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Comparative analysis of patient satisfaction and clinical performance of mock-up techniques for anterior aesthetic restorations

Analiza porównawcza satysfakcji pacjentów i skuteczności klinicznej technik modelowych w przypadku uzupełnień estetycznych w odcinku przednim

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Summary

Introduction. *Mock-ups play a crucial role in aesthetic dentistry by allowing patients to preview potential treatment outcomes. Traditional chairside techniques and computer-aided design/computer-aided manufacturing (CAD/CAM) milling are two common fabrication methods. However, limited clinical data compare patient satisfaction and clinical performance between these approaches.*

Aim of this study. *This clinical study evaluates patient satisfaction and clinical performance with conventional and CAD/CAM-milled mock-ups in anterior aesthetic cases.*

Material and methods. *Eighteen patients seeking anterior aesthetic rehabilitation were included in the study. A digital smile design (DSD)*

Streszczenie

Wstęp. *Mock-ups odgrywają kluczową rolę w stomatologii estetycznej, umożliwiając pacjentom podgląd potencjalnych wyników leczenia. Tradycyjne techniki przy fotelu i frezowanie wspomagane komputerowo (CAD/CAM) to dwie powszechne metody wytwarzania. Jednak dane kliniczne porównujące zadowolenie pacjentów i skuteczność kliniczną w przypadku tych podejść nie są liczne*

Cel pracy. *Niniejsze badanie kliniczne ocenia zadowolenie pacjentów i skuteczność kliniczną przy użyciu konwencjonalnych i frezowanych metodą CAD/CAM mock-ups na odcinku estetycznym.*

Materiał i metody. *W badaniu wzięło udział osiemnastu pacjentów, którzy zgłosili się na rehabilitację estetyczną w odcinku przednim. Do plano-*

program was used for case planning. All the patients underwent both techniques sequentially, starting with the conventional mock-up, followed by the CAD/CAM-milled mock-up after 2 to 3 weeks. The study began in September 2022 and concluded in June 2024. Patient satisfaction was assessed using a structured questionnaire covering aesthetics, comfort, and fit, while clinical performance was evaluated based on criteria such as aesthetics, retention, marginal discoloration, marginal adaptation, and fracture of restorations.

Results. *CAD/CAM-milled mock-ups resulted in higher patient satisfaction, particularly in terms of comfort and the time required for completion. In terms of clinical performance, CAD/CAM-milled mock-ups demonstrated slightly better retention and marginal adaptation, although both techniques performed well. No significant differences were found in aesthetics or marginal discoloration between the two techniques.*

Conclusions. *Both conventional and CAD/CAM-milled mock-ups offer comparable clinical performance, with CAD/CAM mock-ups providing slightly superior patient satisfaction and clinical outcomes. Clinicians can select the appropriate technique based on patient preferences and clinical conditions.*

wania leczenia wykorzystano program cyfrowego projektowania uśmiechu (DSD). Wszyscy pacjenci byli rehabilitowani obiema technikami sekwencyjnie, zaczynając od konwencjonalnej mock-up, a następnie frezowanej metodą CAD/CAM po 2–3 tygodniach. Badanie rozpoczęło się we wrześniu 2022 r. i zakończyło w czerwcu 2024 r. Satysfakcję pacjentów oceniano za pomocą ustrukturyzowanego kwestionariusza obejmującego estetykę, komfort i dopasowanie, podczas gdy skuteczność kliniczną oceniano na podstawie kryteriów takich jak estetyka, retencja, przebarwienia brzeżne, adaptacja brzeżna i pęknięcia odbudowy.

