurately quantify contact intensity and exact interocclusal relationships remains limited.[15]

ARTIFICIAL INTELLIGENCE IN DIGITAL DENTISTRY

Artificial intelligence refers to computational systems capable of performing tasks that traditionally require aspects of human intelligence.

In dentistry, AI applications include:

- Image interpretation
- Tooth identification
- Caries detection
- Periodontal assessment
- Orthodontic diagnosis
- Implant planning
- Prosthetic design
- Occlusal analysis
- Treatment planning
- Predictive modelling[16]

AI-based dental treatment planning is rapidly developing, although current evidence demonstrates substantial variation between algorithms and clinical tasks.

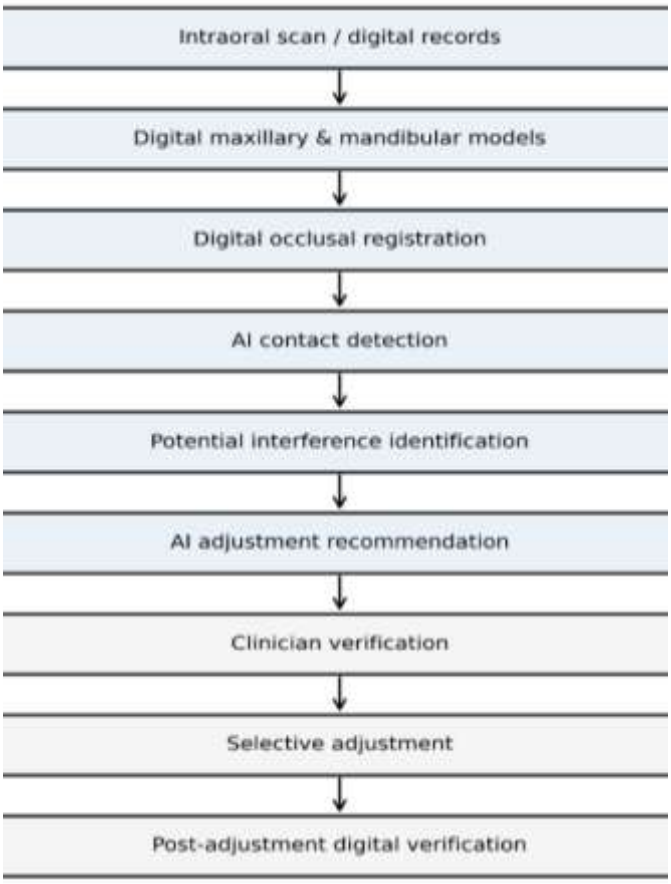


Figure 3. AI-assisted occlusal analysis and adjustment workflow.

APPLICATION OF AI IN OCCLUSAL ANALYSIS

AI can potentially analyze multiple forms of digital information.

1. Intraoral Scan Analysis

AI algorithms can identify:

- Individual teeth
- Occlusal surfaces
- Contact points
- Interocclusal spaces
- Occlusal collisions

2. Digital Articulation

AI can assist in establishing the relationship between maxillary and mandibular digital models.[17]

3. Contact Recognition

AI can automatically identify areas where opposing teeth contact.

4. Occlusal Interference Detection

AI may identify contacts that occur during:

- Centric closure
- Lateral movement
- Protrusion

5. Occlusal Adjustment Recommendation

AI can potentially identify the tooth and surface requiring modification.[16,18]

For example:

Digital Scan

↓
AI Tooth Segmentation
↓
Occlusal Contact Detection
↓
Contact Intensity Analysis
↓
Identification of Potential Interference
↓
AI Adjustment Recommendation
↓
Clinician Verification
↓
Selective Occlusal Adjustment
↓
Post-adjustment Digital Verification

AI-BASED OCCLUSAL ADJUSTMENT

AI-based occlusal adjustment systems may generate recommendations based on predefined algorithms or machine-learning models.

Potential recommendations include:

- Reduction of a specific cusp
- Reduction of a marginal ridge
- Adjustment of an occlusal fossa
- Modification of restoration morphology
- Reduction of excessive occlusal contact
- Alteration of virtual restoration anatomy[19,20]

In CAD/CAM workflows, AI may also assist with automated correction of occlusal collisions.

Recent research on AI-driven occlusal contact adjustment has shown that the effect on virtual occlusal record trueness may vary according to scanner type and the extent of edentulism. This indicates that AI performance cannot be assumed to be universally transferable across digital systems.[21]

AI IN FULL MOUTH REHABILITATION WORKFLOW

Patient Examination
↓
Clinical Occlusal Assessment
↓
Intraoral Scanning
↓
CBCT / Facial Scan / Digital Records Where Indicated
↓
Digital Articulation
↓
AI-Based Occlusal Analysis
↓
Identification of Potential Premature Contacts
↓
AI-Based Adjustment Recommendation
↓
Expert Prosthodontist Verification
↓
Virtual Adjustment
↓
Clinical Adjustment
↓
Post-adjustment Digital Verification

