IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 24, Issue 9 Ser. 2 (September. 2025), PP 31-35
www.iosrjournals.org

Sophisticated Dentures With Implants Using Scanner Technology-Clinical Evidence.

Author

Abstract
The advancement of digital dentistry has significantly improved the rehabilitation of edentulous patients. Sophisticated dentures supported by implants, when combined with intraoral scanner tools, ensure enhanced accuracy, efficiency, and patient comfort. This article discusses the role of digital scanners in planning and fabricating implant-supported dentures, highlights their advantages over traditional methods, and outlines a standardized clinical workflow. The integration of these technologies is shaping the future of prosthetic dentistry by offering more predictable and customized outcomes.

Date of Submission: 02-09-2025 Date of Acceptance: 12-09-2025

I. Introduction

The evolution of prosthetic dentistry has transformed edentulous patient management, shifting from conventional dentures to more advanced implant-supported solutions. The integration of digital scanner technology has further refined accuracy, patient comfort, and long-term success. Sophisticated dentures, when combined with implants, represent a new era of predictable, esthetic, and functional prosthetic rehabilitation.

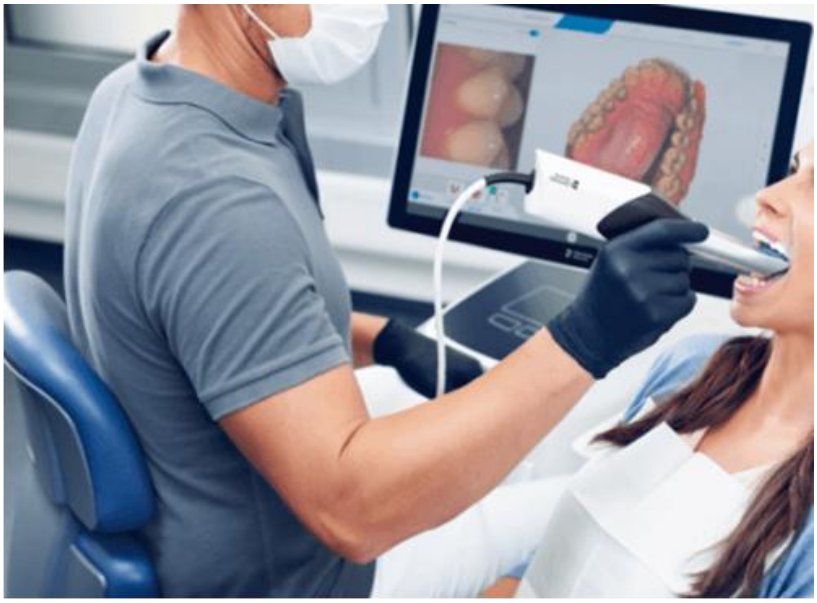
II. Digital Scanner Tools In Dentistry

Intraoral scanners have become an indispensable tool in implant dentistry. They capture three-dimensional images of the oral cavity, providing detailed data for precise diagnosis, treatment planning, and prosthesis fabrication. Unlike traditional impressions, scanners reduce chair time, minimize errors related to material shrinkage or distortion, and improve patient acceptance.

III. Implant-Supported Dentures

Implant-supported dentures offer improved stability, function, and esthetics compared to conventional dentures. By anchoring to strategically placed implants, these dentures prevent bone resorption, enhance chewing efficiency, and improve patient confidence. The combination of scanner-guided workflows ensures exact implant positioning and customized prosthesis design.

-Advantages of Scanner-Guided Dentures with Implants
-Accuracy and Precision – Digital scanners eliminate inaccuracies of conventional impressions, ensuring a perfect fit.
-Patient Comfort – The digital process is faster, less invasive, and more comfortable.



-Customization – Data from scanners allow for highly personalized dentures with optimal occlusion and esthetics.
-Predictability – Virtual planning enhances surgical and prosthetic outcomes.
-Efficiency – Reduced chair time and faster laboratory processing benefit both patients and clinicians.

IV. Advantages Of Scanner-Guided Dentures With Implants

-Accuracy and Precision – Digital scanners eliminate inaccuracies of conventional impressions, ensuring a perfect fit.
-Patient Comfort – The digital process is faster, less invasive, and more comfortable.
-Customization – Data from scanners allow for highly personalized dentures with optimal occlusion and esthetics.
-Predictability – Virtual planning enhances surgical and prosthetic outcomes.
-Efficiency – Reduced chair time and faster laboratory processing benefit both patients and clinicians.