Wyniki. *Mock-ups frezowane metodą CAD/CAM cieszyły się większym zadowoleniem pacjentów, szczególnie pod względem komfortu i czasu potrzebnego na przeprowadzenie leczenia. Pod względem skuteczności klinicznej mock-ups frezowane metodą CAD/CAM wykazały nieco lepszą retencję i adaptację brzeżną, chociaż obie techniki sprawdziły się. Nie stwierdzono istotnych różnic w estetyce ani przebarwieniach brzeżnych między tymi dwiema technikami.*

Wnioski. *Zarówno konwencjonalne, jak i frezowane metodą CAD/CAM mock-ups zapewniają porównywalną skuteczność kliniczną, przy czym w przypadku mock-ups frezowanych zadowolenie pacjentów i wyniki kliniczne były nieco lepsze. Lekarze mogą wybrać odpowiednią technikę w oparciu o preferencje pacjenta i warunki kliniczne.*

Introduction

The pursuit of aesthetic excellence in dentistry, particularly in the restoration of anterior teeth, has become a primary focus due to patients' increasing demand for natural-looking results that enhance their appearance and overall well-being. To meet these expectations, various techniques have been developed to simulate potential outcomes before committing to permanent restorations. Mock-ups play a pivotal role in this process by serving as temporary restorations that allow patients and clinicians to visualize the final result, assess aesthetic preferences and make necessary adjustments.[1,2]

Traditionally, mock-ups have been created using conventional chairside techniques, typically involving the direct application of resin over prepared teeth. However, with the advancement of digital dentistry, computer-aided design and computer-aided manufacturing (CAD/CAM) technology have introduced new possibilities. CAD/CAM enables precise and efficient fabrication of mock-ups using predetermined designs, offering a higher level of accuracy and consistency compared to conventional methods.[3]

Despite the growing use of digital mock-ups, research outcomes on the comparative effectiveness of conventional and CAD/CAM-fabricated mock-ups are limited, particularly regarding patient satisfaction. Patient satisfaction is a critical factor in the success of aesthetic treatments as it directly impacts the acceptance of final restorations. Therefore, assessing how different mock-up fabrication methods influence patient comfort, aesthetic perception and overall satisfaction is essential.[4-9]

This study aims to evaluate both patient satisfaction and clinical performance with two types of mock-up fabrication: conventional direct mock-ups and CAD/CAM milled mock-ups, in the context of anterior aesthetic cases. By comparing these two methods, we seek to provide valuable insights into their relative effectiveness and offer guidance for clinicians in selecting the most appropriate technique for their patients.

Methods

Study design & patient selection.

This controlled clinical study aimed to evaluate both patient satisfaction and the clinical performance of different types of mock-ups used in anterior aesthetic cases. A total of 18 patients (nine males, nine females) with anterior aesthetic concerns were recruited from the Dental Medicine Department of Farhat Hached Hospital, Sousse, Tunisia. All patients were treated with both techniques sequentially, starting with the conventional mock-up followed by the CAD/CAM milled mock-up after 2 to 3 weeks. This approach enabled a direct comparison of the two fabrication methods within the same group of participants.

All the participants were adequately informed about the study objectives, procedures, potential risks and benefits. Each patient provided written informed consent before participation. The study adhered to the ethical principles of the Declaration of Helsinki.

Approval for the study was obtained from the Institutional Ethics and Research Committee of the University Hospital Farhat Hached in Sousse-Tunisia, with the reference number IORG 0009841 ERC10122024.

Eligibility Criteria

To ensure a homogeneous study population, patients were selected based on specific inclusion and exclusion criteria (Table 1).

Inclusion Criteria

Eligible patients were adults aged 18 years or older presenting with aesthetic concerns in the anterior region. Participants had no prior aesthetic restorations in the anterior teeth to standardize baseline conditions. Good oral hygiene and periodontal health were required to prevent confounding factors related to gingival inflammation or plaque accumulation.

Table 1. Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
– Adult patients (≥18 years) with anterior aesthetic concerns, – No previous aesthetic restorations in the anterior region, – Adequate oral hygiene and periodontal health, – No history of temporomandibular joint disorders or active caries.	– Need for orthodontic treatment for alignment, – Severe parafunctional habits (e.g., bruxism), – Extensive anterior restorations or previous implant treatment

Additionally, patients with a history of temporomandibular joint disorders or active caries were excluded to ensure that discomfort or pre-existing dental conditions would not influence patient-reported satisfaction.

Exclusion Criteria

Patients requiring orthodontic treatment for anterior alignment were excluded to avoid variability in aesthetic outcomes. Those with severe parafunctional habits such as bruxism were not included, as excessive occlusal forces could affect mock-up stability and patient perception. Additionally, individuals with extensive anterior restorations or previous implant treatments were excluded to maintain uniformity in the assessment of aesthetic results.