↓

Definitive Prosthetic Rehabilitation

PARAMETERS USED TO ASSESS AI RELIABILITY

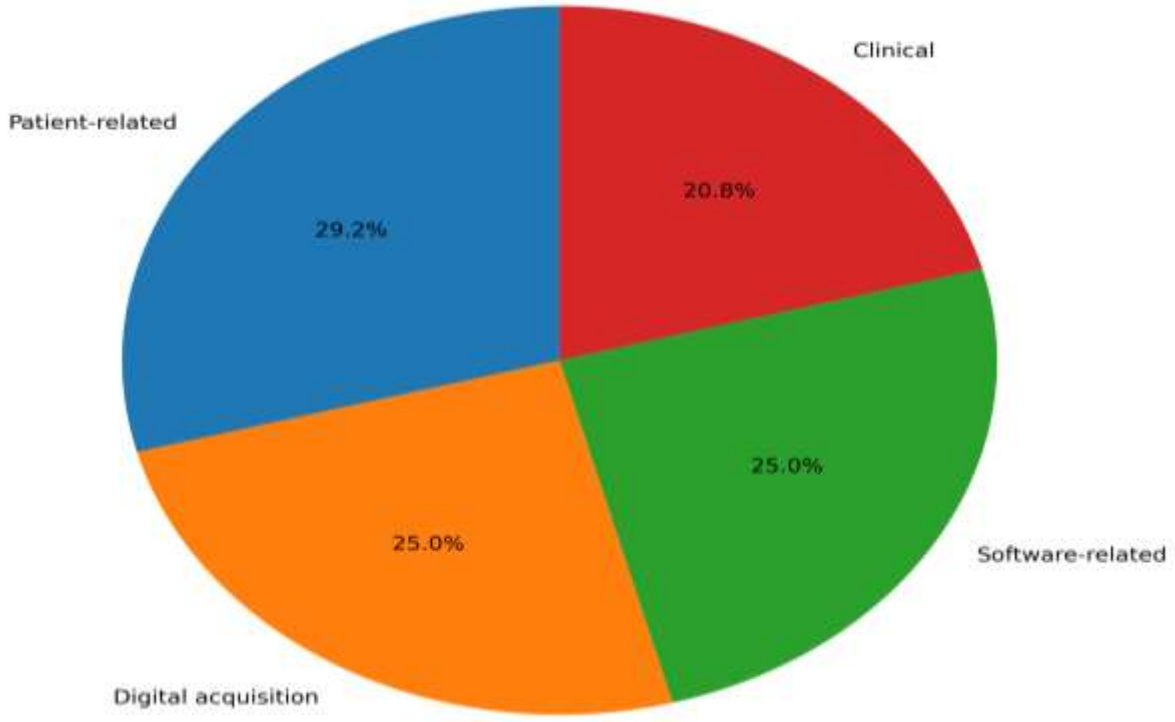


Figure 4. Reliability parameters described in the manuscript for evaluating AI-based occlusal recommendations.

Reliability should be evaluated systematically rather than by simply determining whether an AI recommendation appears clinically reasonable.

Important parameters include:

1. Accuracy

Agreement between the AI recommendation and the reference clinical decision.

2. Repeatability

Whether the AI provides the same recommendation when the same case is analyzed repeatedly.

3. Reproducibility

Whether similar results are obtained across different scanners, datasets, operators, or clinical settings.

4. Sensitivity

Ability to identify clinically relevant occlusal interferences.

5. Specificity

Ability to avoid identifying normal contacts as abnormal.

6. Positive Predictive Value

Probability that an AI-identified interference is actually clinically relevant.

7. Negative Predictive Value

Probability that an area classified as non-problematic truly does not require adjustment.

8. Clinician–AI Agreement

Agreement between AI recommendations and expert prosthodontists.

Cohen's kappa or weighted kappa may be used for categorical recommendations.

9. Intraclass Correlation Coefficient

ICC may be useful when AI and clinicians provide quantitative measurements.

10. Bland–Altman Analysis

Bland–Altman analysis may be used when comparing quantitative measurements obtained by AI with a reference method.[22,23]

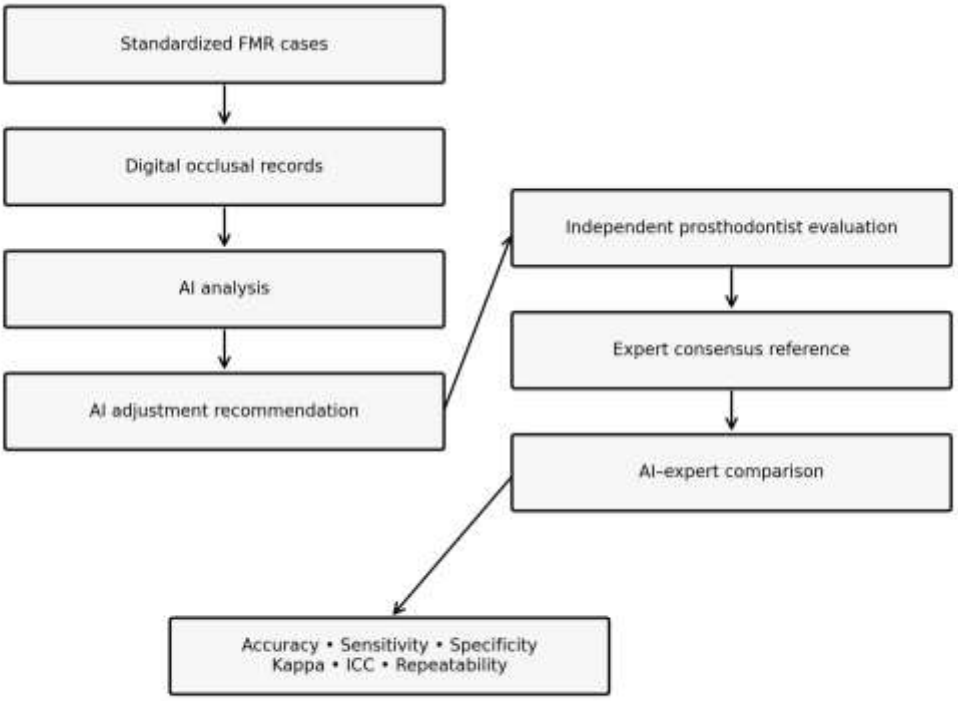


Figure 5. Proposed framework for evaluating reliability and clinician–AI agreement.