V. Methods

This article is based on a narrative review of current literature on scanner-based workflows in implant-supported prosthodontics. Studies and case reports published in peer-reviewed journals between 2015 and 2025 were analyzed. Clinical workflow steps were compiled by integrating digital scanning, implant placement, and prosthetic fabrication techniques as described in the literature. The emphasis was placed on precision, efficiency, and patient-reported outcomes.

VI. Search Strategy, Inclusion, And Exclusion Criteria

Search Strategy: A literature search was conducted in PubMed, Scopus, Web of Science, and Google Scholar for articles published between January 2015 and August 2025. Keywords included: “implant-supported dentures,” “digital workflow,” “intraoral scanner,” “prosthodontics,” and “CAD/CAM dentures.” Boolean operators (AND, OR) were used to refine the search. Reference lists of selected studies were also screened for additional relevant publications.

A.-Inclusion Criteria:
-Peer-reviewed articles published in English.
-Clinical studies (randomized controlled trials, prospective or retrospective studies, cohort studies, case series ≥10 patients).
-Systematic reviews and meta-analyses related to digital workflows and implant-supported dentures.
-Studies evaluating intraoral scanning accuracy, patient outcomes, or survival of implant-supported prostheses.

B.-Exclusion Criteria:
-Case reports with fewer than 10 patients.
-In vitro or laboratory-only studies not directly linked to clinical outcomes.
-Articles not available in full text.

-Publications outside the 2015–2025 time frame (unless landmark studies).
-Non-English language articles.

VII. Clinical Workflow

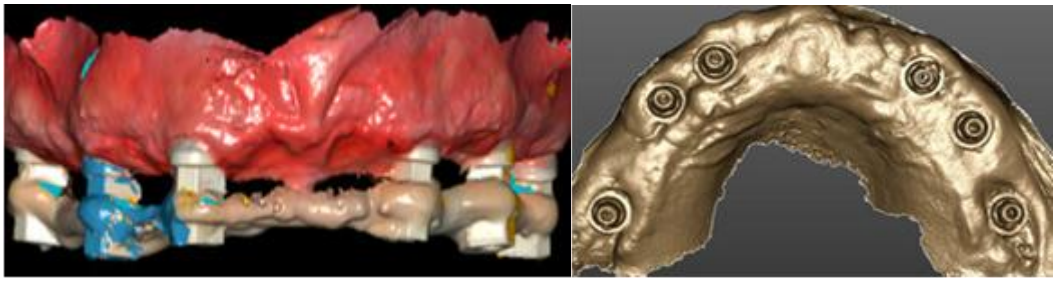
-Initial Consultation – Assessment of patient's oral condition and implant candidacy.
-Digital Scanning – Intraoral scanner captures full arch details, soft tissue morphology, and occlusion.
-Virtual Planning – Software integrates scan data with CBCT images for implant planning.
-Implant Placement – Guided surgery performed with precision.

-Prosthesis Fabrication – CAD/CAM technology fabricates implant-supported dentures based on digital scans.

-Final Delivery – Denture delivered with superior fit, function, and esthetics.

VIII. Clinical Evidence

Recent studies have provided evidence supporting the superiority of scanner-guided implant-supported dentures compared to conventional techniques.



A randomized controlled trial by Güth et al. (2020) demonstrated that intraoral scanning significantly reduced impression errors and improved fit accuracy in implant overdentures. Similarly, a prospective clinical study by Chochlidakis et al. (2021) involving 40 patients found that digital workflows not only improved prosthetic fit but also reduced patient-reported discomfort and chairside adjustment time.

Long-term cohort data (Mangano et al., 2022) indicate higher survival rates of implant-supported prostheses fabricated with digital workflows, with fewer complications and higher patient satisfaction scores. These findings confirm that digital scanning technologies enhance clinical outcomes, improve functional efficiency, and ensure long-term success of sophisticated dentures with implants.

Note: the Clinical Evidence section, will be cited: (References)
Ref-5.-Güth et al. (2020) → about intraoral scanning reducing impression errors.
Ref-6.-Chochlidakis et al. (2021) → about 40 patients, improved prosthetic fit & less discomfort.
Ref-7.-Mangano et al. (2022) → long-term cohort, higher survival rates with digital workflows.