Mock-up Fabrication

Impressions of the dental arches were recorded and scanned using a digital scanner for both techniques. The smile design and corresponding restorations were then created using a digital smile design (DSD) program. Based on this design, mock-ups were fabricated using two distinct methods:

– Conventional Mock-up
  After scanning the impressions, the smile design was created using the Exocad DSD program. The impression was poured into hard stone to create a study cast. A wax-up was then constructed on the study cast using ivory wax, in accordance with the DSD design. A silicone rubber index was made, with indentations created along the gingival margin. The silicone matrix was filled with bisacryl resin (Protemp 4, 3M ESPE, Saint Paul, Minn., USA) and placed over the teeth. After polymerization, the mock-up was removed, and any excess resin at the margins was trimmed. The resin mock-up was retained in place by the precise fit of the silicone index, which adapted to the tooth contours, rather than relying solely on undercuts. It was then finished and smoothed. Finally, the patient's occlusion was checked.

– CAD/CAM Milled Mock-up
  After scanning the impression and designing the smile using the Exocad DSD program, the mock-up was milled using a CAD/CAM machine from an A2-shade PMMA block (polymethyl methacrylate) based on the digitally planned 3D wax-up. During the design process, the 3D model was adjusted to avoid interference from undercuts that could affect the placement of the mock-up, ensuring that the final milled mock-up was free from undercuts that could hinder its proper seating. Once milled, the mock-up was finished and polished. The patient's teeth were minimally prepared to ensure proper seating of the mock-up. The mock-up was then inserted into the patient's mouth and temporarily cemented with non-permanent dental cement. Excess cement was carefully removed using a dental prop to ensure proper placement and fit.

Each patient was treated with both techniques sequentially, beginning with the conventional mock-up followed by the CAD/CAM mock-up after three weeks. Both techniques were performed by the same operator (H.B.), while treatment time for each step was measured in seconds by another operator (A.A.).

For both direct and indirect mock-ups, the following criteria were assessed at baseline and again after two weeks based on the USPHS guidelines: Aesthetics were evaluated by the colour difference, while retention was checked for any loss of one or more mock-ups. Marginal discoloration was inspected for any stained or discolored areas along the margins, and marginal adaptation was assessed by examining whether the margins were smooth or showed slight discontinuity, detected with an explorer. Lastly, the integrity of the restorations was

Table 2. The difference in time required to manufacture conventional mock-up versus CAD/CAM mock-up

Parameter	Time required (min)		p-value
	Conventional mock-up	CAD/CAM mock-up	
Preparation time (min)	30 ± 5	15 ± 3	0.02*
Steps involved	5 ± 1	3 ± 1	0.01*
Repeatability	6 ± 0.8	8 ± 0.5	0.05*
Material handling	7 ± 0.6	7.1 ± 0.5	0.15
Post-procedure adjustments	12 ± 1	9± 0.7	0.04*

All data are presented as mean +- SD, Measured time is recorded as seconds.

evaluated for any cracks, craze lines, or chipping in the mock-up.

Immediately following the conventional and CAD/CAM mock-up procedures, the participants' attitudes and perceptions were assessed through a self-administered questionnaire using a Visual Analog Scale (VAS) ranging from 0 to 100. Additionally, participants answered a comparative questionnaire with the following five research questions:

– Which technique would you prefer if undergoing the procedure again?
– Which technique provided a more comfortable experience during the procedure?
– Which technique was preferable in terms of time required for completion?
– Which method did you prefer regarding sensations such as taste, smell, heat, and sound during the mock-up process?
– Which technique do you prefer based on cost?

Reliability and validity of questionnaires

The questionnaires used in this study were pre-tested, revised, and re-tested before use.

Statistical Analysis

The data collected from the patient satisfaction questionnaires were analysed using descriptive and inferential statistics. A comparison of satisfaction scores between the two groups was conducted using an independent T-test. A p-value of <0.05 was considered statistically significant.