PROPOSED REFERENCE STANDARD FOR AI OCCLUSAL ADJUSTMENT

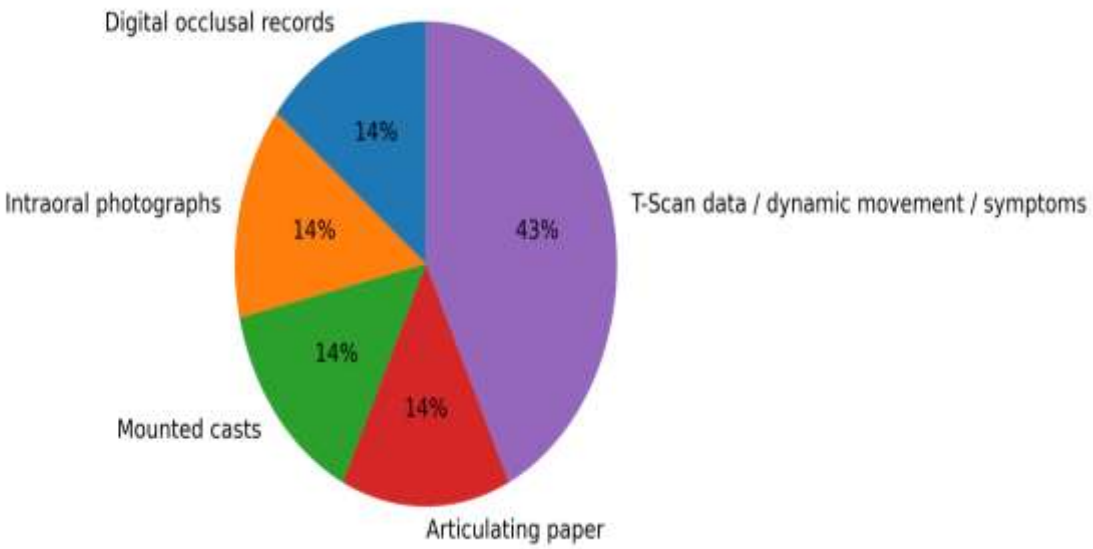


Figure 6. Components considered in the proposed expert reference standard for AI occlusal adjustment.

A major challenge in evaluating AI-based occlusal adjustment is the absence of a universally accepted gold standard.

A clinically meaningful reference standard may involve:

AI Recommendation

versus

Consensus Recommendation of Multiple Experienced Prosthodontists

The expert panel could independently evaluate:

- Digital occlusal records
- Intraoral photographs

- Mounted casts
- Articulating paper
- T-Scan data
- Dynamic mandibular movements
- Clinical symptoms

Consensus can then be compared with AI output.

This approach is preferable to using a single clinician because occlusal diagnosis is inherently dependent on clinical interpretation.

Machine-learning research in altered and parafunctional occlusion has similarly highlighted the lack of standardized reference standards and the potential influence of clinician judgment on validation. [24]

TABLE 1: COMPARISON BETWEEN CONVENTIONAL AND AI-ASSISTED OCCLUSAL ANALYSIS

Parameter	Conventional Method	AI-Assisted Method
Contact identification	Operator dependent	Automated
Contact location	Good	Potentially highly reproducible
Contact intensity	Limited	Quantitative potential
Dynamic analysis	Limited	Possible with digital systems
Repeatability	Operator dependent	Potentially high
Data storage	Physical/digital records	Fully digital
Treatment simulation	Limited	Possible
Adjustment recommendation	Clinician dependent	AI-assisted
Interpretation	Human	AI + clinician
Clinical responsibility	Clinician	Clinician