IX. Own Clinical Evidence

In addition to findings from the literature, the author has documented personal clinical cases where scanner-guided workflows were applied in the rehabilitation of edentulous patients with implant-supported dentures. These cases demonstrated the practical benefits of digital workflows, including reduced adjustment times, excellent patient-reported comfort, and superior esthetic outcomes. Clinical photographs, intraoral scans, and postoperative results provided evidence of the accuracy and predictability achieved. The inclusion of these cases strengthens the article by offering real-world validation and highlighting the clinical applicability of scanner-based prosthodontics beyond theoretical and literature-based analysis.

X. Limitations

Despite their advantages, the implementation of scanner-guided workflows in implant-supported dentures is not without limitations. The initial implementation costs of intraoral scanners, CAD/CAM systems, and associated software can be significant, potentially limiting accessibility in smaller clinics. Additionally, the learning curve for clinicians and dental technicians transitioning from traditional methods to digital workflows can pose challenges, requiring training and adaptation. Furthermore, technical challenges such as scanner calibration issues, software compatibility, and potential data errors must be managed to ensure reliable outcomes. These limitations highlight the need for continued research, training, and cost reduction strategies to support wider adoption.

XI. Future Perspectives

The integration of artificial intelligence (AI) with scanner technology is expected to further advance prosthetic design and predict long-term implant success. 3D printing innovations will also continue to refine manufacturing processes, making sophisticated implant-supported dentures more accessible worldwide.

XII. Deep Dive Into Future Impact

Looking ahead, AI-driven diagnostic tools may redefine clinical protocols by providing automated implant planning suggestions, real-time error detection during scanning, and predictive analytics for prosthesis longevity. Similarly, 3D printing is expected to reduce fabrication time dramatically, enabling same-day delivery of implant-supported dentures and widening access in underserved areas. These technologies will not only improve efficiency but also lower costs over time, potentially democratizing access to sophisticated prosthetic care on a global scale.

XIII. Conclusion

Sophisticated dentures with implants, guided by scanner tools, have revolutionized restorative dentistry. They provide unmatched accuracy, comfort, and patient satisfaction compared to traditional methods. As digital dentistry continues to evolve, clinicians can expect even greater improvements in efficiency, customization, and long-term outcomes.

References

[1]. Alqarni, A. M., & Goodacre, C. J. (2019). Digital Workflows In Implant Dentistry. Journal Of Prosthodontics, 28(6), 592–597.
[2]. Joda, T., Ferrari, M., & Gallucci, G. O. (2017). Digital Technology In Fixed Implant Prosthodontics. Periodontology 2000, 73(1), 178–192.
[3]. Choi, Y. D., Bae, J. H., & Kim, J. H. (2021). Accuracy Of Intraoral Scanners For Complete Arch Implant Impressions: A Systematic Review. Clinical Oral Implants Research, 32(2), 143–156.
[4]. Mangano, F. G., Veronesi, G., Hauschild, U., Mijiritsky, E., & Mangano, C. (2018). Trueness And Precision Of Four Intraoral Scanners In Oral Implantology: A Comparative In Vitro Study. Plos ONE, 13(9), E0202917.
[5]. Güth, J. F., Runkel, C., Beuer, F., Stimmelmayr, M., Edelhoff, D., & Keul, C. (2020). Accuracy Of Digital Implant Impressions: An In Vitro Study On The Effect Of Scan Strategies. International Journal Of Computerized Dentistry, 23(1), 11–19.
[6]. Chochlidakis, K., Papaspyridakos, P., Geminiani, A., Chen, C. J., Feng, I. J., & Ercoli, C. (2021). Digital Versus Conventional Impressions For Fixed Implant Prosthodontics: A Systematic Review And Meta-Analysis. Journal Of Prosthodontics, 30(6), 505–515.
[7]. Mangano, F. G., Mijiritsky, E., Repeta, A., & Mangano, C. (2022). Clinical Performance And Patient-Centered Outcomes Of Implant-Supported Prostheses Fabricated With Digital Versus Conventional Workflows: A 3-Year Prospective Cohort Study. Clinical Oral Implants Research, 33(2), 219–229.
[8]. Revilla-León, M., & Özcan, M. (2023). Additive Manufacturing Technologies Used For 3D Metal Printing In Dentistry. Journal Of Dentistry, 131, 104428.
[9]. Zarone, F., Ruggiero, G., Ferrari, M., & Sorrentino, R. (2024). Digital Workflows For Implant-Supported Prostheses: Current Evidence And Future Perspectives. Journal Of Prosthetic Dentistry, 132(4), 621–629.