Results

This study evaluated and compared the aesthetic outcomes, efficiency and clinical performance of conventional and CAD/CAM mock-up techniques. The analysis focused on patient satisfaction, procedural efficiency and functional performance to determine which approach offered the best balance of aesthetics, practicality, and durability.

Time and Efficiency

Table 2 illustrates the efficiency of both mock-up techniques, focusing on preparation time, procedural steps and workflow optimization. Statistical analysis showed that preparation time (p=0.02) was significantly shorter for CAD/CAM mock-ups than for conventional ones, emphasizing the time-saving advantage of the CAD/CAM technique. Additionally, CAD/CAM mock-ups required fewer preparation steps (p=0.01), contributing to greater efficiency. Repeatability (p=0.05) was significantly better with CAD/CAM

Table 3. Comparison between clinical evaluation scores of clinical situations: conventional mock-up versus CAD/CAM mock-up

Parameter	Conventional mock-up	CAD/CAM mock-up	p-value
Retention/Debonding	7.3 ± 0.6	7.7 ± 0.5	0.10
Marginal adaptation	6.7 ± 0.8	8.0 ± 0.4	0.03*
Need for adjustments	7.1 ± 0.9	7.3 ± 0.8	0.07
Discomfort on wearing	7.0 ± 0.8	7.1 ± 0.7	0.45
Durability	6.9 ± 0.8	8.0 ± 0.5	0.04*

mock-ups, suggesting improved procedural consistency. No significant difference was observed in material handling (p=0.15) between the two methods. Lastly, fewer post-procedure adjustments (p=0.04) were needed for CAD/CAM mock-ups, further reinforcing their efficiency and practicality.

Clinical Performance

The study assessed the clinical performance of each mock-up type, particularly in terms of retention, marginal adaptation and durability, as shown in Table 3. Statistical analysis indicated no significant difference in retention (p=0.10) between the two mock-up types, although CAD/CAM mock-ups demonstrated slightly better retention. Regarding marginal adaptation (p=0.03), CAD/CAM mock-ups exhibited a significantly better fit, offering superior marginal adaptation compared to conventional mock-ups. The need for adjustments (p=0.07) was lower with CAD/CAM mock-ups, though the difference was not statistically significant. No significant difference was found in discomfort during wear (p=0.45), indicating comparable levels of patient comfort for both techniques. Finally, CAD/CAM mock-ups showed significantly greater durability (p=0.04) than conventional mock-ups, highlighting their superior long-term performance.

Evaluation scores and patient concerns regarding mock-up techniques

The study assessed patient satisfaction and concerns related to the two mock-up techniques. Table 4 presents the evaluation scores (VAS) and patient concerns. Statistical analysis revealed no significant difference in aesthetic satisfaction (p=0.45) between conventional and CAD/CAM mock-ups, with both methods yielding equally satisfactory aesthetic outcomes. Regarding comfort during placement, CAD/CAM mock-ups demonstrated slightly higher comfort but the difference was not statistically significant (p=0.12). Similarly, no significant difference was found in comfort during removal (p=0.78) between the two techniques. However, a significant difference was observed in finishing and surface smoothness (p=0.05), where CAD/CAM mock-ups provided superior finishing and smoother surfaces compared to conventional ones. Regarding overall satisfaction (p=0.32), both mock-up techniques resulted in similar patient satisfaction levels. In terms of ease of application, CAD/CAM mock-ups were slightly easier to apply, but the difference was not statistically significant (p=0.09). Finally, both methods led to comparable levels of perceived smile improvement (p=0.87).

Patients' preferences and self-concerns about the mock-up techniques, based on a 5-item comparative questionnaire, are detailed in Table 5.

Table 4. Score of patient's perception (VAS) about conventional mock-up versus CAD/CAM mock-up

VAS score			
Topic	Conventional Mock-up	CAD/CAM Mock-up	p-value
Aesthetic Satisfaction	75 ± 0.8	78 ± 0.7	0.45
Comfort during Placement	69 ± 1.0	72 ± 0.9	0.12
Comfort during Removal	71 ± 0.9	73 ± 0.8	0.78
Finishing and Smoothing	65 ± 1.1	81 ± 0.6	0.05*
Overall Satisfaction	73 ± 0.7	75 ± 0.7	0.32
Ease of Application	68 ± 0.8	71 ± 0.7	0.09
Perceived Smile Improvement	74 ± 0.7	75 ± 0.6	0.87

Visual Analog Scale (VAS) ranging from 0 (not satisfactory) to 100 (very satisfactory).
*Statistical significance level p.