FACTORS AFFECTING AI RELIABILITY

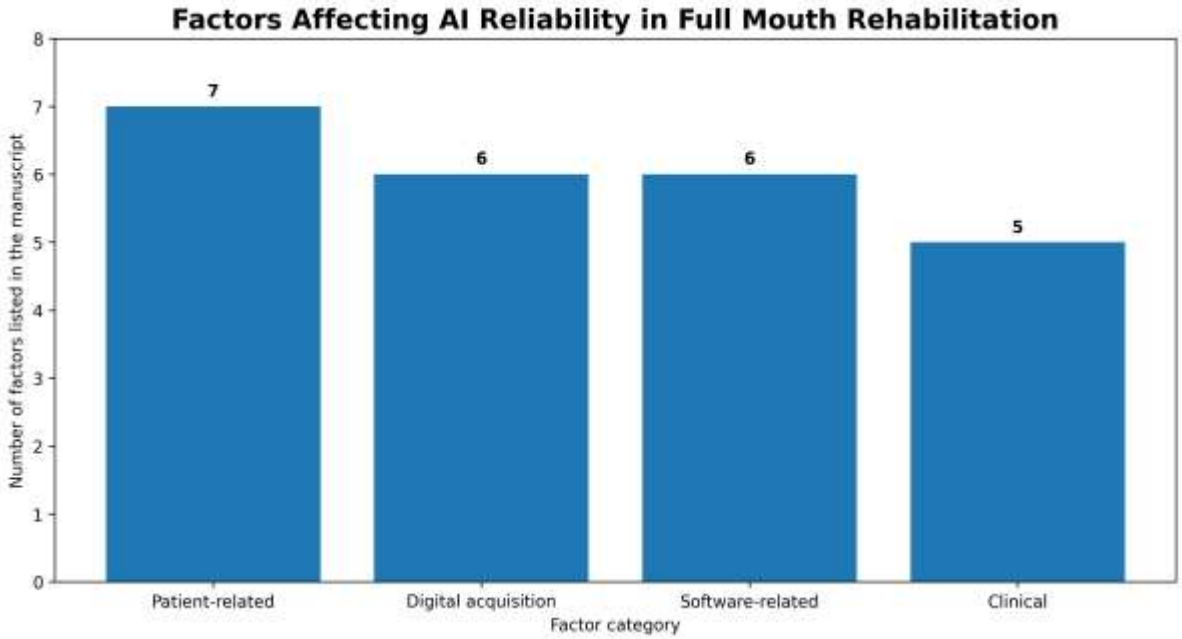


Figure 7. Factors affecting the reliability of AI-based occlusal recommendations.

AI recommendations can be affected by multiple variables.

Patient-related factors

- Tooth loss
- Tooth wear
- Restorations
- Malocclusion
- Periodontal mobility
- Implant restorations
- Limited mouth opening

- Parafunction

Digital acquisition factors

- Scanner type
- Scanning protocol
- Scan completeness
- Scan stitching errors
- Occlusal registration technique
- Patient movement[25]

Software-related factors

- AI algorithm
- Training dataset
- Software version
- Calibration
- Proprietary processing
- Model architecture

Clinical factors

- Clinician experience
- Occlusal philosophy
- Reference position
- Interpretation of functional movements
- Patient symptoms[26]

AI-BASED OCCLUSAL ADJUSTMENT IN DIFFERENT FULL MOUTH REHABILITATION SCENARIOS

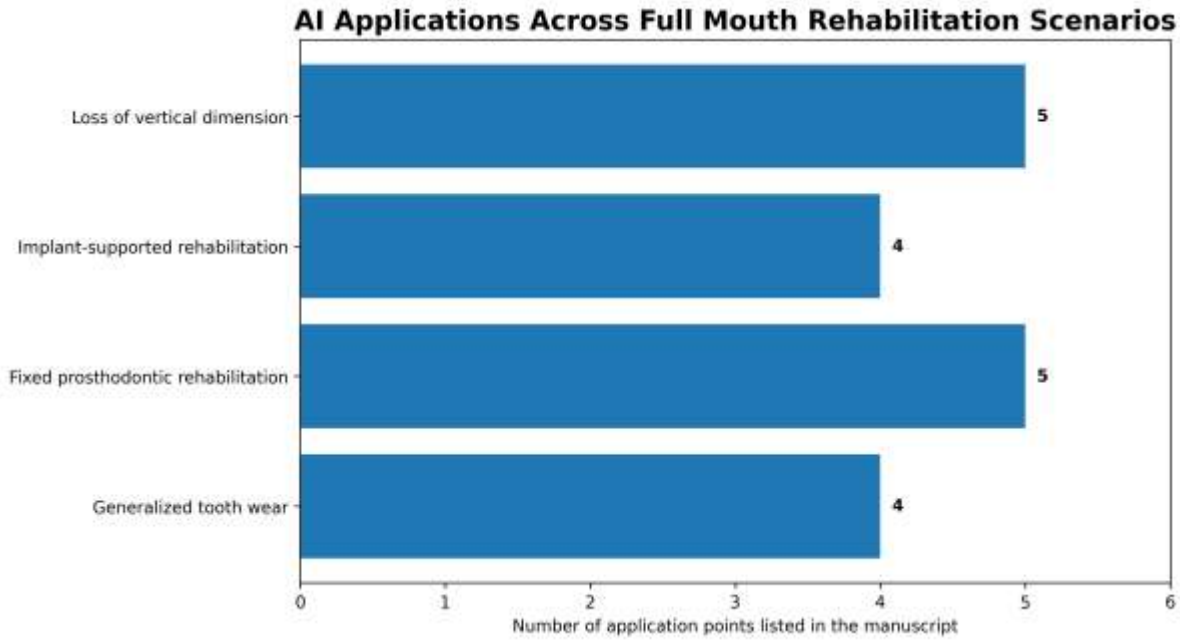


Figure 8. Clinical scenarios in which AI-assisted occlusal analysis may be applied in full mouth rehabilitation.

1. Generalized Tooth Wear

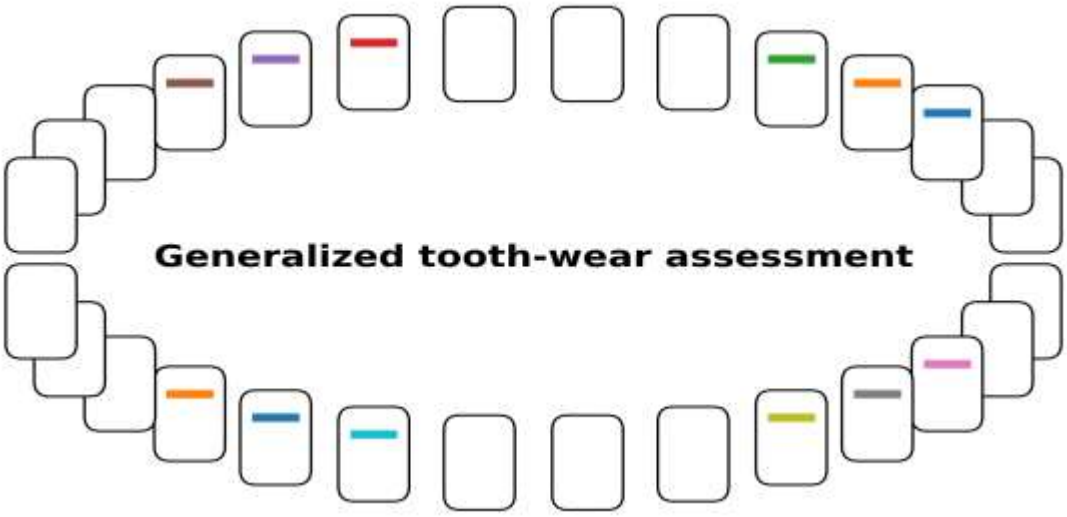


Figure 9. Illustrative generalized tooth-wear pattern relevant to full mouth rehabilitation.

AI may assist in identifying:

- Loss of occlusal anatomy
- Uneven contact distribution
- Reduced posterior support
- Altered anterior guidance

2. Extensive Fixed Prosthodontic Rehabilitation

AI can potentially evaluate:

- Crown-to-crown contacts
- Bridge occlusion
- Posterior support
- Occlusal clearance
- Occlusal morphology[27]

3. Implant-Supported Rehabilitation

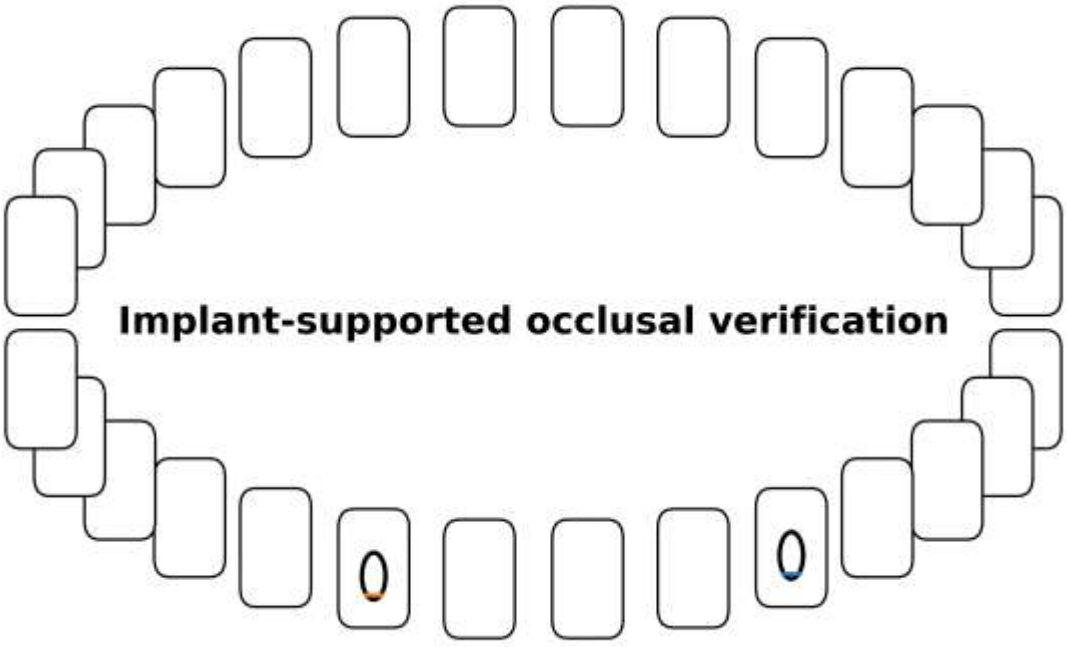


Figure 10. Illustrative implant-supported occlusal verification scenario.

AI-assisted digital occlusion may help evaluate:

- Implant crown contacts

- Opposing dentition
- Occlusal collision
- Interarch relationships

However, implant-supported restorations require particular caution because implant biomechanics differ from natural teeth.

4. Loss of Vertical Dimension

AI can potentially assist in comparing:

- Existing vertical dimension
- Proposed vertical dimension
- Diagnostic wax-up
- Provisional restoration
- Definitive restoration[26,28]

TABLE 2: POTENTIAL AI RECOMMENDATIONS IN FULL MOUTH REHABILITATION

Clinical Problem	Digital Input	Possible AI Output
Premature contact	IOS + occlusal record	Identify contact
Occlusal collision	Digital articulation	Highlight collision
Uneven contacts	Digital occlusion	Contact distribution map
Excessive posterior contact	Occlusal analysis	Flag area
Altered anterior guidance	Digital movement data	Identify interference
Restoration over-contour	3D model	Detect morphology discrepancy
Implant crown interference	IOS + opposing scan	Identify contact
Occlusal instability	Repeated scans	Detect changes

CLINICIAN–AI AGREEMENT

One of the most important measures of AI reliability is agreement with experienced clinicians.