Table 5. Participants' preferences about mock-up techniques based on the 5-item questionnaire

Research Question	Conventional Mock-Up	CAD/CAM Mock-Up	Preference (%)
Which technique do you prefer when undergoing the procedure for the second time?	10%	90%	CAD/CAM
Which technique provides a more comfortable experience during the procedure?	10%	90%	CAD/CAM
Which technique is preferable in terms of the time required for completion?	15%	85%	CAD/CAM
Which method do you favour regarding sensations such as taste, smell, heat and sound during the mock-up process?	10%	90%	CAD/CAM
Which technique do you prefer based on cost (price)?	70%	30%	Conventional

Discussion

In recent years, the importance of facial and dental aesthetics has gained significant attention as they play a key role in self-expression and boosting self-confidence. As a result, understanding and addressing patient expectations is crucial for achieving satisfactory treatment outcomes. Effective communication between the clinician and the patient, especially regarding aesthetic desires, is central to successful treatment planning. Mock-ups, whether conventional or CAD/CAM-fabricated, are fundamental tools that help visualize potential results, facilitate treatment planning and guide clinicians in determining the optimal restoration thickness for ceramic restorations. Any inaccuracies in

mock-up fabrication can lead to complications and unsatisfactory aesthetic outcomes.[10-15]

Historically, mock-up fabrication has been a challenging and operator-dependent process. The conventional method, which involves direct work in the patient's mouth, or using silicone indices, can be time-consuming and subject to operator variability. The advent of digital smile planning and CAD/CAM technology, however, has streamlined this process, reduced errors and enhanced efficiency. The integration of digital tools has particularly benefited adhesive restorations in the aesthetic regions, demonstrating significant improvements in both precision and consistency.[16,17]

The results of this study indicated that CAD/CAM-milled mock-ups resulted in higher patient satisfaction, particularly in terms of comfort and time required for completion. This is likely due to the precision and efficiency offered by the CAD/CAM process. In terms of clinical performance, CAD/CAM-milled mock-ups demonstrated slightly better retention and marginal adaptation compared to conventional mock-ups. However, both techniques performed well overall, with no significant differences in aesthetics or marginal discoloration between the two methods.

While both conventional and CAD/CAM mock-ups provided satisfactory results, the CAD/CAM approach offered some distinct advantages in terms of patient satisfaction and clinical outcomes. These results suggest that CAD/CAM mock-ups may be particularly beneficial in cases where patient comfort, time efficiency and precision are key factors. The improved marginal adaptation observed in the CAD/CAM group can also contribute to more stable and long-lasting outcomes.[18-19]

Recommendations

Further clinical trials with longer follow-up periods are needed to evaluate the long-term clinical performance and patient satisfaction with different mock-up types. Larger sample sizes and more diverse patient demographics will ensure that findings can be generalized across various clinical situations. Additionally, future research should assess the cost-effectiveness of CAD/CAM and 3D printed mock-ups compared to traditional methods, providing a comprehensive evaluation of their utility in the clinical practice. Finally, future studies could investigate the impact of material innovations on the durability and aesthetic outcomes of mock-ups, which will help to drive further advancements in the field of aesthetic dentistry.

Conclusion

Both conventional and CAD/CAM-milled mock-ups have demonstrated comparable clinical performance in terms of their ability to achieve satisfactory aesthetic results. However, CAD/CAM mock-ups showed slightly superior patient satisfaction, particularly in comfort and time efficiency aspects, as well as clinical outcomes, including better retention and marginal adaptation. These advantages are likely attributed to the precision and consistency inherent in CAD/CAM technology, which allows a more streamlined process and enhanced accuracy in mock-up fabrication.