A proposed assessment model is:

AI Recommendation

↓

Prosthodontist 1

Prosthodontist 2

Prosthodontist 3

↓

Independent Evaluation

↓

Consensus Reference Standard

↓

AI–Expert Agreement

Agreement may be measured using:

- Cohen's kappa
- Fleiss' kappa
- Weighted kappa
- ICC
- Sensitivity
- Specificity
- Accuracy

Recent studies evaluating AI-based dental treatment planning have demonstrated that AI performance can vary considerably with case complexity, and complex cases remain substantially more challenging than straightforward cases.[29]

REPEATABILITY OF AI RECOMMENDATIONS

Repeatability is particularly important for AI-based clinical decision support.

The same standardized clinical case can be submitted repeatedly to the same AI system.

For example:

Case 1 → AI Analysis 1

Case 1 → AI Analysis 2
Case 1 → AI Analysis 3
The following can then be compared:

- Tooth selected
- Surface selected
- Type of interference
- Recommended adjustment
- Confidence level

High repeatability would indicate that the algorithm generates consistent recommendations.
However, repeatability alone does not establish clinical accuracy. An AI system may consistently provide the same incorrect recommendation.[30]

VALIDITY VERSUS RELIABILITY

These two concepts must be distinguished.
Reliability
Does AI provide the same recommendation consistently?
Validity
Is the AI recommendation actually correct?
Therefore:
High reliability ≠ high clinical validity
This distinction is particularly important in occlusal adjustment because a reproducible digital contact does not automatically represent a clinically harmful occlusal interference.
The 2025 systematic review of digital occlusal analysis similarly concluded that digital methods can reliably demonstrate contact locations but have limitations in assessing contact intensity and exact interocclusal relationships. [22,30]

ADVANTAGES OF AI-BASED OCCLUSAL ANALYSIS

AI offers several potential advantages in occlusal management and full-mouth rehabilitation. It can improve standardization by applying consistent analytical procedures across multiple cases and may reduce operator variability associated with subjective visual interpretation. AI systems can also enable rapid analysis of large volumes of digital occlusal data, thereby improving clinical efficiency. Another important benefit is digital documentation, as occlusal conditions can be digitally recorded, stored, and compared longitudinally to monitor changes over time. Furthermore, AI-assisted systems may support virtual adjustment, allowing clinicians to simulate potential occlusal modifications before performing clinical adjustments.[22,24]

LIMITATIONS OF AI-BASED OCCLUSAL ADJUSTMENT

Despite its potential, AI-based occlusal adjustment has several limitations. Its accuracy depends greatly on the quality of intraoral scans, as poor or distorted scans may produce inaccurate recommendations. AI algorithms may also be trained on limited patient populations, reducing their applicability to diverse clinical situations. Differences between intraoral scanners can further affect digital occlusal relationships.[29]
Full-mouth rehabilitation involves complex biological and functional factors that may not be captured by digital data alone, including periodontal ligament response, muscle adaptation, patient comfort, neuromuscular accommodation, and pain perception. In addition, there is no universally accepted gold standard for ideal occlusal adjustment in every patient. Therefore, AI should be used primarily as a decision-support tool, while final treatment decisions and clinical adjustments should remain under the supervision of the treating clinician.[30,31,32]

TABLE 3: PROPOSED OUTCOME MEASURES FOR EVALUATING AI

Outcome	Measurement
Recommendation accuracy	Percentage agreement
Inter-examiner agreement	Kappa
Quantitative agreement	ICC
Repeatability	Repeated AI analysis
Sensitivity	True positive rate
Specificity	True negative rate

False-positive recommendation	Percentage
False-negative recommendation	Percentage
Time required	Seconds/minutes
Clinician acceptance	Structured questionnaire
Post-adjustment accuracy	Pre/post comparison

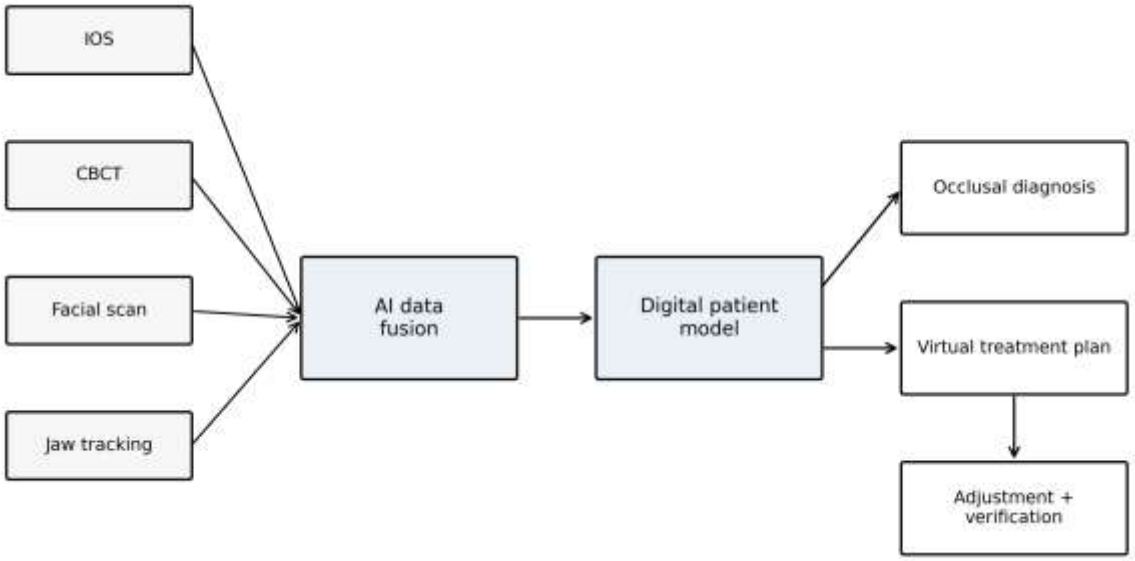


Figure 11. Future multimodal AI workflow integrating multiple digital data sources.