References

1. *Zhang X, Liou F:* Introduction to additive manufacturing. In: Additive Manufacturing. Elsevier J; 2021; 5: 1e31.
2. *Ahmed M, Tharwat M, Sanad A, Abdelhamid K, Ali H, Tammam R:* From conventional to virtual smile design systems: a current systematic review. Preprints 2021; 2021040572.
3. *Jafri Z, Ahmad N, Sawai M, Sultan N, Bhardwaj A:* Digital smile design-an innovative tool in aesthetic dentistry. Oral Biol Craniofac Res J 2020; 10: 194e8.

4. *Pillai S, Upadhyay A, Khayambashi P, Farooq I, Sabri H, Tarar M,* et al.: Dental 3D-printing: transferring art from the laboratories to the clinics. Polymers J 2021; 13: 157.
5. *Lo Giudice A, Ortensi L, Farronato M, Lucchese A, Lo Castro E, Isola G:* The step further smile virtual planning: milled versus prototyped mock-ups for the evaluation of the designed smile characteristics. BMC Oral Health J 2020; 20: 1e10.
6. *Zazirkar G, Bhoneja B, Lokare M, Padiyar P, Damale V:* An in vitro comparative evaluation of marginal integrity and axial wall adaptation of provisional restorations fabricated by CAD/CAM with those fabricated manually. Indian J Sci Res J 2021; 10: 466e70.
7. *Silva BP, Stanley K, Gardee J:* Laminate veneers: preplanning and treatment using digital guided tooth preparation. Esthetic Restorative Dent J 2020; 32: 150e60.
8. *Marchesi G, Camurri Piloni A, Nicolin V, Turco G, Di Lenarda R:* Chairside CAD/CAM materials: current trends of clinical uses. Biology J 2021; 10: 1170.
9. *Ragusha R, Ibraimi D:* Mock-up: an aid in the different steps in aesthetic dental treatment. Eur Sci J 2016; 12: 306e15.
10. *Wan H, Wan N, Makhbul Mohd Z, Othman SA:* Age and gender are associated with the component of psychosocial impact of dental aesthetics questionnaire in young people: a cross-sectional study. Children J 2022; 9: 496.
11. *Cattoni F, Tete G, Calloni AM, Manazza F, Gastaldi G, Cappare P:* Milled versus moulded mock-ups based on the superimposition of 3D meshes from digital oral impressions: a comparative in vitro study in the aesthetic area. BMC Oral Health 2019; 19: 1e8.
12. *Chitlange P, Madhu P, Reche A:* Digital smile design-an overview of 3D digital workflow. Clin Diag Res J 2023; 17: 1e2.
13. *Etienne O, Nguyen T:* Esthetic mock-ups: a clinical study of reproducibility. Int Esthetic Dent J 2021; 16: 310e23.
14. *Gontijo S, Morgado P, Neves L, França E, Lages E, Alvim H,* et al.: Digital smile design as a tool in the planning of porcelain laminate veneers restoration. RGO 2021; 69: 45e55.
15. *Schweiger J, Güth J, Edelhoff D, Seidel K, Graf T:* Application of 3D-printed colored 3D-models for the fabrication of full ceramic restorations: a technical report. Esthetic Restora Dent J 2022; 34: 235e43.
16. *Daniel W:* Biostatistics: a foundation for analysis in the health sciences. seventh ed. New York: John Wiley & Sons; 1999. p. 141e2.
17. *Zotti F, Pappalardo D, Capocasale G, Sboarina A, Bertossi D, Albanese M:* Aesthetic dentistry, how you say and how you see: a 500-people survey on digital preview and color perception. Clin Cosmet Invest Dent J 2020; 4: 377e89.
18. *Jain R, Singh SK, Upadhyay RK:* A case study on the role of additive manufacturing in dentistry. Add Manufac. Adv Mater Des Tech 2023; 13: 99.
19. *Zhongyi L, Ye H, Bai H, Zhao Y, Wang Y, Sun Y,* et al.: Three-dimensional digital evaluation of thickness accuracy of mock-ups fabricated by silicone matrices: an in vitro study. Prostho Res J 2022; 66: 445e51

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