FUTURE PERSPECTIVES

The future of AI-assisted occlusal rehabilitation is likely to involve integration of multiple digital data sources rather than relying on a single intraoral scan.

Potential developments include:

- AI-integrated intraoral scanners
- Automated occlusal contact recognition
- AI-based virtual articulators
- Dynamic mandibular tracking
- Facial scanning
- CBCT integration
- Patient-specific occlusal modelling
- Digital twins
- Predictive occlusal simulation
- Automated CAD/CAM occlusal morphology
- Real-time chairside occlusal monitoring
- AI-assisted implant prosthetic occlusion[33]

A 2026 validation study has already reported promising results for AI-assisted fusion of intraoral-scanner occlusal data with CBCT, with excellent intra-operator reliability in reconstructing occlusal relationships.

Similarly, recent systematic evidence on AI functions incorporated into intraoral scanners suggests potential benefits for occlusal-collision correction, but performance remains dependent on the specific scanner and clinical application.[34,35]

CONCLUSION

Artificial intelligence represents a promising tool for digital occlusal management in full mouth rehabilitation. AI can analyze large volumes of digital occlusal data, identify contact patterns, detect potential discrepancies, and assist in generating adjustment recommendations. Its major advantages include improved standardization, reproducibility, documentation, and clinical efficiency, particularly when integrated with intraoral scanning, digital articulation, jaw tracking, and CAD/CAM technologies. However, AI recommendations should be assessed not only for repeatability but also for clinical validity, sensitivity, specificity, and agreement with experienced

clinicians. Although digital occlusal technologies can reliably identify contact locations, their ability to assess contact intensity and clinically significant interocclusal relationships remains limited.

Because full mouth rehabilitation is influenced by periodontal, neuromuscular, temporomandibular, restorative, implant, and patient-specific factors, AI should currently be considered a clinical decision-support tool rather than an autonomous occlusal adjustment system. Further prospective studies with standardized cases and expert reference panels are needed to establish its accuracy and reliability for routine clinical use.

REFERENCES

1. Thimmappa M, Katarya V, Parekh I. Philosophies of full mouth rehabilitation: a systematic review of clinical studies. J Indian Prosthodont Soc. 2021;21(1):19-27. doi:10.4103/jips.jips_397_19.
2. Kattadiyil MT, Alzaid AA, Campbell SD. The relationship between centric occlusion and the maximal intercuspal position and their use as treatment positions for complete mouth rehabilitation: best evidence consensus statement. J Prosthodont. 2021. doi:10.1111/jopr.13316.
3. Turner KA, Missirlian DM. Restoration of the extremely worn dentition. J Prosthet Dent. 1984;52:467-474. doi:10.1016/0022-3913(84)90326-3.
4. Jones SSM. The principles of obtaining occlusion in occlusal rehabilitation. J Prosthet Dent. 1963;13:706-713. doi:10.1016/0022-3913(63)90141-0.
5. Kazis H, Kazis AJ. Complete mouth rehabilitation through fixed partial denture prosthodontics. J Prosthet Dent. 1960;10:296-303. doi:10.1016/0022-3913(60)90057-3.
6. Lerner J. A systematic approach to full mouth reconstruction of the severely worn dentition. Pract Proced Aesthet Dent. 2008;20:81-87.
7. Song MY, Park JM, Park EJ. Full mouth rehabilitation of the patient with severely worn dentition. J Adv Prosthodont. 2010;2(3):106-110. doi:10.4047/jap.2010.2.3.106.
8. Moslehifard E, Nikzad S, Geraminpanah F, Mahboub F. Full-mouth rehabilitation of a patient with severely worn dentition and uneven occlusal plane: a clinical report. J Prosthodont. 2012;21(1):56-64. doi:10.1111/j.1532-849X.2011.00765.x.
9. Jain AR, Nallaswamy D, Ariga P, Philip JM. Full mouth rehabilitation of a patient with reduced vertical dimension using multiple metal ceramic restorations. Contemp Clin Dent. 2013;4(4):531-535. doi:10.4103/0976-237X.123066.
10. Singh RG, Sinha P. Functional and aesthetic full mouth rehabilitation of a severely worn dentition to restore vertical dimension: a case report. J Indian Prosthodont Soc. 2014;14(Suppl 1):210-214. doi:10.1007/s13191-013-0273-7.
11. Cheong J, Hwang YS, Jung BY. Multidisciplinary approach for full-mouth rehabilitation of an adult patient with collapsed occlusal plane and several missing teeth: a clinical report. J Prosthodont. 2019;28(3):227-233. doi:10.1111/jopr.12778.
12. Abduo J. Occlusal schemes for complete dentures: a systematic review. Int J Prosthodont. 2013;26(1):26-33. doi:10.11607/ijp.3168.
13. Ayuso-Montero R, et al. Reliability and validity of T-scan and 3D intraoral scanning for measuring the occlusal contact area. J Prosthodont. 2020;29(1):19-25. doi:10.1111/jopr.13096.
14. Esposito R, Masedu F, Cicciù M, Tepedino M, Denaro M, Ciavarella D. Reliability of recording occlusal contacts by using intraoral scanner and articulating paper: a prospective study. J Dent. 2024;142:104872. doi:10.1016/j.jdent.2024.104872.
15. Chowdhary R, Sonnahalli NK. Clinical applications of the T-Scan quantitative digital occlusal analysis technology: a systematic review. Int J Comput Dent. 2024;27(1):49-86. doi:10.3290/j.ijcd.b3945153.
16. Seth-Johansen C, Gotfredsen K. Validity and reliability of digital occlusal analyzing methods in dentistry: a systematic review. J Dent. 2025;163:106124. doi:10.1016/j.jdent.2025.106124.
17. Aljulayfi IS, et al. The potential of artificial intelligence in prosthodontics: a comprehensive review. Med Sci Monit. 2024. PMID:38840416.
18. Karvekar S, Anand V, Singh D, Chaudhary VK, Fatima S, Mathar MI. Digital dentistry and artificial intelligence: a systematic review on innovations in diagnosis, treatment planning, and prosthodontics. Cureus. 2026;18(2):e104422. doi:10.7759/cureus.104422.
19. Farook TH, Rashid F, Ahmed S, Dudley J. Clinical machine learning in parafunctional and altered functional occlusion: a systematic review. J Prosthet Dent. 2023;129. PMID:36801145.
20. Thimmappa M, Katarya V, Parekh I. Philosophies of full mouth rehabilitation: a systematic review of clinical studies. J Indian Prosthodont Soc. 2021;21:19-27. doi:10.4103/jips.jips_397_19.

21. Chowdhary R, Sonnahalli NK. Clinical applications of the T-Scan quantitative digital occlusal analysis technology: a systematic review. Int J Comput Dent. 2024;27(1):49-86. doi:10.3290/j.ijcd.b3945153.
22. Seth-Johansen C, Gotfredsen K. Validity and reliability of digital occlusal analyzing methods in dentistry: a systematic review. J Dent. 2025;163:106124. doi:10.1016/j.jdent.2025.106124.
23. Esposito R, Masedu F, Cicciù M, Tepedino M, Denaro M, Ciavarella D. Reliability of recording occlusal contacts by using intraoral scanner and articulating paper: a prospective study. J Dent. 2024;142:104872. doi:10.1016/j.jdent.2024.104872.
24. Aljulayfi IS, et al. The potential of artificial intelligence in prosthodontics: a comprehensive review. Med Sci Monit. 2024. PMID:38840416.
25. Karvekar S, Anand V, Singh D, Chaudhary VK, Fatima S, Mathar MI. Digital dentistry and artificial intelligence: a systematic review on innovations in diagnosis, treatment planning, and prosthodontics. Cureus. 2026;18(2):e104422. doi:10.7759/cureus.104422.
26. Farook TH, Rashid F, Ahmed S, Dudley J. Clinical machine learning in parafunctional and altered functional occlusion: a systematic review. J Prosthet Dent. 2023;129. PMID:36801145.
27. Thimmappa M, Katarya V, Parekh I. Philosophies of full mouth rehabilitation: a systematic review of clinical studies. J Indian Prosthodont Soc. 2021;21:19-27. doi:10.4103/jips.jips_397_19.
28. Kattadiyil MT, Alzaid AA, Campbell SD. The relationship between centric occlusion and the maximal intercuspal position and their use as treatment positions for complete mouth rehabilitation: best evidence consensus statement. J Prosthodont. 2021. doi:10.1111/jopr.13316.
29. Turner KA, Missirlian DM. Restoration of the extremely worn dentition. J Prosthet Dent. 1984;52:467-474. doi:10.1016/0022-3913(84)90326-3.
30. Song MY, Park JM, Park EJ. Full mouth rehabilitation of the patient with severely worn dentition. J Adv Prosthodont. 2010;2(3):106-110. doi:10.4047/jap.2010.2.3.106.
31. Moslehifard E, Nikzad S, Geraminpanah F, Mahboub F. Full-mouth rehabilitation of a patient with severely worn dentition and uneven occlusal plane: a clinical report. J Prosthodont. 2012;21(1):56-64. doi:10.1111/j.1532-849X.2011.00765.x.
32. Jain AR, Nallaswamy D, Ariga P, Philip JM. Full mouth rehabilitation of a patient with reduced vertical dimension using multiple metal ceramic restorations. Contemp Clin Dent. 2013;4(4):531-535. doi:10.4103/0976-237X.123066.
33. Singh RG, Sinha P. Functional and aesthetic full mouth rehabilitation of a severely worn dentition to restore vertical dimension: a case report. J Indian Prosthodont Soc. 2014;14(Suppl 1):210-214. doi:10.1007/s13191-013-0273-7.
34. Cheong J, Hwang YS, Jung BY. Multidisciplinary approach for full-mouth rehabilitation of an adult patient with collapsed occlusal plane and several missing teeth: a clinical report. J Prosthodont. 2019;28(3):227-233. doi:10.1111/jopr.12778.
35. Abduo J. Occlusal schemes for complete dentures: a systematic review. Int J Prosthodont. 2013;26(1):26-33. doi:10.11607/ijp.3168.